STATOIL

Final Well Report
Well 7131/4-1
Guovca, PL 233

EPDS-7131/4-1-025

STATOIL

Title:
Final Well Report **Well 7131/4-1** **Guovca, PL 233**

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Geology and formation data report
Drilling operations report

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1 Summary

The well was designed as a vertical well with as few sections as possible; 36", 9 7/8" pilot hole, 17 ½" and 8 ½". A 9 7/8" pilot hole was drilled and opened to 17 ½" before installing the 13 3/8" surface casing above the pressure build-up zone. An 8 ½" hole was drilled to the well TD. The well was permanently plugged and abandoned.

1.1 Well data record

Well name:	7131/4-1	
Type of well:	Wildcat	
Prospect:	Guovca	
Area:	Barents Sea	
Country:	Norway	
Licence:	PL 233	
Licensees:	Statoil ASA	50 %
	Norsk Hydro Produksjon AS	35 %
	Eni Norge AS	15 %
Drilling unit:	Eirik Raude	
Type:	Semi submersible drilling rig	
Water depth:	331 mMSL	
RKB-MSL:	25 m	
TD:	1295 mTVD MD / 1295 m RKB TVD	
On contract:	31.03.2005	
Off contract:	18.05.2005	
Formation at TD:	Kobbe Formation (Middle Triassic)	
Surface co-ordinates:	Latitude	71º 41' 40.98"
	Longitude	31º 00' 40.96"
Datum/spheroid:	ED-50, INT 1924	
UTM:	UTM zone 35, CM 27º E	
	7 959 769 m N	
	640 535 m E	
Seismic reference:	Seismic survey ST9802, Inline 1792, Crossline 6001	

All depths in this report refer to RKB (Rotary Kelly Bushing) unless otherwise stated.

1.2 Well objectives

The objective of well 7131/4-1 was to prove hydrocarbons in the Fruholmen Formation of Norian age (the Garja 1 and Garja 2 sandstones) and in the Snadd Formation of Carnian age (the Guovca sandstone).

1.3 Result of the well

Well 7131/4-1 was spudded in a water depth of 331 mMSL and drilled to a total depth of 1295 mTVD RKB. TD of the well was set in the Kobbe Formation. No shallow gas was observed.

No hydrocarbons were proven in well 7131/4-1. The observed stratigraphy was close to the prognosis, except for the the presence of the Stø Formation. This sandstone interval was not expected to be present at the location. One core was cut in the Garja 1 sandstone and one core was cut in the Guovca sandstone, as planned. MDT water samples were collected in the Stø and Guovca sandstones.

1.4 Drilling summary

1.4.1 Casing

Table 1-1 Casing programme summary.

Casing	Shoe depth (mMD / mTVD RKB)	LOT / FIT (Equivalent mud weight)
30”	403.5 / 403.5	NA
18 ¾” WH x 13 3/8” casing	799.5 / 799.5	LOT 1.67 g/cm^3

1.4.2 Drilling fluids

Table 1-2 Drilling fluids summary.

Section	Section (mMD RKB)	Maximum mud weight (g/cm3)	Mud type
36”	407.7	1.03	Seawater / high visc. sweeps
9 7/8” pilot hole	811	1.03	Seawater / high visc. Sweeps
17 ½”	806	1.03	Seawater / high visc. Sweeps
8 ½”	1295	1.03	Glydril (99 % KCl/Pac/glycol)

1.5 Data acquisition summary

See Figure 1-2.

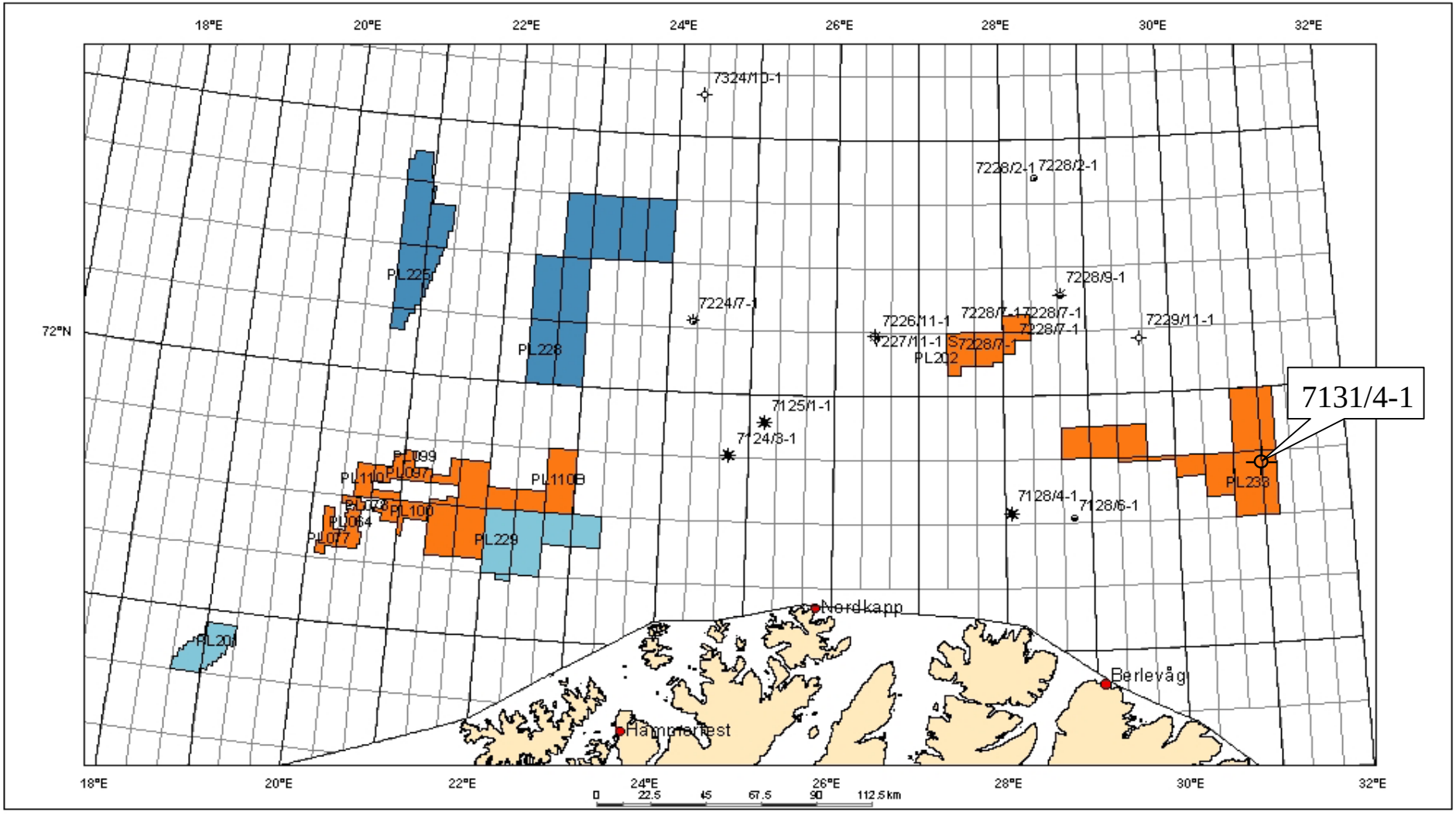


Fig. 1-1 Location map well 7131/4-1 Guovca

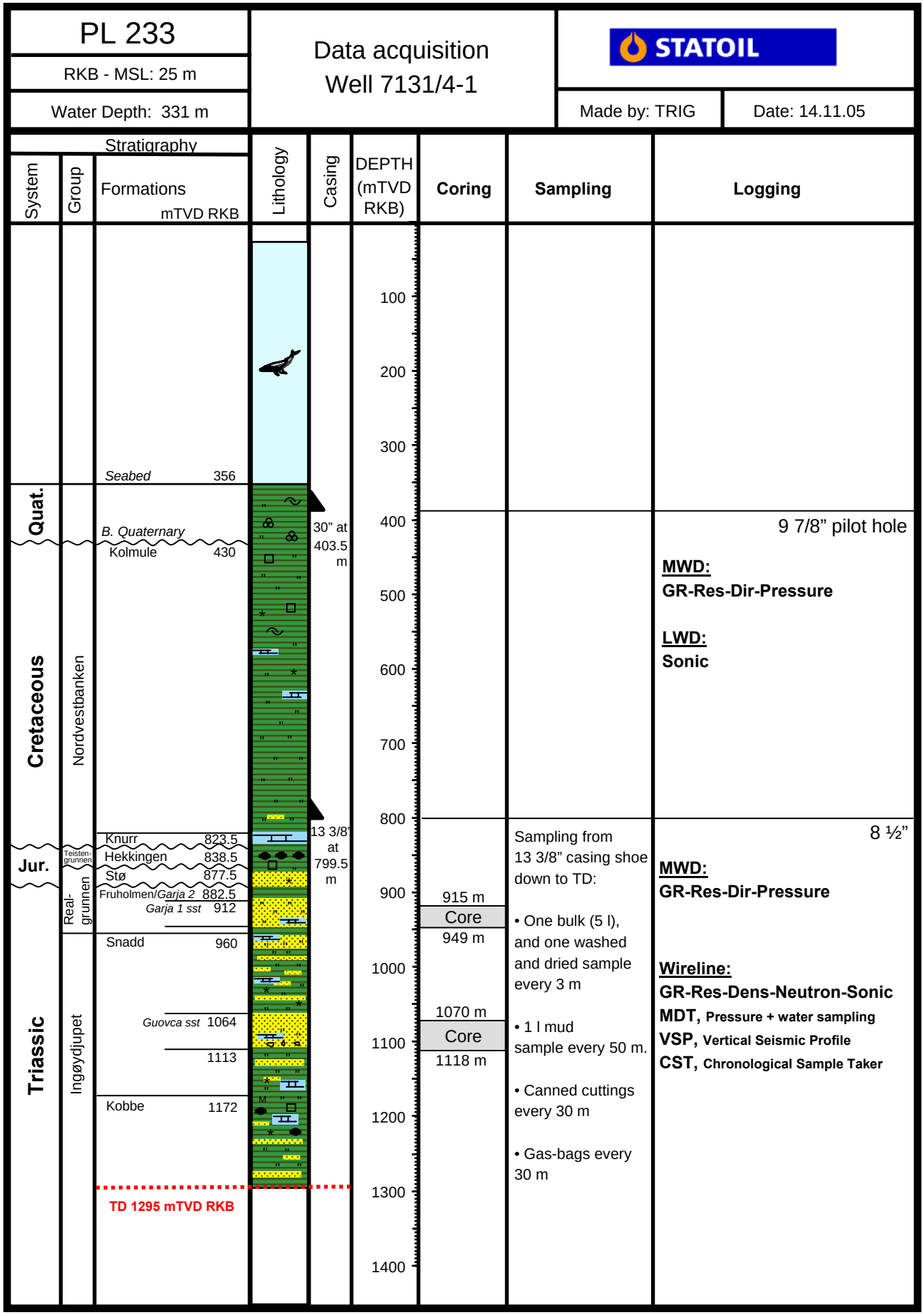


Fig. 1-2 Formation evaluation

2 Exemptions and non-conformances

None.

3 Health, safety, environment and quality (HSE&Q)

3.1 Incident Reports (RUH's)

A total number of 40 RUH's (Incident Reports) were registered while drilling the Guovca well.

3.2 Comments to the reports

Of the above mentioned reports there were:

- 2 LTA's (Lost Time Accident)
- 1 red incident
  - This red incident with two LTA's are reported in Synergy no. 308144; two persons were injured when a ladder broke.
- 3 yellow incidents:
  - Accidental discharge to the sea of approximately 1200 litre hydraulic oil from the BOP carrier.
  - MWD failure in the 9 7/8" pilot hole.
  - Leaking cement plug during P&A operation.
- 1 spill to sea (the yellow discharge incident mentioned above)
- 3 medical treatments:
  - A pinched hand with torque tool.
  - A twisted ankle stepping down from step.
  - A twisted ankle on drill floor.
- 2 first aid incidents:
  - A person hit his leg against a doorframe.
  - A person slipped and fell on riser deck.

There were 0 falling objects and 0 potential falling objects incidents.

801 Care cards were reported.

3.3 Other non-conformances and quality reports in Synergy

Table 3-1 Quality related non-conformances reported in Synergy that was considered as serious.

Synergy No.	Date	Title
308178	02.04.2005	Failure of Anderdrift inclinometer.
308420	03.04.2005	Partly lost communication due to weather conditions
308690	06.04.2005	MWD failure.
311297	06.04.2005	Second back-up tool (MWD MPR) for the 9 7/8” pilot hole had not been sent from vendor.
311311	08.04.2005	17” string stab had not been sent from vendor.
309242	09.04.2005	During reaming top drive came in contact with stand of pipe in hydraracker.
309605	12.04.2005	Hydraulic fluid spill to sea from BOP carrier system.
314417	06.05.2005	Drill pipe stand fell out of finger board.
321340	14.05.2005	P&A leaking of cement plug #2.
322278	14.05.2005	Unable to supply cement from silo A to cement unit/surge tank.

3.4 Experience Summary

Table 3-2 Experience summary

Section	Experience (subject and description)	Immediate solution	Solution recommended for future
36”	Synergy 308178 (Closed) - 02.04.2005 - Non Conformance - Experienced inconsistent readings of survey data from Anderdrift tool. Checked tool against TOTCO while WOW, OK. Re-surveyed hole when RIH, new surveys were 0.25°/0.75° compared to 2.25° previously experienced.	Drilled to 36” TD. Rig downtime: 1.5 hrs	Evaluate use of MWD DIR instead of Anderdrift.
	Synergy 308649 (Closed) – 04.04.2005 – Non Conformance – 500 ton bails not able to fit 30 elevator ears.	Spent time to locate certified slings for lifting conductor to drill floor. Rigged up 350 T drilling bails and 2 m 50 T slings. Rig downtime: 1.0 hrs.	Improve job execution on rig floor – improve operational procedures.
	Cemented the 30” conductor in tension due to 0.75° inclination at TD of the 36” section.	Managed to adjust the bulls-eyes inclination on 30" Conductor housing to 0.5° by pulling the rig 2 m aft.	After releasing the WHH-RT the bulls-eyes reading were 0.5° / 0.0°. Cement conductor in tension when inclination in hole is above limit.
9 7/8”	Synergy 308690 (Closed) – 06.04.2005 – Non Conformance – MWD failure. Was not able to communicate with MPR from the start of the section. POOH, attempted to establish el. communication with tool at surface, no success. PU back-up tool, but crossed threads.	Were able to MU BHA consisting of primary MPR together with back-up APX tool. Rig downtime: 11.5 hrs.	Improve procedures for MU tool when raining. Expecting water intrusion in tool connection to have caused the problem.
17 ½”	Used steel PDC 9 7/8” x 12 ¼” HO between 8” bullnose and the 12 ¼” x 17 ½” HO.		Had none previously experience with this type HO. The PDC HO was run without any wear, the standard HO came out totally worn out. At locations where boulders are not expected, PDC type HO should be evaluated used.
	Problems experienced after cement unit was modified to be environmentally friendly. The drains had been blocked off.	This led to large amounts of cement left in suction lines, inadequate cooling of plunger pumps, unable to wash the displacement tanks.	Better plans for changing layout / procedures for the cement unit must be carried out.
8 ½”	Sticky cuttings blocking the screw-conveyers were experienced during drilling the 8 ½” section.	Flushed the conveyers with water and air to keep operation going.	Re-build the cuttings transport system for the next operation in the Barents Sea.
P&A	Experienced severe problems on cement unit setting plug #3. Samples of cement collected from the surge tank and from silo A showed signs of moisture and presence of cement lumps.	Managed to continue setting of plug #3.	

3.5 Time distribution 7131/4-1

Table 3-3 Time distribution

Total time planned (p50)	22.5 days
Total time (included 432 hrs suspension time)	49.7 days
Total time	31.7 days
Total D-time	59.5 hrs
Total W-time	82.5 hrs
Total Q-time	0.0 hrs
Waiting on weather (WOW)	66.0 hrs

Table 3-4 Operations factor

Ops. Factor: $= \frac{Total\_time - Down\_time - WOW}{Total\_time - WOW} * 100$	91.4 %

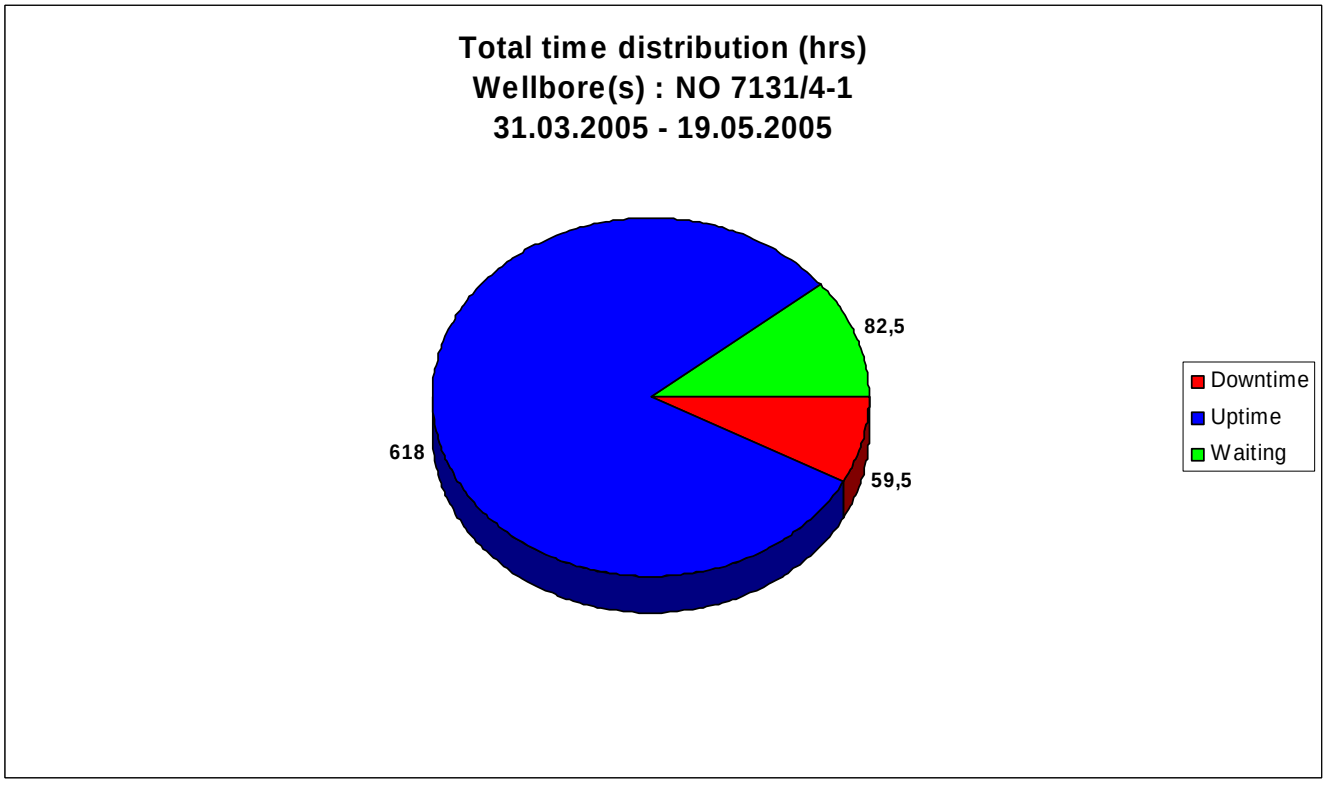


Figure 3-1 Time distribution

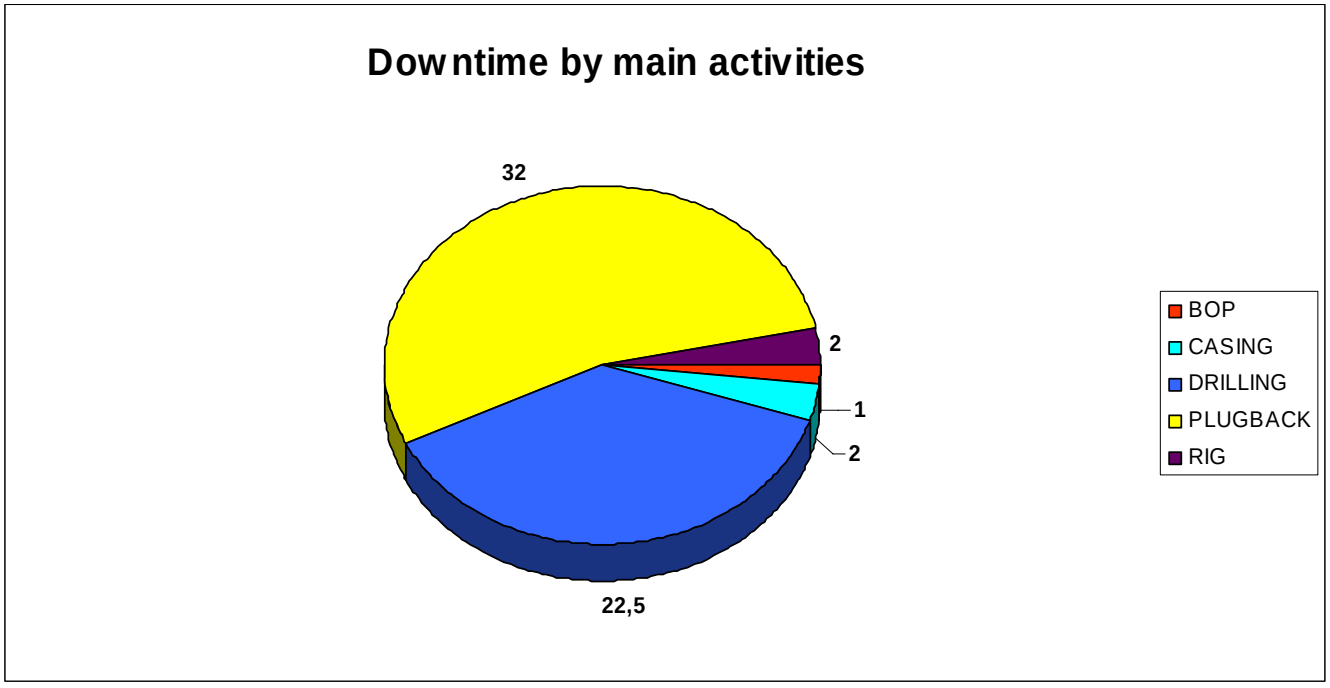


Figure 3-2 Downtime distribution by main activities

Table 3-5 Downtime distribution per company in hours

Company	Downtime description	Downtime (hours)
Statoil	Cement plug #2	32.0
BHI (MWD)	MPR and crossed threads	13.5
BHI (DDR)	Anderdrift tool	1.5
Ocean Rig	Bolt on DDM (7.0 hours) and minor incidents	12.5
N/A	Operations suspended due to hydraulic oil spill to sea	432.0

4 Geology and formation data report

4.1 Geological setting and results

PL 233 is located offshore Finnmark, Norway and is bounded by the Nordkapp and Tiddly Basins to the west and north, respectively (see Figure 4-1). The area is a north dipping monocline, which extends eastwards.

The area west of PL 233 is mainly affected by the Caledonian orogeny (Silurian-Early Devonian), and east of the PL 233 the Baikalian tectonics (pre-Cambrian) have dominated.

Summary of tectonic events in the area:
-Local basins developed in Devonian or older, probably not affected by the Caledonides.
-Block faulting during Carboniferous time with later reactivation.
-Monocline established in the Carboniferous.
-Slightly uplifted southern platform area at the Permian-Triassic transition.
-Block faulting at the Jurassic-Cretaceous transition mainly affected the outer platform margin area.
-Subsidence during Cretaceous times while a new provenance area was established in uplifted areas towards north.
-Major uplift and erosion during Cenozoic times. The southern platform areas are most uplifted.

Tertiary sediments are completely absent in the Finnmark East area. Sediments deposited at that time were later eroded and transported towards the west. The uplift for the Finnmark East area is calculated to be about 1000 – 1500 m.

Well 7131/4-1 penetrates rocks of Quaternary, Cretaceous, Jurassic and Triassic age. TD of the well is in rocks of Triassic age in the Kobbe Formation (Figure 4-2).

4.2 Shallow gas results

A 9 7/8” pilot hole was drilled from 411 - 811 m. No shallow gas was observed.

4.3 Stratigraphy

The stratigraphical division is based on interpretation of the biostratigraphic report, log curves and on correlation with offset wells. The stratigraphy of the well is shown in Figure 4-2 and Figure 4-3. Observed versus prognosed stratigraphy is shown in Figure 4-4.

4.3.1 Table of chronostratigraphy

Table 4-1 Chronostratigraphy

Stratigraphic succession		mMD RKB	
Studied interval 814 – 1295 mMD RKB		**From**	**To**
Cretaceous	Upper Barremian	814	817
	Lower Barremian	820	832
---------- Base Cretaceous Unconformity ----------			
Jurassic	Upper Volgian	840	865
	Middle Volgian	869	870
	Lower Volgian – Middle Oxfordian	871	877
	---------- Unconformity ----------		
	Upper Toarcian	878.5	878.5
---------- Unconformity ----------			
Triassic	Lower Norian	884	956
	Upper Carnian	967	1048
		1054	1072
	Lower Carnian	1081	1147
	Upper Ladinian	1150	1179
	Upper Anisian	1195	1295
	TD	1295	

4.3.2 Table of lithostratigraphy

Table 4-2 Lithostratigraphy

Period	**Group top**	**Formation top and/or seismic marker**		**Observed**			**TWT (from VSP)**
				mMD RKB	**mTVD RKB**	**mTVD MSL**	**Sec.**
Quaternary	NORDLAND GP	Seabed/T. Quaternary		356	356	331	0.447
Cretaceous	NORDVESTBANKEN GP	Kolmule Fm		430	430	405	0.531
		Knurr Fm		823.5	823.5	798.5	0.867
Jurassic	TEISTENGRUNNEN GP	Hekkingen Fm		838.5	838.5	813.5	0.877
	REALGRUNNEN GP	Stø Fm		877.5	877.5	852.5	0.910
Triassic		Fruholmen Fm	Garja 2 Top	882.5	882.5	857.5	0.914
			Garja 1 Top	912	912	887	0.934
	INGØYDJUPET GP	Snadd Fm		960	960	935	0.966
			Guovca Top	1064	1064	1039	1.036
			Guovca Base	1113	1113	1088	1.070
		Kobbe Fm		1172	1172	1147	1.109
	TD			1295	1295	1270	1.184

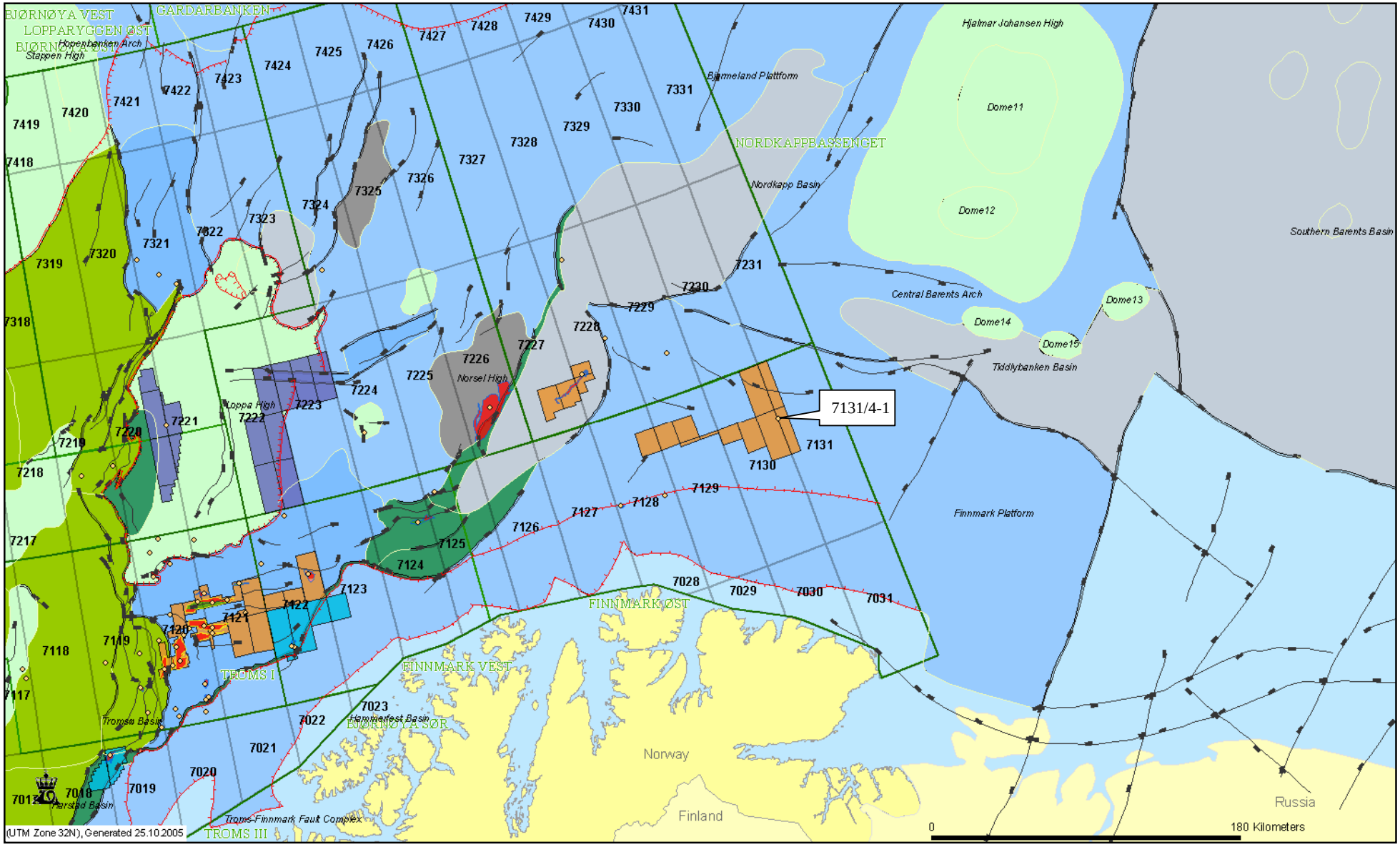
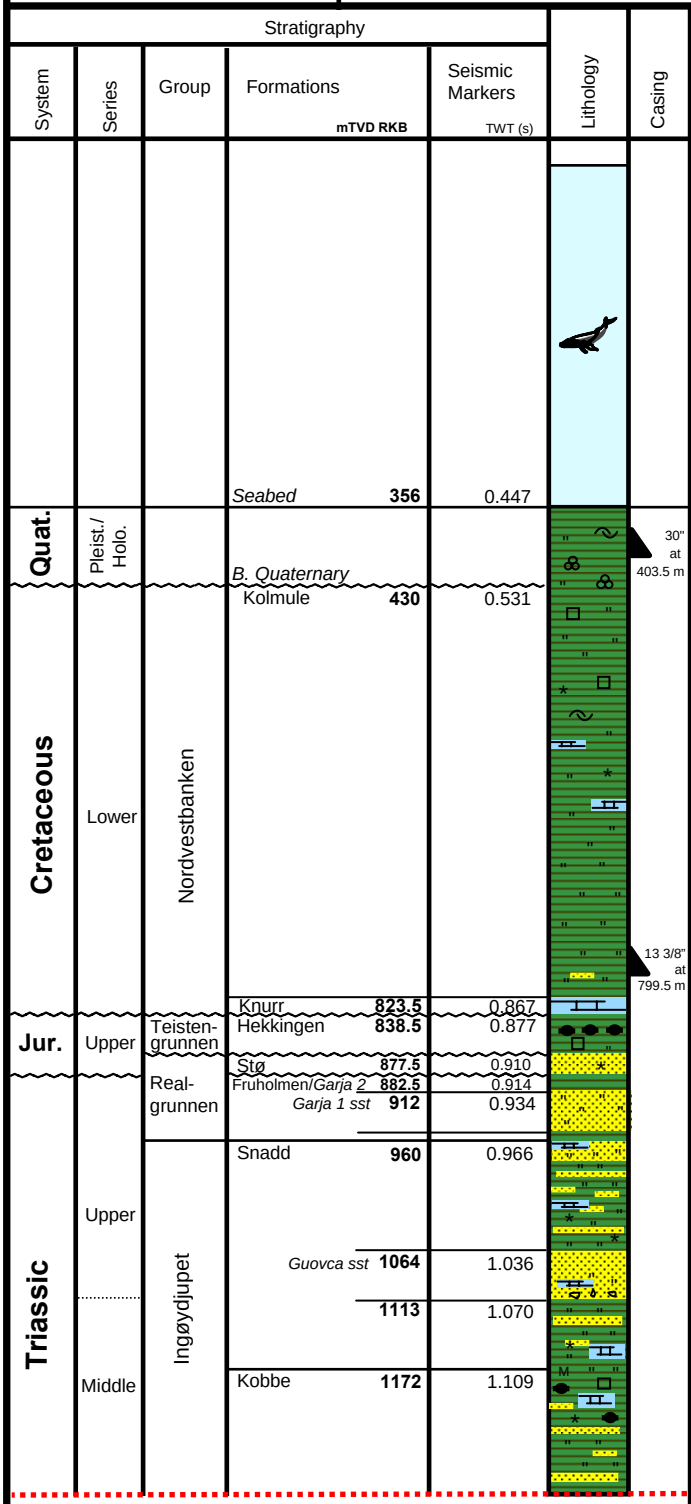


Fig. 4-1 Regional structural setting

PL 233	Stratigraphy	STATOIL
RKB - MSL: 25 m	7131/4-1	
Water Depth: 331 mMSL	GUOVCA	Made by: TRIG / Date: 14.11.2005



Lithology Descriptions

NORDVESTBANKEN GROUP

KOLMULE FORMATION:

Claystone: moderate brown to greyish red, firm, blocky, silty, and non to slightly calcareous, microcarbonaceous, a few calcite/dolomite stringers, a silty and sandy section at the base

KNURR FORMATION:

Claystone: moderate brown to greyish red, firm, blocky, silty, calcareous, grading to marl I.P., abundant micropyrite I.P.

Limestone: white to off white, blocky, crystalline

TEISTENGRUNNEN GROUP

HEKKINGEN FORMATION:

Claystone: brown black to dusky yellow brown, firm, subfissile, silty, slightly to moderate calcareous I.P., carbonaceous, micromicaceous, micropyritic I.P.

Limestone: white to off-white, green grey to light grey, micritic to microcrystalline, argillaceous and micropyritic I.P.

STØ FORMATION:

Sandstone: Pale yellow grey, fine to medium, well sorted, angular to subangular, pale yellow grey argillaceous matrix, green speckles (glauc?), non calcareous, fair visible porosity

REALGRUNNEN GROUP

FRUHOLMEN FORMATION:

The Garja 2 sandstone –

Sandstone: clear to occasionally milky white, olive grey to brownish grey, quarts, very fine to medium, poorly to well sorted, subangular to subrounded, loose, very fine to very coarse, occasionally argillaceous matrix, silica cemented, calcareous cemented I.P., traces of glauconite and pyrite

Between the Garja 2 and the Garja 1 sandstones –

Claystone: medium grey to medium dark grey, soft to firm, subblocky to amorphous, locally sticky, silty, and slightly calcareous, grading to siltstone I.P.

Garja 1 sandstone –

Medium grey, very fine to fine, well sorted, firm to friable, clear, translucent quartz, argillaceous, slightly silica cemented, traces mica and dark green speckles (glauconite?), poor visible porosity, also lenses and lamina of medium grey claystone

Below the Garja 1 sandstone –

Interbedded sandstone and claystone

INGØYDJUPET GROUP

SNADD FORMATION:

Above Guovca sandstone –

Sandstone: clear to translucent, quartz, traces of light pink, very fine to very coarse, very poorly sorted, subangular to subrounded, loose, traces of mica, pyrite and glauconite

Claystone: light grey, light green grey, pale yellow brown, soft, amorphous, non calcareous

Limestone: white to off white, soft to firm, micritic, microcrystalline, dolomitic

Guovca sandstone –

Sandstone: dusky green, medium grey, very fine to occasionally coarse grained, subangular to subrounded, calcareous cemented, occasionally silica cemented, fair to well sorted, fair to poor visible porosity, occasionally micaceous, parts of claystone, poorly sorted conglomerate at the base, traces of pyrite

Below the Guovca sandstone –

Interbedded sandstone and claystone

KOBBE FORMATION:

Interbedded claystone and siltstone with stringers of sandstone and limestone. Claystone dominates the formation.

Claystone: multicoloured, light green grey, light olive grey, brick red, moderate yellow brown, homogenous, massive, occasionally micromicaceous, occasionally pyritic, calcareous, occasionally grading marl, hygroscopic

Siltstone: greyish green, light green grey, light olive grey, firm to moderate hard, homogenous but occasionally grading claystone, occasionally sandy, non to slightly calcareous, very hygroscopic

Sandstone: light to medium grey, very fine to fine, argillaceous, occasionally with dark green grains, non calcareous, well sorted, fair to good visible porosity, very hygroscopic

Fig. 4-2 Stratigraphy

PL 233

RKB - MSL: 25 m

Water Depth: 331 mMSL

Reservoir section
7131/4-1
GUOVCA

STATOIL

Made by: TRIG

Date: 14.11.2005

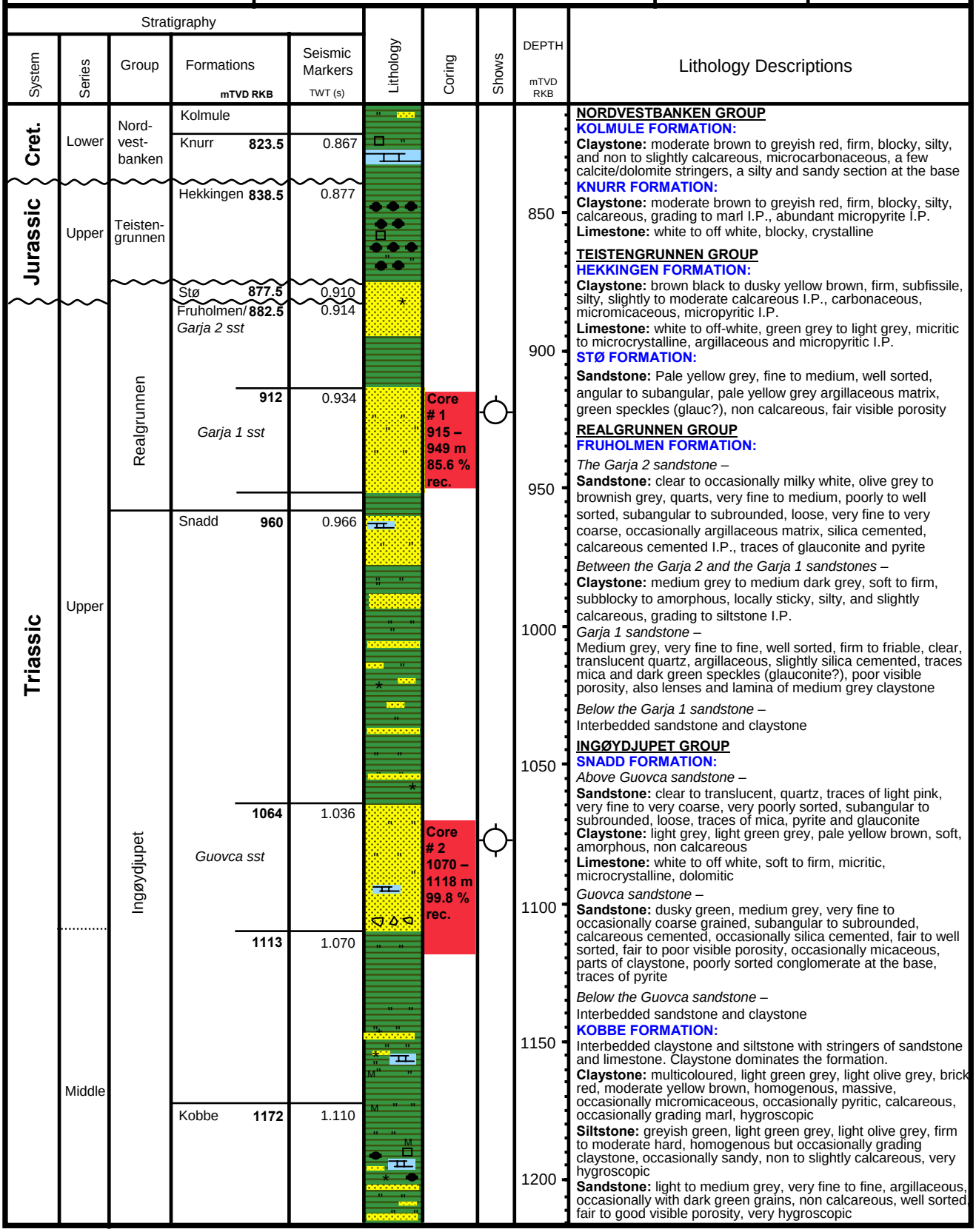


Fig. 4-3 Stratigraphy in the reservoir section

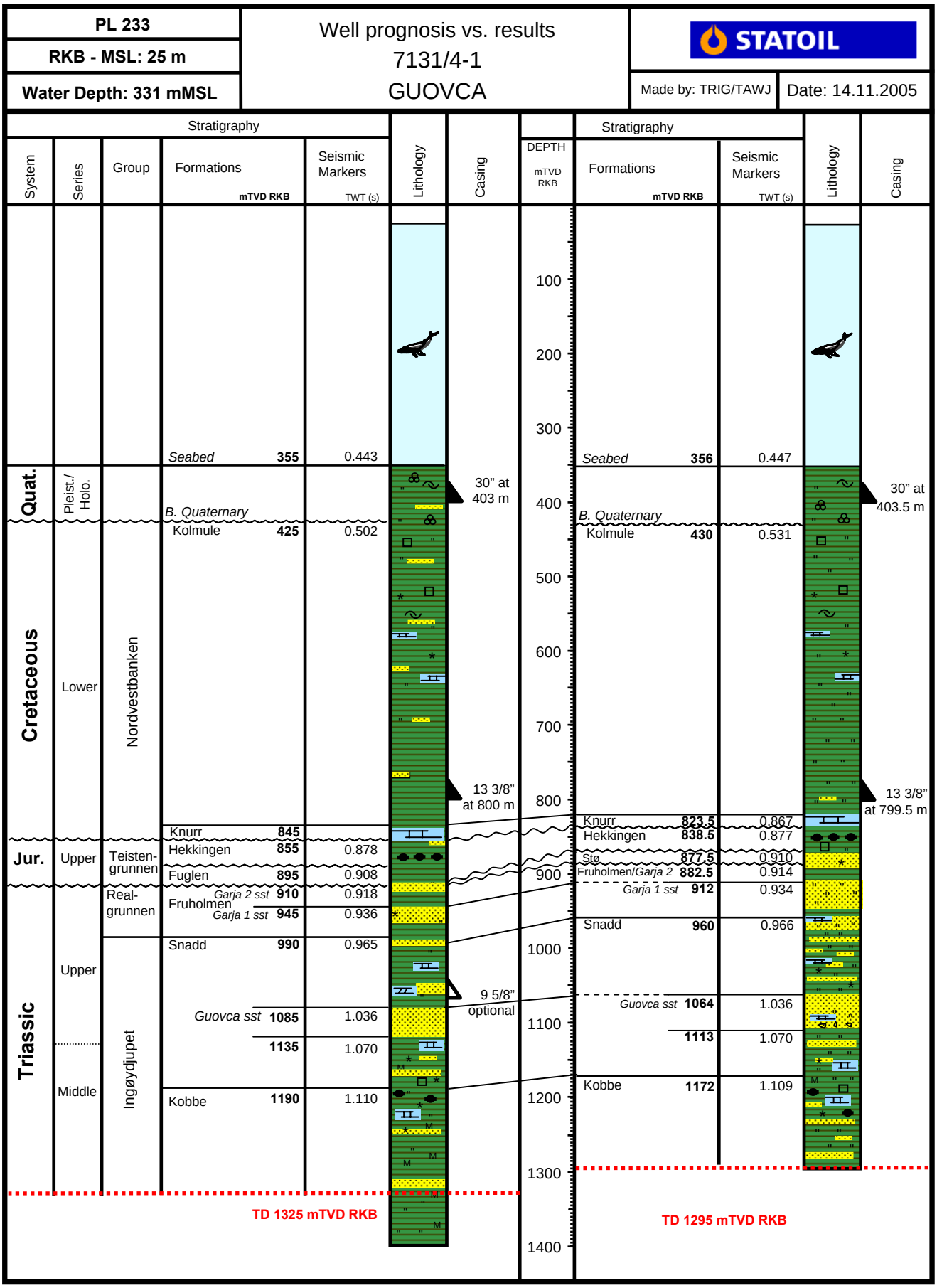


Fig. 4-4 Observed versus prognosed stratigraphy

4.4 Lithostratigraphic descriptions

QUATERNARY **356 – 430 mMD, 356 – 430 mTVD (331 – 405 mMSL)**

System: Quaternary
Series: Pleistocene – Holocene (samples analysed from 814 mMD RKB)

The Quaternary sediments were drilled with returns to the sea floor and lithology is inferred from the recorded MWD memory log (from 415 m) and relevant information from the offset wells. The sediments are dominated by clay, with a few possibly sand layers.

NORDVESTBANKEN GROUP **430 – 838.5 mMD, 430 – 838.5 mTVD (405 – 813.5 mMSL)**

The top of the Nordvestbanken Group is picked at the start of a decreasing resistivity trend. The Nordvestbanken Group comprises the Kolmule Formation and the Knurr Formation.

Kolmule Formation **430 – 823.5 mMD, 430 – 823.5 mTVD (405 – 798.5 mMSL)**

System: Cretaceous
Series: Albian (samples analysed from 814 mMD RKB)

The Kolmule Formation was drilled with returns to the sea floor down to 811 mMD. The lithology description is therefore based on MWD memory logs, gamma ray and resistivity, and info from offset wells and cuttings from the bottom part of the formation.

The sediments are dominated by uniform claystone with a few calcite or dolomite stringers and a silty/sandy section close to TD. The claystone is moderate brown to greyish red, firm, blocky, silty, and non to slightly calcareous.

Knurr Formation **823.5 – 838.5 mMD, 823.5 – 838.5 mTVD (798.5 – 813.5 mMSL)**

System: Cretaceous
Series: Lower Barremian
Depositional environment: Open marine, little terrigenous influence

The top of the Knurr Formation is defined by a decrease in the gamma ray log and an increase in the sonic log velocity. An increase is also seen on the resistivity log.

The Knurr Formation consists of calcareous claystone and limestone stringers. The claystone is moderate brown to greyish red, firm, blocky, silty, grading to marl in part and contains abundant micropyrite in part. The limestone is white to off white, blocky and crystalline.

TEISTENGRUNNEN GROUP **838.5 – 882.5 mMD, 838.5 – 882.5 mTVD (813.5 – 857.5 mMSL)**

The top of the Teistengrunnen Group is defined by an abrupt increase in the gamma ray log, associated with a sharp decrease in sonic log velocity. The Teistengrunnen Group comprises the Hekkingen Formation.

Hekkingen Formation **838.5 – 877.5 mMD, 838.5 – 877.5 mTVD (813.5 – 852.5 mMSL)**

System: Jurassic
Series: Middle – Upper Volgian – Oxfordian
Depositional environment: Marine, anoxic, strong terrigenous influence. Significant freshwater runoff in upper part.

The Hekkingen Formation consists of claystone with traces of limestone. The claystone is described as brown black to dusky yellow brown, firm, subfissile, silty and in parts slight to moderate calcareous. It is carbonaceous, micromicaceous and in parts micropyritic. The limestone is white to off-white, green grey to light grey, micritic to microcrystalline, and argillaceous and micropyritic in part.

REALGRUNNEN GROUP **882.5 – 960 mMD, 882.5 – 960 mTVD (857.5 – 935 mMSL)**

The Realgrunnen Group comprises the Stø and Fruholmen Formations including the Garja 2 and Garja 1 sandstones. The top of the Realgrunnen Group is picked at a sharp decrease on the gamma ray log associated with an increase in sonic log velocity.

Stø Formation **877.5 – 882.5 mMD, 877.5 – 882.5 mTVD (852.5 – 857.5 mMSL)**

System: Jurassic
Series: Upper Toarcian
Depositional environment: Marine, strong terrigenous influence

The Stø Formation sandstone is pale yellow grey, fine to medium, well sorted, angular to subangular, with pale yellow grey argillaceous matrix and green speckles (glauconite?). The sandstone is non calcareous and has fair visible porosity.

Fruholmen Formation **882.5 – 960 mMD, 882.5 – 960 mTVD (857.5 – 935 mMSL)**

System: Triassic
Series: Lower Norian
Depositional environment: Marginal marine, strong terrigenous influence. Garja 1 is non marine, possibly deposited in brackish/fresh water.

The Upper part of the Fruholmen Formation is the Garja 2 sandstone. This sandstone is overlying a claystone sequence. The sandstone is light grey to light yellow grey, with translucent quartz grains. It is fine to coarse, poor to well sorted, subangular to subrounded and with fair to very good visible porosity. There are also fragments of sandstone which are olive grey to brownish grey, very fine, well sorted, brittle, occasionally with argillaceous matrix and silica cement. The sandstone is calcareous cemented in parts, traces of glauconite and rarely pyrite coating on sand grains occur.

The claystone between the Garja 2 and the Garja 1 sandstones is predominately dark green grey to dark grey, soft, homogenous, massive and non calcareous.

Top Garja 1 sandstone is defined by an abrupt decrease on the gamma ray log, and a slight increase in the sonic log velocity trend.

The Garja 1 sandstone (912 – 950.5 mMD / mTVD RKB) is generally pale yellow brown, in parts light to dark grey, generally very fine grained, well sorted, generally subangular, hard and silica cemented. It contains occasional claystone laminae, occasional coal fragments, it is occasional micaceous and has fair to good visual porosity.

The Fruholmen Formation below the Garja 1 sandstone is only 10 m thick, consisting of interbedded sandstone and claystone. The claystone is olive black to dark grey, firm, homogenous, massive, micropyritic and non calcareous.

INGØYDJUPET GROUP **960 – 1295 mMD, 960 – 1295 mTVD (TD) (935 – 1270 mMSL)**

The top Ingøydjupet Group does not initiate any large changes in the logs, although a decrease can be seen on the gamma ray log. The Ingøydjupet Group comprises the Snadd Formation, with the Guovca sandstone, and the Kobbe Formation.

Snadd Formation **960 – 1172 mMD, 960 – 1172 mTVD (935 – 1147 mMSL)**

System: Triassic
Series: Upper Ladinian – Upper Carnian
Depositional environment: Non marine to marginal marine

The Snadd Formation above the Guovca sandstone consists of alternating sandstone and claystone with minor limestone and pyrite nodules.

The sandstone is predominately seen as loose sand grains of clear to translucent quarts, with traces of light pink grains and glauconite. It is very fine to very coarse, in parts predominately fine to medium, generally very poorly sorted and subangular to subrounded. Traces of mica occurs and occasionally pyrite coating on sand grains. Sandstone fragments are pale yellow brown, white to light grey, very fine, occasionally grading to siltstone, well sorted, contains argillaceous matrix and are in parts calcareous. Well calcareous cemented stringers and limestone stringers occur.

The claystone is light grey, light green grey, pale yellow brown, soft, amorphous, sticky and non calcareous. In the lower part, from approximately 1050 m, there are also pale red to greyish red and yellow orange to greyish orange, slightly silty, non calcareous, hygroscopic claystone. Brown black to black, firm, blocky to elongated, non calcareous claystone is also seen, but this might be cavings.

The limestone is white to off white, soft to firm, micritic, locally brownish grey, moderate hard, microcrystalline and dolomitic.

The Guovca sandstone (1064 – 1113 mMD / mTVD RKB) is a massive sandstone with a blocky appearance on the gamma ray log.

From the top to 1087 m, the sandstone is dusky green, fine to medium, occasionally coarse grained, subrounded to subangular, with green argillaceous matrix, firm to moderate hard, non to very calcareous, occasionally silica cemented and with poor visible porosity. In the lower part the sandstone is medium grey with clear to translucent quartz, very fine to fine, moderate to well sorted, firm to hard, friable in part, lenses and laminas of dark grey claystone, micaceous, dark green speckles (glauconite?) and with poor to fair visible porosity. At 1102 m, the sandstone is very well calcareous cemented.

At the base of the Guovca sandstone, a conglomerate occurs. The conglomerate consists of pebbles of quartz, chert and also rounded clasts of medium grey to pale brown shale/claystone. The conglomerate is poorly sorted and without visible porosity and it appears to be matrix supported. The matrix is sandy, well silica cemented and contains traces of pyrite.

The Snadd Formation below the Guovca sandstone consists of interbedded sandstone and claystone. The claystone is greenish black, firm, massive, homogeneus, micromicaceous and non calcareous. The sandstone is light green grey, friable, green speckled, argilleaceous, non caclcareous, very hygroscopic and has fair visible porosity.

Kobbe Formation **1172 – 1295 mMD, 1172 – 1295 mTVD (TD)**
(1147 – 1270 mMSL)

System: Triassic
Series: Upper Anisian
Depositional environment: Marginal marine, strong terrigenous influence. Possibly open marine on top.

The top of the Kobbe Formation is picked at the top of an interval with slightly higher resistivity than the formation above. The Kobbe formation consists of interbedded claystone

and siltstone with occasionally thin stringers of sandstone and limestone, but the claystone dominates the formation.

The claystone is generally multicoloured – light green grey, light olive grey, brick red, moderate yellow brown, moderate hard, homogenous, massive, occasionally micromicaceous, occasionally pyritic to micropyritic and non to very calcareous. It is occasionally grading marl and is none to very hygroscopic and occasionally dissolves rapidly in water.

The siltstone is described as greyish green, light green grey, light olive grey, firm to moderate hard, homogenous but occasionally grading claystone. It is occasionally sandy, none to slightly calcareous and generally very hygroscopic.

The sandstone is described as light to medium grey, very fine to fine, poor to well sorted, argillaceous, occasionally with dark green grains, non calcareous, fair to good visible porosity and very hygroscopic.

TD	**1295 mMD, 1295 mTVD (1270 mMSL)**

4.5 Hydrocarbon indications

No direct fluorescence was observed in the well. Cut and residual fluorescence was observed in core no.1 in argillaceous sandstone/siltstone at: 919-920 m, 925 m, 929-930 m and 937-938 m. The fluorescence is described as very slow blooming blue white cut, and blue white to milky white residual. The description of the fluorescence at 937-938 m is strong milky white residual. The gas readings were very low through the entire well (Table 4-3)

Table 4-3 Gas peaks

Depth mMD	Depth mTVD	Gas content %	C1	C2	C3	iC4	nC4	iC5	nC5	Description	Background gas %
820	820	0.64	6491	59	15	4	3	2		Formation gas	0.3
878	878	0.68	6781	69	14	4	3	3	1	Formation gas	0.3
1075	1075	0.15	1320	4	1	1				Formation gas	0.04
1112	1112	0.14	1338	7	2	1				Formation gas	0.04
1120	1120	0.16	1532	13	2					Formation gas	0.08
1155	1155	0.22	2123	14	2					Formation gas	0.08
1283	1283	0.12	1152	5	1					Formation gas	0.05

4.6 Geophysical results

Most of the observed formation tops came in 20 to 30 meters shallower than predicted, due to a thinner Cretaceous sequence. After adjustment for the Cretaceous sequence, the formation tops were encountered close to the well prognosis. The Fuglen Formation was not present, while a 5 meter thick Stø Formation, which was not prognosed, was found (Figure 4-4). The reservoir sand for the Garja 1 level, in the Fruholmen Formation, was thinner than prognosed.

4.7 Data acquisition

4.7.1 Cuttings and mud samples

A standard mud logging unit and a Flair unit were used for the well (details in Final Well Report and Flair report, Geoservices).

- Cuttings were sampled every 3 m from 800 mMD to 1295 mMD (TD) (Figure 1-2).
- Mud samples were taken every 50 m from 800 mMD to 1295 mMD (TD).
- Canned cuttings were taken every 30 m from 800 mMD 1295 mMD (TD).

The ROP was limited to 15 m/hr due to extensive sampling. The service from the mud logging personnel was very good.

4.7.2 Conventional coring

Table 4-4 Coring summary

Core No	Bit No	Top core m	Base core m	Recovery m	Recovery %	Barrel length m	Barrel type	Spec. preserv.	Utilization m
1	1	915	949	29.1	85.6	54	Aluminium	None	53.9
2	5RR	1070	1118	47.9	99.8	54	Aluminium	None	88.7

The shaly section in the lower part of core 2 (1114-1118 m) was crushed, probably due to jamming.

Coring was performed by Baker Hughes Inteq, and core plugs were drilled by Reslab. Very good service was provided from both companies.

4.7.3 MWD/LWD

The MWD-logging was performed by Baker Hughes Inteq.

Table 4-5 MWD logging

Run No.	Depth interval m RKB	Collar diameter	Tool type	Comments
1	411 - 413	8 ¼”	DCP-APX-MPR	Tool failure
2	413 - 811	8 ¼”	DCP-APX-MPR	Good log quality
3	811 - 915	6 3/4”	OnTrak	Drilled cement. POOH for core # 1
4	915 - 1070	6 3/4”	OnTrak	Logged cored interval. POOH for core # 2
5	1070 - 1295	6 3/4”	OnTrak + APX	Reamed/logged cored interval. Drilled to TD

4.7.4 Wireline logging

Schlumberger did the wireline logging operation in the 8 ½” open hole section (see Table 4-6). 4 runs were performed without any difficulties. The logs are graphically represented in Figure 4-7 and 4-8.

Table 4-6 Wireline logging in the 8 ½” section

Run No.	Tool combination	Run	Interval mMD RKB
1	PEX-DSI-GPIT	1A	799.5 – 1293 m (700 for DSI)
2	MDT, Pressure points and water sampling	1A	880.5 – 1209.8 m (pressure pre-tests) 880.5 m, 1083 m and 1086.5 m (water sampling)
3	VSP	1A	380 – 1280 m
4	CST	1C	818.5 – 1268 m, 60 shots, 59 recovered

A zero offset VSP was performed, 55 levels with 15 m spacing were shot from 1280 up to 380 mTVD RKB with a dual level ASR tool. The gamma ray log could not be connected to the Schlumberger depth reference, the VSP run was therefore logged without depth control from gamma ray. The depth control was quality checked by comparing check shots on the way into the hole, and on the way out. The tool was close to seabed when it came out of the hole.

4.7.5 Data quality

All objectives of the wireline operation and MWD logging were met and the quality of the log data was generally good. Several water samples of good quality were taken in the Garja 1 and Guovca sandstones (see Chapter 4.9). The mudlogging services and the sampling performed in this well were very satisfactory. The coring operation went according to plan. Both cores, cut in the Garja 1 and Guovca sandstones, were of very good quality.

4.8 Formation pressure

The pore pressure profile shows a normal pressure trend from seabed down to TD of the well. Several pressure tests have been made with the MDT tool; see Figure 4-5 for more details. A normal pore pressure of 1.03 is predicted from seabed down to approximately 855 mTVD RKB. Below this depth an increase in the pore pressure is measured from MDT pre tests. The water filled reservoirs has a pore pressure of 1.07 g/cm^3. The higher pore pressure in water filled formation in Triassic Formations is due to higher salinity in the formation water. This is a normal trend in Triassic Formations in the Barents Sea. The pore pressure has been calculated from the sonic, resistivity and the D-exponent data using Predict. All of them follow the same trend as the measured pressure from MDT.

The overburden gradient is calculated using the density log from wireline run 1A from 800 down to TD. Above the 13 3/8" casing shoe, density data is converted from sonic log that was logged in the pilot hole.

4.8.1 Reservoir pressure summary

A total of 25 pretests were taken with the MDT before sampling, 22 good, 1 poor and 2 tight (Table 4-7). 5 pretests were taken before sampling to valid the mobility of the sampling point, and all of these pretests were good. The pressure measurements from the pretests were used to define a water gradient in the different sandstone reservoirs; Garja 1 and Guovca. The water gradient was calculated to be 1.07 g/cm^3 in both intervals, which corresponds with the log prediction. There is pressure communication between the Garja and the Guovca sandstone reservoirs, since the pressure points are one the same gradient (Figure 4-9). The lower sand in the Snadd Group seems to have the same gradient but a different pressure regime than the Garja Formation. It is therefore assumed the same salinity in the formation water from the Stø Formation down to top Kobbe Foramtion. There is only one pressure point in the Kobbe Formation, the pressure point was not stable, and it is therefore difficult to conclude that it is on the same gradient that the lower Snadd Sandstone, see Figure 4-9.

Table 4-7 MDT pressure summary, Run 1A, pretests and water sampling.

Test No	Formation	Depth mTVD RKB	Depth mMSL	Hydro pressure before (Bar)	Hydro pressure after (Bar)	Formation Pressure (Bar)	Mobility mD/cp	Temp (^oC)	Gradient g/cm^3	Comments
1	Fruholmen	880.5	855.5	118.29	118.32	91.96	142.1	17.1	1.06	Good
2	Fruholmen	884.5	859.5	118.85	118.87	92.50	3.4	-	1.07	Good (slightly unstable)
3	Fruholmen	889	864.0	119.39	119.53	92.89	248.8	21.8	1.07	Good
4	Fruholmen	893	868.0	120.03	120.06	93.32	496.1	24.32	1.07	Good
5	Garja 1	913.5	888.5	122.72	122.80	95.54	277.8	25.4	1.07	Good
6	Garja 1	918	893	123.33	123.39	96.03	230.6	26.2	1.07	Good
7	Garja 1	923.5	898.5	124.05	124.08	96.61	777.1	27.0	1.07	Good
8	Garja 1	942.5	917.5	126.63	126.61	98.67	1461.0	27.6	1.07	Good
9	Snadd	968.8	943.8	130.11	130.12	101.53	141.3	28.6	1.07	Good
10	Snadd	975	950	130.92	130.94	102.20	24.0	29.4	1.07	Good
11	Snadd	983.5	958.5	132.11	132.08	103.12	90.2	30.0	1.07	Good
12	Guovca	1067.5	1043	143.29	142.52	-	0.5	-	-	Tight
13	Guovca	1072.5	1048	143.98	143.96	-	0.1	-	-	Tight
14	Guovca	1082	1057	145.28	145.27	113.96	934.4	33.1	1.07	Good
15	Guovca	1086.5	1062	145.85	145.87	114.47	431	-	1.07	Good
16	Guovca	1098.2	1073	147.41	147.48	115.75	17	-	1.07	Good
17	Guovca	1110	1085	148.98	148.99	117.01	350.9	-	1.07	Good
18	Guovca	1159	1134	155.44	155.46	121.40	315.8	-	1.07	Good
19	Kobbe	1164	1139	156.15	156.11	121.96	259.3	-	1.07	Good
20	Kobbe	1170	1145	156.93	156.91	122.60	245.6	-	1.07	Good
21	Kobbe	1209.8	1185	162.23	162.26	127.13	2.7	-	1.07	Not stable
22	Snadd	968.8	943.8	129.08	129.93	101.488	108.7	37.6	1.07	Good
23	Garja 1	942.4	917.4	126.40	126.42	98.619	263.1	36.2	1.07	Good
24	Garja 1	923.5	898.5	123.87	123.88	96.566	628.8	33.7	1.07	Good
25	Garja 1	918	893	123.15	123.14	95.977	352.7	34.1	1.07	Good
Sampling										
26	Fruholmen	880.5	855.5	118.12	-	91.857	99	31.4	1.06	Sample with guard probe
27	Guovca	1086.6	1061.6	145.46	-	114.309	180.5	38.3	1.07	Sample with guard probe
28	Guovca	1082	1057	-	-	113.96	724	-	1.07	Pretest with large diameter probe
29	Guovca	1082.5	1057.5	-	-	113.99	719.6	-	1.07	Pretest with large diameter probe
30	Guovca	1083.0	1058	145.18	-	114.04	373	37.7	1.07	Sample with large diameter probe

4.9 Reservoir fluid sampling

Water samples were collected in both the Stø and the Guovca sandstones. The pumping was performed using both a single probe and a new probe, guard probe, from Schlumberger. The water samples were of very good quality. Deuterium was used as tracer. Due to this, it was difficult to get a good estimate of the contamination, but analysis of the samples indicated very clean samples and the amount of mud filtrate are regarded as nearly zero. See Appendix H for reports regarding analysis of samples.

Table 4-8 Samples collected from Run 1A

Sample depth (mMD)	Run No.	*Bottle Number	Chamber volume	Drawdown (bar)	Formation Pressure (bar)	Pump Volume* (liters)	Mobility (mD/CP)	Opening pressure (bar)	Transferred to
880.5	1A	MRSR#036	420 cc	5	91.857	15.2/26.9	99	0	
880.5	1A	MPSR#190	420 cc	5	91.857	15.7/29.8	99	0	
880.5	1A	MPSC#162	1 Gal	3	91.857	70/156	99	100	TS-52002
880.5	1A	MRSR#770	420 cc	3	91.857	80.2/170	99	0	TS-28601
880.5	1A	MRSR#776	420 cc	3	91.857	83.6/175	99	0	TS-0609
880.5	1A	MRSR#779	420 cc	3	91.857	93.6/187	99	0	TS-4906
1086.5	1A	MRSR#782	420 cc	2	114.466	5.8/11.7	180.5	0	
1086.5	1A	MRSR#783	420 cc	2	114.466	10.5/17	180.5	0	
1086.5	1A	MRSC#166	1 Gal	2	114.466	63.2/117	180.5	170	TS-52101
1086.5	1A	MRSR#786	420 cc	2	114.466	65/146	180.5	0	TS-51602
1086.5	1A	MRSR#785	420 cc	2	167.75	70/160	180.5	0	TS-2316
1083	1A	MRSR#787	420 cc	1.5	114.040	11.7	373	0	
1083	1A	MRSR#852	420 cc	1.5	114.040	136.9	373	0	
1083	1A	MRSR#974	420 cc	1.5	114.040	153.8	373	0	TS-36003

* Were two volumes is listed this is referred to sample probe/guard probe.

4.10 Leak off test

A leak off test (LOT) was performed below the 13 3/8” casing shoe. The LOT was a good test with a mud weight of 1.03 g/cm^3. The LOT value is measured to be 1.67 g/cm^3 at 800 mTVD RKB. The leak off value is higher than the overburden, which is also seen in other wells in the Barents Sea.

4.11 Formation temperature

The evaluated temperature is predicted using gradients from nearby wells and also using temperature measurements from wireline run. The temperature measurements were performed less than 50 hrs after the last circulation, therefore the in-house equation (Hermansrud, 1999) for temperature calculations, can not be used. Because there are only two temperatures from the same depth, PEX and CST, the Horner plot can not be made for this well.

Temperature measurements are available from wireline run 1, 2 and 4. Temperature measurement from MDT sampling has been used to predict two temperature gradients, one from seabed to top reservoir and one from top reservoir to TD. From seabed to top reservoir, a temperature gradient of 5.2 ^{o}C/100 m is calculated. From top reservoir to TD, the temperature increases with a lower gradient, approximately 3.3 ^{o}C/100 m. See Figure 4-6 for the temperature gradients.

Table 4-9 Measured and evaluated temperatures

Tool combination	Depth of measurement mTVD RKB	Recorded max temperature ºC	Time since last circulation hrs	Evaluated temperature ºC
PEXlite-DSI	1256	39	10	-
CST	1260	39	48	-
MDT-sampling	880.5	31.4	26	
MDT-sampling	1083	37.7	32	
MDT-sampling	1086.5	38.3	29	-

4.12 Experiences/Recommendations

The wireline operation in this well went according to plan. The recommendation is to focus on logistic both in the planning and operational phase, especially when operating in the Barents Sea.

A new sampling probe from Schlumberger was successfully tested during MDT logging. The conclusion from the analysis is that there was little contamination in the samples.

In this well we used well site biostratigraphy analysis. These data aided the picking of core points and was very important when TD was decided.

Flair gas analysis performed by Geoservices was used by Statoil for the first time in this well. The method seems promising, but because of the very low gas level in this well the potential of this service was not fully tested (see Table 4-3).

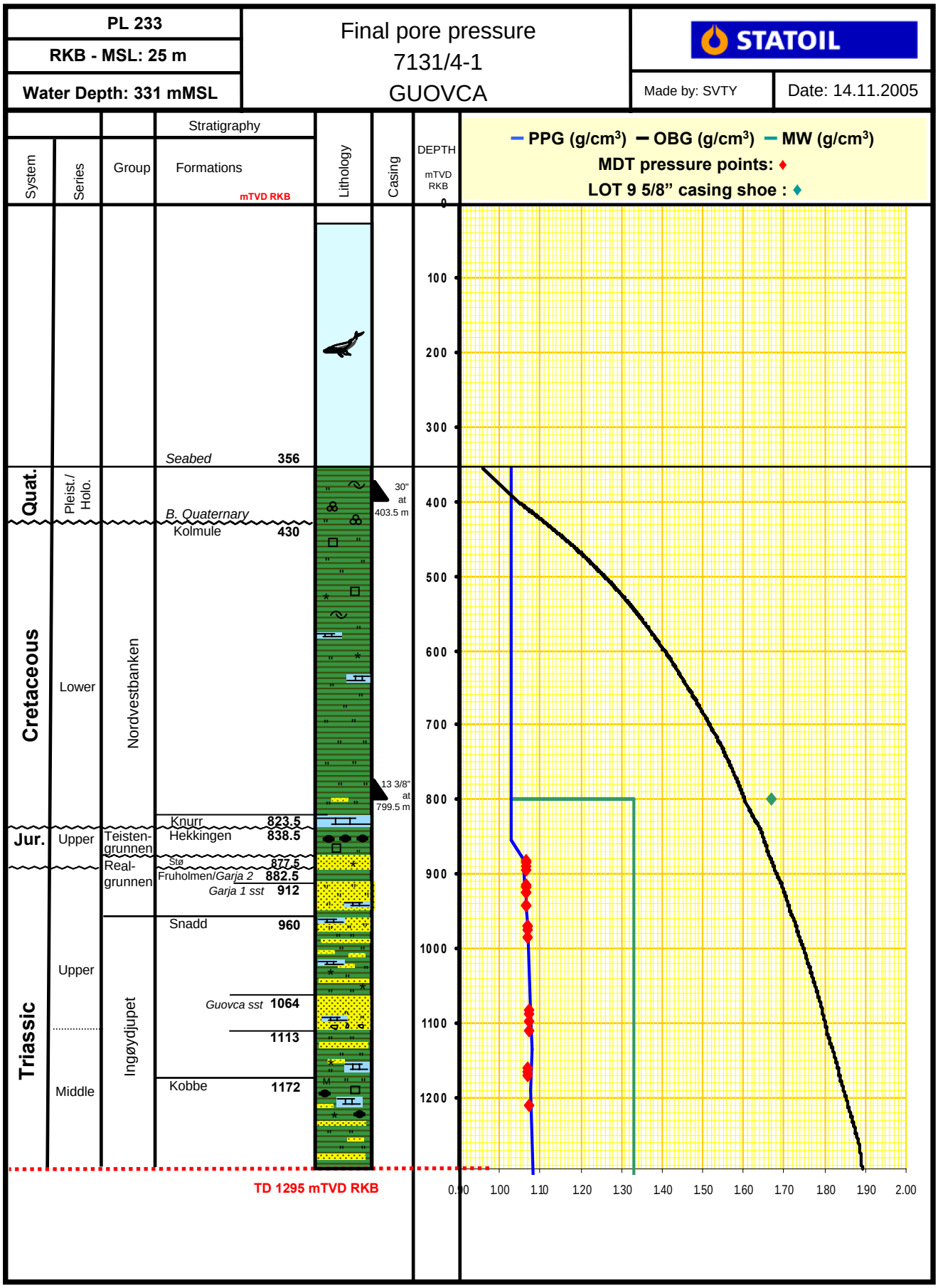


Fig. 4-5 Final pore pressure

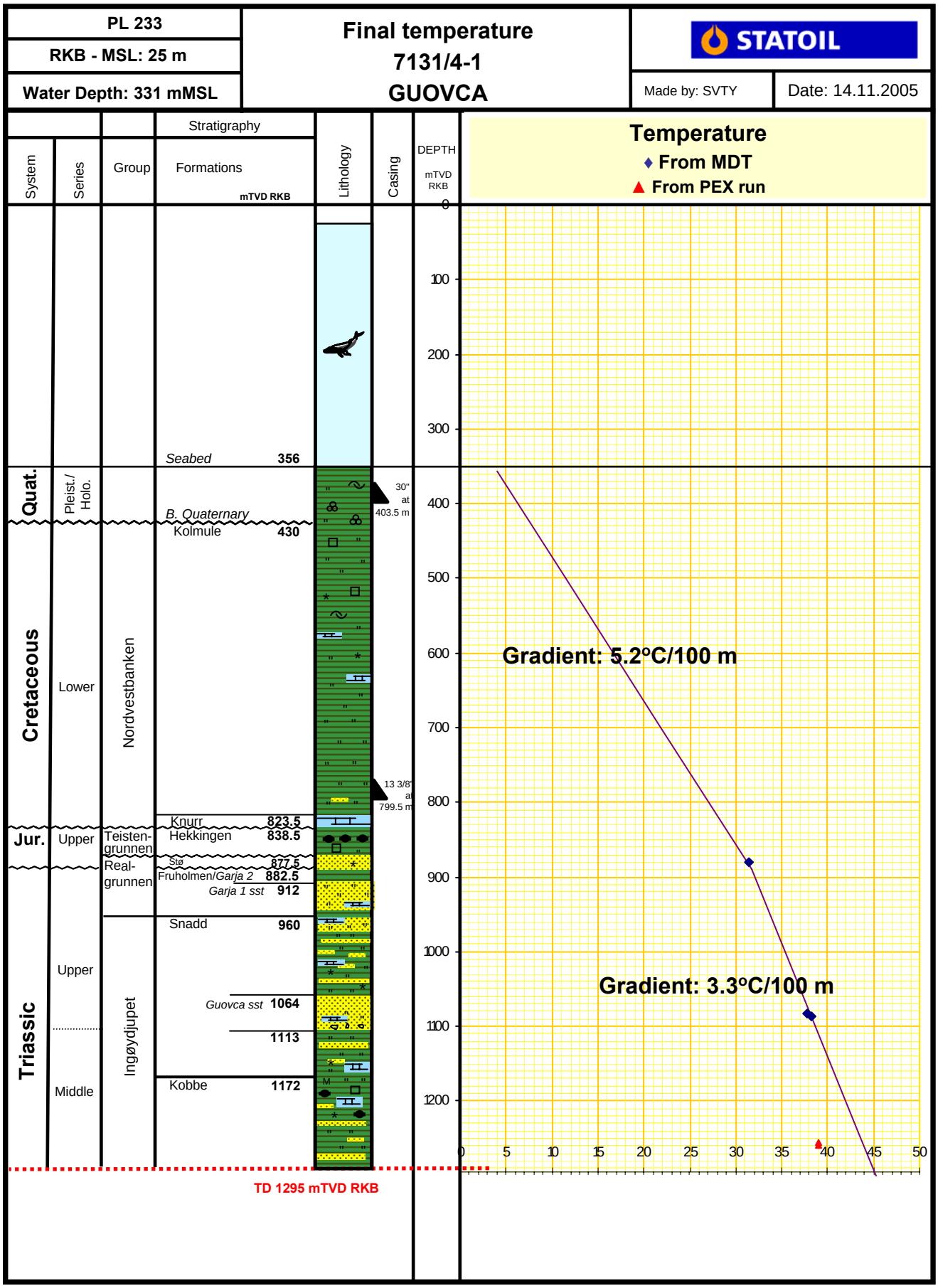


Fig. 4-6 Final temperature

PL 233

RKB - MSL: 25 m

Water Depth: 331 mMSL

Composite plot
Well 7131/4-1

STATOIL

Made by: Svty

Date: 14.11.2005

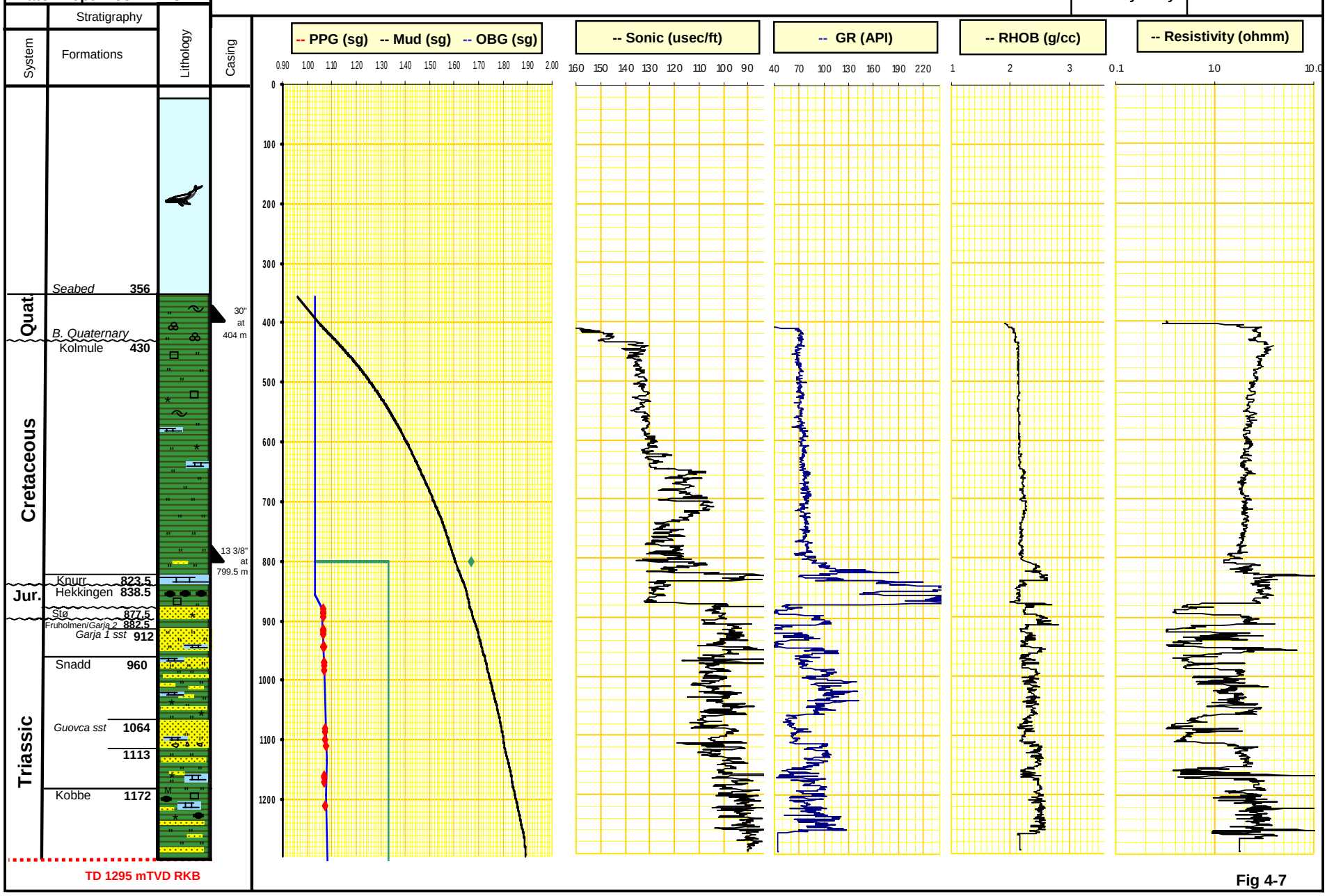


Fig 4-7

PL 233

RKB - MSL: 25 m

Water Depth: 331 mMSL

Composite plot
Well 7131/4-1

STATOIL

Made by: Svty

Date: 14.11.2005

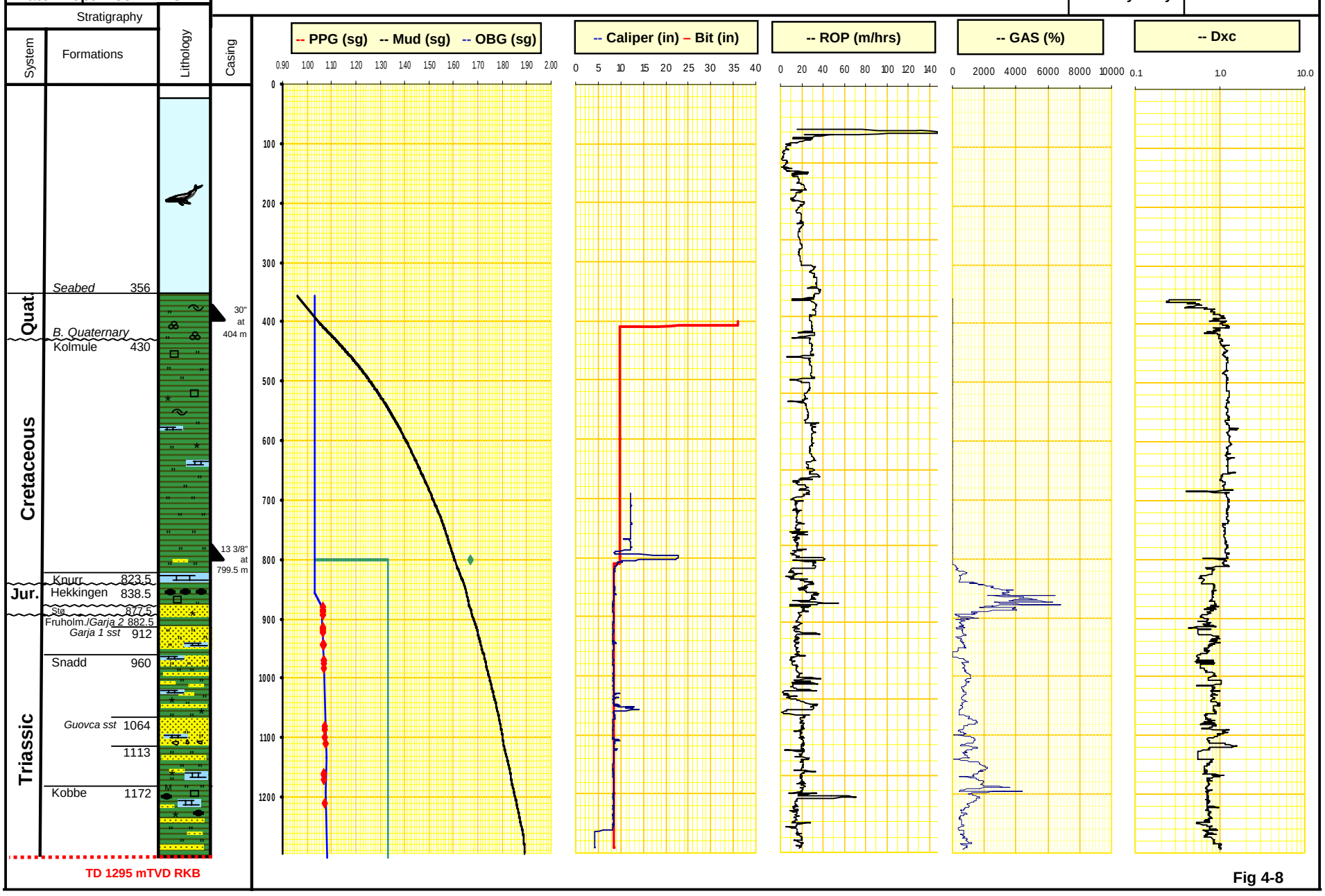


Fig 4-8

PL 233	Gradient plot Well 7131/4-1	STATOIL
RKB - Sea 25 m		Made by: Svty / Date: 28.10.2005
Water depth 331 mMSL		

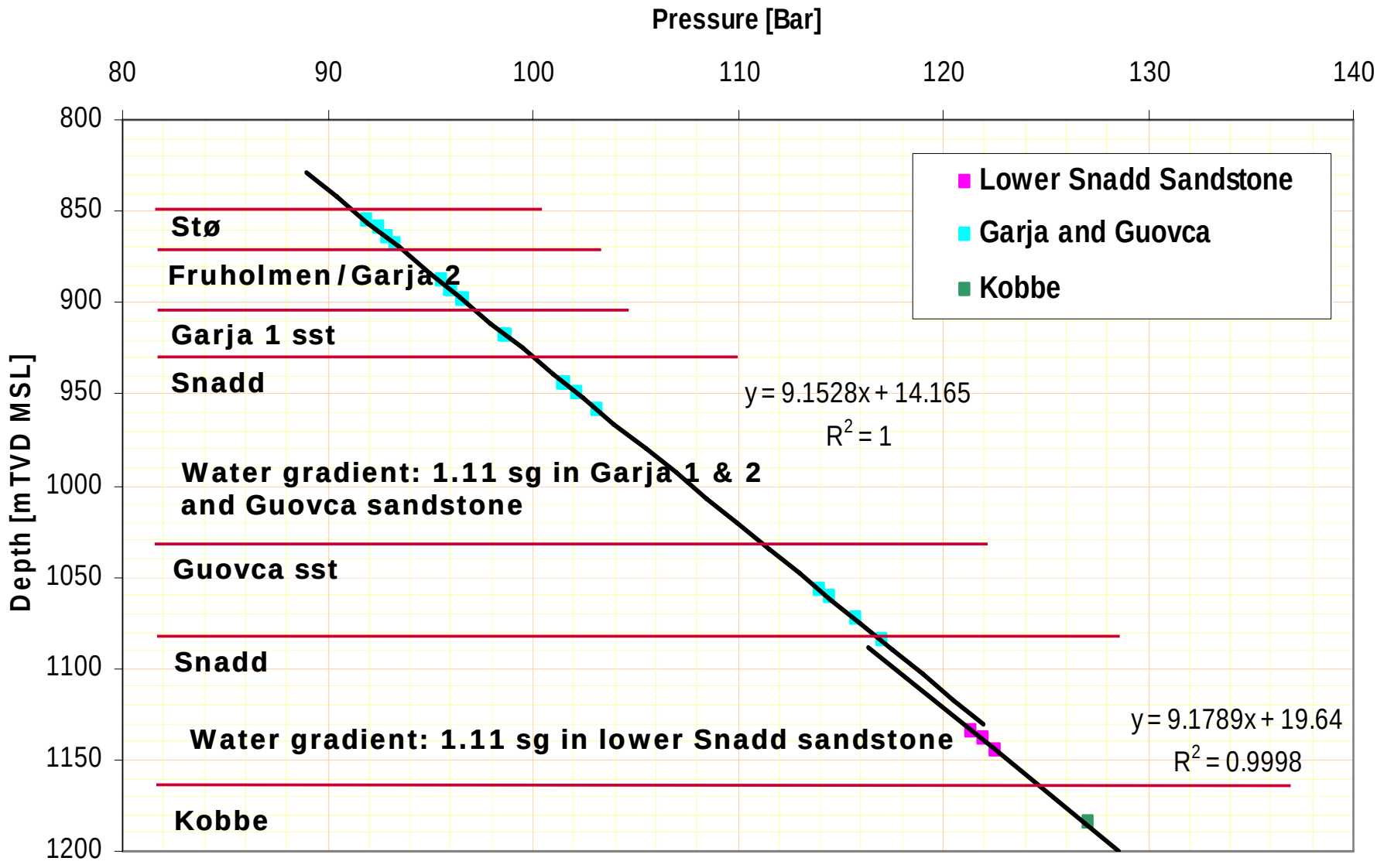


Fig 4-9

5 Drilling operations report

5.1 Rig move and positioning

5.1.1 Summary

The semi-submersible rig Eirik Raude was moved from the Norsk Hydro Produksjon AS operated Obelix well in the Barents Sea to the Guovca location 7131/4-1. The sailed distance of 191 nm was made in 28.5 hrs giving an average transit speed of 6.5 knot. Total transit time included anchor handling, cargo loading and deballasting rig was 79.5 hours (0.5 hrs down time and 24.5 hrs WOW included).

At location eight anchors were run and four marker buoys were deployed. Meanwhile, service and maintenance on rig equipment were carried out as well as preparing and start running down with the spud BHA.

5.1.2 Experiences/Recommendations

None.

5.2 Drilling top hole section

5.2.1 Summary

The 36" hole was drilled from sea bed at 356 m to section TD (17 ½" hole to 407.7 m, 36" hole to 403.5 m) using sea water and 5 m^3 high viscosity pills every 15 m drilled. The BHA consisted of a re-used 17 ½" MX-3 bit (Hughes Christensen), a 26" x 36" two stage hole opener and an Anderdrift tool (vertical inclination indicator).
The sea bed was tagged without circulation. Experienced problems with the inclination tool during function testing. Repeated the test by using various circulation parameters. Found tool working by using the following survey sequence; Circulate at 5000 lpm, pumps off for 4 minutes, 10 seconds flow build up period and 1500 lpm survey flowrate.
Drilled 36" hole down to 386 m, inclination survey readings at 371 m and 386 m were both 2.25°. Reamed the hole three times and inclination readings came down to 2.0°. Pulled out to above sea bed due to bad weather and WOW. Meanwhile, performed Totco and Anderdrift survey. Both systems were reading 0.5°. Re-entered the hole and repeated inclination surveys, this time showing 0.25° at 370 m and 0.75° at 386 m.
Drilled 36" hole to TD, reamed stand once and performed inclination survey to 0.75°. Low weight on bit was maintained to avoid building angle, giving an ROP at 3.7 m/hr. Swept hole with 25 m^3 high viscosity mud and displaced well 1.3 times to 1.35 g/cm^3 mud. As prognosed, no boulders were encountered in this section. No overpull was experienced when pulling out of the hole.

Typical drilling parameters were:
Flow: 5000 lpm, WOB: 1-4 mt, RPM: 70-130 s^{-1}, Pressure: 130 bar.
Made up and ran 4 joints of 30" conductor string to 403.5 m. Cemented conductor in place with 3 metres stick up on 30" WHH. Held conductor in tension while the cement set up to reduce the overall inclination. The cement slurry used for this operation was Tuned Light, 1.52 g/cm³ at surface, predicted to 1.54 g/cm³ down hole due to compression. Total excess cement used was
150 %. After releasing the wellhead housing running tool, the inclination on bull's-eyes were 0.0° and 0.5°.

Drilled out the 30" conductor shoe with a dedicated clean-out assembly consisting of 9 7/8" bit x 12 ¼" HO x 17 ½" HO x 26" HO in order to centralize the 9 7/8" pilot hole. Drilled out and cleaned the rat hole down to 411 m in 3.0 hours. Pulled out of hole and laid down the BHA. Made up and ran in to TD with 9 7/8" pilot hole BHA.

5.2.2 Experiences/Recommendations

Anderdrift inclination tool
The Anderdrift tool displayed inconsistent readings down to 386 m. POOH for WOW and tested the Anderdrift tool against Totco, both tools gave same reading. Re-logging at previous survey depths while running in hole, the inclination readings were found acceptable, from 0.25 to 0.75° instead of 2.0°-2.25°.

ROP and weight on bit
The 48.7 m drilled was made in 22 hrs giving an overall progress at 2.2 m/hr (bit ROP 3.7 m/hr.) Due to the high inclination surveys recorded from sea bed to 386 m, low weight on bit and reaming the hole was prioritized in order to achieve acceptable inclination.

5.3 Drilling 9 7/8" pilot hole

5.3.1 Summary

The pilot hole was drilled with a BHA consisting of 9 7/8" (MXC09, Hughes Christensen) Bit, MWD (MPR-APX-DCP) and 104 m of 8 ¼" drill collars.
Drilled 9 7/8" pilot hole from 411 m to 413 m where communication to the MWD tool was lost. Pulled out and attempted to establish electric communication to the tool without success. Attempted to replace MPR sub and APX tool, but crossed threads on connection. MU primary MPR sub with backup APX tool and RIH. Drilled 9 7/8" pilot hole from 413 m to TD at 811 m. As predicted, no shallow gas were observed. The drilling progress was good (400 m gained in 22.5 hrs) with an ROP on bit of 23.6 m/hr. Only minor tight spots were observed (12 mt) pulling out to pick up the 17 ½" HO assembly.
Inclination through the section varied from 0.11° at 459 m to 0.65° at 750 m, at section TD the inclination was 0.53°. The 9 7/8" bit came out rated 2-2.
Used sea water and 5 m^3 high viscosity pills every 15 m drilled as drilling fluid. At section TD, swept the well with one 10 m^3 high viscosity pill and displaced 1.3 times to 1.35 g/cm³ mud.

Typical drilling parameters:

Flow:	3450 lpm
WOB:	5-11 mt
RPM:	112-165 s^{-1}
Pressure:	148 bar
Torque:	3-6 kNm.

5.3.2 Experiences/Recommendations

Back-up MWD tools.
During the planning phase of this well, mobilization of two back-up MWD tools had been emphasized. During start-up of this section, only one back-up tool had been sent to the rig. Lack of communication from BHI onshore and incorrect inventory control at rig-site, led to a situation where the operation could have been stopped when one tool failed and the back-up tool was damaged during make-up. Close logistic control regarding long lead time items is of outmost importance drilling in the Barents Sea.
The strategy of having three MWD tools on the rig in the Barents Sea is recommended.

5.4 Drilling 17 1/2" section

5.4.1 Summary

The 9 7/8" pilot hole was opened to 17 1/2" from 411 m to 811 m (17 ½" hole to 805.5 m) with a BHA consisting of 8" bullnose x 12 ¼" PDC HO x 17 1/2" HO. The primary purpose of the BHA design was to open the 9 7/8" pilot hole without sidetracking. From 411 m to approximately 600 m the WOB was maintained at 3-6 MT resulting in a decreasing ROP from >12 m/hr to <6 m/hr. From this depth and to section TD the WOB was increased to 20 ton and the ROP increased to >18 m/hr. The bit/HO ROP for this section was 13 m/hr. At TD the well was swept with one 30 m^3 high viscosity pill and displaced 1.3 times to 1.35 g/cm^3. Pulled out of the hole without any problems. Inclination through this interval was maintained as for the pilot hole. The 12 ¼" PDC HO came out rated: 1-1, whilst the 17 ½" HO was rated 7-8.

Typical drilling parameters:

Interval:	411-600	600-811	m
Flow:	5000-6300	5500-6000	lpm
WOB:	3-6	5-20	mt
RPM:	80-120	80-110	s^{-1}
Pressure:	155-216	160-215	bar
Torque:	3.5-6.9	2.0-15.0	kNm

The 13 3/8" casing was run without any problems and set at 799.5 m. The surface casing was successfully cemented to sea bed with full returns. Bumped top wiper plug with 100 bars, 70 bars above FCP. Released casing running tool and POOH.

While moving the BOP to below rotary a hydraulic supply line to the BOP trolley bursted and approximately 1 m^3 hydraulic oil was accidentally discharged to sea. This caused Statoil to suspend the operation for a total of 432 hrs. The incident was investigated both by Ptil and SFT in addition to Statoil internally. After performing investigations, HAZID, HASOP, necessary authorization was obtained and the operation resumed.

RIH with 8 ½" BHA and tagged top of cement at 772 m. Displaced well to 1.03 g/cm³ sea water / KCl brine and drilled out the 13 3/8" casing shoe, rat hole and 3 m new formation. Spotted 10 m³ high viscosity pill on bottom and performed leak-off test to 1.67 g/cm³ EMW.

5.4.2 Experiences/Recommendation

Drilling parameters
Heavy duty hole openers to be run at manufacturer's recommendations for drilling parameters.

PDC hole opener
A 9 7/8" x 12 ¼" steel PDC HO was run between the 8" bull nose and the 17 ½" HO. The reason for including this component was to prevent wear on the 17 ½" HO shaft, reducing the possibility for twist off. Using the PDC hole opener was a success, insignificant wear was found (rated 1-1) compared to the conventional 17 ½" hole opener which was totally worn out. At locations where boulders are not expected, this type of hole opener may be recommended.

5.5 Drilling 8 1/2" section

5.5.1 Summary

Displaced the well to 1.33 g/cm³ Glydril (99% KCl) water based mud and drilled 8 ½" hole from the 13 3/8" casing shoe at 799.5 m to core point #1 at 915 m. The drilling progress was controlled to maximum 15 m/hr due to geological interpretation. Bottoms up were circulated at several depths for samples and biostratigraphical verification.

Core #1 was cut from 915 m to 949 m where the core jammed off. The core was cut in 2.5 hrs, recovered 29.1 m (85.6 %).

The interval from 949 m to core point #2 at 1070 m was drilled with a controlled ROP at 15 m/hr.

Core #2 was cut from 1070 m to 1118 m where the core jammed off. The core was cut in 6.5 hrs, recovered 47.9 m (99.8 %).

Drilled 8 ½" hole from 1118 m to TD at 1295 m in 12.5 hrs at controlled ROP due to capacity restrictions in the cuttings handling system. The ECD readings recorded were: 1.43-1.44 g/cm³.

Typical drilling / coring parameters:

Interval:	799.5-915	915-949	949-1070	1070-1118	1118-1295	m
Flow:	3280	1000	3280	1000	3270	lpm
WOB:	2-4	1-5	1-3	3-10	1-6	mt
RPM:	80	75	70-110	90-100	120	s^{-1}
Pressure:	150	40	152	50	166-171	bar
Torque:	2-6	4-8	3-6	3-8	3-6	kNm

Except for some slip-stick at the initial part of the 8 ½" section no drilling or hole problems were experienced. Hole condition was reported good during the entire operation, electrical logging included.

The mud system was run as per programme maintaining the KCl in the upper range. The sulphate concentration was kept well below the programmed maximum level of 200 mg/l without any problems.

The wireline programme was performed without any problems.
Run #1: PEX-DSI-GPIT.
Run #2: MDT, pressure point and water samples.
Run #3: VSP-GR.
Run #4: CST.

5.5.2 Experiences/Recommendation

Sulphate content in mud

On previous wells drilled with this mud system, maintaining the sulphate content according to programme (<200 mg/l) have been a problem. During this section, the maximum level recorded in the active mud system was 143 mg/l. The basis for achieving the low sulphate content was made by drilling out the shoe and performing LOT with a separate fluid system, drill water weighted to 1.03 g/cm³ with 99% KCl brine. It is recommended to use this procedure on future wells if feasible.

Cuttings handling

For the drilling campaign in the Barents Sea a zero discharge regime for drill cuttings prevails. Collecting and handling drill cuttings at rig site, when using water based mud, was a problem in spite of thorough planning and small amounts generated. The single screw conveyors from the shakers to the cuttings buffer tank was not fit for purpose and restricted the ROP to 15 m/hr. The CBP (cuttings blower pump) system blowing the cuttings from the buffer tank to the holding tank / supply boat, functioned according to expectation (capacity ~10 m3/hr).
It is strongly recommended to modify the cuttings transport system from the shakers to the cuttings buffer tank for future wells, when working under this type discharge regime.

5.6 Permanent P&A

5.6.1 Summary

Ran in hole with tapered string (320 m 3 ½" DP, 580 m 5" DP and 5 ½" DP to surface) to plug back open hole, was not able to pass 1280 m. Circulated bottoms up from this depth prior to cementing.

Set cement plug #1 in open hole from 1280 to 1015 m. Pulled out dry to 984 m and circulated hole. No cement in returns, maximum pH at 11.8. Ran in to 990 m.

Set cement plug #2 in transition zone from 990 m to 743 m with top of cement 56 m inside the 13 3/8" surface casing. Began to pull wet out of hole on stand #3 and had mud flowback. Attempted to pump through drill string (maximum 300 bars) without any success. Pulled string out of hole and found all the 3 ½" DP cemented. Ran in hole with 5" mule shoe, tagged cement at 743.5 m and set down 5 mt weight on plug. Attempted to pressure test cement plug to 100 bars, but pressure bled off to 67 bars. Pulled out of hole and laid down stinger. Ran in hole with open ended 5" DP.

Set cement plug #3 inside the 13 3/8" casing from 743 to 610 m. Pulled out to 600 m, pulled out wet on stand #3, and circulated bottoms up. Diverted out 35 m^3 cement contaminated mud from the active system. Pulled out of hole and prepared to squeeze plug #3. Aborted this operation because the cement set up while cleaning cement unit.

Made up 13 3/8" EZSV dressed as bridge plug. Ran in hole to 600 m and pressure tested cement plug #3 in stages to 100 bar. Set bridge plug at 600 m, used 20 ton over pull to shear out running tool. Pressure tested bridge plug in stages to 100 bar (70 bar above 13 3/8" LOT), displaced surface lines and well to sea water.

Set surface cement plug #4 from 600 m to 400 m and pulled out of hole.

Retrieved wear bushing (23 ton over pull), rigged up and pulled riser and BOP.

Made up MOST tool, ran in and cut 20" x 30" casing at 361 m. Parameters: Flow: 2700-3400 lpm, Pressure: 81-146 bar. Pulled casing free without any overpull, POOH and laid down MOST tool and the cut casing. Meanwhile, performed sea bed survey with ROV, deballasted rig and pulled all 8 anchors.

The rig was transferred to Tulipan operations, well 6302/6-1, May 18th, 2005 at 22:00 hours.

5.6.2 Experiences/Recommendation

<u>Cement plug #2 failed</u>
The reason why cement plug #2 failed is several. Lack of satisfactory bonding between casing wall and the cement; the cement plug was supposed to have reached 100 m into the 13 3/8"

casing, wrong cement silo used, the upper part of the plug may have been contaminated. The procedure for mixing and setting the plug was not in accordance with recommendations given.

5.7 Figures and tables

5.7.1 Well Schematic

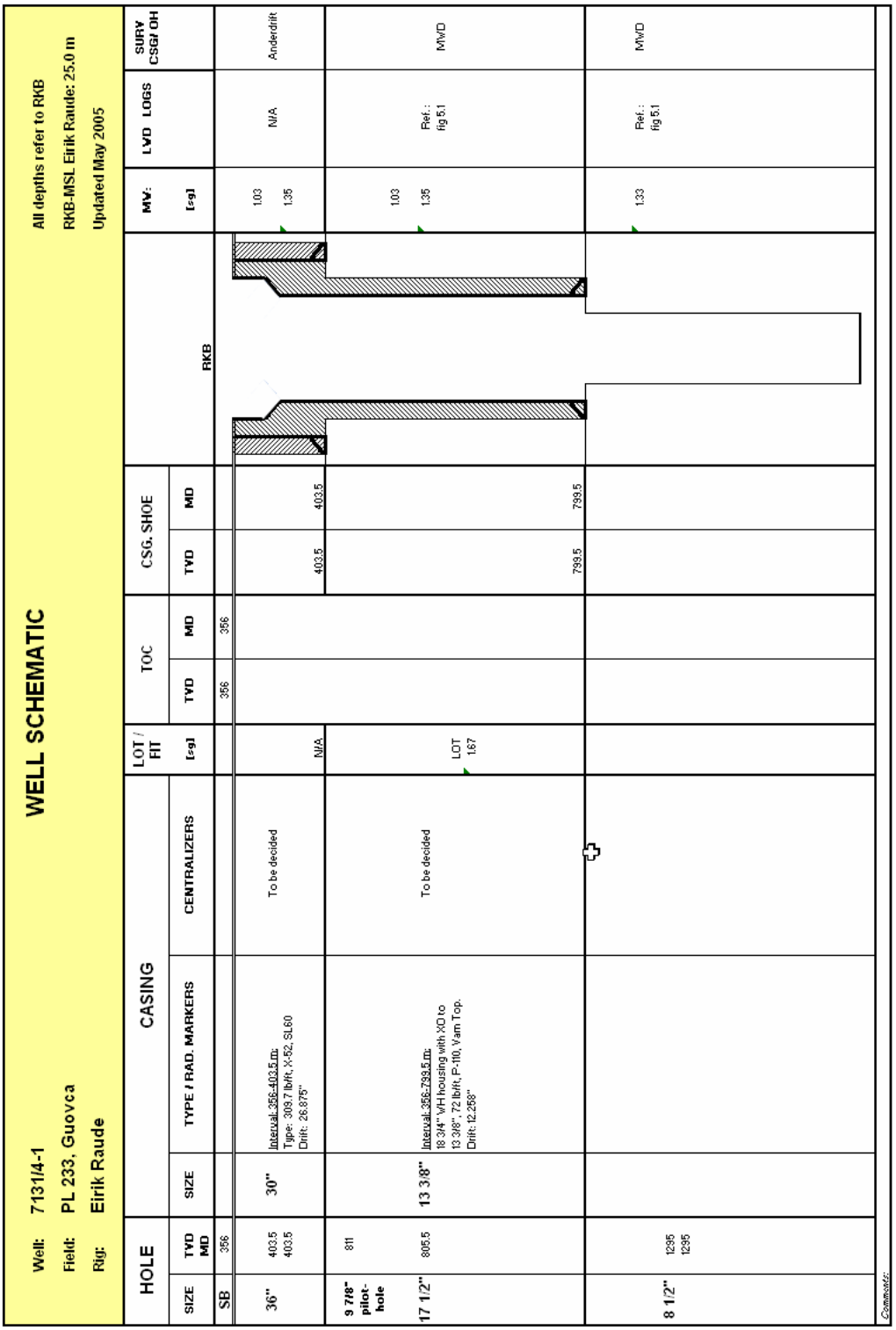


Figure 5-1 Well schematic.

5.7.2 Well Schematic – Permanent P & A

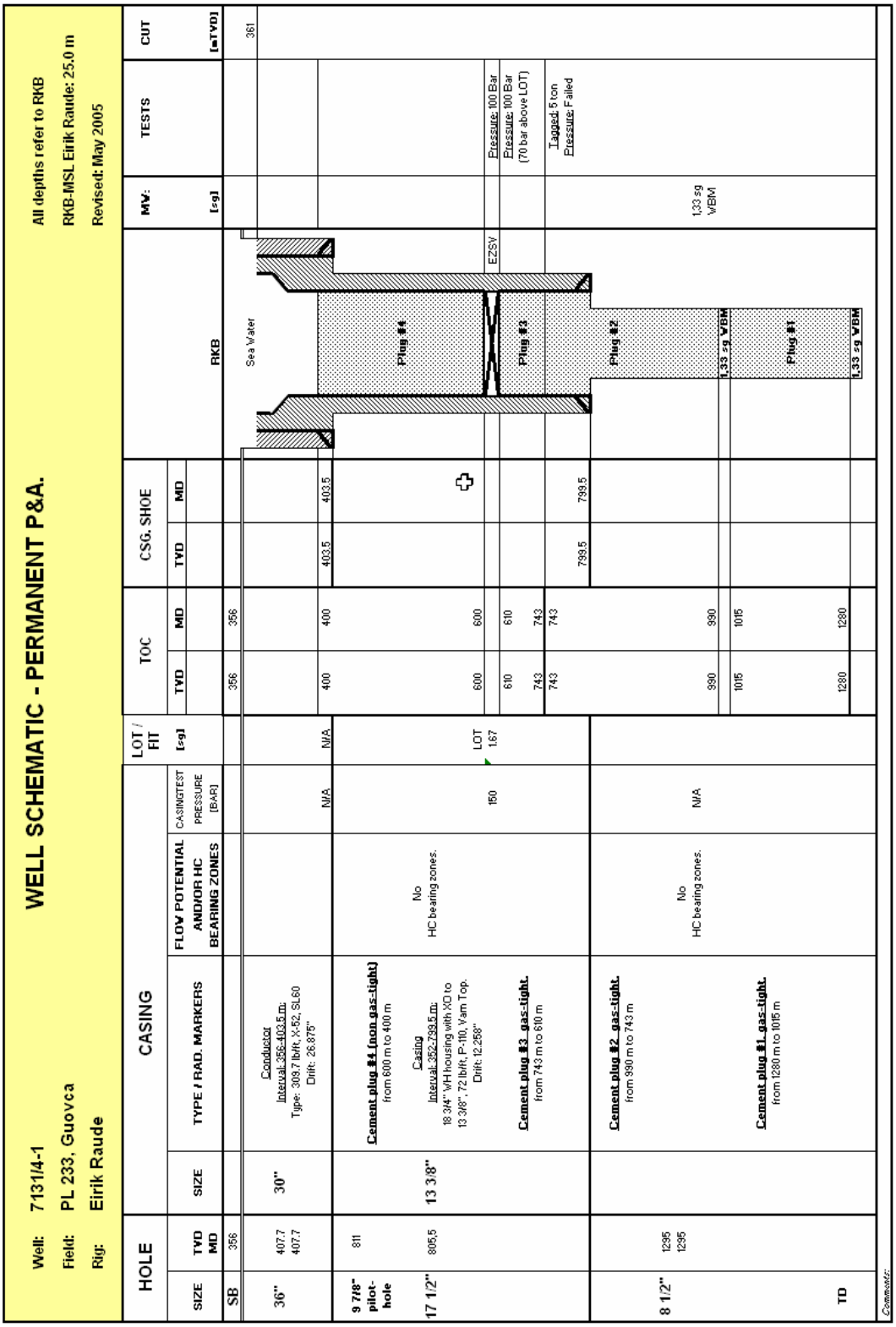


Figure 5-2 Well schematic – P & A.

5.7.3 Time/depth curve

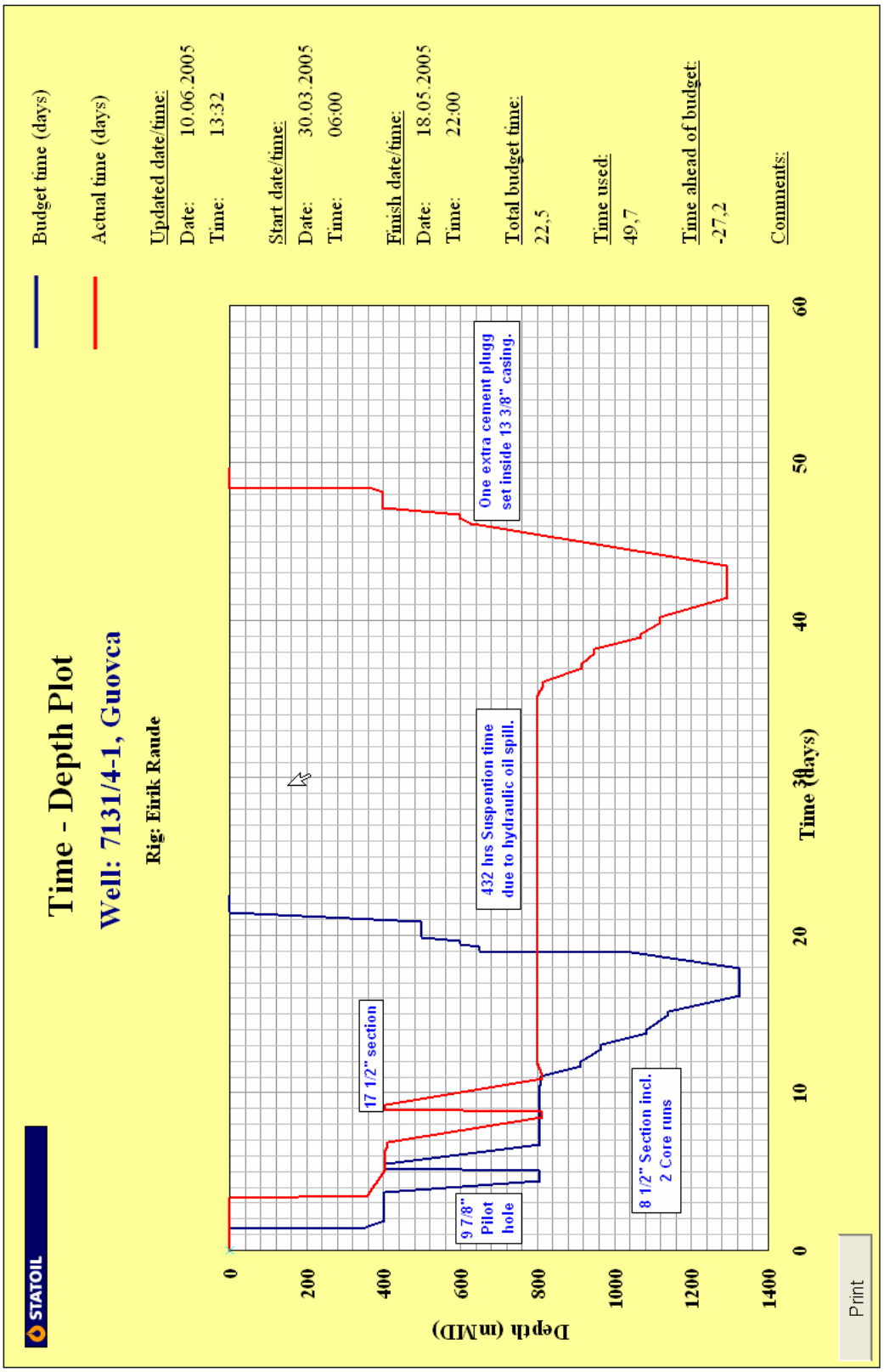


Figure 5-3 Time/Depth curve.

5.7.4 Timeplanner

Table 5-1 Timeplanner.

Project planner — **Guovca well 7131/4-1** — **T.0233A.AP.MAIN**

		Start time	End time	Budget time hrs	Acc Budget days	Tech limit hrs	Acc tech days	Planned time hrs	Actual time hrs	Acc actual days	Down time	Description	Companies
		30.03.05 06:00	02.04.05 13:30	33,0	1,4	29,0	1,2	29,0	79,5	3,3	0,5	**MOVE [NO 7131/4-1]**	
	1 Wed	30.03.05 06:00	31.03.05 15:30	13,0	0,5	11,5	0,5	11,5	33,5	1,4	0,0	1 Move rig from Oblix location to Guovca location. (197 Nm/6 knot)	OR
	2 Thu	31.03.05 15:29	31.03.05 15:30	0,0	0,5	0,0	0,5	0,0	0,0	1,4	0,0	3 If not already done: MU cement stand and 30" conductor housing. R/B same	OR,Hall,DQ
	3 Thu	31.03.05 15:30	02.04.05 13:30	20,0	1,4	17,5	1,2	17,5	46,0	3,3	0,5	2 Set anchors and ballast rig. MU 36" BHA and prepare to drill 36" hole.	OR
		02.04.05 13:30	06.04.05 03:00	56,0	2,3	50,0	2,1	50,0	85,5	3,6	2,5	**36" [NO 7131/4-1]**	
	4 Sat	02.04.05 13:30	02.04.05 18:00	2,0	1,5	1,5	1,3	1,5	4,5	3,5	1,5	4 Run 36" BHA down to sea bed.	OR,Geo,BHI,Ocean,Weir
	5 Sat	02.04.05 18:00	04.04.05 09:00	10,0	1,9	9,0	1,6	9,0	39,0	5,1	0,0	5 Drill 36" hole fram 355 m to 403 m. (ROP: 5 m/hr)	MI,OR,Geo,BHI,Ocean,Weir
	6 Mon	04.04.05 09:00	04.04.05 10:30	4,0	2,0	3,5	1,8	3,5	1,5	5,2	0,0	6 Circulate hole clean and displace to 1.35 sg mud.	MI,OR,Geo,BHI,Ocean,Weir
	7 Mon	04.04.05 10:30	04.04.05 15:00	5,0	2,3	4,5	2,0	4,5	4,5	5,4	0,0	7 POOH, top up hole with 1.35 sg mud from below sea bed. LD 36" HO assembly.	MI,OR,Geo,BHI,Ocean,Weir
	8 Mon	04.04.05 15:00	05.04.05 00:00	10,0	2,7	9,0	2,4	9,0	9,0	5,8	1,0	8 Rig up and run 30" conductor to sea bed on 5 1/2" DP.	OR,Geo,Ocean,DQ
	9 Tue	05.04.05 00:00	05.04.05 02:30	2,0	2,8	2,0	2,4	2,0	2,5	5,9	0,0	9 Stab in and land conductor.	OR,Geo,Ocean,DQ
	10 Tue	05.04.05 02:30	05.04.05 05:00	3,0	2,9	3,0	2,6	3,0	2,5	6,0	0,0	10 Circulate, pump and displace Tuned-light cement.	OR,Hall,Geo,Ocean
	11 Tue	05.04.05 05:00	05.04.05 08:30	0,0	2,9	0,0	2,6	0,0	3,5	6,1	0,0	11 If required: WOC.	OR
	12 Tue	05.04.05 08:30	05.04.05 12:00	3,0	3,0	2,5	2,7	2,5	3,5	6,3	0,0	12 Release RT and wash conductor housing. POOH.	OR,Ocean,DQ
	13 Tue	05.04.05 12:00	05.04.05 15:00	6,0	3,3	5,0	2,9	5,0	3,0	6,4	0,0	13 MU and RIH with 26" clean out assembly.	OR,Geo,BHI,Ocean,Weir
	14 Tue	05.04.05 15:00	05.04.05 21:30	5,0	3,5	4,5	3,1	4,5	6,5	6,6	0,0	14 Drill out 30" conductor shoe and clean out rat hole. POOH	MI,OR,Geo,BHI,Ocean,Weir
	15 Tue	05.04.05 21:30	06.04.05 03:00	6,0	3,7	5,5	3,3	5,5	5,5	6,9	0,0	15 MU and RIH 9 7/8" pilot BHA to bottom.	OR,Geo,BHI,BHI
		06.04.05 03:00	08.04.05 11:30	42,0	1,8	37,5	1,6	37,5	56,5	2,4	14,0	**9 7/8" [NO 7131/4-1]**	
	16 Wed	06.04.05 03:00	07.04.05 16:00	16,0	4,4	14,0	3,9	14,0	37,0	8,4	14,0	16 Drill 9 7/8" pilot hole to 805 m. (ROP: 25 m/hr).	MI,OR,Geo,BHI,BHI,Ocean,Weir
	17 Thu	07.04.05 16:00	07.04.05 17:30	6,0	4,6	5,5	4,1	5,5	1,5	8,5	0,0	17 Circ. hole clean. Flowcheck. Displace to 1.35 sg mud.	MI,OR,Geo,BHI,Ocean,Weir
	18 Thu	07.04.05 17:30	08.04.05 01:30	10,0	5,0	9,0	4,5	9,0	8,0	8,8	0,0	18 POOH and LD 9 7/8" BHA.	OR,Geo,BHI,BHI,Ocean
	19 Fri	08.04.05 01:30	08.04.05 05:30	4,0	5,2	3,5	4,6	3,5	4,0	9,0	0,0	19 MU and rack back cement stand and 18 3/4" WH housing in derrick.	OR,Hall,DQ
	20 Fri	08.04.05 05:30	08.04.05 11:30	6,0	5,5	5,5	4,9	5,5	6,0	9,2	0,0	20 MU and RIH with 17 1/2" HO assembly to bottom.	OR,Geo,BHI,Ocean,Weir
		08.04.05 11:30	05.05.05 06:00	130,0	5,4	116,0	4,8	121,0	642,5	26,8	2,0	**17 1/2" [NO 7131/4-1]**	
	21 Fri	08.04.05 11:30	10.04.05 03:00	30,0	6,7	26,0	5,9	26,0	39,5	10,9	0,0	21 Open pilot hole from 9 7/8" to 17 1/2" hole to 805 m. (ROP: 14 m/hr)	MI,OR,Geo,BHI,Ocean,Weir
	22 Sun	10.04.05 03:00	10.04.05 04:30	8,0	7,0	7,0	6,2	7,0	1,5	10,9	0,0	22 Circulate hole clean and displace to 1,35 sg mud.	MI,OR,Geo,BHI,Ocean
	23 Sun	10.04.05 04:30	10.04.05 08:30	12,0	7,5	10,5	6,7	10,5	4,0	11,1	0,0	23 POOH, wash conductor housing and top up hole with 1,35 sg mud. Rack back 17 1/2" HO assembly.	MI,OR,Geo,BHI,Ocean
	24 Sun	10.04.05 08:30	11.04.05 02:30	16,0	8,2	14,0	7,3	14,0	18,0	11,9	1,0	24 RU and run 13 3/8" casing with 18 3/4" WH housing on 5 1/2" DP.	OR,Geo,Ocean,Weath,DQ
	25 Mon	11.04.05 02:30	11.04.05 04:30	6,0	8,5	5,5	7,5	5,5	2,0	11,9	0,0	25 Circulate, pump and displace cement.	OR,Hall,Geo,Ocean,Weath,DQ
	26 Mon	11.04.05 04:30	11.04.05 07:30	5,0	8,7	4,5	7,7	4,5	3,0	12,1	0,0	26 Release RT and wash WH area. POOH. LD cement head and RT.	OR,Hall,Ocean,DQ
	27 Mon	11.04.05 07:30	12.04.05 14:30	23,0	9,6	21,0	8,5	21,0	31,0	13,4	1,0	27 RU and run BOP and riser.	OR,Hall,Ocean
	28 Tue	12.04.05 14:30	13.04.05 16:00	0,0	9,6	0,0	8,5	0,0	25,5	14,4	0,0	27A WOW.	OR
	29 Wed	13.04.05 16:00	19.04.05 10:00	0,0	9,6	0,0	8,5	0,0	138,0	20,2	0,0	27C Perform hazid/ hazeop	OR
	30 Tue	19.04.05 10:00	20.04.05 09:30	0,0	9,6	0,0	8,5	0,0	23,5	21,1	0,0	27B Cont to run BOP.	OR
	31 Wed	20.04.05 09:30	20.04.05 19:00	4,0	9,8	3,5	8,7	3,5	9,5	21,5	0,0	28 Land, lock and test connector and 13 3/8" casing against BSR.	OR,Hall,Ocean,DQ

Project planner

Guovca well 7131/4-1

T.0233A.AP.MAIN

		Start time	End time	Budget time hrs	Acc Budget days	Tech limit hrs	Acc tech days	Planned time hrs	Actual time hrs	Acc actual days	Down time	Description	Companies
		08.04.05 11:30	**05.05.05 06:00**	**130,0**	**5,4**	**116,0**	**4,8**	**121,0**	**642,5**	**26,8**	**2,0**	**17 1/2" [NO 7131/4-1]**	
	32 Wed	20.04.05 19:00	21.04.05 04:30	6,0	10,0	5,5	8,9	5,5	9,5	21,9	0,0	29 RD BOP landing joint and install diverter.	OR
	33 Thu	21.04.05 04:30	03.05.05 10:30	0,0	10,0	0,0	8,9	0,0	294,0	34,2	0,0	29A Time out due to hydraulic spill	OR
	34 Tue	03.05.05 10:30	03.05.05 13:30	5,0	10,3	5,5	9,1	5,5	3,0	34,3	0,0	30 Test diverter and MU hang off stand.	OR,Geo,BHI,BHI,Weir
	35 Tue	03.05.05 13:30	04.05.05 05:00	4,0	10,4	3,0	9,3	3,0	15,5	35,0	0,0	31 Pressure test BOP.	OR
	36 Wed	04.05.05 05:00	04.05.05 12:00	1,0	10,5	1,0	9,3	6,0	7,0	35,3	0,0	31A MU and RIH w/ 8 1/2" BHA.	OR
	37 Wed	04.05.05 12:00	05.05.05 03:00	4,0	10,6	3,5	9,5	3,5	15,0	35,9	0,0	32 Displce well to 1.03 sg Mud, drill out shoe track and 3 m new formation.	MI,OR,Geo,BHI,BHI,Weir,OTAS
	38 Thu	05.05.05 03:00	05.05.05 06:00	6,0	10,9	5,5	9,7	5,5	3,0	36,0	0,0	33 Circulate hole clean, spot WBM pill on bottom. Perform LOT.	MI,OR,Hall,Geo,BHI,BHI,Weir,OTAS
		05.05.05 06:00	**12.05.05 18:00**	**169,0**	**7,0**	**150,0**	**6,3**	**150,0**	**180,0**	**7,5**	**8,0**	**8 1/2" [NO 7131/4-1]**	
	39 Thu	05.05.05 06:00	05.05.05 08:30	4,0	11,0	3,5	9,8	3,5	2,5	36,1	0,0	34 Displace well to 1.33 sg. low sulphate WBM.	MI,OR,Geo,OTAS
	40 Thu	05.05.05 08:30	06.05.05 06:00	16,0	11,7	14,0	10,4	14,0	21,5	37,0	0,0	35 Drill 8 1/2" hole to core point #1 at approx. 910 m (ROP: 10 m/hr). POOH, rack BHA in derrick.	MI,OR,Geo,BHI,BHI,Weir,OTAS
	41 Fri	06.05.05 06:00	06.05.05 13:00	6,0	12,0	5,5	10,6	5,5	7,0	37,3	0,0	36 MU 180' core BHA and RIH.	OR,Geo,BHI,Weir
	42 Fri	06.05.05 13:00	07.05.05 03:30	20,0	12,8	18,0	11,4	18,0	14,5	37,9	0,5	37 Cut core #1, 54 m core. (ROP: 5 m/hr). POOH, rack core assembly in derrick.	MI,OR,Geo,BHI,BHI,Weir,OTAS
	43 Sat	07.05.05 03:30	07.05.05 11:30	6,0	13,0	5,0	11,6	5,0	8,0	38,2	0,0	38 MU and RIH with 8 1/2" BHA	OR,Geo,BHI,BHI,Weir
	44 Sat	07.05.05 11:30	08.05.05 04:00	18,0	13,8	16,0	12,3	16,0	16,5	38,9	0,0	39 Drill 8 1/2" hole to core point #2 at approx. 1085 m (ROP: 10 m/hr). POOH, rack BHA in derrick.	MI,OR,Geo,BHI,BHI,Weir,OTAS
	45 Sun	08.05.05 04:00	08.05.05 10:00	6,0	14,0	5,5	12,5	5,5	6,0	39,2	0,0	40 MU 180' core BHA and RIH.	OR,Geo,BHI,Weir
	46 Sun	08.05.05 10:00	09.05.05 02:00	21,0	14,9	18,5	13,3	18,5	16,0	39,8	0,0	41 Cut core #2, 54 m core. (ROP: 5 m/hr). POOH, LD core assembly.	MI,OR,Geo,BHI,Weir,OTAS
	47 Mon	09.05.05 02:00	09.05.05 11:30	6,0	15,2	5,0	13,5	5,0	9,5	40,2	0,0	42 MU and RIH with 8 1/2" BHA.	OR,Geo,BHI,BHI,Weir
	48 Mon	09.05.05 11:30	10.05.05 16:00	24,0	16,2	22,0	14,4	22,0	28,5	41,4	7,5	43 Drill 8 1/2" hole to DT at 1325 m (ROP: 10 m/hr). POOH, rack BHA in derrick.	MI,OR,Geo,BHI,BHI,Weir,OTAS
	49 Tue	10.05.05 16:00	12.05.05 18:00	42,0	17,9	37,0	15,9	37,0	50,0	43,5	0,0	44 RU and perform wire line logging (#1: Pexlite-DSI. #2: MDT. #3: VSP. #4: CST).	MI,OR,Geo,Schlum
		12.05.05 18:00	**17.05.05 16:00**	**86,0**	**3,6**	**76,5**	**3,2**	**76,5**	**118,0**	**4,9**	**32,5**	**PERM P&A [NO 7131/4-1]**	
	50 Thu	12.05.05 18:00	15.05.05 09:00	26,0	19,0	24,0	16,9	24,0	63,0	46,1	24,0	45 P/U cement stinger and RIH to TD. Plug back open hole up to minimum 50 m inside 13 3/8" casing.	MI,OR,Hall,Geo,OTAS
	51 Sun	15.05.05 09:00	15.05.05 18:30	6,0	19,3	5,5	17,2	5,5	9,5	46,5	7,5	46 RIH with 13 3/8" EZSV on DP to 650 m.	OR,Hall,Geo
	52 Sun	15.05.05 18:30	15.05.05 22:00	5,0	19,5	4,5	17,4	4,5	3,5	46,7	1,0	47 Pressure test cement plug to 70 bar above 13 3/8" LOT. Set and pressure test EZSV.	OR,Hall,Geo
	53 Sun	15.05.05 22:00	15.05.05 23:30	4,0	19,6	3,5	17,5	3,5	1,5	46,7	0,0	48 Displace well to sea water.	MI,OR,Geo
	54 Sun	15.05.05 23:30	16.05.05 09:00	6,0	19,9	5,5	17,7	5,5	9,5	47,1	0,0	49 Set surface cement plug from 650 m to 500 m. POOH.	OR,Hall,Geo,OTAS
	55 Mon	16.05.05 09:00	17.05.05 10:00	24,0	20,9	21,0	18,6	21,0	25,0	48,2	0,0	50 Pull riser and BOP.	OR,Ocean
	56 Tue	17.05.05 10:00	17.05.05 16:00	13,0	21,4	10,5	19,0	10,5	6,0	48,4	0,0	51 MU and RIH with MOST cutting assembly. Cut WH 5 m below sea bed. POOH.	Weath,OR,Geo,Ocean,DQ
	57 Tue	17.05.05 15:59	17.05.05 16:00	2,0	21,5	2,0	19,1	2,0	0,0	48,4	0,0	52 LD MOST assembly and WH.	OR,DQ
		17.05.05 16:00	**18.05.05 22:00**	**24,0**	**1,0**	**21,0**	**0,9**	**21,0**	**30,0**	**1,3**	**0,0**	**MOVE [NO 7131/4-1]**	
	58 Tue	17.05.05 16:00	18.05.05 22:00	24,0	22,5	21,0	20,0	21,0	30,0	49,7	0,0	53 Pull anchors and deballast rig. Meanwhile: Inspect seabed with ROV. Retrieve transponders	OR
				22,5 days		**20,0 days**		**20,2**	**49,7 days**				

5.7.5 Wellhead system

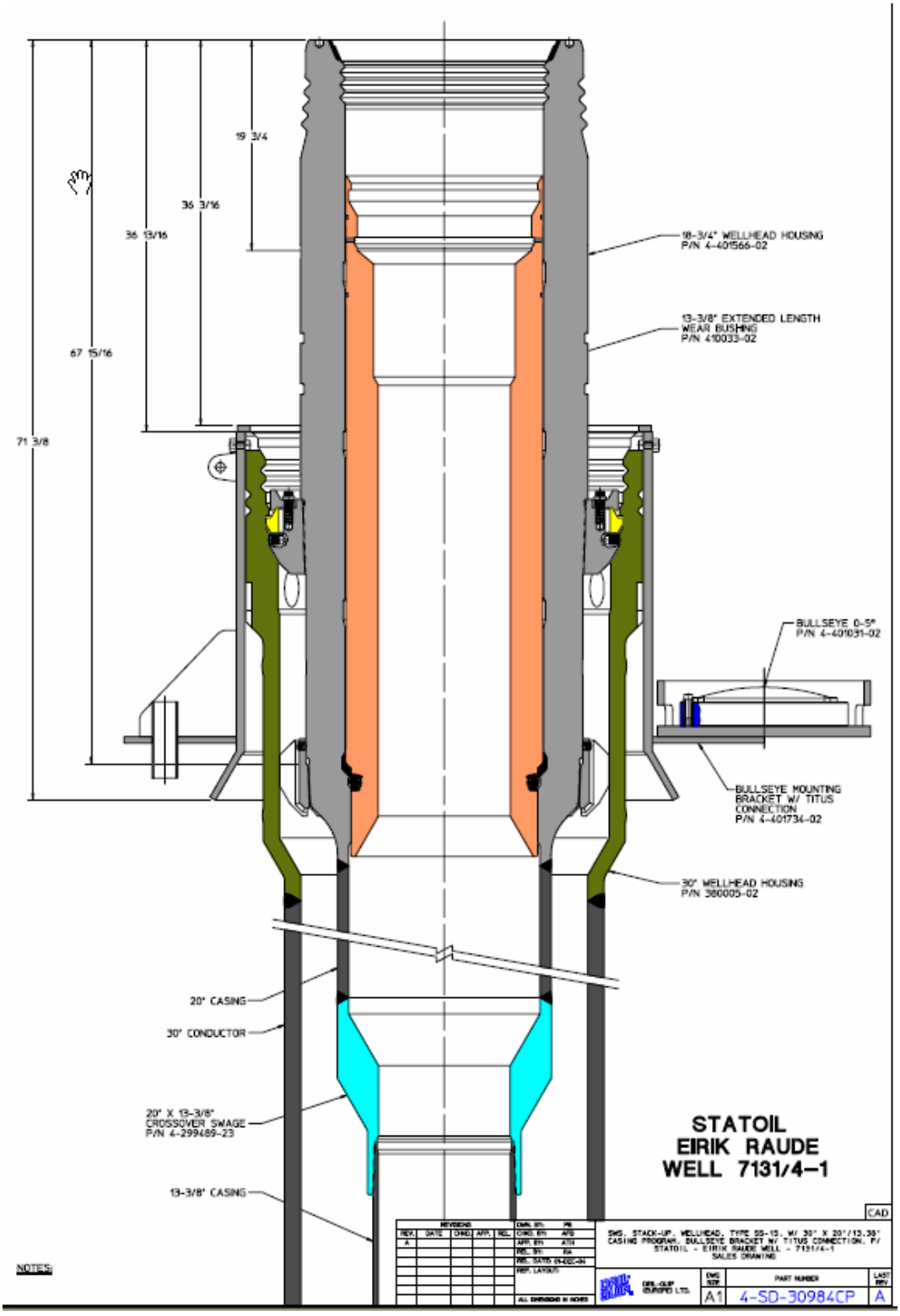


Figure 5-4 Wellhead system schematic.

5.7.6 Drilling fluids data

Table 5-2 Summary of drilling fluids programme

DRILLING FLUIDS DATA

Well: 7131/4-1
Field: PL 233, Guovca
Rig: Eirik Raude

All depths refer to RKB
RKB-MSL Eirik Raude: 25 m.

HOLE SIZE	HOLE TVD MD	CASING SIZE	CASING TVD MD	MUD TYPE	MW [g/cm³]	Funnel Visc. [sec.]	Fann 3 rpm	10 sec. [Pa]	10 min. [Pa]	PV [cP]	YP [Pa]	API FL [ml]	pH	MBT [kg/m³]	Ca ++ [mg/l]	Kcl [kg/m³]	Glyc. [%]	Sulphate [mg/l]	LGS [kg/m³]	Usage Volume [m³]
36"	403.5 403.5	30"	403.5 403.5	SW/ Bentonite/ Polymer	01jan - 1,35	> 150														107
				Section drilled by use of Sea Water and Bentonite high visc sweeps. 5 m3 of high visc pumped every 15 m drilled. At TD the hole was displaced to 1,35 sg Bentonite mud before pulling out to run 30" conducter. The drilling fluid worked as expected and no mud related problem was observed.																
17 1/2"	805.5 805.5	13 3/8"	799,5 799,5	SW/ Bentonite/ Polymer	1,03 - 1,35	> 150														443
				A 9 7/8" pilot hole was drilled and opened up to 17 1/2". The hole was drilled by use of Sea Water and Bentonite high visc pills. 5 m3 high visc was pumped every 15 m drilled. The pilot hole was first filled with high visc and later displaced to 1,35 sg Bentonite mud. After opening up the hole to 17 1/2", the kill mud was diluted to 1,35 sg and used as displacement fluid. The drilling fluid worked as expected and no mud related problem was observed.															
8 1/2"	Dry well: 1 295 1 295	n/a	n/a	Glydril 99% KCl	1,33	na	5 - 7	3 - 4	3,5 - 5	15 - 18	7,5 - 13	2,6 - 3	8,9 - 9	7	120 - 240	150 - 169	4,2	95 - 143	7 - 61	28,5
				Displaced well to drill water weighted up to 1,03 sg with 99% KCl brine, and drilled out cement by use of this fluid in addition to a high visc pill pumped at 791 m. Continued with same fluid through rat hole and 4 m into new formation. Cleaned the hole by pumping 10 m3 high visc and then spotted a 10 m3 high visc on bottom before performing a LOT. After performing LOT the well was displaced to 1,33 sg Glydril 99% KCl fluid. The Glydril 99% KCl fluid was in exellent condition throughout the section. The KCl content was run at the high end of specification. Ran three shakers with 230 mesh screens at the start. Changed to 200 mesh screens on two of the shakers at the end of the well. There were only traces of sand in the mud.															

5.7.7 Cementing data

Table 5-3 Summary of cementing data.

CEMENT DATA

Well: 7131/4-1
Field: PL 233, Guovca
Rig: Eirik Raude

All depths refer to RKB
RKB-MSL Eirik Raude: 25 m.

HOLE		CASING SHOE		TOC		VOLUME/ EXCESS	CEMENT SLURRY DESIGN									SPACER	DISPLACEMENT
SIZE	TYD MD	SIZE	TYD MD	TYD MD			Components	Lead [lbs/100ft]	Tail [lbs/100ft]	Densit g [g/cm³]	Yield [ft³/100sk]	Stat. Temp. Circ. [°C]	Thickening time, [hr:min @ 30 Bc]	API Free [%]	API Fluid loss [ml/30min]	24 hrs C.S. [psi]	Fluids and Rates
36"	403.5 403.5	30"	403.5 403.5	Sea bed Sea bed		25.8 m³ 150 %	Tuned Light (X-LITE) cement CaCl2 liquid NF-6 Seawater		4.50 0.10 54.23	1.52	106.30 Code DWLSP	6-8 API	03:30 (to 70 Bc)	n.a.	n/a	600	30 m³ Sea water	Sea water 800 lpm
17 1/2"	805.5 805.5	13 3/8"	799.5 799.5	Sea bed Sea bed		Lead: 39 m³ Tail: 15 m³ 50% on lead	Norcem "G" + 0,1% EZ-FLO Econolite CaCl2 liquid NF-6 Seawater	3.20 - 0.10 94.37	- 1.50 0.10 41.45	L: 1,56 T: 1,95	L: 129,36 Code STL10 T: 74,14 Code STTI5	23 / 15 API	L: 5:20 T: 4:17 (to 70 Bc)	n.a.	n/a	L:200 T: 1500	26 m³ Sea water	Sea water 3000 lpm
8 1/2"	1295 1295	Plug #1 Plug #2 Plug #3	1280.0 980.0 743.0	1015.0 743.0 610.0		Plug #1: 9.4 m³ Plug #2: 9.4 m³ Plug #3: 9.4 m³ 0% excess	Norcem "G" + 0,1% EZ-FLO Gascon 469 Halad-400L CFR-8L HR-4L NF-6 Fresh water		3.50 3.00 2.50 0.80 0.10 37.10	1.90	78.06 Code GTT30	42 / 34 API	04:10	0	24	1000	6 m³ Spacer 3T ahead 6 m³ Spacer 3T ahead 9 m³ Spacer 3T ahead	Active mud 800 - 2500 lpm
13 3/8" Casing		Plug #4 Surface	600.0	400.0		Plug #4: 15.5 m³	Norcem "G" + 0,1% EZ-FLO NF-6 Seawater		0.10 46.74	1.90	77.90 Code STTNT	14 / 12 API	+/- 4	n.a.	n.a.	+/- 500	Seawater	Seawater 700 l/

5.7.8 Bottom hole assemblies

All data are taken from the DBR system.

BHA report

Wellbore: NO 7131/4-1

BHA seq: 1 BHA category: Drilling BHA description:

BHA no: 1

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	17,500		0,42	0,42
WEIGHT	11,000		2,02	2,44
HO TWO STAGE 26" X 36"	36,000		3,82	6,26
BIT SUB W/FLOAT	9,500		0,91	7,17
ANDERDRIFT	9,500		2,97	10,14
DRILL COLLAR	9,500	2,870	47,32	57,46
XO SUB	9,500	2,870	0,86	58,32
DRILL COLLAR	8,250	2,870	56,59	114,91
XO SUB	8,250	2,870	0,84	115,75
HWDP 5 1/2"	5,500	2,870	83,89	199,64

BHA seq: 2 BHA category: Drilling BHA description:

BHA no: 2

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	9,875		0,29	0,29
FLOAT SUB	8,300		0,88	1,17
HOLE OPENER	12,250		1,31	2,48
XO SUB	8,300		0,65	3,13
HOLE OPENER	17,500		1,25	4,38
HOLE OPENER	26,000		1,79	6,17
BIT SUB	9,565	2,870	0,92	7,09
DRILL COLLAR	9,565	2,870	47,32	54,41
XO SUB	9,565	3,000	0,86	55,27
DRILL COLLAR	8,250	3,000	56,59	111,86
XO SUB	8,250	2,870	0,84	112,70
HWDP 5 1/2"	5,500	2,870	83,89	196,59
DP 5 1/2"	5,500	4,778		196,59

BHA seq: 3 BHA category: Drilling BHA description:

BHA no: 3

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	9,875		0,26	0,26
BIT SUB	8,938	3,000	1,82	2,08
MPR SUB	8,250	3,000	3,60	5,68
APX	8,750	3,000	10,01	15,69
MWD DCP	8,250	3,000	11,15	26,84
SAVER SUB	8,250	3,000	0,89	27,73
FLOAT SUB	7,938	3,000	0,79	28,52
DRILL COLLAR	8,250	2,813	103,83	132,35
JAR	7,938	2,750	9,62	141,97
DRILL COLLAR	8,250	2,813	28,27	170,24
XO SUB	8,250	2,813	0,84	171,08

		HWDP 5 1/2"			5,500		83,89	254,97
		DP 5 1/2"			5,500	4,778		254,97
BHA seq:	4	BHA category:	Drilling	BHA description:				

BHA no: 4

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	9,875		0,26	0,26
GR TOOL	8,938	3,000	1,29	1,55
MPR SUB	8,250	3,000	3,61	5,16
APX	8,750	3,000	9,99	15,15
MWD DCP	8,250	3,000	11,14	26,29
SAVER SUB	8,250	3,000	0,89	27,18
FLOAT SUB	7,938	3,000	0,79	27,97
DRILL COLLAR	8,250	2,813	103,83	131,80
JAR	7,938	2,750	9,62	141,42
DRILL COLLAR	8,250	2,813	28,27	169,69
XO SUB	8,250	2,813	0,84	170,53
HWDP 5 1/2"	5,500		83,89	254,42
DP 5 1/2"	5,500	4,778		254,42

BHA seq: 5 BHA category: Drilling BHA description:

BHA no: 5

String component	OD in	ID in	Length m	Acc length m
BULL NOZE,	7,992	0,000	1,39	1,39
FLOAT SUB,	8,307	2,834	0,88	2,27
HOLE OPENER	12,250	2,834	1,31	3,58
X-OVER	8,307	2,834	0,65	4,23
HOLE OPENER,	17,500	3,070	1,25	5,48
BIT SUB	9,566	3,070	0,92	6,40
X-OVER	9,566	3,070	0,86	7,26
DRILL COLLAR	8,250	2,834	84,93	92,19
JAR	7,937	3,000	9,62	101,81
DRILL COLLAR	8,250	2,834	28,27	130,08
X-OVER	8,307	2,834	0,84	130,92
5 1/2" HWDP	5,500	4,778	83,89	214,81

BHA seq: 6 BHA category: Drilling BHA description:

BHA no: 6

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,500		0,24	0,24
STAB SLEVE NM	8,500	2,250	1,18	1,42
ON TRAK	7,000	2,250	5,16	6,58
MOD STAB	8,346	2,250	1,24	7,82
BCPM	7,000	2,250	3,24	11,06
STOP SUB	7,000	2,250	0,49	11,55
FLOAT SUB	7,000	2,835	0,91	12,46
STAB SLEEVE	8,500	2,250	1,81	14,27
DRILL COLLAR STEEL,	6,750	2,835	75,61	89,88
JAR	6,375		9,49	99,37
DRILL COLLAR STEEL,	6,750	2,835	28,37	127,74
HWDP 5"	5,000		82,40	210,14
DRILL PIPE	5,000		229,88	440,02
XO SUB	6,750	3,000	0,65	440,67

BHA seq: 7 BHA category: Drilling BHA description:

BHA no: 7

String component	OD in	ID in	Length m	Acc length m
BIT, CORE	8,500		0,42	0,42
STAB STRING	8,450	5,375	2,00	2,42
CORE BARREL	7,250	5,375	8,35	10,77
STAB STRING	8,450	5,375	0,79	11,56
CORE BARREL	7,250	5,375	8,35	19,91
STAB STRING	8,450	5,375	0,79	20,70
CORE BARREL	7,250	5,375	8,35	29,05
STAB STRING	8,450	5,375	0,79	29,84
CORE BARREL	7,250	5,375	8,35	38,19
STAB STRING	8,450	5,375	0,79	38,98
CORE BARREL	7,250	5,375	8,35	47,33
STAB STRING	8,450	5,375	0,79	48,12
CORE BARREL	7,250	5,375	8,35	56,47
STAB STRING	8,450	5,375	0,79	57,26
EXTENSION SUB,	7,250	5,375	0,93	58,19
TOP SUB	7,250	3,150	0,43	58,62
FLOAT SUB	6,500	2,250	0,76	59,38
DRILL COLLAR	6,750	2,835	47,25	106,63
JAR	6,378		9,49	116,12
DRILL COLLAR	6,750	2,835	28,37	144,49
HW DRILL PIPE	5,000		82,39	226,88
DRILL PIPE	5,000		229,88	456,76

BHA seq: 8 BHA category: Drilling BHA description:

BHA no: 8

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,500		0,24	0,24
STAB SLEVE NM	8,500	2,250	1,18	1,42
ON TRAK	7,000	2,250	5,10	6,52
MOD STAB	8,346	2,250	1,24	7,76
BCPM	7,000	2,250	3,24	11,00
STOP SUB	7,000	2,250	0,49	11,49
FLOAT SUB	7,000	2,835	0,91	12,40
STAB SLEEVE	8,500	2,250	1,81	14,21
DRILL COLLAR STEEL,	6,750	2,835	75,61	89,82
JAR	6,375		9,49	99,31
DRILL COLLAR STEEL,	6,750	2,835	28,37	127,68
HWDP 5"	5,000		82,40	210,08

BHA seq: 9 BHA category: Drilling BHA description:

BHA no: 7

String component	OD in	ID in	Length m	Acc length m
BIT, CORE	8,500		0,42	0,42
STAB STRING	8,450	5,375	2,00	2,42
CORE BARREL	7,250	5,375	8,35	10,77
STAB STRING	8,450	5,375	0,79	11,56
CORE BARREL	7,250	5,375	8,35	19,91
STAB STRING	8,450	5,375	0,79	20,70
CORE BARREL	7,250	5,375	8,35	29,05

		STAB STRING			8,450	5,375	0,79	29,84
		CORE BARREL			7,250	5,375	8,35	38,19
		STAB STRING			8,450	5,375	0,79	38,98
		CORE BARREL			7,250	5,375	8,35	47,33
		STAB STRING			8,450	5,375	0,79	48,12
		CORE BARREL			7,250	5,375	8,35	56,47
		STAB STRING			8,450	5,375	0,79	57,26
		EXTENSION SUB,			7,250	5,375	0,93	58,19
		TOP SUB			7,250	3,150	0,43	58,62
		FLOAT SUB			6,500	2,250	0,76	59,38
		DRILL COLLAR			6,750	2,835	47,25	106,63
		JAR			6,378		9,49	116,12
		DRILL COLLAR			6,750	2,835	28,37	144,49
		HW DRILL PIPE			5,000		82,39	226,88
		DRILL PIPE			5,000		229,88	456,76
		XO SUB			6,750	3,000	0,65	457,41
BHA seq:	10	BHA category:	Drilling	BHA description:				
BHA no:	9							
		String component			OD in	ID in	Length m	Acc length m
		BIT, PDC			8,500		0,24	0,24
		STAB SLEVE NM			8,500	2,250	1,18	1,42
		ON TRAK			7,000	2,250	5,10	6,52
		BCPM			7,000	2,250	3,24	9,76
		MOD STAB			8,346	2,250	1,24	11,00
		APX			7,000	2,250	11,04	22,04
		STOP SUB			7,000	2,250	0,49	22,53
		FLOAT SUB			7,000	2,835	0,91	23,44
		STAB SLEEVE			8,500	2,250	1,81	25,25
		DRILL COLLAR STEEL,			6,750	2,835	75,61	100,86
		JAR			6,375		9,49	110,35
		DRILL COLLAR STEEL,			6,750	2,835	28,37	138,72
		HWDP 5"			5,000		82,40	221,12
		DRILL PIPE			5,000		316,09	537,21
BHA seq:	11	BHA category:	Drilling	BHA description:				
BHA no:	10							
		String component			OD in	ID in	Length m	Acc length m
		BULL NOSE			8,000	1,500	0,38	0,38
		CASING CUTTER			12,000	1,000	1,84	2,22
		TOP SUB			10,000	3,500	0,96	3,18
		STABILIZER NON.ROT			17,500	2,750	1,40	4,58
		PONY COLLAR			8,000	2,813	1,85	6,43
		SPACER SUB			8,000	2,250	0,19	6,62
		SPACER SUB			8,000	3,063	0,89	7,51
		SPACER SUB			8,000	2,750	0,89	8,40
		MOST TOOL			37,500		8,82	17,22
		DRILL COLLAR			8,250	2,813	84,85	102,07
		XO SUB			8,250		0,87	102,94
		HW DRILL PIPE			5,500	3,500	83,89	186,83

5.7.9 Bit record

All data are taken from the DBR system.

Bit record

Wellbore: NO 7131/4-1

Run no	Bit size	Bit no	BHA no	Bit type	IADC code	Bit manufacturer	Serial no	Nozzles (n/32") no x n	no x n	no x n	no x n	Flow area in2
1	36"	1	1	HOLE OPENER		Odfjell Drilling AS		3 x 18	3 x 16	x	x	1,335
1	17 1/2"	1RR	1	MX-3	135	Hughes Christensen	6003884	3 x 18	1 x 14	x	x	0,896
2	26"	2	2	HOLE OPENER		Odfjell Drilling AS	RS-HO-158	6 x 16	x	x	x	1,179
2	12 1/4"	2	2	HOLEOPENER	PDC	Smith Bits		x	x	x	x	
2	9 7/8"	2	2	EHT11	117	Reed-Hycalog	PP1750	15 x 3	12 x 1	x	x	0,113
2	17 1/2"	2	2	HOLE OPENER		Odfjell Drilling AS	RB-15434	3 x 18	x	x	x	0,746
3	9 7/8"	3	3	MXC09	437	Hughes Christensen	5030889	3 x 18	1 x 16	x	x	0,942
4	9 7/8"	3 rr 1	4	MXC09	437	Hughes Christensen	5030889	3 x 18	1 x 16	x	x	0,942
5	17 1/2"	2RR	5	HOLE OPENER		Odfjell Drilling AS	RB-15434	3 x 22	x	x	x	1,114
5	12 1/4"	2RR	5	HOLE OPENER	PDC	Smith Red Baron	JT-8939	5 x 12	x	x	x	0,553
5	8"	4	5	BULLNOSE		Odfjell Drilling AS		1 x 26	x	x	x	0,519
6	8 1/2"	5	6	MRS89VPX	M423	Smith Bits	SCA547	12 x 6	x	x	x	
7	8 1/2"	6	7	BHC606		Baker Hughes Inteq	7204093	x	x	x	x	1,180
8	8 1/2"	5rr	8	MRS89VPX	M423	Smith Bits	SCA547	6 x 12	x	x	x	0,663
9	8 1/2"	6RR	7	BHC606		Baker Hughes Inteq	7204093	x	x	x	x	1,180
10	8 1/2"	5RR2	9	MRS89VPX	M423	Smith Bits	SCA547	6 x 12	x	x	x	0,663

Wellbore: NO 7131/4-1

Run no	Bit size	Pump rate l/min	Pump press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drld hrs	Circ hrs	ROP m/hr	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min kNm	Torque Max kNm	Con drag Min kdaN	Con drag Max kdaN
1	36"	5000	132	356	403	47,0	47,0	13,8	25,5	3,4	0	4	60	131	4	19		
1	17 1/2"	5000	132	356	407,7	51,7	51,7	13,8	25,5	3,7	0	8	60	131	4	19		
2	26"			403	404	1,0	4,0	0,7	1,3	1,4	3	5	49	81	4	5		
2	12 1/4"			403	409	6,0	9,0	0,7	1,3	8,6	3	5	49	81	4	5		
2	9 7/8"	5000		403	411	8,0	11,0	0,7	1,3	11,4	3	5	49	81	4	5		
2	17 1/2"			403	406	3,0	5,2	0,7	1,3	4,3	3	5	49	81	4	5		
3	9 7/8"	5000	124	411	413	2,0	2,0	0,1	1,3	20,0	1	3	70	99	3	5		
4	9 7/8"	3460	154	413	811	398,0	398,0	16,9	22,5	23,6	4	11	112	165	3	6	77	82
5	17 1/2"	3414	152	411	805	394,0	394,0	30,2	39,2	13,0	2	22	69	134	3.5	20	73	82
5	12 1/4"	3414	152	411	808	397,0	397,0	30,2	39,2	13,1	2	22	69	134	3.5	20	73	82
5	8"	3414	152	411	811	400,0	400,0	30,2	39,2	13,2	2	22	69	134	3.5	20	73	82
6	8 1/2"			811	915	104,0	143,0	11,0	26,0	9,5	1	4	30	80	2	6		
7	8 1/2"			915	949	34,0	34,0	2,3	4,1	14,8								
8	8 1/2"	2400	150	949	1070	121,0	121,0	7,1	13,3	17,0	1	4	70	110	4	7		
9	8 1/2"			1070	1118	48,0	48,0	6,2	7,5	7,7	3	10	90	100	3	8		
10	8 1/2"	2370	170	1118	1295	177,0	160,0	10,1	16,6	17,5	1	4		120	2.95	4.75		

Wellbore: **NO 7131/4-1**

IADC dull grading

Run no	Bit size	I	O	DC	L	B	G	OC	RP	Remarks
1	36"									26" x 36" 2-stage hole opener.
1	17 1/2"	2	2	WT	A	F	I	NO	TD	Used bit. 219 krevs on this run.
2	26"	0	0	NO	A	0	I	NO	TD	Drilled out 30" conductor.
2	12 1/4"	0	0	NO	A	X	I	NO	TD	Drilled out 30" conductor.
2	9 7/8"	0	0	NO	A	E	I	NO	TD	Drilled out 30" conductor.
2	17 1/2"	0	0	NO	A	E	I	NO	TD	Drilled out 30" conductor.
3	9 7/8"	0	0	NO	A	E	I	NO	DTF	2 krevs.
4	9 7/8"	2	2	WT	A	E		NO	TD	Drill pilot hole.
5	17 1/2"	7	8	TR	A	Q	1/16	LT	TD	Hole opener worn out.
5	12 1/4"	1	1	CT	S	X	IN	NO	TD	
5	8"									
6	8 1/2"	1	1	CT	N	X	1	NO	CP	Drill out cement. 97 k revs.
7	8 1/2"	1	1	WT	A	X	I	PN	PR	
8	8 1/2"	1	2	WT	N	X	1	CT	CP	Rerun bit. Limited ROP to max 15 m/hr due to mud logging sample catching rate. 87 krev (for this run)
9	8 1/2"	1	1	BU	A	X	I	PN	PR	69 krevs.
10	8 1/2"	1	2	CT	A	X	1	NO	TD	Drilled with limited ROP due to cuttings handling system.

6 Appendices

App A Extract of daily activities

A.1 DBR summary of activities

Wellbore: **NO 7131/4-1**

Time from	Time to	Time used	Depth mMD	Act code	---Status--- During opr	End opr	Description of activities
30.03.2005 06:00	00:00	18,0	,0	MNMU	OK	OK	Rig in transit to location. Sailed 120 nm from Hydro's Obelix location, 7220/6-1, towards Guovca location. Average speed 6 kts.
31.03.2005 00:00	06:00	6,0	,0	MNMU	OK	OK	Continued rig move to location. Sailed in total 160 nm towards Guovca. 31 nm to Guovca location. Average speed 6,5 kts. ETA Guovca 1030 hrs 31/03/2005. Current position 72° 15,0' N 29° 32,5' E.
31.03.2005 06:00	11:00	5,0	,0	MNMU	OK	OK	Moved rig onto location. Rig 500 m from location at 1020hrs, on location at 1040 hrs, N71 41.7, E31 00.7. Total distance sailed from Obelix 191 nm.
31.03.2005 11:00	15:30	4,5	,0	MNMU	OK	OK	Unloaded deck cargo from the anchor handling vessels. Prepared for anchor handling.
31.03.2005 15:30	00:00	8,5	,0	MAWW	OK	OK	Waited on weather to run anchors. Meanwhile, dived ROV and performed seabed sampling according to program.
01.04.2005 00:00	06:00	6,0	,0	MAWW	OK	OK	Waited on weather to run anchors.
01.04.2005 06:00	16:00	10,0	,0	MAWW	OK	OK	Waited on weather to run anchors.
01.04.2005 16:00	00:00	8,0	,0	MARU	OK	OK	Performed anchor handling. Ran anchors #4, #8, #5 and #1. Pre tensioned anchors to 150 T. Meanwhile, ROV placed 4 marker bouys on the seabed.
02.04.2005 00:00	06:00	6,0	,0	MARU	OK	OK	Continued anchor handling. Ran anchors #7, #3, #6 and #2.
02.04.2005 06:00	09:00	3,0	,0	MARU	OK	OK	Performed 230 T pull test on anchors. Meanwhile picked up and racked 3 stands 5½" HWDP in derrick.
02.04.2005 09:00	11:00	2,0	275,0	MNBU	OK	E FAIL	Ballasted rig. PU and MU 36" BHA. Tripped in to 275 m.
02.04.2005 11:00	11:30	0,5	275,0	RCOD	E FAIL	OK	Fire alarm on rig. Suspended operations and mustered personnel while investigating cause of alarm.
02.04.2005 11:30	13:30	2,0	286,0	MNBU	OK	OK	Continued ballasting rig to 23,5 m operational draft while tripping in with 36" BHA to 286 m.
02.04.2005 13:30	14:00	0,5	356,0	DTDU	OK	E FAIL	RIH with BHA and tagged sea bed without pumping at 356 m. Positioned 4 marker bouys 5 m from well center according to program.
02.04.2005 14:00	15:30	1,5	355,0	DEOD	E FAIL	OK	Function tested Anderdrift tool. Unable to obtain pressure pulses from the tool. Repeated tests at various flow rates. Established flow rate to obtain surveys - 1500 lpm.
02.04.2005 15:30	18:00	2,5	356,5	DTPU	OK	OK	Picked up string 3,5 m and rotated at 60 rpm. Observed string drift 5 m. Moved rig to reposition string within marker bouys while observing well with ROV on sonar.
02.04.2005 18:00	19:00	1,0	371,0	DDRU	OK	OK	Spudded well and drilled with reduced parameters 1000 lpm, 1 T WOB, 60 rpm, 63 bar. Drilled 36" hole to 363 m. Increased flow rate to 5000 lpm and drilled to 371 m. Performed survey and recorded 2,25 deg inclination. Reamed 3 times and repeated survey. Recorded 2,0 deg inclination.
02.04.2005 19:00	23:00	4,0	386,0	DDRU	OK	OK	Drilled 36" hole to 386 m using 0 - 3 T WOB, 120 rpm, 5000 lpm. Pumped 5 m³ high viscosity sweep every 15 m drilled. Performed survey and recorded 2,25 deg inclination. Reamed section 3 times and repeated survey. Recorded 2 deg inclination. RIH after survey, observed 2,5 m fill on bottom.
02.04.2005 23:00	00:00	1,0	387,0	DDRU	OK	OK	Drilled 36" hole to 387 m using 0 - 3 T WOB, 120 rpm, 5000 lpm.
03.04.2005 00:00	01:00	1,0	389,0	DDRU	OK	OK	Continued drillling 36" hole to 389 m using 0 - 3 T WOB, 120 rpm, 5000 lpm, 132 bar. Rig experiencing 9 m - 11 m waves with 6 deg roll and utilizing 97% thruster power to maintain position. Increased anchor tension to 150 T on windward side.
03.04.2005 01:00	02:00	1,0	340,0	DDWW	OK	OK	POOH from 389 m to 340 m.
03.04.2005 02:00	06:00	4,0	340,0	DDWW	OK	OK	WOW.
03.04.2005 06:00	12:00	6,0	314,0	DDWW	OK	OK	WOW. Meanwhile greased the top drive. MU and racked the cement stand with pump-in sub in the derrick.
03.04.2005 12:00	14:00	2,0	314,0	DDWW	OK	OK	WOW. Rigged up Totco survey gear. To check shot survey with Totco at 314 m - 0,5 deg inclination. Performed survey with Anderdrift - 0,5 deg inclination.

03.04.2005 14:00	16:00	2,0	354,0	DDWW	OK	OK	WOW. RIH from 314 mMD to 354 mMD. Repositioned rig for re-entry into 36" hole.
03.04.2005 16:00	17:00	1,0	389,0	DDWW	OK	OK	Re-entered 36" hole. Took check shot surveys with Anderdrift while RIH to bottom. 0,25 deg inclination @ 370 mMD. 0,75 deg inclination @ 380 mMD.
03.04.2005 17:00	00:00	7,0	399,0	DDRU	OK	OK	Drilled 36" hole from 389 mMD to 399 mMD using 1 - 4 T WOB, 80 - 130 rpm, 5000 lpm, 130 bar. Pumped 5 m³ high viscosity at 384 mMD. Reamed section 3 times prior to taking Anderdrift survey. 1,0 deg @ 388 m survey depth.
04.04.2005 00:00	06:00	6,0	405,5	DDRU	OK	OK	Drilled 36" hole from 399 m to 405,5 mMD.
04.04.2005 06:00	08:00	2,0	407,7	DDRU	OK	OK	Drilled 36" hole to 407,7 mMD using 5000 lpm, 131 bar, 3 - 8 T WOB, 70 - 130 rpm. Reamed stand and performed Anderdrift survey. 0.75° inclination at 398 mMD.
04.04.2005 08:00	09:00	1,0	407,7	DDRU	OK	OK	Confirmed depth with ROV and verified with drilling tally to correlate 36" hole depth.
04.04.2005 09:00	10:00	1,0	407,7	DCAU	OK	OK	Pumped 25 m³ high viscosity sweep and circulated bottoms up. Logged well position with ROV.
04.04.2005 10:00	10:30	0,5	407,7	DCAU	OK	OK	Displaced hole to 1,35 sg mud.
04.04.2005 10:30	14:00	3,5	366,0	DTCU	OK	OK	POOH to 366 mMD. Topped up well and POOH to surface.
04.04.2005 14:00	15:00	1,0	,0	DTBU	OK	OK	Pulled PS-30 slips and laid out 36" hole opener assembly.
04.04.2005 15:00	17:00	2,0	,0	CERU	OK	E FAIL	Cleared the drill floor. Held prejob meeting. Rigged up to run 30" conductor.
04.04.2005 17:00	18:00	1,0	,0	CAOD	E FAIL	OK	500 T bails unable to fit into 30" elevator ears. Time spent to locate certified slings for lifting conductor to drill floor. Rigged up 350 T drilling bails and 2 m 50 T slings.
04.04.2005 18:00	22:00	4,0	50,5	CARU	OK	OK	Ran 30" conductor according to tally. Installed handling clamp on conductor housing and landed on rotary table. Installed false rotary and ran 5½" DP inner string. MU 30" conductor housing running tool to conductor string.
04.04.2005 22:00	00:00	2,0	350,0	CARU	OK	OK	Ran conductor to moon pool and installed bulls eye clamp on conductor housing and ball valve on running tool. Filled up string prior to running below the splash zone. Ran 30" conductor to 350 m. Filled up every stand while RIH.
05.04.2005 00:00	02:30	2,5	403,7	CARU	OK	OK	Stabbed conductor string into the wellbore and RIH to 403,7 mMD. Checked bulls eye position and stick up with ROV - 3 m. Pulled rig 2 m aft to adjust bullseye inclication to 0,5° / 0° on the bulls eyes.
05.04.2005 02:30	03:30	1,0	403,7	CCCU	OK	OK	Circulated 30 m³ seawater at 3000 lpm. Meanwhile held prejob safety meeting on the drill floor. Tested surface lines to 100 bar / 5 minutes.
05.04.2005 03:30	05:00	1,5	403,7	CSSU	OK	OK	Mixed and pumped 28 m³ 1,52sg Xlite cement slurry at 830 - 400 lpm, 13 - 6 bar. Displaced cement with 9.4 m³ sea water at 1000 lpm, 60 bar.
05.04.2005 05:00	06:00	1,0	403,7	CSCW	OK	OK	WOC.
05.04.2005 06:00	08:30	2,5	403,0	CSCW	OK	OK	WOC.
05.04.2005 08:30	11:00	2,5	35,0	CTTU	OK	OK	Slacked off string weight to neutral weight while ROV observed bullseyes. Released 30" wellhead running tool. POOH to surface. 30" wellhead housing stick up 3 m, bullseyes: 0° / 0,5°
05.04.2005 11:00	12:00	1,0	,0	CERU	OK	OK	LD wellhead running tool. Broke down cement stand and cleared the drill floor.
05.04.2005 12:00	15:00	3,0	400,6	CTTU	OK	OK	PU 9 7/8" x 26" premade module. MU drill out BHA and RIH. Used ROV to guide string into well head. Tagged cement at 400,6 mMD.
05.04.2005 15:00	18:00	3,0	411,0	CDDU	OK	OK	Drilled out 30" conductor shoe. Drilled to 411 mMD until 26" cutters reamed the rat hole. Reamed the shoe track and rat hole several times. Pumped 5 m³ high viscosity pill and swept hole clean.
05.04.2005 18:00	21:30	3,5	,0	CTTU	OK	OK	POOH. LD excess BHA components and 9 7/8" x 26" premade module. Cleared the drill floor.
05.04.2005 21:30	00:00	2,5	132,0	DTBU	OK	OK	PU and MU MPR, APX and MWD tools. Verified communications across tools. Built 9 7/8" pilot hole BHA and RIH to 132 m.
06.04.2005 00:00	02:00	2,0	340,0	DTBU	OK	OK	Continued to MU 9 7/8" pilot hole assembly. RIH to 340 mMD.
06.04.2005 02:00	02:30	0,5	340,0	DDOU	OK	OK	Held shallow gas safety meeting. Reviewed actions, responses and responsibilites.
06.04.2005 02:30	03:00	0,5	411,0	DTDU	OK	OK	RIH with 9 7/8" pilot BHA. Washed down to bottom.
06.04.2005 03:00	03:30	0,5	413,0	DDRU	OK	E FAIL	Drilled pilot hole from 411 mMD to 413 mMD using 1 T WOB, 70 - 90 rpm, 3 - 5 kNm, 3900 lpm, 93 bar. Lost communication with MWD
06.04.2005 03:30	04:30	1,0	411,0	DEMD	E FAIL	OK	No communication with MPR sub. Picked off bottom and circulated while trouble shooting MWD.
06.04.2005 04:30	06:00	1,5	156,0	DTMD	E FAIL	OK	POOH to 156 m due to MWD failure.
06.04.2005 06:00	07:30	1,5	,0	DEMD	E FAIL	OK	POOH to surface with 9 7/8" pilot BHA. Plugged into MWD read out port, unable to establish communications with MPR sub. LD MPR sub and APX tool.
06.04.2005 07:30	08:30	1,0	,0	DEMD	E FAIL	E FAIL	PU back up MPR sub. Built 9 7/8" BHA.
06.04.2005 08:30	10:30	2,0	,0	DEMD	E FAIL	OK	Cross threaded MPR / APX connection. LD back up MPR sub and APX tool.
06.04.2005 10:30	13:00	2,5	,0	DEMD	E FAIL	OK	PU initially LD MPR tool and MU back up APX tool. Verified tools communication. Shallow hole tested MWD string.
06.04.2005 13:00	16:30	3,5	341,0	DTMD	E FAIL	OK	RIH to 341 m.
06.04.2005 16:30	17:00	0,5	341,0	DDOU	OK	OK	Held shallow gas preparedness safety meeting.
06.04.2005 17:00	17:30	0,5	413,0	DTMD	E FAIL	OK	Stabbed into conductor housing while observed with ROV. RIH and washed down to 413 mMD.

06.04.2005 17:30	00:00	6,5	506,0	DDRU	OK	OK	Drilled 9 7/8" pilot hole from 413 mMD to 506 mMD with 3 -6 T WOB, 145 rpm, 3450 lpm, 146 bar. Pumped 5m³ high viscosity pills every 15 m drilled and took surveys prior to making connections.
07.04.2005 00:00	03:30	3,5	562,0	DDRU	OK	E FAIL	Drilled 9 7/8" pilot hole from 506 mMD to 562 mMD with 5 - 8 T WOB, 165 rpm, 3450 lpm, 148 bar. Pumped 5m³ high viscosity pills every 15 m drilled and took surveys prior to making connections.
07.04.2005 03:30	04:00	0,5	562,0	DERD	E FAIL	OK	Observed hydraulic leakage from PS-30 slips. Rigged down PS-30 slips. Installed manual slips.
07.04.2005 04:00	06:00	2,0	598,0	DDRU	OK	OK	Drilled 9 7/8" pilot hole from 562 mMD to 598 mMD with 5 - 8 T WOB, 165 rpm, 3450 lpm, 148 bar. Pumped 5m³ high viscosity pills every 15 m drilled and took surveys prior to making connections.
07.04.2005 06:00	16:00	10,0	811,0	DDRU	OK	OK	Drilled 9 7/8" pilot hole from 598 m to TD at 811m with 5-8 ton WOB, 165 RPM, 3450 LPM and 148 bar. Pumped 5 m3 high viscosity pills every 15 m drilled and took survey prior to connections.
07.04.2005 16:00	16:30	0,5	811,0	DDRU	OK	OK	Reamed stand, took survey and swept hole with 10 m3 high viscosity pill.
07.04.2005 16:30	17:00	0,5	811,0	DDRU	OK	OK	Flow checked well. Well static.
07.04.2005 17:00	17:30	0,5	811,0	DCAU	OK	OK	Displaced hole to 1,35 sg mud.
07.04.2005 17:30	21:00	3,5	360,0	DTDU	OK	OK	POOH from 811m to 360m. Worked trough minor tight spots, max overpull 12 tons.
07.04.2005 21:00	21:30	0,5	360,0	DTDU	OK	OK	Topped up hole with 1,35 sg mud. Pulled bit above conductor housing and flushed drill string with seawater. Moved rig to safe zone.
07.04.2005 21:30	23:00	1,5	28,0	DTDU	OK	OK	Continued POOH to 28m.
07.04.2005 23:00	00:00	1,0	28,0	DDOU	OK	OK	Dumped data from MWD tool.
08.04.2005 00:00	00:30	0,5	28,0	DDOU	OK	OK	Continued dumping data from MWD tool.
08.04.2005 00:30	01:30	1,0	,0	DTDU	OK	OK	Continued POOH and LD MWD tool.
08.04.2005 01:30	02:00	0,5	,0	DDOU	OK	OK	Performed pre-job safety meeting prior to PU 18 3/4" well head housing assy.
08.04.2005 02:00	05:30	3,5	,0	DEOU	OK	OK	PU wellhead housing. Installed wiper plugs and running tool. LD wellhead assembly on deck.
08.04.2005 05:30	06:00	0,5	,0	DTBU	OK	OK	MU 17 1/2" hole opener assy.
08.04.2005 06:00	11:00	5,0	349,0	DTDU	OK	OK	Continued MU and RIH with 17 1/2" hole opener assy to 349 m. Serviced and inspected top drive for potential dropped objects while RIH.
08.04.2005 11:00	11:30	0,5	411,0	DTDU	OK	OK	Stabed into well and washed down from 390 m to 411 m.
08.04.2005 11:30	00:00	12,5	550,0	DDHU	OK	OK	Drilled and opened 9 7/8" hole to 17 1/2" from 411m to 550 m using 3-6 tons WOB, 80-120 RPM, 5000-6300 LPM and 155- 216 bar, torque min/max: 3.5-6.9 kNm. Pumped 5m3 high viscosity pill every 15m and reamed each stand.
09.04.2005 00:00	06:00	6,0	586,0	DDHU	OK	OK	Drilled and opened 9 7/8" hole to 17 1/2" from 550 m to 586 m using 3-6 tons WOB, 80-120 RPM, 5000-6300 LPM and 155- 216 bar, torque min/max: 3.5-6.9 kNm. Pumped 5m3 high viscosity pill every 15 m and reamed each stand.
09.04.2005 06:00	00:00	18,0	756,0	DDHU	OK	OK	Continued drilling and opening 9 7/8" hole to 17 1/2" from 586 m to 756 m using 5 -20 tons WOB, 80-110 RPM, 5500-6000 LPM and 160-215 bar, torque min/max: 2-15 kNm. Pumped 5m3 high viscosity pill every 15 m and reamed each stand.
10.04.2005 00:00	03:00	3,0	811,0	DDHU	OK	OK	Continued drilling and opening 9 7/8" hole to 17 1/2" from 756 m to 811 m using 5 -20 tons WOB, 80-110 RPM, 5500-6000 LPM and 160-215 bar, torque min/max: 2-15 kNm. Pumped 5m3 high viscosity pill every 15 m and reamed each stand.
10.04.2005 03:00	04:30	1,5	811,0	DCAU	OK	OK	Pumped 30 m3 high viscosity pill and circulated hole clean. Displaced hole to 1,35 sg mud. Flow checked well for 15 minutes.
10.04.2005 04:30	06:00	1,5	367,0	DTCU	OK	OK	POOH from section TD (17 1/2" HO at 805,5 m / bull nose at 811 m) to 367 m. Topped up hole with 1,35 sg mud at 550 m and dropped drift for drifting landing string. No drag in open hole.
10.04.2005 06:00	08:30	2,5	,0	DTCU	OK	OK	Continued POOH and LD 17 1/2" HO assembly.
10.04.2005 08:30	12:30	4,0	,0	CERU	OK	OK	Cleared rigfloor and PU Halliburton cement head. Held pre-job meetings for 13 3/8" casing rig up and for casing running. Rigged up and function tested Weatherford casing power tong.
10.04.2005 12:30	18:00	5,5	351,0	CARU	OK	OK	PU 13 3/8" shoe jnt. Pumped through and checked float. MU and thread locked shoe track and first jnt above float jnt. Continued running in to above the 30" conductor.
10.04.2005 18:00	19:30	1,5	364,0	CARU	OK	OK	Moved rig over location. Stabbed 13 3/8" casing into the well head housing while observing with ROV. Held casing running pre job meeting with night crew.
10.04.2005 19:30	22:00	2,5	450,0	CARU	OK	OK	Continued to run 13 3/8" casing from 364 to 433 m. RD Weatherford power scope and frame. Installed 5 1/2" elevators. PU and made up 18 3/4" wellhead housing w/running tool. Removed bull plug in running tool and topped up w/ seawater. Installed plug and ran wellhead below table. Installed master bushing and cleaned rigfloor for CSG equipment.
10.04.2005 22:00	23:30	1,5	796,0	CARU	OK	OK	Ran 13 3/8" casing on 5 1/2" running string to 796 m.
10.04.2005 23:30	00:00	0,5	796,0	CSSU	OK	OK	Function tested cement head prior to PU.
11.04.2005 00:00	00:30	0,5	796,0	CSSU	OK	E FAIL	MU same and installed cement hose. Attempted to establish 35 bar below IBOP. No go.
11.04.2005 00:30	01:30	1,0	796,0	CSOD	E FAIL	OK	Trouble shot leak. Found leak on IBOP. Closed IBOP manual and pressured up to 35 bar.
11.04.2005 01:30	02:30	1,0	799,5	CARU	OK	OK	Circulated through cement line with mud pumps (850 l/min / 18 bar). Pressure tested

							cement line to 345 bar with cement pumps. Landed 13 3/8" CSG with 36 ton down weight. Performed overpull test to 25 ton. Slacked off to 3 ton overpull.
11.04.2005 02:30	03:45	1,3	799,5	CSSU	OK	OK	Circulated one open hole volume sea water using rig pumps (600 lpm/ 5 bar). Dropped ball for bottom wiper plug. Mixed and pumped 39 m3 1,56 sg lead slurry and 15 m3 1,92 sg tail slurry. Displaced cement to drill fllor (600 liters seawater). Dropped dart and displaced down running string with seawater using cement pumps. (680 lpm / 7 bar). Sheared top wiper plug with 160 bar after 3,9 m3 pumped.
11.04.2005 03:45	04:30	0,8	799,5	CSSU	OK	OK	Displaced cement using rig pumps (2930 lpm / 100 bar). Reduced flow to 470 lpm after 27.29 m3 (1150 strokes) pumped. Bumped plug at 31,89 m3 (1344 stk) pumped. Final circ. pressure: 30 bar. Pressured up to 100 bar (after 32,56 m3 / 1372 stk pumped). Lost pressure when turned off pumps. Attempted to regain pressure pumping 130 liter with cement pumps; - neg. Closed valve on manifold and on cement head and checked for leak on surface system. No leak found.
11.04.2005 04:30	05:30	1,0	799,5	CSSU	OK	OK	Released wellhead running tool (5 turns right). Pulled 4,5 m up to connection. LD cement head. Pulled clear of the wellhead. Moved rig 35 m off location. Dropped 2 Halliburton sponge balls and flushed string with seawater (3000 lpm) using rig pumps.
11.04.2005 05:30	06:00	0,5	,0	CTTU	OK	OK	POOH w/ landing string. LD running tool.
11.04.2005 06:00	07:30	1,5	,0	CERU	OK	OK	LD plug launcher tool and cement head. Cleared rig floor for excess tools.
11.04.2005 07:30	14:30	7,0	,0	BBRU	OK	OK	Held pre-job safety meeting prior to run BOP stack. Rigged up 20" riser handling equipment.
11.04.2005 14:30	17:00	2,5	,0	BBRU	OK	OK	Rigged up handling equipment prior to run BOP.
11.04.2005 17:00	19:30	2,5	,0	BBRU	OK	OK	Transported BOP stack to center below rotary. Connected riser to BOP.
11.04.2005 19:30	20:00	0,5	,0	BBRU	OK	OK	Held pre-job safety meeting with ongoing crew.
11.04.2005 20:00	22:30	2,5	92,0	BBRU	OK	OK	Ran BOP stack to 92m.
11.04.2005 22:30	00:00	1,5	92,0	BBRU	OK	OK	Pressure tested kill & choke lines to 20 bar/ 5 min and 510 bar/ 10 min.
12.04.2005 00:00	01:00	1,0	92,0	BBRU	OK	OK	Continued pressure testing kill & choke lines to 20 bar/ 5 min and 510 bar/ 10 min. Pressure tested conduit lines to working pressure, 345 bar.
12.04.2005 01:00	06:00	5,0	242,0	BBRU	OK	OK	Continued ran BOP stack from 92m to 242m.
12.04.2005 06:00	07:00	1,0	314,0	BBRU	OK	INJURY	Continued running BOP / riser from 242 m to 314m. Held pre job meeting. Installed riser adapter and pressure tested tool.
12.04.2005 07:00	07:30	0,5	314,0	BBRD	INJURY	OK	Incident with member of crew injuring his right hand when working with air operated torque wrench. Shut down operation, informed medic and escorted injured person to hospital for examination.
12.04.2005 07:30	09:00	1,5	314,0	BBRU	OK	OK	Pressure tested kill & choke lines to 20 bar/ 5 min. and 510 bar/ 10 min. Pressure tested conduit lines to working pressue; 345 bar.
12.04.2005 09:00	11:00	2,0	337,0	BBRU	OK	E FAIL	PU and installed slip joint. Mounted storm protection clamps for MUX control lines.
12.04.2005 11:00	11:30	0,5	337,0	BBOD	E FAIL	OK	Tighten loose stop collars on choke, kill & forward conduit lines.
12.04.2005 11:30	12:30	1,0	337,0	BBRU	OK	OK	Continued mounting storm protection clamps on MUX control lines.
12.04.2005 12:30	14:30	2,0	350,0	BBRU	OK	OK	PU and connected landing joint to slip joint. Lower slip joint and locked support ring. Took 10 ton overpull on lock- down dogs on support ring. Continued lower slip joint in place. Total load on riser tensioners; 325 tons.
12.04.2005 14:30	15:30	1,0	350,0	BBWW	OK	OK	Waiting on weather to allow installation of kill, choke, booster, 2 x conduit lines and glycol lines. In process of moving BOP trolly to welll center to assist in hooking up kill/ choke/ boost and services hoses, main hydraulic supply line to skid bursted and approx. 1600 ltrs of hyd. oil was spilled to sea.
12.04.2005 15:30	00:00	8,5	350,0	BBWW	OK	OK	Waiting on weather to allow installation of kill, choke, booster, 2 x conduit lines and glycol lines.
13.04.2005 00:00	06:00	6,0	350,0	BBWW	OK	OK	Continued waiting on weather to allow installation of kill, choke, booster, 2 x conduit lines and glycol lines.
13.04.2005 06:00	16:00	10,0	350,0	BBWW	OK	E FAIL	Waited on weather to allow installation of kill, choke 2 x conduit lines and glycol lines. Cannot continue operations now when weather allows, but continues hazid / hazop for enviromental consequences of the hydraulic oil spill on April 12th at 1530 hrs.
13.04.2005 16:00	00:00	8,0	350,0	ZRUN	OK	OK	Performed hazid/ hazop to identify if there is any possible negative enviormental consequences against continuing operation.
14.04.2005 00:00	06:00	6,0	350,0	ZRUN	OK	OK	Continued with hazid/ hazop checks prior to forthcomming operations in moonpool to install service hoses. Prepared new SJA to hang service hoses with manriding, inspected failed valve on choke manifold, and replaced worn parts. Rerouted winch in moonpool for service hoses.
14.04.2005 06:00	00:00	18,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await on regulatory personell for final checks/authorization to move ahead with operations. Worked with hazid/ hazop checks prior to forthcomming operations in moonpool to install services hoses on to slip joint. Continued with pressure testing of choke manifold. Assisted scaffolding team in moonpool area. Installed cover cap over wellhead.
15.04.2005 00:00	06:00	6,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await on regulatory personell for final checks/authorization to move ahead with operations. Continued working with hazid/ hazop checks prior to forthcomming operations in moonpool to install services hoses on to slip joint. Assisted scaffolding team in moonpool area. Performed general maintenance on rig.

15.04.2005 06:00	00:00	18,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
16.04.2005 00:00	06:00	6,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
16.04.2005 06:00	00:00	18,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
17.04.2005 00:00	06:00	6,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Nine out of fourteen subjects on hazid/ hazop assessment form are completed. Performed general rig maintenance, PM`s, cleaning and housekeeping.
17.04.2005 06:00	00:00	18,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. All fourteen subjects on hazid/ hazop assessment form are completed. Performed general rig maintenance, PM`s, cleaning and housekeeping.
18.04.2005 00:00	06:00	6,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
18.04.2005 06:00	00:00	18,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
19.04.2005 00:00	06:00	6,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping
19.04.2005 06:00	10:00	4,0	350,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping
19.04.2005 10:00	11:00	1,0	350,0	BBRU	OK	OK	Exemption from suspension given to land the BOP. Performed SJA meeting prior to install service hoses to slip joint.
19.04.2005 11:00	12:00	1,0	350,0	BBRU	OK	OK	PU riser and attached safety slings to support ring. Slacked off riser to working height for installation of service lines.
19.04.2005 12:00	15:00	3,0	350,0	BBRU	OK	OK	Steamed both conduit hoses to clear lines for ice. Re-installed armoured protection on blue conduit line at splash zone level.
19.04.2005 15:00	00:00	9,0	350,0	BBRU	OK	OK	Hooked up choke, kill, boost, chemical injection and 2 x conduit lines to slip joint. Held SJA meeting with ongoing night shift at 1900 hrs.
20.04.2005 00:00	04:00	4,0	350,0	BBRU	OK	OK	Continued hooking up choke, kill, boost, chemical injection and 2 x conduit lines to slip joint.
20.04.2005 04:00	05:00	1,0	350,0	BBRU	OK	OK	Pressure tested kill & choke lines to 20 bar/ 5 min and 510 bar/ 10 min. Pressure tested conduit lines to working pressure; 345 bar.
20.04.2005 05:00	06:00	1,0	350,0	BBRU	OK	OK	Installed clevis hangers on MUX lines.
20.04.2005 06:00	08:00	2,0	350,0	BBRU	OK	OK	Installed slip joint service lines, moved rig 25 m off location.
20.04.2005 08:00	08:30	0,5	350,0	BBRU	OK	OK	Attached tugger to wellhead cap and pulled same to surface.
20.04.2005 08:30	09:00	0,5	350,0	BBOW	OK	OK	Aborted operation due to mustering caused by false gas alarm in engine room.
20.04.2005 09:00	09:30	0,5	350,0	BBRU	OK	OK	Removed safety sling from marine riser tensioner.
20.04.2005 09:30	12:00	2,5	350,0	BBRU	OK	OK	Positioned rig in well center. Landed BOP, set down 20 ton and locked wellhead connector. Performed 25 ton overpull test.
20.04.2005 12:00	16:00	4,0	350,0	BBRU	OK	OK	Finalised all service loops in moonpool. Displaced conduite lines from fresh water to BOP fluid. Meanwhile checked bull's-eyes on BOP with ROV, Flex joint in centre, LMRP 1 deg port, BOP in centre.
20.04.2005 16:00	17:30	1,5	350,0	CATU	OK	OK	Flushed seawater through choke line, closed shear ram and pressure tested 13 3/8" casing and wellhead connector to 150 bar, 10 min.
20.04.2005 17:30	19:00	1,5	350,0	BBFU	OK	OK	Tested accoustic by closing shear ram. Prevented kill, coke and glycol lines from freezing by blowing air through lines.
20.04.2005 19:00	21:00	2,0	,0	BBRU	OK	OK	Released dogs on inner barrel. Pulled up landing joint, and landed inner barrel in spider. LD landing joint and riser running tool.
20.04.2005 21:00	00:00	3,0	,0	BBRU	OK	OK	Held safety meeting with crew prior to install diverter. Installed diverter and performed 5 ton overpull test. Released diverter running tool and rigged down BOP handling equipment.
21.04.2005 00:00	04:30	4,5	,0	BBRU	OK	OK	Continued laying down BOP handling equipment.
21.04.2005 04:30	06:00	1,5	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Await regulatory

							personell for final checks / authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping
21.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
22.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
22.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
23.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
23.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
24.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
24.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
25.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
25.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
26.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Worked with hazid / hazop checks. Performed general rig maintenance, PM`s, cleaning and housekeeping.
26.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
27.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
27.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
28.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
28.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
29.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
29.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
30.04.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
30.04.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
01.05.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
01.05.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting

							authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
02.05.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
02.05.2005 06:00	00:00	18,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
03.05.2005 00:00	06:00	6,0	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Awaiting authorization to move ahead with operations. Corrected hazid / hazop and dropped object findings. Performed general rig maintenance, PM`s, cleaning and housekeeping.
03.05.2005 06:00	10:30	4,5	,0	ZRUN	OK	OK	All drilling operations suspended due to hydraulic spill on April 12th. Got authorization to move ahead with operations.
03.05.2005 10:30	11:00	0,5	,0	BBOU	OK	OK	Held pre job safety meeting with all involved personell.
03.05.2005 11:00	12:30	1,5	,0	BBOU	OK	OK	Held toolbox meeting with drilling crew. PU 5 1/2" DP and performed diverter test.
03.05.2005 12:30	13:30	1,0	,0	DEOU	OK	OK	PU hang off stand. MU and racked back same. Checked and racked back same.
03.05.2005 13:30	17:30	4,0	350,0	BBDU	OK	OK	MU BOP test assembly w/ jet sub and 1 std 5 1/2" HW below. RIH on 5 1/2" DP and landed off in WH with 10 ton. Flushed K & C line w/ cement pumps. Lined up surface lines. Isolated off hazardious areas and made PA announcement prior to pressure testing BOP.
03.05.2005 17:30	18:30	1,0	350,0	BBOU	OK	OK	Due to change in wind direction, adjusted kill/choke goosnecks to avoid damage to the mux cables. Meanwhile, to check for any oil spill in the riser, slowly filled riser and took return to triptank via overflow line into chemical mix tank A. No oil observed.
03.05.2005 18:30	00:00	5,5	350,0	BBDU	OK	OK	Confirmed test tool seated correctly by closing upper annular and applying 35 bar down kill line. Commenced BOP test programme as per test procedure. Pressure tested BOP on blue pod to 35/150 bar, 5/10 minutes. Meanwhile, sample tested contents of trip tank for oil residue (OK).
04.05.2005 00:00	02:00	2,0	,0	BBFU	OK	OK	Continued to function test BOP on yellow pod. POOH and LD BOP test tool.
04.05.2005 02:00	05:00	3,0	,0	BBOU	OK	OK	RU to test surface equipment. Tested IBOP and mud hoses to 35/150 bar, 5/10 minutes. RD surface test equipment.
04.05.2005 05:00	06:00	1,0	,0	DTBU	OK	OK	MU 8 1/2" BHA and surface tested MWD tool, OK.
04.05.2005 06:00	10:30	4,5	250,0	DTBU	OK	OK	Continued MU 8 1/2" BHA.
04.05.2005 10:30	12:00	1,5	772,0	DTDU	OK	OK	RIH w/ 8 1/2" BHA on 8 std 5" DP and 5 1/2" DP. Tagged cement at 772 m with 6 ton.
04.05.2005 12:00	14:30	2,5	772,0	DDOU	OK	OK	Took SCR. Conducted choke drill with crew holding 16 bar on annulus.
04.05.2005 14:30	17:30	3,0	772,0	DCAU	OK	OK	Held toolbox meeting with involved personnel. Lined up and displaced well to 1,03 sg weighted drillwater. Re- instated overboard dump isolation prior to drill out the shoe track.
04.05.2005 17:30	00:00	6,5	799,0	CDDU	OK	OK	Drilled out cement in 13 3/8" casing with 2 - 6 T WOB, 40 - 80 RPM, 2 - 5 kNm, 2400lpm, 120 bar. Hard cement from 772 m. Drilled plugs/float from 774.5 m to 799 m. Drilled hard cement in shoe track. Pumped 5m3 high viscosity pill at 791 m.
05.05.2005 00:00	03:00	3,0	815,0	CDDU	OK	OK	Continued drilling out shoe track with 2 - 6 T WOB, 80 - 50 RPM, 2 - 3,5 kNm, 2400 lpm, 110 - 120 bar. Drilled out shoe, cleaned shoe track. Drilled rat hole and 4 m new formation to 815 m. Pumped 8,4 m3 high viscosity pill at 812 m.
05.05.2005 03:00	04:00	1,0	815,0	EXLU	OK	OK	Circulated hole clean. Spotted 10 m3 hi vis pill in open hole into 13 3/8" casing. POOH into 13 3/8" casing shoe. Meanwhile held prejob meeting with involved personnel.
05.05.2005 04:00	06:00	2,0	815,0	EXLU	OK	OK	Pressure tested surface lines against fail safe valves on C&K lines to 150 bar 5 min. Lined up to pump down drill pipe, kill and choke lines. Closed UAP, pressured up well to 5 bar. Performed LOT with 1,03 sg weighted drill water at 100 lpm. Pumped 189 ltr. Observed formation break down at 51 bar, 1.67 sg EMW. Monitored well pressure for 10 min, stabilzed at 38 bar. Bled down pressure to 5 bar, bled back 189 ltr.
05.05.2005 06:00	08:30	2,5	815,0	DCAU	OK	OK	Displaced choke, kill and booster lines and well to 1,33 sg Glydril WBM. Cleared cement and silt from header box. Took SCRs and performed flow back finger print with pumps off.
05.05.2005 08:30	09:00	0,5	818,0	DDRU	OK	OK	Drilled 8½" hole from 815 mMD to 818 mMD using 1-4 T WOB, 80 RPM, 2 - 5 kNm, 2380 lpm, 145 - 150 bar. Observed formation change on GR.
05.05.2005 09:00	09:30	0,5	818,0	DDOU	OK	OK	Observed 0,8 m³ pit gain. Shut in well with UAP and monitored on trip tank. Well static. Opened UAP.
05.05.2005 09:30	11:00	1,5	839,0	DDRU	OK	OK	Drilled 8½" hole from 818 mMD to 839 mMD using 1-4 T WOB, 80 RPM, 2 - 5 kNm, 2380 lpm, 145 - 150 bar. Observed formation change on GR.
05.05.2005 11:00	11:30	0,5	839,0	ECSU	OK	OK	Circulated bottoms up for samples.
05.05.2005 11:30	14:30	3,0	882,0	DDRU	OK	OK	Drilled 8½" hole from 839 m to 882 m with controlled ROP max 15 m/hr using 2 - 4 T WOB, 80 RPM, 2 -5 kNm, 24380 lpm, 152 bar. Observed fromation change with GR.
05.05.2005 14:30	15:30	1,0	882,0	ECSU	OK	OK	Flow checked - 15 mins. Well static. Circulated bottoms up for samples.
05.05.2005 15:30	16:00	0,5	887,0	DDRU	OK	OK	Drilled 8½" hole from 882 m to 887 mMD with controlled ROP - max 15 m/hr using 2 - 4T WOB, 80 RPM, 2 - 6 kNm, 2380 lpm, 150 bar.

05.05.2005 16:00	17:00	1,0	887,0	ECSU	OK	OK	Circulated bottoms up for samples.
05.05.2005 17:00	17:30	0,5	891,0	DDRU	OK	OK	Drilled 8½" hole from 887 mMD to 891 mMD with controlled ROP max 15 m/hr using 2 - 4 T WOB, 80 RPM, 2 - 6 kNm, 2380 lpm, 150 bar.
05.05.2005 17:30	18:00	0,5	891,0	ECSU	OK	OK	Circulated bottoms up for samples.
05.05.2005 18:00	19:00	1,0	814,0	DTRU	OK	OK	POOH for coring. Pulled from 891mMD. Observed 11 T OP. Pumped OOH to 814 mMD.
05.05.2005 19:00	19:30	0,5	891,0	DTDU	OK	OK	Decided to drill ahead. RIH to bottom at 891 mMD.
05.05.2005 19:30	20:00	0,5	891,0	DDOU	OK	OK	Observed 700 l gain in pit. Flow checked well on trip tank. Well stable.
05.05.2005 20:00	23:30	3,5	915,0	DDRU	OK	OK	Drilled 8½" hole from 891 mMD to 915 mMD with controlled ROP max 15 m/hr using 2 - 4 T WOB, 80 RPM, 2 - 6 kNm, 2380 lpm, 150 bar.
05.05.2005 23:30	00:00	0,5	915,0	ECSU	OK	OK	Circulated bottoms up from samples.
06.05.2005 00:00	01:00	1,0	915,0	ECSU	OK	OK	Continued circulating bottoms up for samples. Meanwhile performed biostratigraphic verification of samples.
06.05.2005 01:00	06:00	5,0	915,0	DTRU	OK	OK	Flow checked well. Stable. POOH for coring. Observed 13T overpull at 814 m. Wiped section with 1000 lpm. Flow checked at BOP. POOH to surface.
06.05.2005 06:00	07:00	1,0	,0	EECU	OK	OK	Cleared the drill floor. Held prejob safety meeting.
06.05.2005 07:00	09:30	2,5	56,0	EECU	OK	OK	PU and MU 54 m 4" x 6 3/4" core barrel assembly with 8½" core bit. Installed inner core barrels and spaced out for expansion.
06.05.2005 09:30	13:00	3,5	888,0	ETCU	OK	OK	RIH with 8½" core assembly to 888 mMD.
06.05.2005 13:00	14:00	1,0	915,0	ERCU	OK	OK	Washed down from 888 mMD to bottom at 915 mMD. Dropped ball and pumped down with 1000 lpm 20 bar. Observed ball seat and pressure increased to 38 bar. Performed SCR.
06.05.2005 14:00	16:30	2,5	949,0	ERCU	OK	OK	Cut core from 915 mMD to 949 mMD using 1 - 5 T WOB, 75 RPM, 4 - 8 kNm, 1000 lpm, 40bar. Observed torque drop to 2 kNm and pressure to 35 bar with bit on bottom, which indicated core jam.
06.05.2005 16:30	18:30	2,0	949,0	ECFU	OK	OK	Circulated bottoms up. Flow checked - well static.
06.05.2005 18:30	21:30	3,0	313,0	ETCU	OK	O FAIL	POOH with core barrel at controlled rate to 313 mMD. Flow checked at 13 3/8" casing shoe.
06.05.2005 21:30	22:00	0,5	313,0	RCOD	O FAIL	OK	Stand of drill pipe fell across derrick from finger board. Retrieved and secured properly in the finger board.
06.05.2005 22:00	00:00	2,0	58,0	ETCU	OK	OK	POOH with core barrel at controlled rate to 58 mMD - top of core barrel on surface. Flow checked at BOP on the way out.
07.05.2005 00:00	03:30	3,5	,0	EECU	OK	OK	Held prejob safety meeting with involved personnel on drill floor. Recovered inner barrels and LD inner barrels in 9 m sections. POOH and racked core barrels in derrick. Core recovery: 29.1 m, 85.6 %, 53.9 % utilization.
07.05.2005 03:30	05:30	2,0	,0	DTBU	OK	OK	PU 8½" drilling BHA. Broke out and LD Ontrak sub, cleaned and redressed connections. PU new Ontak sub and rebuilt 8½" BHA. Verified electrical connectivity.
07.05.2005 05:30	06:00	0,5	42,0	DTDU	OK	OK	RIH with 8½" drilling assembly to 42 m.
07.05.2005 06:00	08:30	2,5	949,0	DTDU	OK	OK	RIH with 8½" drilling BHA to 949 mMD. Tagged bottom 3 m high due to stump from coring. Washed down last stand. Took SCRs.
07.05.2005 08:30	11:30	3,0	949,0	ELDU	OK	OK	Reamed through cored section from 915 mMD to 949 mMD and logged with LWD tool at 20 m/hr sampling rate with 2380 lpm, 142 bar, 20 RPM, 3 kNm.
07.05.2005 11:30	20:30	9,0	1070,0	DDRU	OK	OK	Drilled 8½" hole from 949 mMD to 1070 mMD with controlled ROP max 15 m/hr using 1 - 3 T WOB, 70 - 110 RPM, 3 - 6 kNm, 2380 lpm, 152 bar. Observed formation change on LWD GR.
07.05.2005 20:30	22:00	1,5	1070,0	ECSU	OK	OK	Circulated bottoms up for samples. Meanwhile performed biostratigraphic verification of samples.
07.05.2005 22:00	23:00	1,0	1070,0	DTRU	OK	OK	Boosted the riser, flushed choke and kill lines. Flow checked well prior to POOH for coring. Well static.
07.05.2005 23:00	00:00	1,0	798,0	DTRU	OK	OK	POOH from 1070 mMD to 798 mMD. No drag in hole.
08.05.2005 00:00	00:30	0,5	798,0	DTRU	OK	OK	Flow checked well at 13 3/8" casing shoe - well static. Slugged drill string.
08.05.2005 00:30	04:00	3,5	,0	DTRU	OK	OK	POOH with 8½" drilling BHA to surface. LD premade MWD/LWD string. Cleared the drill floor.
08.05.2005 04:00	06:00	2,0	52,0	EECU	OK	OK	Held prejob meeting with involved personnel on the drill floor. MU 54 m 4" x 6 3/4" core barrel assembly with 8½" core bit. Installed inner barrels. Building coring BHA.
08.05.2005 06:00	09:30	3,5	1040,0	ETCU	OK	OK	RIH with 8½" core assembly to 1040 mMD. PU 1 single DP to space out string.
08.05.2005 09:30	10:00	0,5	1070,0	ERCU	OK	OK	Washed down to 1070 mMD. Dropped ball and pumped down with 1000 lpm 39 bar. Observed ball seat and pressure increase to 49 bar. Performed SCR.
08.05.2005 10:00	16:30	6,5	1118,0	ERCU	OK	OK	Cut core from 1070 mMD to 1118 mMD using 3 - 10 T WOB, 90 - 100 RPM, 3 - 8 kNm, 1000 lpm, 50 bar. No further penetration with increased WOB.
08.05.2005 16:30	18:00	1,5	1118,0	ECFU	OK	OK	Circulated bottoms up prior to POOH. Flow checked - well static.
08.05.2005 18:00	23:00	5,0	58,0	ETCU	OK	OK	POOH with core barrel at controlled rate to 58 mMD - top of core barrel on surface. Flow checked at 13 3/8" casing shoe and prior to entering the BOP on the way out.
08.05.2005 23:00	00:00	1,0	58,0	EECU	OK	OK	Held prejob safety meeting with involved personnel on the drill floor. Recovered and laid down 2 x 9 m sections of inner barrels.
09.05.2005 00:00	02:00	2,0	,0	EECU	OK	OK	Recovered and LD 4 x 9 m sections of inner barrels. POOH and racked core barrels in

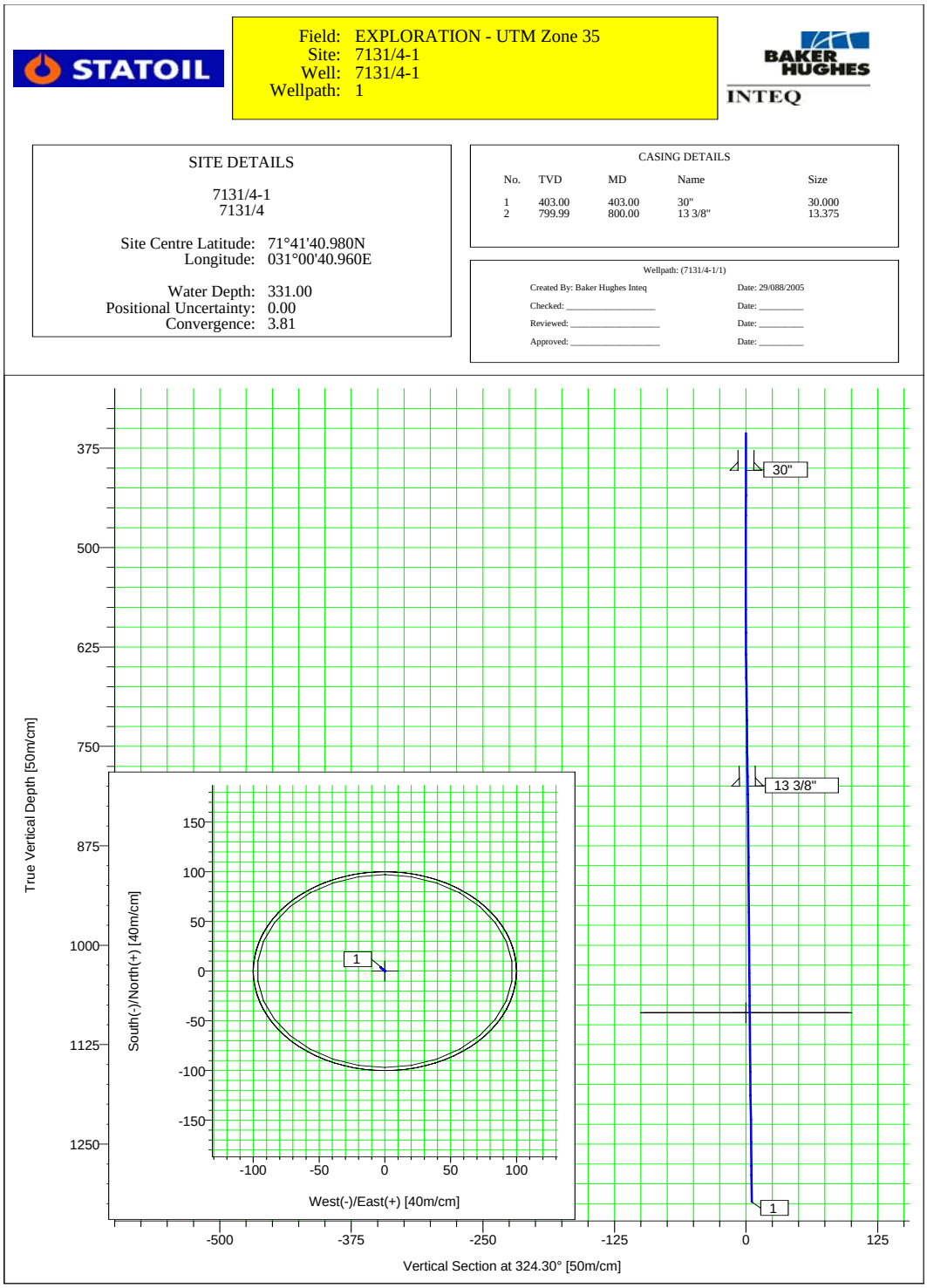
							the derrick. Cleared the drill floor. Core recovery: 47,9m, 99,8%, 88,7% utilization.
09.05.2005 02:00	05:00	3,0	28,0	DTBU	OK	OK	PU 8½" drilling BHA. Repositioned modular stabilizer, cleaned and dressed connections. PU and MU APX tool to string. Verified electrical connectivity. Meanwhile flushed choke, kill and booster lines.
09.05.2005 05:00	06:00	1,0	200,0	DTDU	OK	OK	RIH with 8½" BHA to 200 mMD.
09.05.2005 06:00	08:00	2,0	1070,0	DTDU	OK	OK	RIH with 8½" drilling BHA from 200 mMD to 1070 mMD.
09.05.2005 08:00	11:30	3,5	1118,0	ELDU	OK	OK	Washed down and logged cored section from 1070 mMD to 1118 mMD with max 30 m/hr using 2380 lpm, 166 bar, 30 - 90 RPM, 3 kNm, ECD 1,43 sg.
09.05.2005 11:30	13:30	2,0	1168,0	DDRU	OK	E FAIL	Drilled 8½" hole from 1118 mMD to 1168 mMD using 1 - 5 T WOB, 120 RPM, 6 - 3 kNm, 2370 lpm, 166 bar, ECD 1, 43 sg. Observed loose bolt on top drive.
09.05.2005 13:30	17:00	3,5	795,0	DERD	E FAIL	E FAIL	Unable to replace bolt. POOH to 795 mMD. Bit inside 13 3/8" casing. Fire alarm at mud process room.
09.05.2005 17:00	17:30	0,5	795,0	RCOD	E FAIL	OK	Deluge system energised and sprayed mud processing room with seawater due to false fire alarm.
09.05.2005 17:30	20:00	2,5	795,0	DERD	E FAIL	OK	Replaced bolt on top drive. Observed leakage on hydraulic hose coupling for top drive retract system during inspection after bolt replacement. Changed "o-ring" coupling.
09.05.2005 20:00	21:00	1,0	1168,0	DERD	E FAIL	OK	RIH to bottom. Confirmed levels of all pits in the active system.
09.05.2005 21:00	00:00	3,0	1206,0	DDRU	OK	OK	Drilled 8½" hole from 1168 mMD to 1206 mMD using 2 T WOB, 120 RPM, 6 - 3 kNm, 2370 lpm, 168 bar, ECD 1, 43 sg.
10.05.2005 00:00	06:00	6,0	1278,0	DDRU	OK	OK	Drilled 8½" hole from 1206 mMD to 1278 mMD using 1 - 5 T WOB, 120 RPM, 6 - 3 kNm, 2370 lpm, 170 bar, ECD 1, 44 sg. Reduced ROP from 20 m/hr to 15 m/hr due to cuttings handling capacity at the cuttings handling system.
10.05.2005 06:00	07:30	1,5	1295,0	DDRU	OK	OK	Drilled 8½" hole from 1278 mMD to 1295 mMD using 3 - 6 T WOB, 120 RPM, 4 - 6 kNm, 2370 lpm, 171 bar, 1,44 sg ECD.
10.05.2005 07:30	09:00	1,5	1295,0	DCAU	OK	OK	Circulated hole clean and conditioned mud prior to POOH for wireline logging. Flow checked - well stable.
10.05.2005 09:00	14:30	5,5	,0	DTLU	OK	OK	POOH to surface. Flow checked at 13 3/8" casing shoe and prior to entering the BOP on the way out. LD LWD/MWD tools.
10.05.2005 14:30	16:00	1,5	,0	EECU	OK	OK	PU core barrels from the derrick. Broke and LD the core barrels. Cleared the drill floor.
10.05.2005 16:00	18:00	2,0	,0	ELWU	OK	OK	RU to run wireline logs. Installed sheaves on the drill floor. Held prejob safety meeting. MU string for wireline logging run #1 PEXlite-DSI-GPIT. Installed RA sources in string.
10.05.2005 18:00	00:00	6,0	1295,0	ELWU	OK	OK	RIH. Performed wireline logging run #1 PEXlite-DSI-GPIT according to logging programme. POOH and retrieved RA sources in string.
11.05.2005 00:00	01:00	1,0	,0	ELWU	OK	OK	RD wireline logging string.
11.05.2005 01:00	02:30	1,5	,0	ELRU	OK	OK	MU string for wireline logging run # 2 MDT to take formation pressure measurement and fluid samples.
11.05.2005 02:30	06:00	3,5	1295,0	ELRU	OK	OK	RIH and perfromed depth correlation and recorded 8 pressure points.
11.05.2005 06:00	22:00	16,0	1295,0	ELRU	OK	OK	Recorded 17 formation pressure points and took fluid samples from 2 levels. Hole in good condition. No overpull after sampling.
11.05.2005 22:00	00:00	2,0	,0	ELRU	OK	OK	POOH logging run #2 - MDT tool string. Held prejob meeting on the drill floor. LD MDT string.
12.05.2005 00:00	06:00	6,0	250,0	ELWU	OK	OK	MU and RIH logging run # 3 - VSP. Tagged fill, stopped at 1282 mMD. Performed VSP and logged up according to programme. POOH to 250 mMD.
12.05.2005 06:00	06:30	0,5	,0	ELWU	OK	OK	POOH logging run #3 - VSP. RD VSP string.
12.05.2005 06:30	08:00	1,5	30,0	ELCU	OK	OK	RU for logging run #4 - CST for SWC. Changed logging head. Held prejob meeting on the drill floor.
12.05.2005 08:00	15:30	7,5	1268,0	ELCU	OK	OK	RIH logging run #4 - CST. On bottom at 1100 hrs. Performed SWC according to programme. Took 60 shots.
12.05.2005 15:30	16:30	1,0	,0	ELCU	OK	OK	POOH logging run #4 - CST. Recovered SWC. 59 shots full, 1 empty.
12.05.2005 16:30	18:00	1,5	,0	ELCU	OK	OK	RD wireline logging gear. Cleared the drill floor.
12.05.2005 18:00	21:30	3,5	320,0	PTPU	OK	OK	Installed 3½" DP handling gear on the top drive. PU 3½" DP singles, MU and RIH 3½" DP cement stinger. RD 3½" handling gear.
12.05.2005 21:30	00:00	2,5	900,0	PTTU	OK	OK	Installed BX elevator with 5" DP inserts. MU and RIH 21 stands 5" DP.
13.05.2005 00:00	02:00	2,0	1280,0	PTTU	OK	OK	Changed DP inserts to 5½" and RIH 5½" DP to 1280 mMD. Unable to pass 1280 mMD.
13.05.2005 02:00	03:00	1,0	1280,0	PCCU	OK	OK	Circulated bottoms up prior to pumping cement plugs with 2500 lpm 118 bar. Meanwhile, held prejob meeting on the drill floor.
13.05.2005 03:00	04:00	1,0	1280,0	PSSU	OK	OK	Pressure tested cement lines to 200 bar for 5 mins. Pumped 6 m^3 1,60 sg spacer ahead using the cement unit. Mixed and pumped 10,3 m^3 1,90 sg cement slurry at 650 lpm, 12 bar. Pumped 0,7 m^3 spacer after using the cement unit. Displaced cement slurry with 6,7 m^3 1,33 sg mud with 2500 lpm 64 bar. Set balanced cement plug from 1280 mMD - 1015 mMD.
13.05.2005 04:00	05:00	1,0	984,0	PTTU	OK	OK	Disconnected cement stand. POOH to 984 m. String dry.
13.05.2005 05:00	06:00	1,0	984,0	PCCU	OK	OK	Circulated bottoms up with 2500 lpm, 112 bar.
13.05.2005 06:00	06:30	0,5	990,0	PSSU	OK	OK	MU cement stand to drill string. Pressure tested surface lines to 200 bar / 5 min.

13.05.2005 06:30	07:30	1,0	990,0	PSSU	OK	OK	Pumped 0,6 m³ 1,60 sg spacer rig floor with cement pumps. Pumed 5,4 m³ spacer ahead. Cleaned cement tank and held tool box talk with morning crew prior to cementing operations.
13.05.2005 07:30	08:30	1,0	990,0	PSSU	OK	OK	Mixed and pumped 16 m³ 1,90 sg cement slurry with cement unit using 650 lpm, 12 bar. Pumped 0,33 m³ spacer after. Displaced cement using rig pumps at 1700 lpm, 80 bar.
13.05.2005 08:30	09:00	0,5	872,0	PTTU	OK	OK	LD cementing stand. POOH to 872 m. Pulled wet on stand #3 out of hole and had mud back flow. Attempted to pump through string with mud pumps, no circulation: 300 bar SPP. String plugged.
13.05.2005 09:00	11:00	2,0	329,0	PTTU	OK	OK	POOH. Observed XO below the 5" DP plugged with cement.
13.05.2005 11:00	13:30	2,5	,0	PTPU	OK	OK	POOH . LD 3½" DP in singles. 3½" DP plugged with cement.
13.05.2005 13:30	00:00	10,5	,0	PSCW	OK	OK	Waited on cement. Meanwhile, slipped and cut 33 m drilling line.
14.05.2005 00:00	02:00	2,0	342,0	PSCW	OK	OK	Waited on cement. Meanwhile RIH with 5" mule shoe to 342 mMD.
14.05.2005 02:00	02:30	0,5	342,0	PAOU	OK	OK	Time out for safety. Held safety meeting on the drill floor due to incident involving a roughneck on the drill floor.
14.05.2005 02:30	03:30	1,0	743,5	PSSU	OK	OK	Continued RIH to 743,5 mMD. Tagged cement and set down 5 T weight on cement plug.
14.05.2005 03:30	05:00	1,5	743,5	PSSU	OK	O FAIL	Closed UAP. Lined up and pumped down DP, C & K lines to test cement plug. Pressured up well to 86 bar, pressure bled off to 51 bar in 6 mins.
14.05.2005 05:00	06:00	1,0	743,5	PAOD	O FAIL	OK	Checked surface lines. OK. Pressure tested well down choke line against UPR in stages to 60 bar, 75 bar and 100 bar. Pressure bled off and stabilized at 67 bar. Pumped 331 l, bled back 183 l.
14.05.2005 06:00	09:00	3,0	743,5	PAOD	O FAIL	OK	Circulated bottoms up at 3200 lpm, 48 bar while discussing options. Boosted riser at 1270 lpm
14.05.2005 09:00	09:30	0,5	743,5	PAOD	O FAIL	OK	Flowchecked. Well stable.
14.05.2005 09:30	11:30	2,0	,0	PAOD	O FAIL	OK	POOH. LD cement stinger and x-over.
14.05.2005 11:30	13:30	2,0	743,5	PAOD	O FAIL	OK	RIH open ended 5" DP from surface, took weight at 737 m. Washed down from 737 m to bottom.
14.05.2005 13:30	16:00	2,5	743,5	PAOD	O FAIL	OK	Circulated and conditioned mud, treated mud for cement contamination.
14.05.2005 16:00	16:30	0,5	743,5	PAOD	O FAIL	O FAIL	Performed pre-job meeting prior to cement operation. Ran down and tagged TOC at 743,5 m. Pressure tested surface lines to 200 bars. Not able to transfer cement from cement silo.
14.05.2005 16:30	17:00	0,5	743,5	RCOD	O FAIL	OK	Unblocked supply line from cement silo A to cement unit.
14.05.2005 17:00	19:00	2,0	743,5	PAOD	O FAIL	OK	Mixed and pumped 9.0 m3 1,60 sg spacer, 8,6 m3 1,90 sg cement slurry and 1.3 m3 1,60 sg Spacer with cement unit. Chased same with 350 litre drill water. Displaced cement with 4.15 m3 1,33 sg WBM at 1520 lpm/ 22 bars with mud pumps.
14.05.2005 19:00	19:30	0,5	743,5	PAOD	O FAIL	OK	LD cement stand and POOH to 600 m, pulled 3 first stands wet.
14.05.2005 19:30	20:30	1,0	600,0	PAOD	O FAIL	OK	Circulated bottoms up at 2500 lpm, 30 bars. Boosted riser with 2370 lpm. Estimated TOC at 630 m. Diverted 35 m3 cement contaminated mud out of the active system.
14.05.2005 20:30	21:30	1,0	289,0	PAOD	O FAIL	OK	POOH from 600 m to 289 m.
14.05.2005 21:30	22:30	1,0	289,0	PAOD	O FAIL	OK	Prepared for squeeze operation. Waited on cement unit, cleaning after last cement job was not completed. Aborted squeeze operation.
14.05.2005 22:30	00:00	1,5	,0	DTPU	OK	OK	Performed pre-job meeting. POOH from 289 m. LD 5" DP while tripping out.
15.05.2005 00:00	02:30	2,5	,0	DTPU	OK	OK	RIH 5" DP to 289 m. POOH while LD ramaining 10 stands of 5" DP.
15.05.2005 02:30	06:00	3,5	,0	PAOD	O FAIL	OK	WOC. Meanwhile: Worked on droped object list, performed PMs.
15.05.2005 06:00	09:00	3,0	,0	PAOD	O FAIL	OK	WOC. Meanwhile continued with dropped object defect list.
15.05.2005 09:00	10:30	1,5	,0	PTPU	OK	OK	MU 13 3/8" EZSV dressed as bridge plug to 5 1/2" DP.
15.05.2005 10:30	11:00	0,5	288,0	PTTU	OK	OK	RIH 13 3/8" EZSV bridge plug to 288 m.
15.05.2005 11:00	18:30	7,5	288,0	PAOD	O FAIL	OK	WOC. Meanwhile continued with dropped object defect list. Pressure tested surface lines to 35 bars / 5 min and 200 bars / 10 min.
15.05.2005 18:30	19:30	1,0	288,0	PAOD	O FAIL	OK	Lined up cement unit on well, closed BSR and pressure tested cement plug #3 in stages to 100 bars. Volume pumped 170 l, volume bled back 140 l.
15.05.2005 19:30	20:30	1,0	600,0	PTTU	OK	OK	Opened BSR and RIH 13 3/8" EZSV from 288 m to 600 m. Ran through BOP with compensator activated.
15.05.2005 20:30	22:00	1,5	600,0	PSMU	OK	OK	Set 13 3/8" EZSV according to Halliburton procedure, used 20 MT overpull to shear out RT. Pressure tested EZSV in stages to 100 bars / 15 min. Volume pumped 110 l, volume bled back 110 l.
15.05.2005 22:00	23:30	1,5	600,0	PCCU	OK	OK	Performed pre-job meeting. Displaced Booster, K&C lines and surface equipment to sea water. Displaced drill string and well to sea water.
15.05.2005 23:30	00:00	0,5	600,0	PSSU	OK	OK	Spaced out drill string and MU cement stand. Performed pre-job meeting prior to cementing.
16.05.2005 00:00	01:00	1,0	600,0	PSSU	OK	OK	Cleaned out surface pits. Lined up and tested surface lines.
16.05.2005 01:00	01:30	0,5	600,0	PSSU	OK	OK	Mixed and pumped 15,5 m³ 1,90 sg cement slurry at 700 lpm 5 bar. Chased cement up to the drill floor with 300 l. Displaced cement with 4,1 m³ SW. Set balanced cement plug from 600 mMD to 400 mMD.
16.05.2005 01:30	02:30	1,0	365,0	PTTU	OK	OK	POOH from 600 mMD to 365 mMD.

16.05.2005 02:30	03:00	0,5	365,0	PCCU	OK	OK	Dropped 2 wiper balls. Circulated bottoms up using SW at 2500 lpm down DP, 2500 lpm down C& K lines, 25 bar.
16.05.2005 03:00	04:00	1,0	,0	PTTU	OK	OK	POOH to surface. LD EZSV RT.
16.05.2005 04:00	06:00	2,0	300,0	BHRU	OK	OK	MU 5½" jetting sub to 1 stand 5½" DP. MU MPT and RIH to retrieve the wear bushing. Washed well head area on the way in.
16.05.2005 06:00	09:00	3,0	,0	BHRU	OK	OK	RIH MPT to WH, worked string and washed WH area with 2500 lpm - DP and 2500 lpm - C&K lines, 35 bar. Landed and set down 8 T with active heave compensator and engaged wearbushing. Pulled wear bushing free with 23 T overpull. POOH. LD wear bushing and MPT.
16.05.2005 09:00	09:30	0,5	,0	BBRU	OK	OK	Cleared the drill floor. Held prejob meeting. Checked crown saver and performed brake test on draw works.
16.05.2005 09:30	12:30	3,0	,0	BBRU	OK	OK	RU riser handling gear. Changed 500 T elevator and bails to 750 T. Installed riser handling sub hydraulic piston and lines. Changed jaw on drill floor manipulator arm. Removed master bushing and installed gimbal and riser spider.
16.05.2005 12:30	14:30	2,0	,0	BBRU	OK	OK	Installed diverter running tool, pull tested to confirm latch, released diverter dogs and pulled up to drill floor. Cleaned diverter.
16.05.2005 14:30	17:00	2,5	,0	BBRU	OK	OK	PU and MU landing joint to slip joint. Collapsed slip joint inner barrel. Meanwhile dived ROV to seabed. Unlatched BOP from WH @ 1645 hrs. Moved rig 30 m port from WH.
16.05.2005 17:00	21:00	4,0	,0	BBRU	OK	OK	Held tool box talk on removal of choke, kill and booster line goose necks. Removed goose necks.
16.05.2005 21:00	21:30	0,5	,0	BBRU	OK	OK	PU and secured MRT support ring to diverter housing.
16.05.2005 21:30	22:00	0,5	,0	BBRU	OK	OK	Held tool box talk for riser pulling operations.
16.05.2005 22:00	22:30	0,5	314,0	BBRU	OK	OK	Laid out landing joint. Removed MUX cable clamps from slip joint.
16.05.2005 22:30	00:00	1,5	251,0	BBRU	OK	OK	Laid out slip joint. Pulled BOP/Riser to 251 m. LD 5ft, 50 ft and 75 ft riser joints.
17.05.2005 00:00	03:30	3,5	50,0	BBRU	OK	OK	Pulled BOP/Riser from 251 m to 50 m at 3 joints / hr, LD 9 ea 75 ft riser joints.
17.05.2005 03:30	04:00	0,5	,0	BBRU	OK	OK	Held tool box talk. Pulled BOP through the splash zone with 70 ft and 30 ft risers.
17.05.2005 04:00	06:00	2,0	,0	BBRU	OK	OK	Landed BOP in carrier @ 0535 hrs and split BOP from the riser.
17.05.2005 06:00	06:30	0,5	,0	BBRU	OK	OK	Laid out 70' and 30' riser joints.
17.05.2005 06:30	10:00	3,5	,0	BBRU	OK	OK	Held tool box talk. Rigged down riser running gear. Cleared the drill floor.
17.05.2005 10:00	12:30	2,5	311,0	PACU	OK	OK	PU MOST tool. MU and RIH with casing cutting assembly to 311 m. Meanwhile moved rig back to location.
17.05.2005 12:30	14:00	1,5	361,0	PACU	OK	OK	Adjusted rig position and stabbed into wellhead with ROV assistance. Landed and engaged MOST tool in WH.
17.05.2005 14:00	16:00	2,0	361,0	PACU	OK	OK	Cut 20" x 30" casing pumping SW at 2700 - 3400 lpm, 81 - 146 bar. Clean cut through 20" casing and 30" conductor. No overpull used to pull casing.
17.05.2005 16:00	00:00	8,0	,0	MARU	OK	OK	Commenced anchor handling operations while deballasting rig. Pulled anchors #7, #2 and #6. Meanwhile POOH MOST tool and cut casing. Released cut casing from MOST tool. LD cut casing and MOST tool. Recovered marker bouys with ROV.
18.05.2005 00:00	06:00	6,0	,0	MARU	OK	OK	Continued deballasting rig and anchor handling operations. Anchors #3 and #5 on bolster. Pulling anchors # 1 and #4. Meanwhile laid out 8¼" DCs and 5½" HWDP from the derrick.
18.05.2005 06:00	11:00	5,0	,0	MARU	OK	OK	Continued anchor handling operations. Pulled anchor # 1, 4 and 8. Meanwhile put lift ring cross for handling MRT ring on to 100 ton dolly.
18.05.2005 11:00	18:00	7,0	,0	MARU	OK	OK	Continued anchor handling operations. Pulled anchor #8. Meanwhile released MRT ring from diverter housing and located ring to port aft moonpool.
18.05.2005 18:00	22:00	4,0	,0	MARU	OK	OK	Backloaded equipment to anchorhandler vessels. Meanwhile laid out cement stand and removed excess equipment from rig floor. End of operation on well NO 7131/1-4 at 2200 hrs. Rig released to well NO 6302/6-1, Tulipan.

App B Directional data, survey listing

B.1 Well plot



B.2 Well survey listing

Company:	STATOIL - Norway			**Date:**	29/066/2005	**Time:**	09:57:15	**Page:**	1
Field:	EXPLORATION - UTM Zone 35			**Co-ordinate(NE) Reference:**		Site: 7131/4-1, Grid North			
Site:	7131/4-1			**Vertical (TVD) Reference:**		SITE 25.0			
Well:	7131/4-1			**Section (VS) Reference:**		Well (0.00N,0.00E,324.30Azi)			
Wellpath:	1			**Survey Calculation Method:**		Minimum Curvature		**Db:**	Oracle

Field:	EXPLORATION - UTM Zone 35		
	Norway		
Map System:	Universal Transverse Mercator	**Map Zone:**	UTM Zone 35, North 24E to 30E
Geo Datum:	ED50 (International 1924)	**Coordinate System:**	Site Centre
Sys Datum:	Mean Sea Level	**Geomagnetic Model:**	bggm2005

Site:	7131/4-1								
	7131/4								
Site Position:			**Northing:**	7959770.00	m	**Latitude:**	71 41 40.980	N	
From:	Geographic		**Easting:**	640534.60	m	**Longitude:**	31 0 40.960	E	
Position Uncertainty:		0.00 m				**North Reference:**		Grid	
Water Depth:		331.00 m				**Grid Convergence:**		3.81	deg

Well:	7131/4-1					**Slot Name:**			
	Guovca								
Surface Position:	**+N/-S**	0.00 m	**Northing:**	7959770.00	m	**Latitude:**	71 41 40.980	N	
	+E/-W	0.00 m	**Easting :**	640534.60	m	**Longitude:**	31 0 40.960	E	
Position Uncertainty:		0.00 m							
Reference Point:	**+N/-S**	0.00 m	**Northing:**	7959770.00	m	**Latitude:**	71 41 40.980	N	
	+E/-W	0.00 m	**Easting :**	640534.60	m	**Longitude:**	31 0 40.960	E	
			Measured Depth:	356.00	m	**Inclination:**	0.00	deg	
			Vertical Depth:	356.00	m	**Azimuth :**	0.00	deg	

Wellpath:	1			**Drilled From:**	Well Ref. Point		
	Guovca			**Tie-on Depth:**	356.00	m	
Current Datum:	SITE	**Height**	25.00 m	**Above System Datum:**	Mean Sea Level		
Magnetic Data:	27/1010/2004			**Declination:**	13.79	deg	
Field Strength:	54200 nT			**Mag Dip Angle:**	79.44	deg	

Vertical Section:	**Depth From (TVD)**	**+N/-S**	**+E/-W**	**Direction**
	m	m	m	deg
	356.00	0.00	0.00	324.30

Survey Program for Definitive Wellpath
Date: 13/066/2005 **Validated:** Yes **Version:** 2

Actual From	**To**	**Survey**	**Toolcode**	**Tool Name**
m	m			
356.10	1289.10	7131/4-1 MWD (356.10-1289.10)	Magnetic, std, mag-corr	Magnetic Tools (MWD, EMS)

Survey

MD	**Incl**	**Azim**	**TVD**	**+N/-S**	**+E/-W**	**Map Northing**	**Map Easting**	**<--- Latitude --->**			**<--- Longitude --->**		
m	deg	deg	m	m	m	m	m	Deg	Min	Sec	Deg	Min	Sec
356.00	0.00	0.00	356.00	0.00	0.00	7959770.00	640534.60	71	41	40.980 N	31	0	40.960 E
356.10	0.00	0.00	356.10	0.00	0.00	7959770.00	640534.60	71	41	40.980 N	31	0	40.960 E
434.00	0.18	152.60	434.00	-0.11	0.06	7959769.89	640534.66	71	41	40.976 N	31	0	40.965 E
459.40	0.11	42.97	459.40	-0.13	0.09	7959769.87	640534.70	71	41	40.976 N	31	0	40.969 E
490.00	0.21	82.60	490.00	-0.10	0.17	7959769.90	640534.77	71	41	40.977 N	31	0	40.977 E
518.70	0.15	128.04	518.70	-0.11	0.25	7959769.88	640534.85	71	41	40.976 N	31	0	40.985 E
546.30	0.23	33.18	546.30	-0.09	0.31	7959769.91	640534.91	71	41	40.976 N	31	0	40.991 E
577.50	0.17	335.77	577.50	0.00	0.32	7959770.00	640534.93	71	41	40.979 N	31	0	40.993 E
607.00	0.21	278.15	607.00	0.05	0.25	7959770.05	640534.86	71	41	40.981 N	31	0	40.986 E
634.40	0.44	314.88	634.40	0.13	0.13	7959770.13	640534.73	71	41	40.984 N	31	0	40.974 E
663.70	0.54	327.54	663.70	0.33	-0.03	7959770.33	640534.58	71	41	40.991 N	31	0	40.960 E
693.00	0.42	297.69	693.00	0.50	-0.20	7959770.49	640534.41	71	41	40.996 N	31	0	40.944 E
717.20	0.59	308.34	717.20	0.61	-0.37	7959770.61	640534.23	71	41	41.001 N	31	0	40.926 E
750.25	0.65	302.27	750.24	0.82	-0.66	7959770.82	640533.94	71	41	41.008 N	31	0	40.898 E
779.10	0.53	335.45	779.09	1.03	-0.86	7959771.03	640533.75	71	41	41.015 N	31	0	40.879 E
788.00	0.57	310.86	787.99	1.10	-0.91	7959771.09	640533.70	71	41	41.017 N	31	0	40.875 E
832.60	0.45	322.64	832.59	1.38	-1.16	7959771.38	640533.42	71	41	41.027 N	31	0	40.848 E
862.50	0.46	321.59	862.49	1.57	-1.33	7959771.56	640533.28	71	41	41.033 N	31	0	40.835 E
889.60	0.42	313.22	889.59	1.72	-1.47	7959771.72	640533.14	71	41	41.039 N	31	0	40.822 E
910.00	0.42	311.48	909.99	1.82	-1.58	7959771.82	640533.03	71	41	41.042 N	31	0	40.811 E
1006.60	0.30	309.30	1006.59	2.22	-2.04	7959772.21	640532.57	71	41	41.056 N	31	0	40.766 E
1034.80	0.32	310.80	1034.79	2.31	-2.16	7959772.31	640532.45	71	41	41.059 N	31	0	40.755 E
1063.30	0.32	311.70	1063.29	2.42	-2.28	7959772.42	640532.33	71	41	41.063 N	31	0	40.744 E
1076.40	0.39	313.22	1076.38	2.47	-2.34	7959772.47	640532.27	71	41	41.065 N	31	0	40.738 E

Company:	STATOIL - Norway	**Date:**	29/088/2005	**Time:**	09:57:15	**Page:**	2
Field:	EXPLORATION - UTM Zone 35	**Co-ordinate(NE) Reference:**	Site: 7131/4-1, Grid North				
Site:	7131/4-1	**Vertical (TVD) Reference:**	SITE 25.0				
Well:	7131/4-1	**Section (VS) Reference:**	Well (0.00N,0.00E,324.30Azi)				
Wellpath:	1	**Survey Calculation Method:**	Minimum Curvature	**Db:**	Oracle		

Survey

MD m	Incl deg	Azim deg	TVD m	+N/-S m	+E/-W m	Map Northing m	Map Easting m	<---- Latitude ----> Deg	Min	Sec		<---- Longitude ----> Deg	Min	Sec	
1132.00	0.49	324.04	1131.98	2.80	-2.61	7959772.79	640531.99	71	41	41.076	N	31	0	40.712	E
1159.20	0.48	330.36	1159.18	2.99	-2.74	7959772.99	640531.87	71	41	41.082	N	31	0	40.700	E
1188.90	0.49	339.82	1188.88	3.22	-2.84	7959773.21	640531.76	71	41	41.090	N	31	0	40.691	E
1218.90	0.50	340.91	1218.88	3.46	-2.93	7959773.46	640531.67	71	41	41.098	N	31	0	40.684	E
1247.80	0.50	341.71	1247.78	3.70	-3.01	7959773.70	640531.59	71	41	41.106	N	31	0	40.677	E
1277.50	0.55	348.58	1277.48	3.96	-3.08	7959773.96	640531.52	71	41	41.114	N	31	0	40.672	E
1289.10	0.54	350.79	1289.08	4.07	-3.10	7959774.07	640531.51	71	41	41.118	N	31	0	40.670	E
1323.00	0.54	350.79	1322.98	4.39	-3.15	7959774.38	640531.45	71	41	41.128	N	31	0	40.667	E

App C List of contractors

C.1 List of contractors

SERVICE	COMPANY
Base Service	Polarbase
Casing cutting	Weatherford Norge AS
Casing running	Weatherford Norge AS
Cementing	Halliburton AS
Conventional Coring	Baker Hughes Norge A/S
Cuttings Removal	KMC Oiltools NUF
Directional Drilling	Baker Hughes Norge A/S
Drilling Contractor	Ocean Rig ASA
Drilling Fluids	M-I Norge AS
Electric Logging	Schlumberger offshore services
Helicopters	Norsk Helikopter AS
Helicopter Booking	Lufttransport (Statoil)
Lab Services	ResLab Reservoir Laboratories
Mud Logging	Schlumberger Norge AS (Geoservices)
MWD	Baker Hughes Norge A/S
Rig Positioning	Fugro survey A/S
ROV	Oceaneering AS
Transportation	Nor-Cargo As, Bergen
Wellhead	Dril-Quip (Europe) ltd – NUF

App D Wellsite sample description

STATOIL

WELLSITE SAMPLE DESCRIPTION

Country:	Norway	Area:	Barents Sea	Field:	Guovca
Well no:	7131/4-1	Company:	Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB:	25 meters	Geologist:	D. Alm, S. Greve, Ø. Hovden		
Hole size:	8 1/2”	Cut solvent:	Iso Propanol	Date:	05-10.05.2005

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Remarks: Shows, cavings, mud additives, etc.
814		Cmt	mostly cmt Cont Tr micromic, Tr micropyr i.p., Tr Nod micropyr, slily-non calc	No shows
817	50	Sd:	lse Qtz, clr, vf-f, mod-wl srt, ang-sbang	
	50	Clst:	mod brn-grysh rd, frm, blky, slty, slily-non calc	
	gd Tr	Calcite:	clr, xln, blky	
	gd Tr	Cmt:	Cont	
820	40	Clst:	mod brn-grysh rd, a.a	
	40	Clst:	brn blk, frm, microcarb, slily slty, non calc	
	20	Sd:	a.a	
	gd Tr	Calcite:	a.a	
	Tr	Cmt:	Cont	
823	35	Clst:	mod brn-grysh rd, non-mod calc, else a.a	
	40	Clst:	also blk, micropyr, else a.a	
	10	Ls:	wh-off wh, xln, blky	
	5	Sd:	a.a	
	Tr	Calcite:	a.a	
826	a.a			
829	70	Clst:	mod brn-grysh rd, grad to Mrl i.p, else a.a	
	15	Clst:	brn blk, blk, also med dk gry, else a.a	
	15	Ls:	a.a	
832	60	Clst:	mod brn-grysh rd, a.a	
	25	Ls:	a.a	
	5	Clst:	brn blk, blk, also med dk gry, a.a	
	Tr	Sd:	a.a	
	Tr	Calcite:	a.a	
835	Lost			
838	50	Clst:	mod brn-grysh rd, a.a	
	45	Ls:	wh-off wh, gn gry-lt gry, micropyr i.p, microxln, arg i.p.	
	5	Clst:	brn blk, blk, also med dk gry, abd micropyr	
	gd Tr	Pyr:		
841	95	Clst:	brn blk-dsky yel brn, frm, sbfis, diss pyr i.p., micromic, microcarb, slty, slily calc i.p	
	5	Clst:	mod brn-grysh rd, a.a	
	gd Tr	Ls:	a.a	
844	100	Clst:	brn blk-dsky yel brn, a.a	
	Tr	Clst:	mod brn-grysh rd, a.a	
	Tr	Ls:	a.a	
847	a.a			
850-53	Lost			

Country:	Norway	Area:	Barents Sea	Field:	Guovca
Well no:	7131/4-1	Company:	Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB:	25 meters	Geologist:	D. Alm, S. Greve, Ø. Hovden		
Hole size:	8 1/2”	Cut solvent:	Iso Propanol	Date:	05-10.05.2005

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
856	100	Clst: brn blk-dsky yel brn, frm, sbfis, diss pyr i.p., micromic, microcarb, slty, sl-mod calc i.p	
	Tr	Clst: mod brn-grysh rd, a.a	
	Tr	Ls: wh-off wh, gn gry-lt gry, micropyr i.p, microxln, arg i.p.	
	gd Tr	Pyr:	
859	a.a		
862	a.a		
865	a.a		
868	a.a		
871	a.a		
874	a.a		
877	a.a		
880	a.a		
883	95	Clst: a.a	
	5	Sd: clr-mky Qtz, f-med, sbrndd, pr srt, lse	
	Tr	Ls: a.a	
	Tr	Pyr:	
886	95	Sd: clr-occ mky Qtz, med, also vf-v crs, sbang-sbrndd, occ calc cmt Agg w/no vis por, pr srt, Glauc gr, occ glauc Agg, lse	
	5	Clst: a.a	
	Tr	Ls: a.a	
889	95	Sd: pred f-med, pr-mod srt, else a.a	
	5	Clst: a.a	
	gd Tr	Ls: a.a	
	Sl Tr	Pyr:	
892	80	Sst: pred lse Qtz, f-m, occ crs, Tr v crs, pr srt, sbrndd-rndd,	
	20	Clst: brnsh blk-olv blk, dsky brn, frm, i.p. slty, non-slily calc	
	Tr	Ls: yel wh, sft, micr	
	Tr	Pyr: Nod	
895	65	Sst: pred lse Qtz a.a., rr Pyr cotg on gr; also Sst frag, olv gry-brnsh gry, vf, wl srt, brit, Sil cmt, i.p. calc cmt	
	35	Clst: pred brnsh blk-olv blk a.a.	
	Tr	Ls: a.a.	
	Tr	Pyr: Nod	
898	80	Sst: f-v crs, v pr srt, else a.a., also frag, vf-f, i.p. arg Mtrx, else a.a.	
	20	Clst: pred a.a., Tr dk gn gry	
	Tr	Ls: a.a.	
	Tr	Pyr: Nod	

STATOIL

WELLSITE SAMPLE DESCRIPTION					Page 3 of 10
Country: Norway		Area: Barents Sea		Field: Guovca	
Well no: 7131/4-1		Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS			
RKB: 25 meters		Geologist: D. Alm, S. Greve, Ø. Hovden			
Hole size: 8 1/2”		Cut solvent: Iso Propanol		Date: 05-10.05.2005	

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
901	90	Sst: pred lse Qtz, f-v crs, v prly srt, sbrndd-rndd, also Sst Frag, olv gry-brnsh gry, Tr dk gn gry, vf-f, wl srt, brit, Sil cmt, i.p. calc cmt	
	10	Clst: brnsh blk-olv blk, occ dsky brn, Tr dk gn gry, sft-frm, i.p. slty, non-slily calc	
	Tr	Ls: yel wh, sft, micr, r brn gry, mod hd, microxln	
	Tr	Pyr: Nod	
904	a.a.		
907	60	Sst: f-v crs - gran, else a.a.	
	40	Clst: med gry-med dk gry, sft-frm, sbblky-amor, loc stky, non calc, slty i.p. grad Sltst	
	Tr	Ls: yel wh, sft-frm, micr, occ micropyr	
	Tr	Pyr: Nod	
910	a.a.		
913	80	Sst: pred lse Qtz, f-v crs, pred f-m, prly srt, sbrndd-rndd, Tr Mic	
	20	Clst: pred a.a.	
	Tr	Ls: yel wh, sft-frm, micr	
	Tr	Pyr Nod	
915-949		Core # 1	
952	95	Sst: pred lse Qtz, clr-trnsl, vf-v crs, v prly srt, sbang-sbrndd; Tr Sst Frag lt gry, vf, wl srt, arg Mtrx, Glauc	No shows
	5	Clst: brn blk-blk, frm, blky-elong, occ fibr, non calc	
	Tr	Ls: off wh, frm, micr	
	Tr	Pyr: Nod	
955		pred a.a.	
958		lost	
961		lost	
964		lost	
967	100	Sst: lse Sd a.a., Tr Pyr cotg on Sd Gn; Sst Frag a.a., i.p. slty grad to Sltst	
	Tr	Clst: a.a.	
	Tr	Ls: a.a.	
	Tr	Pyr: Nod	
970	100	Sst: pred lse Sd a.a., Tr lt pk, Tr Glau; Sst Frag, pl yel brn, vf-Slt, frm	
	Tr	Clst: a.a.	
	Tr	Ls: a.a.	
	Tr	Pyr: Nod	
973		pred a.a.	
976		a.a.	

Country:	Norway	Area:	Barents Sea	Field:	Guovca
Well no:	7131/4-1	Company:	Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB:	25 meters	Geologist:	D. Alm, S. Greve, Ø. Hovden		
Hole size:	8 1/2”	Cut solvent:	Iso Propanol	Date:	05-10.05.2005

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
979	100	Sst: pred lse Qtz, clr-trnsl, Tr lt pk, vf-v crs, v prly srt, sbang-sbrndd, Tr Glau, Tr Mic, Tr Sst Frag, pl yel brn, vf-Slt, arg Mtrx	Clst probl underrepr due to dissolving during washing
		Clst: brn blk-blk, frm, blky-elong, non calc	
		Ls: off wh, frm, micr	
		Pyr: Nod	
982		pred a.a.	
985	100	Sst: a.a.	
	Tr	Ls: wh – off wh, sft – frm, micr	
	Tr	Pyr: Nod	
988	100	Sst: pred lse Qtz, clr-trnsl, vf-v crs, v prly srt, sbang-sbrndd, Tr Mic; Tr Sst Frag, wh-lt gry, vf, sft, arg, calc, also pl yel brn a.a.	
	Tr	Ls: a.a.	
	Tr	Pyr Nod	
991	100	Sst: a.a.	
	Tr	Ls: a.a., also brnsh gry, mod hd, microxln, Dol	
994	95	Sst: a.a.	
	5	Ls: pred off wh a.a.	
997	100	Sst: a.a., also Tr lse pk Qtz	
	Tr	Ls: a.a.	
1000	95	Sst: pred lse Qtz, clr-trnsl, vf-v crs, v prly srt, sbang-sbrndd, Tr Mic; Sst Frag a.a.	
	5	Clst: lt gry, sft, amor, stky	
	Tr	Ls: a.a.	
	Tr	Pyr: Nod	
1003	95	Sst: pred lse Qtz, clr-trnsl, vf-crs, prly srt, sbang-sbrndd; Sst Frag a.a.	
	5	Ls: off wh-lt gry a.a., also brnsh gry a.a.	
1006	100	Sst: Tr lse pk Qtz, else a.a.	
	Tr	Ls/Dol: brnsh gry a.a.	
1009	95	Sst: a.a.	
	5	Clst: lt gn gry, sft, amor, non calc	
	Tr	Ls: a.a.	
	Tr	Pyr: Nod	
1012	90	Sst: Tr Pyr cotg on Sd Gn, else a.a.	
	10	Clst: a.a.	
1015	95	Sst: a.a.	
	5	Ls/Dol: a.a.	

STATOIL

WELLSITE SAMPLE DESCRIPTION					Page 5 of 10
Country: Norway		Area: Barents Sea		Field: Guovca	
Well no: 7131/4-1		Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS			
RKB: 25 meters		Geologist: D. Alm, S. Greve, Ø. Hovden			
Hole size: 8 1/2”		Cut solvent: Iso Propanol		Date: 05-10.05.2005	

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Remarks: Shows, cavings, mud additives, etc.
1018	70	Sst:	pred lse Qtz, clr – trnsl, vf – crs, sbang – sbrndd, prly srt		Clst dissolved, Sst over-represented in samples. No shows
	30	Clst:	Lt gry, pl yel brn, lt gr, sft-amor- hygr, slty occ sdy?, non calc, dissolved in Wtr		
	Tr	Ls:	wh, hd, blky, microxln		
	Sl Tr	Pyr:	as xln Nod		
1021	70	Sst:	a.a		a.a
	30	Clst:	a.a		
	Tr	Ls:	a.a		
1030	70	Sst:	a.a		a.a
	30	Clst:	a.a		
	Tr	Ls:	a.a		
1033	70	Clst:	gen lt gn gry, sft-amor, non calc		a.a
	30	Sst:	lse pred f-med, occ crs, sbang-sbrndd		
	Tr	Ls:	a.a		
1036	70	Clst:	a.a		a.a
	30	Sst:	a.a		
	Tr	Ls:	a.a		
1042	50	Clst:	a.a		a.a
	50	Sst:	a.a		
	Tr	Ls:	a.a		
1045	70	Sst:	gen a.a		a.a
	30	Clst:	a.a		
1048	70	Clst:	a.a		a.a
	30	Sst:	a.a		
1051	70	Clst:	a.a		a.a
	30	Sst:	a.a		
1054	90	Clst:	a.a		a.a
	10	Sst:	a.a		
1057	50	Clst:	a.a, but also frm blky rd brn		a.a
	50	Sst:	a.a		
1060	70	Clst:	gen a.a but also Tr sft pl yel or Clst		a.a
	30	Sst:	a.a		
	Tr	Ls:	a.a		
1063	70	Clst:	a.a		a.a
	30	Sst:	a.a		
	Sl Tr	Ls:	a.a		

Country:	Norway	Area:	Barents Sea	Field:	Guovca
Well no:	7131/4-1	Company:	Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB:	25 meters	Geologist:	D. Alm, S. Greve, Ø. Hovden		
Hole size:	8 1/2”	Cut solvent:	Iso Propanol	Date:	05-10.05.2005

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Remarks: Shows, cavings, mud additives, etc.
1066	95	Clst:	pred pl rd-grysh rd, frm- mod hd, blky, non calc	Formation change
	5	Sst:	lse pred f-med, occ crs, sbang-sbrndd	
1069	100	Clst:	a.a, but increasing cont of grysh org Clst	
1070	90	Clst:	a.a	
	10	Sst:	lse clr Qtz gr, occ gnsh coated parts, f-med sbang-sbrnd, occ arg Sst Agg w gnsh Mtrx	No shows
1070-1118			Core # 2	
1120	70	Sst:	pred lse Qtz, clr – trnsl, occ mky wh, f - crs, prly srt, sbang – sbrndd, occ rndd, occ gn Mtrx on gr	
	30	Clst:	multicol, lt – dk gn gry, dsky yel – lt olv gry, grysh rd – v dsky rd, brn gry, frm – mod hd, blky – sbblky, i.p. micropyr, non calc	
	Tr	Pyr:	Nod	
1123	70	Clst:	a.a.	
	30	Sst:	a.a.	grysh rd – v dsky rd Clst
	Tr	Sltst:	gry brn – brn blk, frm, occ blk strks, non calc	gives elongated cavings
1126	60	Sst:	f -m, occ crs - v crs, else a.a.	
	40	Clst:	Tr lt gry (poss Sst Mtrx), else a.a.	
	Tr	Pyr:	Nod	
1129			pred a.a.	
1132	60	Clst:	a.a.	
	30	Sst:	lse Qtz a.a., also Sst Frag, lt gry, sft, vf, wl srt, Tr rd gr, non calc	
	10	Sltst:	a.a.	
	Tr	Pyr:	Nod	
1135			pred a.a.	a.a.
1138			a.a.	
1141			pred a.a., incr lt – dk gn gry Clst	
1144	70	Clst:	pred lt – dk gn gry, brn gry, Tr dsky yel – lt olv gry, Tr grysh rd – v dsky rd, else a.a.	
	25	Sst:	lse Qtz a.a., also Sst Frag, also lt gn gry, else a.a.	
	5	Sltst:	a.a.	
	Tr	Pyr:	Nod	
1147			pred a.a.	
1150	50	Clst:	pred a.a.	
	30	Sst:	pred Sst Frag a.a.	
	20	Sltst:	sdy, i.p. grad to Sst, else a.a.	

STATOIL

WELLSITE SAMPLE DESCRIPTION					Page 7 of 10
Country: Norway		Area: Barents Sea		Field: Guovca	
Well no: 7131/4-1		Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS			
RKB: 25 meters		Geologist: D. Alm, S. Greve, Ø. Hovden			
Hole size: 8 1/2"		Cut solvent: Iso Propanol		Date: 05-10.05.2005	

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
1153	50 Clst:	lt – dk gn gry, brn gry, Tr dsky yel – lt olv gry, Tr grysh rd – v dsky rd, frm – mod hd, blky – sbblky, i.p. micropyr, non calc	
	30 Sst:	Sst Frag, lt gry, lt olv gry, sft, v f, wl srt, Tr rd gr, non calc; also lse Qtz, clr – trnsl, occ mky wh, f-m, occ crs – v crs, prly srt, sbang – sbrndd, occ rndd, occ gn Mtrx on gr	
	20 Sltst:	gry brn – brn blk, frm, occ blk strks, sdy, i.p. grad to Sst, non calc	
	Tr Ls:	gry wh, sft – frm, micr	
1156	50 Clst:	pred a.a.	
	30 Sst:	Sst Frag a.a., also lse Qtz, pred vf-m, else a.a.	
	20 Sltst:	a.a.	
	Tr Ls:	a.a.	
1159	60 Clst:	a.a.	
	25 Sltst:	a.a.	
	15 Sst:	a.a.	
	Tr Ls:	a.a.	
1162	50 Clst:	lt – dk gn gry, brn gry, blky – plty, frm – mod hd, pred non calc	
	30 Sst:	lse Qtz, clr – trnsl, vf-f, occ m, mod – wl srt, sbang – sbrndd, also Sst Frag, lt gry, lt olv gry, sft – frm, vf, Tr rd brn gr	
	20 Sltst:	a.a.	
	Tr Ls:	a.a.	
1165	40 Sst:	a.a.	
	40 Clst:	Tr rd brn, else a.a.	
	20 Sltst:	a.a.	
	Tr Ls:	a.a.	
	Tr Pyr:	Nod	
1168	50 Sst:	a.a.	
	30 Clst:	a.a.	
	15 Sltst:	a.a.	
	5 Ls:	a.a., also brn gry, mod hd, microxln, Dol	
1171	70 Clst:	mulitcol, gen a.a, occ slty	
	30 Sst:	wh-lt gry-lt brn gry, sft, sbblky - amor, vf, occ f, Qtz gr in wh Mtrx (Kao?), mod-w srt, poor vis Por	
1174	70 Clst:	a.a	
	30 Clst:	a.a	
1177	90 Clst:	a.a, but pred lt gry-lt brn gry, rarely pa gn	
	10 Sst:	gen a.a	
1180	90 Clst:	lt brn gry, v sft-amor, diss in water, occ slty	Poor sample quality
	10 Sst:	a.a	
1183	100 Clst:	a.a	
1186	100 Clst:	a.a	
	Tr Sst:	wh-lt gry, sft-amor (Kao Mtrx?)	

STATOIL

WELLSITE SAMPLE DESCRIPTION					Page 8 of 10
Country: Norway		Area: Barents Sea		Field: Guovca	
Well no: 7131/4-1		Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS			
RKB: 25 meters		Geologist: D. Alm, S. Greve, Ø. Hovden			
Hole size: 8 1/2”		Cut solvent: Iso Propanol		Date: 05-10.05.2005	

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
1189	100 Clst:	dk gry, gen hd, occ frm, blky, occ slily calc, slty occ grad Sltst	
	Tr Sst:	wh, sft-amor-sbblky, vf, occ f, Qtz gr in wh Mtrx (Kao?), mod-wl srt, poor vis Por	
1192	100 Clst:	a.a	
1195	100 Clst:	a.a, but less slty	
1198	60 Clst:	a.a	
	40 Sltst:	lt olv gry, blky, mod hd-frm, occ dk spks, arg, occ grad slty Clst	
	Tr Ls:	wh, sft-frm, occ suc, occ arg, occ grad calc Clst	
1201	80 Clst:	multicol; gry pk, med gry, pl yel gn, mod gn, grysh or, lt brn, v pa gn, brck rd, blky-sbblky, sft-frm, occ hom, occ slty, non to v calc, occ grad Ls	
	Tr Sltst:	a.a	
	Tr Ls:	a.a	
	Tr Sst:	a.a	
1204	Lost		
1207	100 Clst:	a.a	Poor sample quality
	gd Tr Ls:	a.a	
1210	100 Clst:	a.a	a.a
	gd Tr Ls:	a.a	
1213	100 Clst:	a.a	a.a
	gd Tr Ls:	a.a	
1216	Lost		
1219	100 Clst:	a.a	a.a
	gd Tr Sst:	lt gry, fri vf ang Qtz gr and Glauc? gr, arg, grad sdy Clst	
1222	100 Clst:	a.a	a.a
	gd Tr Ls:	a.a	
1225	100 Clst:	a.a	a.a
	gd Tr Ls:	a.a	
1228	80 Clst:	a.a	
	20 Ls:	wh-lt gnsh, hd-fri, blky, suc, Sst text	
1231	90 Clst:	a.a	
	10 Ls:	a.a	
1234	100 Clst:	a.a, occ slty i.p, occ grad Sltst	
	Tr Ls:	a.a	
1237	100 Clst:	a.a	
	Tr Ls:	a.a	

STATOIL

WELLSITE SAMPLE DESCRIPTION					Page 9 of 10
Country: Norway		Area: Barents Sea		Field: Guovca	
Well no: 7131/4-1		Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS			
RKB: 25 meters		Geologist: D. Alm, S. Greve, Ø. Hovden			
Hole size: 8 1/2"		Cut solvent: Iso Propanol		Date: 05-10.05.2005	

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
1240	100 Clst:	gen a.a: multicol; gry pk, med gry, pa yel gn, mod gn, grysh or, lt brn, v pa gn, brck rd, blky-sbblky, sft-frm, occ hom, occ slty, occ grad Sltst non to v calc, occ grad Ls	Poor sample
	Tr Ls:	a.a; wh-lt gnsh, hd-fri, blky, suc, Sst text	
1243	100 Clst:	a.a	
	Tr Ls:	a.a	
1246	100 Clst:	a.a	
	Tr Sst:	as clr lse Qtz, vf, ang	
1249	100 Clst:	gen a.a	Poor sample
	Gd Tr Sst:	wh-lt gry, vf, sbblky, sft-occ amor, wh arg Mtrx, wl srt, no vis Por	
1252	100 Clst:	a.a	a.a
1255		lost	
1258		lost	
1261	70 Clst:	multicol; olv blk, mod olv brn, pa brn – gry brn, lt gry, frm – mod hd, sbblky – blky, loc slty, Tr dk spots, non calc	
	30 Sst:	lse Qtz, clr – mky wh, loc rd brn gr, loc dk gn gry, f-m, occ crs, mod srt, sbang – sbrndd; also Sst Frag, lt gry, dk gn gry, lt brn gry, vf-f, wl srt, i.p. arg Mtrx, frm, calc	
1264	90 Clst:	i.p. grad Sltst, else a.a.	
	10 Sst:	pred Sst Frag; also lse gr, vf-f, else a.a.	
1267		pred a.a.	
1270	50 Clst:	also rd brn – gry brn, else a.a.	
	30 Sst:	a.a.	
	20 Sltst:	m gry, frm, blky, sdy, i.p. grad Sst	
1273	40 Sltst:	a.a.	
	30 Sst:	a.a.	
	30 Clst:	a.a.	
1276	50 Sltst:	a.a.	
	30 Sst:	a.a.	
	20 Clst:	Tr brn blk, brit – frm, carb, micropyr	
	Tr Ls:	lt gry – lt olv gry, frm, sdy, i.p. grad calc Sst	
1279	40 Sltst:	a.a.	
	30 Sst:	a.a.	
	30 Clst:	lt – dk gn gry, pa brn – gry brn, med gry, sbblky – blky, frm – mod hd, loc slty, non calc, Tr brn blk, brit – frm, carb, micropyr	
	Tr Coal:	brn blk – blk, frm	

STATOIL

WELLSITE SAMPLE DESCRIPTION

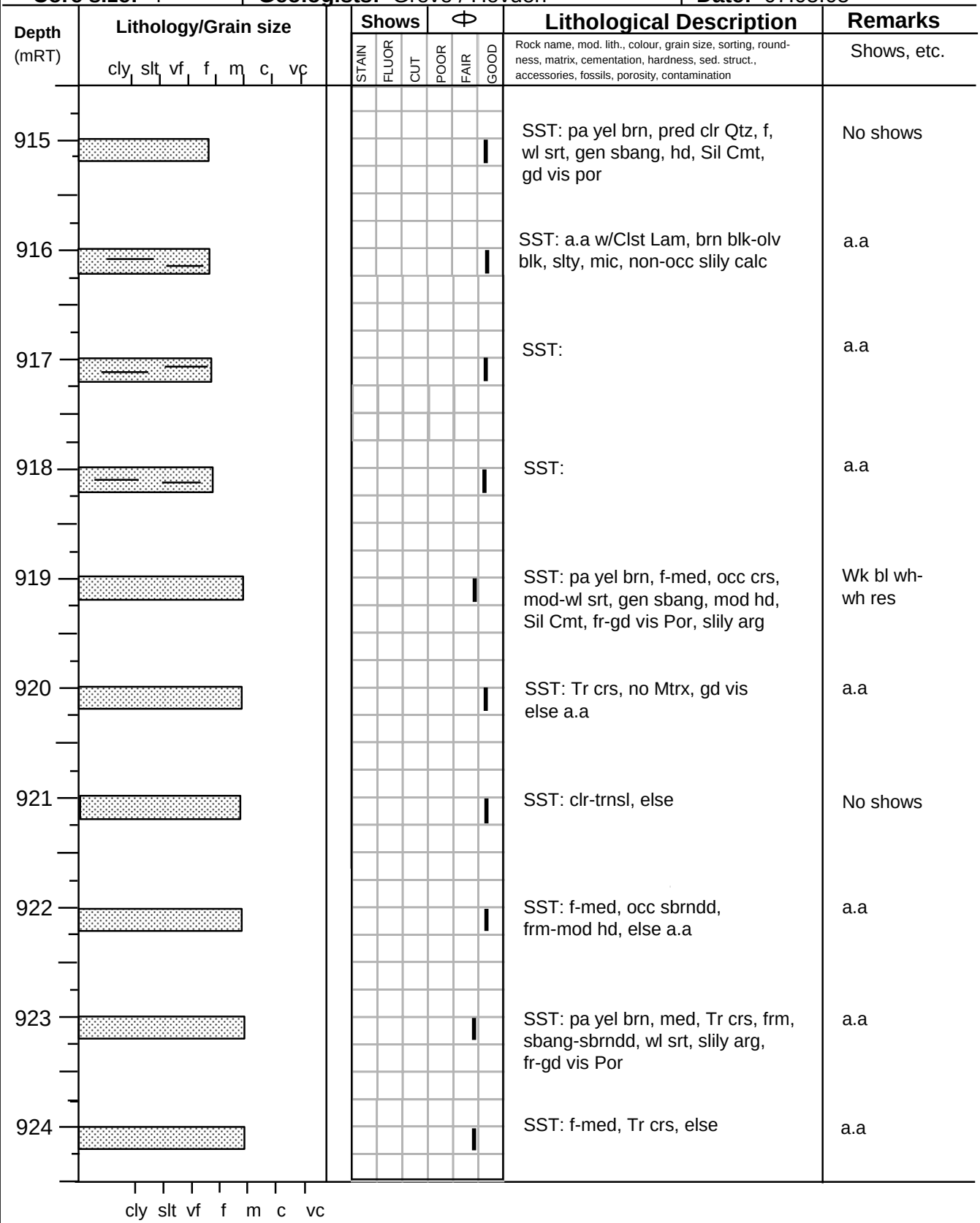
Country:	Norway	Area:	Barents Sea	Field:	Guovca
Well no:	7131/4-1	Company:	Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB:	25 meters	Geologist:	D. Alm, S. Greve, Ø. Hovden		
Hole size:	8 1/2”	Cut solvent:	Iso Propanol	Date:	05-10.05.2005

Depth (mRKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Remarks: Shows, cavings, mud additives, etc.
1282	60	Clst:	mulitcol; olv blk, mod olv brn, pa brn – gry brn, lt gry, frm – mod hd, sbblky – blky, loc slty, non calc, Tr brn blk, brit – frm, carb, micropyr	
	30	Sst:	lse Qtz, clr – mky wh, loc rd brn gr, loc dk gn gr, vf-f, Tr m-crs, mod srt, sbang – sbrndd; also Sst Frag, lt gry, lt - dk gn gry, lt brn gry, vf-f, wl srt, i.p. arg Mtrx, frm, calc	
	10	Sltst:	m gry, frm, blky, i.p. sdy, loc arg	
	Tr	Coal:	blk, brit, shny	
1285	50	Clst:	pred lt – dk gn gry, brn gry, lt gry – med gry, Tr other col a.a., else a.a.	
	40	Sst:	lse Sd: vf-m, else a.a., Sst Frag: also lt gry, i.p. vf - Slt, else a.a.	
	10	Sltst:	a.a.	
	Tr	Coal:	a.a.	
1288			pred a.a.	
1291	40	Sst:	occ crs – v crs, else a.a.	
	40	Clst:	also off wh – yel wh, else a.a.	
	20	Sltst:	a.a.	
	Tr	Coal:	a.a.	
1294	65	Clst:	incr off wh – yel wh, Tr brn blk, occ sft, else a.a.	
	25	Sst:	vf-m, else a.a.	
	10	Sltst:	a.a.	
	Tr	Coal:	grad to carb Clst, else a.a.	
	Tr	Ls:	lt gry – lt olv gry, sft – frm, micr, arg	
1295	70	Clst:	Tr rd brn, else a.a.	TD 8 ½” section
	30	Sst:	vf-m, else a.a.	
	Tr	Ls:	a.a.	

App E Core descriptions

CONVENTIONAL CORE DESCRIPTION

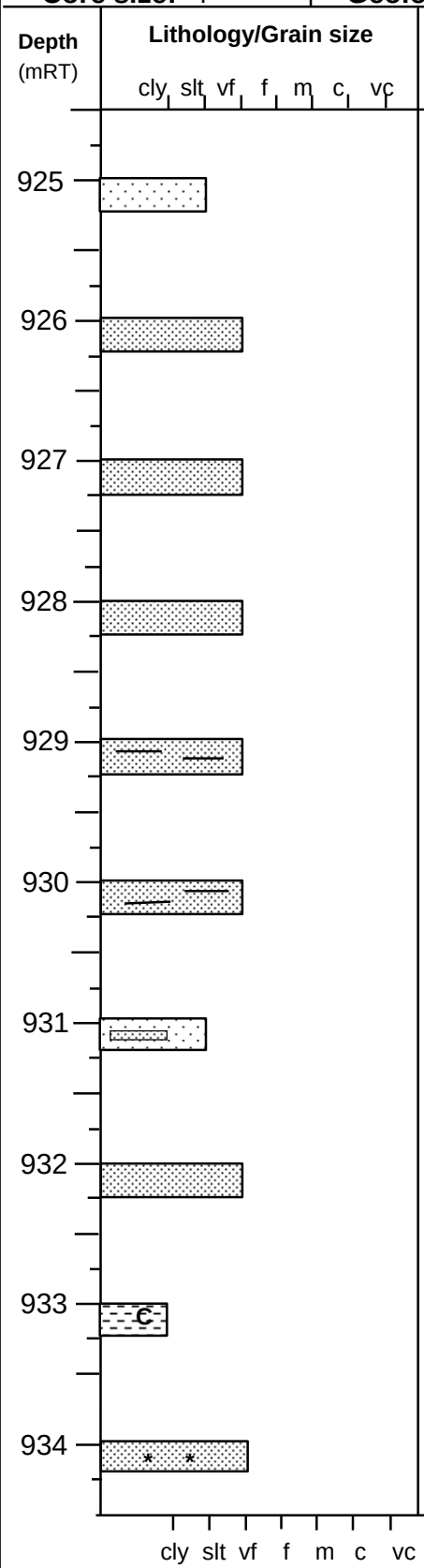
Country: Norway	**Area:** Barents Sea	**Field:** Guovca
Well no: 7131/4-1	**Formation:** Fruholmen, Garja 1 sst	
Core no: 1	**Interval:** 915 – 949 mMD RKB	**Cored:** 34 m **Rec:** 29.1 m / 85.6 %
Core size: 4”	**Geologists:** Greve / Hovden	**Date:** 07.05.05



Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.
SST: pa yel brn, pred clr Qtz, f, wl srt, gen sbang, hd, Sil Cmt, gd vis por	No shows
SST: a.a w/Clst Lam, brn blk-olv blk, slty, mic, non-occ slily calc	a.a
SST:	a.a
SST:	a.a
SST: pa yel brn, f-med, occ crs, mod-wl srt, gen sbang, mod hd, Sil Cmt, fr-gd vis Por, slily arg	Wk bl wh-wh res
SST: Tr crs, no Mtrx, gd vis else a.a	a.a
SST: clr-trnsl, else	No shows
SST: f-med, occ sbrndd, frm-mod hd, else a.a	a.a
SST: pa yel brn, med, Tr crs, frm, sbang-sbrndd, wl srt, slily arg, fr-gd vis Por	a.a
SST: f-med, Tr crs, else	a.a

CONVENTIONAL CORE DESCRIPTION

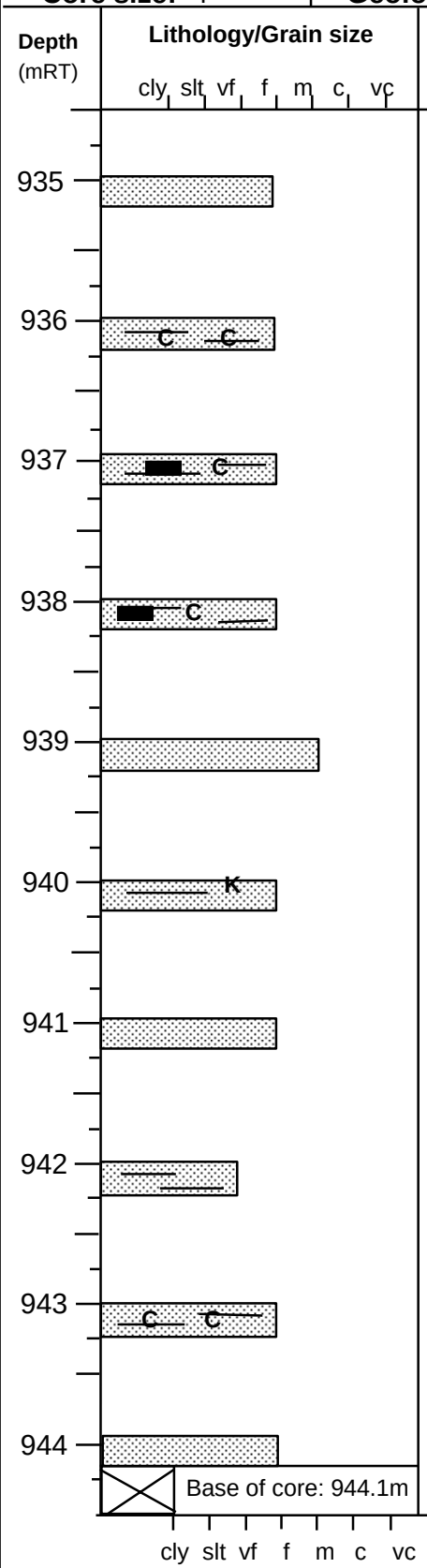
Country: Norway	**Area:** Barents Sea		**Field:** Guovca
Well no: 7131/4-1	**Formation:** Fruholmen, Garja 1 sst		
Core no: 1	**Interval:** 915-945 mMD RKB	**Cored:** 34 m	**Rec:** 29.1 m / 85.6 %
Core size: 4”	**Geologists:** Greve / Hovden		**Date:** 07.05.05



Depth (mRT)	Shows: STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Lithological Description (Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination)	Remarks (Shows, etc.)
925							SLTST: dk gry, frm-mod hd, sdy, mic, i.p. grad to vf sst	V slow blmg bl wh cut fluor, bl wh res
926							SST: pa yel brn, vf, wl srt, mod hd-hd, Sil Cmt, fr-pr vis Por	No shows
927							SST: pa yel brn, vf, wl srt, mod hd, Sil Cmt, i.p. arg/slty Mtrx, pr vis Por	a.a
928							SST: v lt gry, vf, wl srt, hd, Sil Cmt, pr vis Por	a.a
929							SST: pa yel brn, vf, wl srt, frm, slty/arg Mtrx, pr-fr vis Por, arg Lam	V slow bl wh cut, bl wh–mky wh res
930							SST: a.a, fr vis Por	a.a
931							SLST: olv gry, frm-hd, arg, non calc, occ tr vf Sd	No shows
932							SST: lt gry, gen vf, frm, wl srt, ang-sbang, slily Cmt, non calc, gd vis por	a.a
933							CLST: med dk-dk gry, hd, occ mic, occ pyr, occ carb Frag, non calc	a.a
934							SST: lt gry, hd, vf, arg, non calc, occ Glauc, slily Cmt, pr vis Por	a.a

CONVENTIONAL CORE DESCRIPTION

Country: Norway	**Area:** Barents Sea	**Field:** Guovca
Well no: 7131/4-1	**Formation:** Fruholmen, Garja 1 sst	
Core no: 1	**Interval:** 915-949 mMD RKB	**Cored:** 34 m **Rec:** 29.1 m / 85.6 %
Core size: 4”	**Geologists:** Greve / Hovden	**Date:** 07.05.05



Depth (mRT)	Shows: STAIN	FLUOR	CUT	Porosity: POOR	FAIR	GOOD	Lithological Description (Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination)	Remarks (Shows, etc.)
935							SST: lt brn gry, vf-f, frm-hd, arg, wl srt, non calc, pr vis Por	No shows
936							SST: gen a.a, but w/blk carb Lam	a.a
937							SST: a.a, but w/occ coal Frag and occ brnish stain	Strg mky wh res
938							SST: a.a	a.a
939							SST: lt yel brn, f-med, wl srt, pt Cmt, sbang-sbrndd, gd vis Por	No shows
940							SST: lt yel brn, clr qtz, gen f grad, slily Qtz Cmt, occ wh arg Mtrx, wl srt, mod vis Por, occ rsty lams	a.a
941							SST: lt yel brn, f, occ vf, sbang-sbrndd, slily Cmt, non calc, gd vis Por	a.a
942							SST: lt yel brn, clr Qtz, vf, arg, sbang, pr srt, Clst Lam, pr vis Por	a.a
943							SST: lt yel brn, clr-mky Qtz, f-med, fri, slily Cmt, non calc, occ carb Lam, gd vis Por	a.a
944							SST: lt brn, clr-mky Qtz, fri, med-v crs, sbang, occ sbrndd, med-wl srt, slily Cmt, v gd vis Por	a.a

CONVENTIONAL CORE DESCRIPTION

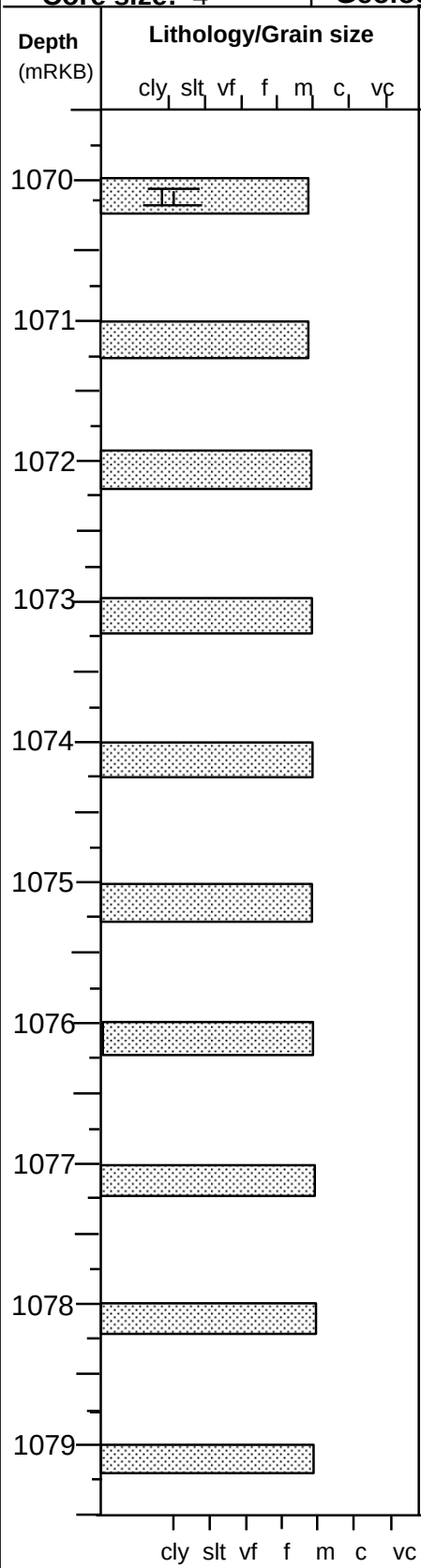
Country: Norway	**Area:** Barents Sea	**Field:** Guovca
Well no: 7131/4-1	**Formation:** Fruholmen, Garja 1 sst	
Core no: 1	**Interval:** 915-949 mMD RKB	**Cored:** 34 m **Rec:** 29.1 m / 85.6 %
Core size: 4”	**Geologists:** Greve / Hovden	**Date:** 07.05.05

Depth (mRT)	Lithology/Grain size (cly slt vf f m c vc)	Shows: STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Lithological Description (Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination)	Remarks (Shows, etc.)
945									
946									No recovery: 944.12 -
947									
948									
949									
950									
951									
952									
953									
954									

cly slt vf f m c vc

CONVENTIONAL CORE DESCRIPTION

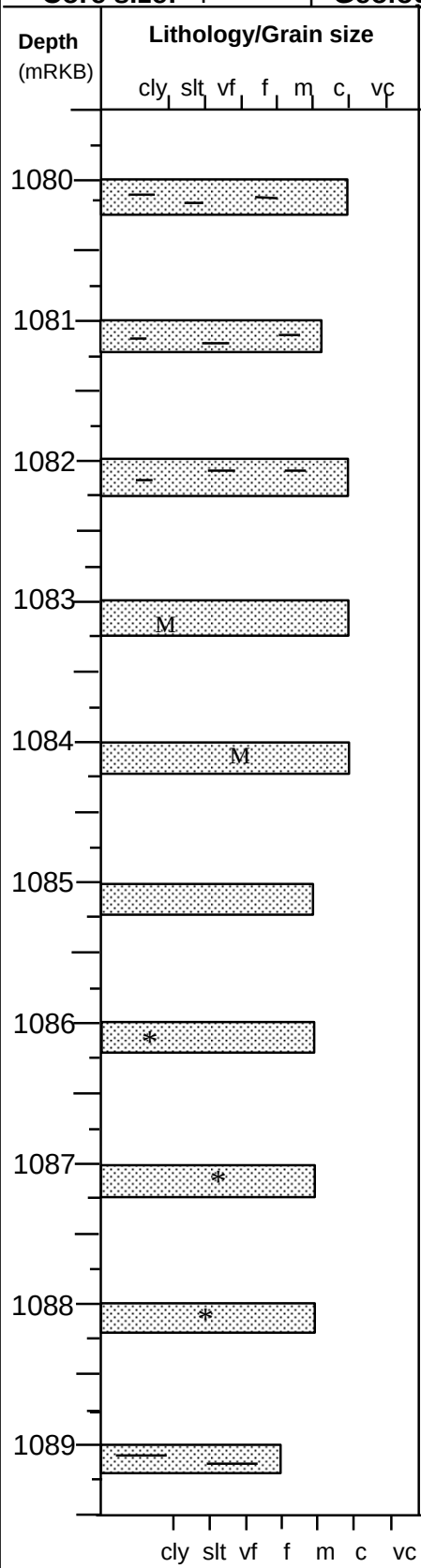
Country: Norway	**Area:** Barents Sea	**Field:** Guovca
Well no: 7131/4-1	**Formation:** Snadd Fm, Guovca Sst	
Core no: 2	**Interval:** 1070 - 1118 mMD RKB	**Cored:** 48 m **Rec:** 47.9 m / 99.8 %
Core size: 4”	**Geologists:** Greve / Hovden	**Date:** 08.05.05



Shows						Lithological Description	Remarks
STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
						SST: dsky gn, f–med, mod srt, sbrndd–sbang, gn arg Mtrx, Tr frm–mod hd, v calc, pr vis por	No shows
						SST: non calc, Sil cmt, else	a.a.
						SST: Tr crs, gry brn-rd brn Clst gn, else a.a.	a.a.
						SST: f-med, Tr dsky yel Clst gr, else a.a.	a.a.
						SST: dsky gn, f-med, mod srt, sbrndd-sbang, gn arg Mtrx, Tr gry brn-rd brn arg gn, Tr dsky yel arg gn, frm, Sil cmt, pr vis por	a.a.
						SST: frm-mod hd, Tr sli else a.a.	a.a.
						SST: frm, non calc, else	a.a.
						SST: frm – mod hd, Mic, Tr sli else a.a.	a.a.
						SST: dsky gn, f-med, mod srt, sbang-sbrndd, gn arg Mtrx, sli-mod calc, pr vis por	a.a.
						SST: med, occ med-crs, Tr sli calc, Mic, else a.a	a.a.

CONVENTIONAL CORE DESCRIPTION

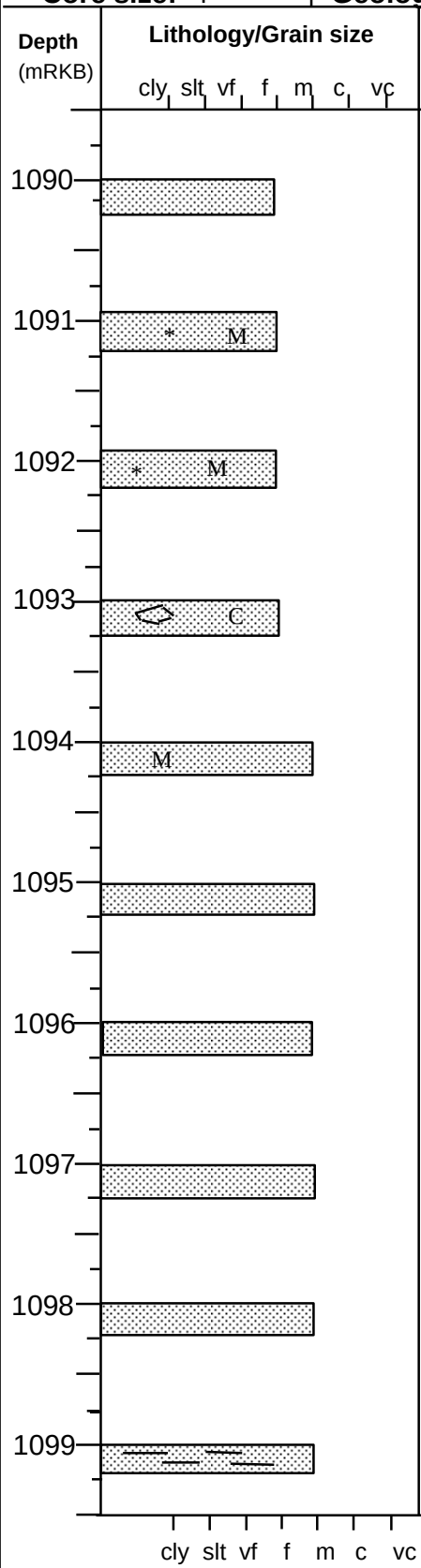
Country: Norway | **Area:** Barents Sea | **Field:** Guovca
Well no: 7131/4-1 | **Formation:** Snadd Fm, Guovca Sst
Core no: 2 | **Interval:** 1070 - 1118 mMD RKB | **Cored:** 48 m | **Rec:** 47.9 m / 99.8 %
Core size: 4" | **Geologists:** Greve / Hovden | **Date:** 08.05.05



Shows						Lithological Description	Remarks
STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
						SST: brn gry, med, occ crs, mod-wl srt, v hd, i.p. arg Mtrx, Sil cmt, i.p. sli calc, no- v pr vis por	No shows
						SST: dk gn gry, f-med, wl srt, frm-mod hd, sil cmt, fr vis por	a.a.
						SST: f, wl srt, sli arg Mtrx, spks, else a.a	a.a.
						SST: f-med, Tr Mic else a.a.	a.a.
						SST: pred	a.a.
						SST: frm, v f, occ med, else	a.a.
						SST: med gry, f, frm-fri, clr-trnsl wl srt, sli sil cmt, Tr Mic and dk gn spks (Glauc?), fr vis por	a.a.
						SST: gen a.a, but gd vis	a.a.
						SST:	a.a.
						SST: gen a.a, but vf-f, arg, pr vis por, also Len/lams of med gry Clst	a.a.

CONVENTIONAL CORE DESCRIPTION

Country: Norway | **Area:** Barents Sea | **Field:** Guovca
Well no: 7131/4-1 | **Formation:** Snadd Fm, Guovca Sst
Core no: 2 | **Interval:** 1070 - 1118 mMD RKB | **Cored:** 48 m | **Rec:** 47.9 m / 99.8 %
Core size: 4" | **Geologists:** Greve / Hovden | **Date:** 08.05.05



Depth (mRKB)	Shows: STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Lithological Description (Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination)	Remarks (Shows, etc.)
1090							SST: med gry, vf - f, wl srt, frm-fri, clr-trnsl Qtz, arg, sli sil cmt, Tr Mic and dk gn spks (Glauc?), pr vis also Len/lams of med gry Clst	No shows
1091							SST: med gry, hd, vf-f, pred Qtz gr, mod srt, sbang, sli arg, dk spks (Glauc?), Mic, non calc, fr srt, pr vis por	a.a.
1092							SST:	a.a.
1093							SST v/ang clasts of Clst SST: a.a CLST: med dk gry, slty, occ sdy, hd, occ carb spks, non calc	a.a.
1094							SST: med gry, Qtz gr, f-med, mod srt, fri, sli cmt, Mic, gd vis por	a.a.
1095							SST: a.a, but gen f, hd, wl cmt, dk gn spks, also sli Tr rd/brn mod srt, pr vis por	a.a.
1096							SST:	a.a.
1097							SST:	a.a.
1098							SST:	a.a.
1099							SST: gen a.a, but w/lams and Frag of dk gry Clst a.a.	a.a.

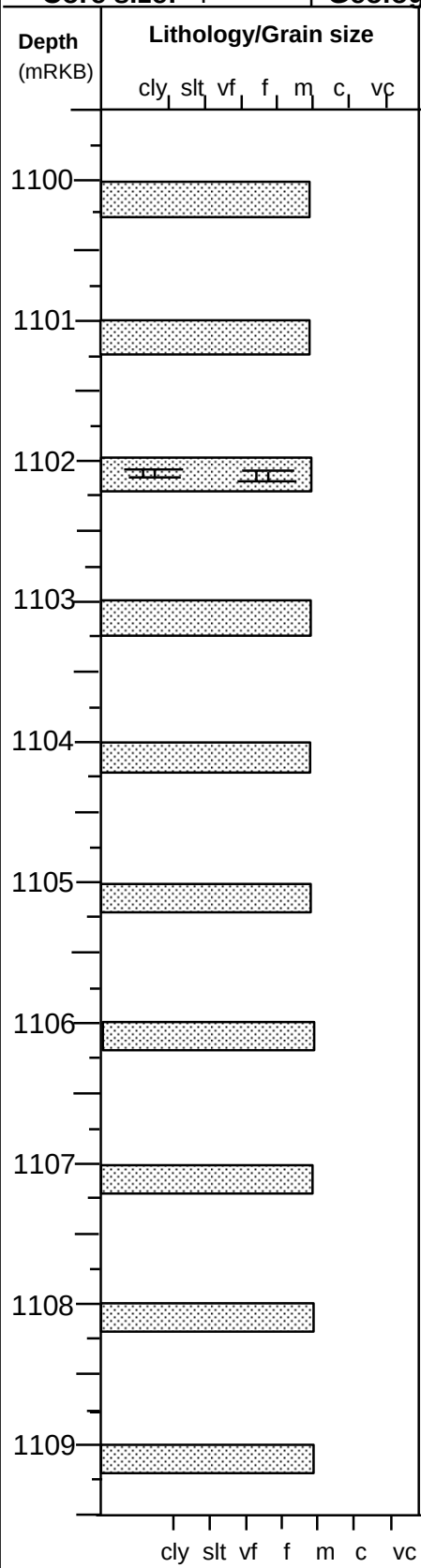
CONVENTIONAL CORE DESCRIPTION

Country: Norway | **Area:** Barents Sea | **Field:** Guovca

Well no: 7131/4-1 | **Formation:** Snadd Fm, Guovca Sst

Core no: 2 | **Interval:** 1070 - 1118 mMD RKB | **Cored:** 48 m | **Rec:** 47.9 m / 99.8 %

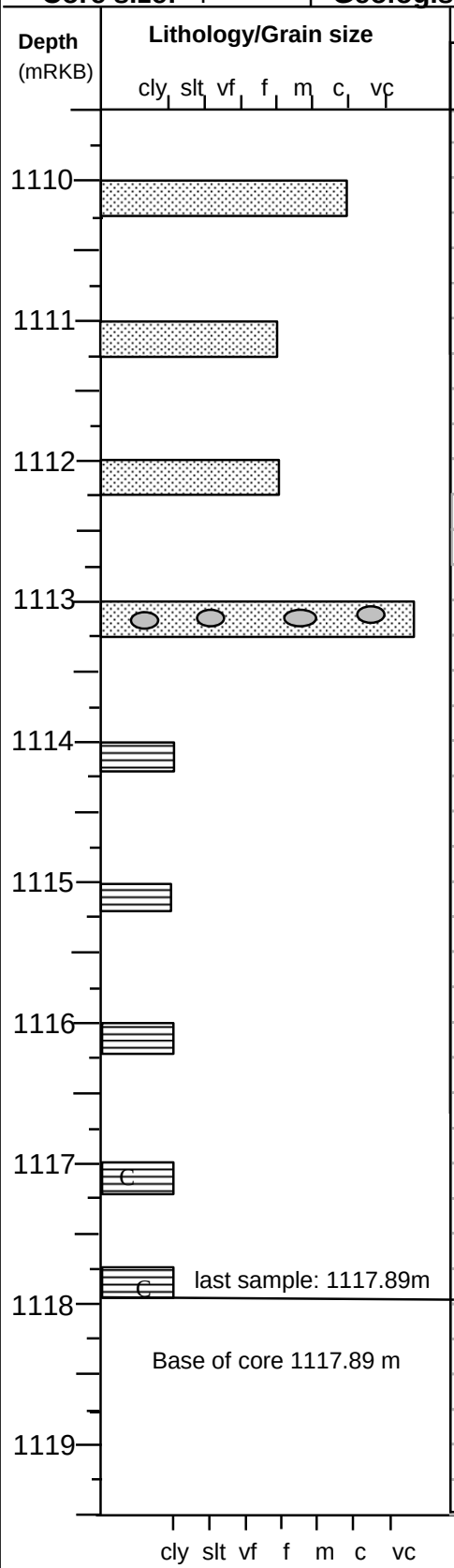
Core size: 4” | **Geologists:** Greve / Hovden | **Date:** 08.05.05



Shows						Lithological Description	Remarks
STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
						SST: med gry, f, mod srt, hd, mic, dk gn spks, tr rd brn spks, sil cmt, pr-fr vis por	No shows
						SST:	a.a.
						SST: a.a but v wl calc no vis por	a.a.
						SST: a.a, but no calc cmt, sli sil cmt, fr vis por	a.a.
						SST:	a.a.
						SST:	a.a.
						SST:	a.a.
						SST: dk gn gry, else a.a	a.a.
						SST: gnsh gry, f-med, fri, sli sli arg, fr vi por	a.a.
						SST:	a.a.

CONVENTIONAL CORE DESCRIPTION

Country: Norway	**Area:** Barents Sea	**Field:** Guovca
Well no: 7131/4-1	**Formation:** Snadd Fm, Guovca Sst	
Core no: 2	**Interval:** 1070 - 1118 mMD RKB	**Cored:** 48 m **Rec:** 47.9 m / 99.8 %
Core size: 4”	**Geologists:** Greve / Hovden	**Date:** 08.05.05



Shows						Lithological Description	Remarks
STAIN	FLUOR	CUT	POOR	FAIR	GOOD	Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
						SST: med gry, f-crs, prly srt, sbang, arg, fri-lse, pr vis por	No shows
						SST: med gry, frm, gen f, mod sli arg, dk gn spks, mod cmt, non calc, mod srt, fr-pr vis por	a.a.
						SST:	a.a.
						CONGL: pbls of Clst, Cht? and Qtz, rnd in sdy/arg Mtrx, Mtrx supp CLST: med gry-pl yel brn, sdy Mtrx, wl sil cmt, Tr pyr, no por	a.a.
						SH: dsky gn, hd, mass, hom, non calc	
						SH: a.a	
						SH: a.a, but sample v	
						SH: grysh blk-olv blk, fiss, hd, occ coal Frag and lams, micromic, non calc, slickensides	
						SH: a.a	

App F Sidewall core descriptions

STATOIL

SIDEWALL CORE DESCRIPTION

Country: Norway	Area: Barents Sea	Field:	Guovca
Well no: 7131/4-1	Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB: 25 meters	Geologist: Ø. Hovden		
Hole size: 8 1/2 "	Cut solvent: Iso Propyl Alcohol	Date:	12-13.05.2005
Run no.:	Reference log: PEXlite-DSI-GPIT		

Shot no.	Depth (mRKB)	Recov. (mm)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
Only minor fragments of the sidewall cores have been described.				
60	818.5	25	Clst: med dk gry, sft-mod hd, mass, hom, non calc	
59	839.0	17	Clst: a.a	
58	850.0	20	Clst: a.a	
57	861.9	20	Clst: dk gry, else a.a	
56	875.0	Empty		
55	877.0	20	Clst: a.a	
54	878.5	24	Sst: pa yel gry, fri, f-m, trnsl Qtz Gr, ang-sbang, wl srt, pa yel gry arg Mtrx, gn spks (Glau?), non calc, fr vis Por	No shows
53	878.5	23	Sst : lt gry-m gry, spkld, vf-f, lt grysh Mtrx, gn spks, mod srt, fr-pr vis Por	a.a
52	878.5	15	Sst : gen a.a	a.a
51	883.0	15	Sst : lt yel gry, fri, gen crs-m trnsl Qtz Gr, sbang-sbrnd, wl-mod srt, v gd vis Por	a.a
50	884.0	25	Sst: lt yel gry, fri, f-crs Qtz Gr, lt yel gry arg Mtrx, occ dk gn Gr, pr srt, fr vis Por	a.a
49	884.0	20	Clst a.a	
48	888.0	10	Clst: a.a	
47	894.0	22	Sst: lt gry, else a.a	a.a
46	894.0	10	Sst lt gry-wh, else a.a	a.a
45	894.0	35	Sst: lt gry, gen f, occ vf, Mic, ab dk gn gr, else a.a	a.a
44	894.0	20	Clst: dk gn gry, sft, hom, mass, non calc	
43	907.5	15	Clst: dk gry, else a.a	
42	911.5	23	Clst: a.a	
41	911.5	17	Clst: a.a	
40	913.0	18	Sst: wh-med gry, vf-f, occ m (m Gr in vf-f Mtrx), frm, arg, pr srt, pr vis Por	No shows
39	951.7	22	Clst: pa yel brn, hd w/rr m rndd Qtz Gr, non calc, v hygr, diss inst in Wtr	

SIDEWALL CORE DESCRIPTION

Country:	Norway	Area:	Barents Sea	Field:	Guovca
Well no:	7131/4-1	Company:	Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB:	25 meters	Geologist:	Ø. Hovden		
Hole size:	8 1/2 "	Cut solvent:	Iso Propyl Alcohol	Date:	12-13.05.2005
Run no.:		Reference log:	PEXlite-DSI-GPIT		

Shot no.	Depth (mRKB)	Recov. (mm)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
38	951.7	20	Clst a.a	
37	955.7	20	Clst olv blk-dk gry, frm, hom, mass, micropyr, non calc	
36	973.3	40	Clst: lt yel brn-lt gry, frm, sl slty, Tr f arg Sst in edge of SWC	
35	993.0	25	Clst: med gry, mod hd, mass, hom, non calc	
34	1008.5	30	Clst: grysh gn, mod hd, mass, micromic, dk spks, hygr	
33	1009.0	27	Clst: a.a	
32	1014.8	35	Clst: grysh blk, frm-mod hd, hom, non calc, hygr	
31	1025.5	20	Sltst: grysh gn, spkld w/dk Gr, slily sdy, micromic, non calc, v hygr	
30	1025.5	20	Sst: grysh gn, fri-lse, vf-f, mod srt, dk spks, (Glau?) pr vis Por	
29	1029.2	17	Clst: grysh gn, frm, mass, vns of Pyr, micromic, non calc, v hygr	
28	1041.0	25	Sltst: grysh blk, mod hd, sl sdy, arg, v calc, grad slty arg Ls	
27	1043.8	33	Sst: grysh gn, f, sbang-sbrnd, clr-trnsl gn Gr, arg, wl srt, mod vis Por, v hygr, slily calc	
26	1052.5	30	Clst: dk yel brn, frm, hom, slily slty, non calc, hygr	
25	1052.5	27	Clst: a.a	
24	1055.0	36	Clst: gen a.a, but Incl of olv gry Sltst, v hygr	
23	1063.8	20	Clst: lt gry, gn gry, frm, hom, gn spks, arg, fr vis Por, non calc, v hygr	
22	1142.0	20	Clst: gnsh blk, frm, mass, hom, micromic, non calc	
21	1155.6	20	Sst: lt gn gry, fri, gn spks, arg, fr vis Por, non calc, v hygr	
20	1162.8	25	Sltst: olv gry, m dk gry, occ lt gry, dk gn spks, fri, micromic, sdy, v hygr, non calc	
19	1168.0	25	Silts/ Clst: Clst: olv gry, hom, micromic, frm, non calc Sltst: m gry, frm, arg, v hygr, non calc	
18	1177.0	25	Clst: dk gn-gry, frm, micromic, hom, non calc, hygr	
17	1186.0	15	Sltst: med gry, frm, micromic, sl sdy, v calc, grad arg Ls	
16	1197.5	25	Clst: gn gry, frm-mod hd, mass, hom, non calc, hygr	

STATOIL

SIDEWALL CORE DESCRIPTION

Country: Norway	Area: Barents Sea	Field:	Guovca
Well no: 7131/4-1	Company: Statoil ASA, Eni Norge A/S, Norsk Hydro Produksjon AS		
RKB: 25 meters	Geologist: Ø. Hovden		
Hole size: 8 1/2 "	Cut solvent: Iso Propyl Alcohol	Date:	12-13.05.2005
Run no.:	Reference log: PEXlite-DSI-GPIT		

Shot no.	Depth (mRKB)	Recov. (mm)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
15	1201.0	22	Mrl: lt gry, frm-mod hd, hom, arg	
14	1202.1	30	Clst: olv gry, hom, frm, non calc, dk spks	
13	1207.0	20	Clst: gry, m, frm, non calc, hom, but dk spks, non calc, v hygr	
12	1213.5	22	Clst: gen a.a, but slily slty, non calc	
11	1217.0	20	Sltst: grysh gn, frm, v micromic, Tr Pyr Incl, non calc, v hygr	
10	1221.9	15	Sst: lt gry, vf gn, fri, arg, non calc, v hygr, w srt, gd vis Por	
9	1226.5	35	Clst: lt gn-gry, lt olv gry, dk rd, mod yel brn, mod hd, mass, non calc	
8	1231.5	20	Sltst: lt gn gry, frm, hom, non-slily calc, v hygr	
7	1237.2	20	Sltst / Clst: Sltst: a.a, but also vf Sd Clst: multicol, a.a	Different lith. in the SWC
6	1239.4	25	Clst: dsky brn, also Tr lt gn gry, mass, non calc	
5	1242.0	25	Clst: dk gry, occ w/gry blk, carb Incl, grad coal i.p., non calc	
4	1251.0	25	Clst: grysh blk, frm-mod hd, hom, mass, non calc	
3	1255.7	30	Clst/ Mrl: med gry, frm, w/spher rnd m Gr (Qtz?), v calc, grad Mrl	
2	1259.0	25	Clst: lt gn gry, mass, hom, non calc, hygr	
1	1268.0	20	Sst: m gn gry, dk gn spks, vf occ f, fri, occ v arg, pr srt, fr vis Por, v hygr	

App G NPD standard sheet for reporting shallow gas

WELL DATA: 7131/4-1

1. Distance from drill floor to sea level:	25 m
2. Water depth:	331 mMSL
3a. Setting depth for conductor:	403.5 mTVD RKB
3b. Leak Off/Formation Integrity Test:	N/A
4a Setting depth for casing on which BOP is installed:	799.5 mTVD RKB
4b. Leak Off/Formation Integrity test:	1.67 g/cc

5. Depth (mTVD RKB) and TWT to formation/section/layer tops:

Seabed	356.0 mTVD RKB / 0.447 s
Base Quaternary/Top Kolmule Formation	430.0 mTVD RKB / 0.531 s
Top Knurr Formation	823.5 mTVD RKB / 0.867 s
Base Cretaceous Unc./Top Hekkingen Formation	838.5 mTVD RKB / 0.877 s
Top Stø Formation	877.5 mTVD RKB / 0.910 s

6. Depth interval (mTVD RKB and TWT) and age of sand layers shallower than 1000 m below seabed. State which layers, if any, contain gas.

No distinct sand layers were observed before top Stø Formation at 877.5 mTVD RKB.

7. How was presence of gas proven?

Shallow gas was not found in the well.

8.Composition and origin of gas:

N/A

9. Describe all measurements performed in gas bearing layers:

N/A

10. Indicate the depths (mTVD RKB and TWT) of unconformities in the well bore:

Base Cretaceous Unconformity 838.5 mTVD RKB /0.877 s

11. Indicate depth and extension of sand layers (communication, continuity, truncation, etc.):

First sand layer which has regional continuity is the Stø Formation at 877.5 m MD RKB.

12. Indicate depth and extension of any gas blanking, seismic anomalies, etc:

N/A

13. State possible seismic indications that the gas originates from deeper levels. Description if gas originates from deeper levels:

N/A

14. How does the interpretation of the site survey correspond with well data with respect to:

The site survey interpretation and the observations correlate well.

Shallow gas: No shallow gas was prognosed in the 36" and 17 1/2" sections, and no shallow gas was observed.
Sand layers: No distinct sand layers were prognosed, and neither was observed above target.
Unconformities: Base Quaternary and Base Cretaceous were encountered close to the prognosis (Base Quaternary + 5 m and Base Cretaceous -16.5 m).
Correlation with adjacent wells: The nearest well is 7229/11-1, which is located 75 km northwest of the Guovca well. The sands at reservoir level can be correlated to this well and other adjacent wells, but shallower sands can not be correlated.

App H Other reports

Title	Company
Borehole Seismic Report, Zero Offset VSP, Velocity Survey Field Guovca, Well 7131/4-1, Vol 1 + 2	Baker Hughes
Well Program PL233, Well 7131/4-1 Guovca	Statoil
STO491 Site Survey Block 7131/4 PL233 Well 7131/4-1 Results Report	GARDLINE GEOSURVEY
Navigation and Positioning Report "Eirik Raude" to exploration well 7131/4-1 "Guovca"	Fugro Survey
Brønn 7131/4-1. Foto (Well 7131/4-1 Photo White Light/UV-Light)	ResLab
Brønn 7131/4-1 Logger (DSI-HRLA-PEX-ECRD MDT-GR; CST-GR)	Schlumberger
Logger 7131/4-1 DSI-HRLA-PEX-ECRD; MDT-GR: CST-GR; corrrected LAS file	Schlumberger
Flair Guovca 7131/4-1	Geoservices
Final Well Report Well: 7131/4-1 Guovca	Geoservices
End of Well Report MWD well: 7131/4-1	Baker Hughes Inteq
Guovca 7131/4-1. Transfer and Analysis and Open Hole Wireline Formation Samples. Reservoir Fluid Analysis Report (28.04. - 13.05.05)	Altinex
Final Drilling Report well 7131/4-1, Guovca, PL 233	Statoil
Biostratigraphy of the interval 814 m – 1295 m TD well 7131/4-1	Fugro Robertson
End of Well Report 7131/4-1 GUOVCA (Coring) 05Y94*30418	Baker Hughes Inteq
Characterization of water samples Well 7131/4-1, Guovca field	Statoil
Geochemistry Hydrocarbon Core Scanning (HCS) Well 7131/4-1	Applied Petroleum Technology AS (APT)
Core Photographs well 7131/4-1	ResLab

7 Enclosures

Composite log

Formation evaluation log

Pressure evaluation log

Norsk Hydro Produksjon AS, Eni Norge AS

PARTNERS

STATOIL

WELL **7131/4-1**

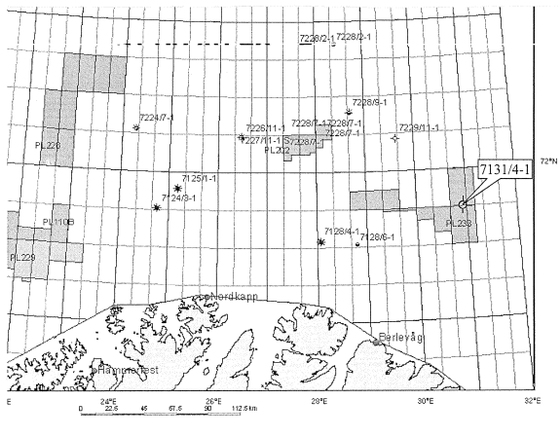
COMPOSITE LOG
1 : 500

PROSPECT STRUCTURE

Guovca

AREA:	BARENTS SEA
LICENCE:	PL 233
COORDINATES:	71°41'40.98" N 31°00'40.96" E
RKB:	25 m
WATER DEPTH:	331 m
TOTAL DEPTH:	1295 mMD RKB
FM. AT T.D.:	KOBBE FORMATION
SPUD DATE:	02.04.2005
RIG RELEASE:	18.05.2005
WELL STATUS:	P&A, DRY WELL
RIG:	EIRIK RAUDE
CONTRACTOR:	OCEAN RIG
GEOLOGIST:	S. RENSHAW, B. KJELLIN, T-A. JOHNSEN, O. GISKEØDEGAARD D. ALM, S. GREVE, Ø. HOVDEN
PREPARED BY:	T-A. W. JOHNSEN, T. GJESSEN

LOCATION MAP



CASING DATA		LEAK OFF TESTS	VELOCITY SURVEY
30"	403.5 mMD		Performed by Read
13 3/8"	799.5 mMD	LOT 1.67 g/cc	Zero offset VSP
			1280-380 mMD

LOGS RUN

CONTRACTOR: Schlumberger, BHI (MWD)

MWD runs		Wireline runs				
9 7/8" section Run 1: MPR: 411-413 mMD Run 2: MPR: 413-811 mMD	8 1/2" section Run 3: Ontrack: 811-915 mMD Run 4: Ontrack: 915-1070 mMD Run 5: Ontrac+APX: 1070-1295 mMD	Run 1A: PEX-DSI-GPIT Run 1A: MDT Run 1A: VSP-GR Run 1A: CST-GR	1293 - 799.5 mMD 1209.8 - 880.5 mMD 1280 - 380 mMD 1268.0 - 818.5 mMD			

COMMENTS:
MWD log curves down to 13 3/8" casing at 779.5 m. Wireline log curves from this depth down to TD, except for the resistivity curves.
2 cores were cut in the Garja 1 sandstone and Guovca sandstone respectively.

LITHOLOGICAL SYMBOLS

CLAY CLAYSTONE | DOLOMITE | ANHYDRITE | SHELL FRAGS | GLAUCONITE | SIDERITE

CUTTINGS/FLUORESCENCE | OIL SHOW | OIL/GAS SHOW | GAS SHOW

AZIMUTH & INCLINATION (16°)

SIDEWALL CORES: 1.5 SIDEWALL CORE; 2.8 NO RECOVERY; R 1.2 ROTARY SIDEWALL CORE

CORES: CORE NO

DST

RFT/FMT: 1 — SAMPLE

CASING SHOE / LINER

CHRONO STRAT UNCERTAINTY

Well Log

Chron Strat: System	Series	Stage	Depth	Litho Strat: Group	Formation	Depositional Environment	Lithological Descriptions
QUATERNARY			356.0				SEABED 356 mMD RKB / 356 mTVD RKB (-330 m MSL, TWT: 0.447 sec.)
							Drilled with returns to seabed down to 811 mMD RKB
							30" casing 403.5 m MD RKB / 403.5 mTVD RKB
			430.0				NORDVESTBANKEN GROUP KOLMULE FORMATION 430 mMD RKB / 430 mTVD RKB (-405 mMSL, TWT: 0.531 sec.)

Well Log tracks:

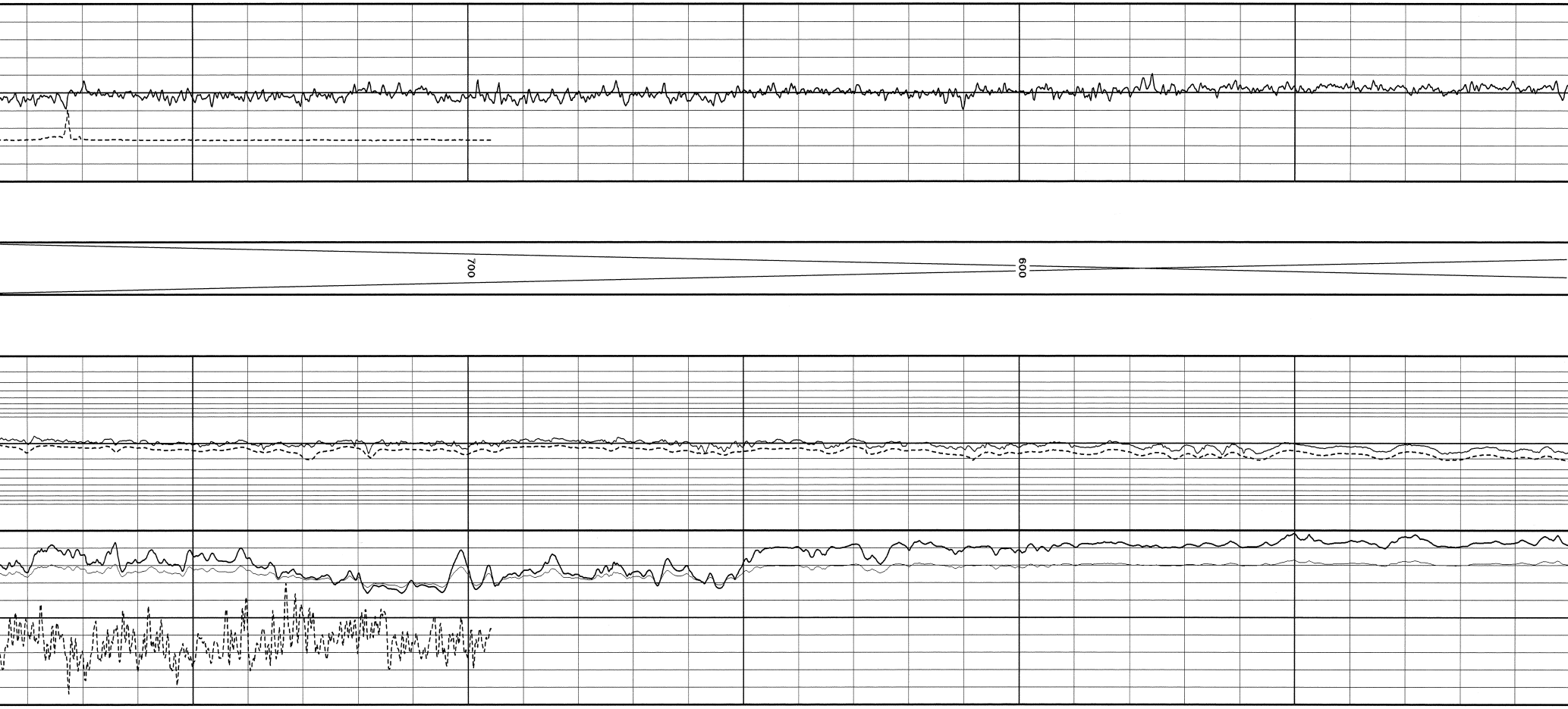
- GR(API) 0 — 150
- CALI(in) 0 — 16
- 300 / 400 / 500
- 30 " 404m
- RXO(ohmm) 0.20 — 20
- RT(ohmm) 0.20 — 20
- RHOB EDI(gm/cc) 1.95 — 2.95
- NPHI(in) 0.45 — -0.15
- DT(msec/ft) 140 — 40

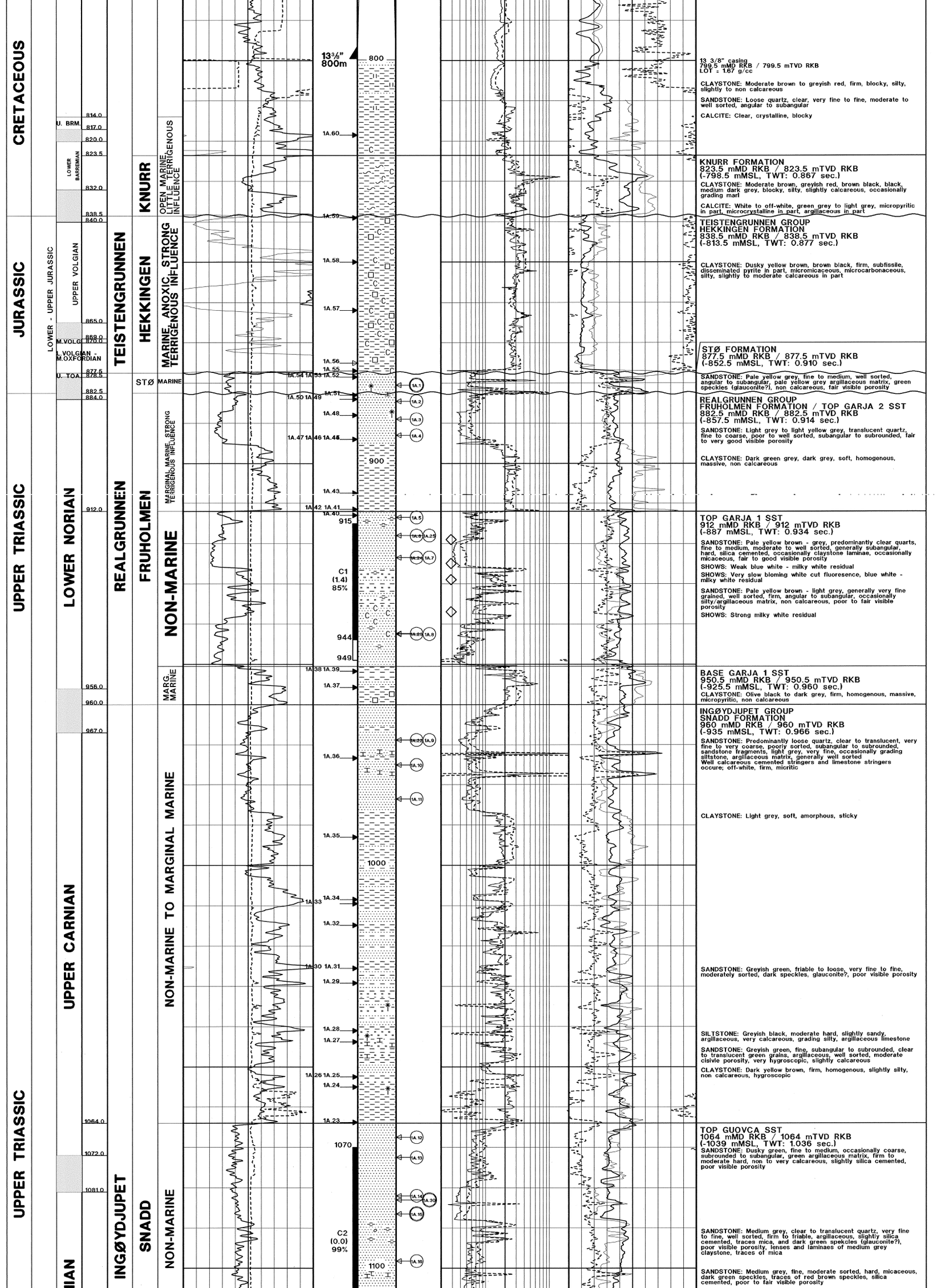
CRETACEOUS

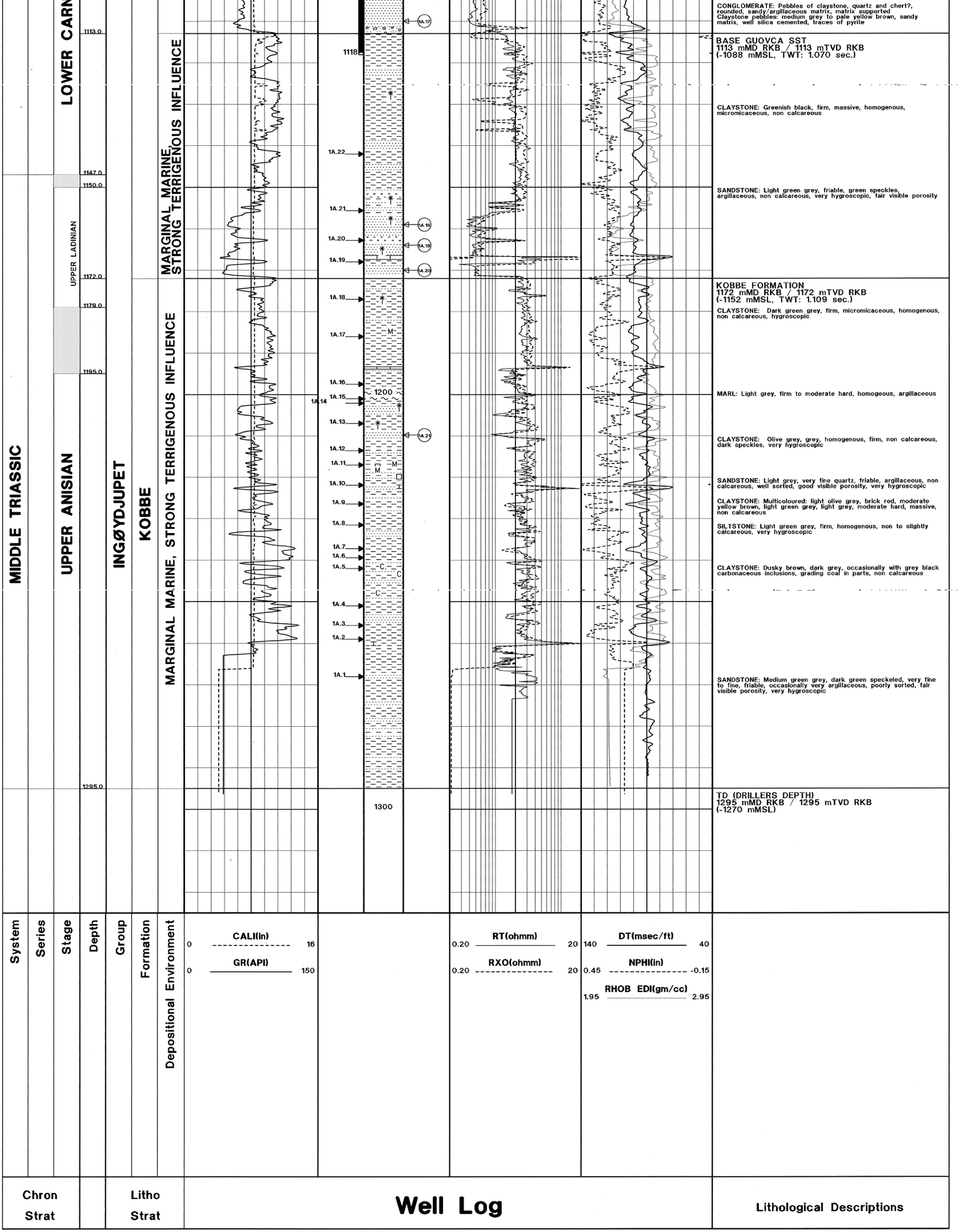
LOWER CRETACEOUS

NORDVESTBANKEN

KOLMULE




CRETACEOUS
JURASSIC
UPPER TRIASSIC
UPPER TRIASSIC
LOWER - UPPER JURASSIC
U. BRM.
LOWER BARREMIAN
UPPER VOLGIAN
M.VOLG.
L.VOLGIAN - M.OXFORDIAN
U. TOA.
LOWER NORIAN
UPPER CARNIAN
TEISTENGRUNNEN
REALGRUNNEN
INGØYDJUPET
KNURR
HEKKINGEN
STØ
FRUHOLMEN
SNADD
OPEN MARINE, LITTLE TERRIGENOUS INFLUENCE
MARINE, ANOXIC, STRONG TERRIGENOUS INFLUENCE
MARINE
MARGINAL MARINE, STRONG TERRIGENOUS INFLUENCE
NON-MARINE
MARG. MARINE
NON-MARINE TO MARGINAL MARINE
NON-MARINE
13 3/8" 800m
800
900
915
944
949
1000
1070
1100
C1 (1.4) 85%
C2 (0.0) 99%
814.0
817.0
820.0
823.5
832.0
838.5
840.0
865.0
868.0
870.0
877.5
878.5
882.5
884.0
912.0
956.0
960.0
967.0
1064.0
1072.0
1081.0
1A.60
1A.59
1A.58
1A.57
1A.56
1A.55
1A.54 1A.53 1A.52
1A.51
1A.50 1A.49
1A.48
1A.47 1A.46 1A.45
1A.43
1A.42 1A.41
1A.40
1A.38 1A.39
1A.37
1A.36
1A.35
1A.34
1A.33
1A.32
1A.31
1A.30
1A.29
1A.28
1A.27
1A.26 1A.25
1A.24
1A.23
1A.1
1A.2
1A.3
1A.4
1A.5
1A.6 1A.25
1A.24 1A.7
1A.28 1A.8
1A.22 1A.9
1A.10
1A.11
1A.12
1A.13
1A.14 1A.30
1A.15
1A.16
13 3/8" casing
799.5 mMD RKB / 799.5 mTVD RKB
LOT = 1.67 g/cc
CLAYSTONE: Moderate brown to greyish red, firm, blocky, silty, slightly to non calcareous
SANDSTONE: Loose quartz, clear, very fine to fine, moderate to well sorted, angular to subangular
CALCITE: Clear, crystalline, blocky
KNURR FORMATION
823.5 mMD RKB / 823.5 mTVD RKB
(-798.5 mMSL, TWT: 0.867 sec.)
CLAYSTONE: Moderate brown, greyish red, brown black, black, medium dark grey, blocky, silty, slightly calcareous, occasionally grading marl
CALCITE: White to off-white, green grey to light grey, micropyritic in part, microcrystalline in part, argillaceous in part
TEISTENGRUNNEN GROUP
HEKKINGEN FORMATION
838.5 mMD RKB / 838.5 mTVD RKB
(-813.5 mMSL, TWT: 0.877 sec.)
CLAYSTONE: Dusky yellow brown, brown black, firm, subfissile, disseminated pyrite in part, micromicaceous, microcarbonaceous, silty, slightly to moderate calcareous in part
STØ FORMATION
877.5 mMD RKB / 877.5 mTVD RKB
(-852.5 mMSL, TWT: 0.910 sec.)
SANDSTONE: Pale yellow grey, fine to medium, well sorted, angular to subangular, pale yellow grey argillaceous matrix, green speckles (glauconite?), non calcareous, fair visible porosity
REALGRUNNEN GROUP
FRUHOLMEN FORMATION / TOP GARJA 2 SST
882.5 mMD RKB / 882.5 mTVD RKB
(-857.5 mMSL, TWT: 0.914 sec.)
SANDSTONE: Light grey to light yellow grey, translucent quartz, fine to coarse, poor to well sorted, subangular to subrounded, fair to very good visible porosity
CLAYSTONE: Dark green grey, dark grey, soft, homogenous, massive, non calcareous
TOP GARJA 1 SST
912 mMD RKB / 912 mTVD RKB
(-887 mMSL, TWT: 0.934 sec.)
SANDSTONE: Pale yellow brown - grey, predominantly clear quarts, fine to medium, moderate to well sorted, generally subangular, hard, silica cemented, occasionally claystone laminae, occasionally micaceous, fair to good visible porosity
SHOWS: Weak blue white - milky white residual
SHOWS: Very slow blooming white cut fluoresence, blue white - milky white residual
SANDSTONE: Pale yellow brown - light grey, generally very fine grained, well sorted, firm, angular to subangular, occasionally silty/argillaceous matrix, non calcareous, poor to fair visible porosity
SHOWS: Strong milky white residual
BASE GARJA 1 SST
950.5 mMD RKB / 950.5 mTVD RKB
(-925.5 mMSL, TWT: 0.960 sec.)
CLAYSTONE: Olive black to dark grey, firm, homogenous, massive, micropyritic, non calcareous
INGØYDJUPET GROUP
SNADD FORMATION
960 mMD RKB / 960 mTVD RKB
(-935 mMSL, TWT: 0.966 sec.)
SANDSTONE: Predominantly loose quartz, clear to translucent, very fine to very coarse, poorly sorted, subangular to subrounded, sandstone fragments, light grey, very fine, occasionally grading siltstone, argillaceous matrix, generally well sorted
Well calcareous cemented stringers and limestone stringers occure; off-white, firm, micritic
CLAYSTONE: Light grey, soft, amorphous, sticky
SANDSTONE: Greyish green, friable to loose, very fine to fine, moderately sorted, dark speckles, glauconite?, poor visible porosity
SILTSTONE: Greyish black, moderate hard, slightly sandy, argillaceous, very calcareous, grading silty, argillaceous limestone
SANDSTONE: Greyish green, fine, subangular to subrounded, clear to translucent green grains, argillaceous, well sorted, moderate cisivle porosity, very hygroscopic, slightly calcareous
CLAYSTONE: Dark yellow brown, firm, homogenous, slightly silty, non calcareous, hygroscopic
TOP GUOVCA SST
1064 mMD RKB / 1064 mTVD RKB
(-1039 mMSL, TWT: 1.036 sec.)
SANDSTONE: Dusky green, fine to medium, occasionally coarse, subrounded to subangular, green argillaceous matrix, firm to moderate hard, non to very calcareous, slightly silica cemented, poor visible porosity
SANDSTONE: Medium grey, clear to translucent quartz, very fine to fine, well sorted, firm to friable, argillaceous, slightly silica cemented, traces mica, and dark green spekcles (glauconite?), poor visible porosity, lenses and laminaes of medium grey claystone, traces of mica
SANDSTONE: Medium grey, fine, moderate sorted, hard, micaceous, dark green speckles, traces of red brown speckles, silica cemented, poor to fair visible porosity


MIDDLE TRIASSIC
LOWER CARN
UPPER LADINIAN
UPPER ANISIAN
INGØYDJUPET
KOBBE
MARGINAL MARINE, STRONG TERRIGENOUS INFLUENCE
MARGINAL MARINE, STRONG TERRIGENOUS INFLUENCE
1113.0
1147.0
1150.0
1172.0
1179.0
1195.0
1295.0
1118
1200
1300
1A.1
1A.2
1A.3
1A.4
1A.5
1A.6
1A.7
1A.8
1A.9
1A.10
1A.11
1A.12
1A.13
1A.14
1A.15
1A.16
1A.17
1A.18
1A.19
1A.20
1A.21
1A.22
CONGLOMERATE: Pebbles of claystone, quartz and chert?, rounded, sandy/argillaceous matrix, matrix supported
Claystone pebbles: medium grey to pale yellow brown, sandy matrix, well silica cemented, traces of pyrite
BASE GUOVCA SST
1113 mMD RKB / 1113 mTVD RKB
(-1088 mMSL, TWT: 1.070 sec.)
CLAYSTONE: Greenish black, firm, massive, homogenous, micromicaceous, non calcareous
SANDSTONE: Light green grey, friable, green speckles, argillaceous, non calcareous, very hygroscopic, fair visible porosity
KOBBE FORMATION
1172 mMD RKB / 1172 mTVD RKB
(-1152 mMSL, TWT: 1.109 sec.)
CLAYSTONE: Dark green grey, firm, micromicaceous, homogenous, non calcareous, hygroscopic
MARL: Light grey, firm to moderate hard, homogeous, argillaceous
CLAYSTONE: Olive grey, grey, homogenous, firm, non calcareous, dark speckles, very hygroscopic
SANDSTONE: Light grey, very fine quartz, friable, argillaceous, non calcareous, well sorted, good visible porosity, very hygroscopic
CLAYSTONE: Multicoloured: light olive grey, brick red, moderate yellow brown, light green grey, light grey, moderate hard, massive, non calcareous
SILTSTONE: Light green grey, firm, homogenous, non to slightly calcareous, very hygroscopic
CLAYSTONE: Dusky brown, dark grey, occasionally with grey black carbonaceous inclusions, grading coal in parts, non calcareous
SANDSTONE: Medium green grey, dark green speckeled, very fine to fine, friable, occasionally very argillaceous, poorly sorted, fair visible porosity, very hygroscopic
TD (DRILLERS DEPTH)
1295 mMD RKB / 1295 mTVD RKB
(-1270 mMSL)
System
Series
Stage
Depth
Group
Formation
Depositional Environment
CALI(in) 0 16
GR(API) 0 150
RT(ohmm) 0.20 20
RXO(ohmm) 0.20 20
DT(msec/ft) 140 40
NPHI(in) 0.45 -0.15
RHOB EDI(gm/cc) 1.95 2.95
Chron Strat
Litho Strat
Well Log
Lithological Descriptions

FORMATION EVALUATION LOG

MA32_N1Q.PR1

FROM : 350 TO : 1305 SCALE 1/ 500

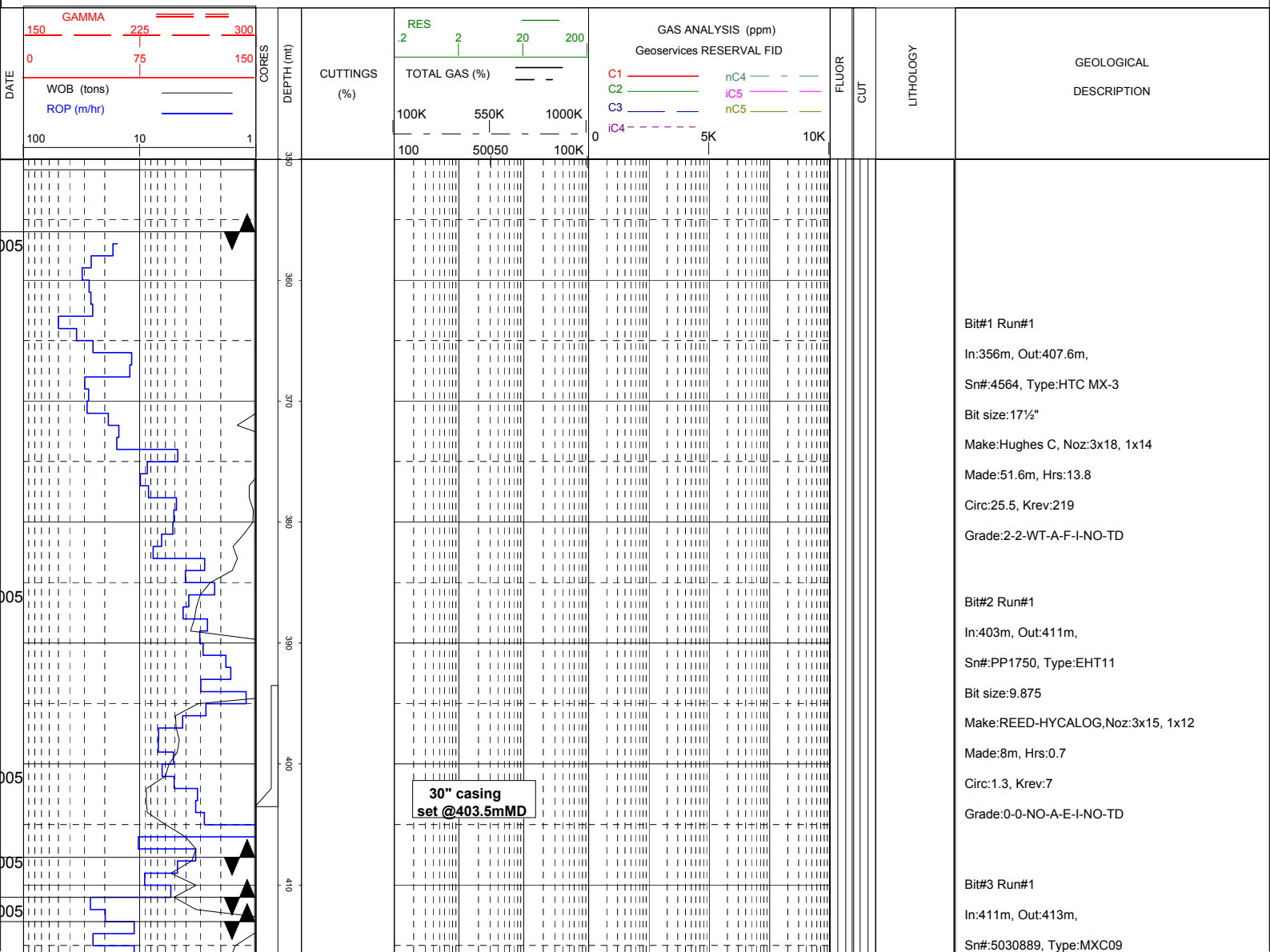
Well name	: 7131/4-1	Location lat	: 71deg41'40.98"N	Rig Name	: Eirik Raude
Client name	: Statoil	Location long	: 31deg00'40.96"E	Rig Type	: Semi submersible
Field	: Guovca	UTM loc [N] (m)	: 7 959 769	Contractor	: Statoil
Country	: Norway	UTM loc [E] (m)	: 640 535		
Area	: Barents Sea			Total Depth (m)	: 1295
Block	: 7131/4			TVD (m)	: 1295
		Spudded	: 02-04-05	RT - MSL (m)	: 25
		TD reached	: 10-05-05	MSL - Seabed (m)	: 331
		Total drill days	: 49,7	Depth Reference	: ROTARY TABLE

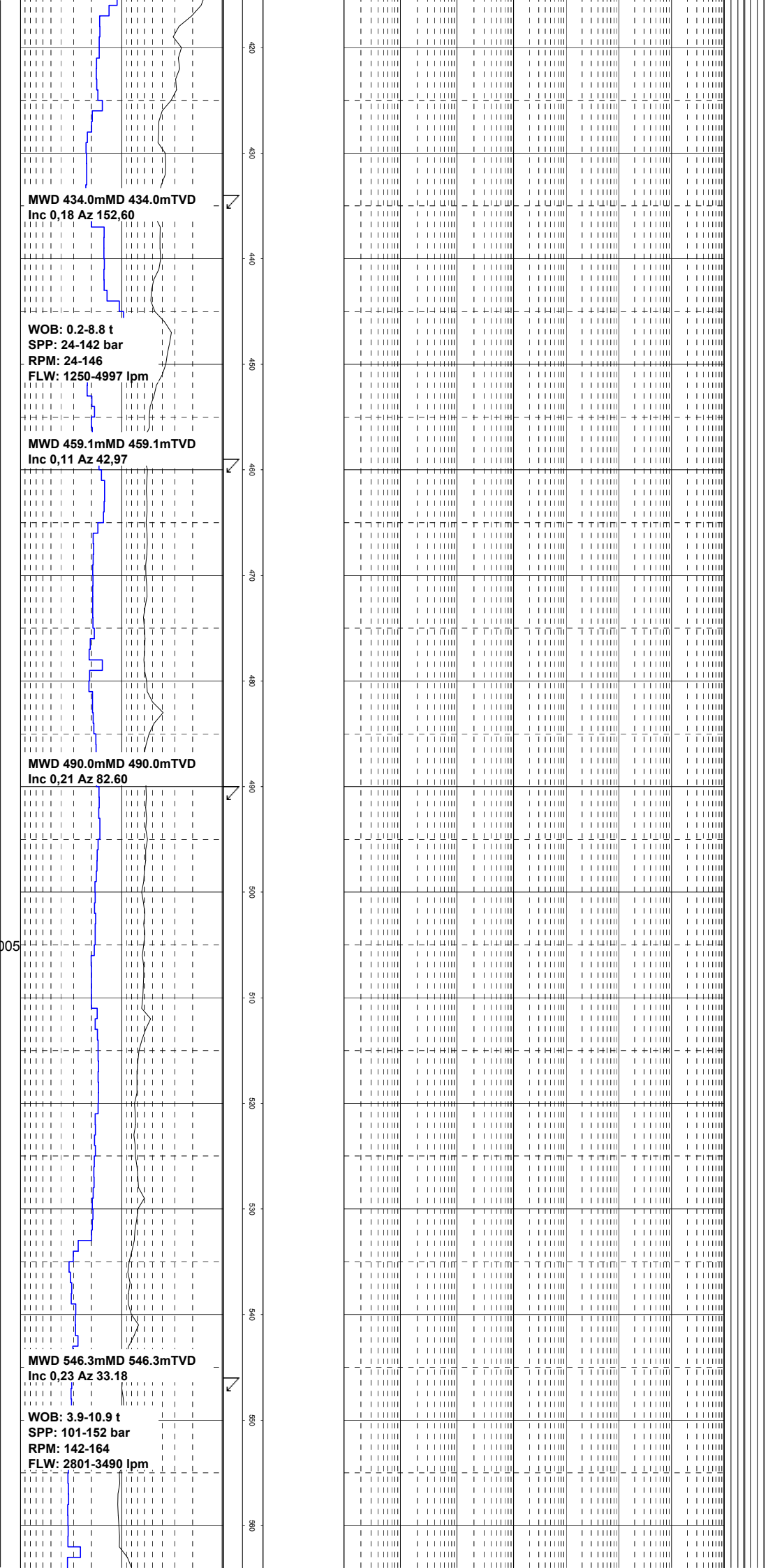
Clay-shale | Calcareous clay-shal | Marl | Silty clay-shale | Sandy clay-shale | Chert | Silstone

Fine sandstone | Medium sandstone | Coarse sandstone | Calcareous sandstone | Argillaceous sandsto | Limestone | Argillaceous limes

Dolomite | Microcrystallized do | Calcite | Fossils | Smell | Oil and Gas | FIT

Survey | Mud loss | Mud gain | Sidewall core | Core | Casing Top | Casing shoe





Bit size:9.875

Make:Hughes C, Noz:3x18, 1x16

Made:2m, Hrs:0.2,

Circ:1.1, Krev:7

Grade:0-0-NO-A-E-I-NO-DTF

Bit#3 Run#2

In:411m, Out:811m,

Sn#:5030889, Type:MXC09

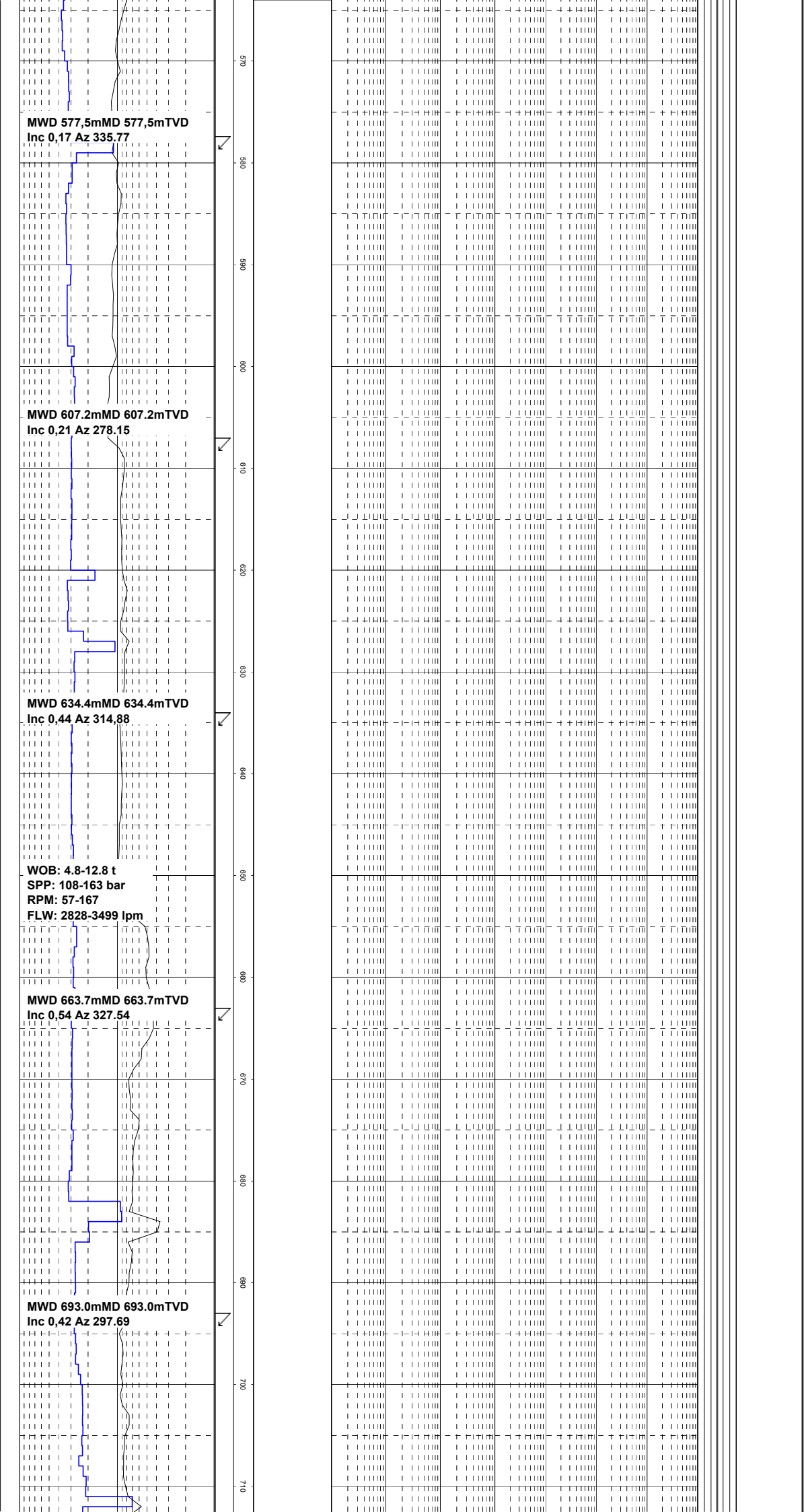
Bit size:9.875

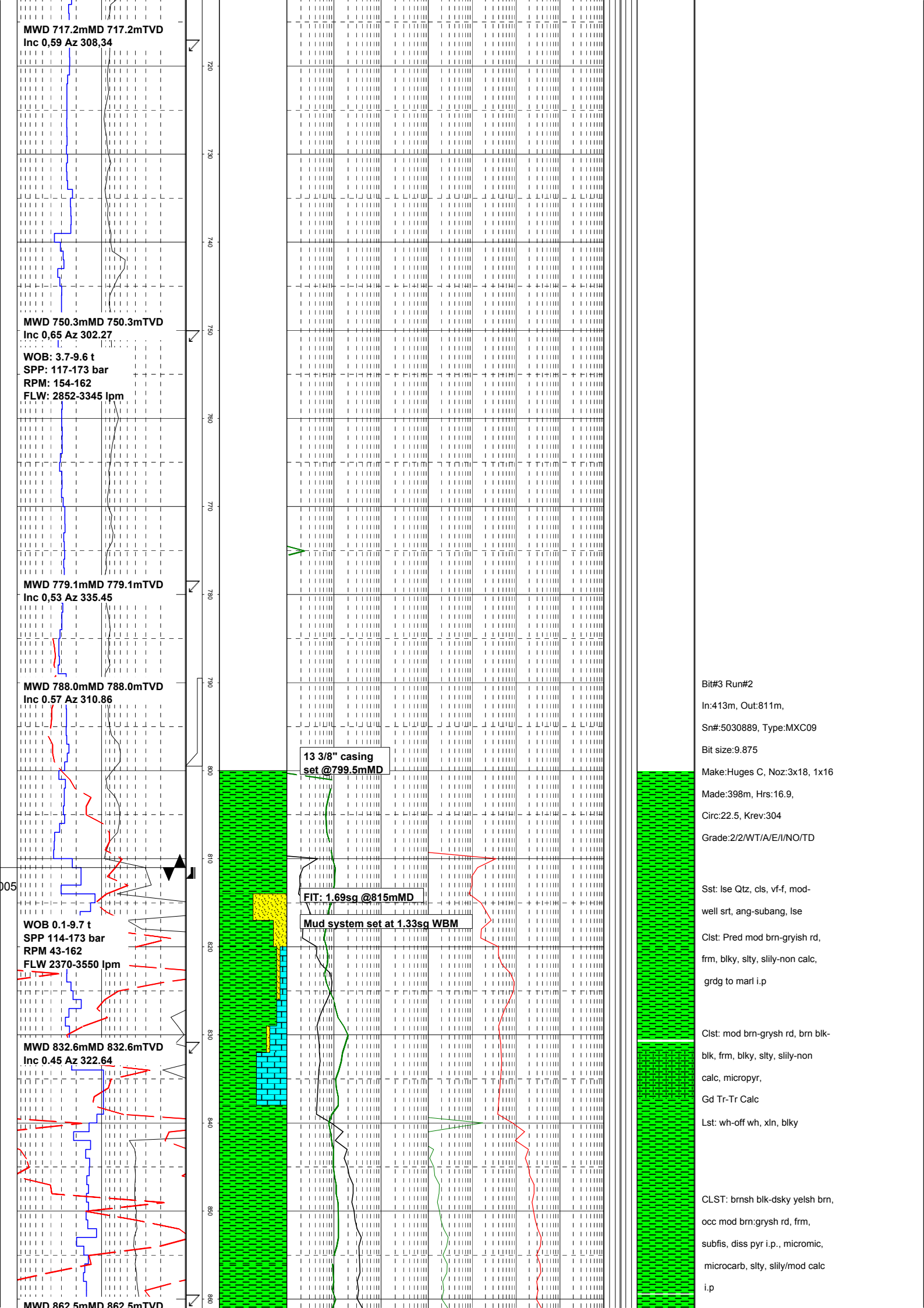
Make:Hughes C, Noz:3x18, 1x16

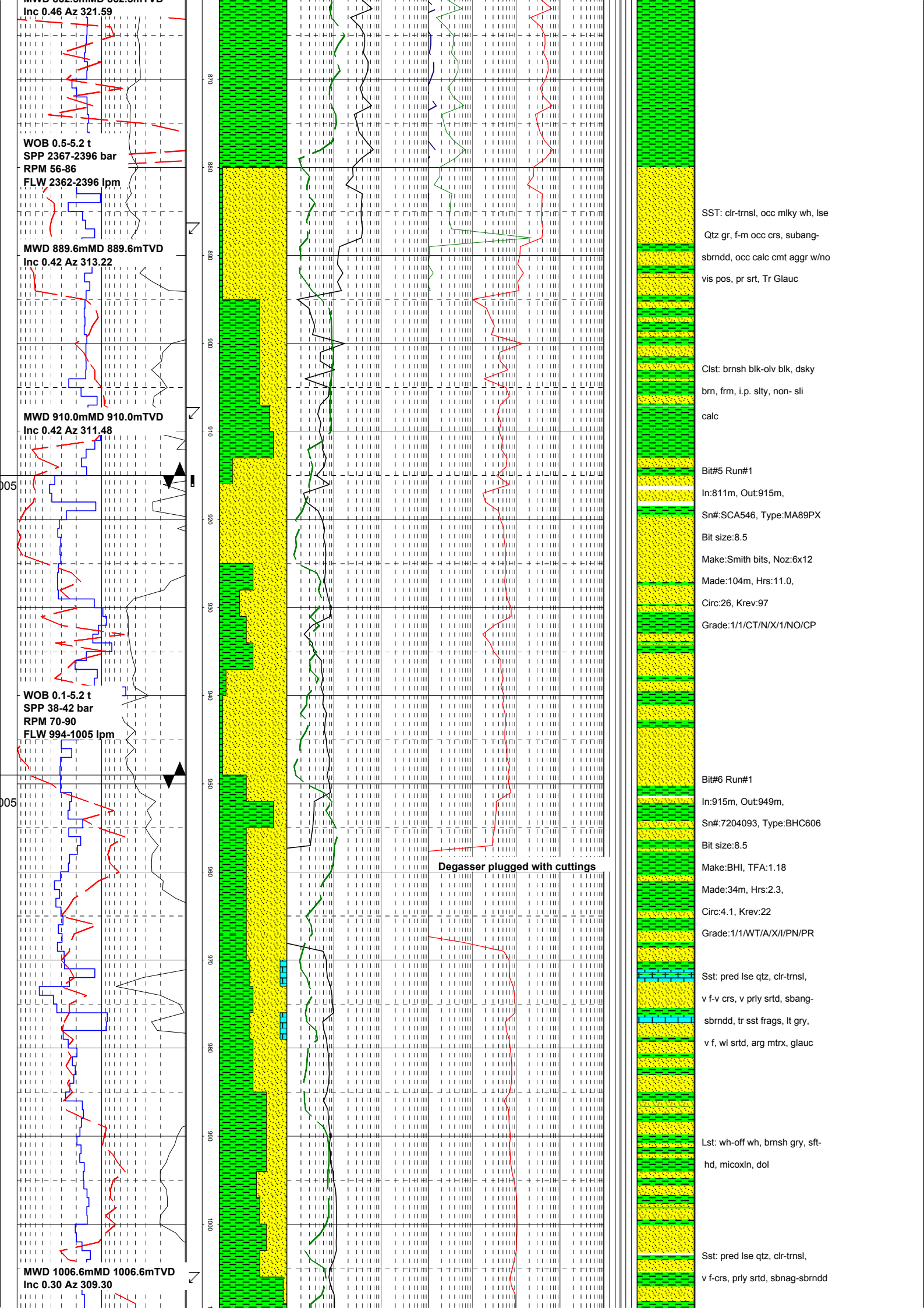
Made:398m, Hrs:16.9,

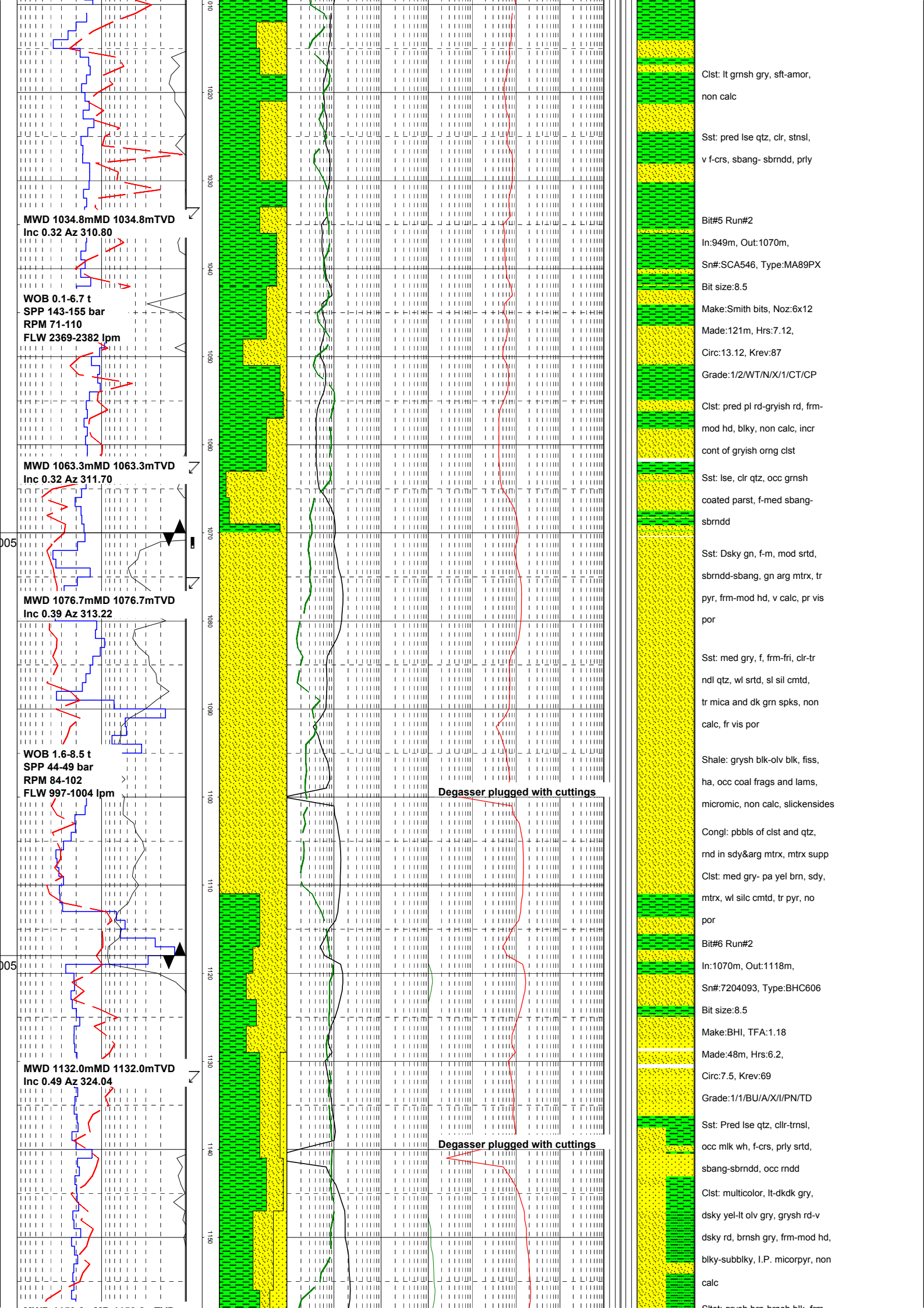
Circ:22.5, Krev:304

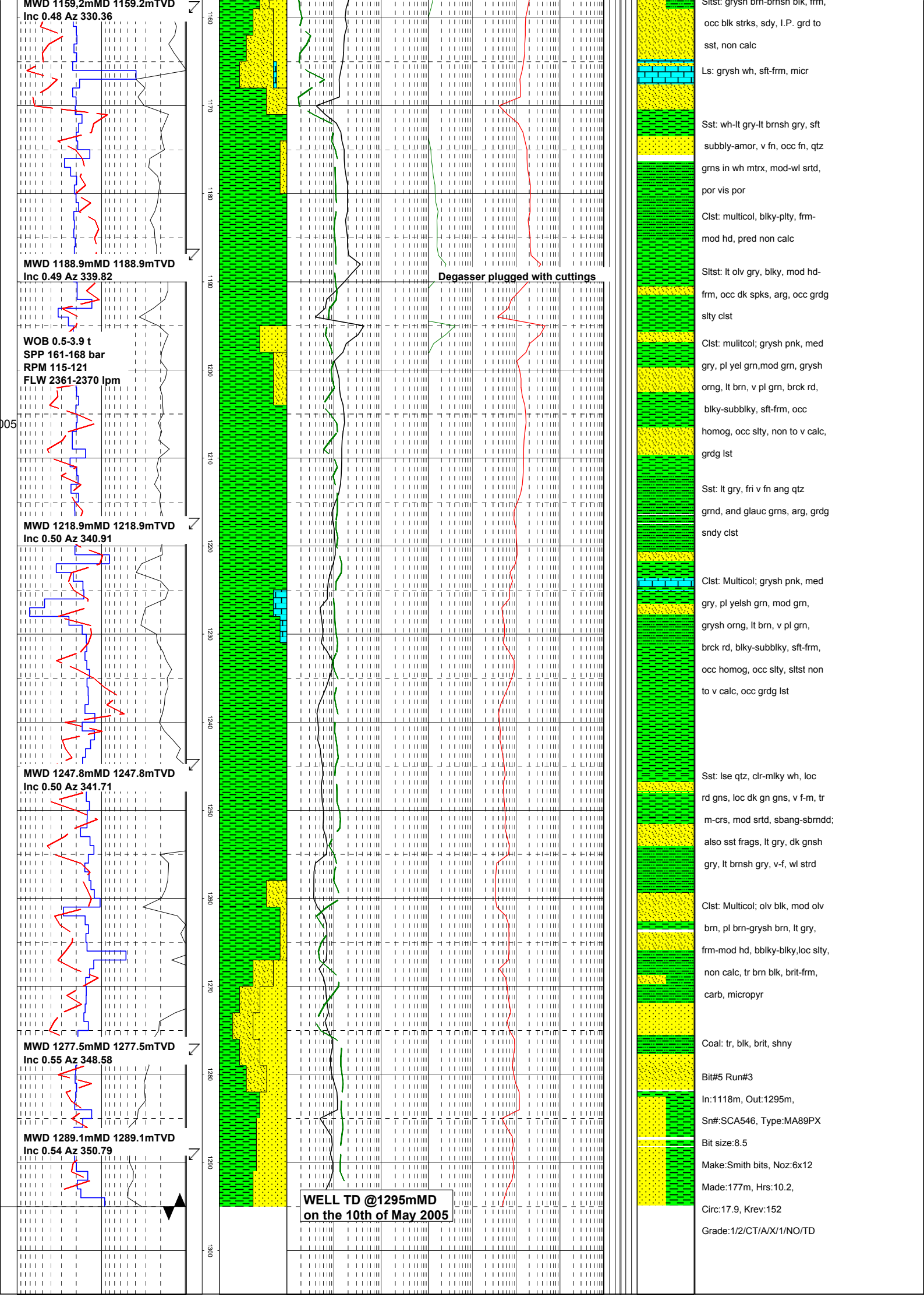
Grade:2-2-WT-A-E-I-NO-TD


MWD 577,5mMD 577,5mTVD
Inc 0,17 Az 335.77
MWD 607.2mMD 607.2mTVD
Inc 0,21 Az 278.15
MWD 634.4mMD 634.4mTVD
Inc 0,44 Az 314.88
WOB: 4.8-12.8 t
SPP: 108-163 bar
RPM: 57-167
FLW: 2828-3499 lpm
MWD 663.7mMD 663.7mTVD
Inc 0,54 Az 327.54
MWD 693.0mMD 693.0mTVD
Inc 0,42 Az 297.69


MWD 717.2mMD 717.2mTVD
Inc 0,59 Az 308,34
MWD 750.3mMD 750.3mTVD
Inc 0,65 Az 302.27
WOB: 3.7-9.6 t
SPP: 117-173 bar
RPM: 154-162
FLW: 2852-3345 lpm
MWD 779.1mMD 779.1mTVD
Inc 0,53 Az 335.45
MWD 788.0mMD 788.0mTVD
Inc 0.57 Az 310.86
13 3/8" casing
set @799.5mMD
FIT: 1.69sg @815mMD
Mud system set at 1.33sg WBM
WOB 0.1-9.7 t
SPP 114-173 bar
RPM 43-162
FLW 2370-3550 lpm
MWD 832.6mMD 832.6mTVD
Inc 0.45 Az 322.64
MWD 862.5mMD 862.5mTVD
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
Bit#3 Run#2
In:413m, Out:811m,
Sn#:5030889, Type:MXC09
Bit size:9.875
Make:Huges C, Noz:3x18, 1x16
Made:398m, Hrs:16.9,
Circ:22.5, Krev:304
Grade:2/2/WT/A/E/I/NO/TD
Sst: lse Qtz, cls, vf-f, mod-
well srt, ang-subang, lse
Clst: Pred mod brn-gryish rd,
frm, blky, slty, slily-non calc,
grdg to marl i.p
Clst: mod brn-grysh rd, brn blk-
blk, frm, blky, slty, slily-non
calc, micropyr,
Gd Tr-Tr Calc
Lst: wh-off wh, xln, blky
CLST: brnsh blk-dsky yelsh brn,
occ mod brn:grysh rd, frm,
subfis, diss pyr i.p., micromic,
microcarb, slty, slily/mod calc
i.p


Inc 0.46 Az 321.59
WOB 0.5-5.2 t
SPP 2367-2396 bar
RPM 56-86
FLW 2362-2396 lpm
MWD 889.6mMD 889.6mTVD
Inc 0.42 Az 313.22
MWD 910.0mMD 910.0mTVD
Inc 0.42 Az 311.48
WOB 0.1-5.2 t
SPP 38-42 bar
RPM 70-90
FLW 994-1005 lpm
MWD 1006.6mMD 1006.6mTVD
Inc 0.30 Az 309.30
870
880
890
900
910
920
930
940
950
960
970
980
990
1000
Degasser plugged with cuttings
SST: clr-trnsl, occ mlky wh, lse
Qtz gr, f-m occ crs, subang-
sbrndd, occ calc cmt aggr w/no
vis pos, pr srt, Tr Glauc
Clst: brnsh blk-olv blk, dsky
brn, frm, i.p. slty, non- sli
calc
Bit#5 Run#1
In:811m, Out:915m,
Sn#:SCA546, Type:MA89PX
Bit size:8.5
Make:Smith bits, Noz:6x12
Made:104m, Hrs:11.0,
Circ:26, Krev:97
Grade:1/1/CT/N/X/1/NO/CP
Bit#6 Run#1
In:915m, Out:949m,
Sn#:7204093, Type:BHC606
Bit size:8.5
Make:BHI, TFA:1.18
Made:34m, Hrs:2.3,
Circ:4.1, Krev:22
Grade:1/1/WT/A/X/I/PN/PR
Sst: pred lse qtz, clr-trnsl,
v f-v crs, v prly srtd, sbang-
sbrndd, tr sst frags, lt gry,
v f, wl srtd, arg mtrx, glauc
Lst: wh-off wh, brnsh gry, sft-
hd, micoxln, dol
Sst: pred lse qtz, clr-trnsl,
v f-crs, prly srtd, sbnag-sbrndd


MWD 1034.8mMD 1034.8mTVD
Inc 0.32 Az 310.80
WOB 0.1-6.7 t
SPP 143-155 bar
RPM 71-110
FLW 2369-2382 lpm
MWD 1063.3mMD 1063.3mTVD
Inc 0.32 Az 311.70
MWD 1076.7mMD 1076.7mTVD
Inc 0.39 Az 313.22
WOB 1.6-8.5 t
SPP 44-49 bar
RPM 84-102
FLW 997-1004 lpm
MWD 1132.0mMD 1132.0mTVD
Inc 0.49 Az 324.04
Degasser plugged with cuttings
Degasser plugged with cuttings
Clst: lt grnsh gry, sft-amor, non calc
Sst: pred lse qtz, clr, stnsl, v f-crs, sbang- sbrndd, prly
Bit#5 Run#2
In:949m, Out:1070m,
Sn#:SCA546, Type:MA89PX
Bit size:8.5
Make:Smith bits, Noz:6x12
Made:121m, Hrs:7.12,
Circ:13.12, Krev:87
Grade:1/2/WT/N/X/1/CT/CP
Clst: pred pl rd-gryish rd, frm-mod hd, blky, non calc, incr cont of gryish orng clst
Sst: lse, clr qtz, occ grnsh coated parst, f-med sbang-sbrndd
Sst: Dsky gn, f-m, mod srtd, sbrndd-sbang, gn arg mtrx, tr pyr, frm-mod hd, v calc, pr vis por
Sst: med gry, f, frm-fri, clr-tr ndl qtz, wl srtd, sl sil cmtd, tr mica and dk grn spks, non calc, fr vis por
Shale: grysh blk-olv blk, fiss, ha, occ coal frags and lams, micromic, non calc, slickensides
Congl: pbbls of clst and qtz, rnd in sdy&arg mtrx, mtrx supp
Clst: med gry- pa yel brn, sdy, mtrx, wl silc cmtd, tr pyr, no por
Bit#6 Run#2
In:1070m, Out:1118m,
Sn#:7204093, Type:BHC606
Bit size:8.5
Make:BHI, TFA:1.18
Made:48m, Hrs:6.2,
Circ:7.5, Krev:69
Grade:1/1/BU/A/X/I/PN/TD
Sst: Pred lse qtz, cllr-trnsl, occ mlk wh, f-crs, prly srtd, sbang-sbrndd, occ rndd
Clst: multicolor, lt-dkdk gry, dsky yel-lt olv gry, grysh rd-v dsky rd, brnsh gry, frm-mod hd, blky-subblky, l.P. micorpyr, non calc


MWD 1159.2mMD 1159.2mTVD
Inc 0.48 Az 330.36
MWD 1188.9mMD 1188.9mTVD
Inc 0.49 Az 339.82
WOB 0.5-3.9 t
SPP 161-168 bar
RPM 115-121
FLW 2361-2370 lpm
MWD 1218.9mMD 1218.9mTVD
Inc 0.50 Az 340.91
MWD 1247.8mMD 1247.8mTVD
Inc 0.50 Az 341.71
MWD 1277.5mMD 1277.5mTVD
Inc 0.55 Az 348.58
MWD 1289.1mMD 1289.1mTVD
Inc 0.54 Az 350.79
Degasser plugged with cuttings
WELL TD @1295mMD
on the 10th of May 2005
1160
1170
1180
1190
1200
1210
1220
1230
1240
1250
1260
1270
1280
1290
1300
Sltst: grysh brn-brnsh blk, frm,
occ blk strks, sdy, l.P. grd to
sst, non calc
Ls: grysh wh, sft-frm, micr
Sst: wh-lt gry-lt brnsh gry, sft
subbly-amor, v fn, occ fn, qtz
grns in wh mtrx, mod-wl srtd,
por vis por
Clst: multicol, blky-plty, frm-
mod hd, pred non calc
Sltst: lt olv gry, blky, mod hd-
frm, occ dk spks, arg, occ grdg
slty clst
Clst: mulitcol; grysh pnk, med
gry, pl yel grn,mod grn, grysh
orng, lt brn, v pl grn, brck rd,
blky-subblky, sft-frm, occ
homog, occ slty, non to v calc,
grdg lst
Sst: lt gry, fri v fn ang qtz
grnd, and glauc grns, arg, grdg
sndy clst
Clst: Multicol; grysh pnk, med
gry, pl yelsh grn, mod grn,
grysh orng, lt brn, v pl grn,
brck rd, blky-subblky, sft-frm,
occ homog, occ slty, sltst non
to v calc, occ grdg lst
Sst: lse qtz, clr-mlky wh, loc
rd gns, loc dk gn gns, v f-m, tr
m-crs, mod srtd, sbang-sbrndd;
also sst frags, lt gry, dk gnsh
gry, lt brnsh gry, v-f, wl strd
Clst: Multicol; olv blk, mod olv
brn, pl brn-grysh brn, lt gry,
frm-mod hd, bblky-blky,loc slty,
non calc, tr brn blk, brit-frm,
carb, micropyr
Coal: tr, blk, brit, shny
Bit#5 Run#3
In:1118m, Out:1295m,
Sn#:SCA546, Type:MA89PX
Bit size:8.5
Make:Smith bits, Noz:6x12
Made:177m, Hrs:10.2,
Circ:17.9, Krev:152
Grade:1/2/CT/A/X/1/NO/TD

PRESSURE EVALUATION LOG

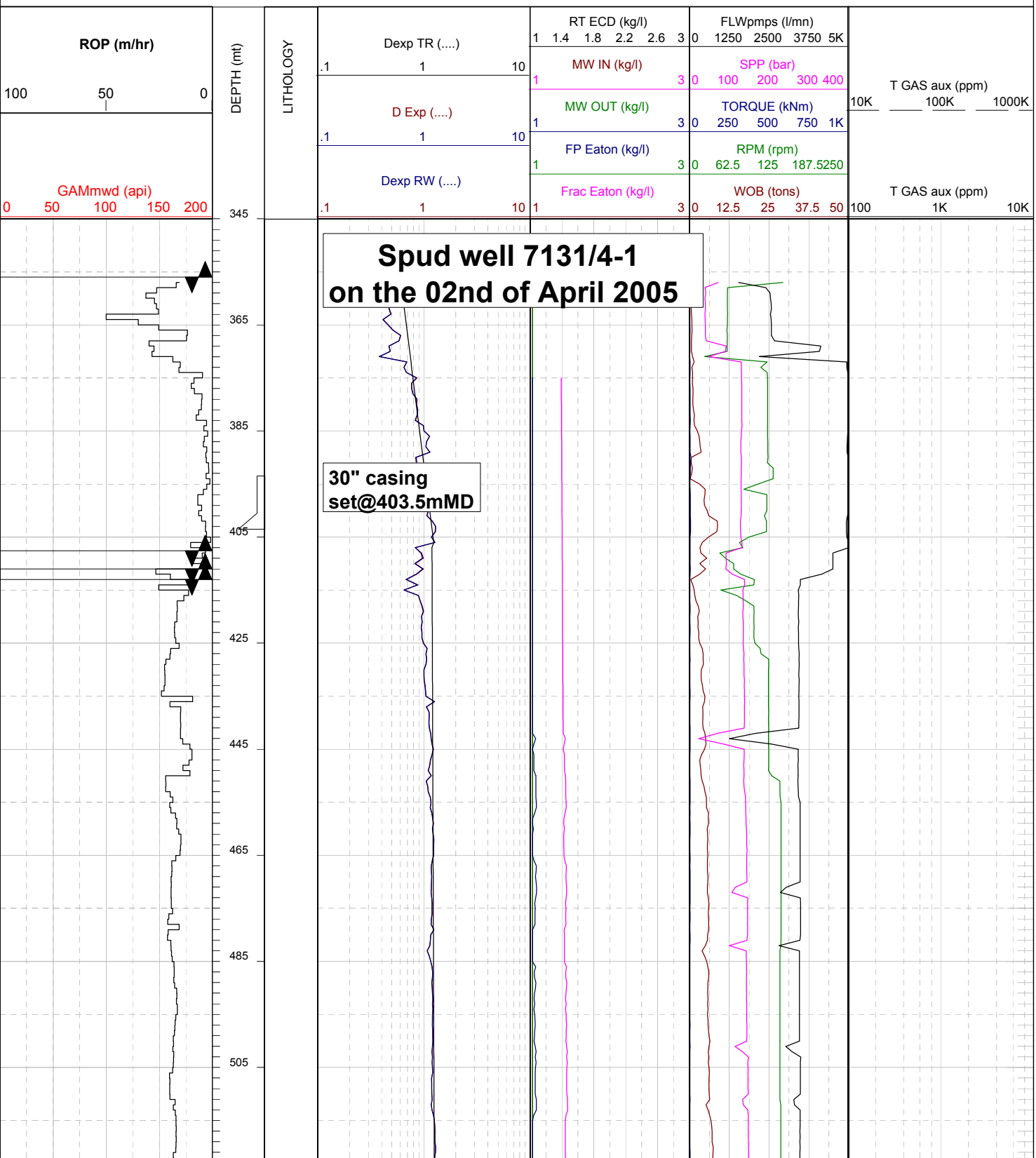
Tot Depth (m): 1295 **TVD Depth (m): 1295**

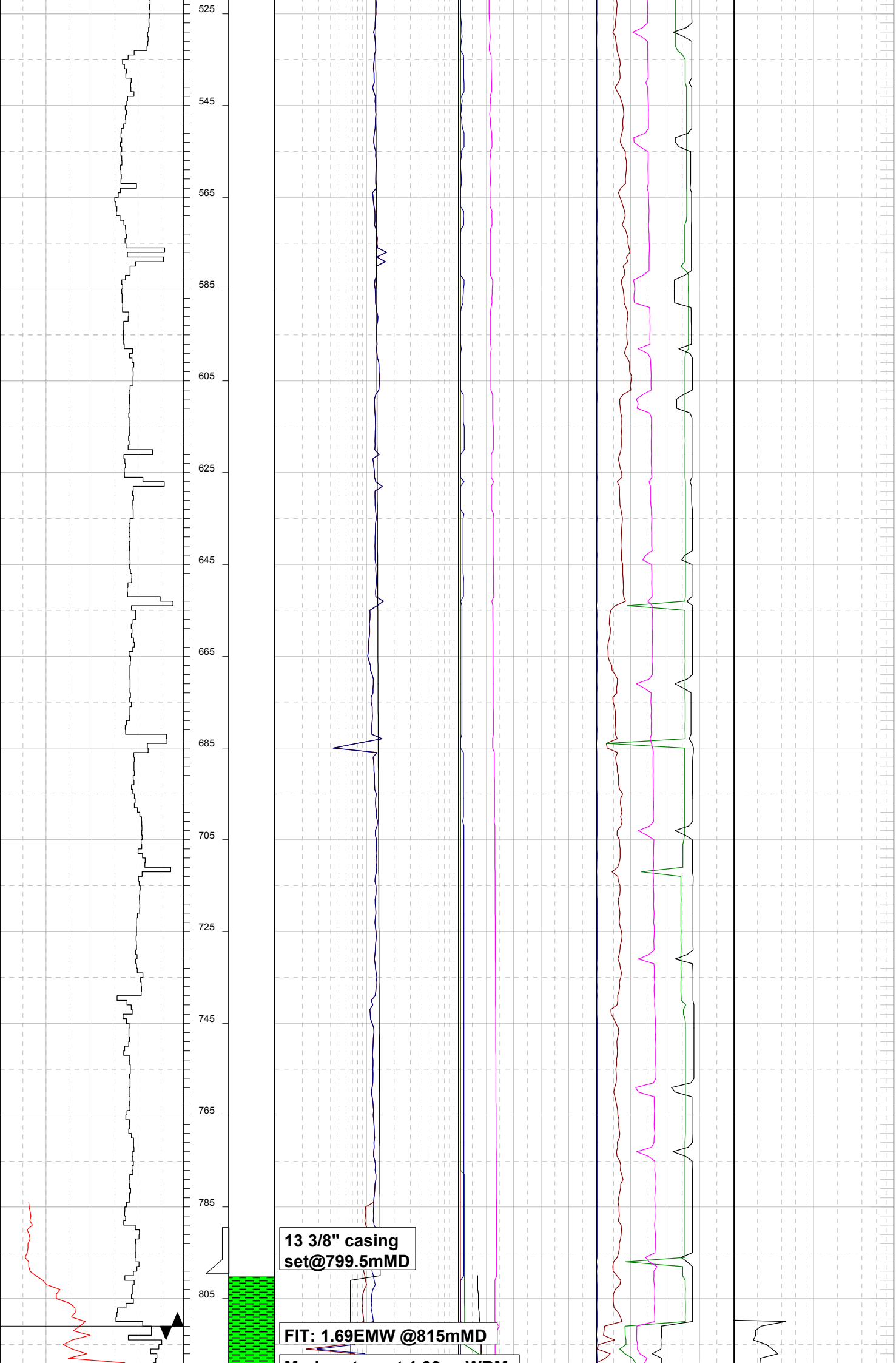
Well name : 7131/4-1	Country : Norway	Date : 05-17-2005	Time : 18:32:54	SCALE : 1/ 1000

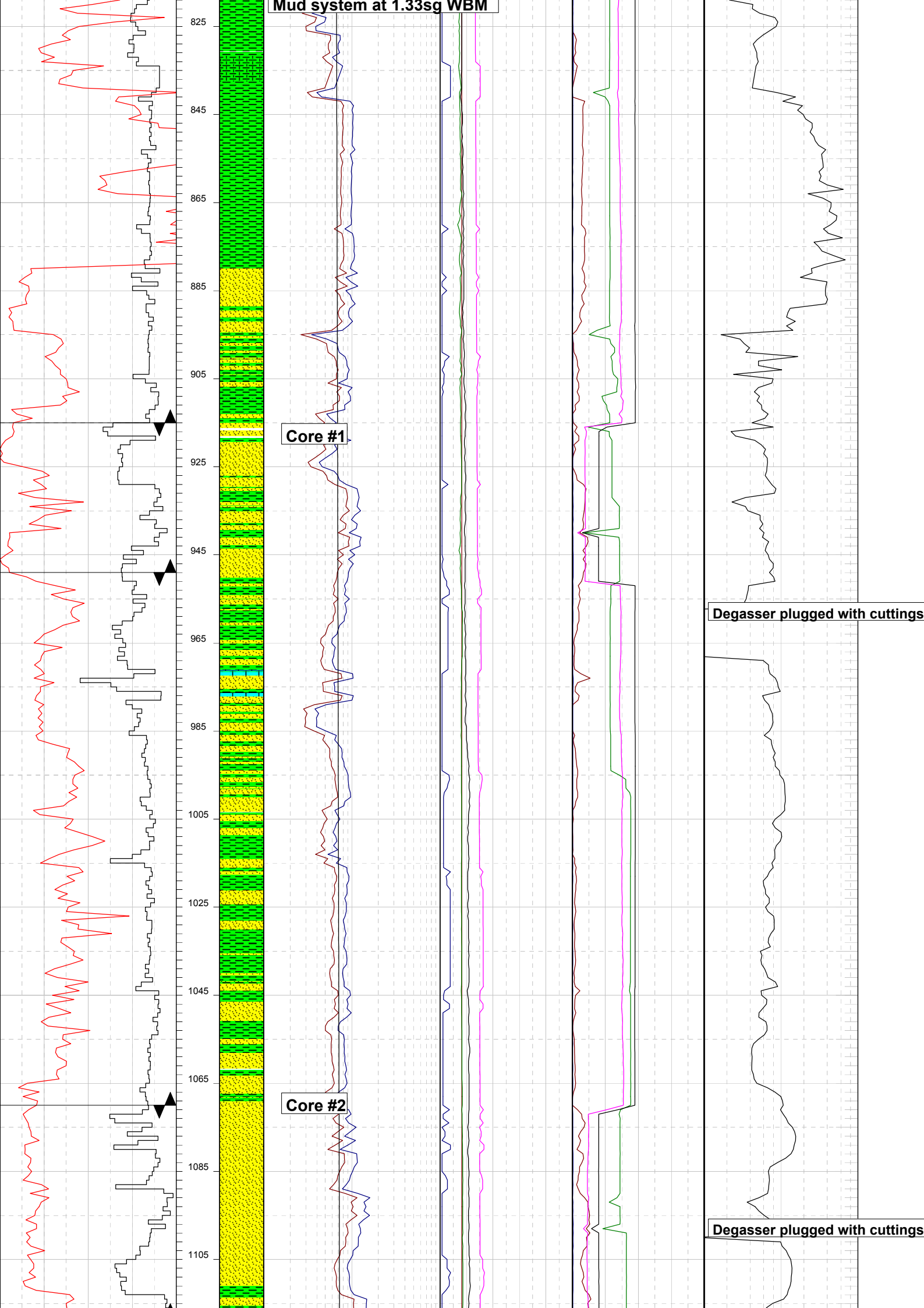
Clay-shale | Calcareous clay-shale | Marl | Silty clay-shale | Chert

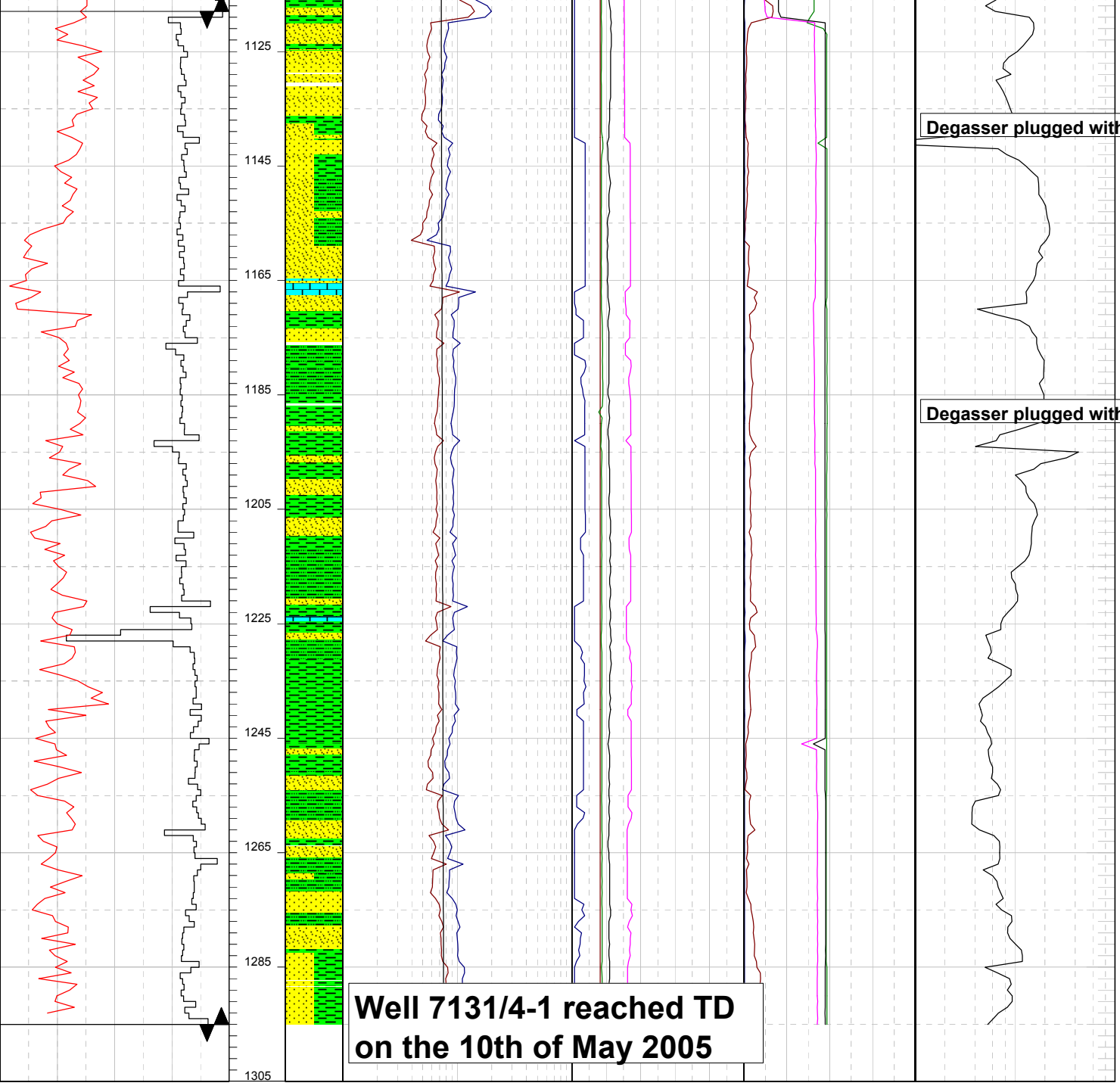
Silstone | Fine sandstone | Medium sandstone | Coarse sandstone | Core

Limestone | Argillaceous limestone | Microcrystallized dolomite | Dolomite | Casing shoe




525
545
565
585
605
625
645
665
685
705
725
745
765
785
805
13 3/8" casing
set@799.5mMD
FIT: 1.69EMW @815mMD


Mud system at 1.33sg WBM
825
845
865
885
905
925
945
965
985
1005
1025
1045
1065
1085
1105
Core #1
Core #2
Degasser plugged with cuttings
Degasser plugged with cuttings


1125
1145
1165
1185
1205
1225
1245
1265
1285
1305
Degasser plugged with cuttings
Degasser plugged with cuttings
Well 7131/4-1 reached TD
on the 10th of May 2005