

**Final Well Report
PL 072B
Well 16/7-8S, Beta West**

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Title: Final Well Report PL 072B Well 16/7-8S, Beta West		
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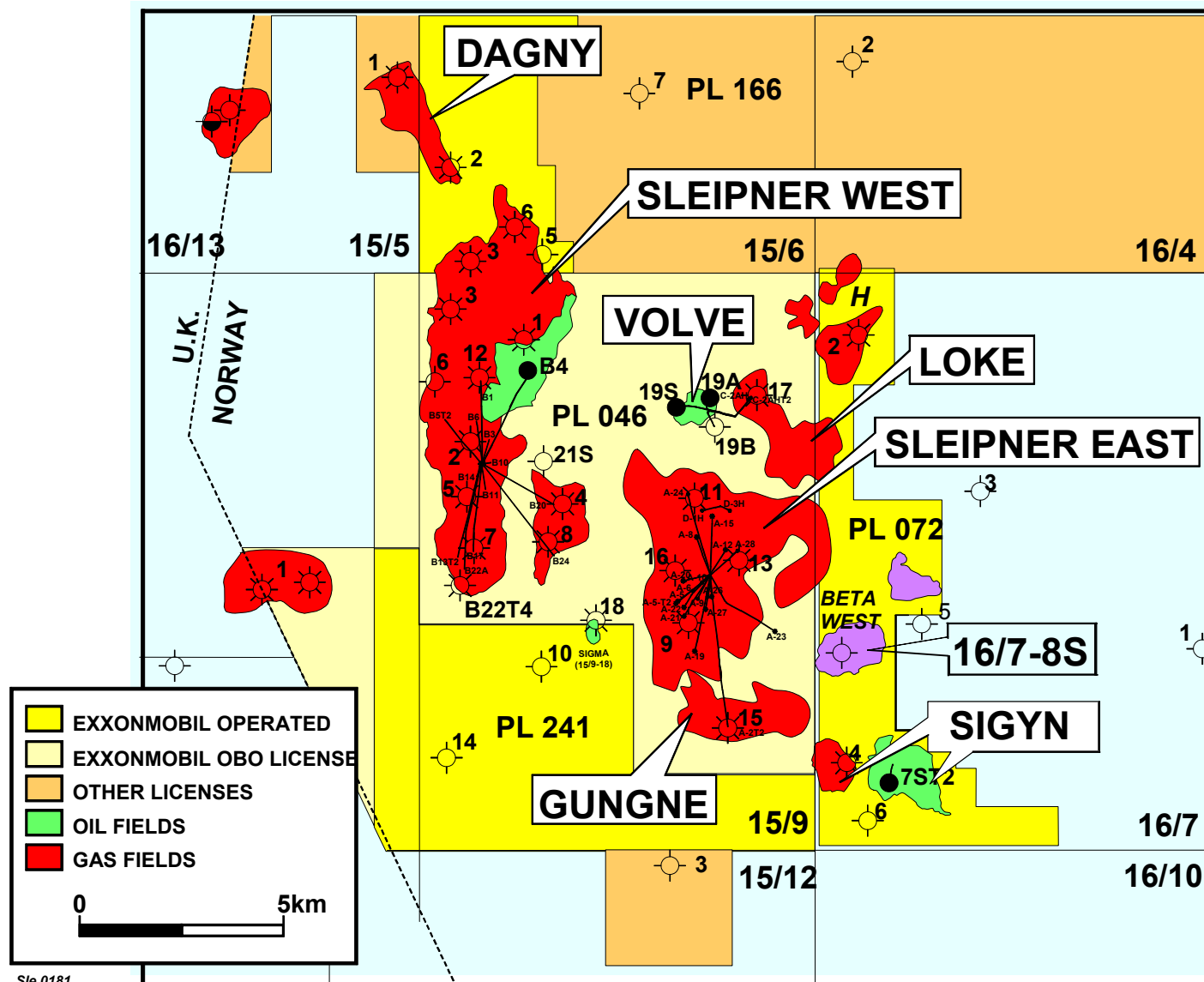
1 Introduction

1.1 Well data record

Well name	:	16/7-8S
Type of well	:	Exploration
Prospect	:	Beta West
Country	:	Norway
Area	:	North Sea
License	:	PL 072B
Licencees	:	Esso Norge AS 50 % (Operator) Statoil 50 %
Drilling unit	:	Deepsea Bergen
Type	:	Semi submersible drilling rig
Water depth	:	79.5 m
Air gap	:	23 m
On license	:	17.12.2002 at 00:00 hrs
Rig release	:	19.01.2003 at 19:00 hrs
Formation at TD	:	Skagerrak Formation
Geographic co-ordinates (surface)	:	58° 20' 22.06" N 02° 00' 35.15" E
Datum/Spheroid	:	ED-1950 / Int. 1924
UTM	:	UTM Zone 31, CM 03° E 6 467 079N 442 021E
Seismic location (surface)	:	Seismic survey, es9401RR99, Inline 1039, Cross-line 6364
Seismic location (target)	:	Seismic survey es9401RR99, Inline 1039, Cross-line 6300

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

Prospect Map



Sle 0181

Fig. 1.1

1.2 Well objectives

The primary objective of well 16/7-8S was to test the hydrocarbon potential in the Triassic Skagerrak Formation.

1.3 Result of the well

Well 16/7-8S was spudded in a water depth of 79.5 m and drilled to a total depth of 2900 mMD/ 2645.5 mTVD.

No shallow gas was observed by the ROV at the wellhead, although the well had received two shallow gas warnings.

The top of the reservoir was penetrated at 2585 m TVD, 25 mTVD deeper than prognosed. The reservoir consists of approx. 21 m TVD with Jurassic sandstone above the Skagerrak Formation. The base of the Skagerrak Formation was not penetrated in this well.

The reservoirs proved to be water bearing.

1.4 Drilling summary

1.4.1 Casing

A 30" conductor was run with the shoe at 148 mTVD. Thereafter the 18 3/4" Wellhead was run on a 13 3/8" casing, with the shoe set at 442 mTVD. A 9 5/8" liner set from 392 mTVD to 1315 mTVD completed the casing programme.

Casing	Shoe depth (mMD)	FIT / Leak off tests
30"	148 m	N/A
13 3/8"	442 m	1.51 g/cm ³ (LOT)
9 5/8"	1317 m (1315 mTVD RKB)	1.58 g/cm ³ (LOT)

1.4.2 *Drilling fluids*

Section	Section TD (mMD)	Maximum mud weight [g/cm ³]	Mud type
36"	148	1.03	Sea water / high visc. sweeps
9 7/8"	445	1.03	Sea water / high visc. Sweeps
17 1/2"	445	1,20	Sea water / high visc. Sweeps/NaCL brine
12 1/4"	1319	1.20	Glydril (KCl/Glycol WBM)
8 1/2"	2900	1.45	Versavert OBM

1.5 **Data acquisition summary**

Figure 1.2 summarized the data acquisitions conducted in this well.

Well 16/7-8S
Formation evaluation



Made by: OH

Date: 13.01.03

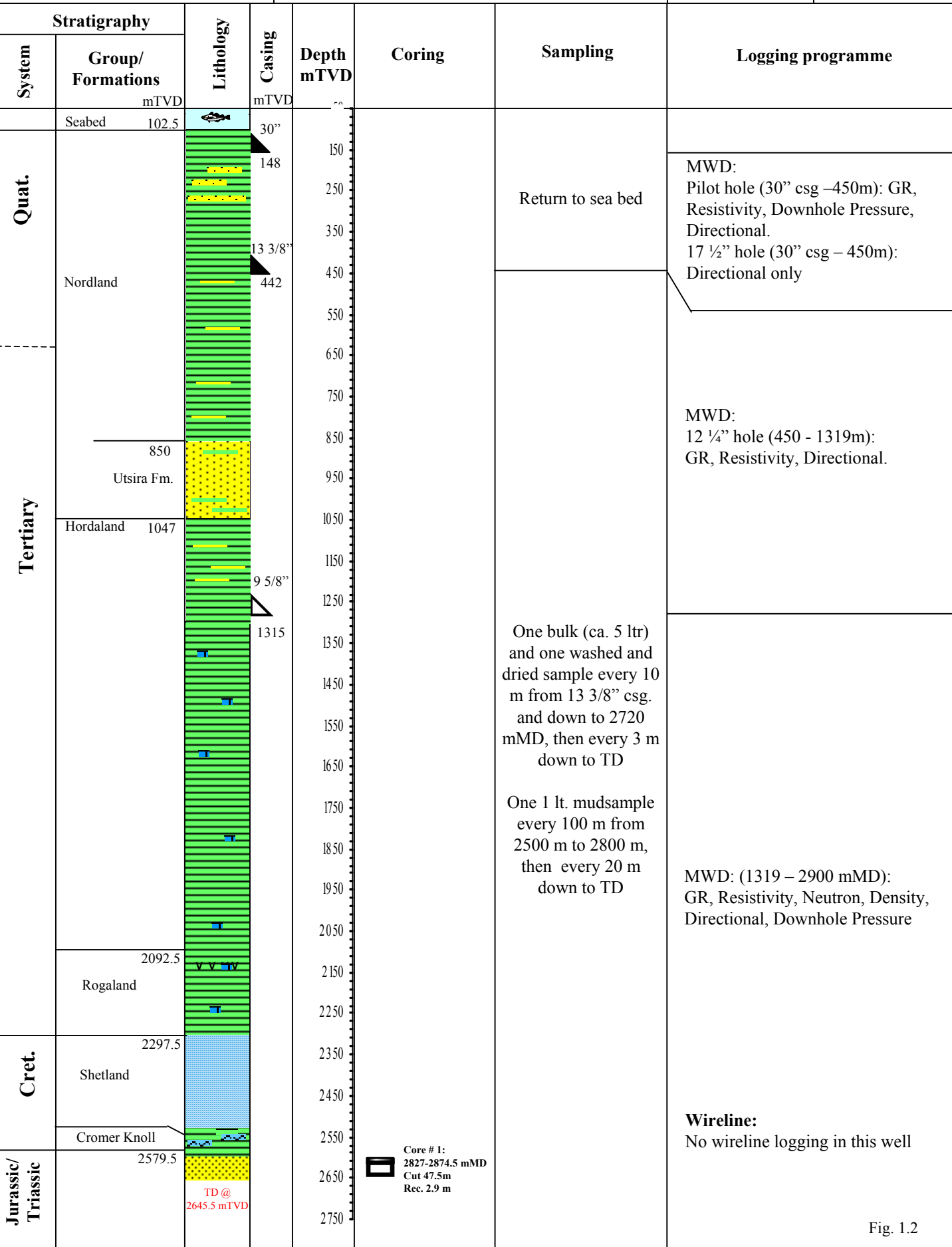


Fig. 1.2

2 Exemptions and non-conformances

The following exemptions have been identified and approved during the operation phase:

Dispensation from	Synergi no.	Date	Title
WR0436 Drilling & Completion Operations	N/A	07.05.02	Circulation Sub is left out of 9 7/8" Pilot BHA.
WR0436 Drilling & Completion Operations NPD Regulations	N/A	07.05.02	Class I Shallow Gas warning is drilled into with seawater. <i>Exemption towards KP-10. Not an exemption with regards to WR0436.</i>
WR0436 Drilling & Completion Operations NPD Regulations	N/A	07.05.02	The 9 7/8" Pilot hole is drilled out of 30" Conductor with first shallow gas warning closer than 150 m from the shoe.
WR0436 Drilling & Completion Operations NPD Regulations	N/A	07.05.02	Opening up 9 7/8" Pilot hole to 17 1/2" hole with WBM and returns to seabed, if shallow gas is hit.
WR0436 Drilling & Completion Operations	N/A	15.11.02	No dressing performed of 9 5/8" Liner lap prior to wireline logging operations.
WR0436 Drilling & Completion Operations NPD Regulations	N/A	06.01.03	Exemptions described in the "standard" slimhole P&A Programme: <ol style="list-style-type: none"> 1) The OH cement plug is set from TD and up to 100m above top of the reservoir. 2) The 9 5/8" Liner Hanger is set with an integrated Liner Packer and pressure tested to 345 Bar. The TOL is set 50m into the 13 3/8" Casing. The Liner is cemented all the way. 3) The Transition zone Cement plug is set on a Perigon CST utilized as base, and this CST will prevent the cement from falling through the 1.45 sg OBM in hole. <p>Based on the above – the transition zone cement plug is not load tested according to NPD requirements.</p>

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

3.1 RUH's on well

The number of RUHs reported is very high, demonstrating a high motivation for the HSE work on board, among both Odfjell's personnel and in the service companies. Following RUH-reports have been received from the various companies involved during the Beta West operations:

COMPANIES	NO. OF RUH-REPORTS
Baker Hughes Inteq	1
Halliburton	1
Halliburton Sperry Sun	5
Hydralift	1
Norsk Offshore Catering	5
Oceaneering	1
Odfjell Drilling	114
Odfjell Services	2
Statoil	1
Weatherford Norge	2
Other/not known	8
TOTAL	141

All of the RUH reports are now closed.

3.2 Comments to the RUH reports

No lost time accidents, medical treatment or red incidents were recorded during the operation on Beta West. There were recorded 2 first aid incidents, 1 minor environmental discharge, 3 falling objects and 9 potential falling objects.

1 incident was classified as "yellow" due to the potential for personal injuries. A sheave suspended in an A-frame above the ROV moon pool, came loose and fell into the water causing damage on the railing around the moon pool. One person was in the area.

When the rig went off contract, 527 days had passed since last lost time accident

3.3 Comments to HSE

HSE Experience Transfer: The transfer from the Sigyn project to Beta West went very well. The operation management and key personnel were the same, the same procedures and programmes were used, and the transfer of HSE experience was well taken care of.

Weekly HSE meetings: The project has very good experience from the weekly HSE meetings. Both Statoil, the rig owner and service companies participated. These meetings with a duration of 1 hour, helped the involved companies and personnel to maintain a strong focus on HSE matters. However, it is recommended that such HSE meetings to a larger degree should have a role as a pro-active forum for the HSE work on board. The crew should also be represented by a safety delegate in these meetings.

Weekly operation meetings were also arranged together with Odfjell. The meetings contributed to an optimal communication between the two main parties, an effective implementation of corrective actions and improvements in general.

Pre-departure meetings were arranged at Sola Airport before each helicopter departure to the rig. In these meetings Odfjell and Statoil informed the ongoing crew about the actual situation on the rig, the planned operations and all relevant HSE-matters. These meetings were well received by the crew and it is strongly recommended for other projects.

HSE Focus Areas: Various focus areas were addressed during the operation, like good house keeping, good work planning, prevention of dropping objects and safe lifting operations. Good house keeping was emphasized during the entire operation, with very good effect on the general HSE work and the HSE attitude on board.

Open Safety Dialog (ÅSS): Before the operation on West Alpha, Statoil had recently introduced a program called Open Safety Dialog (Åpen Sikkerhetssamtale - ÅSS). Supervisors are to visit their employees on their work places while they are performing their work. The purpose is to discuss the employee's own safety in connection with the ongoing work. The experience on Deepsea Bergen was good.

3.4 Experience summary

Fig. 3. 1 summarize the experience for well 16/7-8S

EXPERIENCE SUMMARY		WELL 16/7-8S BETA WEST (DEEPSEA BERGEN)	EXPLORATION
NO	SECTION	DESCRIPTION	DATE & TIME
36"	ANCHOR HANDLING	Anchor Pull-Off test: Fullscale test was done successfully - 50 m off in 2 min 40 sec	20.12.2002 05:00
36"	DIRECTIONAL	Tophole Inclination: Reamed to reduce tophole inclination	19.12.2002 00:00
36"	ROV	Tophole Cementing: Limited value of Cement Returns Detector Tool (CRD)	19.12.2002 20:00
36"	WELLHEAD/ASA	WOC: CART Released without WOC - with 30" Conductor on bottom.	19.12.2002 20:30
9 7/8"	BHA	Painting: Should be YELLLOW as opposed to WHITE	22.01.2003 00:00
9 7/8"	DRI LLING	Boulders: Hit boulders in 9 7/8" pilot hole	27.12.2002 00:00
9 7/8"	ROV	Downhole Camera: Too little light available for downhole Oceaneering camera	20.12.2002 00:00
17 1/2"	DIRECTIONAL	Hole Opening: Opening 9 7/8" Pilothele with 17 1/2" Bit	27.12.2002 00:00
17 1/2"	MWD/LWD	MWD: 9 1/2" MWD survey tool failed to pulse. POOH and replaced tool.	27.12.2002 00:00
17 1/2"	ROV	ROV: Loss of ROV sheave to sea, from A-frame.	27.12.2002 00:00
12 1/4"	BHA	3D RSS Software: AutoTrak G3.0 (OnTrak) needed re-programming. POOH - Re-program - RI H.	31.12.2002 00:00
12 1/4"	CASING/LINER	Casing Point: Loss zone in bottom of 12 1/4" Hole - experiences and recommendations.	30.10.2002 00:00
12 1/4"	CEMENTING	Cement Head: Twisted off control lines for RCTDCH on 9 5/8" Liner job	30.12.2002 08:30
12 1/4"	CEMENTING	Weatherford Liner Hanger: Ball for 9 5/8" Liner Hanger did not land in seat	30.12.2002 07:00
12 1/4"	DRI LLING	Losses at TD prior to running Casing: Experienced losses when drilling at 1319 m.	01.01.2003 00:00
12 1/4"	DRI LLING	Geology & Seismic interpretation: No shallow Gas encountered at 632 m (Class II Warning given)	28.12.2002 00:00
12 1/4"	LOT/FIT	FIT: Planned FIT on well ended up as LOT / No verification from MWD PWD Sub	01.01.2003 00:00
12 1/4"	MUDLOGGING	Mudlogging: Sperry Sun system problems	30.12.2002 00:00
8 1/2"	BIT	Hughes Christensen: 8 1/2" HCR TX607 Bit run w/Roller Reamer drilled well	02.01.2003 16:00
8 1/2"	CORING	Core Jammed Off: Poor coring practice in 8 1/2" section led to the core jamming off pre-maturely.	07.01.2003 01:00
8 1/2"	DRI LLING	Stick Slip: AutoTrak G3.0 & HCR TTX607 PDC Bit boring i Kalk	09.01.2003 00:00
8 1/2"	DRI LLING	Mud Bucket: Newly installed Mud Bucket fully functional.	08.01.2003 18:00
8 1/2"	DRI LLING	Seepage Loss: Drilling 8 1/2" Section with Loss zone above	02.01.2003 07:30
8 1/2"	DRI LLING FLUID	OBM out of spec: 1.45 sg VersaVert out of Spec - causing excessive ECD readings	02.01.2003 00:00
8 1/2"	RIG EQUIPMENT	Pipe Doper: Newly installed pipe doper needs modification	01.01.2003 11:30
PA	CEMENTING	13 3/8" Cement Job: No Cement observed between 30" WHH and 20" WHH during P&A	22.01.2003 00:00
PA	CEMENTING	NEG Pressure test of P&A Plug: Transition Zone Plug not holding 100 Bar PT	10.01.2003 00:00
PA	CEMENTING	Perigon & 3 1/2" DP Drifting: CST with 2 3/8" (61 mm) did not pass 3 1/2" XO with 58 mm ID	09.01.2003 01:00
PA	CUTTING/PATCHING	Cutting 20"/30": Use of motor proved very efficient	22.01.2003 00:00
PA	T/A PLUGS & MECH. PLUGS	Equipment: Hydraulic R/T and Casing scrapers should be onboard during P&A	10.01.2003 00:00
PA	WELLHEAD/ASA	ABB WHH Rubber Sleeve: Functioned successfully - only 25 MT OP when retrieving wellhead	11.01.2003 16:00
MOVE	ANCHOR HANDLING	Fluke Angle: Adjustment from 30 Deg to 50 Deg Fluke angle performed on AHTS	22.01.2003 00:00

A total of 26,5 hours down time was recorded originating from 17 incidents of which Statoil was responsible for 11 hours and Odfjell 7,5 hours.

Quality costs due to equipment failures resulted in 14 hours of down time, and operation failures caused 12,5 hours.

Further comments are given under the relevant chapters in the Summary Report.

3.5 Time distribution

Planned total time (including changes in scope of work)	32,0 days
Actual total time	33,8 days
Total down time (incl. 2.5 Hrs waiting on mud)	29,0 hrs
Waiting on weather (WOW)	193,5 hrs

Ops. Factor: $= \frac{Total_time - Down_time - WOW}{Total_time - WOW} * 100$	95,3 %
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Fig. 3.1 D-time distribution

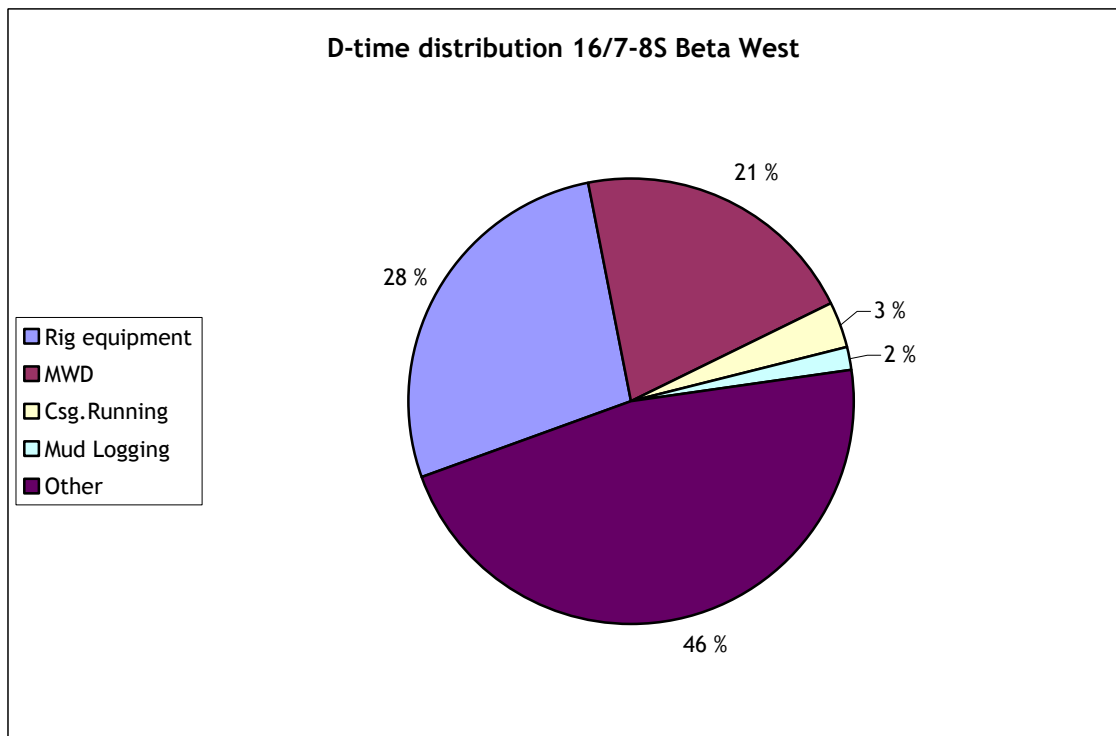
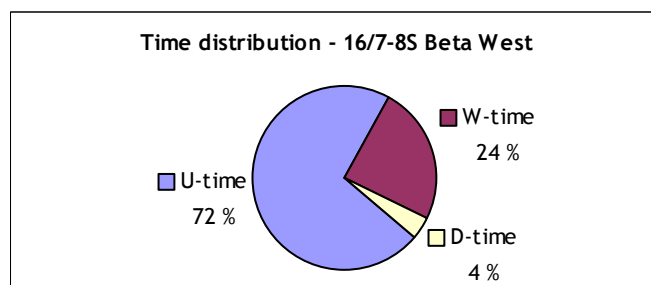


Fig. 3.2 Overall Time distribution



4 Geology and formation data report

4.1 Geological setting and results

The Beta West prospect is located in the Ling Graben, south of the Utsira - Ling High, on the eastern margin of the South Viking Graben.

The primary reservoir is continental, fluvial sandstones (red beds) of the Triassic Skagerrak Formation, with approx. 20 m TVD of Upper Jurassic shallow marine sandstone, overlaying the Skagerrak Formation. The Beta West structure is defined by a 4-way dip closure.

The Well 16/7-8S penetrates rocks of Quaternary, Tertiary, Cretaceous (chalk), Jurassic and Triassic age (Fig. 4.1-4.2).

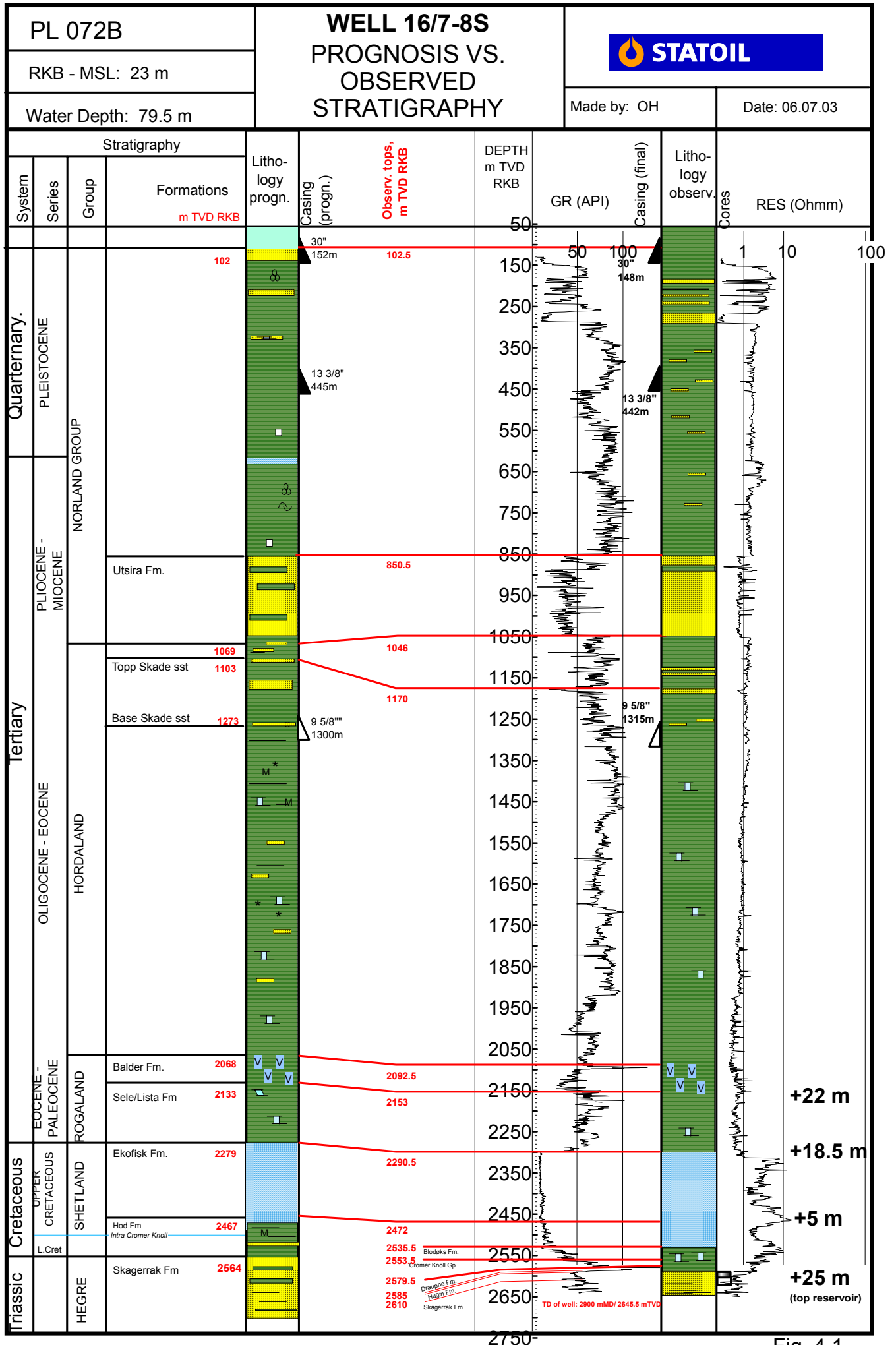


Fig. 4.1

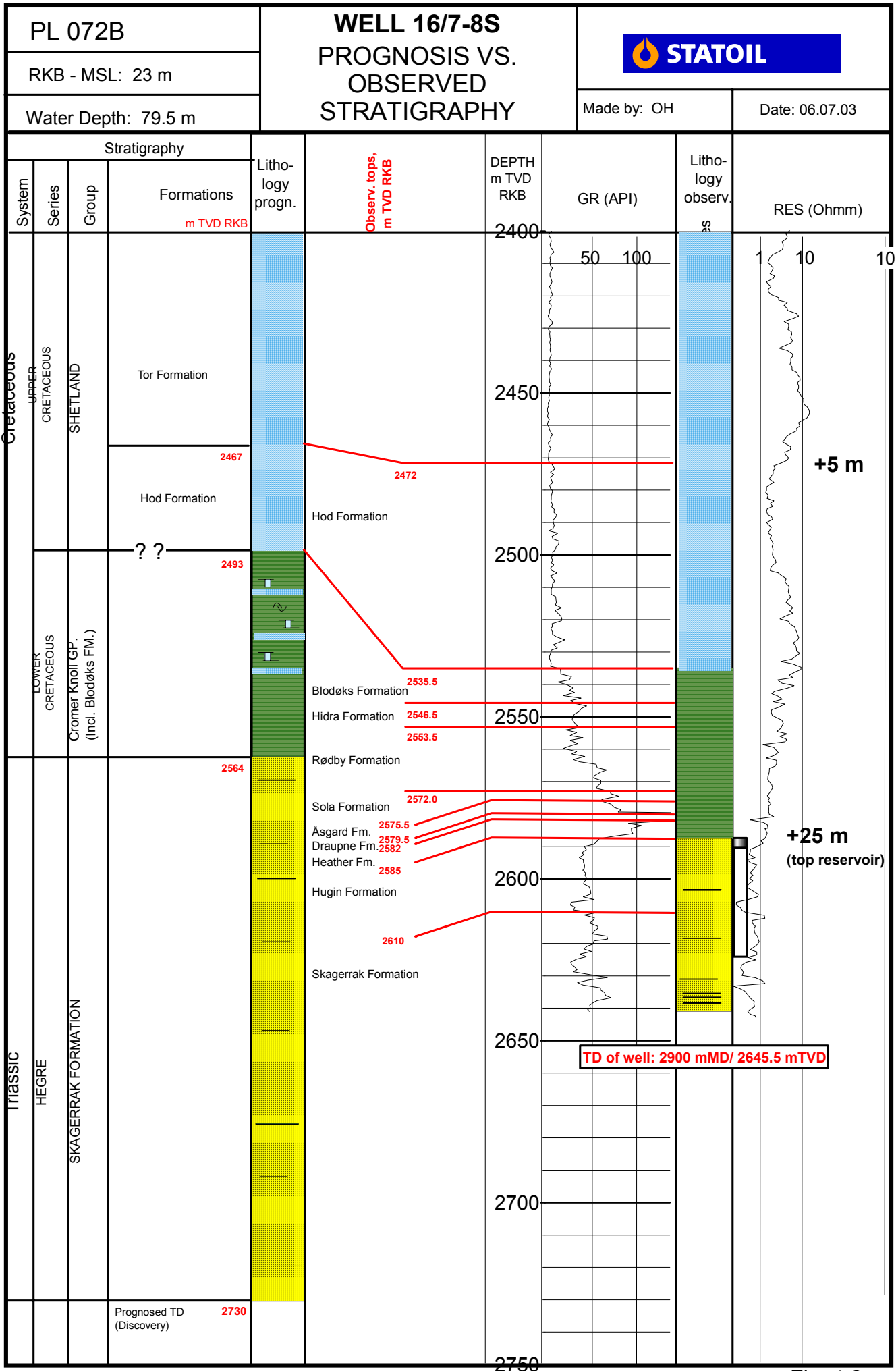


Fig. 4.2

4.2 Shallow gas results

Shallow gas was expected at 234 mTVD (Class 1) and at 634 mTVD (Class 2). Sandstones were observed at 235-240 m and at 650-655 m TVD, but proved to be water wet. Fig. 4.3 summarize the shallow geology of the well down to ca. 650 msec.

PL 072B

RKB - MSL: 23 m

Water Depth: 79.5 m

Observed lithology down to 650 msec



Made by: OH

Date: 14.01.2003

2DHR Seismic Line X01N-114 through Original and Final Surface Location for well 16/7-8S

Observed Lithology

Comments

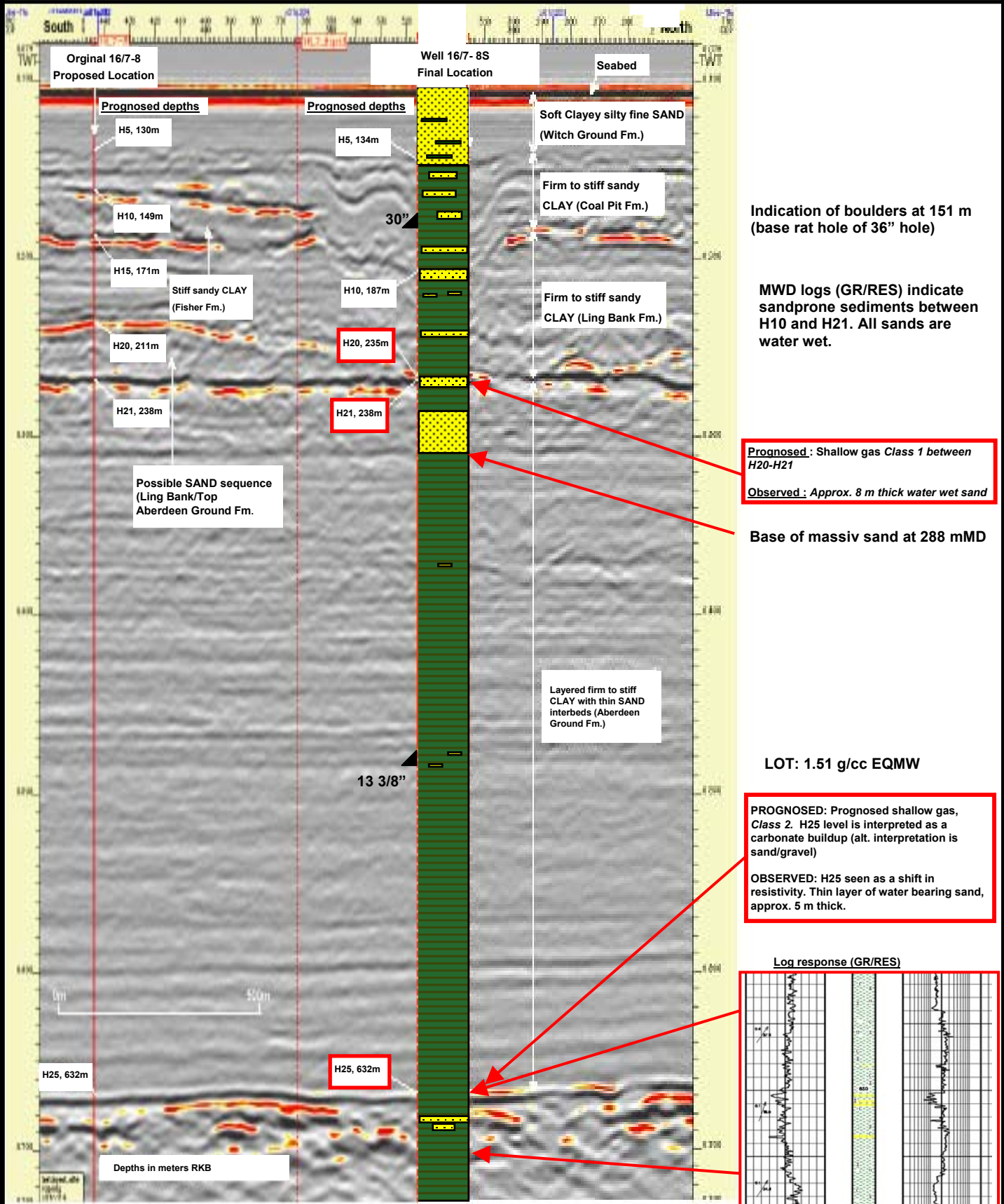


Fig. 4.3

4.3 Stratigraphy

The stratigraphical division is based on the biostratigraphic report, MWD log curves and on correlation with nearby wells. The stratigraphy of the entire well and the reservoir sections is shown in Figures 4.1 and 4.2.

4.3.1 Table of chronostratigraphy

Table 4.1

Stratigraphic succession		Sample Depths (m)
	Studied interval 820-2889 mMD (spot samples only)	
Tertiary	Lower Pliocene	820
	Lower Miocene	1420
	Basal Middle Eocene	2160
	Upper Paleocene	2430
Cretaceous	Uppermost Hauterivian	2795
	Lower Hauterivian	2813
	Lower Ryazanian	2819
Jurassic	Middle Volgian	2822
	Middle Kimmeridgian	2825
	Middle Kimmeridgian (core)	2827
	Middle Kimmeridgian (core)	2828.05
	Middle Kimmeridgian (core)	2829.85
Triassic	Intermediate	2880
	Intermediate	2886
	Intermediate	2889

4.3.2 Table of lithostratigraphy

Table 4.2

Table of lithostratigraphy					
Period	Group / Formation	Observed depth			TWT sec.
		mMD	m TVD RKB	m MSL	
QUATERNARY	NORDLAND GROUP. (Sea Floor)	102.5	102.5	- 79.5	
TERTIARY	Utsira Formation	850.5	850.5	-827.5	
	HORDALAND GROUP	1046.0	1046.0	-1023.0	
	Skade Formation	1170.0	1170.0	-1147.0	
	ROGALAND GROUP	2224.0	2092.5	-2069.5	
	Balder Formation	2224.0	2092.5	-2069.5	
	Sele Formation	2298.0	2153.0	-2130.0	
	Lista Formation	2389.0	2228.5	-2205.5	
CRETACEOUS	SHETLAND GROUP	2473.5	2290.5	-2267.5	
	Ekofisk Formation	2473.5	2290.5	-2267.5	
	Tor Formation	2484.0	2306.0	-2283.0	
	Hod Formation	2687.0	2472.0	-2449.0	
	Blodøks Formation	2765.0	2535.5	-2512.5	
	Hidra Formation	2778.0	2546.5	-2523.5	
	CR. KNOLL GROUP	2786.5	2553.5	-2530.5	
	Rødby Formation	2786.5	2553.5	-2530.5	
	Sola Formation	2809.0	2572.0	- 2549.0	
Åsgard Formation	2813.0	2575.5	-2552.5		
JURASSIC	VIKING GROUP	2818.0	2579.5	-2556.5	
	Draupne Formation	2818.0	2579.5	-2556.5	
	Heather Formation	2821.0	2582.0	- 2559.0	
	VESTLAND GROUP	2825.0	2585.0	-2562.0	
	Hugin Formation	2825.0	2585.0	-2562.0	
TRIASSIC	HEGRE GROUP	2855.5	2610.0	-2587.0	
	Skagerrak Formation	2855.5	2610.0	-2587.0	
	TD	2900.0	2645.5	-2622.5	-

4.4 Lithostratigraphic description

NORDLAND GROUP 102.5 – 1046.0 m MD, (102.5 – 1046.0 m TVD)

The well was drilled with returns to seabed down to 450 m. From 150 m the MWD (gamma ray and resistivity) was run. Interpretation of the lithology down to 450 m is mainly based on interpretation on the MWD logs.

The Nordland Group consist predominantly of claystone with some sand stringers and a sand rich lower part, the Utsira Formation. The Utsira Formation is described separately below.

The very upper part of the Nordland Group is quite sandprone down to approximately 285 mTVD with 2-20 m thick sand beds. Indications of boulders or coarse gravel, based on drilling parameters, were observed in the uppermost few meters below seabed and at approximately 150 m

From approx. 285 m and down to the top Utsira Formation the sediments consist of fairly uniform claystone with occasional thin silt or sand layers.

The clay is described as greenish grey to dark greenish grey, subblocky to amorphous, very sticky, soft to firm, soluble and silty. Fine to medium grained quartz grains were observed floating in the clay. The grains are subrounded to rounded. Occasionally also medium to very coarse quartz grains with trace amount of disseminated carbonaceous matter are observed.

Utsira Formation 850.5 - 1046.0 m MD, (850.5 - 1046.0 m TVD)

The top of the Utsira Formation is seen as a clear shift in the lithology, changing from a clay dominant lithology to massive sands. Both the gamma-ray readings and the resistivity readings shows a clear drop when entering the Utsira Formation.

The formation comprises mainly sand, with some interbeds of silt and clay.

The sand is described as clear to translucent quartz grains, dominantly medium but also fine and occasionally coarse, subrounded to rounded, occasionally subangular, loose and moderate to well sorted.

The claystone is described as greenish grey to dark greenish grey, amorphous to subblocky, sticky, soft to firm, silty, slightly calcareous occasionally glauconitic and with disseminated carbonaceous fragments.

Thin stringers of limestone are also observed. These are described as yellowish white, dark yellowish orange and greyish orange. The limestone is microcrystalline, soft to firm and occasionally argillaceous.

HORDALAND GROUP 1046.0 – 2224.0 m MD, (1046.0 – 2092.5m TVD)

System: Tertiary

The boundary to the overlying Utsira Formation is on the MWD logs seen as a shift in the resistivity and the gamma ray readings to a higher and even level.

Only one formation, the Skade Formation, is recognized within the Hordaland Group in this well.

Apart from the Skade Formation the Hordaland Group is dominated by claystones. Stringers of carbonates are common throughout, mainly limestones but also dolomite is observed. Minor sandstones are logged throughout.

The colours of the claystones vary from dark greenish grey to olive grey and brownish grey. Also medium bluish grey colours appear in the lower part of the Hordaland Group. The claystones are silty to very silty and often grading into siltstones, particularly in the upper part of the Hordaland Group. The claystones are soft to firm, slightly calcareous to occasionally very calcareous, occasionally very silty to sandy and with traces of glauconite.

The limestone is off white, microcrystalline to cryptocrystalline, subblocky, soft to firm and occasionally argillaceous. Downwards the limestone becomes greyish orange to pale yellowish brown, firm to moderately hard, crystalline to microcrystalline, slightly argillaceous to occasionally very argillaceous grading to calcareous claystone and occasionally pyritic.

The dolomites are light olive grey, blocky, microcrystalline and firm to occasionally moderate hard.

The sandstone appears as loose quartz grains, which vary from fine to medium in grain size. They are moderately sorted and have subrounded to rounded shape. Occasionally the sand grains are seen floating in the claystone.

Skade Formation 1170.0 - 1263.0 m MD, (1170.0 – 1262.5 m TVD)

System: Tertiary

The upper boundary is defined by a drop in the gamma ray and resistivity and the lower boundary with an increase in gamma ray and resistivity compared to that in the claystones of the Hordaland Group.

The Skade Formation consist of sandstone, with thin interbeds of claystone/siltstone, with very much the same lithology as for the surrounding upper part of the Hordaland Group. The sandstones appear as clear to translucent quartz, fine to medium grained, subrounded to rounded, occasionally subangular, loose and moderate to well sorted.

The claystone is dark greenish grey to olive grey, slightly calcareous, occasionally very silty to sandy and with traces of glauconite.

ROGALAND GROUP **2224.0 – 2473.5 m MD, (2092.5 – 2290.5 m TVD)**

System: Tertiary

The boundary to the overlying Hordaland Group is picked on the logs. The GR log shows a steep increase and a distinct peak when entering the Balder Formation, before going back to lower levels and a slightly decreasing trend downwards. The resistivity shifts from a decreasing compaction trend above to a slightly increasing trend downwards into the Rogaland Group. The Rogaland Group comprises three lithostratigraphical units: The Balder-, Sele- and Lista Formations.

Balder Formation **2224.0 – 2298.0 m MD, (2092.5 – 2153.0m TVD)**

System: Tertiary

This formation consists of claystone and tuffaceous claystones with stringers of limestone.

The claystone is greenish grey to medium bluish grey, olive grey, brownish grey, platy to blocky, firm to moderately hard, slightly silty to silty, micropyrritic, non calcareous and with rare traces of disseminated carbonaceous material.

The tuffaceous claystone is white, greyish to bluish green, blocky, firm to moderately hard, non calcareous, micropyrritic and speckled with black and green silica.

The limestone is greyish orange to pale yellowish brown, blocky to subplaty, firm to moderately hard, microcrystalline to crystalline, slightly argillaceous to occasionally very argillaceous grading calcareous claystone. Traces of pyrite occur.

Sele Formation **2298.0 – 2389.0 m MD, (2153.0 – 2228.5m TVD)**

System: Tertiary

This formation is separated from the overlying Balder Formation by a change in the GR levels to a higher and smoother, less erratic response, whilst the resistivity shifts down and also shows a less spiky curve than above.

The Sele Formation comprises mainly claystones with rare and thin limestone stringers as well as trace amounts of tuffaceous claystone.

The claystones are dark brown grey to dark green grey, brownish grey to brownish black, blocky to subblocky to platy, firm to moderately hard, non calcareous, occasionally micropyrritic and with occasional traces of disseminated carbonaceous material.

The limestone is pale yellowish brown to dark greyish orange to very pale orange, blocky to subblocky, firm to moderately hard, microcrystalline to crystalline, slightly argillaceous to very argillaceous and grading to calcareous claystone and occasionally slightly pyretic.

The tuffaceous claystone is white, grey blackish green, non calcareous, micropyrritic and speckled with black and green silica.

Lista Formation 2389.0 – 2473.5 m MD, (2228.5 – 2290.5m TVD)

System: Tertiary

The top of the Lista Formation is defined by a subtle change in the gamma ray and resistivity readings.

The formation comprises claystones with a few thin stringers of limestone. The descriptions of the claystone and the limestone are similar to the description of the Sele Formation.

SHETLAND GROUP 2473.5 – 2786.5 m MD, (2290.5 – 2553.5 m TVD)

System: Cretaceous

Series: Upper cretaceous

The upper boundary is recognized by the characteristic drop in GR readings when entering the limestones from the overlying claystones. The resistivity level remains on a similar level with the Sele Formation claystones for some meters before showing a significant and rapid increase. The Shetland Group comprises the Ekofisk-, Tor-. Hod-. Blodøks- and Hidra Formations.

Ekofisk Formation 2473.5 – 2484.0 m MD, (2290.5 – 2306.0 m TVD)

System: Cretaceous

Series: Upper Cretaceous

This formation consists of limestone / chalk which is white to very pale orange, subblocky to blocky, firm to moderately hard, microcrystalline and occasionally slightly argillaceous.

Trace amounts of claystone occur, which is brownish grey to brownish black, greenish grey to dark green grey, blocky to subblocky, moderately hard, non calcareous, occasionally micropyrritic and with occasional traces of disseminated carbonaceous material.

Tor Formation 2484.0 – 2687.0 m MD, (2306.0 – 2472.0 m TVD)

System: Cretaceous
Series: Upper Cretaceous

The top of the Tor Formation is defined by a change in the resistivity readings. The resistivity increases to a more uniform level in the uppermost parts of the formation compared to the Ekofisk Formation.

The Tor Formation consists of a chalky limestone, which is white to very pale orange, yellowish grey, and light brown to pale brown. It is firm to moderately hard, microcrystalline to crystalline and occasionally sucrosic. Occasionally the limestone becomes slightly argillaceous and rarely very argillaceous grading into calcareous claystone.

The formation also holds small amounts of claystone characterized by a brownish grey to brownish black and greenish grey to dark greenish grey colour. It is also firm to moderate hard, none calcareous and occasionally micropyrritic.

Hod Formation 2687.0 – 2765.0 m MD, (2472.0 – 2535.5 m TVD)

System: Cretaceous
Series: Upper Cretaceous

The top of the Hod Formation is picked at a slight increase in the gamma-ray readings and a decrease in the resistivity and density readings.

The lithology in the Hod Formation consists of a limestone which is white to yellowish grey, occasional greenish grey, interbedded in the upper part with a marly limestone which is medium light grey to pale yellowish brown or pale brown and also greyish orange.

The limestone is microcrystalline to occasionally sucrosic and argillaceous sometimes grading to claystone.

The marly limestone is glauconitic in varying amounts from almost nothing to very glauconitic. Both lithologies are firm to moderately hard.

Claystone in trace amounts is seen throughout the formation and is characterized by brownish grey to brownish black and greenish grey to dark greenish grey colours, moderately hard, slightly silty to silty, occasionally sandy, non calcareous and occasionally micropyrritic.

Blodøks Formation 2765.0 – 2778.0 m MD, (2535.5 – 2546.5 m TVD)

System: Cretaceous
Series: Upper Cretaceous

The top of the Blodøks Formation is defined by an increase in the gamma-ray readings combined with a slightly decreasing trend in the resistivity readings which vary with a rather rough pattern down through the formation.

The Blodøks Formation consists of a marly limestone interbedded with stringers of limestone.

The marly limestone is described as a greyish orange and pale yellowish brown carbonate which is firm to occasionally moderate hard, microcrystalline to crystalline and occasionally glauconitic.

The limestone is predominantly white to yellowish grey and greenish grey with a trace of light brown to pale brown. It is firm to moderately hard, microcrystalline and occasionally sucrosic. Occasionally it is argillaceous and grades into claystones.

Traces of brownish grey to brownish black and greenish grey to dark greenish grey claystone are seen throughout the formation. This claystone is moderately hard, slightly silty to silty, occasionally sandy, and micropyrritic.

Hidra Formation 2778.0 – 2786.5 m MD, (2546.5 – 2553.5 m TVD)

System: Cretaceous
Series: Upper Cretaceous
Stage: Turonian
Depositional environment: Marine, inner - outer Shelf

The top of the Hidra Formation is defined by a decreasing trend in the gamma-ray values and an increasing trend in resistivity.

The lithology consists of interbedded marly limestone as described for the Blodøks Formation and a limestone which is yellowish grey to greenish grey, firm to moderately hard microcrystalline to crystalline and glauconitic to very glauconitic.

CROMER KNOLL GROUP **2786.5 – 2818.0 m MD, (2553.5 – 2579.5 m TVD)**

System: Cretaceous
Series: Lower Cretaceous

|
This group consists of the Rødby, Sola and Åsgard Formations

The Cromer Knoll Group is defined by an increasing gamma-ray trend that in several steps increases down through the group together with a decreasing resistivity trend.

The colour changes throughout the group, which predominantly is a mixture of thinly interbedded claystones and limestone.

Rødby Formation **2786.5 – 2809.0 m MD, (2553.5 – 2572.0 m TVD)**

System: Cretaceous
Series: Lower Cretaceous

The Rødby Formation consists mainly of a claystones with interbedded limestone.

The claystones is of two types, a moderate brown to greyish brown and greyish red to moderate reddish brown and a second less prominent type which is brownish grey to brownish black and also greenish grey.

The two types of claystones are both moderate hard, slightly silty to silty and while the reddish brown type is calcareous to very calcareous the brownish grey to brownish black type is non calcareous throughout.

The limestone is yellowish grey to greenish grey or olive grey, firm to occasionally moderate hard, microcrystalline to crystalline and glauconitic to very glauconitic.

Sola Formation **2809.0 – 2813.0 m MD, (2572.0 – 2575.5 m TVD)**

System: Cretaceous
Series: Lower Cretaceous

This formation consists mainly of the reddish brown claystone as described in the Rødby Formation above and it is defined by an almost box shaped increasing gamma-ray log and fairly steady resistivity readings.

Åsgard Formation 2813.0 – 2818.0 m MD, (2575.5 – 2579.5 m TVD)

System: Cretaceous
Series: Lower Cretaceous

The top of the Åsgard Formation is defined by a sharp decrease in the gamma ray readings followed by an increasing trend. The resistivity has more or less the same log response as in the Sola Formation.

This lowermost formation in the Cromer Knoll Group consists of all three lithologies as described under the Rødby Formation but with a slightly larger content of limestone.

VIKING GROUP 2818.0 – 2825.0 m MD, (2579.5 – 2585.0 m TVD)

System: Jurassic
Series: Upper Jurassic

The Viking Group consists in this well of two formations, the thinly developed Draupne- and Heather Formations. The upper boundary is the characteristic “hot-shale” peak when entering the Draupne Formation from the overlying Åsgard Formation.

Draupne Formation 2818.0 – 2821.0 m MD, (2579.5 – 2582.0 m TVD)

System: Jurassic
Series: Upper Jurassic

The Draupne Formation consists of claystone which is dark grey to grey black, olive black, dusky yellow brown, blocky to subblocky, moderately hard, slightly silty to silty, non calcareous to calcareous and occasionally micropyrritic. Also minor amounts of a claystone, similar to the claystone observed in the overlying Cromer Knoll Group, are recorded (cavings?).

Trace amounts of limestone, which is yellow grey to light olive grey, glauconitic and occasionally micropyrritic, are also described.

Heather Formation 2821.0 – 2825.0 m MD, (2582.0 – 2585.0 m TVD)

System: Jurassic
Series: Upper Jurassic

The Heather formation is separated from the overlying Draupne Formation by the distinct drop in the gamma ray readings.

This formation is composed of claystones visually described from cuttings to be similar to the lithologies of the overlying Draupne Formation. Trace amounts of limestone occur also seen.

VESTLAND GROUP 2825.0 – 2855.5 m MD, (2585.0 – 2610.0 m TVD)

System: Jurassic
Series: Middle Jurassic

In this well the Vestland Group is represented by the Hugin Formation. The boundary to the Viking Group above is defined by a drop in the GR readings and resistivity levels characteristic for entering a water-wet sandstone from the overlying claystone.

Hugin Formation 2825.0 – 2855.5 m MD, (2585.0 – 2610.0 m TVD)

System: Jurassic
Series: Middle Jurassic

The Hugin Formation is for the upper part down to approximately 2845 mMD a sandstone which consists of clear to translucent quartz grains, which is fine to medium grained, occasionally very fine, subrounded to rounded and loose. From this depth and downwards, the sandstone is also occasionally coarse to very coarse with an olive grey to greyish blue green argillaceous matrix (kaolin?), it is soft to loose, pyritic and with traces of disseminated carbonaceous material.

Claystone, which is seen throughout the formation, is described as olive grey to dark grey, blocky to subblocky, soft to firm, slightly silty to silty, occasionally sandy grading into argillaceous sandstone, micropyrritic to very micropyrritic, non calcareous and with occasional traces of disseminated carbonaceous material.

Traces of limestone is described as greyish orange to light brown, white, subblocky, soft to firm, microcrystalline and slightly to very argillaceous.

HEGRE GROUP (base not seen) 2855.5 – 2900.0 m MD, (2610.0 – 2645.5 m TVD)

System: Triassic
Depositional environment: Arid - savanna

The Skagerrak Formation is the only lithostratigraphical unit of the Hegre Group, which is present in the well. It is separated from the overlying Hugin Formation by a moderate increase in both the gamma ray- and the resistivity levels.

Skagerrak Formation 2855.5 – 2900.0 m MD, (2610.0 – 2645.5 m TVD)

System: Triassic

Depositional environment: Arid - savanna

The Skagerrak Formation consists of sandstone described as moderate brown to grey brown quartz, clear to translucent quartz, very fine to fine grained, argillaceous to very argillaceous matrix grading into sandy claystone, non calcareous and occasionally micropyrritic.

In the upper part, down to approximately 2860m MD RKB, a sandstone also occurs which is composed of very fine to fine quartz grains in a light olive grey to greenish grey matrix, soft to occasionally firm, subrounded and weak to moderately silica/calcite cemented. Also this sandstone is very argillaceous (matrix) and is grading into sandy claystone.

The claystone is described as dark green grey to olive black, firm to moderately hard, subblocky to blocky, occasionally subplaty, non-to slightly calcareous and slightly carbonaceous in parts.

Traces of limestone, which is yellow white to grey white, blocky, firm, argillaceous and silty is observed at the basal part of the well.

4.5 Hydrocarbon indications

No indications of HC have been observed in the well. Maximum gas readings recorded in the well is 0.1 %. The gas comprises mainly C1 with occasionally minor traces of C2.

No fluorescence or cut fluorescence was observed.

4.6 Geophysical results

The observed formation tops in the Tertiary and Cretaceous sections were in general deeper than prognosed. The reservoir was encountered 25 mTVD RKB deeper than prognosed, but within the prognosed uncertainty.

4.7 Data acquisition

4.7.1 *Cuttings and mud samples*

A standard mud logging unit was used for the wells (details in End of Well Report, Halliburton Sperry Sun). Refer to Fig. 1.2

- Cuttings were sampled every 10 m from 453 mMD to 2700 mMD, and then every 3 m down to 2900 mMD (TD of the well).

- Mud samples were sampled every 100 m from 2500 to 2800 mMD and the every 20 m down to 2900 mMD (TD of the well).

4.7.2 Coring

One oriented core was cut in this well. The coring was conducted by Security DBS (Halliburton). A total of 47.5m was cored and only 2.9 m was recovered.

Table 4.7

Core no.	Cored interval (m)	Recovered			Barrel length	Date	Comments
		interval (m)	m	%			
1	2827.0 – 2874.5	2827 – 2829.9	2.9	6.1	54 m	07.01.03	Hugin Fm./ Skagerrak Fm.

4.7.3 MWD/LWD

The MWD-logging was performed by Halliburton Sperry Sun. Gamma ray and resistivity were logged in all sections from the 30” casing shoe to TD. Pressure While Drilling was recorded in the 9 7/8” pilot hole and in the 8 1/2” section. Neutron and density were logged in the 8 1/2” hole.

Table 4.3

Run no.	Depth interval mMD	Collar diam.	Tool type	Comments
1	146 – 450	8 3/4”	MWD-MPR	9 7/8” pilot hole
2	146 – 152	9,5”	MWD- DIR only	17 1/2” hole. Tool failure.
3	152 – 450	8 3/4”	MWD-DIR only	17 1/2” hole. Rerun tool from pilot hole. DIR only
4	450 – 1319	8 1/4”	MWD-MPR	12 1/4” hole. Reboot the tool at 636m, otherwise no major problems.
5	1319 – 2827	8 1/4”	MWD- ATK/OTK/APLS	Had to reboot the tool at 1492,0m.
6	2874 – 2900	8 1/4”	MWD- ATK/OTK/APLS	Reamed cored section 2827-2874m

4.7.4 Wireline logging

No wireline logs were run in this well.

4.7.5 *Data quality*

A summary of the data quality of the coring, mudlogging and MWD data are given below:

- Coring: One oriented core was cut with 6.1 % recovery. The low core recovery proved to be, most likely, a result of deviation of the coring procedures. The core jammed when the drillstring was rotated without circulation with the bit at bottom. The acquiring of the orientation data proved to be trouble free.
- Mudlogging: Not able to acquire some of the drilling parameters in 36" hole. The gas system was not calibrated while drilling the 12 1" hole section. Calibration of the gas system after the 12 ¼" hole section was drilled verified very low gas readings (<0.1%).
- MWD: The data quality of the MWD logs (gamma ray, resistivity, neutron, density and directional) were good. Acquired all planned data except memory data from the PWD (pressure while drilling) in 8 ½" section.

4.8 **Formation pressure**

The pore pressure evaluation is based on MWD log data (resistivity) and drilling parameters (D-exponent and gas readings).

The pore pressure gradient, mud weight and overburden gradients are graphically presented in Figure 4.4.

A normal pore pressure gradient of 1.03 g/cm³ is estimated down to approximately 1400 m TVD RKB where an increase starts and continues through the Hordaland Group. The highest pore pressure is assumed at 2000 m TVD RKB, in the Balder Formation, with a gradient of 1.20 g/cm³. A decrease in the gradient is calculated through the Sele and Lista Formations. A low gradient is assumed through the Ekofisk Formation, and a slight increase is assumed in the Cromer Knoll shale sequence.

At the top of the Upper Jurassic/ Skagerrak sandstone a pore pressure gradient of 1.16 g/cm³ is estimated in the water filled reservoir. At TD a pore pressure of 1.14 g/cm³ is assumed. No pressure points were conducted so the reported pore pressure in the reservoir is based on the prognosis.

PL 072B

Well 16/7-8S Pressure Plot



RKB - MSL: 23 m

Water Depth: 79.5 m

Made by: JEH

Date: 23.05.03

Stratigraphy			
System	Formations Groups mTVD RKB	Lithology	Casing
Quaternary	Seabed		
	102.5		30" at 148 m
	Nordland		13 3/8" at 442 m
Tertiary	850.5		
	Utsira		
	1046		13 3/8" at 1315m
	Hordaland		
	Balder 2092.5		
Cretaceous	2153		
	Sele Lista		
	2290.5		
Triassic	2472		
	Hod Fm.		
	2585		
	U. Jurassic sst / Skagerrak Fm.		

TD
2645.5 m
TVD RKB

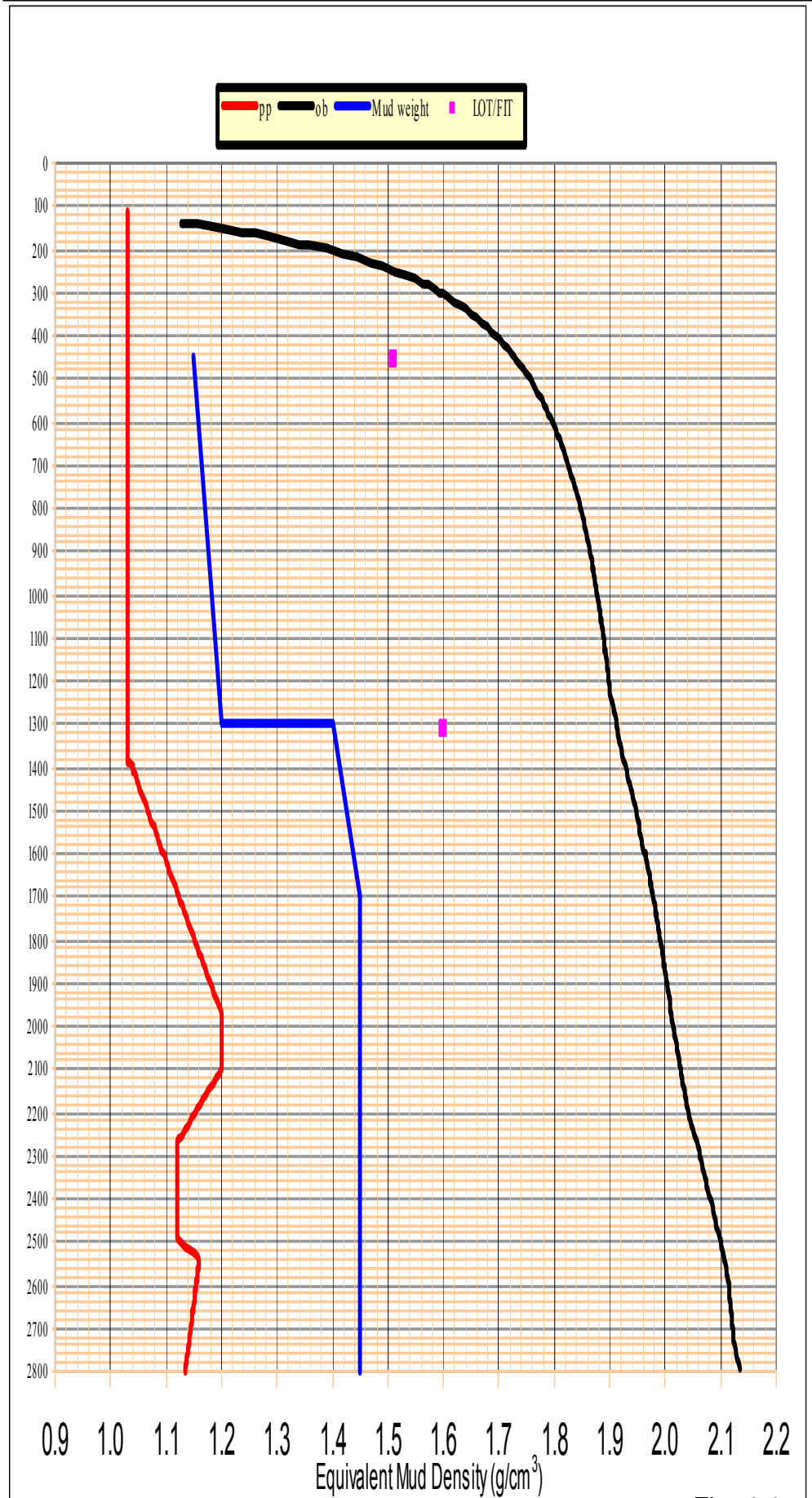


Fig. 4.4

4.8.1 *Reservoir pressure summary*

No formation pressure data was measured in this well

4.9 **Reservoir fluid sampling**

No fluid sample was collected in this well

4.10 **Formation temperature**

Since no wireline data was collected, the temperature profile is based on temperature data from reference wells. Data from logs in well 16/7-4 and the test in well 16/7-7S T2 is regarded as the most representative for this well.

The estimated formation temperature at TD is 104 °C. Figure 4.5 shows the temperature gradient.

PL 072B

Well 16/7-8S Temperature Plot



RKB - MSL: 23 m

Water Depth: 79.5 m

Made by: JEH

Date: 23.05.02

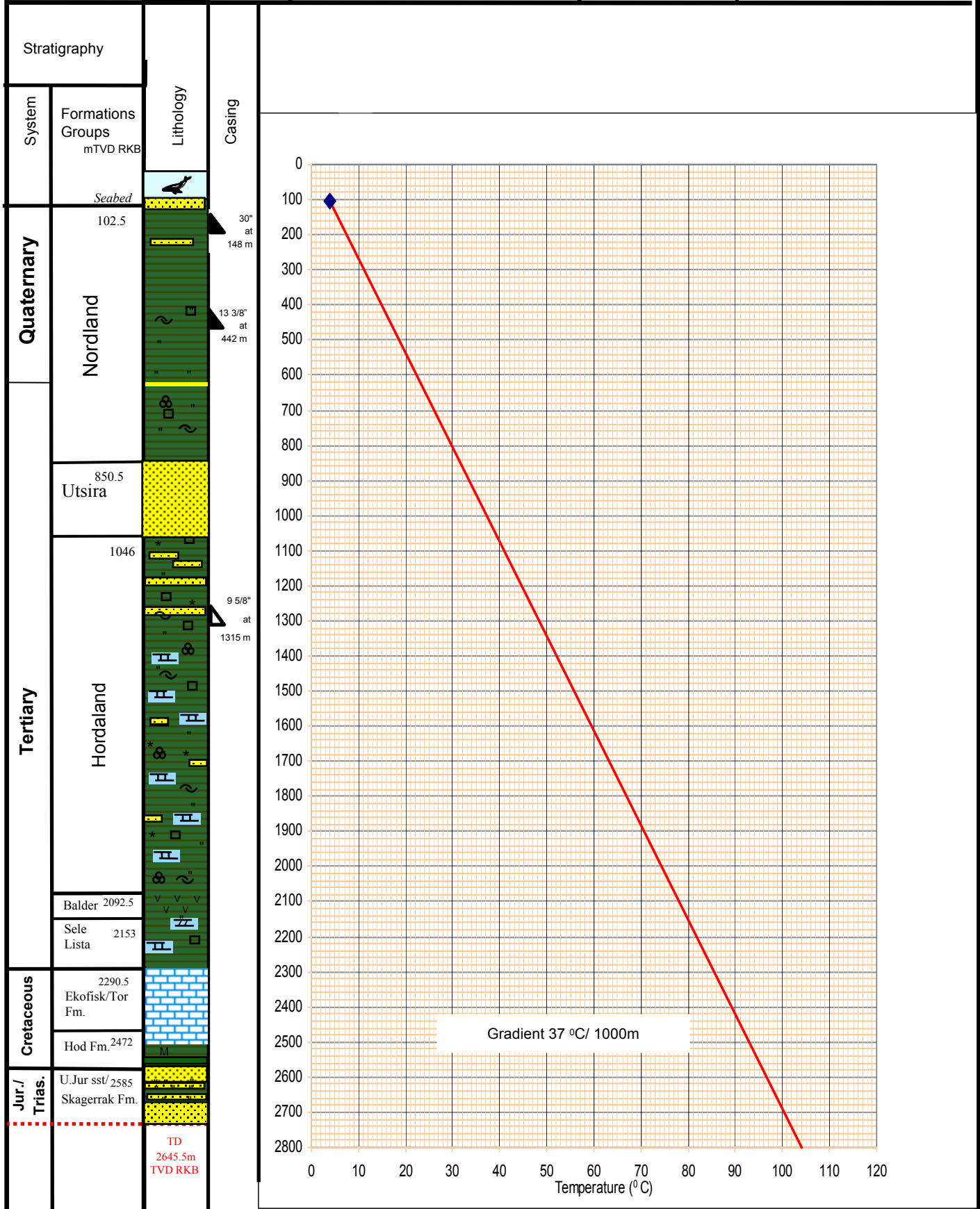


Fig. 4.5

4.11 Experiences / recommendations

4.11.1 Coring

One oriented core was cut with 6.1 % recovery. The jamming of the core was most likely a result of rotating with bit at TD without circulation during a flow-check. This is not according to procedures and should be avoided.

5 Drilling operations report

The 16/7-8S Beta West well was drilled in a total of 33,8 days, resulting in a Rushmore drilling benchmark of 133,1 m/d from spud to ready-for-P&A. The operational efficiency was **96,1%** in the Rushmore benchmark, and 95,3% on the overall well period.

The well was drilled as a deviated well due to shallow gas concerns on the vertical well location. Moving the well 800 m to the North on surface reduced the likelihood for hitting shallow gas (deviated well downdip from vertical well) as well as reduced the thickness of the potential sand layer (thinner potential sand).

5.1 Rig move and positioning

5.1.1 Summary

“Deepsea Bergen” was moved from the Sigyn field on block 16/7 to exploration well 16/7-8S Beta West. The last anchor was bolstered on well 16/7-A01H at 24:00 Hrs on the 16.12.03.

The rig was on transit/approach for 1.5 hrs, and anchor handling on the Beta West location commenced at 01:30 Hrs on the 17.12.02.

Due to a very challenging shallow gas situation on the 16/7-8S location, a full scale anchor pull-off test was performed once the rig was anchored and ballasted. The anchor pull-off test was performed in a controlled manner, by heaving on one side at the same time as slacking on the anchors on the opposite side. **The rig was pulled 50 m off location within 2 min and 40 sec.** See details in Appendix G

5.1.2 Experiences (E) / recommendations (R)

- (E) Fullscale pull-off test shows that in an emergency case where the anchors are dropped, the rig should move more than 50 m off location within 2 min. The pull-off test itself was conducted very efficiently offshore, without use of substantial amounts of rig-time.
- (E) Preparing the rig for Beta West operations was time consuming as large quantities of equipment had to be offloaded after the Sigyn operations.
- (E) Very efficient anchor handling - entire AH operation performed in 16 hrs.

5.2 Drilling top hole section

5.2.1 Summary

4 Marker buoys were placed around the spud location with a radius of 6 m from well center. After placing the marker buoys, a pre-made assembly with a two stage hole opener and a used 17 ½" insert bit was made up and RIH. Seabed was tagged at 102,6 m.

The 36" Hole was drilled from 102,6 m to 151,5 m using seawater and Hi-Vis sweeps. The hole was swept twice at TD. The section was drilled with low WOB and high RPM, resulting in a straight hole. Reamed hole at 127-134 m. Inclination at TD was measured to 0,25 deg. The 30" conductor run string consisted of shoe joint, 3 intermediate joints and the wellhead housing assembly. The conductor was run with a thin Hepalon rubber sleeve on the wellhead housing assembly - for easier retrieval during P&A. The 26" hole shoulder was tagged at 149,2 m - and the string was picked 1 m off-bottom. The inclination of the PGB was 0,25 to 0,5 deg. The innerstring consisted of 3 joints 5 ½" drill pipe.

The conductor was cemented in place with 35 m³ X-Lite/G-Cement blend. The slurry weight was ranging from 1.63 g/cm³ to 1.73 g/cm³. 300% OH excess was used. After the cement job the conductor was set back on bottom with the shoe at 148 m. The running tool was disengaged and the conductor left freestanding on bottom with 2,5 m stick-up / inclination of 0,5 Deg.

5.2.2 Experiences (E) / recommendations (R)

- (E) Base case cement design was intended to be 1,53 g/cm³ X-LITE slurry. Due to an open valve on the bulk tanks, 40 MT G-Cement was dumped on top off the 40 MT X-Lite bulk leading to a 50/50 mix of the two blends. Laboratory tests ahead of the job showed the blend to set up firmly, and the job was performed without problems. The resulting downforce available is reduced compared with a pure X-Lite blend.
- (E) A Cement Return Detector tool (CRD) from Oceanering was run on this well. The CRD tool is a PH measuring device. The tool is landed on the PGB frame, and has a long probe sticking down towards the seabed. The tool did not substantiate between mud and cement, and did not aid in making the decision on whether to displace the cement or not.
- (R) For future operations the CRD tool should not be run, as it made the observation with the ROV more awkward. The ROV was attached to the CRD tool with a hydraulic line for flushing of the probe, and this necessitated moving the probe for observing the seabed.
- (E) Based on the low inclination when tagging bottom of the 26" hole shoulder (0,5 Deg), it was decided to release the running tool from the WHH without engaging the guidewires. Ie. The 30" conductor would be left freestanding on bottom. The operation went according to plan, and the running string was pulled back to surface.
- (R) For future operations with low inclination & calm sea, this method should be applied.

5.3 Drilling 9 7/8" Pilot Hole

5.3.1 Summary

Based on the site survey, the Beta West location was given two shallow gas warnings. The first one being a Class 1 (possible shallow gas - but at normal pressure) at 232 m, and a Class 2 warning (very likely presence of shallow gas - and at over pressure) at 632 m. Based on the shallow gas warnings, the well was designed with a 20" casing set at 445 m, well above the Class 2 warning at 632 m. Hence a pilot hole was drilled to 450 m prior to opening the hole to full size. Focus was kept on shallow gas, and drilling a vertical hole for opening to 17 1/2".

The principle for detection of shallow gas on this well was utilizing the GR/RES measurements from the MWD tool as the main device. Based on experience and theoretical calculations, the ECD effect when pumping at 4000 LPM with a pilot hole BHA would be in the range of 2,5 bar with 80 m of 8" drill collars above the Class 1 level. Ie. as long as the pumps were kept running, the well was in a killed position.

If any signs of shallow gas bubbles were observed with the ROV, the strategy was to pull the bit off bottom and observe with the ROV. If the trend was decreasing, drilling would be resumed. If the trend was increasing, 1.20 g/cm³ WBM would be pumped on the fly, and drilling would commence to pilot hole TD at 450 m with 1.20 g/cm³ WBM. The heavy 1.60 g/cm³ kill mud was kept in the pits for contingency only.

The pilot hole was drilled with a 9 7/8" rotary BHA consisting of 150 m 8" drill collars, a GR/RES MWD sub and a used Hughes MX-C09 insert bit. The entire pilot hole was drilled using seawater and Hi-Vis sweeps. A pump-off test was performed once the GR-RES measurements were below the shallow gas levels. A 30 min flowcheck was performed at TD, verifying no shallow gas presence.

The section was drilled with controlled ROP, with maximum instantaneous ROP of 30 m/h, for proper data acquisition. At TD the hole was swept clean, and displaced to 1,35 g/cm³ WBM. The BHA was pumped out of hole.

5.3.2 Experiences / recommendations

- (R) The pre-made assemblies shipped from shore for the tophole sections should be painted yellow rather than white (easier to spot by ROV cameras).
- (E) A ROV camera was run down to the PGB on a pre-made frame - round two guidewires on a podwire. The intent was to give an additional aid in evaluating any shallow gas, especially in a pumps-off situation. The lighting on the camera did not suffice for the task at hand.

- (R) If the camera is to be utilized on future wells, there should be extra lamps installed on the frame, run on a separate power supply.
- (E) Focus was kept on drilling a straight well, which would be easy to trail with a 17 1/2" rock bit BHA. A directional driller was at the drillfloor for assistance in this. The maximum angle recorded from the MWD was less than 0,4 deg.

5.4 Drilling 17 1/2" section

5.4.1 Summary

A 17 1/2" section was drilled out of the 30" conductor down to 450 m. A packed BHA with a used 17 1/2" MX-T1 milled tooth bit trailed the 9 7/8" pilot hole track very well.

The section was drilled with an overall ROP of 71,2 m/hrs (299 m in 4,2 hrs). Seawater and Hi-Vis pills were used for drilling the section. The hole was displaced to 1,35 g/cm³ WBM at TD.

Ran and landed the 18 3/4" wellhead housing on 13 3/8" casing at 442 m. The casing was successfully cemented to surface using the remaining X-Lite/G-cement blend from the tophole section. The cement job was performed with full returns, and the plug bumped with 97 % efficiency.

WOW for 41 hrs to run the BOP. Ran BOP and riser and landed same on WH. Pressure tested WH connection against well and shear ram to 345 bar.

The 12 1/4" BHA was made up and RIH. TOC was tagged at 416 m. The shoetrack was drilled through in 4,4 hrs, including cleaning the rathole and shoetrack. 3 m new formation was drilled and a LOT to 1,51 g/cm³ equivalent MW was performed.

5.4.2 Experiences (E) / recommendations (R)

- (E) The MWD stopped pulsing and had to be pulled and replaced. Investigations afterwards showed that gelled up particles had plugged off the turbine leading to a short-circuit in the tool. The particles are believed to arise from rapidly mixed spud mud.
- (E) Tracking of 9 7/8" pilot hole was excellent with the packed 17 1/2" milled tooth BHA. Surveys were taken at same depths as in the pilot hole, and proved the bit following the 9 7/8" wellpath.
- (E) The plan was to perform a FIT to 1,55 g/cm³. The shoe leaked off at 1,51 g/cm³.

5.5 Drilling 12 ¼" section

5.5.1 Summary

The 12 ¼" section was drilled from 13 3/8" casing shoe at 442 m down to 1319 m. The casing point was picked below the Skade sand unit, prior to the pressure build-up in the Hordaland Group.

The section was drilled with a packed motor assembly with 1,5 deg bend and a MX-C1 milled tooth bit. The drilling fluid used was 1.20 g/cm³ Kcl/Glycol/Polymer waterbased mud. The section was drilled with an overall ROP of 43,2 m/h (869 m in 20,1 hrs).

The well was drilled vertical down below the Utsira Formation, and kicked off at 1150 m. The wellpath was brought up to 12 degrees at section TD. The reason for building in the 12 ¼" section was to maintain a lower sail angle in 8 ½" section, and to have a starting angle for the 3D RSS BHA utilized in the 8 ½" section.

Observed a sudden loss at 1319 m, but the loss stabilized rapidly. A flowcheck indicated stable well conditions.

The 9 5/8" liner was run and set from 392 m to 1318 m, 1 m off bottom. The liner was run with an integrated liner packer. The liner was successfully cemented in place and the packer set. The liner was pressure tested to 345 bar after the cement was set up.

The 8 ½" 3D RSS BHA was made-up and RIH. Tagged TOC/landing collar at 1277,5 m. Drilled shoetrack from 1277,5 m to 1318 m and 3 m new formation in 5,5 hrs. Observed 2 m³ losses at 1319 m. Reduced flowrate to 1400 lpm to avoid losses. Performed FIT/LOT to 1,58 g/cm³ equivalent MW.

5.5.2 Experiences (E) / recommendations (R)

- (E) The ball for setting the 9 5/8" liner hanger did not seat. Made several attempts to seat the ball by chasing it with different pump rates and Hi-Vis pill without success. Dropped second ball and set hanger.
- (E) The sudden loss experienced at 1319 m should have been remediated by either drilling the section one stand deeper and case the loss point off, or setting the liner at bottom when cementing same in place.

5.6 Drilling 8 ½” section

5.6.1 Summary

The 8 ½” section was drilled from the 9 5/8” liner shoe at 1318 m down to well TD at 2900m in three (3) runs. One core was cut. No wireline logging was performed.

The section was drilled with an AutoTrak 3D RSS BHA with an 8 ½” HCR-607 PDC bit and a roller reamer. The drilling fluid used was 1.45 g/cm³ VersaVert OBM. The mud weight chosen was based on hole stability concerns. The overall ROP on the section was 24,4 m/h (1508 m in 61,8 hrs) for the first run, and 23,6 m/h (26 m in 1,1 hrs) for the re-run after coring. The bit performed very well on the 3D RSS assembly, giving good steerability and high ROP with low vibrations. Due to a loss zone at 1319 m, the pumping rate was limited to 1400 lpm until the BHA was past the loss zone, and then gradually increased to 1900 lpm.

The well was drilled from north to south, and inclination was build from 12 degrees at 9 5/8” liner shoe to 35 degrees sail angle from 1750 m.

The reason for using a 3D RSS system was based on two issues. The first was a higher ROP with a non-sliding system. The second was the need for picking of the core point, where the transition zone was to be cored. This would lead to a bit trip with a motor assembly, due to the distance from the bit to the GR/RES sensor. With a 3D RSS assembly this distance was shortened, and a bit trip for picking the core point could be avoided.

RIH with a 180 Ft (54 m) coring assembly to core the transition zone and the reservoir. Cored from 2884 m to 2874,5 m. Core appeared to jam off. Retrieved core assembly and found only 2,9 m of core.

RIH with a packed rotary assembly and drilled to TD at 2900 m with the 8 ½” HCR-607 PDC bit (RR). Logged LWD across the cored interval and the remaining reservoir section. POOH and prepared for permanent abandonment of well.

5.6.2 Experiences (E) / recommendations (R)

- (E) The 1,45 g/cm³ OBM received onboard was not within specifications with regards to oil/water content, and this lead to a high ECD contribution at start of the section. Combined with a loss zone at 1319 m, and a LOT well below the expected planned FIT value, the flow rate had to be reduced to maintain stable well conditions. Adding pre-mix remediated the situation, and normal drilling parameters could again be utilized.
- (R) The well was circulated clean prior to entering the Balder Formation.
- (E) SWACO performed the cuttings handling very well, with no incidents, and utilizing the CCB system for transport of cuttings from the shaker ditch to the loading station for the closed containers.

- (R) The core jammed off due to rotating the coring BHA on bottom without flow. This is against good coring practices, and caused the core to jam prematurely.

5.7 P&A

5.7.1 *Summary*

Ran in hole with 260 m 3 ½” drillpipe stinger. Placed a one-stage cement plug across the reservoir section from well TD at 2900 m to 2440 m. POOH to 2400 m and circulated drillpipe clean with a wash ball.

POOH to 1550 m. Spotted a 150 m long OBM based Hi-Vis pill. POOH to 1400 m. Placed a 220 m long cement plug from 1400 m to 1180 m. POOH to 800 m and circulated drillpipe clean with a wash ball. Closed BSR and attempted pressure testing cement plug to 100 bar after surface sample verified set up. Negative. Not able to hold more than 30 Bar.

RIH and installed 9 5/8” EZSV with top of plug at 795 m. Pressure tested same to 100 Bar. POOH. RIH and installed 13 3/8” EZSV with top of plug 385 m. Pressure tested same to 100 Bar. POOH and L/D running tool.

Unlatched BOP and pulled same to surface. RIH with MOST tool and motor assembly. Cut 30” wellhead housing and 18 ¾” wellhead housing at 105,5 m. Clear indications of both casings being cut. 20” casing cut after 20 min, whereas 30” casing was cut after 1 hr 45 min. Maintained cutting action for additional 10 minutes. Pulled housings free with 25 MT overpull. POOH.

The remaining Drillpipe and Bottomhole assemblies were laid down, and the rig de-ballasted for anchor handling. WOW for 152,5 hrs to start anchor handling. Pulled anchors and released rig from well 16/7-8S Beta West.

5.7.2 *Experiences / recommendations*

- (E) The Perigon CST will not pass a standard 3 ½” X-Over. This was discovered after the string was run in the well, and the X-over had not been drifted. The string had to be pulled for verification of the ID, and found too small for utilizing the Perigon CST.
- (E) The Hepalon rubber sleeve proved to ease retrieval of the wellhead housings. The cement job for the 30” conductor was very good, with 300% OH excess - however retrieval of the housing after being cut was performed with only 25 MT overpull.
- (E) The Hi-Vis pill used as base for the casing - open hole transition zone plug was based on OBM. This gave no/little support for the cement plug, and lead to a leaking cement plug when pressure testing. Statoil Best Practices states that a waterbased Hi-Vis pill

should be used with OBM.

- (E) The fluke angle on the rig anchors had to be adjusted from 30 Deg to 50 Deg to be fit-for-purpose on the next well location. The operation was performed on the AHTs without problems.

5.8 Figures and tables

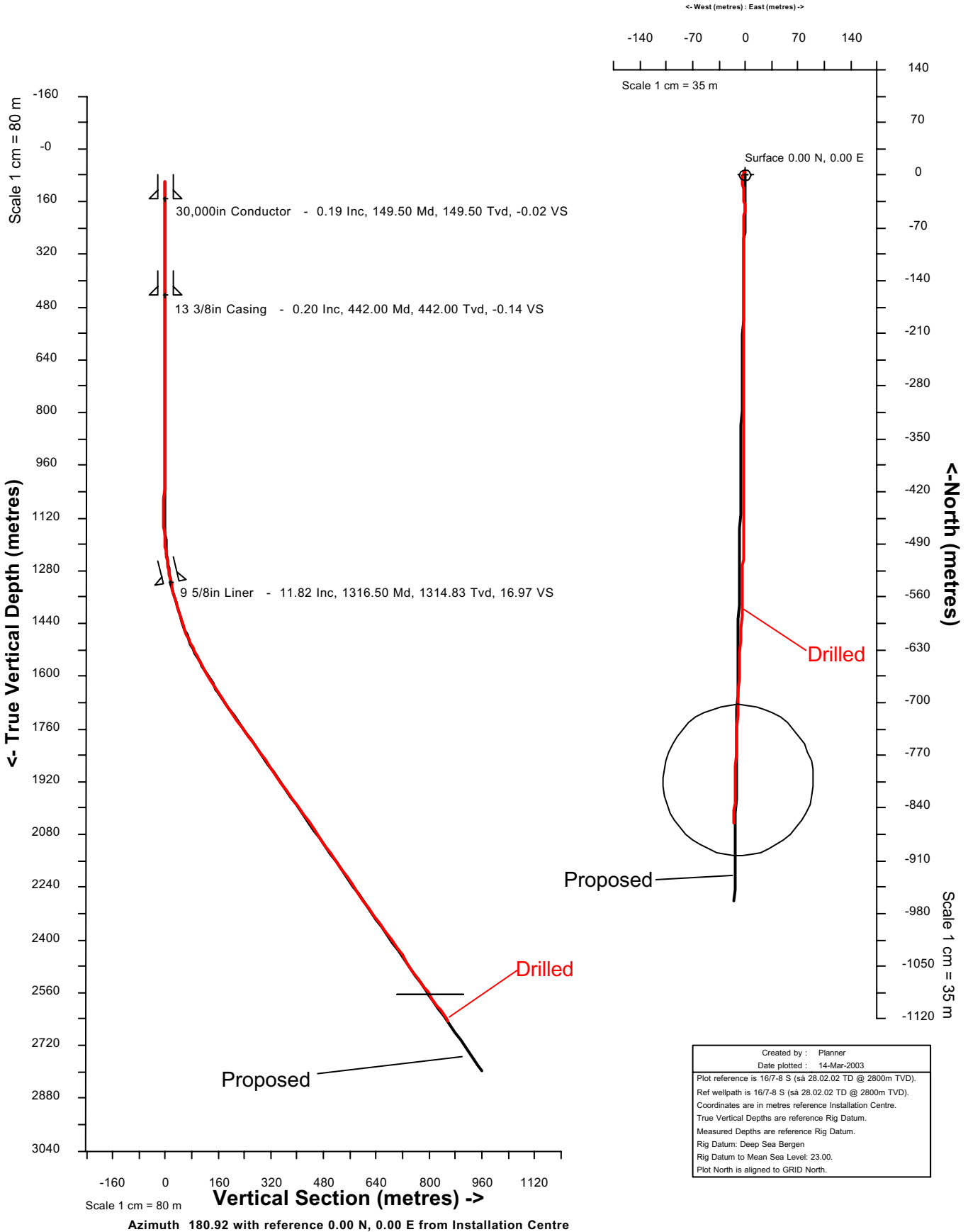
5.8.1 *Well path*

Statoil



Location: Norway
Field: EXPLORATION ZONE 31
Installation: 16/7 Exploration (Ref 8 S)

Slot: 16/7-8 S
Well: 16/7-8 S



Created by : Planner
 Date plotted : 14-Mar-2003
 Plot reference is 16/7-8 S (sà 28.02.02 TD @ 2800m TVD).
 Ref wellpath is 16/7-8 S (sà 28.02.02 TD @ 2800m TVD).
 Coordinates are in metres reference Installation Centre.
 True Vertical Depths are reference Rig Datum.
 Measured Depths are reference Rig Datum.
 Rig Datum: Deep Sea Bergen
 Rig Datum to Mean Sea Level: 23.00.
 Plot North is aligned to GRID North.

5.8.2 *P&A wellbore schematic*

Well: 16/7-8S
Field: Beta West, PL 072B
Rig: Deepsea Bergen

WELL SCHEMATIC - PLUGGED WELL (DRY Case)

Purpose of plugging: Permanent P&A
Date of abandonment: January, 2003

P&A Program
FINAL

HOLE		CASING AND FORMATION					LOT / FIT	CSG & TOC		PLUG BACK		RKB	PRESSURE / LOAD TESTS	CASING CUT
SIZE	TVD MD	SIZE	CASING TYPE	PERMEABLE HC BEARING ZONES	MUD [SG]	[SG]	TVD	MD	TVD	MD				
SB	101,5													
36"	148 148	30"	4 jnts. 30", 310 lb/ft, X-52, ST-2. incl 30" WH housing & shoe joint	None	SW	N/A	148	148	Top Cmt: 140	Top Cmt: 140	CUT at 105,5 m			106
17 1/2"	445 445	13 3/8"	18 3/4" WH hanger incl. extension jnt. x-over to 13 3/8" 72 lb/ft, P-110, New Vam	None	SW & 1.20 sg	LOT 1.51 sg	Top liner: 392	Top liner: 392	Top EZSV: 385	Top EZSV: 385	Surface Cement plug (#3)		PRESS. TEST 70 BAR ABOVE FP AT 13 3/8" SHOE [100 BAR SP] 1.45 sg OBM	
12 1/4"	1 318 1 319	9 5/8"	9 5/8", 53,5 lb/ft, P-110 New Vam.	None	WBM 1.20 sg	LOT 1.58 sg	2237 (Calculated)	2400	Top EZSV: 795	Top EZSV: 795	EZSV		PRESS. TEST 70 BAR ABOVE FP AT 9 5/8" SHOE [100 BAR SP] 1.45 sg OBM	
8 1/2"	2 647 2 900	7"	7" liner 32 lb/ft, P-110 Vam TOP (Optional)	Top Skagerrak Formation 2830 m TVD / 2589 m mD (Prognosis)	OBM 1.45 sg	N/A	Top liner: 0	Top liner: 0	Top Cmt: 1180	Top Cmt: 1180	EZSV		NEGATIVE PRESSURE TEST Leaked-off at 30 Bar	
							1 315	1 317			Transition Zone Cement Plug (#2)			
									Top Cmt: 2440	Top Cmt: 2650	Hi-Vis			
							2647	2900			Reservoir Cement Plug (#1)			

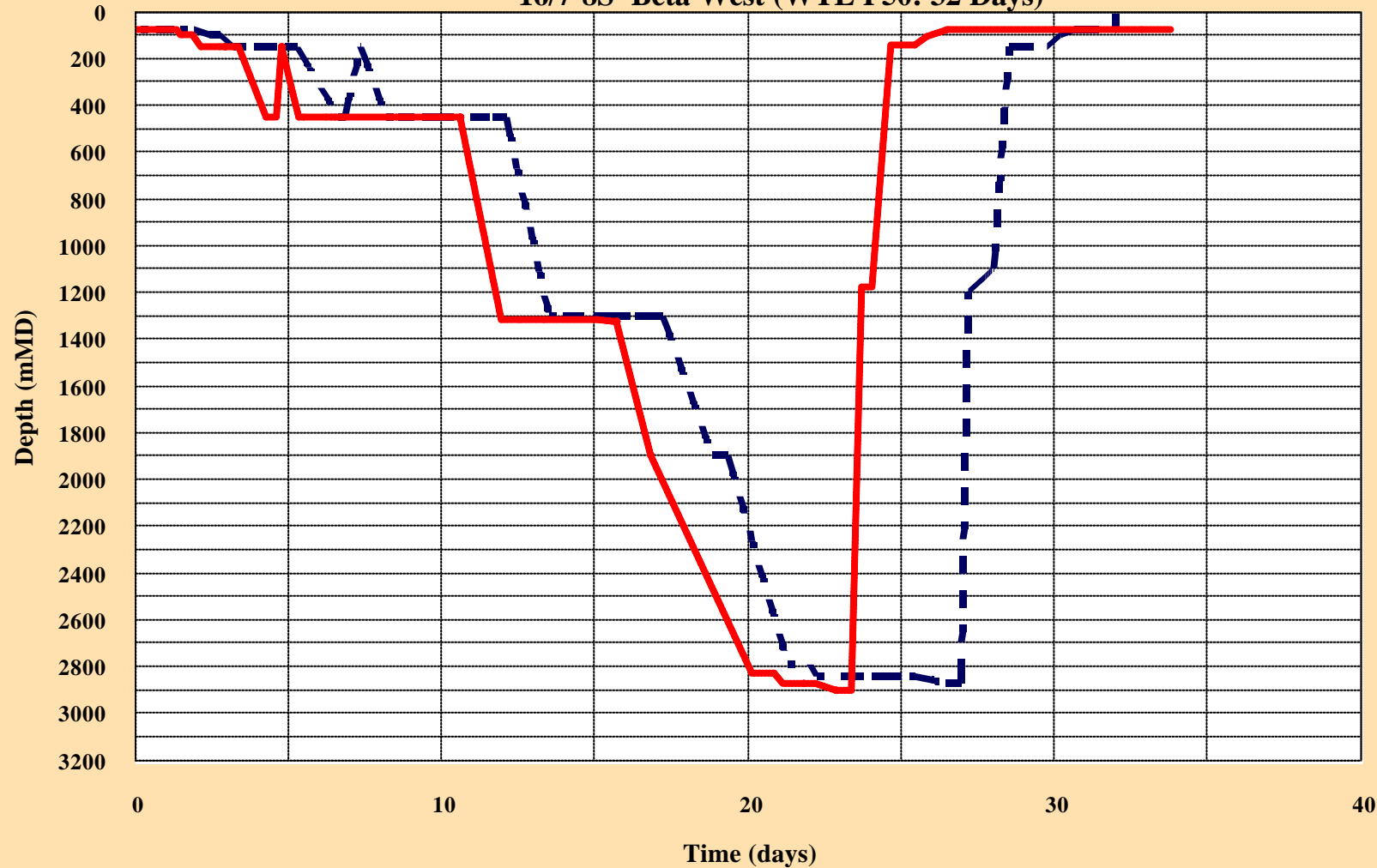
5.8.3 *Time/depth curve*

Time - Depth Plot

Deepsea Bergen

16/7-8S Beta West (WTE P50: 32 Days)

- - - Budget time (days)
— Actual time (days)



Updated date/time:

Date: 10.07.2003

Time: 15:39

Start date/time:

Date: 17.12.2002

Time: 00:00

Est. finish date/time:

Date: 19.01.2003

Time: 19:00

Total budget time:

32,0 days

Time used:

33,8 days

Time behind budget:

1,8 days

Comments:

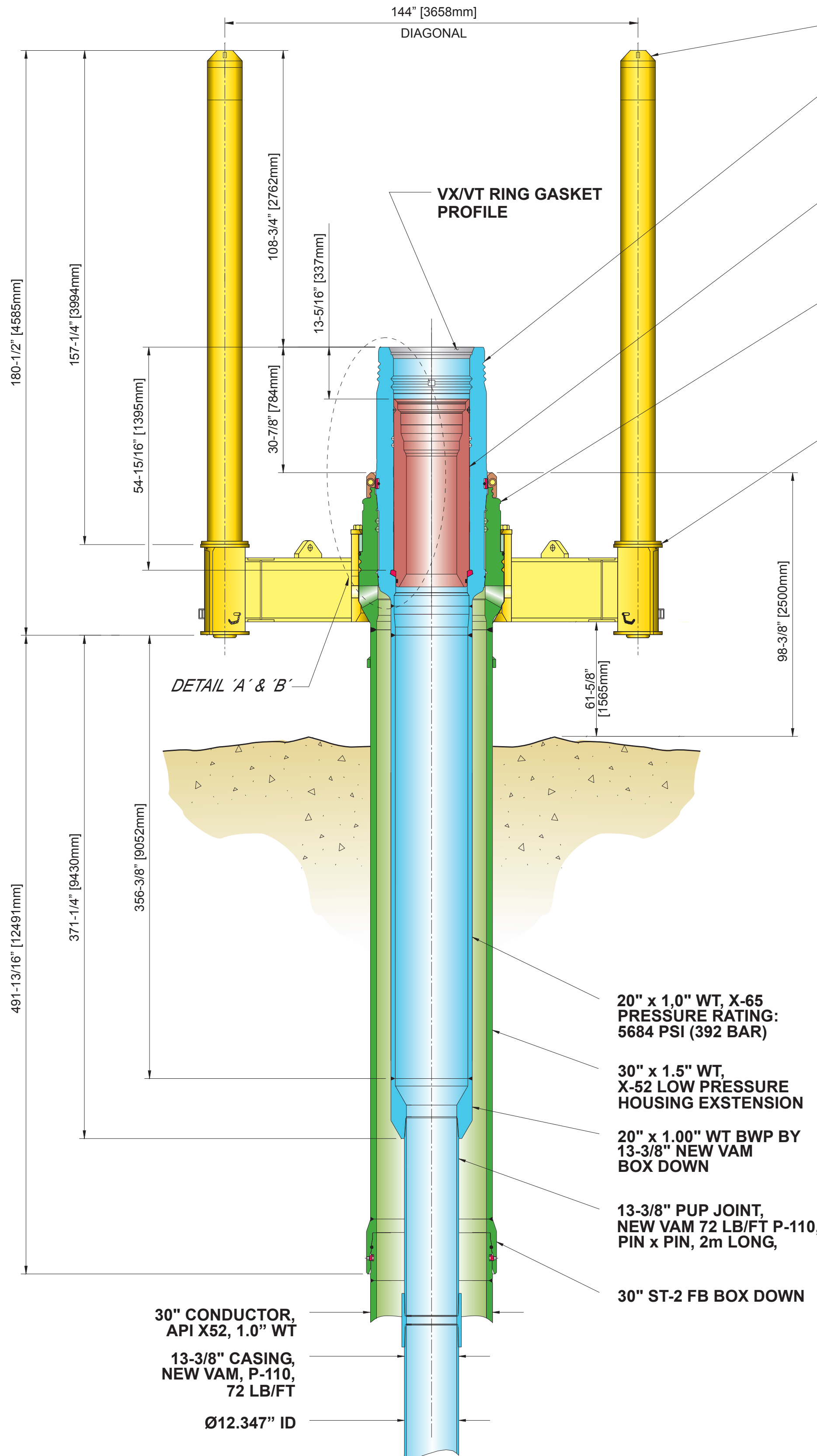
Based on dry well scenario
 . Actual time estimate
 from WTE. Shallow Gas
 Class II at 632 m.

5.8.4 *Timeplanner*

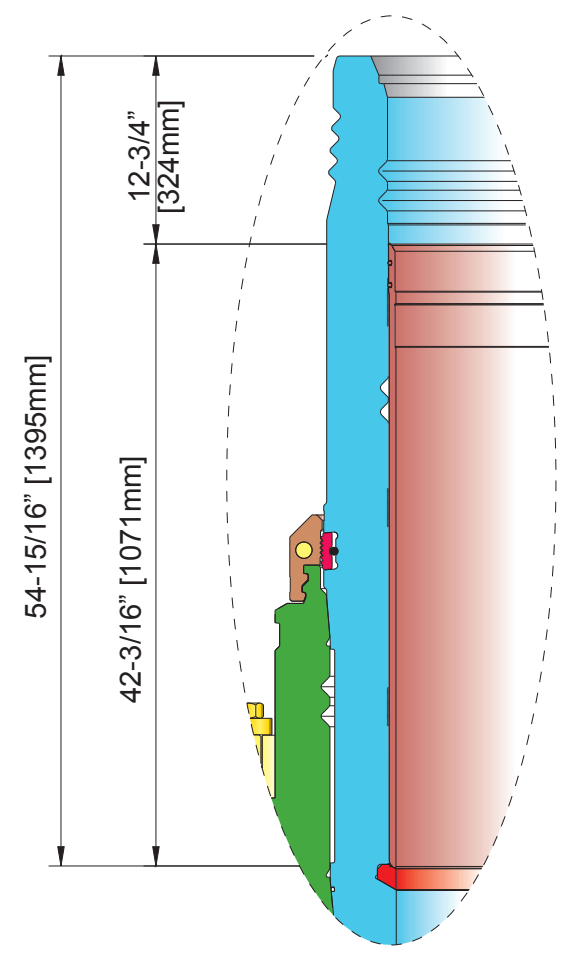
TIMEPLANNER										STATOIL		Down time/Waiting time						
Deepsea Bergen										Time behind budget:		Deepsea Bergen						
16/7-8S Beta West (WTE P50: 32 Days)										1.8 days		16/7-8S Beta West (WTE P50: 32 Days)						
D A Y	START DATE	START TIME	Budg. time (hrs)	Acc. budg. time (days)	Opt. time (hrs)	Acc. opt. time (days)	Budg./ Opt. depth (m/MDD)	Plan time (hrs)	Actual time (hrs)	Acc. actual time (days)	Actual Depth (mMDD)	Company	Down time (hrs)	Accum. down time (hrs)	Waiting time (hrs)	Accum. waiting time (hrs)	Comments (reason for down/waiting time)	
Wed	12.02.2003	15:38	Updated															
Tue	17.12.2002	00:00	Start date															
Sun	19.01.2003	19:00	Est. finish date															
Mon	06.01.2003	03:00	18,0	22,0	11,0	8,5	2790	16,0	17,5	20,9	2827	U	MU and RIH with 180 Ft oriented core barrel assembly.		19,0		43,5	
Mon	06.01.2003	20:30	6,0	22,3	2,5	8,6	2844	4,0	7,5	21,2	2874,5	U	Cut core #1 - 54 m (15 m/hr effective ROP).		19,0		43,5	
Tue	07.01.2003	04:00	18,0	23,0	8,5	8,9	2844	12,0	15,5	21,8	2874,5	U	POOH w/ core BHA. Recover Core #1. L/D coring assembly.		19,0		43,5	
Tue	07.01.2003	19:30	6,0	23,3	0,0	8,9	2844	0,0	0,0	21,8	2874,5	U	RIH with W/L PEX to verify HC filled reservoir (Optional)		19,0		43,5	
Tue	07.01.2003	19:30	18,0	24,0	10,5	9,4	2844	0,0	0,0	21,8	2874,5	U	MU and RIH with 180 Ft oriented core barrel assembly.		19,0		43,5	
Tue	07.01.2003	19:30	6,0	24,3	2,5	9,5	2844	0,0	0,0	21,8	2874,5	U	Cut core #2 - 54 m (15 m/hr effective ROP).		19,0		43,5	
Tue	07.01.2003	19:30	12,0	24,8	9,0	9,8	2844	0,0	0,0	21,8	2874,5	U	POOH w/ core BHA. Recover Core #2.		19,0		43,5	
Tue	07.01.2003	19:30	16,0	25,5	10,0	10,3	2844	12,0	9,5	22,2	2874,5	U	MU and RIH with 8 1/2" Rotary BHA.		19,0		43,5	
Wed	08.01.2003	05:00	24,0	26,5	24,0	11,3	2870	20,0	16,0	22,9	2900	U	Drill 8 1/2" hole to TD at +/-2900 m. Log cored interval. POOH. L/D BHA.		19,0		43,5	
Wed	08.01.2003	21:00	0,0	26,5	0,0	11,3	2870	0,0	0,0	22,9	2900	U			19,0		43,5	
Section time (days)			9,3	4,0	11,3			5,2	7,1			U	Section time ahead of/behind (-) budg:-3,3 days, Tot. time ahead of/behind (-) budg:-1,8 days	1,5	hours	0,0	hours	Down time: 0.9% . Total Down time: 3.5% . Waiting time: 0.0% . Total Waiting time: 7.9%
					11,3							U						
					11,3							U	DST (In HC Discovery case)					DST (In HC Discovery case)
Wed	08.01.2003	21:00	0,0	26,5	0,0	11,3	2870	0,0	0,0	22,9	2900	U			19,0		43,5	
Wed	08.01.2003	21:00	0,0	26,5	0,0	11,3	2870	0,0	0,0	22,9	2900	U	Grand total time estimate for 2 DSTs in one run - 19 days/456 hrs		19,0		43,5	
Wed	08.01.2003	21:00	0,0	26,5	0,0	11,3	2870	0,0	0,0	22,9	2900	U			19,0		43,5	
Section time (days)			0,0	0,0	11,3			0,0	0,0			U		0,0	hours	0,0	hours	
					11,3							U						
					11,3							U	Permanent P&A					Permanent P&A
Wed	08.01.2003	21:00	12,0	27,0	7,0	11,5	2870	15,0	12,0	23,4	2900	U	PU 300 m 3 1/2" DP cement stinger and RIH to TD on 5 1/2" DP. Circulate B/U.	2,0	21,0		43,5	Odffjell: Failing PS slips (0.5 hrs) / Not drifted 3 1/2" DP - Pulled back to drift XO (1,5 hrs O-Fail)
Thu	09.01.2003	09:00	6,0	27,2	2,5	11,6	1200	8,0	8,5	23,7	1180	U	Place Cmt plug. POOH to 1550 m. Place Hi-Vis pill. POOH to 1400m. Place Cmt Plug.		21,0		43,5	
Thu	09.01.2003	17:30	20,0	28,0	4,5	11,8	1100	7,0	8,0	24,1	1180	U	Pump stop. POOH. L/D DP while POOH.		21,0		43,5	
Fri	10.01.2003	01:30	0,0	28,0	0,0	11,8	1100	4,0	6,0	24,3	795	U	Press. test cement. NEG. RIH & Set 9 5/8" EZSV at 795 m. PT to 100 Bar. POOH	5,5	26,5		43,5	Statoil: Transition zone cement plug not holding pressure test
Fri	10.01.2003	07:30	12,0	28,5	4,5	12,0	150	8,5	9,0	24,7	140	U	Set 13 3/8" EZSV at 395 m. PT to 100 Bar. Displace. Place Cmt Plug. POOH		26,5		43,5	
Fri	10.01.2003	16:30	7,0	28,8	6,5	12,3	150	3,0	3,0	24,8	140	U	RIH w/WB RT. Jet WB/BOP. Retrieve WB. L/D DP.		26,5		43,5	
Fri	10.01.2003	19:30	22,0	29,8	13,5	12,9	150	16,0	16,0	25,5	140	U	Prepare for and pull riser/BOP.		26,5		43,5	
Sat	11.01.2003	11:30	12,0	30,3	9,0	13,2	102	8,0	8,5	25,8	105,5	U	P/U and RIH with MOST tool and motor cutter assy. Cut WHHs and POOH. L/D same.		26,5		43,5	
Sat	11.01.2003	20:00	10,0	30,7	0,0	13,2	79	16,0	16,5	26,5	79	U	Demobilize equipment. LD DC, HWDP and DP from derrick.		26,5		43,5	
Sun	12.01.2003	12:30	0,0	30,7	0,0	13,2	79	152,5	152,5	32,9	79	U	Waiting on Weather to Pull Anchors. Meanwhile perform general rig maintenance		26,5	152,5	196,0	WoW to start Anchor Handling (6.35 days)
Sat	18.01.2003	21:00	32,0	32,0	12,0	13,7	79	20,0	22,0	33,8	79	U	Deballast Rig & Pull anchors. Meanwhile perform general rig maintenance.		26,5		196,0	
Sun	19.01.2003	19:00	0,0	32,0	0,0	13,7	79	0,0	0,0	33,8		U	End of Well. Transfer rig to well 6608/10-9 Lerke.		26,5		196,0	
Sun	19.01.2003	19:00		32,0		13,7	0			33,8		U			26,5		196,0	
Sun	19.01.2003	19:00	5,5	2,5	13,7			10,8	10,9			U	Section time ahead of/behind (-) budg:-5,4 days, Tot. time ahead of/behind (-) budg:-1,8 days	7,5	hours	152,5	hours	Down time: 2.9% . Total Down time: 3.3% . Waiting time: 58.2% . Total Waiting time: 24.2%
End of operation					13,7													

Technical Limit	13,7 Days
AFE Budget time	32,0 Days
Plan Time	29,8 Days
Actual time	33,8 Days
Total Down Time	26,5 Hrs
Total Waiting Time	196,0 Hrs
Actual - Waiting Time	25,6 Days
Actual - Down & Waiting Time	24,5 Days

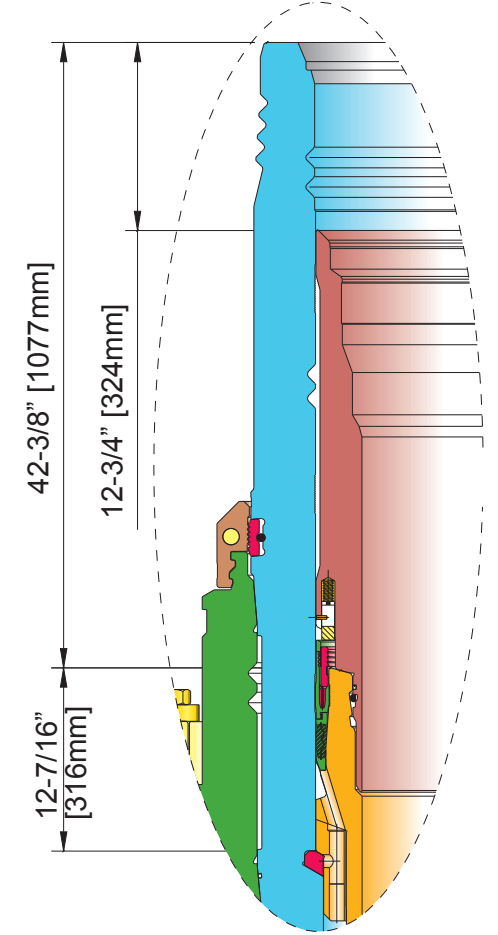
5.8.5 *Wellhead system*



- WPCO/IMENCO POST TOPS
- 18-3/4" WELLHEAD HOUSING UNIT
C/W VX/VT RING GROOVE
P/N N50410-2
- SLIMHOLE SEAT PROTECTOR
P/N A50128-6
- 30" LOW PRESSURE WELLHEAD
HOUSING UNIT,
P/N N50369-4
- PERMANENT GUIDE BASE
RADIUS FOR 30" HOUSING
P/N N50270-1



DETAIL 'A'
18-3/4" NOMINAL
SEAT PROTECTOR INSTALLED,
P/N H57034-1






DETAIL 'B'
18-3/4" x 13-3/8"
WEARBUSHING INSTALLED,
P/N H57224-1

- 20" x 1.0" WT, X-65
PRESSURE RATING:
5684 PSI (392 BAR)
- 30" x 1.5" WT,
X-52 LOW PRESSURE
HOUSING EXTENSION
- 20" x 1.00" WT BWP BY
13-3/8" NEW VAM
BOX DOWN
- 13-3/8" PUP JOINT,
NEW VAM 72 LB/FT P-110,
PIN x PIN, 2m LONG,
- 30" ST-2 FB BOX DOWN
- 30" CONDUCTOR,
API X52, 1.0" WT
- 13-3/8" CASING,
NEW VAM, P-110,
72 LB/FT
- Ø12.347" ID

MS-700 Wellhead System
18-3/4" x 15,000 PSI

5.8.6 *Drilling fluids*

36		Section: 36" Seawater/CMC - Spud							SPEC # 6							Product usage				Conc. (unit/m3)				Volumes																	
Depth meters	Inclination deg.	MW sg	FV sec	YP Pa	PV cP	Gel 10s Pa.	Gel 10m Pa.	3 rpm lb100sqft	pH [-lg[H+]]								TYPE: SW/Bentonite	Unit	New	Maint	Tot Unit		m3																		
104	0	1.03	> 200						8								Barite	mt	0.417			187	SURFACE	225																	
148		-							-								Soda Ash	kg	2			895	RISER	0																	
		-							-								CMC-EHV	kg	17			7 600	CASING/LINER	0																	
		1.35							9								Sea Water	m3	0.89			398	OPEN HOLE	32																	
Length:		COMMENTS: Ref. Anchor/M-I, Operational Procedures - Rev. 1 - 18.08.00: This section will be drilled using seawater with CMC-EHV havis sweeps. Mix havis CMC-EHV mud according to programmed specifications. Pump 5 - 10 m3 havis pills every 15 m. At TD , sweep the hole by pumping a 30-40 m3 havis pill around before displacing the hole to 1.35 sg CMC-mud by pumping 1.5 times the hole volume. Before strat up, prepare; 60 m3 - 1,6 sg - CMC-EHV mud as kill mud, mix and store the mud in a pit with direct suction. Also prepare one pit (+/- 60 m3) with 1,9 sg CMC-EHV , and one pit (+/- 60 m3) with 1,2 sg CMC-EHV mud, also make sure that a boat with 3-400 m3 of 1,2 sg NaCl brine is available at the rig side. All the extra fluid is contingency in case of shallow gas occurs and the drilling has to be performed by weighted fluid - 1,2 sg - with return to sea bed. If no shallow gas occurs, transfer the contingency fluid to next section.														NaCl brine				m3				300				DILUTION		191											
																								HOLE TOT		32															
																								LOST AT SEABED		0															
																								LOST IN HOLE		0															
																								TOT. VOL.		447															
																								RECEIVED		0															
																								MIXED		447															
																								MUD LEFT		0															
																								BACKLOADED		0															
																								Dilution OH (m3/m3)		6.0															
9 7/8		Section:9 7/8" pilot hole Seawater/CMC-EHV - Spud							SPEC # 6							Product usage				Conc. (unit/m3)				Volumes																	
Depth meters	Inclination deg.	MW sg	FV sec	YP Pa	PV cP	Gel 10s Pa.	Gel 10m Pa.	3 rpm lb100sqft	pH [-lg[H+]]								TYPE:	Unit	New	Maint	Tot Unit		m3																		
148	0	1.03	> 200						8								Barite	mt	0.417			240	SURFACE	225																	
450		-							-								Soda Ash	kg	2			1 130	RISER	0																	
		-							-								CMC-EHV	kg	17			9 610	CASING / LINER	0																	
		1.35							9								Sea Water	m3	0.89			500	OPEN HOLE	18																	
Length:		COMMENTS: Ref. Anchor/M-I, Operational Procedures - Rev. 1 - 18.08.00: This section will be drilled using seawater with CMC-EHV havis sweeps. Mix havis CMC-EHV mud according to programmed specifications. Pump 5 - 10 m3 havis pills every 15 m. At TD , sweep the hole by pumping a 30-40 m3 havis pill around before displacing the hole to 1.35 sg CMC-mud by pumping 1.5 times the hole volume. Before strat up, prepare; 60 m3 - 1,6 sg - CMC-EHV mud as kill mud, mix and store the mud in a pit with direct suction. Also prepare one pit (+/- 60 m3) with 1,9 sg CMC-EHV , and one pit (+/- 60 m3) with 1,2 sg CMC-EHV mud, also make sure that a boat with 3-400 m3 of 1,2 sg NaCl brine is available at the rig side. All the extra fluid is contingency in case of shallow gas occurs and the drilling has to be performed by weighted fluid - 1,2 sg - with return to sea bed. If no shallow gas occurs, transfer the contingency fluid to next section.														NaCl brine				m3				300				DILUTION		322											
																								HOLE TOT		18															
																								LOST AT SEABED		0															
																								LOST IN HOLE		0															
																								TOT. VOL.		565															
																								RECEIVED		0															
																								MIXED		565															
																								MUD LEFT		0															
																								BACKLOADED		0															
																								Dilution OH (m3/m3)		18.0															
17 1/2		Section:17 1/2" hole Seawater/CMC-EHV - Spud							SPEC # 6							Product usage				Conc. (unit/m3)				Volumes																	
Depth meters	Inclination deg.	MW sg	FV sec	YP Pa	PV cP	Gel 10s Pa.	Gel 10m Pa.	3 rpm lb100sqft	pH [-lg[H+]]								TYPE: Water based kill fluid	Unit	New	Maint	Tot Units		m3																		
148	0	1.03	> 200						8								Barite	mt	0.417			368	SURFACE	225																	
450		-							-								Soda Ash	kg	2			1 764	RISER	0																	
		-							-								CMC-EHV	kg	17			15 000	CASING / LINER	64																	
		1.35							9								Sea Water	m3	0.89			800	OPEN HOLE	54																	
Length:		COMMENTS: Ref. Anchor/M-I, Operational Procedures - Rev. 1 - 18.08.00: This section will be drilled using seawater with CMC-EHV havis sweeps. Mix havis CMC-EHV mud according to programmed specifications. Pump 5 - 10 m3 havis pills every 15 m. At TD , sweep the hole by pumping a 30-40 m3 havis pill around before displacing the hole to 1.35 sg CMC-mud by pumping 1.5 times the hole volume. Before strat up, prepare; 60 m3 - 1,6 sg - CMC-EHV mud as kill mud, mix and store the mud in a pit with direct suction. Also prepare one pit (+/- 60 m3) with 1,9 sg CMC-EHV , and one pit (+/- 60 m3) with 1,2 sg CMC-EHV mud, also make sure that a boat with 3-400 m3 of 1,2 sg NaCl brine is available at the rig side. All the extra fluid is contingency in case of shallow gas occurs and the drilling has to be performed by weighted fluid - 1,2 sg - with return to sea bed. If no shallow gas occurs, dilute the fluid back to 1,2 sg and use it as displacement fluid.														NaCl brine				m3				300				DILUTION		539											
																								HOLE TOT		118															
																								LOST ON CUTTINGS		0															
																								LEFT BEHIND CSG.		0															
																								TOT. VOL.		882															
																								RECEIVED		0															
																								MIXED		882															
																								MUD LEFT		0															
																								BACKLOADED		0															
																								Dilution OH (m3/m3)		10.0															
12 1/4		12 1/4" Section: Glydriil drilling fluid (WBM)							SPEC # 13							Product usage				Conc. (unit/m3)				Volumes																	
Depth meters	Inclination deg.	MW sg	PV mPaS	YP Pa	Gel 10s Pa.	Gel 10m Pa.	pH	3 rpm lb100sqft	API ml	KCl kg/m3	Glycol %	Ca++ mg/ltr	LGS kg/m3	MBT kg/m3			TYPE: Novatec	Unit	New	Maint	Tot Unit		m3																		
450	0	1.12		10	2	5	8	8	2	150	4	<1000	< 200	<60			M-I Bar	mt	0.175			120	SURFACE	60																	
1 303	-	-	alap	-	-	-	-	-	-	-	-						KCl brine w/Glycol	m3	0.555	0.1		430	RISER	64																	
		-		-	-	-	-	-	-	-	-						Glydriil MC (Glycol)	kg	10	10		13 200	CASING / LINER	36																	
		1.20		23	6	12	9	15	5	160	5						Duotec NS	kg	4	2		4 000	OPEN HOLE	71																	
Length:		COMMENTS: Note: Use "Manual 73.00 - Operational Procedures Manual" as a reference in the operation. This section will be drilled with Glydriil water based mud (KCl/Pac/Glycol). Mix up fresh mud on the rig by use of saturated KCl brine diluted back to a final KCl concentration of 150-160 kg/m3 KCl. Add chemical and shear the fluid as per general program. As drilling commences, maintain KCl concentration in return flow at minimum 150 kg/m3 by addition of premixes with higher KCl concentration. Also maintain Pac polymers concentration and add Duotec NS to maintain low end viscosity to programmed value. The Glydriil MC (Glycol) concentration should be maintained above 4 % at all time when drilling. Allow the density to drift up as drilling commence, but try to maintain below 1,20 sg. Max. density at TD before POOH to run liner is 1,25 sg. If required reduce pumprate/ROP, increase dilution and optimize centrifuging to achieve lowest possible density at TD of the section. Dress the shakers with coarse screens when displacing/breaking circulation after trips. Run finest possible shaler screens and optimise all the available solids removal equipment - MAKE SURE THAT THE CENTRIFUGE IS WORKING - in order to maintain lowest possible mud weight while drilling this section. Ensure available pit space for displacement of riser volume in case of hanging off.														Polypac ELV				kg				14				1				9 900		DILUTION		428					
																								HOLE TOT		171															
																								LOST ON CUTTINGS		107															
																								LOST IN HOLE		0															
																								TOT. VOL.		659															
																								RECEIVED		0															
																								MIXED		659															
																								MUD LEFT		265															
																								BACKLOADED		265															
																								Dilution OH (m3/m3)		6.0															
8 1/2		Section							SPEC # 41							Product usage				Conc. (unit/m3)				Volumes																	
Depth meters	Inclination deg.	MW sg	PV mPaS	YP Pa	Gel 10s Pa.	Gel 10m Pa.	100 rpm lb100sqft	3 rpm lb100sqft	HTHP ml	Activity	ES volt	OWR	LGS kg/m3				TYPE: Novatec	Unit	New	Maint	Tot Unit		m3																		
1 303	10	1.45		alap	6	< 25		10	< 2	0.88	> 600	70/30	< 200				M-I Bar	mt	0.627			187	SURFACE	60																	
2 872	-	-															EDC 95/11	l	0.582	0.1		223	RISER	64																	
		1.45			12		15		0.94			80/20					Versavert PE	l	20			6 000	CASING / LINER	0																	
Length:		COMMENTS: Note: Use "Manual 73.00 - Operational Procedures Manual" as a reference in the operation. This section will be drilled with Versavert OBM drilling fluid. A start out volume of Versavert OBM will be transferred from shore. Adjust to drilling spec within the first circulation. Maintain properties and volume with premixes utilizing used mud. Strat out density will be 1,40 sg - strat weigh up just after strat drilling new formation and make sure that 1,45 sg is achieved at 1500 m mD. Avoid direct additions of chemicals to active. Dress shakers with coarser screens when displacing/breaking circulations after trips. Run finest possible shaker screens and optimise the solids removal equipment in order to reduce solids build-up and dilution. Prior to logging, treat the active system with Versatrol and emulsifiers in order to optimize fluid loss control and stability. NOTE: Regarding content CaCl2, start out the section with +/- 120 kg/m3 CaCl2 and increase slowly up to max. +/- 180 kg/m3 when drilling . If the mud received from shore has higher CaCl2 content, add water and emulsifiers and shear the fluid. O/W ratio down to 70/30 can be accepted. Watch cutting quality at all time and adjust CaCl2 content if cutting quality require. Special attention to fluid logistics must be paid.Ensure available pit space for displacement of riser volume in case of hanging off.														Versavert SE				l				8								2 400		OPEN HOLE		60					
																								Versavert F		l		6				1 800		DILUTION		253					
																								Lime		kg		15				4				6 500		HOLE TOT		125	
																								VG-Plus		kg		22				1				7 100		LOST ON CUTTINGS		90	
																								Versatrol		kg		10								3 000		LOST IN HOLE		60	
																								CaCl2		kg		48								14 300		TOT. VOL.		498	
																								Water		m3		0.2								60		RECEIVED		200	
																																0		MIXED		298					
																																0		MUD LEFT		347					
																																0		BACKLOADED		347					
																																Dilution OH (m3/m3)		4.2							
		Framework contract: SAP4600002159							Drilling Fluids Program Rev:5 Unpriced version WELL: 16/7-8 - S, Beta West RIG: Deepsea Bergen																																
Prepared date/by: Project Leader 29.10.2002 Jan Moe				Verified and Approved by: Project Leader 29.10.2002 Stig Seglem				Verified date/by: 29.10.2002 Oluf Bergsvik				STATOIL approval date/by: 29.10.2002 Scott Kerr																													

5.8.7 *Cementing data*

Well: 16/7-8
 Field: Beta West
 Rig: Byford Dolphin

CEMENT PROGRAM

HOLE		CASING SHOE		TOC	VOLUME/ EXCESS	CEMENT SLURRY DESIGN										SPACER	DISPLACEMENT
SIZE	TVD MD	SIZE	TVD MD	TVD MD		Components	Lead [ltr/100kg]	Tail [ltr/100kg]	Density [SG]	Yield [ltr/100kg]	Stat. / Circ. Temp [°C]	Thickening time [hrs to 30 Bc]	API Free Water [%]	API Fluid loss [cc/30min]	24 hrs C. S. [psi]	Fluids and Rates	
36"	151.6	30"	150.1	Surface	35 m3 300%	X-lite/Norcem "G" cmt CaCl2 liquid NF-6 Sea water		4.50 0.10 48.70	1.70	91.74 Code DWLSP	6-8	03:00	n/a	n/a	+/- 500	Min. 30 m3 Sea water	Sea water 1000 - 2000 lpm
17 1/2"	450	13 3/8"	442	Surface	Lead: 36,1m3 Tail: 15 m3 50% (Lead)	X-lite/Norcem "G" cmt (lead) Norcem "G" Cmt. (tail) Econolite NF-6 Sea water	2.00 0.10 73.95	- 0.10 44.94	L: 1,56 T: 1,92	L: 114,49 Code STL10 T: 76,13 Code STTNT	17/15	L: 06:03 T: 04:45	L: 1 T: n/a	n/a	L: +/- 300 T: +/- 1000	100 m3 Sea water	Sea water 3000 lpm
12 1/4"	1319	9 5/8" Liner	1316	392	Lead: 27 m3 Tail: 8 m3 30 %	Norcem "G" Cmt. Econolite Halad-613 L HR-4L NF-6 Seawater Freshwater	3.20 - 2.40 0.10 93.37 -	- 0.50 0.60 0.10 44.48	L: 1,56 T: 1,90	L: 130,13 Code STL40 T:76,74 Code MPT14	56/39	L: 06:45 T: 03:55	L: 1,4 T: 0,7	n.a.	L: +/- 500 T: +/- 2000	15 m3 1,35 SG Tuned SpacerE	Glydriil WBM 2000 lpm
8 1/2"	2900 2900	P&A OH-plug	2900	2650	8,8 m3 20 %	Norcem "G" Cmt. Halad-613 L CFR-3L HR-5L NF-6 Fresh water		10.00 1.00 0.30 0.10 34.74	1.90	77.19 Code MFL05	97/80	03:48	0	165	+/- 2500	5,2 m3 1,68 SG Tuned SpacerE	OBM 2000 lpm
9 5/8" liner shoe		P&A transition plug	1400	1180	8,3 m3 20% on OH	Norcem "G" Cmt. Halad-613 L HR-4L NF-6 Fresh water		0.50 0.60 0.10 42.81	1.92	75.07 Code MPT14	53/43	03:35	0.72	n.a.	+/- 2300	10,5 m3 1,68 SG Tuned SpacerE	OBM 2000 lpm
13 3/8" casing		P&A surface	375	135	18,5 m3	Norcem "G" Cmt. NF-6 Seawater		0.10 46.74	1.90	77.90 Code GTT90	14/12	+/- 4	n.a.	n.a.	+/- 1500	seawater	Seawater 2000 lpm

5.8.8 *Bit record*

Bit record

Wellbore: 0016/07-008S

Run No	Bit Size	Bit No	BHA No	Bit Type	IADC code	Bit manufacturer	Serial No	Nozzles (n/32")				Flow Area in2	
								no x n	no x n	no x n	no x n		
1	17 1/2"	1	1	MXT09DDT	437	Hughes Christensen	T28DR	4 x 14	x	x	x	x	,602
2	9 7/8"	2	2	MXC09	437	Hughes Christensen	C26ZM	3 x 20	1 x 18	x	x	x	1,169
3	17 1/2"	3	3	MAXGT00	415	Hughes Christensen	S34CM	1 x 20	2 x 22	1 x 14	x	x	1,200
4	17 1/2"	3RR1	4	MAXGT00	415	Hughes Christensen	S34CM	1 x 20	2 x 22	1 x 14	x	x	1,200
5	12 1/4"	4	5	MXC1	117	Hughes Christensen	600109	3 x 18	1 x 20	x	x	x	1,053
6	8 1/2"	5	6	HCR607	M323	Hughes Christensen	7201163	4 x 11	3 x 12	x	x	x	,703
7	8 1/2"	6	7	FC284LI		Security DBS	7011259	x	x	x	x	x	
8	8 1/2"	5RR1	8	HCR607	M323	Hughes Christensen	7201163	4 x 11	3 x 12	x	x	x	,703

Run No	Bit Size	Pump Rate l/min	Pump Press bar	Depth in mMD	Depth out mMD	Drilled length m	Hours Drilled	ROP	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag 1000 daN	Con drag Max 1000 daN
1	17 1/2"	4850	145	102	151,5	49,5	7,5	6,6	0	2	50	100				
2	9 7/8"	4000	155	151	450	299	14	21,4	0	5	130	130	1045	1683		
3	17 1/2"	4400	155	151	151	0	0		0	4	47	98	2	6		
4	17 1/2"	4400	155	151	450	299	4,2	71,2	0	4	47	98	2	6		
5	12 1/4"	4100	189	450	1319	869	20,1	43,2	0	13	0	142	1800	9700		
6	8 1/2"	1900	171	1319	2827	1508	61,8	24,4	6	10	200	200	0	34		
7	8 1/2"	1042	124	2827	2875	48	6,3	7,6	8	29	80	120	0	31		
8	8 1/2"	2011	140	2874	2900	26	1,1	23,6	2	5	93	140	8	12		

Run No	Bit Size	IADC dull grading								Remarks
		I	O	DC	L	B	G	OC	RP	
1	17 1/2"	1	1	WT	A	E	I	NO	TD	Re-Run bit. Part of 26" x 36" HO assy. Controlled ROP to avoid inclination. No Boulders.
2	9 7/8"	1	1	WT	A	E	I	NO	TD	Re-run Bit. Rotary assembly. Controlled ROP due to shallow gas warnings.
3	17 1/2"	1	1	WT	A	E	I	NO	DTF	Re-run bit. Drilled Cmt and 30" shoe. Opening up 9 7/8" Pilot hole. Pulled due to MWD failure.
4	17 1/2"	1	1	WT	A	E	I	NO	TD	Opened up 9 7/8" pilot hole. Surveys taken at same depth as in 9 7/8" PH. 17 1/2" Hole tracking 9 7/8" PH.
5	12 1/4"	1	1	WT	A	E	1/16	ER	TD	New Bit. Run with PDM (AKO 1,0 Deg).
6	8 1/2"	0	1	CT	S	X	I	NO	CP	New Bit. Run on AutoTrak - Building from 12 Deg to 35 Deg.
7	8 1/2"	2	2	CT	C	X	I	BT	TD	One broken teeth in cone area. 3 water channels plugged. Washout in 3 water channels inside core bit.
8	8 1/2"	0	1	CT	S	X	1/16	NO	TD	Re-Run Bit. Run on Rotary assembly - to drill to TD.

5.8.9 *Bottomhole assemblies*

BHA report

Wellbore: 0016/07-008S

BHA seq: 1 BHA category: Drilling

BHA description:

BHA no:

String component	OD in	ID in	Length m	Acc length m
BIT	17,500		0,40	0,40
BIT SUB W/FLOAT	9,500		0,91	1,31
HOLE OPENER	26,000		1,50	2,81
HOLE OPENER	36,000		2,50	5,31
BIT SUB	9,500		0,91	6,22
ANDERDRIFT	9,500		3,28	9,50
DRILL COLLAR	9,500	3,000	27,59	37,09
X-OVER	9,375	3,000	1,00	38,09
DRILL COLLAR	8,000	2,875	52,51	90,60
X-OVER	8,000	3,000	0,81	91,41
H W DRILL PIPE	5,500	3,875	26,72	118,13

BHA seq: 2

BHA category: Drilling

BHA description:

BHA no:

String component	OD in	ID in	Length m	Acc length m
BIT	9,875		0,25	0,25
BIT SUB W/FLOAT	8,000	2,750	0,91	1,16
PIN X PIN SUB	8,250	2,875	0,72	1,88
MWD MPR	8,250	3,500	4,78	6,66
MWD DCP	8,250	3,000	11,27	17,93
SAVER SUB	8,250	3,000	1,00	18,93
DRILL COLLAR	8,000	2,875	114,15	133,08
JAR	8,000		9,67	142,75
DRILL COLLAR	8,000	2,875	18,33	161,08
X-OVER	8,000	3,000	0,84	161,92
H W DRILL PIPE	5,500	3,875	27,18	189,10

BHA seq: 3

BHA category: Drilling

BHA description:

BHA no:

String component	OD in	ID in	Length m	Acc length m
BIT	17,500		0,40	0,40
NEARBIT STAB	17,500	3,000	2,44	2,84
NM DRILL COLLAR	9,500	3,000	2,95	5,79
STABILIZER, NM	17,500	3,000	2,35	8,14
PIN X PIN SUB	9,500		0,56	8,70
MWD TOOL	9,500		9,05	17,75
SAVER SUB	9,500		0,75	18,50
STABILIZER	17,500	3,000	2,31	20,81
X-OVER	9,375	3,000	1,00	21,81
DRILL COLLAR	8,000	2,875	61,33	83,14
JAR	7,875		9,67	92,81
DRILL COLLAR	8,000	2,875	18,33	111,14
X-OVER	8,000	3,000	0,84	111,98
H W DRILL PIPE	5,500	3,875	27,18	139,16

BHA seq: 4

BHA category: Drilling

BHA description:

BHA no:

String component	OD in	ID in	Length m	Acc length m
BIT	17,500		0,40	0,40
NEARBIT STAB	17,500	3,000	2,42	2,82
NM DRILL COLLAR	9,500	3,000	2,95	5,77
STABILIZER, NM	17,500	3,000	2,35	8,12
X-OVER	9,500	3,000	1,00	9,12
PIN X PIN SUB	8,250		0,72	9,84
MWD MPR	8,250		4,78	14,62
MWD DCP	8,250		11,27	25,89
SAVER SUB	9,500		1,00	26,89
DRILL COLLAR	8,000	2,875	61,33	88,22
JAR	7,875		9,67	97,89
DRILL COLLAR	8,000	2,875	18,33	116,22
X-OVER	8,000	3,000	0,84	117,06

BHA seq:	5	H W DRILL PIPE	5,500	3,875	27,18	144,24
BHA no:		BHA category: Drilling	BHA description:			
		String component	OD in	ID in	Length m	Acc length m
		BIT	12,500		0,33	0,33
		NAVIDRILL M1/XL 1,0	9,500		10,94	11,27
		STAB SLEEVE	12,125	2,875	2,09	13,36
		PIN X PIN SUB	8,250	2,875	0,72	14,08
		MWD, MPR	8,250	3,500	4,78	18,86
		MWD DCP	8,250	3,000	11,27	30,13
		SAVER SUB	8,250	3,000	1,00	31,13
		STAB STRING	12,000	2,875	2,04	33,17
		DRILL COLLAR	8,000	2,875	78,92	112,09
		JAR	7,875		9,67	121,76
		DRILL COLLAR	8,000	2,875	18,33	140,09
		X-OVER	8,000	2,875	0,84	140,93
		H W DRILL PIPE	5,500	3,875	27,18	168,11
BHA seq:	6	BHA category:	BHA description:			
BHA no:		String component	OD in	ID in	Length m	Acc length m
		BIT	8,500		0,32	0,32
		AUTOTRAK	6,750	2,813	4,26	4,58
		ON TRAK	9,750	2,813	5,17	9,75
		BCPM	6,500	2,813	5,08	14,83
		ORD	6,750	2,813	2,49	17,32
		CCN	6,500	2,813	2,36	19,68
		STOP SUB	6,500	2,813	0,51	20,19
		ROLLER REAMER	6,500	2,813	2,03	22,22
		FLOAT SUB	6,500	2,875	0,97	23,19
		EXTENSION SUB	6,500	2,750	0,50	23,69
		NM DRILL COLLAR	6,500	2,750	9,47	33,16
		DRILL COL	6,500	2,750	28,11	61,27
		JAR	6,500	2,750	9,56	70,83
		DRILL COL	6,500	2,750	18,92	89,75
		X-OVER	7,250	3,000	0,98	90,73
		HW DRILL PIPE	5,500	3,875	81,74	172,47
		DRILL PIPE	5,500	4,778		172,47
BHA seq:	7	BHA category:	BHA description:			
BHA no:		String component	OD in	ID in	Length m	Acc length m
		CORE HEAD	8,500		0,36	0,36
		CORE BARREL	6,750	4,000	67,74	68,10
		FLOAT SUB			0,91	69,01
		DRILL COLLAR	6,500	2,750	28,11	97,12
		JAR	6,500	2,750	9,56	106,68
		DRILL COLLAR	6,500	2,750	18,92	125,60
		X-OVER	6,500	3,000	0,98	126,58
		HW DRILL PIPE	5,500	3,875	81,74	208,32
		DRILL PIPE	5,500	4,778		208,32
BHA seq:	8	BHA category:	BHA description:			
BHA no:		String component	OD in	ID in	Length m	Acc length m
		BIT	8,500		0,32	0,32
		NEARBIT STAB	8,500	2,875	1,96	2,28
		STOP SUB	6,500	2,813	0,50	2,78
		ON TRAK	8,375	2,813	5,17	7,95
		BCPM	6,500	2,813	5,08	13,03
		ORD	8,375	2,813	2,49	15,52
		CCN	6,500	2,813	2,36	17,88
		STOP SUB	6,500	2,813	0,52	18,40
		ROLLER REAMER	8,500	2,813	2,03	20,43
		FLOAT SUB	6,500	2,875	0,97	21,40
		EXTENSION SUB	6,500	2,750	0,50	21,90
		NM DRILL COLLAR	6,500	2,750	9,75	31,65

		DRILL COLLAR	6,500	2,750	28,11	59,76
		JAR	6,500	2,750	9,56	69,32
		DRILL COLLAR	6,500	2,750	18,92	88,24
		X-OVER	7,250	3,000	0,98	89,22
		HW DRILL PIPE	5,500	3,875	80,74	169,96
		DRILL PIPE	5,500	4,778		169,96
BHA seq:	9	BHA category:	BHA description:			
BHA no:						
		String component	OD in	ID in	Length m	Acc length m
		DRILL PIPE	3,500	2,750	260,99	260,99
		X-OVER	7,625	2,250	1,00	261,99
		DRILL PIPE	5,500	4,778		261,99
BHA seq:	10	BHA category:	BHA description:			
BHA no:						
		String component	OD in	ID in	Length m	Acc length m
		EZSV	9,625		0,88	0,88
		SETTING TOOL	6,250		1,49	2,37
		X-OVER	6,500	2,250	0,66	3,03
		DP 3 1/2"	3,500	2,750	260,99	264,02
		X-OVER	7,625	2,250	1,00	265,02
		DP 5 1/2"	5,500	4,778		265,02
BHA seq:	11	BHA category:	BHA description:			
BHA no:						
		String component	OD in	ID in	Length m	Acc length m
		EZSV	13,375		0,95	0,95
		SETTING TOOL	6,250		1,49	2,44
		X-OVER	6,500	2,250	0,66	3,10
		DP 3 1/2"	3,500	2,750	260,99	264,09
		X-OVER	7,625	2,250	1,00	265,09
		DP 5 1/2"	5,500	4,778		265,09
BHA seq:	12	BHA category:	BHA description:			
BHA no:						
		String component	OD in	ID in	Length m	Acc length m
		MOST TOOL			11,89	11,89
		DRILL COLLAR	8,000	3,000	51,52	63,41
		X-OVER	8,000	3,000	0,83	64,24
		HW DRILL PIPE	5,500	3,875		64,24

Printed
date:

21.01.2003

DBR standard report

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6 Appendices

App A : Operational listing

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities	
					During opr	End of opr		
17.12.2002 00:00	01:30	1,5	79,0	MNMU	OK	OK	Rig in transit from well 16/7-A01H. Skandi Bergen in towing gear.	
17.12.2002 01:30	06:00	4,5	79,0	MARU	OK	OK	Dropped Anchor #5 on approach. Ran Anchors #10, #6, #7 and #1.	
17.12.2002 06:00	09:00	3,0		MARU	OK	OK	Ran anchors on Beta West location.	
17.12.2002 09:00	14:00	5,0		MARU	OK	OK	Ballasted rig to 22 m draught.	
17.12.2002 14:00	17:00	3,0		MARU	OK	OK	Pull tested anchors to 160 ton / 15 min. No 1 anchor slipped and was reset w/ piggy back anchor. Finished ballasting rig to 22 m draught at 1420 hrs.	
17.12.2002 17:00	20:00	3,0		RMMU	OK	OK	Backloaded "Sigyn" equipment to "Normand Borg".	
17.12.2002 20:00	21:00	1,0		RMMU	OK	OK	Loaded bulk material from "Viking Dynamic"	
17.12.2002 21:00	22:00	1,0		DDOU	OK	OK	Held pre spud meeting w/ all crew.	
17.12.2002 22:00	00:00	2,0		RMMU	OK	OK	Cont unloading drilling equipment / bulk material from "Viking Dynamic". Meanwhile pressure tested top drive and lower kelly cock to 35bar/5min and 345 bar/ 10 min.	
		24,0						
18.12.2002 00:00	06:00	6,0		RMMU	OK	OK	Cont to take on drilling equipment from supply boat. Meanwhile tested stand pipe manifold to 35 bar / 5 min and 345 bar / 10 min. Started mixing spud mud at 0115 hrs.	
18.12.2002 06:00	07:30	1,5		RMMU	OK	OK	Took onboard drilling equipment and chemicals from supply boats. Meanwhile cont testing standpipe manifold. Hooked up cmt hose on drill floor.	
18.12.2002 07:30	09:00	1,5		DDOU	OK	OK	Cleared rig floor. Held SJA meeting prior to P/U DP from deck. P/U and installed auto slips. Held SJA meeting prior to using deck crane for moving DP from deck to cat walk due to ongoing repair work on Hydralift crane. Rearranged pipe in derrick.	
18.12.2002 09:00	12:00	3,0		DTPU	OK	OK	P/U and M/U 12 std 5 1/2" DP. Racked same in derrick.	
18.12.2002 12:00	13:00	1,0		CSOU	OK	OK	P/U and M/U cement stand and racked same in derrick	
18.12.2002 13:00	17:00	4,0	100,0	DTBU	OK	OK	P/U and M/U 3 std 5 1/2" HWDP and racked same in derrick. P/U and M/U BHA #1 and RIH to 100 m.	
18.12.2002 17:00	18:00	1,0	100,0	DDOU	OK	E FAIL	ROV installed 4 marker buoys in square pattern around well senter, 6 m radius. Meanwhile made check on top drive.	
18.12.2002 18:00	19:00	1,0	100,0	RMRD	E FAIL	OK	Made and installed extra rubber protection on main power cables for Top Drive.	
18.12.2002 19:00	19:30	0,5	100,0	DDOU	OK	OK	Pulled out one sgl DP, broke and L/O same. P/U drilling stand and M/U to string.	
18.12.2002 19:30	20:30	1,0	102,5	DDOU	OK	OK	Tagged sea bed at 102,6 m adjusted marker bouy position.	
18.12.2002 20:30	00:00	3,5	134,0	DDRU	OK	OK	Spudded well w/ 800 LPM, 50 RPM and 0 - 2 ton WOB. Incr pumprate from 112 m to 1500 LPM and further in steps to 4900 LPM. Also incr RPM from 50 to 100. Survey at 117 m 1,25 deg and at 134 m 1,5 deg. Reamed 5 m 3 times and drilled ahead.	
		24,0						
19.12.2002 00:00	03:30	3,5	151,6	DDRU	OK	OK	Drilled 17 1/2" x 26" x 36" hole from 134 m to 151,6 m w/ seawater sweeping hole w/ HiVis pills every 10 m. 4800 LPM / 140 bar, 0 - 2 ton WOB, 100 RPM. Inclination at TD 0,25 DEG.	
19.12.2002 03:30	05:00	1,5	151,6	DCAU	OK	OK	Cleaned out hole w/ HiVis mud at 5000 LPM / 140 bar. Displaced hole to 1,35 SG WBM at 4800 LPM / 175 bar.	
19.12.2002 05:00	06:00	1,0	38,0	DTCU	OK	OK	POOH to run casing. Stopped at 107 m and filled hole w/ 1,35 SG mud. 1 std 9 1/2" DC's and HO assy left at 0600 hrs.	
19.12.2002 06:00	07:00	1,0		DTCU	OK	OK	Cont B/U & L/D 26" x 36" HO assy.	
19.12.2002 07:00	09:00	2,0		CAOU	OK	OK	Prepared to run 30" CSG / PGB. Cleared rig floor, inspected derrick and top drive. Held SJA meeting prior to moving PGB. Moved PGB on trolley to well center, installed guide posts #1 and #2.	
19.12.2002 09:00	10:30	1,5		CAOU	OK	OK	Moved 30" running equipment to drill floor and rigged up same. P/U CART and racked in derrick on 1 std 5 1/2" DP. Held SJA meeting prior to running 30 " CSG/ PGB.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	--- Status ---		Description of activities	
					During opr	End of opr		
19.12.2002 10:30	12:00	1,5	37,0	CARU	OK	OK	P/U 30" shoe jt. Checked float. Ran shoe jt and 2 intermediate jts. Changed to 5 1/2" BX elevator. P/U 30" housing joint, cut off lifting lugs to make space for elevator.	
19.12.2002 12:00	15:30	3,5	60,0	CARU	OK	OK	Landed 30" WH housing in rotary. Broke and L/O CART handling tool. Ran 3 jts of 5 1/2" DP and a 5 1/2" pup jt as stinger. P/U CART std from derrick and M/U to stinger. M/U CART to WH housing w/ 5 left hand turns. Performed P/U test and lowered CSG through rotary. Oriented WH housing and landed in PGB. Locked housing to PGB. Lowered 30 " conductor / PGB into sea. Filled Conductor w/ seawater. Closed Valve on CART tool.	
19.12.2002 15:30	18:00	2,5	149,2	CARU	OK	OK	Ran 30" conductor / PGB on 5 1/2" landing string. Checked bulls eye indicators w/ free hanging string. M/U cmt stand and connected cmt hose. Cont RIH and landed string on 26" shoulder at 149,2 m MD. Checked WH stick up above seabed, verified 2,5 m. P/U string 1m and adjusted string wt to neutral. Pressure tested surface lines to 100 bar for 5 min. Circ 30 m3 seawater at 3000 LPM. Held pre job meeting prior to cementing conductor.	
19.12.2002 18:00	20:30	2,5	148,2	CSSU	OK	OK	Mixed and pumped 35 m3 cement slurry consisting of X-lite / G-cement / mix liquid to a SG varying from 1,63 to 1, 74. Displaced CMT w/ 5452 ltr seawater.	
19.12.2002 20:30	21:00	0,5	149,5	CAOU	OK	OK	Set conductor on 26" shoulder at 149,5 m. Checked w/ ROV: bulls eye indicator 0,75 deg, stick up 2,2 m. Released CART w/ 5 RH turns. Final check of PGB showing heading 313 deg. Pulled CART 3 m above wellhead. No movement of PGB observed. Final Bulls eye reading on PGB: 0.5 Deg.	
19.12.2002 21:00	23:00	2,0		CAOU	OK	OK	POOH w/ cmt std and racked in derrick. Flushed landing string and cmt stinger w/ cmt stinger 5 m into conductor. Pumped 25 m3 SW at 5000 LPM / 23 bar.	
19.12.2002 23:00	00:00	1,0		CAOU	OK	OK	P/U cmt std from derrick, broke and L/D pump in sub and kelly cock. Racked back stand in derrick. Changed out 2 ea 5 1/2" HWDP that was washed out on tool joints.	
		24,0						
20.12.2002 00:00	03:30	3,5		DDOU	OK	OK	P/U jar and 5 ea 8" DC. Made up in stands and set back in derrick.	
20.12.2002 03:30	05:00	1,5		DDOU	OK	OK	P/U premade bit and MWD assy. Connected cable to MWD and verified tool functions. Meanwhile prep. camera frame on cellar deck.	
20.12.2002 05:00	05:30	0,5		DDOU	OK	OK	Performed pull-off test: Pulled rig 36 m off in 2 min, 50 m off in 2 min 40 sec. Repositioned rig.	
20.12.2002 05:30	06:00	0,5		DDOU	OK	OK	Continued to prepare camera frame on cellar deck.	
20.12.2002 06:00	08:00	2,0	134,0	DTAK	OK	OK	RIH w/ 9 7/8" BHA. Positioned rig above well center and stabbed into 30" housing at 0728 hrs.	
20.12.2002 08:00	08:30	0,5	134,0	DDOU	OK	OK	Held shallow gas meeting w/ day crew prior to drilling 9 7/8" pilot hole.	
20.12.2002 08:30	10:00	1,5	134,0	DDOU	OK	OK	Ran frame w/ shallow gas observation camera on guide lines. Meanwhile checked out items on Odfjell shallow gas check list.	
20.12.2002 10:00	11:30	1,5	150,5	CDDU	OK	OK	RIH and tagged cmt at 146 m. Drilled cmt and shoetrack from 146 m to 150,5 m. 3000 LPM / 75bar, 65 RPM, 1 - 3 ton WOB and 1 - 2 Kftlbs torque. Reamed shoetrack several times.	
20.12.2002 11:30	00:00	12,5	329,0	DDLK	OK	OK	Drilled 9 7/8" pilot hole from 150,5 m to 329 m. Pumped 3000 LPM SW / 75 bar, 65 RPM / 1 - 2 Kftlbs, 1 - 3 ton WOB. At 225 m increased pump rate to 4000 LPM SW / 145 bar, 130 RPM / 1 - 2 Kftlbs, 0 - 2 ton WOB. Pumped 10 m3 Hi-vis sweeps every 15 m drilled. At 247 m, after drilling through possible shallow gas sand at 232 m, performed pump off test, pumped btm up and flow checked. No indication of shallow gas.	
		24,0						
21.12.2002 00:00	06:00	6,0	440,0	DDLK	OK	OK	Cont drilling 9 7/8" pilot hole from 329 m to 440 m. Pumped 4000 LPM SW / 145 to 155 bar, 1 - 5 ton WOB, 130 RPM / 1 - 3 Kftlbs. Pumped 10 m3 Hi-vis sweeps every 15 m.	
21.12.2002 06:00	06:30	0,5	450,0	DDLK	OK	OK	Cont drilling 9 7/8" pilot hole from 440 m to 450 m. Pumped 4000 LPM SW / 155 bar, 1 - 5 ton WOB, 130 RPM / 1 - 3 Kftlbs.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities
					During opr	End of opr	
21.12.2002 06:30	08:00	1,5	450,0	DDOU	OK	OK	Swept hole w/ 30 m3 Hi-vis pill. Flowchecked well for 30 min. Displaced hole to 1,35 SG WBM.
21.12.2002 08:00	10:00	2,0	100,0	DTAK	OK	OK	POOH from 450 m. Pumped 1,5 m3 1,35 SG WBM every std.
21.12.2002 10:00	12:30	2,5		DTBU	OK	OK	Racked std w/ jar back in derrick. Broke and L/O 3 x 8" DC. Racked back in derrick 1 std 8" DC. Dumped MWD tool memory. Meanwhile held SJA meeting for use of rig tongs on 17 1/2" BHA. Broke 9 7/8" bit and racked MWD in derrick.
21.12.2002 12:30	13:30	1,0		DDOU	OK	OK	Retrieved WH camera. Inspected and maintained top drive while retrieving camera.
21.12.2002 13:30	15:00	1,5		DDOU	OK	OK	P/U and M/U Weatherford remote operated cmt head to a stand, hooked up cement hose to same and set back in derrick.
21.12.2002 15:00	17:30	2,5	100,0	DTBU	OK	OK	P/U and M/U 171/2" BHA. Attached ropes to guide wires and RIH on 1 sgl + 2 std 8" DC's and jar stand. Stabbed into WH at 1655 hrs.
21.12.2002 17:30	19:00	1,5	151,5	CDDU	OK	E FAIL	RIH and tagged CMT in conductor at 146 m. Drilled CMT from 146 m to 151,5 m. WOB 0 - 3 ton, 60 RPM / 2 Kftlbs, 4000 LPM / 130 bar. Cleaned out shoetrack several times and pumped HI-vis pill.
21.12.2002 19:00	20:30	1,5	151,5	DEMD	E FAIL	OK	Attempted to start MWD. No pulses. Made 1,35 SG WBM for displacement prior to POOH.
21.12.2002 20:30	21:00	0,5	151,0	DEMD	E FAIL	OK	MWD started to pulse. Decoding of signals difficult. Took test survey, no success. Displaced hole to 1, 35 SG WBM.
21.12.2002 21:00	23:00	2,0		DTMD	E FAIL	OK	POOH. Broke and L/O defect MWD, P/U MWD stand from derrick and installed same in BHA.
21.12.2002 23:00	23:30	0,5	30,0	DTMD	E FAIL	OK	RIH. Installed ropes to guide wires and painted bit white.
21.12.2002 23:30	00:00	0,5	151,5	DTMD	E FAIL	OK	Cont RIH . Entered WH at 0010 hrs. Cont RIH to 151,5 m.
		24,0					
22.12.2002 00:00	06:00	6,0	378,0	DDRU	OK	OK	Drilled / reamed 17 1/2" hole from 151,5 m to 378 m. 4500 LPM / 152 bar, 150 RPM , 2 - 5 ton WOB.
22.12.2002 06:00	08:00	2,0	450,0	DDRU	OK	OK	Drilled / reamed 17 1/2" hole from 378 m to 450 m. 4400 LPM SW / 155 bar, 150 RPM / 2 - 5 Kftlbs, 1 - 4 ton WOB. Pumped Hi-vis pills every stand.
22.12.2002 08:00	09:30	1,5	450,0	DCAU	OK	OK	At TD at 450 m pumped 30 m3 Hi-vis pill. Displaced hole to 1,20 SG WBM. Pumped another 30 m3 Hi-vis pill and flowchecked well. While flowchecking made 20 m3 1,35 SG WBM. Displaced well to 1,35 SG mud.
22.12.2002 09:30	11:00	1,5	155,0	DTCU	OK	OK	POOH to run csg. Stopped at 155 m and topped up hole w/ 1,35 SG mud.
22.12.2002 11:00	12:30	1,5		DTBU	OK	OK	POOH w/BHA racking same in derrick. L/D NM stab, pony DC, NB stab and 17 1/2" bit.
22.12.2002 12:30	13:30	1,0		CERU	OK	OK	P/U 18 3/4" WH housing jt. P/U 1 sgl 5 1/2" DP and pupjt. M/U to WH housing jt and racked back in derrick.
22.12.2002 13:30	17:30	4,0		CERU	OK	E FAIL	Held pre job meeting prior to R/U and run 13 3/8" csg. Inspected top drive. R/U 13 3/8" csg running equipment. P/U drill floor stabbing arm (floormonkey) and installed same. Held SJA meeting prior to run 13 3/8" csg. Function tested csg tong and flush mounted slips.
22.12.2002 17:30	18:00	0,5		RMRD	E FAIL	OK	Changed 3 hoses on floormonkey.
22.12.2002 18:00	19:00	1,0	12,0	CARU	OK	OK	P/U shoe jt. Ran and set same in slips. Attached ropes to guide wires and painted shoe white.
22.12.2002 19:00	19:30	0,5	12,0	CAOU	OK	OK	Held pre job meeting / SJA with night crew prior to running 13 3/8" csg.
22.12.2002 19:30	21:30	2,0	87,0	CARU	OK	OK	RIH w/ 13 3/8" csg. Bakerlocked intermediate jt and float collar jt. Mounted centralizers on first 3 jts. RIH to 87 m.
22.12.2002 21:30	22:30	1,0	110,0	CAOU	OK	OK	Moved rig and adjusted over well center guided by ROV. Stabbed into well at 2215 hrs.
22.12.2002 22:30	23:00	0,5	123,0	CARU	OK	O FAIL	RIH w/ 13 3/8" csg from 110 m to 123 m. Had cross threading.
22.12.2002 23:00	23:30	0,5	111,0	CAOD	O FAIL	OK	Broke and L/O 2 ea csg jts due to cross threading.

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities
					During opr	End of opr	
22.12.2002 23:30	00:00	0,5	135,0	CARU	OK	OK	Ran 13 3/8" csg from 111 m to 135 m filling every jt w/ SW.
		24,0					
23.12.2002 00:00	02:00	2,0	330,0	CARU	OK	OK	Cont running 13 3/8" csg from 135 m to 330 m filling every joint.
23.12.2002 02:00	04:00	2,0	330,0	CARU	OK	OK	Held pre job meeting w/ SJA prior to P/U WH housing joint. P/U and M/U 13 3/8" x 20 " x-o and 18 3/4" WH housing. Changed to 5 1/2" DP elevator and slips.
23.12.2002 04:00	05:00	1,0	434,0	CARU	OK	OK	RIH w/ csg on 5 1/2" DP from 330 m to 434 m. Installed cmt stand.
23.12.2002 05:00	06:00	1,0	442,0	CARU	OK	OK	Circ and wash down to land CSG at 442 m. 55 LPM / 12 bar. Landed in conductor housing at 0530 hrs. Performed OP test to 25 ton. Circ around csg w/ 1700 LPM / 40 bar.
23.12.2002 06:00	06:30	0,5	442,0	CCCU	OK	OK	Cont circ SW around csg w/ 1700 LPM / 40 bar. Total 100 m3.
23.12.2002 06:30	09:30	3,0	442,0	CSSU	OK	OK	Pressure tested surface lines to 200 bar / 5 min. Held pre job meeting prior to cementing 13 3/8" csg. Dropped ball for bttm plug. Mixed and pumped 36,1 m3 1,56 SG lead slurry followed by 15 m3 1,92 SG tail slurry. Released dart and pumped 1250 l SW w/ cmt unit to shear out top plug. Top plug sheared w/ 90 bar. Displaced top plug w/ 200 LTR SW w/ cmt unit. Cont displacement w/ rig pumps. Total displacement w/ rigpumps = 23920 LTR = 1259 strokes (97 % eff). Final displ pressure 20 bar. Bumped plug w/ 90 bar. Checked for backflow. Had 800 LTR flowing back. Disconn cmt hose, released CART w/ 5 RH turn, racked back cmt std and pulled out to 5 m above PGB.
23.12.2002 09:30	11:00	1,5	90,0	CSOU	OK	OK	Released guideline from PGB. Pulled rig 35 m off location direction 210 deg.
23.12.2002 11:00	20:00	9,0		CTTU	OK	OK	POOH. B/O CART and cmt stinger. B/O and L/D cmt stand. Made up emergency hang off tool. P/U 12 1/4" motor assy. M/U MWD and 12 1/8" string stab, took scribe line, verified MWD and racked assy in derrick.
23.12.2002 20:00	00:00	4,0		DDWW	OK	OK	WOW. Performed maintenance acc to "maisy".
		24,0					
24.12.2002 00:00	06:00	6,0		DDWW	OK	OK	WOW to run BOP. Meanwhile performed housekeeping / routine maintenance on rig / drilling equipment.
24.12.2002 06:00	00:00	18,0		DDWW	OK	OK	WOW to run BOP. Meanwhile rig crew performed general maintenance on rig.
		24,0					
25.12.2002 00:00	06:00	6,0		DDWW	OK	OK	Cont WOW to run BOP.
25.12.2002 06:00	13:00	7,0		DDWW	OK	OK	WOW to run BOP. Meanwhile performed general rig maintenance. Ballasted rig from 17,5 m to 22 m draught from 0830 to 0945 hrs.
25.12.2002 13:00	15:30	2,5		BBOU	OK	OK	R/D monkeyarm on catwalk. R/U riser running equipment.
25.12.2002 15:30	18:00	2,5		BBOU	OK	OK	P/U 20 ft riser pupjt and 2 x 50 ft riser jts w/ float elements.
25.12.2002 18:00	19:00	1,0		BBOU	OK	OK	Moved BOP to moonpool center.
25.12.2002 19:00	19:30	0,5		BBOU	OK	OK	Held pre job meeting w/involvement crew prior to running BOP / riser. Held SJA to work in moonpool.
25.12.2002 19:30	00:00	4,5		BBOU	OK	OK	Connected riser to BOP. Adjusted bulls eye indicator on LMRP. Installed guidelines and beacon to BOP.
		24,0					
26.12.2002 00:00	00:30	0,5		BBOU	OK	OK	Cont preparation to run BOP / riser.
26.12.2002 00:30	06:00	5,5		BBRU	OK	OK	Ran BOP through splash zone at 0030 hrs. Tested k & ch lines to 35 / 345 bar for 5 / 10 min. Ran intermediate jts. P/U slip jt from derrick and made up same. Installed hydr hoses on slip jt. P/U supporting and installed same.
26.12.2002 06:00	11:00	5,0		BBRU	OK	OK	Ran BOP and riser. Cont to install support ring. Pressure tested k & ch lines through support ring to 35 / 345 bar for 5 / 10 min. Installed rucker wire # 2 and #5. Meanwhile moved rig to above well center. Stabbed guidelines #1, #2 and #4 W/ ROV. Landed BOP on WH at 0920 hrs. Locked WH-connector and performed OP test to 25 ton. Checked bulls eye indicator w/ ROV. Installed diverter and nipped up on cellar deck.

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	--- Status ---		Description of activities	
					During opr	End of opr		
26.12.2002 11:00	13:30	2,5		BBOU	OK	OK	Rigged down riser handling equipment. Meanwhile pressure tested csg and WH -connector against closed shear ram to 25 / 345 bar for 5 / 15 min. Hooked up drilling bailes and elevator. Installed autoslips.	
26.12.2002 13:30	18:30	5,0		DTPU	OK	E FAIL	P/U 36 single 5 1/2" DP and racked back in std in derrick. Hydr hose broke on iron roughneck.	
26.12.2002 18:30	19:00	0,5		DDOD	E FAIL	OK	Changed broken hydr hose on iron roughneck.	
26.12.2002 19:00	21:30	2,5		DTPU	OK	OK	Cont P/U 24 single 5 1/2" DP and Racked back in derrick.	
26.12.2002 21:30	23:30	2,0		CSOU	OK	OK	M/U cement stand and racked back in derrick.	
26.12.2002 23:30	00:00	0,5		DDOU	OK	OK	Ran motor stand below rotary. Plugged in MWD and verified same. Meanwhile Sperry Sun calibrated depth sensor on DW.	
		24,0						
27.12.2002 00:00	01:30	1,5	140,0	DTDU	OK	OK	Cont RIH w/ 12 1/4" BHA.	
27.12.2002 01:30	02:30	1,0	263,0	DTPU	OK	E FAIL	P/U 5 1/2" DP from deck and RIH to 263 m. Had failure on BX elevator.	
27.12.2002 02:30	03:00	0,5	263,0	DDOD	E FAIL	OK	Changed hydr hose on BX-elevator.	
27.12.2002 03:00	05:30	2,5	416,0	DTPU	OK	OK	Cont P/U 5 1/2" DP from deck and RIH from 263 m to 390 m. Washed down on last stand and tagged cmt/float collar at 416 m.	
27.12.2002 05:30	06:00	0,5	400,0	DDOU	OK	OK	Held pre job meeting and stuck pipe meeting prior to drilling cmt.	
27.12.2002 06:00	07:30	1,5	400,0	DDOU	OK	OK	Performed kick drill with day and night crew. Took SCR.	
27.12.2002 07:30	11:00	3,5	442,0	CDDU	OK	OK	Drilled float and cement from 416 m to 442 m. 3800 l/min, 145 bar, 50 rpm, 1-4 ton WOB.	
27.12.2002 11:00	12:00	1,0	450,0	CDDU	OK	OK	Drilled cement and cleaned rat hole from 442 m to 450 m. Pumped 10 m3 hi-vis pill and displaced well to 1,12 sg Glydril WBM while drilling cement. 4000 l/min, 142 bar, 60 rpm, 1-5 ton WOB.	
27.12.2002 12:00	13:00	1,0	453,0	CDDU	OK	OK	Cleaned out rat hole. Drilled 3 m new formation to 453 m. 4000 l/min, 142 bar, 200 bit rpm, 1,8-2,5 kNm, 1,7-7,4 ton WOB.	
27.12.2002 13:00	13:30	0,5	453,0	CDDU	OK	OK	Circulated B/U. Displaced K/C lines to 1,12 sg WBM.	
27.12.2002 13:30	14:30	1,0	453,0	EXLU	OK	OK	Performed LOT equivalent to 1,51 sg.	
27.12.2002 14:30	22:30	8,0	636,0	DDTU	OK	E FAIL	Picked up drilling stand from derrick. Drilled 12 1/4" hole from 453 m to 636 m. 4000 l/min, 155 bar, 200 bit rpm, 2,0-3,4 kNm, 1,0-6,4 ton WOB. MWD database freezed.	
27.12.2002 22:30	23:00	0,5	636,0	DEMD	E FAIL	OK	Rebooted MWD computer.	
27.12.2002 23:00	00:00	1,0	647,0	DDTU	OK	OK	Drilled 12 1/4" hole from 636 m to 647 m. 4050 l/min, 157 bar, 303 bit rpm, 2,5-3,5 kNm, 1,0-6,1 ton WOB.	
		24,0						
28.12.2002 00:00	06:00	6,0	805,0	DDTU	OK	OK	Drilled 12 1/4" hole from 647 m to 805 m. Reamed one singel on each connections from 709 m. Gained 1 m3 at 748 m. Flow checked for 15 min, well stable. 4065 l/min, 170 bar, 303 bit rpm, 2,0-4,4 kNm, 1,0-13 ton WOB.	
28.12.2002 06:00	13:30	7,5	1080,0	DDTU	OK	OK	Drilled 12 1/4" hole from 805 m to 1080 m. 4010 l/min, 185 bar, bit rpm 54-296, 2-9 kNm, WOB 1-8 ton.	
28.12.2002 13:30	16:00	2,5	1080,0	DDOW	OK	OK	Waited on boat to arrive with mud chemicals. Meanwhile circulated to conditioned mud. Reduced MW from 1,22 sg to 1,19 sg. 4000 l/min, 174 bar.	
28.12.2002 16:00	23:30	7,5	1319,0	DDTU	OK	OK	Drilled 12 1/4" hole from 1080 m to section TD at 1319 m. 4050 l/min, 177 bar, bit rpm 295, 2,2-7,3 kNm, 1-43 ton WOB. Steered intervals: 1133 m - 1165 m, 1176 m - 1196 m, 1220 m - 1230 m, 1239 m - 1260m, 1272 m - 1288 m.	
28.12.2002 23:30	00:00	0,5	1319,0	DCAU	OK	OK	Circulated to hole clean. 4500 l/min, 200 bar.	
		24,0						
29.12.2002 00:00	00:30	0,5	1319,0	DDOU	OK	OK	Flow checked well due to sudden stop in losses, well stable.	
29.12.2002 00:30	02:00	1,5	1319,0	DCAU	OK	OK	Circulated hole clean meanwhile boosted riser. 4500 l/min, 200 bar.	
29.12.2002 02:00	03:00	1,0	1172,0	DTCU	OK	OK	Took tourque and weight readings. Flow checked, well static. Pulled 5 stand wet. Pumped slug. Dropped 3" drift.	
29.12.2002 03:00	05:00	2,0	445,0	DTCU	OK	OK	POOH from 1172 m to 445 m.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

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Time from	Time to	Time used	Depth mMD	Act code	--- Status ---		Description of activities	
					During opr	End of opr		
29.12.2002 05:00	05:30	0,5	445,0	DCAU	OK	OK	Circulated hole clean, meanwhile boosted riser. 4600 l/min, 185 bar. Took tourque and weight readings.	
29.12.2002 05:30	06:00	0,5	303,0	DTCU	OK	OK	Flow checked well. POOH from 445 m to 303 m.	
29.12.2002 06:00	09:30	3,5		DTCU	OK	OK	POOH from 303 m. Flow checked before BHA entered BOP. Picked up one singel 8" DC, made up to one stand and racked back same. Laid down jar. Racked back motor and MWD.	
29.12.2002 09:30	10:00	0,5		DTCU	OK	OK	Cleaned and cleared rig floor.	
29.12.2002 10:00	10:30	0,5		CERU	OK	OK	Held tool box meeting. Picked up liner running equipment. Rigged up to run liner.	
29.12.2002 10:30	13:00	2,5		CERU	OK	E FAIL	Picked up hanger. Made up racking pup and pup on hanger, racked back same. Height sensor failed.	
29.12.2002 13:00	13:30	0,5		CAOD	E FAIL	OK	Calibrated mud logging height sensor.	
29.12.2002 13:30	14:00	0,5		CERU	OK	OK	Held pre job meeting and SJA prior to run 9 5/8" liner. Checked top drive.	
29.12.2002 14:00	17:00	3,0	257,0	CARU	OK	E FAIL	Ran 9 5/8" liner to 257 m. Baker locked Shoe, intermediate and float joint. Casing tong failed.	
29.12.2002 17:00	17:30	0,5	257,0	CAOD	E FAIL	OK	Repaired internal leak in valves on casing tong.	
29.12.2002 17:30	00:00	6,5	843,0	CARU	OK	OK	Ran 9 5/8" liner from 257 m to 843 m.	
		24,0						
30.12.2002 00:00	00:30	0,5	915,0	CARU	OK	OK	Ran 9 5/8/ liner from 843 m to 915 m. Lost 4,6 m3 mud to formation.	
30.12.2002 00:30	01:30	1,0	915,0	CARU	OK	OK	Made up 9 5/8" liner hanger.	
30.12.2002 01:30	02:00	0,5	915,0	CARU	OK	OK	Filled floating junk bonnet with fresh water.	
30.12.2002 02:00	05:00	3,0	1311,0	CARU	OK	OK	Broke out racking pup and pup on hanger. Ran 9 5/8" liner on landing string down to 1311 m. Lost 2,0 m3 mud to formation, total losses 6,6 m3 mud.	
30.12.2002 05:00	06:00	1,0	1316,5	CARU	OK	OK	Made up cement stand. Broke circulation. Circulated down and tagged bottom at 1319 m, no fill. Picked up, shoe depth 1316,5 m, top PBR 392 m. Connected control hoses to cement head.	
30.12.2002 06:00	06:30	0,5	1316,5	CARU	OK	OK	Circulated 1,5 times bottoms up. Increased pump rate in steps to 1000 l/min, 33 bar, 11 rpm, 4000 ftlb.	
30.12.2002 06:30	07:00	0,5	1316,5	CARU	OK	E FAIL	Dropped ball to set liner hanger. Pumped ball down, ball not seated.	
30.12.2002 07:00	08:00	1,0	1316,5	CAOD	E FAIL	OK	Pumped 4 m3 hivis pill to clear pipe/push ball down, no success. Dropped second ball.	
30.12.2002 08:00	09:00	1,0	1316,5	CARU	OK	OK	Pumped down ball with 500 l/min. Ball seat shear at 130 bar. Set liner hanger. Rotated 8 turns, running tool free. Circulated with 500 l/min.	
30.12.2002 09:00	10:00	1,0	1316,5	CSSU	OK	OK	Held pre job meeting. Pressure tested surface lines to 345 bar/10 min. Pumped 15 m3 1,35 sg spacer with rig pumps.	
30.12.2002 10:00	11:00	1,0	1316,5	CSSU	OK	OK	Mixed and pumped 27 m3 1,56 sg lead slurry followed by 8 m3 1,90 sg tail slurry. Released DP wiper plug	
30.12.2002 11:00	11:30	0,5	1316,5	CSSU	OK	OK	Displaced cement with 1,19 sg mud with rig pumps, 700 l/min. Dart sheared at 145 bar. Increased flow to 2000 l/min. Reduced pump rate last 4 m3, 60 bar. Bumped plug and pressure tested plug to 130 bar. 97% efficiency on mud pumps.	
30.12.2002 11:30	12:00	0,5	1316,5	CSSU	OK	OK	Bled off pressure on cement unit and checked for back flow.	
30.12.2002 12:00	12:30	0,5	388,0	CARU	OK	OK	Pulled up 4 m. Set down 30 ton, sheared packer dogs and set packer. Picked up landing string. Circulated bottoms up from liner lap, dumped 44 m3 cement contaminated mud.	
30.12.2002 12:30	14:30	2,0	388,0	CARU	OK	E FAIL	Flushed booster, kill and choke line. Slugged pipe. Drained cement stand, racked same back in derrick. Unable to open BX-elevator.	
30.12.2002 14:30	15:00	0,5	388,0	CAOD	E FAIL	OK	Repaired sensor in derrick for BX-elevator.	
30.12.2002 15:00	16:30	1,5		CARU	OK	OK	POOH, laid down liner hanger running tool.	
30.12.2002 16:30	17:30	1,0		CARU	OK	OK	Cleared rig floor for 9 5/8" liner running equipment.	
30.12.2002 17:30	18:30	1,0		CSSU	OK	OK	Laid down cement head.	
30.12.2002 18:30	19:30	1,0		DTBU	OK	OK	Laid down 12 1/4" BHA.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities	
					During opr	End of opr		
30.12.2002 19:30	20:30	1,0		CARU	OK	E FAIL	Cleaned and cleared rig floor. Laid down excess equipment on deck. Derrick camera failed.	
30.12.2002 20:30	21:30	1,0		DEOD	E FAIL	OK	Took down derrick camera, to be repaired.	
30.12.2002 21:30	22:00	0,5		CARU	OK	OK	Cleaned and tidy up on rig floor. Laid down excess equipment on deck.	
30.12.2002 22:00	00:00	2,0	203,0	DTPU	OK	OK	Picked up 5 1/2" DP from deck while drifting DP to 2 3/4". Made up and RIH to 203 m.	
		24,0						
31.12.2002 00:00	03:30	3,5		DTPU	OK	OK	Picked up 5 1/2" DP from deck while drifting DP to 2 3/4". Made up and RIH from 203 m to 522 m. POOH, racked 5 1/2" DP back in derrick.	
31.12.2002 03:30	04:00	0,5		CATU	OK	OK	Pressure tested 9 5/8" liner against BSR to 35/345 bar for 5/10 min. Meanwhile cleaned drip pan below rotary.	
31.12.2002 04:00	06:00	2,0		DTBU	OK	OK	Picked up from deck and made up 5 x 6 1/2" DC and 6 1/2" jar. Racked back in derrick.	
31.12.2002 06:00	09:00	3,0		DTBU	OK	OK	Held pre job meeting. Picked up and made up AutoTrack and MWD tool, BHA no. 6.	
31.12.2002 09:00	10:30	1,5		DTBU	OK	OK	Programmed AutoTrack.	
31.12.2002 10:30	13:00	2,5	171,0	DTBU	OK	OK	Installed radioactive source in MWD tool. Made up BHA no. 6.	
31.12.2002 13:00	14:00	1,0	202,0	DTDU	OK	O FAIL	RIH with 8 1/2" BHA from 171 m to 202 m while picking up 5 1/2" DP from deck. Drifted DP to 2 3/4". Wrong programming of AutoTrack tool.	
31.12.2002 14:00	18:00	4,0	202,0	DTMD	O FAIL	OK	POOH. Removed radioactive source. Reprogrammed AutoTrack. Installed radioactive source. RIH to 202 m.	
31.12.2002 18:00	00:00	6,0	849,0	DTDU	OK	OK	RIH with 8 1/2" BHA from 202 m to 849 m while picking up 5 1/2" DP from deck. Drifted DP to 2 3/4".	
		24,0						
01.01.2003 00:00	02:30	2,5	1244,0	DTDU	OK	OK	RIH with 8 1/2" BHA from 849 m to 1244 m while picking up 5 1/2" DP from deck. Drifted DP to 2 3/4".	
01.01.2003 02:30	03:00	0,5	1273,0	DTDU	OK	OK	Washed down last 2 stand, 1000 l/min. Tagged landing collar at 1277,5 m. Racked back one stand.	
01.01.2003 03:00	05:00	2,0	1273,0	DCAU	OK	OK	Held pre job meeting while checking AutoTrack, flow 2000 l/min. Displaced kill, choke and booster line to 1,45 sg Versavert OBM. Pumped 10 m3 hi-vis pill. Displaced well to 1,45 sg Versavert OBM, 2280 l/min, 210 bar. Meanwhile checked out temperature sensor on top drive.	
01.01.2003 05:00	06:00	1,0	1273,0	DCAU	OK	OK	Cleaned pits and surface equipment for WBM while transferring WBM to boat. Meanwhile checked out temperature sensor on top drive.	
01.01.2003 06:00	08:00	2,0	1273,0	DCAU	OK	E FAIL	Cleaned pits and surface equipment for WBM while transferring WBM to boat. Meanwhile checked out temperature sensor on top drive. Leakage in drip pan.	
01.01.2003 08:00	08:30	0,5	1273,0	DERD	E FAIL	OK	Repaired drip pan.	
01.01.2003 08:30	09:30	1,0	1273,0	DCAU	OK	OK	Displaced out interface. Performed choke drill with day crew.	
01.01.2003 09:30	15:00	5,5	1322,0	CDDU	OK	OK	Drilled out of 9 5/8" liner from 1277 m to 1316,5 m. Cleaned out rat hole from 1316,5 m to 1319 m. Drilled 3 m new formation to 1322 m. Lost 2 m3 mud to formation at 1319 m.	
01.01.2003 15:00	16:00	1,0	1282,0	ECFU	OK	E FAIL	Circulated hole clean and to even mud weight in/out, 1,42 sg. Meanwhile change electric cable on temperature sensor on top drive.	
01.01.2003 16:00	17:00	1,0	1282,0	DERD	E FAIL	OK	Changed electric cable on temperature sensor on top drive. Meanwhile circulating.	
01.01.2003 17:00	17:30	0,5	1282,0	EXLU	OK	OK	Closed pipe ram. Pulled string underneath ram. Lined up to pump down string and choke line. Pressured up with cement unit to 25 bar, pressure dropped to 22 bar and stabilized. Equivalent LOT to 1,58 sg at 1315 m TVD. Bled off pressure and opened BOP.	
01.01.2003 17:30	18:00	0,5	1322,0	DDDU	OK	OK	Took SCR.	
01.01.2003 18:00	23:00	5,0	1400,0	DDDU	OK	OK	Drilled 8 1/2" hole from 1322 m to 1400 m. Parameters: 83 rpm, 2-9 kNm, 2-4 ton WOB, 1393-1716 l/min, 101-138 bar.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

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					During opr	End of opr	
01.01.2003 23:00	23:30	0,5	1400,0	DCAU	OK	OK	Circulated bottoms up due hole packing off, pressure increased from 140 bar to 170 bar.
01.01.2003 23:30	00:00	0,5	1403,0	DDDU	OK	OK	Drilled 8 1/2" hole from 1400 m to 1403 m. Parameters: 85-121 rpm, 3,9-4 kNm, 4,6-5,4 ton WOB, 1780 l/min, 147-156 bar. Hole tendency to packing off.
		24,0					
02.01.2003 00:00	06:00	6,0	1492,0	DDDU	OK	OK	Drilled 8 1/2" hole from 1403 m to 1492 m. Parameters: 70-140 rpm, 3,9-4 kNm, 2-5,4 ton WOB, 1392-1932 l/min, 92-115 bar. Boosted riser at 1460 m. ECD at bit 1,59-1,63 sg.
02.01.2003 06:00	07:00	1,0	1492,0	DEMD	E FAIL	E FAIL	MWD computer freezed. Restarted MWD computer. Meanwhile circulating, 1870 l/min, 160 bar.
02.01.2003 07:00	22:00	15,0	1943,0	DDDU	OK	E FAIL	Drilled and surveyed 8 1/2" hole from 1492 m to 1943 m. Parameters: 112-140 rpm, 2,7-12,2 kNm, 2-8 ton WOB, 1820-1880 l/min, 147-168 bar. ECD at bit 1,58-1,66. Boosted riser at regularly intervals. Problems to read signals from MWD tool.
02.01.2003 22:00	22:30	0,5	1943,0	DEMD	E FAIL	OK	Cycled rig pumps to obtain good signals from MWD tool.
02.01.2003 22:30	00:00	1,5	1974,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 1943 m to 1974 m. Parameters: 140-142 rpm, 2,7-20 kNm, 0-6 ton WOB, 1850 l/min, 156-165 bar, ECD at bit 1,61-1,63. Boosted riser.
		24,0					
03.01.2003 00:00	05:00	5,0	2143,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 1974 m to 2143 m. Parameters: 140 rpm, 4,1-16,2 kNm, 0-6 ton WOB, 1850 l/min, 156-159 bar, ECD at bit 1,60-1,61.
03.01.2003 05:00	06:00	1,0	2143,0	DCAU	OK	OK	Circulated hole clean prior to drill into Balder Fm, 1850 l/min, 159 bar.
03.01.2003 06:00	00:00	18,0	2525,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 2143 m to 2525 m. Parameters: 140-200 rpm, 2,7-31,1 kNm, 2-12 ton WOB, 1820-1900 l/min, 147-170 bar, ECD at bit 1,58-1,62.
		24,0					
04.01.2003 00:00	06:00	6,0	2605,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 2525 m to 2605 m. Parameters: 200 rpm, 0-31,1 kNm, 7-11 ton WOB, 1900 l/min, 167-175 bar, ECD at bit 1,61-1,62.
04.01.2003 06:00	00:00	18,0	2750,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 2605 m to 2750 m. Parameters: 200 rpm, 0-34 kNm, 7-10 ton WOB, 2030 l/min, 190-192 bar, ECD at bit 1,61-1,62.
		24,0					
05.01.2003 00:00	05:30	5,5	2801,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 2750 m to 2801 m. Parameters: 200 rpm, 7-31 kNm, 6-8 ton WOB, 2000 l/min, 196 bar, ECD at bit 1,61-1,63.
05.01.2003 05:30	06:00	0,5	2801,0	ECSU	OK	OK	Circulated due to formation evaluation, 2000 l/min, 196 bar, ECD at bit 1,63.
05.01.2003 06:00	06:30	0,5	2801,0	ECSU	OK	OK	Circulated due to formation evaluation, 2000 l/min, 196 bar, ECD at bit 1,63.
05.01.2003 06:30	08:00	1,5	2827,0	DDDU	OK	OK	Drilled and surveyed 8 1/2" hole from 2801 m to core point at 2827 m. Parameters: 200 rpm, 3,5-17 kNm, 3,2-11 ton WOB, 2000 l/min, 196 bar, ECD at bit 1,61-1,63.
05.01.2003 08:00	10:30	2,5	2827,0	DCAU	OK	OK	Circulated hole clean, 2000 l/min, 190 bar, 160 rpm. Booted riser. Meanwhile held pre job meeting prior to dropp ESS.
05.01.2003 10:30	11:30	1,0	2827,0	DCAU	OK	OK	Flow checked well, well static.
05.01.2003 11:30	12:00	0,5	2827,0	DUSU	OK	OK	Dropped ESS tool in drillstring.
05.01.2003 12:00	16:00	4,0	1244,0	DTRU	OK	OK	POOH from 2827 m to 1244 m.
05.01.2003 16:00	17:30	1,5	1244,0	RMSU	OK	OK	Slipped 100' drill line. Adjusted crown saver and toggle valve.
05.01.2003 17:30	19:00	1,5	1244,0	BBDU	OK	OK	Function tested BOP from Blue and Yellow pod.
05.01.2003 19:00	21:00	2,0	1244,0	DCAU	OK	OK	Circulated bottoms up, 700-1700 l/min, 44-135 bar. Lossed 2 m3 to formation. Pumped slug.

Operations

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Wellbore: NO 16/7-8 S INITIAL

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					During opr	End of opr	
05.01.2003 21:00	00:00	3,0	61,0	DTRU	OK	OK	POOH to 61 m. Held pre job meeting prior to lay down ESS tool. Laid down ESS tool.
		24,0					
06.01.2003 00:00	02:00	2,0		DTRU	OK	OK	POOH with BHA. Removed radioactive sources. Broke out bit. Dumped data from MWD tool. Laid down AutoTrak steering system. Installed stop sub on MWD and racked back same.
06.01.2003 02:00	03:00	1,0		DTRU	OK	OK	Clean and cleared rig floor. Meanwhile checked topdrive and function tested BSR on acoustic.
06.01.2003 03:00	04:00	1,0		EECU	OK	OK	Held pre job meeting and performed SJA prior to pick up coring assembly. Meanwhile calibrated drill string compensator.
06.01.2003 04:00	04:30	0,5		ELOU	OK	OK	Calibrated drill string compensator.
06.01.2003 04:30	06:00	1,5		EECU	OK	OK	Made up coring assembly, BHA no. 7.
06.01.2003 06:00	11:30	5,5	207,0	EECU	OK	OK	Made up coring assembly, BHA no. 7. Held SJA meeting with day crew. Loaded EMS tool into inner tube.
06.01.2003 11:30	20:00	8,5	2827,0	ETCU	OK	OK	RIH with coring assembly from 207 m to 2827 m. Broke circulation at 1000 m, 1500 m and 2000 m with 1000 l/min, 52-53 bar. Circulated on riser while RIH. Washed down last stand and tagged TD at 2827 m.
06.01.2003 20:00	20:30	0,5	2827,0	ETCU	OK	OK	Dropped ball. Circulated ball down with 800 l/min, 55 bar, 25 rpm. Ball landed, pressure increased to 70 bar.
06.01.2003 20:30	00:00	3,5	2844,0	ERCU	OK	OK	Cut core from 2827 m to 2844 m. Parameters: 80-110 rpm, 6-9 kNm, 8-29 ton WOB, 1042 l/min, 106 bar.
		24,0					
07.01.2003 00:00	04:00	4,0	2874,5	ERCU	OK	OK	Cut core from 2884 m to 2874,5 m. Parameters: 110-120 rpm, 0-31 kNm, 18-22 ton WOB, 1042 l/min, 124 bar. Core jammed off. String torqued up and pressure increased to 145 bar. Took survey on bottom.
07.01.2003 04:00	05:30	1,5	2874,5	ECFU	OK	OK	Circulated 1,2 bottoms up, 1040 l/min, 130 bar, 20 rpm.
07.01.2003 05:30	06:00	0,5	2856,0	ETCU	OK	OK	Flow checked 10 min, well stable. POOH from 2874,5 to 2856 m.
07.01.2003 06:00	14:00	8,0	65,0	ETCU	OK	OK	POOH to top core barrel in RKB. Tight spot at 2850 m, 20 ton overpull. Flow checked at 9 5/8" shoe and before pulling BHA through BOP.
07.01.2003 14:00	14:30	0,5	65,0	EECU	OK	OK	Prepared to lay down core inner barrel's.
07.01.2003 14:30	16:30	2,0		EECU	OK	OK	Held pre job and SJA meeting. Laid down core inner barrel's. Recovered 2,9 m of 47,5 m cored, 6,1% recovery.
07.01.2003 16:30	17:00	0,5		EECU	OK	OK	Cleaned and cleared rig floor.
07.01.2003 17:00	19:30	2,5		EECU	OK	OK	Held pre job and SJA meeting. Laid down outer barrels.
07.01.2003 19:30	23:00	3,5	169,0	DTBU	OK	OK	Made up BHA no. 8. Connected electrical cable to MWD tool, programmed MWD tool. Installed radioactive sources.
07.01.2003 23:00	23:30	0,5	500,0	DTDU	OK	OK	RIH from 169 m to 500 m. Boosted riser with 1000 l/min while RIH.
07.01.2003 23:30	00:00	0,5	500,0	DTDU	OK	OK	Broke circulation and checked MWD tool.
		24,0					
08.01.2003 00:00	05:00	5,0	2750,0	DTDU	OK	OK	RIH from 500 m to 2750 m. Broke circulation at 1000 m, 1500 m and 2000 m, 1000 l/min, 43-51 bar. Boosted riser while RIH to 1500 m.
08.01.2003 05:00	06:00	1,0	2811,0	DTDU	OK	OK	Washed and reamed from 2750 m to 2811 m, 980-2000 l/min, 66-198 bar, 54 rpm, 6-7 kNm.
08.01.2003 06:00	08:30	2,5	2874,0	DTDU	OK	OK	Washed and reamed while logging from 2811 m to 2874 m, 2000 l/min, 193 bar, 50 rpm, 6-7 kNm.
08.01.2003 08:30	09:30	1,0	2900,0	DDRU	OK	OK	Drilled and surveyed 8 1/2" hole from 2874 m to final TD at 2900 m, 2003 l/min, 196 bar, 93-140 rpm, 8-12 kNm, 2-5 ton WOB.
08.01.2003 09:30	12:00	2,5	2900,0	DCAU	OK	OK	Logged with MWD (repeat section) from 2867 m to 2900 m while circulating bottoms up, 2000 l/min, 184 bar, 50 rpm. Flowchecked 10 min, well stable.
08.01.2003 12:00	17:00	5,0	88,0	DTDU	OK	OK	POOH with BHA. Flowchecked at 9 5/8" liner shoe for 10 min. Flowchecked with BHA below BOP for 10 min.

Operations

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Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities	
					During opr	End of opr		
08.01.2003 17:00	20:30	3,5		DTBU	OK	OK	POOH and laid down BHA. Laid down 6 1/2" DC and jar. Removed radioactive sources. Broke off bit. Dumped data from MWD tool. Laid down MWD tools.	
08.01.2003 20:30	21:00	0,5		DTPU	OK	OK	Laid down 1 stand 5 1/2" DP with damaged threads.	
08.01.2003 21:00	21:30	0,5		PTPU	OK	OK	Made up cement stand, racked same back in derrick.	
08.01.2003 21:30	22:00	0,5		PTPU	OK	E FAIL	Held pre job meeting prior to pick up 3 1/2" DP from deck. 3 1/2". Picked up one joint 3 1/2" DP. Automat slips failed.	
08.01.2003 22:00	22:30	0,5		PAOD	E FAIL	OK	Performed SJA and changed to manunell slips. Meanwhile repairing atomatslips.	
08.01.2003 22:30	00:00	1,5	126,0	PTPU	OK	OK	Picked up 3 1/2" DP from deck. RIH to 126 m and drifted same to 61 mm. Re-installed atomatslips.	
		24,0						
09.01.2003 00:00	01:00	1,0	260,0	PTPU	OK	OK	Picked up 3 1/2" DP from deck. RIH from 126 m to 260 m. Drifted same to 61 mm.	
09.01.2003 01:00	02:00	1,0	609,0	PTTU	OK	O FAIL	Changed to 5 1/2" handling equipment. RIH with cement stinger on 5 1/2" DP from 260 m to 609 m. Realized x-over on cement stinger was not drifted.	
09.01.2003 02:00	03:30	1,5	609,0	PAOD	O FAIL	OK	POOH to verify 2 1/4" ID on x-over on cement stinger. Not able to drift x-over. Evaluated situation. RIH to 609 m.	
09.01.2003 03:30	06:00	2,5	2067,0	PTTU	OK	OK	RIH with cement stinger on 5 1/2" DP from 609 m to 2067 m.	
09.01.2003 06:00	07:30	1,5	2872,0	PTTU	OK	OK	RIH with 3 1/2" cement stinger on 5 1/2" DP to 2872 m.	
09.01.2003 07:30	08:30	1,0	2900,0	PCCU	OK	OK	Washed down to TD at 2900 m. Circulated bottoms up, 2000 lpm, 157 bar. Meanwhile had pre-job meeting for setting cement plugs.	
09.01.2003 08:30	09:00	0,5	2900,0	PTPU	OK	OK	Racked back 1 stand and installed cement stand. Flushed cement line with spacer and pressure tested same to 200 bar/5 min.	
09.01.2003 09:00	10:30	1,5	2900,0	PSSU	OK	OK	Pumped 3 m3 1,68 sg spacer. Mixed and pumped 8,8 m3 1,90 sg cement slurry. Pumped 2,2 m3 spacer. Displaced with 26 m3 1,45 sg OBM using rig pump, 2000 lpm, 50 rpm.	
09.01.2003 10:30	12:00	1,5	2400,0	PTTU	OK	OK	Pulled 9 stands dry to 2640 m. Continued POOH to 2400 m.	
09.01.2003 12:00	12:30	0,5	2400,0	PCCU	OK	OK	Dropped wash ball and circulated same down.	
09.01.2003 12:30	13:30	1,0	1550,0	PTTU	OK	OK	POOH to 1550 m.	
09.01.2003 13:30	14:00	0,5	1550,0	PCCU	OK	OK	Pumped 7,5 m3 1,45 sg high viscosity pill, displaced same with 14,5 m3 1,45 sg OBM.	
09.01.2003 14:00	14:30	0,5	1400,0	PTTU	OK	OK	POOH to 1400 m.	
09.01.2003 14:30	15:00	0,5	1400,0	PCCU	OK	OK	Circulated with 1000 lpm/41 bar for 10 minutes to chase top of high viscosity pill up casing. Meanwhile pressure tested cement line to 150 bar/5 min. Pumped 7 m3 1,68 sg spacer with rig pumps.	
09.01.2003 15:00	15:30	0,5	1400,0	PSSU	OK	OK	Mixed and pumped 8,3 m3 1,92 sg cement slurry. Pumped 7,0 m3 spacer. Displaced with 8,5 m3 1,45 sg OBM using rig pump, 2000 lpm, 50 rpm.	
09.01.2003 15:30	17:00	1,5	800,0	PTTU	OK	OK	Pulled 9 stands dry to 1121 m. Continued POOH to 800 m.	
09.01.2003 17:00	18:00	1,0	800,0	PCCU	OK	OK	Dropped wash ball and circulated same down. Circulated bottoms up: 2000 lpm, 106 bar, 50 rpm. Pumped 10 m3 1,06 sg slop and displaced same with 6 m3 1,45 sg OBM. Pumped slug.	
09.01.2003 18:00	20:00	2,0	260,0	PTPU	OK	OK	POOH, L/D 5 1/2" DP, total 56 joints.	
09.01.2003 20:00	00:00	4,0	340,0	PTPU	OK	OK	P/U 5 1/2" stands from derrick, RIH to 800 m. Continued L/D 5 1/2" DP with 3 1/2" DP i hole.	
		24,0						
10.01.2003 00:00	00:30	0,5	260,0	PTPU	OK	OK	Continued L/D 5 1/2" DP with 3 1/2" DP in hole. Total 132 joints laid down to deck.	
10.01.2003 00:30	01:30	1,0		PTPU	OK	OK	POOH with 3 1/2" DP, racked same in derrick, total 9 stands.	
10.01.2003 01:30	02:00	0,5		PSTU	OK	O FAIL	Closed BSR. Attempted to pressure test cement plug to 100 bar, not able to exceed 30 bars. Bled off pressure. Opened BSR.	
10.01.2003 02:00	02:30	0,5		PAOD	O FAIL	OK	Prepared for running 9 5/8" EZSV. Had pre-job meeting.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities	
					During opr	End of opr		
10.01.2003 02:30	05:30	3,0	795,0	PAOD	O FAIL	OK	RIH with EZSV to 795 m. TOOK Up/Down weights: 52/51 tons.	
10.01.2003 05:30	06:00	0,5	795,0	PAOD	O FAIL	OK	Rotated 37 turns to set EZSV. Pulled 7 tons, held for 2 min. Increased OP to 14 tons, held for 2 min. Sheared sleeve with 21 tons OP. Pressure tested EZSV to 100 bar/10 min.	
10.01.2003 06:00	07:30	1,5		PAOD	O FAIL	OK	POOH from 795 m with 5 1/2" DP and 3 1/2" DP.	
10.01.2003 07:30	11:00	3,5	385,0	PSMU	OK	OK	Had pre-job meeting. M/U 13 3/8" EZSV, RIH on 3 1/2" DP and 5 1/2" DP to 385 m. Set EZSV and pressure tested same to 100 bar/10 min. Meanwhile displaced kill, choke and booster line to 1.20 sg high viscosity WBM, used base oil as spacer.	
10.01.2003 11:00	12:30	1,5	385,0	PCCU	OK	OK	Had pre-job meeting. Displaced well to sea water by pumping 3,5 m3 base oil and 13 m3 1,20 high viscosity WBM followed by SW. Displaced surface lines to SW.	
10.01.2003 12:30	14:00	1,5	385,0	PSSU	OK	OK	Hooked up cement line and pressure tested same to 100 bar/5 min. Mixed and pumped 18,5 m3 1,90 sg cement slurry. Displaced cement with 1 m3 sea water.	
10.01.2003 14:00	16:30	2,5		PTTU	OK	OK	R/D cement hose. POOH to 120 m. Circulated bottoms up. POOH.	
10.01.2003 16:30	18:00	1,5		BHRU	OK	OK	M/U jet sub and wear bushing retrieving tool. RIH, washed BOP and well head.	
10.01.2003 18:00	19:30	1,5		BHRU	OK	OK	Landed WB retrieving tool. Pulled WB free with 15 tons OP. POOH, L/D WB, B/O jet sub. Racked 5 1/2" DP in derrick.	
10.01.2003 19:30	20:30	1,0		PXXU	OK	OK	Re-arranged pipe/collars in derrick. Cleared rig floor.	
10.01.2003 20:30	22:30	2,0		BBRU	OK	OK	R/U to pull riser/BOP. Changed bails. Installed spider and diverter running tool. Had pre-job meeting.	
10.01.2003 22:30	00:00	1,5		BBRU	OK	OK	Disconnected and pull diverter, L/D same to pipe deck. Installed stand with running tool. Collapsed innerbarrel, locked dogs.	
		24,0						
11.01.2003 00:00	02:30	2,5		BBRU	OK	OK	Disconnected BOP at 00:10 hrs. Pulled rig 10 m off location. Hung off support ring. R/D landing stand. M/U one single 5" ITAG lift pipe to slip joint. Pulled slip joint and racked same in derrick.	
11.01.2003 02:30	06:00	3,5		BBRU	OK	OK	Pulled riser/BOP. BOP out of water at 03:35 hrs. R/D transponder and riser angle indicator. Removed guide lines. Installed new VX-ring. Landed BOP on carrier at 06:00 hrs.	
11.01.2003 06:00	09:30	3,5		BBRU	OK	OK	Secured BOP on carrier. Had pre-job meeting. Disconnected riser at 08:25 hrs. Skidded BOP to parking position. L/D 2 riser joints and 1 pup.	
11.01.2003 09:30	11:30	2,0		BBRU	OK	OK	L/D riser handling tool. Changed bails, installed BX elevator. Meanwhile positioned rig over well center.	
11.01.2003 11:30	13:30	2,0		PAHU	OK	OK	P/U MOST tool and RIH with same. Landed MOST tool on Wellhead at 13:35 hrs. Set down 10 tons.	
11.01.2003 13:30	15:30	2,0	105,5	PAHU	OK	OK	Cut 20" casing at 105,5 m, with 2000 lpm/135 bar. 20" casing cut at 13:55 hrs, pressure increased to 155 bar. Increased pump rate to 3200 lpm/180 bar. 30" conductor cut at 15:20 hrs. Locked MOST to WH housing, pulled housing free with 25 tons overpull.	
11.01.2003 15:30	18:00	2,5		PAHU	OK	OK	Disconnected guide wires and pulled same to surface. POOH with guide base, 20" casing and WH. Landed guide base on trolley and secured same. Disconnected MOST, racked back last stand of 8" DC and L/D MOST tool.	
11.01.2003 18:00	20:00	2,0		PAHU	OK	OK	P/U CART and landed same in WH. Locked CART to WH housing, pulled and L/D same.	
11.01.2003 20:00	00:00	4,0		RMMU	OK	OK	Broke and L/D 4 stands 8 1/2" DC and 1 stand 9 1/2" DC. Broke and L/D 3 1/2" test pipe with 5" ITAG lift pipe. L/D cement stand and drilling stand.	
		24,0						
12.01.2003 00:00	03:30	3,5		RMMU	OK	OK	Broke and L/D 9 stands 3 1/2" DP. L/D 42 joints 5 1/2" DP.	
12.01.2003 03:30	06:00	2,5		RMMU	OK	OK	Cleared rig floor. Secured slip joint i derrick. Disconnected and R/D BX elevator and bails.	

Operations

Start first activity: 01.01.1980 00:00 Start last activity: 08.07.2003 23:59

Well: NO 16/7-8 S

Wellbore: NO 16/7-8 S INITIAL

Time from	Time to	Time used	Depth mMD	Act code	---- Status ----		Description of activities
					During opr	End of opr	
12.01.2003 06:00	12:30	6,5		RMMU	OK	OK	R/D torque assembly on top drive. B/O upper kelly cock on top drive. Disconnected flex joint from BOP. Performed general rig maintenance. Backloaded demobilized equipment.
12.01.2003 12:30	00:00	11,5		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed general rig maintenance.
		24,0					
13.01.2003 00:00	06:00	6,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed general rig maintenance.
13.01.2003 06:00	00:00	18,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
		24,0					
14.01.2003 00:00	06:00	6,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
14.01.2003 06:00	00:00	18,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
		24,0					
15.01.2003 00:00	06:00	6,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
15.01.2003 06:00	00:00	18,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
		24,0					
16.01.2003 00:00	06:00	6,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
16.01.2003 06:00	00:00	18,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
		24,0					
17.01.2003 00:00	06:00	6,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
17.01.2003 06:00	00:00	18,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
		24,0					
18.01.2003 00:00	06:00	6,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed rig maintenance.
18.01.2003 06:00	21:00	15,0		MNWW	OK	OK	WOW to pull anchors. Meanwhile performed general rig maintenance.
18.01.2003 21:00	00:00	3,0		MARU	OK	OK	Started deballast rig at 20:45 hrs. Started anchor handling: Anchor #1: Boa Giant. Pulled surface bouy and pendant, found bolt in shackle missing. Wire broke when trying to lift piggy back. Hooked on anchor with grapple at 24:00 hrs. Piggy back left on bottom. Anchor #5: Olympic Poseidon. Pendant delivered at 21:30 hrs. Anchor off bottom at 22:10 hrs. Anchor #6: Skandi Bergen. Pendant delivered at 21:50 hrs.
		24,0					
19.01.2003 00:00	06:00	6,0		MARU	OK	OK	Finished deballasting rig to 11,5 m draught at 01:10 hrs. Anchor handling Anchor #6: Skandi Bergen. Anchor off bottom 00:40 hrs, anchor on bolster at 03:53 hrs. Anchor #5: Olympic Poseidon: Anchor on bolster at 04:10 hrs Anchor #8: Skandi Bergen. Pendant delivered at 04:10 hrs. Anchor off bottom at 04:55 hrs Anchor #3: Olympic Poseidon. Pendant delivered 05:00 hrs. Anchor off bottom at 05:25 hrs.
19.01.2003 06:00	19:00	13,0		MARU	OK	OK	Completed Anchor handling: Anchor #1: Boa Giant. Anchor on bolster at 06:00 hrs. Anchor #8: Skandi Bergen. Anchor on bolster at 06:45 hrs. Anchor #3: Olympic Poseidon. Anchor on bolster at 07:00 hrs. Anchor #10: Boa Giant. Pendant delivered at 07:37 hrs. Anchor on bolster at 12:00 hrs. Anchor #4: Boa Giant. Pendant delivered at 14:40 hrs. Anchor on bolster 15:35 hrs Anchor #9: Olympic Poseidon. Pendant delivered at 12:25 hrs. Anchor #2: Skandi Bergen. Pendant delivered at 16:04 hrs. Anchor #7. Boa Giant. Pendant delivered at 16:08 hrs. Anchor on bolster at 18:55 hrs. Ready for tow to lerce location with Skandi Bergen in anchor chain #2 and Olympic Poseidon in anchor chain #9. END OF WELL.
		19,0					
Sum wellbore		811,0					

**Final Well Report
PL 072B
Well 16/7-8S**

Doc. no.

Date
2003-07-07



Rev. no.

69 of 76

App B : Directional data, survey listing



Statoil,Slot #1
 16/7 Exploration,16/7
 EXPLORATION ZONE 31,Norway

SURVEY LISTING Page 1
 Wellbore: 16/7-8
 Wellpath: 16/7-8 Definitive (TD@2900)
 Date Printed: 12-Mar-2003



Wellbore

Name	Created	Last Revised
16/7-8	5-Mar-2003	12-Mar-2003

Well

Name	Government ID	Last Revised
16/7-8		5-Mar-2003

Slot

Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Slot #1	6467078.5901	442021.3048	N58 20 22.0600	E2 0 35.1500	14357.15S	47.12W

Installation

Name	Easting	Northing	Coord System Name	North Alignment
16/7 Exploration	442068.408	6481430.590	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Field

Name	Easting	Northing	Coord System Name	North Alignment
EXPLORATION ZONE 31	0.0000	0.0000	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Created By

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Comments

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All data is in Metres unless otherwise stated
 Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
 Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
 Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
 Calculation method uses Minimum Curvature method
 Prepared by Baker Hughes Incorporated

Wellpath Report								
MD[m]	Incl[deg]	Dir[deg]	TVD[m]	North[m]	East[m]	Dooleg [deg/30m]	Vertical Section[m]	
102.50	0.00	0.00	102.50	14357.15S	47.12W	0.00	0.00	
177.80	0.31	285.64	177.80	14357.10S	47.32W	0.12	-0.05	
209.20	0.28	230.77	209.20	14357.12S	47.46W	0.26	-0.02	
236.90	0.26	270.14	236.90	14357.17S	47.57W	0.20	0.02	
267.40	0.20	315.21	267.40	14357.13S	47.68W	0.18	-0.01	
295.50	0.40	223.29	295.50	14357.17S	47.78W	0.48	0.02	
324.10	0.28	261.00	324.10	14357.25S	47.92W	0.26	0.11	
353.40	0.11	215.65	353.40	14357.28S	48.01W	0.22	0.15	
382.30	0.34	354.40	382.30	14357.22S	48.03W	0.45	0.08	
411.60	0.22	312.83	411.60	14357.09S	48.08W	0.23	-0.04	
439.20	0.22	11.10	439.20	14357.01S	48.11W	0.23	-0.13	
454.00	0.16	42.63	454.00	14356.96S	48.09W	0.24	-0.17	
483.00	0.40	50.55	483.00	14356.87S	47.98W	0.25	-0.27	
512.00	0.38	41.13	512.00	14356.73S	47.84W	0.07	-0.41	
541.00	0.34	7.35	541.00	14356.58S	47.77W	0.22	-0.57	
570.00	0.40	42.06	570.00	14356.42S	47.69W	0.24	-0.73	
600.00	0.43	45.68	599.99	14356.26S	47.54W	0.04	-0.89	
629.00	0.40	37.61	628.99	14356.10S	47.40W	0.07	-1.05	
658.00	0.14	19.03	657.99	14355.99S	47.33W	0.28	-1.16	
687.00	0.13	34.37	686.99	14355.93S	47.30W	0.04	-1.22	
715.00	0.33	353.28	714.99	14355.82S	47.29W	0.26	-1.33	
745.00	0.38	337.48	744.99	14355.64S	47.34W	0.11	-1.51	
773.00	0.30	4.35	772.99	14355.49S	47.37W	0.19	-1.66	
802.00	0.27	20.33	801.99	14355.34S	47.34W	0.09	-1.80	
829.00	0.39	0.08	828.99	14355.19S	47.31W	0.18	-1.96	
859.00	0.18	1.99	858.99	14355.04S	47.31W	0.21	-2.10	
888.00	0.25	329.91	887.99	14354.94S	47.34W	0.14	-2.20	
918.00	0.46	2.74	917.99	14354.77S	47.37W	0.28	-2.38	
947.00	0.52	347.41	946.99	14354.52S	47.39W	0.15	-2.63	
976.00	0.69	359.66	975.99	14354.22S	47.42W	0.22	-2.93	
1005.00	0.49	341.67	1004.99	14353.93S	47.46W	0.28	-3.22	
1034.00	0.49	344.99	1033.98	14353.69S	47.53W	0.03	-3.46	
1063.00	0.83	333.82	1062.98	14353.38S	47.66W	0.37	-3.76	
1092.00	0.59	330.16	1091.98	14353.06S	47.83W	0.25	-4.08	
1121.00	0.69	333.91	1120.98	14352.78S	47.98W	0.11	-4.36	
1150.00	1.98	216.41	1149.97	14353.02S	48.35W	2.46	-4.11	
1179.00	4.66	202.57	1178.92	14354.51S	49.10W	2.87	-2.60	
1208.00	5.44	200.17	1207.81	14356.89S	50.03W	0.84	-0.21	
1238.00	7.39	192.55	1237.62	14360.11S	50.94W	2.12	3.03	
1267.00	10.05	179.11	1266.29	14364.46S	51.30W	3.45	7.38	
1296.00	11.74	172.60	1294.76	14369.92S	50.88W	2.16	12.83	
1322.60	11.85	172.33	1320.80	14375.31S	50.17W	0.14	18.21	
1352.70	13.55	172.84	1350.16	14381.87S	49.32W	1.70	24.75	
1380.00	15.01	175.49	1376.62	14388.57S	48.64W	1.76	31.44	
1409.10	17.34	177.66	1404.57	14396.66S	48.17W	2.48	39.52	
1437.70	20.01	182.13	1431.66	14405.81S	48.17W	3.18	48.67	
1468.30	21.59	180.82	1460.26	14416.67S	48.45W	1.61	59.53	
1495.50	23.35	180.25	1485.40	14427.07S	48.55W	1.96	69.93	
1525.60	25.26	181.33	1512.83	14439.45S	48.72W	1.95	82.32	
1554.60	26.85	181.75	1538.88	14452.19S	49.06W	1.66	95.05	
1583.60	28.47	180.62	1564.57	14465.65S	49.34W	1.76	108.51	
1611.50	30.04	180.24	1588.91	14479.28S	49.44W	1.70	122.15	
1640.60	31.35	179.24	1613.93	14494.13S	49.37W	1.45	137.00	
1669.70	32.72	179.97	1638.60	14509.57S	49.27W	1.47	152.43	
1698.60	34.03	180.22	1662.73	14525.47S	49.29W	1.37	168.32	
1727.70	34.73	180.34	1686.75	14541.90S	49.37W	0.73	184.76	
1756.70	35.09	180.52	1710.53	14558.49S	49.50W	0.39	201.35	

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Baker Hughes Incorporated

Wellpath Report									
MD[m]	Inc[deg]	Dir[deg]	TVD[m]	North[m]	East[m]	Dooleg [deg/30m]	Vertical Section[m]		
1785.80	35.20	179.80	1734.33	14575.24S	49.55W	0.44	218.10		
1814.70	35.06	179.83	1757.96	14591.87S	49.49W	0.15	234.73		
1843.80	35.22	180.15	1781.76	14608.62S	49.49W	0.25	251.47		
1872.80	35.16	180.24	1805.46	14625.34S	49.55W	0.08	268.18		
1901.80	35.21	179.86	1829.16	14642.05S	49.56W	0.23	284.89		
1932.10	35.18	179.20	1853.92	14659.51S	49.42W	0.38	302.35		
1959.00	35.17	179.49	1875.91	14675.00S	49.24W	0.19	317.84		
1989.00	35.15	179.42	1900.43	14692.28S	49.08W	0.04	335.11		
2018.00	35.13	180.19	1924.15	14708.97S	49.02W	0.46	351.80		
2047.40	35.24	179.94	1948.18	14725.91S	49.04W	0.18	368.73		
2076.00	35.11	179.67	1971.56	14742.39S	48.98W	0.21	385.21		
2105.10	35.12	179.76	1995.36	14759.13S	48.90W	0.05	401.94		
2133.90	35.11	179.82	2018.92	14775.69S	48.84W	0.04	418.50		
2163.00	35.13	180.39	2042.72	14792.43S	48.87W	0.34	435.24		
2191.80	35.15	180.51	2066.27	14809.01S	49.00W	0.07	451.82		
2220.90	35.10	180.74	2090.07	14825.75S	49.18W	0.15	468.56		
2249.90	35.17	181.34	2113.79	14842.44S	49.48W	0.36	485.25		
2278.90	35.06	181.41	2137.51	14859.11S	49.88W	0.12	501.93		
2307.90	33.71	181.36	2161.44	14875.49S	50.28W	1.40	518.31		
2337.00	33.81	181.01	2185.64	14891.66S	50.61W	0.23	534.48		
2365.90	35.18	181.52	2209.45	14908.02S	50.98W	1.45	550.85		
2394.90	35.19	181.55	2233.16	14924.72S	51.42W	0.02	567.56		
2424.00	35.22	182.39	2256.93	14941.49S	52.00W	0.50	584.33		
2454.00	35.23	182.49	2281.44	14958.78S	52.74W	0.06	601.63		
2482.20	35.21	182.85	2304.48	14975.02S	53.49W	0.22	617.88		
2511.30	35.14	182.23	2328.26	14991.77S	54.24W	0.38	634.64		
2540.60	35.13	182.55	2352.22	15008.62S	54.94W	0.19	651.50		
2569.70	35.07	182.27	2376.03	15025.33S	55.65W	0.18	668.23		
2597.80	35.19	182.16	2399.01	15041.49S	56.27W	0.14	684.39		
2627.40	35.17	182.19	2423.21	15058.53S	56.92W	0.03	701.44		
2656.40	35.19	181.86	2446.91	15075.23S	57.51W	0.20	718.15		
2685.80	34.81	181.73	2470.99	15092.09S	58.04W	0.40	735.01		
2715.00	34.86	181.52	2494.96	15108.76S	58.51W	0.13	751.69		
2744.00	34.87	181.98	2518.76	15125.33S	59.02W	0.27	768.27		
2772.50	34.81	182.07	2542.15	15141.60S	59.59W	0.08	784.54		
2791.90	34.83	181.88	2558.07	15152.67S	59.97W	0.17	795.62		
2801.50	34.87	181.40	2565.95	15158.15S	60.13W	0.87	801.11		
2819.40	34.84	181.26	2580.64	15168.38S	60.37W	0.14	811.34		
2827.00	34.93	181.62	2586.88	15172.73S	60.48W	0.89	815.68		
2858.70	36.51	182.69	2612.61	15191.22S	61.17W	1.61	834.18		
2888.70	37.78	182.54	2636.52	15209.32S	62.00W	1.27	852.29		
2893.00	37.80	182.55	2639.92	15211.95S	62.12W	0.15	854.93		
2900.00	37.80	182.55	2645.45	15216.23S	62.31W	0.00	859.21		

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 Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
 Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
 Calculation method uses Minimum Curvature method
 Prepared by Baker Hughes Incorporated

Hole Sections									
Diameter [in]	Start MD[m]	Start TVD[m]	Start North[m]	Start East[m]	End MD[m]	End TVD[m]	End North[m]	Start East[m]	Wellbore
36.000	102.50	102.50	14357.15S	47.12W	150.50	150.50	14357.13S	47.20W	16/7-8
17 1/2	150.50	150.50	14357.13S	47.20W	450.00	450.00	14356.97S	48.10W	16/7-8
12 1/4	450.00	450.00	14356.97S	48.10W	1319.00	1317.28	14374.58S	50.27W	16/7-8
8 1/2	1319.00	1317.28	14374.58S	50.27W	2900.00	2645.45	15216.23S	62.31W	16/7-8

Casings									
Name	Top MD[m]	Top TVD[m]	Top North[m]	Top East[m]	Shoe MD[m]	Shoe TVD[m]	Shoe North[m]	Shoe East[m]	Wellbore
30.000in Conductor	102.50	102.50	14357.15S	47.12W	149.50	149.50	14357.13S	47.20W	16/7-8
13 3/8in Casing	102.50	102.50	14357.15S	47.12W	442.00	442.00	14357.00S	48.11W	16/7-8
9 5/8in Casing	102.50	102.50	14357.15S	47.12W	1316.50	1314.83	14374.07S	50.34W	16/7-8

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Statoil, Slot #1
 16/7 Exploration, 16/7
 EXPLORATION ZONE 31, Norway

SURVEY LISTING Page 1
 Wellbore: 16/7-8
 Wellpath: 16/7-8 Definitive (TD@2900)
 Date Printed: 12-Mar-2003



INTEQ

Wellbore

Name	Created	Last Revised
16/7-8	5-Mar-2003	12-Mar-2003

Well

Name	Government ID	Last Revised
16/7-8		5-Mar-2003

Slot

Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Slot #1	6467078.5901	442021.3048	N58 20 22.0600	E2 0 35.1500	14357.15S	47.12W

Installation

Name	Easting	Northing	Coord System Name	North Alignment
16/7 Exploration	442068.408	6481430.590	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Field

Name	Easting	Northing	Coord System Name	North Alignment
EXPLORATION ZONE 31	0.0000	0.0000	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Created By

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Comments

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 Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
 Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
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Wellpath (Grid & Lat/Long) Report										
MD[m]	Inc[deg]	Dir[deg]	TVD[m]	Northing[]	Easting[]	Latitude	Longitude	Vertical Section[m]		
102.50	0.00	0.00	102.50	6467078.5	442021.3	N58 20 22.0600	E2 0 35.1500	0.00		
177.80	0.31	285.64	177.80	6467078.6	442021.1	N58 20 22.0617	E2 0 35.1379	-0.05		
209.20	0.28	230.77	209.20	6467078.6	442020.9	N58 20 22.0608	E2 0 35.1292	-0.02		
236.90	0.26	270.14	236.90	6467078.5	442020.8	N58 20 22.0594	E2 0 35.1222	0.02		
267.40	0.20	315.21	267.40	6467078.6	442020.7	N58 20 22.0605	E2 0 35.1156	-0.01		
295.50	0.40	223.29	295.50	6467078.5	442020.6	N58 20 22.0593	E2 0 35.1094	0.02		
324.10	0.28	261.00	324.10	6467078.4	442020.5	N58 20 22.0565	E2 0 35.1010	0.11		
353.40	0.11	215.65	353.40	6467078.4	442020.4	N58 20 22.0554	E2 0 35.0957	0.15		
382.30	0.34	354.40	382.30	6467078.5	442020.3	N58 20 22.0574	E2 0 35.0941	0.08		
411.60	0.22	312.83	411.60	6467078.6	442020.3	N58 20 22.0614	E2 0 35.0910	-0.04		
439.20	0.22	11.10	439.20	6467078.7	442020.3	N58 20 22.0642	E2 0 35.0891	-0.13		
454.00	0.16	42.63	454.00	6467078.7	442020.3	N58 20 22.0656	E2 0 35.0903	-0.17		
483.00	0.40	50.55	483.00	6467078.8	442020.4	N58 20 22.0687	E2 0 35.0967	-0.27		
512.00	0.38	41.13	512.00	6467079.0	442020.5	N58 20 22.0732	E2 0 35.1052	-0.41		
541.00	0.34	7.35	541.00	6467079.1	442020.6	N58 20 22.0784	E2 0 35.1097	-0.57		
570.00	0.40	42.06	570.00	6467079.3	442020.7	N58 20 22.0836	E2 0 35.1144	-0.73		
600.00	0.43	45.68	599.99	6467079.4	442020.8	N58 20 22.0887	E2 0 35.1235	-0.89		
629.00	0.40	37.61	628.99	6467079.6	442021.0	N58 20 22.0938	E2 0 35.1319	-1.05		
658.00	0.14	19.03	657.99	6467079.7	442021.1	N58 20 22.0975	E2 0 35.1363	-1.16		
687.00	0.13	34.37	686.99	6467079.8	442021.1	N58 20 22.0995	E2 0 35.1381	-1.22		
715.00	0.33	353.28	714.99	6467079.9	442021.1	N58 20 22.1029	E2 0 35.1385	-1.33		
745.00	0.38	337.48	744.99	6467080.1	442021.0	N58 20 22.1087	E2 0 35.1354	-1.51		
773.00	0.30	4.35	772.99	6467080.2	442021.0	N58 20 22.1138	E2 0 35.1334	-1.66		
802.00	0.27	20.33	801.99	6467080.4	442021.0	N58 20 22.1183	E2 0 35.1351	-1.80		
829.00	0.39	0.08	828.99	6467080.5	442021.1	N58 20 22.1232	E2 0 35.1363	-1.96		
859.00	0.18	1.99	858.99	6467080.7	442021.1	N58 20 22.1280	E2 0 35.1363	-2.10		
888.00	0.25	329.91	887.99	6467080.8	442021.0	N58 20 22.1313	E2 0 35.1344	-2.20		
918.00	0.46	2.74	917.99	6467080.9	442021.0	N58 20 22.1370	E2 0 35.1326	-2.38		
947.00	0.52	347.41	946.99	6467081.2	442021.0	N58 20 22.1449	E2 0 35.1309	-2.63		
976.00	0.69	359.66	975.99	6467081.5	442021.0	N58 20 22.1547	E2 0 35.1288	-2.93		
1005.00	0.49	341.67	1004.99	6467081.8	442020.9	N58 20 22.1641	E2 0 35.1261	-3.22		
1034.00	0.49	344.99	1033.98	6467082.0	442020.8	N58 20 22.1717	E2 0 35.1215	-3.46		
1063.00	0.83	333.82	1062.98	6467082.3	442020.7	N58 20 22.1816	E2 0 35.1136	-3.76		
1092.00	0.59	330.16	1091.98	6467082.6	442020.6	N58 20 22.1918	E2 0 35.1030	-4.08		
1121.00	0.69	333.91	1120.98	6467082.9	442020.4	N58 20 22.2010	E2 0 35.0935	-4.36		
1150.00	1.98	216.41	1149.97	6467082.7	442020.0	N58 20 22.1929	E2 0 35.0707	-4.11		
1179.00	4.66	202.57	1178.92	6467081.2	442019.3	N58 20 22.1443	E2 0 35.0260	-2.60		
1208.00	5.44	200.17	1207.81	6467078.8	442018.4	N58 20 22.0670	E2 0 34.9712	-0.21		
1238.00	7.39	192.55	1237.62	6467075.6	442017.4	N58 20 21.9626	E2 0 34.9182	3.03		
1267.00	10.05	179.11	1266.29	6467071.2	442017.1	N58 20 21.8218	E2 0 34.8997	7.38		
1296.00	11.74	172.60	1294.76	6467065.8	442017.5	N58 20 21.6456	E2 0 34.9304	12.83		
1322.60	11.85	172.33	1320.80	6467060.4	442018.2	N58 20 21.4718	E2 0 34.9791	18.21		
1352.70	13.55	172.84	1350.16	6467053.8	442019.1	N58 20 21.2601	E2 0 35.0373	24.75		
1380.00	15.01	175.49	1376.62	6467047.1	442019.7	N58 20 21.0440	E2 0 35.0850	31.44		
1409.10	17.34	177.66	1404.57	6467039.1	442020.2	N58 20 20.7828	E2 0 35.1214	39.52		
1437.70	20.01	182.13	1431.66	6467029.9	442020.2	N58 20 20.4871	E2 0 35.1292	48.67		
1468.30	21.59	180.82	1460.26	6467019.0	442019.9	N58 20 20.1359	E2 0 35.1221	59.53		
1495.50	23.35	180.25	1485.40	6467008.7	442019.8	N58 20 19.8000	E2 0 35.1256	69.93		
1525.60	25.26	181.33	1512.83	6466996.3	442019.7	N58 20 19.3996	E2 0 35.1261	82.32		
1554.60	26.85	181.75	1538.88	6466983.5	442019.3	N58 20 18.9880	E2 0 35.1165	95.05		
1583.60	28.47	180.62	1564.57	6466970.1	442019.0	N58 20 18.5529	E2 0 35.1118	108.51		
1611.50	30.04	180.24	1588.91	6466956.5	442018.9	N58 20 18.1123	E2 0 35.1179	122.15		
1640.60	31.35	179.24	1613.93	6466941.6	442019.0	N58 20 17.6323	E2 0 35.1356	137.00		
1669.70	32.72	179.97	1638.60	6466926.2	442019.1	N58 20 17.1336	E2 0 35.1560	152.43		
1698.60	34.03	180.22	1662.73	6466910.3	442019.1	N58 20 16.6198	E2 0 35.1687	168.32		
1727.70	34.73	180.34	1686.75	6466893.9	442019.0	N58 20 16.0887	E2 0 35.1786	184.76		

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 Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
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Wellpath (Grid & Lat/Long) Report									
MD[m]	Inc[deg]	Dir[deg]	TVD[m]	Northing[]	Easting[]	Latitude	Longitude	Vertical Section[m]	
1756.70	35.09	180.52	1710.53	6466877.33	442018.91	N58 20 15.5524	E2 0 35.1859	201.35	
1785.80	35.20	179.80	1734.33	6466860.58	442018.88	N58 20 15.0110	E2 0 35.1982	218.10	
1814.70	35.06	179.83	1757.96	6466843.94	442018.94	N58 20 14.4736	E2 0 35.2165	234.73	
1843.80	35.22	180.15	1781.76	6466827.21	442018.94	N58 20 13.9324	E2 0 35.2319	251.47	
1872.80	35.16	180.24	1805.46	6466810.50	442018.88	N58 20 13.3923	E2 0 35.2435	268.18	
1901.80	35.21	179.86	1829.16	6466793.80	442018.81	N58 20 12.8523	E2 0 35.2577	284.89	
1932.10	35.18	179.20	1853.92	6466776.34	442019.01	N58 20 12.2880	E2 0 35.2823	302.35	
1959.00	35.17	179.49	1875.91	6466760.84	442019.19	N58 20 11.7873	E2 0 35.3072	317.84	
1989.00	35.15	179.42	1900.43	6466743.58	442019.34	N58 20 11.2292	E2 0 35.3329	335.11	
2018.00	35.13	180.19	1924.15	6466726.90	442019.41	N58 20 10.6898	E2 0 35.3515	351.80	
2047.40	35.24	179.94	1948.18	6466709.90	442019.39	N58 20 10.1423	E2 0 35.3656	368.73	
2076.00	35.11	179.67	1971.56	6466693.49	442019.44	N58 20 9.6099	E2 0 35.3839	385.21	
2105.10	35.12	179.76	1995.36	6466676.70	442019.51	N58 20 9.0690	E2 0 35.4042	401.94	
2133.90	35.11	179.82	2018.92	6466660.20	442019.51	N58 20 8.5337	E2 0 35.4229	418.50	
2163.00	35.13	180.39	2042.72	6466643.41	442019.50	N58 20 7.9927	E2 0 35.4361	435.24	
2191.80	35.15	180.51	2066.27	6466626.90	442019.41	N58 20 7.4570	E2 0 35.4431	451.82	
2220.90	35.10	180.74	2090.07	6466610.10	442019.24	N58 20 6.9159	E2 0 35.4470	468.56	
2249.90	35.17	181.34	2113.79	6466593.44	442018.94	N58 20 6.3765	E2 0 35.4435	485.25	
2278.90	35.06	181.41	2137.51	6466576.81	442018.54	N58 20 5.8374	E2 0 35.4340	501.93	
2307.90	33.71	181.36	2161.44	6466560.44	442018.14	N58 20 5.3081	E2 0 35.4244	518.31	
2337.00	33.81	181.01	2185.64	6466544.20	442017.81	N58 20 4.7854	E2 0 35.4185	534.48	
2365.90	35.18	181.52	2209.45	6466527.92	442017.44	N58 20 4.2565	E2 0 35.4110	550.85	
2394.90	35.19	181.55	2233.16	6466511.21	442017.00	N58 20 3.7165	E2 0 35.3986	567.56	
2424.00	35.22	182.39	2256.93	6466494.41	442016.41	N58 20 3.1744	E2 0 35.3783	584.33	
2454.00	35.23	182.49	2281.44	6466477.18	442015.68	N58 20 2.6154	E2 0 35.3487	601.63	
2482.20	35.21	182.85	2304.48	6466460.94	442014.91	N58 20 2.0900	E2 0 35.3168	617.88	
2511.30	35.14	182.23	2328.26	6466444.20	442014.19	N58 20 1.5484	E2 0 35.2863	634.64	
2540.60	35.13	182.55	2352.22	6466427.30	442013.49	N58 20 1.0037	E2 0 35.2583	651.50	
2569.70	35.07	182.27	2376.03	6466410.61	442012.78	N58 20 0.4631	E2 0 35.2302	668.23	
2597.80	35.19	182.16	2399.01	6466394.50	442012.10	N58 19 59.9406	E2 0 35.2064	684.39	
2627.40	35.17	182.19	2423.21	6466377.40	442011.51	N58 19 59.3896	E2 0 35.1821	701.44	
2656.40	35.19	181.86	2446.91	6466360.71	442010.91	N58 19 58.8497	E2 0 35.1609	718.15	
2685.80	34.81	181.73	2470.99	6466343.92	442010.30	N58 19 58.3048	E2 0 35.1436	735.01	
2715.00	34.86	181.52	2494.96	6466327.24	442009.91	N58 19 57.7658	E2 0 35.1297	751.69	
2744.00	34.87	181.98	2518.76	6466310.69	442009.41	N58 19 57.2301	E2 0 35.1135	768.27	
2772.50	34.81	182.07	2542.15	6466294.41	442008.81	N58 19 56.7040	E2 0 35.0929	784.54	
2791.90	34.83	181.88	2558.07	6466283.30	442008.40	N58 19 56.3460	E2 0 35.0794	795.62	
2801.50	34.87	181.40	2565.95	6466277.80	442008.30	N58 19 56.1687	E2 0 35.0747	801.11	
2819.40	34.84	181.26	2580.64	6466267.61	442008.00	N58 19 55.8381	E2 0 35.0694	811.34	
2827.00	34.93	181.62	2586.88	6466263.31	442007.91	N58 19 55.6977	E2 0 35.0666	815.68	
2858.70	36.51	182.69	2612.61	6466244.81	442007.20	N58 19 55.0997	E2 0 35.0404	834.18	
2888.70	37.78	182.54	2636.52	6466226.71	442006.41	N58 19 54.5145	E2 0 35.0060	852.29	
2893.00	37.80	182.55	2639.92	6466224.10	442006.31	N58 19 54.4294	E2 0 35.0012	854.93	
2900.00	37.80	182.55	2645.45	6466219.81	442006.11	N58 19 54.2908	E2 0 34.9933	859.21	

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 Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
 Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
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Hole Sections									
Diameter [in]	Start MD[m]	Start TVD[m]	Start North[m]	Start East[m]	End MD[m]	End TVD[m]	End North[m]	Start East[m]	Wellbore
36.000	102.50	102.50	14357.15S	47.12W	150.50	150.50	14357.13S	47.20W	16/7-8
17 1/2	150.50	150.50	14357.13S	47.20W	450.00	450.00	14356.97S	48.10W	16/7-8
12 1/4	450.00	450.00	14356.97S	48.10W	1319.00	1317.28	14374.58S	50.27W	16/7-8
8 1/2	1319.00	1317.28	14374.58S	50.27W	2900.00	2645.45	15216.23S	62.31W	16/7-8

Casings									
Name	Top MD[m]	Top TVD[m]	Top North[m]	Top East[m]	Shoe MD[m]	Shoe TVD[m]	Shoe North[m]	Shoe East[m]	Wellbore
30.000in Conductor	102.50	102.50	14357.15S	47.12W	149.50	149.50	14357.13S	47.20W	16/7-8
13 3/8in Casing	102.50	102.50	14357.15S	47.12W	442.00	442.00	14357.00S	48.11W	16/7-8
9 5/8in Casing	102.50	102.50	14357.15S	47.12W	1316.50	1314.83	14374.07S	50.34W	16/7-8

All data is in Metres unless otherwise stated
 Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
 Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
 Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
 Calculation method uses Minimum Curvature method
 Prepared by Baker Hughes Incorporated

Errors start at Slot Permanent Datum (102.50)
Ellipses reported at a confidence limit of 95.00%.
Ellipse error terms are CORRELATED across ties between tools of the SAME CLASS

Wellbore		
Name	Created	Last Revised
16/7-8	5-Mar-2003	12-Mar-2003

Well		
Name	Government ID	Last Revised
16/7-8		5-Mar-2003

Slot						
Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Slot #1	6467078.5901	442021.3048	N58 20 22.0600	E2 0 35.1500	14357.15S	47.12W

Installation				
Name	Easting	Northing	Coord System Name	North Alignment
16/7 Exploration	442068.408	6481430.590	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Field				
Name	Easting	Northing	Coord System Name	North Alignment
EXPLORATION ZONE 31	0.0000	0.0000	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Created By

Comments

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
Calculation method uses Minimum Curvature method
Confidence Limit of 95.00%
Prepared by Baker Hughes Incorporated

Wellpath (Ellipse Semi-Axis) Report												
MD [m]	Inc [deg]	Dir [deg]	TVD [m]	North [m]	East [m]	Dogleg [deg/30m]	Vertical Section [m]	Ellipse Major Semi-Axis [m]	Ellipse Minor Semi-Axis [m]	Ellipse Vertical Semi-Axis [m]	Ellipse Minor Azi. [deg]	
102.50	0.00	0.00	102.50	14357.158	47.12W	0.00	0.00	0.00	0.00	0.69	N/A	
177.80	0.31	285.64	177.80	14357.108	47.32W	0.12	-0.05	0.21	0.21	0.69	N/A	
209.20	0.28	230.77	209.20	14357.128	47.46W	0.26	-0.02	0.22	0.22	0.70	N/A	
236.90	0.26	270.14	236.90	14357.178	47.57W	0.20	0.02	0.24	0.23	0.70	N/A	
267.40	0.20	315.21	267.40	14357.138	47.68W	0.18	-0.01	0.25	0.25	0.71	N/A	
295.50	0.40	223.29	295.50	14357.178	47.78W	0.48	0.02	0.26	0.26	0.72	N/A	
324.10	0.28	261.00	324.10	14357.258	47.92W	0.26	0.11	0.27	0.27	0.73	N/A	
353.40	0.11	215.65	353.40	14357.288	48.01W	0.22	0.15	0.28	0.28	0.75	N/A	
382.30	0.34	354.40	382.30	14357.228	48.03W	0.45	0.08	0.29	0.29	0.76	N/A	
411.60	0.22	312.83	411.60	14357.098	48.08W	0.23	-0.04	0.30	0.30	0.78	N/A	
439.20	0.22	11.10	439.20	14357.018	48.11W	0.23	-0.13	0.31	0.31	1.05	N/A	
454.00	0.16	42.63	454.00	14356.968	48.09W	0.24	-0.17	0.32	0.31	1.06	N/A	
483.00	0.40	50.55	483.00	14356.878	47.98W	0.25	-0.27	0.33	0.32	1.07	N/A	
512.00	0.38	41.13	512.00	14356.738	47.84W	0.07	-0.41	0.33	0.33	1.09	N/A	
541.00	0.34	7.35	541.00	14356.588	47.77W	0.22	-0.57	0.34	0.34	1.10	N/A	
570.00	0.40	42.06	570.00	14356.428	47.69W	0.24	-0.73	0.35	0.35	1.12	N/A	
600.00	0.43	45.68	599.99	14356.268	47.54W	0.04	-0.89	0.36	0.36	1.14	N/A	
629.00	0.40	37.61	628.99	14356.108	47.40W	0.07	-1.05	0.37	0.37	1.16	N/A	
658.00	0.14	19.03	657.99	14355.998	47.33W	0.28	-1.16	0.38	0.38	1.18	N/A	
687.00	0.13	34.37	686.99	14355.938	47.30W	0.04	-1.22	0.39	0.39	1.20	N/A	
715.00	0.33	353.28	714.99	14355.828	47.29W	0.26	-1.33	0.40	0.39	1.22	N/A	
745.00	0.38	337.48	744.99	14355.648	47.34W	0.11	-1.51	0.40	0.40	1.25	N/A	
773.00	0.30	4.35	772.99	14355.498	47.37W	0.19	-1.66	0.41	0.41	1.27	N/A	
802.00	0.27	20.33	801.99	14355.348	47.34W	0.09	-1.80	0.42	0.42	1.29	N/A	
829.00	0.39	0.08	828.99	14355.198	47.31W	0.18	-1.96	0.43	0.42	1.32	N/A	
859.00	0.18	1.99	858.99	14355.048	47.31W	0.21	-2.10	0.43	0.43	1.35	N/A	
888.00	0.25	329.91	887.99	14354.948	47.34W	0.14	-2.20	0.44	0.44	1.37	N/A	
918.00	0.46	2.74	917.99	14354.778	47.37W	0.28	-2.38	0.45	0.45	1.40	N/A	
947.00	0.52	347.41	946.99	14354.528	47.39W	0.15	-2.63	0.46	0.45	1.43	N/A	
976.00	0.69	359.66	975.99	14354.228	47.42W	0.22	-2.93	0.47	0.46	1.46	N/A	
1005.00	0.49	341.67	1004.99	14353.938	47.46W	0.28	-3.22	0.47	0.47	1.49	N/A	
1034.00	0.49	344.99	1033.98	14353.698	47.53W	0.03	-3.46	0.48	0.47	1.52	N/A	
1063.00	0.83	333.82	1062.98	14353.388	47.66W	0.37	-3.76	0.49	0.48	1.56	N/A	
1092.00	0.59	330.16	1091.98	14353.068	47.83W	0.25	-4.08	0.50	0.49	1.59	348.68	
1121.00	0.69	333.91	1120.98	14352.788	47.98W	0.11	-4.36	0.51	0.49	1.62	347.50	
1150.00	1.98	216.41	1149.97	14353.028	48.35W	2.46	-4.11	0.51	0.50	1.66	155.01	
1179.00	4.66	202.57	1178.92	14354.518	49.10W	2.87	-2.60	0.52	0.51	1.69	121.30	
1208.00	5.44	200.17	1207.81	14356.898	50.03W	0.84	-0.21	0.53	0.51	1.73	277.39	
1238.00	7.39	192.55	1237.62	14360.118	50.94W	2.12	3.03	0.55	0.53	1.76	245.50	
1267.00	10.05	179.11	1266.29	14364.468	51.30W	3.45	7.38	0.59	0.54	1.80	218.63	
1296.00	11.74	172.60	1294.76	14369.928	50.88W	2.16	12.83	0.67	0.58	1.96	207.15	
1322.60	11.85	172.33	1320.80	14375.318	50.17W	0.14	18.21	0.75	0.59	1.99	193.30	
1352.70	13.55	172.84	1350.16	14381.878	49.32W	1.70	24.75	0.88	0.61	2.02	186.65	
1380.00	15.01	175.49	1376.62	14388.578	48.64W	1.76	31.44	1.02	0.63	2.06	183.52	
1409.10	17.34	177.66	1404.57	14396.668	48.17W	2.48	39.52	1.21	0.65	2.09	181.92	
1437.70	20.01	182.13	1431.66	14405.818	48.17W	3.18	48.67	1.43	0.68	2.13	181.42	
1468.30	21.59	180.82	1460.26	14416.678	48.45W	1.61	59.53	1.70	0.71	2.17	181.45	
1495.50	23.35	180.25	1485.40	14427.078	48.55W	1.96	69.93	1.96	0.74	2.20	181.31	
1525.60	25.26	181.33	1512.83	14439.458	48.72W	1.95	82.32	2.27	0.78	2.24	181.23	
1554.60	26.85	181.75	1538.88	14452.198	49.06W	1.66	95.05	2.59	0.81	2.27	181.27	
1583.60	28.47	180.62	1564.57	14465.658	49.34W	1.76	108.51	2.94	0.85	2.31	181.26	
1611.50	30.04	180.24	1588.91	14479.288	49.44W	1.70	122.15	3.29	0.89	2.34	181.16	

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Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees

Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead

Calculation method uses Minimum Curvature method

Confidence Limit of 95.00%

Prepared by Baker Hughes Incorporated

Wellpath (Ellipse Semi-Axis) Report												
MD [m]	Inc [deg]	Dir [deg]	TVD [m]	North [m]	East [m]	Dogleg [deg/30m]	Vertical Section[m]	Ellipse Major Semi-Axis [m]	Ellipse Minor Semi-Axis [m]	Ellipse Vertical Semi-Axis [m]	Ellipse Minor Azi. [deg]	
1640.60	31.35	179.24	1613.93	14494.139	49.37W	1.45	137.00	3.67	0.93	2.38	181.00	
1669.70	32.72	179.97	1638.60	14509.579	49.27W	1.47	152.43	4.06	0.98	2.42	180.86	
1698.60	34.03	180.22	1662.73	14525.479	49.29W	1.37	168.32	4.47	1.03	2.46	180.79	
1727.70	34.73	180.34	1686.75	14541.909	49.37W	0.73	184.76	4.89	1.08	2.49	180.74	
1756.70	35.09	180.52	1710.53	14558.499	49.50W	0.39	201.35	5.32	1.12	2.53	180.72	
1785.80	35.20	179.80	1734.33	14575.249	49.55W	0.44	218.10	5.75	1.17	2.58	180.67	
1814.70	35.06	179.83	1757.96	14591.879	49.49W	0.15	234.73	6.17	1.22	2.62	180.61	
1843.80	35.22	180.15	1781.76	14608.629	49.49W	0.25	251.47	6.60	1.27	2.66	180.57	
1872.80	35.16	180.24	1805.46	14625.349	49.55W	0.08	268.18	7.03	1.33	2.70	180.55	
1901.80	35.21	179.86	1829.16	14642.059	49.56W	0.23	284.89	7.46	1.38	2.75	180.51	
1932.10	35.18	179.20	1853.92	14659.519	49.42W	0.38	302.35	7.90	1.44	2.79	180.45	
1959.00	35.17	179.49	1875.91	14675.009	49.24W	0.19	317.84	8.30	1.49	2.84	180.40	
1989.00	35.15	179.42	1900.43	14692.289	49.08W	0.04	335.11	8.74	1.55	2.88	180.35	
2018.00	35.13	180.19	1924.15	14708.979	49.02W	0.46	351.80	9.17	1.60	2.93	180.33	
2047.40	35.24	179.94	1948.18	14725.919	49.04W	0.18	368.73	9.60	1.66	2.98	180.31	
2076.00	35.11	179.67	1971.56	14742.399	48.98W	0.21	385.21	10.03	1.72	3.03	180.29	
2105.10	35.12	179.76	1995.36	14759.139	48.90W	0.05	401.94	10.45	1.78	3.07	180.27	
2133.90	35.11	179.82	2018.92	14775.699	48.84W	0.04	418.50	10.88	1.84	3.12	180.25	
2163.00	35.13	180.39	2042.72	14792.439	48.87W	0.34	435.24	11.31	1.90	3.17	180.25	
2191.80	35.15	180.51	2066.27	14809.019	49.00W	0.07	451.82	11.73	1.97	3.22	180.26	
2220.90	35.10	180.74	2090.07	14825.759	49.18W	0.15	468.56	12.16	2.03	3.27	180.27	
2249.90	35.17	181.34	2113.79	14842.449	49.48W	0.36	485.25	12.59	2.09	3.32	180.30	
2278.90	35.06	181.41	2137.51	14859.119	49.88W	0.12	501.93	13.02	2.16	3.38	180.34	
2307.90	33.71	181.36	2161.44	14875.499	50.28W	1.40	518.31	13.43	2.21	3.43	180.37	
2337.00	33.81	181.01	2185.64	14891.669	50.61W	0.23	534.48	13.85	2.28	3.48	180.39	
2365.90	35.18	181.52	2209.45	14908.029	50.98W	1.45	550.85	14.27	2.35	3.54	180.42	
2394.90	35.19	181.55	2233.16	14924.729	51.42W	0.02	567.56	14.70	2.41	3.59	180.45	
2424.00	35.22	182.39	2256.93	14941.499	52.00W	0.50	584.33	15.13	2.48	3.65	180.50	
2454.00	35.23	182.49	2281.44	14958.789	52.74W	0.06	601.63	15.57	2.55	3.70	180.56	
2482.20	35.21	182.85	2304.48	14975.029	53.49W	0.22	617.88	15.99	2.61	3.76	180.62	
2511.30	35.14	182.23	2328.26	14991.779	54.24W	0.38	634.64	16.42	2.68	3.81	180.66	
2540.60	35.13	182.55	2352.22	15008.629	54.94W	0.19	651.50	16.85	2.75	3.87	180.71	
2569.70	35.07	182.27	2376.03	15025.339	55.65W	0.18	668.23	17.28	2.82	3.93	180.75	
2597.80	35.19	182.16	2399.01	15041.499	56.27W	0.14	684.39	17.69	2.88	3.99	180.78	
2627.40	35.17	182.19	2423.21	15058.539	56.92W	0.03	701.44	18.13	2.96	4.04	180.82	
2656.40	35.19	181.86	2446.91	15075.239	57.51W	0.20	718.15	18.56	3.02	4.10	180.84	
2685.80	34.81	181.73	2470.99	15092.099	58.04W	0.40	735.01	18.99	3.09	4.16	180.86	
2715.00	34.86	181.52	2494.96	15108.769	58.51W	0.13	751.69	19.42	3.16	4.23	180.88	
2744.00	34.87	181.98	2518.76	15125.339	59.02W	0.27	768.27	19.84	3.24	4.29	180.90	
2772.50	34.81	182.07	2542.15	15141.609	59.59W	0.08	784.54	20.26	3.30	4.35	180.92	
2791.90	34.83	181.88	2558.07	15152.679	59.97W	0.17	795.62	20.55	3.35	4.39	180.94	
2801.50	34.87	181.40	2565.98	15158.159	60.13W	0.87	801.11	20.69	3.38	4.41	180.94	
2819.40	34.84	181.26	2580.64	15168.389	60.37W	0.14	811.34	20.95	3.42	4.45	180.94	
2827.00	34.93	181.62	2586.88	15172.739	60.48W	0.89	815.68	21.06	3.44	4.46	180.95	
2858.70	36.51	182.69	2612.61	15191.229	61.17W	1.61	834.18	21.54	3.52	4.53	180.98	
2888.70	37.78	182.54	2636.52	15209.329	62.00W	1.27	852.29	22.00	3.60	4.59	181.01	
2893.00	37.80	182.55	2639.92	15211.959	62.12W	0.15	854.93	22.07	3.65	4.63	181.02	
2900.00	37.80	182.55	2645.48	15216.239	62.31W	0.00	859.21	22.18	3.66	4.65	181.02	

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Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees

Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead

Calculation method uses Minimum Curvature method

Confidence Limit of 95.00%

Prepared by Baker Hughes Incorporated

Hole Sections

Diameter [in]	Start MD[m]	Start TVD[m]	Start North[m]	Start East[m]	End MD[m]	End TVD[m]	End North[m]	End East[m]	Wellbore
36.000	102.50	102.50	14357.15S	47.12W	150.50	150.50	14357.13S	47.20W	16/7-8
17 1/2	150.50	150.50	14357.13S	47.20W	450.00	450.00	14356.97S	48.10W	16/7-8
12 1/4	450.00	450.00	14356.97S	48.10W	1319.00	1317.28	14374.58S	50.27W	16/7-8
8 1/2	1319.00	1317.28	14374.58S	50.27W	2900.00	2645.45	15216.23S	62.31W	16/7-8

Casings

Name	Top MD[m]	Top TVD[m]	Top North[m]	Top East[m]	Shoe MD[m]	Shoe TVD[m]	Shoe North[m]	Shoe East[m]	Wellbore
30.000in Conductor	102.50	102.50	14357.15S	47.12W	149.50	149.50	14357.13S	47.20W	16/7-8
13 3/8in Casing	102.50	102.50	14357.15S	47.12W	442.00	442.00	14357.00S	48.11W	16/7-8
9 5/8in Casing	102.50	102.50	14357.15S	47.12W	1316.50	1314.83	14374.07S	50.34W	16/7-8

Survey Tool Program

Reference	Survey Name	MD[m]	TVD[m]	Survey Tool	Error Model
668061	16/7-8 BHI.MWD 9 7/8" (177.80-439.20)	439.20	439.20	Magnetic (MWD, EMS)	MWD, standard, mag-corr
668094	16/7-8 BHI.MWD 12 1/4" (454-1296)	1296.00	1294.76	Magnetic (MWD, EMS)	MWD, standard, mag-corr
668155	16/7-8 BHI.MWD 8 1/2" (1322.60-2893)	2893.00	2639.92	Magnetic (MWD, EMS)	MWD, standard, mag-corr
668159	16/7-8 Extrapolation (TD@2900)	2900.00	2645.45	Magnetic (MWD, EMS)	MWD, standard, mag-corr

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Vertical Section is from 14357.15S 47.12W on azimuth 181.01 degrees
Bottom hole distance is 859.21 Metres on azimuth 181.01 degrees from Wellhead
Calculation method uses Minimum Curvature method
Confidence Limit of 95.00%
Prepared by Baker Hughes Incorporated

**Final Well Report
PL 072B
Well 16/7-8S**

Doc. no.

Date
2003-07-07



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App C : Contractors list

List of Contractors

Service	Company	Telephone main office
Casing/ Liner hanger	Odfjell Casing Services	51 64 71 80
Cementing	Halliburton AS	51 83 70 00
Directional drilling	Baker Hughes INTEQ	51 71 75 00
Helicopters	Norsk Helikopter AS	51 64 66 00
	Helikopter Service AS	51 94 10 00
Diving	Oceaneering AS	51 82 51 00
Drilling contractor	Odfjell Drilling Services A.S	51 64 71 80
Electric logging	Schlumberger Offshore Service NV	51 69 50 00
Helicopter booking	Lufttransport (Statoil)	55 14 39 10
Mud	Anchor/M-I Drilling Fluids AS	51 57 73 00
Mud logging	Halliburton (Sperry Sun)	51 63 78 50
MWD	Baker Hughes INTEQ	51 71 75 00
Rig positioning	Thales Survey	55 34 94 00
Site survey	Switzer	
Wellhead system	ABB Offshore System AS	51 63 44 00

**Final Well Report
PL 072B
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App D : Wellsite sample description

WELLSITE SAMPLE DESCRIPTION			Page 1 of 17
Country: Norway		Area: North Sea	Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA	
RKB: 23 meters	Geologist: Tore Klungsøyr, Lars Rasmussen		
Hole size: 12 1/4 "	Cut solvent: Isopropanol		Date: 27.12.2002
Depth (m RKB)	Lithology (%)	Lithological Description	Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Shows, cavings, mud additives, etc.
460	80 20	Cl/Clst: med gry-med dk gry, amor-blky, stky, sft, sol, slty, v calc, tr diss carb mat Cmt	No shows
480	LOST		
490	100	Cl/Clst: a.a.	a.a.
500	100	Cl/Clst: a.a.	a.a.
510	100	Cl/Clst: a.a.	a.a.
520	LOST		
530	100	Cl/clst: a.a.	a.a.
540	100	Cl/Clst: also gnsh gry, lt olv gry, else a.a.	a.a.
550	LOST		
560	100	Cl/Clst: pred gnsh gry, amor, v stky, sft, sol, slty, v calc, gd tr diss carb mat	a.a.
570	LOST		
580	100	Cl/Clst: occ v f Qtz grains, occ tr of micropyr, else a.a.	a.a.
590	A.A.		
600	A.A.		
610	100	Cl/Clst: pred gnsh gry, amor, v stky, sft, sol, slty, v calc	a.a.
620	100	Cl/Clst: gnsh gry – dk gnsh gry, occ v f Qtz grains, else a.a.	a.a.
630	A.A.		
640	100	Cl/Clst: gnsh gry – dk gnsh gry, amor, v stky, sft, sol, slty – v slty, also f – med Qtz grains floating in the clay, v calc, tr diss carb mat	a.a.
650	A.A.		
655	100	Cl/Clst: occ med – v crs Qtz grains, rndd – sbrndd, occ sbang,, else a.a.	spot sample
660	LOST		
670	100	Cl/Clst: gnsh gry – dk gnsh gry, amor, v stky, sft, sol, slty – v slty, also f – med Qtz grains occ med – v crs Qtz grains, rndd – sbrndd, occ sbang floating in the clay, v calc, tr diss carb mat	a.a.
680	A.A.		
690	LOST		

WELLSITE SAMPLE DESCRIPTION			Page 2 of 17
Country: Norway		Area: North Sea	Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA	
RKB: 23 meters		Geologist: Tore Klungsøyr, Lars Rasmussen	
Hole size: 12 1/4 "		Cut solvent: Isopropanol	Date: 28.12.2002
Depth (m RKB)	Lithology (%)	Lithological Description	Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Shows, cavings, mud additives, etc.
700	100	Cl/Clst: gnsh gry – dk gnsh gry, amor, v stky, sft, sol, slty – v slty, also f – med Qtz grains floating in the Clay, v calc, tr diss carb mat	No shows
710	A.A.		
720	LOST		
730	100	Cl/Clst: sblky – amor, calc – v calc, else a.a.	a.a.
740	100	Cl/Clst: v f – f Qtz grains, else a.a.	a.a.
750	A.A.		
760	LOST		
770	LOST		
780	100	Cl/Clst: also occ med qtz grns, else a.a.	a.a.
790	100	Cl/clst: gnsh gry – dk gnsh gry, sblky – amor, v stky, sft – frm, sol, slty, f – med qtz grns floating in Clay, sbrnd – rnd, tr diss carb mat	a.a.
800	A.A.		
810	A.A.		
820	100	Cl/Clst: tr micropyr, else a.a.	a.a.
830	A.A.		
840	LOST		
850	100	Cl/clst: v sdy, a.a.	a.a.
860	100	Sst: clr – trnsl Qtz, dom med, also f and crs, sbrnd – rnd, occ sbang, lse, w srt Tr Cl/Clst: gnsh gry, amor, stky, sft, sol, slty, calc, diss carb frags Tr Shl frags, glauc	a.a.
870	100	Sst: mod – w srt, else a.a. Tr Cl/Clst: a.a. Tr Shl frags, glauc	a.a.
880	A.A.		
890	90 10	Sst: a.a. Cl/Clst: gnsh gry – dk gnsh gry, amor – sblky, stky, sft – frm, slty, sl calc, occ glauc, diss carb frags Tr Shl frags, glauc	a.a.
900	A.A.		

WELLSITE SAMPLE DESCRIPTION				Page 3 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 12 1/4 "		Cut solvent: Isopropanol		Date: 28.12.2002
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
910	LOST			
920	100 Tr	Sst: clr – transl Qtz, fn - med, also crs, sbrnd – rnd, occ sbang, lse, mod -w srt Cl/Clst: gnsh gry – dk gnsh gry, amor – sbblky, stky, sft – frm, slty, sl calc, occ glauc, diss carb frgs Tr Shl frags, glauc		No shows
930	100 GdTr Tr	Sst: a.a. Cl/Clst: a.a. Shl frags, glauc		a.a.
940	A.A.			
950	LOST			
960	100 Tr Tr Tr	Sst: a.a. Cl/Clst: a.a. Ls: off wh, dk yelsh or, grysh or, microxln, sft – frm Shl frags, glauc		a.a.
970	A.A.			
980	LOST			
990	A.A.			
1000	A.A.			
1010	LOST			
1020	A.A.			
1030	LOST			
1040	LOST			
1050	A.A.			
1060-1070: LOST				
1080	80 20 Tr	Sst: a.a. Clst: olv gry, amor – sbblky, sft – frm, slty, calc, occ micropyr Shl frags, glauc		a.a.
1090	65 30 5 Tr	Clst: dk gnsh gry, olv gry, sbblky, sft – frm, non – sl calc, occ v sdy/slty grdg arg Sst: a.a. Ls: off wh, microxln – cryptoxln, sbblky, sft – frm, occ arg Dol: lt olv gry, blk, microxln, frm		a.a.

WELLSITE SAMPLE DESCRIPTION				Page 4 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23	Meters	Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 12 1/4 "		Cut solvent: Isopropanol		Date: 28.12.2002
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
1100	LOST			
1110	100	Clst:	dk gnsh gry, olv gry, sbblky, sft – frm, sl calc – occ v calc, occ v sdy/slty	No shows
	Tr	Ls:	off wh, microxln – cryptoxln, sbblky, sft – frm, occ arg	
	Tr	Dol:	lt olv gry, blk, microxln, frm	
	Tr	Sst:	clr – transl Qtz, f - med, also crs, sbrnd – rnd, occ sbang, lse, mod -w srted	
1120	100	Clst:	a.a.	a.a.
1130	A.A.			
1140	95	Clst:	a.a.	a.a.
	5	Sst:	clr Qtz, f – occ med, sbrnd, mod – w srt, lse	
	Tr	Ls:	a.a.	
1150	LOST			
1160	LOST			
1170	100	Clst:	also brn gry, else a.a.	a.a.
	Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
1180	60	Sst:	a.a.	a.a.
	40	Clst:	a.a.	
	Tr	Ls:	a.a.	
1190	90	Clst:	a.a.	a.a.
	10	Sst:	a.a.	
	Tr	Ls:	a.a.	
1200	100	Clst:	a.a.	a.a.
	Gd Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
1210	100	Clst:	tr glauc, else a.a.	a.a.
	Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
1220	100	Clst:	a.a.	a.a.
	Tr	Sst:	a.a.	
	Tr	Dol:	a.a.	
1230	100	Clst:	a.a.	a.a.
	Tr	Sst:	a.a.	
	Tr	Dol:	a.a.	
	Tr	Ls:	a.a.	

WELLSITE SAMPLE DESCRIPTION				Page 5 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 Meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 12 1/4 "		Cut solvent: Isopropanol		Date: 28.12.2002
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
1240	95	Clst: dk gnsh gry, olv gry, brn gry, sbblky, sft – frm, sl calc – occ v calc, occ v sdy/slty, tr glauc		No shows
	5	Sst: clr Qtz, f – occ med, sbrnd, mod – w srtd, lse		
	Tr	Dol: lt olv gry, blk, microxln, frm		
	Tr	Ls: off wh, microxln – cryptoxln, sbblky, sft – frm, occ arg		
1250	100	Clst: a.a.		a.a.
	Tr	Sst: a.a.		
1260	100	Clst: a.a.		a.a.
	Tr	Sst: a.a.		
	Tr	Shl frags		
1270	100	Clst: a.a.		a.a.
	Tr	Sst: a.a.		
1280	100	Clst: mainly brnsh gry, else a.a.		a.a.
	Tr	Sst: a.a.		
1280	A.A.			
1300	LOST			
1310	100	Clst: brnsh gry, else a.a.		a.a.
	Tr	Sst: a.a.		
	Tr	Ls: a.a.		
1320	100	Clst: a.a.		a.a.

TD for 12 1/4" hole section at 1320.0mMD/1320.0mTVD

WELLSITE SAMPLE DESCRIPTION				Page 6 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 01.01.2003-02.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.

SPOT SAMPLE WHEN DRILLING 3M NEW FORMATION FROM 1319 – 1323M:

1323	100	Clst: olv blk, plty – blk, frm – mod hd, slty, occ glauc, non – sl calc	No shows 60% cmt contamin sample

1330	100	Clst: olv blk – gry blk, plty – sbblk, frm – mod hd, slty, non calc, micropyr?	No shows 50% cmt
1340	A.A.		a.a. 30 – 40% cmt
1350	A.A.		a.a. 30% cmt
1360	A.A.		a.a. 5– 10% cmt
1370	A.A.		
1380	100 Tr	Clst: a.a. Ls: pa gry brn, plty, frm	a.a. Trace of cmt
1390	A.A.		
1400	A.A.		No shows
1410	A.A.		
1420	A.A.		
1430	A.A.		
1440	A.A.		
1450	A.A.		
1460	100 Tr	Clst: Rare tr disseminated carb mat, else a.a. Ls: Grysh or – pa yelsh brn, blk – sbplty, frm – mod hd, microxln, sl arg – occ v arg grad calc Clst, occ pyr	No shows
1470	A.A.		
1480	100 Gd Tr	Clst: a.a. LS: a.a.	No shows

WELLSITE SAMPLE DESCRIPTION				Page 7 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 02.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
1490	100	Clst:	olv blk – gry blk, plty –blky, frm – mod hd, slty, non calc, micropyr, rare tr diss carb mat	No shows
	Gd Tr	Ls:	grysh or – pa yelsh brn, blk – sbplty, frm – mod hd, xln - microxln, sl arg – occ v arg grdg calc Clst, occ pyr	
1500	LOST			
1510	100	Clst:	a.a.	No shows
	Tr	Ls:	a.a.	
1520	A.A.			
1530	A.A.			
1540	100	Clst:	a.a.	No shows
	SITr	Ls:	a.a.	
1550	A.A.			
1560	100	Clst:	olv gry, brnsh gry, else a.a	a.a.
	Tr	Ls:	a.a.	
1570	A.A.			
1580	A.A.			
1590	A.A.			
1600	A.A.			
1610 – 1620: LOST				
1630	100	Clst:	a.a.	No shows
	GDTR	Ls:	a.a.	
1640	A.A.			
1650 – 1660: LOST				
1670	A.A.			
1680	95	Clst:	a.a.	
	5	Ls:	a.a.	
1690	LOST			
1700	A.A.			
1710	LOST			

WELLSITE SAMPLE DESCRIPTION				Page 8 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 02.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
1720	100 Gd Tr	Clst:	olv gry, brnsh gry, plty -blky, frm - mod hd, slty, non calc, micropyr, rare tr diss carb mat	No shows
		Ls:	gryish or - pa yelsh brn, blky - sbplty, frm - mod hd, xln - microxln, sl arg - occ v arg grdg calc Clst, occ pyr	
1730	A.A.			
1740	A.A.			
1750	95 5	Clst: Ls:	a.a. a.a.	a.a.
1760	A.A.			
1770	A.A.			
1780	100 Gd Tr	Clst: Ls:	a.a. a.a.	a.a.
1790	A.A.			
1800	A.A.			
1810	A.A.			
1820	A.A.			
1830	LOST			
1840	100 Gd Tr Tr	Clst: Ls:	a.a. a.a.	a.a.
			Shl frags	
1850	100 Gd Tr	Clst: Ls:	a.a. a.a.	a.a.
1860	95 5	Clst: Ls:	a.a. a.a.	a.a.
1870 - 1880	LOST			
1890	A.A.			
1900	90 10	Clst: Ls:	a.a. a.a.	a.a.
1910	95 5	Clst: Ls:	a.a. a.a.	a.a.
1920	95 5	Clst: Ls:	a.a. a.a.	a.a.

WELLSITE SAMPLE DESCRIPTION				Page 9 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 02.01.-03.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
1930	100	Clst:	olv gry, brnsh gry, plty -blky, frm - mod hd, slty, non calc, micropyr, rare tr diss carb mat	No shows
	Gd Tr	Ls:	grysh or - pa yelsh brn, blky - sbplty, frm - mod hd, xln - microxln, sl arg - occ v arg grad calc Clst, occ pyr	
1940	A.A.			
1950	80	Clst:	a.a.	a.a.
	15	Sst:	clr - trnsl Qtz, v f - f, occ med, sbrnd, lse	
	5	Ls:	a.a.	
	Tr	Pyr,	foss frags, carb mat	
1960	100	Clst:	a.a.	a.a.
	Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
1970	95	Clst:	a.a.	a.a.
	5	Ls:	a.a.	
	Tr	Sst:	a.a.	
	Tr	Pyr,	carb mat	
1980	100	Clst:	a.a.	a.a.
	Gd Tr	Ls:	a.a.	
	Tr	Sst:	a.a.	
	Tr	Carb mat		
1990 - 2000		LOST		
2010	100	Clst:	a.a., also gnsh gry - med blsh gry & non - sl slty	a.a.
	Gd Tr	Ls:	a.a.	
2020		LOST		
2030	100	Clst:	a.a., incr amount gnsh gry - blsh gry, else a.a. (40%)	a.a.
	Gd Tr	Ls:	a.a.	
2040	A.A.			
2050	100	Clst:	a.a.	a.a.
	Tr	Ls:	a.a.	
	Tr	Sst:	a.a.	
2060	A.A.			
2070	A.A.			
2080	A.A.			
2090	A.A.			

WELLSITE SAMPLE DESCRIPTION				Page 10 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 03.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
2100	100	Clst:	olv gry, brnsh gry, gnsh gry – med blsh gry , plty –blky, frm – mod hd, sl slty - slty, non calc, micropyr, rare tr diss carb mat	No shows
	Tr	Ls:	gryish or – pa yelsh brn, blky – sbplty, frm – mod hd, xln - microxln, sl arg – occ v arg grdg calc Clst, occ pyr	
	Sl Tr	Sst:	clr-trnsl Qtz, v f – f, occ med, sbrnd, lse	
2110	LOST			
2120	90	Clst:	a.a.	a.a.
	10	Ls:	a.a.	
2130	95	Clst:	gnsh gry – med blsh gry, olv gry, else a.a.	a.a.
	5	Ls:	a.a.	
2140	A.A.			
2150	LOST			
2160	100	Clst:	a.a.	a.a.
	Tr	Ls:	a.a.	
2170	80	Clst:	a.a.	a.a.
	20	Ls:	a.a.	
2180	95	Clst:	a.a.	a.a.
	5	Ls:	a.a.	
2190	100	Clst:	a.a.	a.a.
	Gd Tr	Ls:	a.a.	
2200	100	Clst:	a.a.	a.a.
	Gd Tr	Ls:	a.a.	
	Tr	Tuffitic Clst:	wh, blky, frm – mod hd, blk spks of silica, non calc, micropyr	
2210	100	Clst:	a.a.	a.a.
	Gd Tr	Ls:	a.a.	
	Tr	Tuffitic Clst:	a.a.	
	Tr	Pyr		
2220	100	Clst:	also brn gry, else a.a.	a.a.
	Gd Tr	Ls:	a.a.	
	Tr	Tuffitic Clst:	wh, gry - bl gn, blk and gn spks of silica, else a.a.	
	Tr	Pyr		
2230	A.A.			
2240	A.A.			
2250	A.A.			

WELLSITE SAMPLE DESCRIPTION				Page 11 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 03.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
2260	95	Clst: gnsh gry – med blsh gry, olv gry, brnsh gry, plty –blky, frm – mod hd, sl slty - slty, non calc, micropyr, rare tr diss carb mat		No shows
	5	Tuffitic Clst: wh, gry bl gn, blk and gn spks of silica, non calc, micropyr		
	Tr	Ls: gryish or – pa yelsh brn, blk – sbplty, frm – mod hd, xln - microxln, sl arg – occ v arg grd calc Clst, occ pyr		
	Tr	Pyr		
2270	90	Clst: a.a.		a.a.
	10	Tuffitic Clst: a.a.		
	Tr	Ls: a.a.		
	Tr	Pyr		
2280	A.A.			
2290	LOST			
2300	100	Clst: a.a.		a.a.
	Gd Tr	Tuffitic Clst: a.a.		
	Tr	Ls: a.a.		
2310	100	Clst: dk brn gry, plty –blky, frm – mod hd, sl slty - slty, non calc, micropyr, rare tr diss carb mat		a.a.
	Gd Tr	Tuffitic Clst: a.a.		
	Gd Tr	Ls: a.a.		
2320	100	Clst: a.a.		a.a.
	Tr	Tuffitic Clst: a.a.		
	Tr	Ls: a.a.		
2330	100	Clst: a.a.		a.a.
	Tr	Ls: a.a.		
2340	A.A.			
2350	A.A.			
2360	100	Clst: dk brn gry – dk gn gry, else a.a.		a.a.
	Tr	Ls: a.a.		
2370	100	Clst: mainly dk gn gry, also dk brn gry, else a.a.		a.a.
	Tr	Ls: a.a.		
2380	A.A.			
2390	A.A.			
2400	100	Clst: brn gry – brn blk, dk gn gry, blk – sbplty, mod hd, non calc, occ micropyr, rare tr diss carb mat		a.a.
	Tr	Ls: a.a.		

WELLSITE SAMPLE DESCRIPTION				Page 12 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 04.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
2410	100	Clst: brnsh gry – brnsh blk, gnsh gry – dk gnsh gry, blkly – sbblkly, mod hd, non calc, occ micropyr, occ tr diss carb mat		No shows
	Tr	Ls: Pa yelsh brn – dk gryish or - v pa or, blkly – sbblkly, frm – mod hd, microxln – xln, sl arg – occ v arg grdg calc Clst, occ slily micropyr		
2420	A.A.			
2430	A.A.			
2440	A.A.			
2450	A.A.			
2460	A.A.			
2470	LOST			
2480	85 15	Ls/Chk : wh – v pa or, sbblkly – blkly, frm – mod hd, microxln, occ sl arg Clst : a.a.		a.a.
2490	A.A.			
2500	95 5	Ls/Chk: a.a. Clst: a.a.		a.a.
2510	A.A.			
2520	A.A.			
2530	100 Gd Tr	Ls/Chk: a.a. Clst: a.a.		a.a.
2540	A.A.			
2550	LOST			
2560	A.A.			
2570	A.A.			
2580	A.A.			
2590	A.A.			
2600	A.A.			
2610	LOST			
2620	95 5	Ls/Chk: wh – v pa or, also lt brn – pa brn, microxln – occ sucr, else a.a. Clst: a.a.		No shows

WELLSITE SAMPLE DESCRIPTION				Page 13 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 04.01-05.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
2630	95	Ls: mainly lt brn – pa brn, occ wh – v pa or, sbblky – blk, frm – mod hd, microxln – occ sucr, occ sl arg		No shows
	5	Clst: brnsh gry – brnsh blk, gnsh gry – dk gnsh gry, blk – sbblky, mod hd, non calc, occ micropyr,		
2640	A.A.			
2650	100	Ls : a.a.		a.a.
	Tr	Clst: a.a.		
2660	100	Ls: lt brn – pa brn occ grad into Clst, tr wh – v pa or, sbblky – blk, frm – mod hd, microxln – occ sucr, occ sl arg		a.a.
	Tr	Clst : a.a.		
2670	A.A.			
2680	A.A.			
2690	A.A.			
2700	95	Ls : a.a.		a.a.
	5	Clst: a.a.		
2710	A.A.			
2720	100	Ls: a.a.		a.a.
	Tr	Clst: a.a.		
2723	A.A.			
2726	A.A.			
2729	A.A.			
2732	100	Ls: a.a.		a.a.
	Tr	Clst: Occ v sdy/slty, else a.a.		
2735	A.A.			
2738	100	Ls: Bec pred wh - yelsh gry, also lt brn – pa brn a.a.		a.a.
	Tr	Clst: a.a.		
2741	A.A.			
2744	50	Ls: a.a.		a.a.
	50	Ls/Mrl: med lt gry – pa yelsh brn, sbblky – blk, frm, microxln, grd calc Clst		
	Tr	Clst: a.a.		

WELLSITE SAMPLE DESCRIPTION				Page 14 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23	Meters	Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 05.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
2747	95	Ls: pred wh - yelsh gry, tr lt brn – pa brn occ grad into Clst, sbblky – blk, frm – mod hd, microxln – occ sucr, occ arg		No shows
	5	Ls/Mrl: med lt gry – pa yelsh brn, sbblky – blk, frm, microxln, grdg calc Clst		
	Tr	Clst: brnsh gry – brnsh blk, gnsh gry – dk gnsh gry, blk – sbblky - plty, mod hd, sl slty - slty, occ sdy, non calc, occ micropyr		
2750	100	Ls: a.a.		a.a.
	Tr	Ls/Mrl: a.a.		
	Tr	Clst: a.a.		
2753	LOST			
2756	100	Ls: also occ gnsh gry, else a.a.		a.a.
	Tr	Clst: a.a.		
2759	A.A.			
2762	A.A.			
2765	A.A.			
2768	80	Ls/Mrl: grysh or, pa yelsh brn, sbblky – blk, frm – occ mod hd, microxln – xln, occ glauc		a.a.
	20	Ls: occ glauc, else a.a.		
	Tr	Clst: a.a.		
2771	95	Ls/Mrl: a.a.		a.a.
	5	Ls: a.a.		
	Tr	Clst: a.a.		
2774	90	Ls/Mrl: a.a.		a.a.
	10	Ls: a.a.		
	Tr	Clst: a.a.		
2777	95	Ls/Mrl: grysh or, pa yel brn – pa brn, else a.a.		a.a.
	5	Ls: a.a.		
	Tr	Clst: a.a.		
2780	100	Ls/Mrl: a.a.		a.a.
	Gd Tr	Ls: a.a.		
	Tr	Clst: a.a.		
2783	60	Ls: yel gry – gnsh gry, sbblky – blk, frm – occ mod hd, microxln – xln, glauc – v glauc		a.a.
	40	Ls/Mrl: a.a.		
2786	60	Ls/Mrl: a.a.		a.a.
	40	Ls: a.a.		
2789	80	Ls: a.a.		a.a.
	20	Ls/Mrl: a.a.		

WELLSITE SAMPLE DESCRIPTION				Page 15 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 ½ "		Cut solvent: Isopropanol		Date: 05.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
2792	90	Clst(1): mod brn – gry brn, gry rd – mod rdsh brn, mod hd, occ sl slty, calc – v calc		No shows
	10	Ls: yel gry – gnsh gry, sbblky – blk, frm – occ mod hd, microxln – xln, glauc – v glauc		
	Tr	Ls/Mrl: grysh or, pa yel brn – pa brn, sbblky – blk, frm – occ mod hd, microxln – xln, occ glauc		
2795	90	Clst(1): a.a.		a.a.
	10	Ls: yel gry – lt olv gry, glauc, else a.a.		
	Tr	Clst(2): brnsh gry – brnsh blk, gnsh gry, blk – sbblky – plty, mod hd, sl slty – slty i.p., non calc		
2798	A.A.			
2801	90	Clst(1): a.a.		a.a.
	5	Ls: a.a.		
	5	Clst(2): a.a.		
2804	LOST			
2807	A.A.			
2810	A.A.			
2813	100	Clst(1): a.a.		a.a.
	Gd Tr	Ls: a.a.		
	Gd Tr	Clst(2): a.a.		
2816	80	Clst(1): a.a.		a.a.
	10	Ls: a.a.		
	10	Clst(2): a.a.		
2819	80	Clst(1): a.a.		a.a.
	10	Ls: occ micropyr, else a.a.		
	10	Clst(2) : a.a.		
2822	80	Clst(3): dk gry – gry blk, ol blk, blk – sbblky, mod hd, sl slty – slty, non calc – calc, occ micropyr		a.a.
	10	Clst(1): mod brn – gry brn, gry rd – mod rdsh brn, else a.a.		
	10	Ls: a.a.		
2825	90	Clst(3): a.a.		a.a.
	10	Clst(1): a.a.		
	Tr	Ls: a.a.		
2827	90	Clst(3): also dsk yel brn, else a.a.		a.a.
	10	Clst(1): a.a.		
	Tr	Ls: a.a.		

For section between 2827 –2874.5 mMD see also separate core description for core no. 1

WELLSITE SAMPLE DESCRIPTION				Page 16 of 17
Country: Norway		Area: North Sea		Field: Beta West
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA		
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr		
Hole size: 8 1/2 "		Cut solvent: Isopropanol		Date: 07.01.2003
Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.

DESCRIPTIONS FROM CUTTINGS WHILE CUTTING CORE #1, 2827- 2874.5 m

2830	90	Clst: olv blk, dk gry, blkly – sbblky, frm, sl slty - slty, occ micropyr, non calc, occ diss carb mat	No shows
	GdTr	Ls: varicol. Cvgs?"	
	10	Sst: clr – transl Qtz, f- med, occ v f, sbrnd-rnd, lse grns	
	Tr	Pyr	
2833	50	Clst: olv blk, dk gry, blkly – sbblky, sft - frm, pred v sdy grdg arg sst, micropyr-v micropyr, non calc, occ diss carb mat	a.a.
	50	Sst: a.a.	
	Tr	Pyr	
2839	80	Clst: med gry - dk gry, olv blk, else a.a.	a.a.
	20	Sst: a.a.	
	Tr	Ls: gryish or - lt brn, wh, sbblky, sft - frm, microxln, sl – v arg	
2842	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	
2848	A.A.		
2851	80	Sst: clr-trnsl Qtz, v f - med, occ crs - v crs, sbrnd - rnd, occ sbang, sft - lse, grns floating in arg (kaol?) mtx of ol gry - occ gryish bl gn Clst grad v sdy Clst, pyr, tr diss carb mat	a.a.
	20	Clst: a.a.	
	Tr	Ls: a.a.	
2854	A.A.		
2857	80	Clst: a.a.	a.a.
	20	Clst (1): mod brn – gryish brn, dk rdsh brn, blkly, frm – mod hd, slty, calc,	
	Tr	Sst: lse grns a.a.	occ wk tr of diss carb mat
	Tr	Ls: wh, else a.a.	
	Tr	Pyr	
2860	80	Clst (1): a.a.	a.a.
	20	Sst: lt ol gry-gnsh gry coloured from cmt/mtx, sft - occ frm, v f – f, clr - transl Qtz, sbrnd, wk – mod sil/calc cmt, v arg/arg mtx grdg sdy Clst	
	Tr	Ls: a.a.	
	Tr	Lse sd grns: Clr – transl qtz, vf-crs, sbrnd-rnd,	
	Tr	Clst (2): dk grnsh gry, mod hd, blkly-plty, sl slty, non calc	
2863	95	Clst (1): a.a.	a.a.
	5	Sst: a.a.	
	Tr	Lse sd grns a.a.	
	Tr	Clst (2): a.a.	

2866 – 2874.5 (btms up): A.A.

WELLSITE SAMPLE DESCRIPTION			Page 17 of 17
Country: Norway		Area: North Sea	
Well no: 16/7-8S		Company: Esso Norge AS, Statoil ASA	
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr	
Hole size: 8 1/2 "		Cut solvent: Isopropanol	
		Date: 08.01.2003	
Depth (m RKB)	Lithology (%)	Lithological Description	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks
2877	100	Sst: cly, mod brn – gry brn Qtz, also clr – transl Qtz, v f – f, occ grad slty Clst, arg – v arg (mtx), non calc, occ micropyr	No shows
	Tr	Clst : dk gn gry – ol blk, frm – mod hd, sbblky – blk, occ sbplty, non calc – slily calc, slily calc i.p.	
2880	A.A.		
2883	A.A.		
2886	A.A.		
2889	100	Sst: a.a.	a.a.
	Tr	Clst: a.a.	
	Tr	Ls: yel wh – gry wh, blk, frm, arg, slty	
2892	A.A.		
2895	A.A.		
2898	A.A.		
2899	A.A.		

TD for Well 16/7-8S @ 2900 mMD / 2646.5 mTVD

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App E : Core descriptions

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App F : NPD standard sheet for reporting shallow gas

NPD standard sheet for reporting shallow gas (In Norwegian)

1. Avstand fra boredekk til havnivå: 23m
2. Vanddyp: 79,5m
- 3a. Settedyp for lederør: 149,5 m MD RKB
- 3b. Evt. formasjonstyrketest (g/cc): -----
- 4a. Settedyp for foringsrør hvorpå BOP settes: 442 mMD RKB
- 4b. Formasjonstyrketest (g/cc): 1.51 g/cc (integritetstest)
6. *Dybdeintervall (mRKB og mTVD) og alder for sandlag grunnere enn 1000 m under havbunnen. Oppgi hvilke lag som evt. inneholder gass.*
Kvartær sandlag 180-192 mMD RKB, 206-221 mMD RKB og 228-244 mMD RKB består av vekslende sand- og leirlag. Intervallet 264-287 mMD RKB er et rent sandlag. Alle sandlagene er vannvåte.
Pliocene sandlag 651 – 656m MD RKB, vekslende sand/silt/leire, vannvåt
Utsira Formasjonen 850 - 1046m MD, sandstein med enkelte lag eller strenger av silt og leirstein, vannvåt
7. Grunn gass er ikke påvist i brønnen.
8. Sammensetning og opprinnelse til gassen: ingen gass er registrert i sander ned til top Hordaland Gruppe på 1046mMD/1046mTVD.
9. Beskriv alle målinger i gassførende lag: -----
10. *Angi dyp (mRKB og TVG) til inkonformiteter i borehullsposisjonen.*
Hordaland gruppen var prognosert på 1069 mMD RKB, observert på 1046 mMD RKB på MWD logg (formasjonsgrense, men trolig ikke inkonformitet).
11. Angi utbredelsen av sandlagene (kommunikasjon, kontinuitet, trunkering, etc.): -----
12. Angi utbredelsen av evt. gass- skygging ("gas blanking"): -----
13. Angi evt seismiske indikasjoner på at gassen stammer fra dypere nivå.
Beskrivelse dersom gassen stammer fra dypere nivå: -----

14. *Hvordan samsvarer tolkingen av borestedundersøkelsen med borehullsdata mht. :*

- *grunn gass*

Det var varslet muligheten for grunn gass omkring 232 mRKB TVD og på 632 mRKB TVD. Sandlagene var der, men ingen gass ble registrert.

- *sandlag*

Sandige intervaller som 180-192 mMD RKB og 206-221 mMD RKB var forventet ut fra en generell beskrivelse av lagen. Sanden mellom 228-244 mMD RKB var varslet. Sanden påvist i intervallet 264-287 mMD RKB var ikke varslet. Sandlaget mellom 651 – 656 mMD var varslet, men kom inn 19 meter dypere end forventet.

- *inkonformiteter*

Refererer til punkt 10.

- *korrelasjon til nærliggende borehull*

God korrelasjon til referansebrønn 15/9-15 som ligger ca. 3 km mot vestsørvest. Kvaliteten på loggene i korrelasjonsbrønnen og i vår brønn er brukbare.

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App G : Detailed Experience Summary from DBR

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 36" **Section start:** 17.12.2002 17:00 **Section end:** 20.12.2002 10:00
Category: NEGATIVE EXPERIENCE
Report Date: 19.12.2002
Keywords: DIRECTIONAL
Subject: Tophole Inclination: Reamed to reduce tophole inclination
Downtime: **Potensial time improvement:**
Company involved:
References:

Description:

This is a test example. Please update as appropriate.

Immediate solution:

Soluton recommend for the future:

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 36" **Section start:** 17.12.2002 17:00 **Section end:** 20.12.2002 10:00
Category: POSITIVE EXPERIENCE
Report Date: 19.12.2002
Keywords: WELLHEAD/ASA
Subject: WOC: CART Released without WOC - with 30" Conductor on bottom.
Downtime: **Potensial time improvement:** 6
Company involved:
References:

Description:

After the 30" Cement job the conductor was set back on bottom at 26" Holeopener shoulder. The stick-up and heading was confirmed to 2.2 m and 313 Deg. The inclinations was 0.75 Deg. Based on the low inclination it was decided to go ahead and release the CART. No pull was applied on guidewires. The CART was pulled 3 m above the wellhead housing. The inclination after release was 0.5 Deg. The landing string was pulled - and no tension was applied on guidewires. Target of No WOC for 30" Conductor was achieved.

Immediate solution:

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 36" **Section start:** 17.12.2002 17:00 **Section end:** 20.12.2002 10:00
Category: NEGATIVE EXPERIENCE
Report Date: 19.12.2002
Keywords: ROV
Subject: Tophole Cementing: Limited value of Cement Returns Detector Tool (CRD)
Downtime: **Potential time improvement:**
Company involved: Oceaneering
References:

Description:

A Cement Return Detector tool (CRD) - also known as a cement sniffer, was run for detection of cement in return on the 30" Conductor job. The tools consist of a 2m long rod pointing down in the 36" Hole, measuring PH of the fluids coming out of the hole. The tool was laid down on the PGB, and a stinger for flushing of the Tool was connected to the ROV. This prevents the possibility of the ROV to swim down and check the returns visually during the cement job. The nominal PH after start of cement job was 8.3. The highest number recorded during the job was 9.3. After the job was ended and the inclination etc. was checked, the maximum recording of 10.3 was made. The tool seems to give limited information that can be used to make a decision whether to pump more cement. Pumped 300% Rxcross - 36 m3 slurry. The 1.35 sg WBM was checked for PH value: 9.3. Seawater is believed to have a value of 8.3, and cement would be in the range 12-14.

Immediate solution:

Solution recommend for the future:

The CRD tool offers limited help - and is not considered fit-for-purpose.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 36" **Section start:** 17.12.2002 17:00 **Section end:** 20.12.2002 10:00
Category: POSITIVE EXPERIENCE
Report Date: 20.12.2002
Keywords: ANCHOR HANDLING
Subject: Anchor Pull-Off test: Fullscale test was done successfully - 50 m off in 2 min 40 sec
Downtime: **Potential time improvement:**
Company involved:
References:

Description:

Due to the shallow gas scenario on the well - it was decided to pull the rig off location in a controlled manner, to verify that it could be moved off location rapidly. The test was performed with reduced tension in chains #5 and #6, to prevent them from stopping the rig motion. The rig was pulled "Upwind" directly Forward (FWD). The result of the test showed that the rig could be pulled 36 m off in 2 min, and 50 m off in 2 min 40 sec. The exemption stated a target of 50 m off location in 2 min - and is considered achieved. If dropping the anchors the rig will move further off more rapidly.

Immediate solution:

Solution recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 9 7/8" **Section start:** 20.12.2002 10:00 **Section end:** 21.12.2002 15:00
Category: NEGATIVE EXPERIENCE
Report Date: 20.12.2002
Keywords: ROV
Subject: Downhole Camera: Too little light available for downhole Oceaneering camera
Downtime: **Potensial time improvement:**
Company involved: Oceaneering
References:

Description:

The picture supplied from the downhole camera run on the Special made camera frame, was too dark for use. The reason for this is that the lighting provided by the camera is too low for the large area to be seen. The light is sufficient when run inside Riser, but too low when run in the sea. The intensity can be increased for a short period - before the fuses in the system will blow.

Immediate solution:

Use the camera As-Is. Wait until any possible shallow gas is seen, and increase the power supplied to the camera until fuse blows.

Soluton recommend for the future:

Fit frame with Auxilary Lighths with a seperate power cable from surface.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 9 7/8" **Section start:** 20.12.2002 10:00 **Section end:** 21.12.2002 15:00
Category: POSITIVE EXPERIENCE
Report Date: 27.12.2002
Keywords: DRILLING
Subject: Boulders: Hit boulders in 9 7/8" pilot hole
Downtime: **Potensial time improvement:**
Company involved:
References:

Description:

Drilled 9 7/8" pilot hole from 150,5 - 450 m. Experience possible boulders at 155 m, had to ream stand twice. Else no boulders experienced.

Immediate solution:

Hole drilled was found vertical.

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 17 1/2" **Section start:** 21.12.2002 15:00 **Section end:** 27.12.2002 14:30
Category: NEGATIVE EXPERIENCE
Report Date: 27.12.2002
Keywords: MWD/LWD
Subject: MWD: 9 1/2" MWD survey tool failed to pulse. POOH and replaced tool.
Downtime: 5 **Potensial time improvement:**
Company involved: Baker Hughes Inteq
References:

Description:

Tripped due to MWD survey failure. Changed MWD tool.

Immediate solution:

Soluton recommend for the future:

Investigation shows that there was gelled up particles inside the Turbine causing a short circuit. Screen ??

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 17 1/2" **Section start:** 21.12.2002 15:00 **Section end:** 27.12.2002 14:30
Category: POSITIVE EXPERIENCE
Report Date: 27.12.2002
Keywords: DIRECTIONAL
Subject: Hole Opening: Opening 9 7/8" Pilothole with 17 1/2" Bit
Downtime: **Potensial time improvement:**
Company involved: Baker Hughes Inteq
References:

Description:

Opened up 9 7/8" pilot hole to 17 1/2" hole, using 17 1/2" bit. Surveys showed the 17 1/2" hole followed the 9 7/8" pilot hole track, the distance between the tracks/ survey tools at TD at 450 m was only 20 centimeters.
Experienced the solution using 17 1/2" bit, instead of bull nose/ hole opener, was acceptable.

Immediate solution:

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 17 1/2" **Section start:** 21.12.2002 15:00 **Section end:** 27.12.2002 14:30
Category: NEGATIVE EXPERIENCE
Report Date: 27.12.2002
Keywords: ROV
Subject: ROV: Loss of ROV sheave to sea, from A-frame.
Downtime: **Potensial time improvement:**
Company involved:
References:

Description:

During WOW lost ROV cable/ umbilical sheave from A-frame to sea. ROV still operational. Installed new sheave. Cut an reterminated umbilical/ cable.

Ref. internal investigation report.

Immediate solution:

Soluton recommend for the future:

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 28.12.2002
Keywords: DRILLING
Subject: Geology & Seismic interpretation: No shallow Gas encountered at 632 m (Class II Warning given)
Downtime: **Potensial time improvement:** 24
Company involved: Statoil
References:

Description:

The well was drilled with a Class II warning for the H25 reflector at 632 m. As shallow gas was encountered at the Sigyn field at the same reflector, and the seismic indicating a mor obvious situation on this well, no plans were made for the case where no shallow gas was encountered. This led to the section being drilled with WBM (and waiting on mud occured), and cemented to TOL wheras 400 m around the shoe would suffice.

The MWD logs show a clear change in lithology at the given depth - but no shallow gas was encountered.

Immediate solution:

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 30.12.2002
Keywords: CEMENTING
Subject: Weatherford Liner Hanger: Ball for 9 5/8" Liner Hanger did not land in seat
Downtime: 1,5 **Potensial time improvement:**
Company involved: Weatherford
References: RUH DSB #1796/02 / Statoil Quality Synergi 204412

Description:

The 2 1/8" ball for setting of the liner hanger was dropped and chased with 500 LPM. Did not seat. Attempted varying flow rate, rotating string, pumping Hi-Vis. NEG. Not able to land ball and set liner hanger. P/U and broke connection below 1st single on Cmt stand. Dropped second ball. M/U connection. Pressured up and set Hanger according to plan.

Will investigate reason for 1st ball not seating (eventually did not leave the RCTDCH)

Immediate solution:

Soluton recommend for the future:

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 30.12.2002
Keywords: CEMENTING
Subject: Cement Head: Twisted off control lines for RCTDCH on 9 5/8" Liner job
Downtime: **Potensial time improvement:**
Company involved: Weatherford
References: RUH # DSB 1797/02

Description:

Due to the malfunction of the first ball dropped for the 9 5/8" Liner hanger, the connection below the RCTDCH had to be broken to drop a second ball. The swivel is placed above the RTCDH cement inlet, and with the pistons below. As the string was turned to screw out the connection, the control lines caught grip in one of the dart plungers and got twisted off and fell down. The job was done manually (operating Lo-Torque valve & Releasing dart). The remaining part of the job went according to plan.

No downtime recorded on this incident. Manrider operation of equipment as fast as remote. 1.5 Hrs recorded on ball failure.

Immediate solution:

Released the Dart and operated Lo-Torque valve manually.

Soluton recommend for the future:

The swivel should be placed below the RCTDCH (underneath the valves, inlet and plungers), as opposed to on the top (today).

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 30.12.2002
Keywords: MUDLOGGING
Subject: Mudlogging: Sperry Sun system problems
Downtime: **Potential time improvement:**
Company involved: Halliburton
References:

Description:

There have been several and repeating problems with the mudlogging unit. The screens/system keep freezing up (strokes not counting etc) and depths not updating. Also the data communication between Sperry Sun and BHI (regarding ECD etc) is not up-and-running, and they were missing the calibration gas for the gas measurement have been missing until the 8 1/2" section was started. They have also experienced problems with the DDM heigh/position sensor.

They were informed of the necessity to check out the unit thoroughly as the rig was placed at CCB, and they were the first company aboard after the Sigyn operation. However - the check out seems insufficient, and the operation has a large potential for improvement.

Immediate solution:

Soluton recommend for the future:

Sperry Sun should investigate the problems reported in RUHes etc. and upgrade/maintain the system properly prior to the next well.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 31.12.2002
Keywords: BHA
Subject: Software: AutoTrak G3.0 (OnTrak) needed re-programming. POOH - Re-program - RIH.
Downtime: 4 **Potential time improvement:**
Company involved: Baker Hughes Inteq
References: Statoil Synergi 204408

Description:

A separate Laptop was sent offshore for the programming of the new AutoTrak G3.0 version. The tool was programmed according to plan, and RIH to 120 m. BHI then discovered that the Laptop used for programming the tool would not be able to do the job in a proper manner. The tool had to be pulled back to surface, the radioactive sources unloaded, and the stationary PC in the BHI container was moved to Drillfloor for programming the tool. The BHA was then RIH again.

The problem was known to BHI, but relatively recently discovered, and a Technical Alert was about to be sent out. This is unacceptably poor pre-planning, and the incident should have been avoided.

A separate Failure report will have to be filed.

Immediate solution:

Remedied situation by placing Statoinary computer on drillflor and re-programmed the tool (after having POOH).

Soluton recommend for the future:

Fix the software bug. And - when

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 01.01.2003
Keywords: DRILLING
Subject: Losses at TD prior to running Casing: Experienced losses when drilling at 1319 m.
Downtime: **Potensial time improvement:**
Company involved: Statoil
References:

Description:

Experienced losses at end of 12 1/4" Section (Ref DBR 29.12.02). Got losted when drilling through when drilling through shoetrack with 1700 LPM. Lost 2m3. Losses stopped when flow rate was reduced to 1400 LPM.

MW In/ MW Out was 1.42 sg. MWD PWD Sub reading 1.40 sg static, and 1.59 sg at 1700 LPM (19 pts). Theoretical MudCalc ECD value is 1.50 sg with 1.42 sg MW. Estimated Fracture strength is 1.74 sg

Loss rate when increasing from 1400 LPM (no loss) to 1700 LPM: 20 litres/min = 1.2 m3/hr

Attempted taking FIT to 1.60 sg. Got LOT of 1.58 sg.

Immediate solution:

Soluton recommend for the future:

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 01.01.2003
Keywords: LOT/FIT
Subject: FIT: Planned FIT on well ended up as LOT / No verification from MWD PWD Sub
Downtime: **Potensial time improvement:**
Company involved: Statoil
References:

Description:

A FIT was planned to be performed below the 9 5/8" Liner shoe. During drill out of the shoetrack 2 m3 was lost to the formation with a flowrate of 1700 LPM and a PWD ECD value of 1.59 sg. The Bit was placed inside the Casing at 1282 m, and the PWD sensor was 5 m behind the bit.

The Well was pressured up to 25 Bar down choke line drillpipe / The pressure stabilised at 22 Bar, and is believed to be a LOT. The resulting LOT value is 1,58 sg.

The Max / Min PWD value from the FIT/LOT was attempted retrieved from the MWD tool - without success. The tool was placed still, and the pump rate was 1600 LPM - but only zero values were returned. If the numbers were retrieved, they could have confirmed the value recorded at surface.

Immediate solution:

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 12 1/4" **Section start:** 27.12.2002 14:30 **Section end:** 01.01.2003 17:30
Category: NEGATIVE EXPERIENCE
Report Date: 30.10.2002
Keywords: CASING/LINER
Subject: Casing Point: Loss zone in bottom of 12 1/4" Hole - experiences and recommendations.
Downtime: **Potensial time improvement:**
Company involved: Statoil
References:

Description:

Experienced losses at section TD of 12 1/4" Hole (1319 m). Ref. DBR 29.12.2002. The pumps were stopped, a flowcheck performed, and a gain observed. Well stabilized, and no further losses experienced (1.19 sg Glydril WBM in hole).

When the liner was run, it was observed that there was not placed any SpiraGliders on the Shoe Joint. It was agreed in the planning phase that this should be done onshore, as these have to be tripped over the joint prior to make-up of shoe joint/Float Joint. As this was discovered, the situation discussed and it was agreed between onshore/offshore that this was not crucial for a succesful operation. The liner was run & cemented according to plan - with the shoe 2.5 m above TD. 2x centralizers was placed on the Intermediate joint and on the Float joint.

After the Liner shoetrack was drilled out - losses was experienced with a pump rate of 1700 LPM (resulting ECD 1.59 sg).

Conclusion:(In Hindsight)

- 1) If losses occur at TD like this - and they stabilize, drill another stand to cement the loss zone in behind casing.
- 2) If 1) is not advisable - Tag TD with the Liner Shoe, pick-up 10-20 cm - and set the Hanger (leaving no rathole).

Immediate solution:

Live with the "seepage loss situation"

Soluton recommend for the future:

Conclusion:(In Hindsight)

- 1) If losses occur at TD like this - and they stabilize, drill another stand to cement the loss zone in behind casing.
 - 2) If 1) is not advisable - Tag TD with the Liner Shoe, pick-up 10-20 cm - and set the Hanger (leaving no rathole).
-

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: POSITIVE EXPERIENCE
Report Date: 02.01.2003
Keywords: DRILLING
Subject: Seepage Loss: Drilling 8 1/2" Section with Loss zone above
Downtime: **Potensial time improvement:**
Company involved: Statoil
References:

Description:

A loss was experienced when drilling out of the 9 5/8" Shoetrack. 2 m3 was lost at 1700 LPM. A decision was made to reduce the rate to 1400 LPM (loss-free rate) and continue drilling. The LOT ended up as 1.58 sg.

When drilling with the 8 1/2" OD BHA across the loss zone, the ECD at bit was 1.58 sg when pumping 1400 LPM. No losses observed. Increasing the pump rate to 1700 LPM led to a slight loss-in-hole (and a ECD at bit of 1.60-1.61 sg). The flow rate was kept low until the BHA was past the loss zone. Slowly the rate was increased to 1800 LPM, resulting in a downhole ECD at 1500 mMD of 1.61-1.63. No losses were experienced.

Halted weighting up the mud from 1.42 sg to 1.45 sg, to maintain margins. Weighted up and limited pump rate until the well was observed stable with the new mudweight.

Immediate solution:

The right solution was made, continue drilling with 1400 LPM and observe the well for losses.

Soluton recommend for the future:

The prognosed LOT was 1,74 sg at 1300 mMD. Based on this a 5 1/2" DP string was selected, resulting in a estimated ECD of +/- 1.55 sg at the casing shoe when drilling at TD with 2400 LPM. The ECD experienced is considerably higher than the MudCalc values (+/- 5 pts). 5" DrillPipe would have been a better choice knowing the resulting LOT and ECD.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: NEGATIVE EXPERIENCE
Report Date: 02.01.2003
Keywords: DRILLING FLUID
Subject: OBM out of spec: 1.45 sg VersaVert out of Spec - causing excessive ECD readings
Downtime: **Potensial time improvement:**
Company involved: M-I Drilling Fluids
References:

Description:

The mud supplied from Shore was not within specification for the 8 1/2" section. This is believed to be a part of the excessive ECD readings on this well, causing losses and limitations on pump rate.

At 1610 m:

Actual ECD reading when pumping 1.45 sg OBM at 1800 LPM - 1.65 sg.

Theoretical ECD reading from MudCalc with same parameters: 1.57 sg (8 pts less)

The mud is out of spec for the following parameters:

Oil/Water ratio: 66/34 vs. Planned minimum 70/30 - to be increased to 80/20 towards TD.

Immediate solution:

Limited pump rate from planned 2400 LPM to 1800 LPM.

Mixed Premix and treated Active system to get it within specification.

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: POSITIVE EXPERIENCE
Report Date: 02.01.2003
Keywords: BIT
Subject: Hughes Christensen: 8 1/2" HCR TX607 Bit run w/Roller Reamer drilled well
Downtime: **Potential time improvement:**
Company involved: Hughes Christensen
References:

Description:

The PDC bit selected for the AutoTrak G3.0 (OnTrak) BHA has functioned very well in the Claystones above the reservoir. A steady ROP has been achieved, with very low (0) vibrations registered from the MWD system. No glitches in the MWD data due to noise etc. ROP kept at 60 m/hr steady - flowrate 1850 LPM, 150 Bar SPP, 140 RPM. BHI believes that part of reason for the low level vibrations are the Roller Reamer incorporated in the string.

Directionally the bit has performed very well with the AutoTrak tool, building according to plan. A slikt RH walk is observed.

Immediate solution:

Soluton recommend for the future:

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: NEGATIVE EXPERIENCE
Report Date: 07.01.2003
Keywords: CORING
Subject: Core Jammed Off: Poor coring practice in 8 1/2" section led to the core jamming off pre-maturely.
Downtime: 0 **Potential time improvement:** 0
Company involved: Security DBS
References:

Description:

SecDBS providing the coring services had very good references with regards to coring in the Sleipner region. They had no experiences with jammed cores, and very good recovery. Based on this the operational plan to core 54m in the first run was designed. It was also decided to run oriented cores, with a ESS survey tool on top, and with knives in the telescopic shoe.

The coring operation was started at 2827m. Based on the MWD logs in retrospect, the coring was started in shale, 1m above the reservoir. The core seemed to jam off after 47.5m at 2874.5m, and the coring was terminated. The core was retrieved to surface. Due to tight hole the jar hit app. 50 m above TD. On surface it was discovered that the recovery was only 2.9 m.

Investigating what happened - it appers that due to a potential gain, a flowcheck was performed. During the flowcheck, the string was rotated for 30 seconds twice, without the pumps running. No clear interface is seen at the jamming point.

Immediate solution:

Coring was terminated after the one core. A total of 47.5m was "cut" - although the core had jammed after only 2.9m.

Soluton recommend for the future:

Rotating on-bottom without pumps running is a "sure" way of jamming the core. If the need for a Flowcheck arises, place the bit on bottom and flowcheck without rotation. OR - Pick off bottom and flowcheck with rotation.

The oriented coring equipment (knives) has been believed to induce some extra drag, causing a higher tendency to jamming the core. There are no indications that the knives have had any impact on the jamming of this core.

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section PA **Section start:** 08.01.2003 21:00 **Section end:** 12.01.2003 12:30
Category: NEGATIVE EXPERIENCE
Report Date: 09.01.2003
Keywords: CEMENTING
Subject: Perigon & 3 1/2" DP Drifting: CST with 2 3/8" (61 mm) did not pass 3 1/2" XO with 58 mm ID
Downtime: 1,5 **Potensial time improvement:**
Company involved: Perigon
References:

Description:

For the P&A operation it had been ordered a 2 3/8" (60.3 mm) OD Perigon CST through Halliburton. This was planned to be used as base for the Transition zone P&A cement plug.

The 3 1/2" DP string RIH was drifted to 61 mm. However - the 3 1/2" XO was not drifted prior to RIH. This was discovered after the string was RIH - but prior to pumping the CST.

Immediate solution:

Did not run the Perigon CST. Performed the P&A Operation with a Hi-Vis pill as base. Notified Perigon of the incident, urging them to highlight the fact that a Perigon CST will not pass a standard 3 1/2" XO nor a 15.5 #/ft 3 1/2" DP.

Soluton recommend for the future:

Perigon is designing a "future version" of the CST, with a smaller OD, allowing it to pass all the types of DP/XOs.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: NEGATIVE EXPERIENCE
Report Date: 09.01.2003
Keywords: DRILLING
Subject: Stick Slip: AutoTrak G3.0 & HCR TTX607 PDC Bit boring i Kalk
Downtime: **Potensial time improvement:**
Company involved: Baker Hughes Inteq
References:

Description:

During drilling of the 8 1/2" section the Stcik Slip was generally very low in the upper part of the section. Drilling into the Chalk layer, the ROP decreased and the Stick Slip tendency increased. There was measurements of 5 to 6 (Red zone) was recorded throughout the chalk package. Recommended Drilling parameters from Hughes Christensen was 140-160 RPM, with a maximum WOB of 10 MT. This was based on experiences from Ringhorne and Gyda.

Results from varying RPM / WOB:

200 RPM	15 MT WOB	No improvement of Stick Slip / High Readings
200 RPM	10 MT WOB	No improvement of Stick Slip / High Readings
180 RPM	10 MT WOB	No improvement of Stick Slip / High Readings
200 RPM	5-7 MT WOB	Improvement / Acceptable Stick Slip

ROP versus TMD:

From:	To:	Formation:	Effective ROP (m/hr):
1403	1974		27,4
1974	2525	TOP Chalk at 2473,5	30,8
2525	2750		25,7
2638	2696	BOT TOR to TOP Hod	5,4
2750	2827		24,4

The bit design has been improvd over the years, and the bit was graded 1-1-CT at the end of the job, drilled to TD.

Immediate solution:

Adjusted Drilling parametres in a systematic manner until acceptable values were achieved. Hod was seen to have a different lithology from the rest of the chalk - considerably harder to drill.

Soluton recommend for the future:

Drilling of hard chalk is a challenge - and was resolved in a reasonable good manner on this well.

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section PA **Section start:** 08.01.2003 21:00 **Section end:** 12.01.2003 12:30
Category: NEGATIVE EXPERIENCE
Report Date: 10.01.2003
Keywords: CEMENTING
Subject: NEG Pressure test of P&A Plug: Transition Zone Plug not holding 100 Bar PT
Downtime: 6 **Potensial time improvement:**
Company involved: Statoil
References:

Description:

The Transition zone plug should be set on a Perigon CST - which due to the minimum ID of 3 1/2" XO could not be run. The CST was replaced with a traditional Hi-Vis pill, mixed to the same density as the 1.45 sg OBM. The Hi-Vis Pill was mixed on OBM rather than being waterbased and mixed with Bentonite (As in Cementing "Best Practices").

During pressure test to 100 Bar - only 30 Bar was achieved.

The Hi-Vis pill is believed to be the cause of the problem (not holding the 1.90 sg cement plug).

Immediate solution:

RIH with a 9 5/8" EZSV at 800 m. Pressure tested same to 100 Bar.

Soluton recommend for the future:

Follow Best Practice - mix Hi-Vis pill on WBM and Bentonite.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section PA **Section start:** 08.01.2003 21:00 **Section end:** 12.01.2003 12:30
Category: NEGATIVE EXPERIENCE
Report Date: 10.01.2003
Keywords: T/A PLUGS & MECH. PLUGS
Subject: Equipment: Hydraulic R/T and Casing scrapers should be onboard during P&A
Downtime: **Potensial time improvement:**
Company involved: Statoil
References:

Description:

No Casing scrapers was ordered for the 9 5/8" Casing nor 13 3/8" Casing. If there had been experienced problems with the setting of the EZSV, there would be few fallback options.

No Hydraulic R/T was onboard during the P&A PHASE.

Immediate solution:

Soluton recommend for the future:

Evaluate having Casing scrapers and Hydraulic R/T aboard.

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: NEGATIVE EXPERIENCE
Report Date: 01.01.2003
Keywords: RIG EQUIPMENT
Subject: Pipe Doper: Newly installed pipe doper needs modification
Downtime: **Potensial time improvment:**
Company involved: Odfjell Drilling AS
References:

Description:

The newly installed Pipe doper on the Iron Roughneck needs modification before it is fit-for-use. The pipe doper closes to fast, and hence gets mechanical damaged due to the rapid impact. Also the closing and doping function should be seperated. One of the hydraulic hoses jumps off due to the sudden impact.

As per today - the pipe doper cannot be used, and manual doping takes place.

Immediate solution:

Dope pipe manually.

Soluton recommend for the future:

Modify pipe doper:

- Install pressure reduction valve to slow down closing action
- Seperate closing & doping action

Actions are suggestion - not decided solutions.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 8 1/2" **Section start:** 01.01.2003 17:30 **Section end:** 08.01.2003 21:00
Category: POSITIVE EXPERIENCE
Report Date: 08.01.2003
Keywords: DRILLING
Subject: Mud Bucket: Newly installed Mud Bucket fully functional.
Downtime: **Potensial time improvment:**
Company involved: Odfjell Drilling AS
References:

Description:

The new mud bucket installed prior to Beta West have been fully functional and worked well throughout the 8 1/2" section drilled with OBM. The remote control have been working well, and no operational problems have found place.

Immediate solution:

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section PA **Section start:** 08.01.2003 21:00 **Section end:** 12.01.2003 12:30
Category: POSITIVE EXPERIENCE
Report Date: 11.01.2003
Keywords: WELLHEAD/ASA
Subject: ABB WHH Rubber Sleeve: Functioned successfully - only 25 MT OP when retrieving wellhead
Downtime: **Potential time improvement:** 10
Company involved: ABB Vetco Gray
References:

Description:

In the planning phase it was decided to use X-Lite cement for the 30" Conductor Job. The excess was set to 300%. Based on well 34/7-32 Xenon, this gave cement flush to seabed, and the Overpull applied on the WHH was excessive during the P&A phase.

ABB suggested to run a greased up rubber sleeve, to prevent cement bonding to 30" WHH, and this was accepted as a good idea by Statoil. To be environmentally friendly, the grease was removed, and the rubber selected to be run was a Hepalon rubber. This was wrapped around the 30" WHH, and the connection glued together. Bandits and Tape was put on to assist in keeping the rubber sleeve in place.

After the wellhead had been cut, The MOST tool was locked down and overpull applied. At 25 MT the WHH came smoothly out of hole, and the rubber was observed to be left only on the upper part. The operation was performed without any operational problems, and very efficiently.

Time saving from Well 34/7-32 Xenon where the same cement type was run (overall saving): 10 Hrs.

Immediate solution:

N/A.

Soluton recommend for the future:

Continue using the "Rapid" 30" solution where the 30" Conductor is cemented in place using X-Lite cement with good amount of excess (300%). Also continue using the Hepalon rubber sleeve. This reduces the amount of time spent in P&A and is well worth the money spent on the sleeve (app. 40 000 NOK).

The sleeve length could be reduced to go from 2m below the wellhead/PGB(Normally at seabed) and 5 m down below seabed. Ie. The total length could be reduced to app 5-7 m.

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section 9 7/8" **Section start:** 20.12.2002 10:00 **Section end:** 21.12.2002 15:00
Category: NEGATIVE EXPERIENCE
Report Date: 22.01.2003
Keywords: BHA
Subject: Painting: Should be YELLOW as opposed to WHITE
Downtime: **Potential time improvement:**
Company involved: Statoil
References:

Description:

All BHAs was painted from shore - for easier stabbing and guiding of the BHA when BOP not installed. The yellow colour was used on some BHAs, and proves to give less reflection than the white paint. It is hence easier to observe the BHA with the ROV with yellow paint.

Immediate solution:

Soluton recommend for the future:

Utilize YELLOW paint as standard.

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section PA **Section start:** 08.01.2003 21:00 **Section end:** 12.01.2003 12:30
Category: POSITIVE EXPERIENCE
Report Date: 22.01.2003
Keywords: CUTTING/PATCHING
Subject: Cutting 20"/30": Use of motor proved very efficient
Downtime: **Potential time improvement:**
Company involved: Weatherford
References:

Description:

A 11 3/4" Drilex motor was used for cutting the Wellhead housings 4.5 m below datum. The cutting operation on this well was extremely efficient. Cut the 20" Casing with 2000 lpm/135 bar. Observed casing cut after appr. 30 min - as pressure increased to 155 bar. Increased pump rate to 3200 lpm/180 bar. 30" Cut after additional 1 Hr 20 min cutting. Continued pumping for 10 min. Pulled WHHs free with 25 MT Overpull.

Immediate solution:

Soluton recommend for the future:

Utilize motor for cutting operation (Together with rubber sleeve).

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section MOVE **Section start:** 12.01.2003 12:30 **Section end:** 19.01.2003 19:00
Category: POSITIVE EXPERIENCE
Report Date: 22.01.2003
Keywords: ANCHOR HANDLING
Subject: Fluke Angle: Adjustment from 30 Deg to 50 Deg Fluke angle performed on AHTS
Downtime: **Potential time improvement:**
Company involved: Statoil
References:

Description:

Due to the rig moving from hard seabed (16/7-8S) to soft seabed (6608/10-9) - the fluke angle had to be adjusted to 50 Deg. The onshore based plan was to disconnect the anchors, send them ashore to Balmoral, and have the Fluke angle adjusted. This was based on a time & risk assesment. However - based on a offhsore review and a discussion with the AHTs (Boa Giant, Skandi Bergen, Olympic Poseidon) it was decided that this operation could be performed in a safe and

Immediate solution:

Soluton recommend for the future:

Experience details

Field: EXPLORATION
Rig Name: DEEPSEA BERGEN
Wellbore: 0016/07-008S
Section: PA **Section start:** 08.01.2003 21:00 **Section end:** 12.01.2003 12:30
Category: NEGATIVE EXPERIENCE
Report Date: 22.01.2003
Keywords: CEMENTING
Subject: 13 3/8" Cement Job: No Cement observed between 30" WHH and 20" WHH during P&A
Downtime: **Potensial time improvement:**
Company involved: Statoil
References:

Description:

The 18 3/4" WHH x 13 3/8" Hosuing was cemented to seabed (with 40% Excess). However - during P&A no cement was observed between the 30" WHH and the 20" WHH above the cut. This verifies the theory of the cement settling down to some degree, leaving a void between the two housings.

Immediate solution:

Soluton recommend for the future:

**Final Well Report
PL 072B
Well 16/7-8S**

Doc. no.

Date
2003-07-07



Rev. no. 75 of 76

App H : Listing of other reports

COMPANY	REPORTS
Statoil	Well Programme
Statoil	Samtykkesøknad Beta West – Byford Dolphine
Esso	Søknad om samtykke til leteboring og bruk av Deepsea Bergen
Halliburton	Coring Report
Halliburton	Surface Data Logging (mudlogging)
ResLab	Core Photographs
Thales	Navigation & Positioning Reort
Baker Hughes Inteq	End of Well Report, MWD and Directional Drilling

7 Enclosures

Composite log

Formation evaluation log

Pressure evaluation log