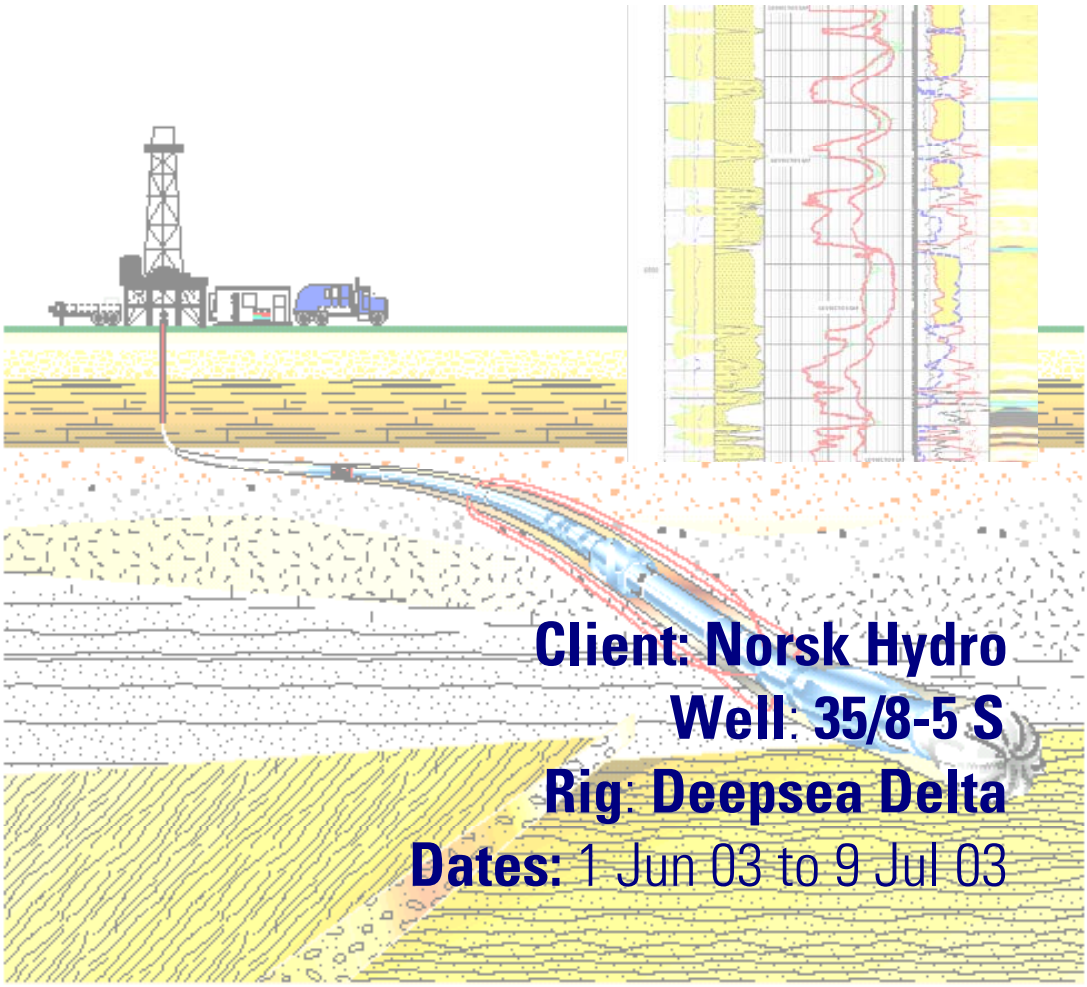
End of Well Report



Client: Norsk Hydro
Well: 35/8-5 S
Rig: Deepsea Delta
Dates: 1 Jun 03 to 9 Jul 03

Services provided by	:	Drilling and Measurements Schlumberger Offshore Services Ltd.
Report compiled by	:	Deepsea Delta Crew
Date	:	22nd July 2003
Report verified by	:	Julian Coles
Report approved by	:	Julian Coles

Table of Contents

1. Introduction

Company	:	Norsk Hydro
Well	:	35/8-5 S
Field	:	Sogn
Area	:	Norwegian North Sea
Country	:	Norway
Rig	:	Deepsea Delta
Drilling Contractor	:	Odfjell
Spud Date	:	1 June 2003
TD Date	:	9 July 2003
Total Depth	:	4000m MD
BRT-MSL	:	29m
MSL-Seabed	:	370m
BRT-Seabed	:	399m

2. Services Provided

2.1. MWD Services

The Schlumberger Drilling and Measurements IDEAL* Wellsite Information System (IWIS) provided the interface for Measurements While Drilling (MWD) data acquisition along with the real-time outputs needed for Drilling and Formation Evaluation.

Schlumberger Drilling and Measurements provided MWD services for all of the boreholes, starting from seabed at 399m below rotary table right through to when TD was called.

The PowerPulse MWD system provided stationary and continuous surveys and also transmitted Logging While Drilling (LWD) data up hole in real-time. It employs a mud siren to encode data digitally into a format, which is transmitted in the mud column inside the drill string. This is picked up at surface by pressure transducers mounted on the standpipe and decoded by the IWIS system. Data for this well was transmitted at a rate of 6 bits per second (6-bps) using Quadrant Phase Shift Keying (QPSK) technology

In addition toolface, continuous inclination and continuous azimuth measurements were available as parts of the repeating frame format to continuously monitor the wellbore as it was drilled. All surveys from the tool are transmitted with all 6-axis raw data measurements to allow quality checking of surveys on the surface.

As well as these core directional measurements, the MWD tools provided down hole tool temperature, MWD turbine RPM, which can give early warning of drill string washouts and down hole shock measurements to give early warning of potential damage to downhole equipment and inefficient drilling conditions. The MWD tool also provided a RPM and Stick-Slip measurements. These measurements can be used to improve drilling performance and also assists in preventing tool failure by detecting adverse downhole conditions.

2.2. LWD Services

Schlumberger Drilling and Measurements provided Logging While Drilling (LWD) as part of the data acquisition strategy for the well. The LWD tools used provided Resistivity and Gamma Ray measurements, in various bottom hole assembly (BHA) configurations, to optimise real-time decision making.

All real-time data acquired while drilling was transferred to town in real-time using InterACT Web Witness. In addition, surface-drilling parameters from BHI was transferred using the same.

During 12.25 X 26", 17 ½" and 12 ¼" sections of 35/-8-5 S, a Compensated Dual Resistivity (CDR) tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. These were used to evaluate the geology of the shallow formations and measure the downhole equivalent circulating density (ECD) in order to assist with hole cleaning. In the 12 ¼" section a ISONIC tool was used for pore pressure.

In the 8 ½" section, a Vision Resistivity (V675) tool was used for resistivity, gamma ray and annular pressure while drilling measurements. An Azimuthal Density Neutron (ADN6) tool provided density and porosity measurements, and an ISONIC tool was used for determining pore pressure. All data was transmitted in Real-time by a PowerPulse MWD tool.

2.3. Directional Drilling Services

Schlumberger D & M provided the Directional Drilling Services on the well 35/8-5-S of the Sogn prospect located offshore Norway. The services were provided from the 12 ¼" X 26" section of the well to the TD of the 8 ½" reservoir section.

During the 12 ¼" X 26" and 17" sections Schlumberger provided PowerPak motors, stabilisers and other non-magnetic BHA elements that allowed a directional well to be drilled along a planned trajectory. In addition, for the 12 ¼" sections and the 8 ½" reservoir sections, Schlumberger provided the PowerDrive and Xceed RSS tools to allow precise placement of the well, allowing the horizontal reservoir section to remain within the very small target tolerance of +/-

1m.

Throughout the well two directional drillers were on location to supervise the drilling of the well and to ensure defined target criteria were adhered too.

2.4. Schlumberger Personnel

2.4.1. MWD Personnel

Steinar Inge Bidne
Yasser Mansoor
Geir Bjørløw
Ukato Ayemere
Geir Meidell
Lars Rivenaes

2.4.2. LWD Personnel

John Tait
Erik Norgren

2.4.3. DD Personnel

Tim Booker
Egil Stranden
Gerard van Ditshuizen
Peter Roberts
Alf Lingren
Gerdt Widding

2.4.4. Project Manager

Inge Kartveit

3. Open Hole and Casing Record

3.1. Open Hole Record

Hole Size	Operation	Start Depth	TD
36 in	Drilling	399m MD	458m MD
12 ¼ in x 26 in.	Drilling	458m MD	683m MD
17 in.	Drilling	555m MD	1326m MD
12 ¼ in.	Drilling	1326m MD	3265m MD
8 1/2 in	Drilling	3265m MD	4000m MD

3.2. Casing Record

Casing Size	Start Depth	TD
30 in.	396m MD	458m MD
20 in.	396m MD	549.5m MD
13 3/8 in.	396m MD	1320 m MD
9 5/8 in	396m MD	3258 MD

4. Drilling Objectives and Results

4.1. Section Summary

4.1.1. 36" Section

The 36" section was drilled with a 17 ½" bit and a 26 x 36" hole opener in one bit run from 399m MD to 458m MD (17 ½" bit to 462 mMD).

The BHA incorporated a 9" PowerPulse MWD tool. The tool behaved well throughout the section, with good signal quality. No stabilizers wanted in BHA to avoid damage to sub sea template construction. Maximum inclination allowed was set to 1.5°. The maximum experienced inclination was 0.79° after some reaming. The maximum observed inclination was 0.79°. Boulders were seen occasionally from 420m. The hole was displaced to 1.3 SG mud before POOH.

POOH due to section TD at 458m MD

Recommendations:

This BHA meets the drilling criteria.

4.1.2. 26" Section

Cleanout assembly, drilled cement and 17 ½" track below hole opener.

Only Bit was included in this BHA; no tools were used.

4.1.3. 12.25" Pilot hole

The 12.25" Pilot hole was drilled from 458m MD to 683m MD in one bit run and was TD' due to well control problems (Flowing well).

Five attempts were done to cement the 12.25" Pilot hole before a successful run to dress off the cement.

For all runs, an 8.25" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

The section was planned as vertical, the first survey showing an inclination of 1.85 deg. Some short slides were made to reduce the inclination down to 0.69 deg and from 576m the BHA was rotated to TD. The last survey showed 0.79 deg.

At 683m there was a drilling break and a flow check showed that a shallow water zone had been penetrated. The well was flowing and so kill mud was pumped to stabilize the flow before pulling out to set cement plug and run casing.

Recommendations:

This BHA meets the drilling criteria.

4.1.4. 26" Section

The 17 ½" x 26" hole opening assembly was run without any problems, giving 26" hole to 555m. An MWD tool was included in the assembly that showed a final inclination of 2.67 degrees.

A 9" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys.

POOH due to section TD at 555m MD

Recommendations:

This BHA meets the drilling criteria.

4.1.5. 17" Section

Drilled in one run from 555m to 1326m MD. A CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. These were used to evaluate formation geology and pore pressure

A PowerPulse MWD tool was used for borehole surveys. Drilling was completed in one bit run with 100% data acquisition, real time and memory.

An 11 ¼" PowerPak motor tool made up to a Smith mill tooth bit, with an MWD and CDR tool run above the motor together with two NMDC.

The 26" section was planned to drill to 1100m and set 20" before drilling 16" hole but due to the shallow water flow the 20" casing was set shallow at 549.5m. The 17" section objective was to drill to 1400m without losses and set 13 3/8" casing. The section was planned to be drilled vertical with the motor included for performance drilling and to give the opportunity to nudge the well path if required. The 20" casing plugs were drilled without difficulty with 8 – 10 kkg and 4500lpm but limiting surface rotation to 50 rpm. After drilling the shoe and carefully reaming the rathole 3m of new formation was drilled to 561m. This was above to sands so that the required FIT of 1.25sg could be reached. During drilling flow was maintained at 3500lpm to prevent losses in the numerous sand zones through the Utsira and Grid formations, and the rate of penetration was controlled to 30m/hr to aid hole cleaning. After each formation change a flow check was made prior to proceeding. The hole was circulated clean several times during the section in addition to a number of stops to change shaker screens due to blinding by the volume of sand. Several limestone stringers were drilled at the top of the Grid formation requiring up to 15kkg to break through, but generally the formation was soft allowing 30m/hr to be maintained with 2 - 4 kkg. TD was called at 1326m after penetrating the top of the Balder formation.

Surveys showed the assembly keeping vertical, inclination varying between 1.5 and 2.5 degrees and generally in a north direction

At TD a wiper trip was made to the shoe without any problems, and after conditioning the mud the drilling assembly was pulled out and racked while the 13 3/8" casing was run.

The bit was in good condition, though starting to show signs of wear on all rows and all cones, most likely as a result of the limestone stringers.

Recommendations:

This BHA meets the drilling criteria. Higher penetrations rates would have been achievable with the motor had well bore conditions allowed.

4.1.6. 12 ¼" Section

Drilled in two runs from 1326m to 3265m MD. An 8.25" CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements whilst a 8.25" ISonic tool was used to provide porosity and pore pressure analysis data. These were used to evaluate formation geology and pore pressure trends.

A 8.25" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys.

We POOH in the first run due to low rate of penetration, found a washout on the ISonic tool at surface. Changed the tools and drilled to TD at 3265m MD.

Drilling was completed in two bit runs with 100% data acquisition, real time and memory.

1939m were drilled in two runs both of which used the Power Drive PD900 Rotary Steering tool made up to a Smith MRS74SPX PDC bit. MWD, CDR Resistivity and ISONIC LWD tools were run above the Power Drive.

After drilling out the cement and cleaning the rathole, 3m of new formation was drilled and an FIT was performed to 1.59 s.g. The mud system was then displaced to 1.20 s.g. Versavert OBM prior to commencing drilling. The Power

Drive was set to 180° toolface and 60% efficiency at 1395m, in order to drop the inclination from 2.5° to vertical. The flow was kept at 2700lpm as one nozzle was suspected to be blocked. This setting was held until 2285m, where it was adjusted to 90° magnetic toolface and 60% efficiency in order to kick off the well to 21° inclination in 105° azimuth. This was achieved by 2630m MD. 100% power settings were needed to achieve a 2°/30m build. The low response from the tool could be wash out at the pads or that the nozzle was not plugged and not enough power was routed to the pads.

From 2630 the angle was slowly dropped to 3.5° at 2945m and subsequently the tool was set to Magnetic tool face 233° at 100% power with the intention to turn the well to 270 degrees and start the build up to the target. Drilling was very slow the last 140m due to drilling through calcareous formation. The dropping rate was reducing while drilling this formation and at 2831m it was decided to increase the flow to 3000lpm to see if this would have any impact on increasing the drop rate. This could give some information if one of the nozzles was plugged or not which could explain the poor performance in 100% power setting. The drop rate actually increased with 1°/30m. At 2962m it was decided to pull the bit due to continuing low rate of penetration.

At surface the bit showed to be well worn on the shoulder/gauge area, but no blocked nozzles, and the seals of the pads of the PD900 were in good shape. A washout was however found in the ISONIC.

Drilling continued with the PowerDrive adjusted to 233° Magnetic toolface and 100% effect in order to turn the well path towards 270° azimuth and build inclination with 3°/30m. At 10° inclination, the setting was changed to 288° gravity toolface and 100% effect. The ROP was held to 30 m/hr in order to obtain 3-3.5°/30m dogleg.

At 3181m, the target TVD was shifted 60m up, from 3358m TVD to 3298m TVD, and the PowerDrive was adjusted to 323° toolface and 100% effect, as the azimuth was achieved and only inclination to build. The ROP was held back to 15 m/hr using 180 RPM in order to obtain maximum doglegs due to the target shift. Doglegs of 5°/30m was achieved. Drilling continued to 3265m MD / 3237m TVD, where section TD was called as formations came in 97m TVD higher then expected. After weighing up the mud to 1.27 s.g and circulating the hole clean, the string was pulled out of the hole.

Recommendations:

This BHA mainly meets the drilling criteria, but throughout lower Jorsalfaret and Tryggvason Formations in the Shetland Group, the generated doglegs were relatively low around 2°/30m. This should be noted in case of a developing program for the field.

4.1.7. 8 ½" Section

Drilled from 3265m to 4000m MD in 3 bit runs and 3 core runs. A Vision675R tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements, whilst an ISONIC tool was used to give pore pressure estimates. An Azimuthal Density Neutron (ADN6) tool provided density and porosity measurements. These were used to evaluate formation geology and pore pressure trends.

A PowerPulse MWD tool was used for borehole survey. It included a multi axis vibration cartridge. These were used as aids to improve drilling performance by monitoring the amount of BHA stick-slip and bit bounce. Drilling was completed in three bit runs with 100% data acquisition, real time and memory.

The drilling assembly for the 8 ½" section used the Anadrill XCEED Rotary-Steering-System (RSS), incorporating a near bit inclination sensor. This tool was made up to a Smith MRS68EXP PDC bit. Above the RSS tool were a suite of MWD and LWD tools incorporating the ARC6, MWD, ISONIC and ADN (Neutron Porosity) tool. Completing the BHA was one non-magnetic pony drill collar.

After making up the BHA and running in the hole, the float, cement and shoe were drilled out carefully while increasing the mud weight from 1.27 s.g to 1.35 s.g. An FIT to 1.80 s.g. Was performed after drilling 3m of new formation.

The Xceed was initialized at surface in 40% highside setting and drilling continued with a controlled ROP of 10 m/hr in order to look for the reservoir while building inclination from 32° to 36° inclination by 3305m using 3°/30m doglegs.

Drilling continued looking for the reservoir with a controlled low ROP and a variation of 0-30% effect was used to hold the inclination close to 36°. At 3381m, bottoms up was circulated to evaluate samples and the decision to POOH in order to core was made.

After 4 coring runs the decision were made to RIH with the same previous drilling assembly to drill from the coring point and down to the Balder formation.

This second drilling run was used to wash/ream down through the cored section for the LWD logs.

A MWD survey at the start of the run showed that the core runs had built the inclination 1deg to 37.1deg and turned the azimuth left from 266 to 263deg. The Xceed tool was therefore left in its neutral mode until 3466m that allowed the inclination to slowly drop to 36.2deg, although azimuth only showed a slight right hand walk. Therefore 20% settings of 66deg toolface were used to bring the azimuth around to 266deg.

At 3490m, the tool was set to its Hold-the-Line (HTL) mode that would allow the tool to automatically hold the desired inclination and azimuth of 36.2deg and 266deg respectively. This was the first use of this new development in the tools capability. However, a sudden dropping tendency taking the inclination to 34.4deg caused some concern and after 6m the tool was reset to its manual mode and tool commands sent to bring the wells trajectory back to that planned.

Once the well was back on track a further attempt was made to use the HTL mode at a depth of 3469. This time the tool responded very well and from 3569m to 3845m the tool maintained the wellpath automatically with only 3 small 'trimming' courses sent to the tool for fine-tuning the wellpath.

Some stick/slip problems were seen during the latter stages of the section as hard limestone stringers were encountered. However, this did not detrimentally affect the tools response and the tangent section was held within 0.3m of the planned line. At 3841m a drilling break indicated the top Brent and after drilling to 3845m to confirm the sandstone with the LWD logs, bottoms up was circulated and a trip made to pick up the coring assembly. No problems were encountered on the trip.

Two coring runs were then made that cored from 3845-3883m

The third and final drilling run was used to wash/ream down through the cored

section from 3845-3883m for the LWD logs and drill to TD.

A MWD survey at the start of the run showed that the core runs had dropped the inclination 1.5 deg to 34.6 deg. Consequently; the Xceed tool was set to its manual mode with a steering ratio of 20% and a toolface of 24deg. On previous runs this setting had given a building tendency, but in this case the inclination continued slowly to drop.

The tool was therefore set to 50% steering ratio, but after 10m this only gave a holding tendency. A 70% setting was therefore used and built the inclination at 5°/30m back toward 36deg, over 8m. Steering ratios were then moderated to 30% that showed a slow build at 1-2°/30m, and then to 20%.

However, this Steering ratio of 20% 354deg toolface did not give the expected holding tendency but again showed a sudden dropping tendency and 70% settings were required to build the inclination back to 36deg.

With such a short run and the lack of success in keeping the inclination about 36deg, the Hold-the-Line mode was not used for this run.

Throughout the run intermittent high stick/slip values were seen from the Xceed tool, accompanied by high shock values from the MWD. Over the final 10m of the run, with the tool set in its 30% steering ratio and toolface of 354deg, high stick/slip became almost constant and although several attempts were made to minimize this with parameter changes, high stick/slip persisted until the end of the run. Corresponding with this the inclination started to decrease rapidly and over the final 10m the Xceed inclination and azimuth readings showed that the inclination had decreased from 36.4deg to 34.2deg, with the azimuth turning from 264 to 261deg. TD was reached at 4000m, 50m below the OWC to allow wire line logs to pass across the reservoir zone. No problems were encountered on the trip out.

Recommendations:

This was the first occasion that the Hold-the-Line (HTL) capability of the Rotary Steerable Xceed tool was used and was considered a field test. The first and final runs of this section that used this tool were not long enough to use the HTL mode. However, in manual mode the Xceed tool worked very well responding to the commands sent without problems, especially during the first run.

The second run did utilize the HTL capability and was very successful. Some problems were found after setting the tool to its HTL mode on the first attempt at 3490m, but when attempted again at 3569m, no problems were encountered. The tool was able to automatically hold the tangent trajectory for 276m with minimal interference from the Directional Driller. This was the remainder of the run until a core point was reached. The first unsuccessful attempt at HTL is being investigated with the data from the tools memory analyzed to understand the problem

The first and second run used a Smith MSR68EPX PDC bit that gave very stable and predictable responses. This bit had an extra long gauge of 4" and was also a field test and was designed to overcome the very over responsive behaviour seen on the previous Fram well when using the Xceed tool together with short gauge bits.

For the third and final run the bit was changed to the same bit type as before but with the standard 2" gauge. This run gave much more unpredictable building and dropping tendencies, similar to that seen on Fram where there were interbedded formations. This was to the extent that the tangent inclination and azimuth could not be achieved for long enough to allow the HTL mode to be used.

In conclusion, the Xceed tool worked excellently without problems. Hold-the-Line capability proved successful and maintained the hole trajectory to within 0.3m of the planned well. The comparison of the longer gauge bit against the shorter gauge bit indicates that the combination of longer gauge bits with Xceed RSS tools gives a much more stable and predictable response, and may be a necessity when using the HTL mode. However using longer gauge bits may reduce the dogleg potential of the tool although from the short steering intervals seen with the long gauge bits 6deg doglegs seemed well within the tools capability.

5. Run Details

5.1. BHA Reports

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ROTARY BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	36
RUN No:	1	**BHA No. 1**		**BIT No:**	1
MD In:	399.0m	**MD Out: 458.0m**		**INTERVAL:**	59m

OBJECTIVE:

General:	26x36 2-stage holeopener with 9 1/2" drillcollars to drill vertical.
Inclination:	Vertical
Azimuth:	Vertical

BIT No. 1

	#1	#2	#3	#4
Nozzles:	18	18	18	15

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
17 1/2	Insert			Smith	10GMODPD	LW 9922	0.918	2.5"

Features:	Tungsten carbide inserts at gauge.							
Condition in:	New							
Hydraulics:	With a MW of	1.03 SG	at	4000 lpm	bit pd =	73 bar	and H.S.I =	2.72
Dull Grading:	1,1,WT,A,E,NO,TD							

BHA No. 1 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
LW 9922	17 1/2	Bit	-	-	7 5/8 R P	0.45	0.45	
	26 x 36	Holeopener *	3 1/5	7 5/8 R B	7 5/8 R B	4.32	4.77	36" @ 2.23m
DOT 1826	9 1/2	Pony NMDC	3	7 5/8 R P	7 5/8 R B	4.30	9.07	
37608	9	MWD	-	7 5/8 R P	7 5/8 R B	8.90	17.97	D&I @ 13.68m
3 x	9 1/2	DC's	3 1/4	7 5/8 R P	7 5/8 R B	27.78	45.75	
	9 5/16	X/O Sub	2 7/8	7 5/8 R P	6 5/8 R B	1.04	46.79	
4 x	8	DC's	2 13/16	6 5/8 R P	6 5/8 R B	35.79	82.58	
WHC 0281	8	Jar	2 13/16	6 5/8 R P	6 5/8 R B	9.65	92.23	
2 x	8	DC's	2 13/16	6 5/8 R P	6 5/8 R B	18.07	110.30	

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
N/A								
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe	Circ	Other	TOTAL
In:	10:00; 01/Jun	399.0m						
Out:	02:30; 03/Jun	458.0m	24.5	17.9	0.0	10.1	16.0	40.5
	ROP:	**59m**	**in**	**17.9hrs**	**=**	**3.3**	**m/hr**	
	Drilled:	59m	Rotated:	59m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW (lpm)	SPP (bar)	RPM (string)	WOB (kdaN)	TRQ (KN.m)	STRING WEIGHTS ROT (tons)	UP (tons)	DN (tons)
Min:	2800	30	70	0	2			
Max:	4150	109	110	12	13	78	78	78

SURVEY DATA: *Comments:* Heavy magnetic interference, Az measurement not good VS Azimuth 32.70

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	409.01	0.06	0.00	409.01	0.21	0.00	0.21	0.66
Last survey:	442.34	0.79	0.00	442.34	0.46	0.00	0.46	

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
SW								10° C

RESULTS:

The 2 stage hole opener with a 17 ½" tri cone bit used to spud the well, performed as expected. To ensure vertical the ROP was held back, as well as WOB. No stabilizers wanted in BHA to avoid damage to sub sea template construction. Maximum inclination allowed was set to 1.5°. The maximum experienced inclination was 0.79° after some reaming. Boulders experienced the last 15m were the drilling were slow. The hole was displaced to 1.3 SG mud before POOH. BHA was in the hole when DD's arrived on the rig.

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ROTARY BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	26
RUN No:	2	**BHA No. 2**		**BIT No:**	2rr
MD In:	458.0m	**MD Out: 461.0m**		**INTERVAL:**	3m

OBJECTIVE:

General:	Clean out assembly
Inclination:	Drill cement and rathole from holeopener.
Azimuth:	Hold

BIT No. 2

	#1	#2	#3	#4
Nozzles:	20	20	20	19

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
26	Mill Tooth	-	1 1 5	Smith	MSDSSHODC	LW-6136	1.197	2.5"

Features:	Tungsten carbide inserts at gauge.							
Condition in:	Rerun bit							
Hydraulics:	With a MW of	1.03 SG	at	4500 lpm	bit pd =	54 bar	and H.S.I =	1.03
Dull Grading:	1,1,NO,A,E,IN,NO,TD.							

BHA No. 2 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
LW-6136	26	Bit	-	-	7 5/8 R P	0.65	0.65	
Bit sub	9 7/16	Float Sub *	3	7 5/8 R B	7 5/8 R B	0.96	1.61	
2 x	9 1/2	DC	3	7 5/8 R P	7 5/8 R B	18.45	20.06	
WH 1102	9 1/4	X/O Sub	2 13/16	7 5/8 R P	7 5/8 H90 B	1.09	21.15	
4 x	8	DC	2 13/16	6 5/8RP	6 5/8RB	35.79	56.94	
WHC 0281	7 3/4	Jar	2 13/16	6 5/8RP	7 5/8 R B	9.65	66.59	
2 x	8	DC	3 1/2	6 5/8RP	6 5/8 R B	18.07	84.66	
	7 7/8	X/O Sub	2 13/16	6 5/8RP	4 1/2 IF	1.06	85.72	
15 x		5" HW		4 1/2 IF	4 1/2 IF	139.62	225.34	

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
N/A								
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	06:15; 04/Jun	458.0m						
Out:	10:00; 04/Jun	461.0m	1.0	0.5	0.5	0.0	2.8	3.8
	ROP:	**3m**	**in**	**0.5hrs**	**=**	**6.0**	**m/hr**	
	Drilled:	3m	Rotated:	3m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW (lpm)	SPP (bar)	RPM (string)	WOB (kdaN)	TRQ (KN.m)	STRING WEIGHTS ROT (tons)	UP (tons)	DN (tons)
Min:	4150	100	60	1	2			
Max:	4150	100	100	4	5	78	78	78

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 32.70

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	442.34	0.79	0.00	442.34	0.46	0.00	0.46	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
SW w/sweeps	✠		1.03					

RESULTS:

Cleanout assembly, drilled cement and 17 1/2" track below hole opener.

No tools in BHA bit only.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	26
RUN No:	3	**BHA No. 3**		**BIT No:**	3
MD In:	461.0m	**MD Out: 683.0m**		**INTERVAL:**	222m

OBJECTIVE:

General:	Drill pilot hole vertical to 1150m to look for possible shallow water.
Inclination:	Vertical
Azimuth:	

BIT No. 3	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*		
Nozzles:	20	20	18	16				
Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
12 1/4	Mill Tooth		1 1 7	Smith	FGXiC	MM 3702	1.058	1.5"
Features:	Rock bit							
Condition in:	New							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	42 bar	and H.S.I =	2.80
Dull Grading:	1-1-NO-A-E-IN-NO-TD							

BHA No. 3 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
MM 3702	12 1/4	Bit	-	-	6 5/8 R B	0.33	0.33	
1033	9 5/8	PowerPak Motor	-	6 5/8 R B	6 5/8 R B	8.30	8.63	
30143	8	Float Sub		6 5/8 RP	6 5/8 R B	0.92	9.55	
26123	12 1/8	NM Stab	2 3/4	6 5/8 RP	6 5/8 R B	2.56	12.11	
8200	8 1/8	CDR	-	6 5/8 RP	6 5/8 FH	6.59	18.70	
V799	8 1/8	MWD	-	6 5/8 FH	6 5/8 R B	8.90	27.60	D&I @ 23.74m
26120	12	NM Stab	2 13/16	6 5/8 R P	6 5/8 R B	2.45	30.05	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	39.52	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.86	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	84.56	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	94.21	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	112.28	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF	1.06	113.34	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	252.96	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
A962XP	12 1/8"	0.78	2270 lpm	4540 lpm	0.03	30	0 mm	1 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	*Imp. size*	*Mud Data*	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	11:30; 04/Jun	461.0m						
Out:	02:30; 05/Jun	683.0m	8.2	5.3	0.0	2.9	6.8	15
	ROP:	**222m**	**in**	**5.3hrs**	**=**	**41.9**	**m/hr**	
	Drilled:	222m	Rotated:	196m	88%	Oriented:	26m	12%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	3350	119	100	1	1	*(tons)*	*(tons)*	*(tons)*
Max:	4000	171	110	3	2	67	67	68

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	457.59	1.45	0.00	457.59	0.76	0.76	0.00	1.30
Last survey:	628.71	0.79	26.97	628.66	4.33	4.33	0.71	

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Seawater	✠		1.03					

RESULTS:

Drilled out of the casing and the rathole from the 26 in cleanout assembly at 461m. The first survey showed a inclination of 1.85 deg correction steering was applied to get the inclination down to 0.69 deg. After 576m the BHA was rotated to TD, the last survey showed 0.79 deg.
At 683m there was a drilling break and a flowcheck showed that we had hit shallow water, the well was flowing and kill mud was pumped to stop the flow. Pulled out of hole to set cement plug and run casing.

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STEERABLE BHA REPORT

HYDRO

RIG: DeepSea Delta | **WELL: 35/8-5 S** | **PHASE:** 26
RUN No: 4 | **BHA No. 4** | **BIT No:** 3rr1
MD In: 683.0m | **MD Out: 683.0m** | **INTERVAL:** 0m

OBJECTIVE:

General:	Dress off cement plug down to 50m above Utsira
Inclination:	Vertical
Azimuth:	

BIT No. 3rr1	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*		
Nozzles:	20	20	18	16				
Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
12 1/4	Mill Tooth		1 1 7	Smith	FGXiC	MM 3702	1.058	1.5"
Features:	Rock bit							
Condition in:	1-1-NO-A-E-IN-NO-TD							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	42 bar	and H.S.I =	2.80
Dull Grading:	1-1-NO-A-E-IN-NO-TD							

BHA No. 4 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
MM 3702	12 1/4	Bit	-	-	6 5/8 R B	0.33	0.33	
1033	9 5/8	PowerPak Motor	-	6 5/8 R B	6 5/8 R B	8.30	8.63	
30143	8	Float Sub		6 5/8 RP	6 5/8 R B	0.92	9.55	
26123	12 1/8	NM Stab	2 3/4	6 5/8 RP	6 5/8 R B	2.56	12.11	
8200	8 1/8	CDR	-	6 5/8 RP	6 5/8 FH	6.59	18.70	
V799	8 1/8	MWD	-	6 5/8 FH	6 5/8 R B	8.90	27.60	D&I @ 23.74m
26120	12	NM Stab	2 13/16	6 5/8 R P	6 5/8 R B	2.45	30.05	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	39.52	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.86	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	84.56	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	94.21	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	112.28	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF		112.28	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	251.90	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
A962XP	12 1/8"	0.78	2270 lpm	4540 lpm	0.03	30	1 mm	1 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	20:00; 05/Jun	683.0m						
Out:	02:45; 06/Jun	683.0m	1.5	0.0	0.0	1.5	5.3	6.75
	ROP:	**0m**	**in**	**0.0hrs**	**=**	**0.0**	**m/hr**	
	Drilled:	0m	Rotated:	0m	#DIV/0!	Oriented:	26m	#DIV/0!

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	3350	119	100	1	1	*(tons)*	*(tons)*	*(tons)*
Max:	4000	171	110	3	2	67	67	68

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	628.71	0.79	26.97	628.66	4.33	4.33	0.71	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Seawater	✠		1.03					

RESULTS:

The 12 1/4" assembly was run in to dress the cement plug to 633m prior to opening the hole to 26". First cement was tagged at 594m but only 5m of hard cement was found before reaming to 683m. The hole was circulated clean and displced to 1.3sg mud prior to pulling out to set a further cement plug.

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STEERABLE BHA REPORT

HYDRO

RIG: DeepSea Delta | **WELL: 35/8-5 S** | **PHASE:** 26
RUN No: 5 | **BHA No. 5** | **BIT No:** 3rr2
MD In: 675.0m | **MD Out: 675.0m** | **INTERVAL:** 0m

OBJECTIVE:

General:	Dress off cement plug down to 50m above Utsira
Inclination:	Vertical
Azimuth:	

BIT No. 3rr2	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*		
Nozzles:	20	20	18	16				
Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
12 1/4	Mill Tooth		1 1 7	Smith	FGXiC	MM 3702	1.058	1.5"
Features:	Rock bit							
Condition in:	1-1-NO-A-E-IN-NO-TD							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	42 bar	and H.S.I =	2.80
Dull Grading:	1-1-NO-A-E-IN-NO-TD							

BHA No. 5 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
MM 3702	12 1/4	Bit	-	-	6 5/8 R B	0.33	0.33	
1033	9 5/8	PowerPak Motor	-	6 5/8 R B	6 5/8 R B	8.30	8.63	
30143	8	Float Sub		6 5/8 RP	6 5/8 R B	0.92	9.55	
26123	12 1/8	NM Stab	2 3/4	6 5/8 RP	6 5/8 R B	2.56	12.11	
8200	8 1/8	CDR	-	6 5/8 RP	6 5/8 FH	6.59	18.70	
V799	8 1/8	MWD	-	6 5/8 FH	6 5/8 R B	8.90	27.60	D&I @ 23.74m
26120	12	NM Stab	2 13/16	6 5/8 R P	6 5/8 R B	2.45	30.05	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	39.52	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.86	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	84.56	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	94.21	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	112.28	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF		112.28	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	251.90	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
A962XP	12 1/8"	0.78	2270 lpm	4540 lpm	0.03	30	1 mm	1 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	21:45; 06/Jun	683.0m						
Out:	05:30; 07/Jun	683.0m	2.2	0.0	0.0	2.2	5.5	7.75
	ROP:	**0m**	**in**	**0.0hrs**	**=**	**0.0**	**m/hr**	
	Drilled:	0m	Rotated:	0m	#DIV/0!	Oriented:	26m	

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	350	15	0	-	-	*(tons)*	*(tons)*	*(tons)*
Max:	-	-	-	-	-	67	67	68

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	628.71	0.79	26.97	628.66	4.33	4.33	0.71	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Seawater	✠		1.03					

RESULTS:

The 12 1/4" assembly was run in to dress the cement plug to 633m prior to opening the hole to 26". First cement was expected at 523m, but not tagged until 674.5m. 0.5m was dressed off prior to circulating the hole clean and pumping a kill pill over the Utsira sand. The well was observed to be still flowing so the top sands between 520m and 537m were suspected. The 12 1/4" assembly was pulled out to set a further cement plug.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	26
RUN No:	6	**BHA No. 6**		**BIT No:**	3rr3
MD In:	658.0m	**MD Out: 658.0m**		**INTERVAL:**	0m

OBJECTIVE:

General:	Dress off cement plug down to 555m
Inclination:	Vertical
Azimuth:	

BIT No. 3rr3

	#1	#2	#3	#4	#5	#6
Nozzles:	20	20	18	16		

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
12 1/4	Mill Tooth		1 1 7	Smith	FGXiC	MM 3702	1.058	1.5"

Features:	Rock bit							
Condition in:	1-1-NO-A-E-IN-NO-TD							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	42 bar	and H.S.I =	2.80
Dull Grading:	1-1-NO-A-E-IN-NO-TD							

BHA No. 6 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
MM 3702	12 1/4	Bit	-	-	6 5/8 R B	0.33	0.33	
1033	9 5/8	PowerPak Motor	-	6 5/8 R B	6 5/8 R B	8.30	8.63	
30143	8	Float Sub		6 5/8 RP	6 5/8 R B	0.92	9.55	
26123	12 1/8	NM Stab	2 3/4	6 5/8 RP	6 5/8 R B	2.56	12.11	
8200	8 1/8	CDR	-	6 5/8 RP	6 5/8 FH	6.59	18.70	
V799	8 1/8	MWD	-	6 5/8 FH	6 5/8 R B	8.90	27.60	D&I @ 23.74m
26120	12	NM Stab	2 13/16	6 5/8 R P	6 5/8 R B	2.45	30.05	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	39.52	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.86	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	84.56	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	94.21	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	112.28	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF		112.28	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	251.90	

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
A962XP	12 1/8"	0.78	2270 lpm	4540 lpm	0.03	30	1 mm	1 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	05:30; 08/Jun	683.0m						
Out:	23:30; 08/Jun	683.0m	1.9	0.0	0.0	1.9	16.1	18
	ROP:	**0m**	**in**	**0.0hrs**	**=**	**0.0**	**m/hr**	
	Drilled:	0m	Rotated:	0m	#DIV/0!	Oriented:	26m	#DIV/0!

PARAMETERS: *Comments:*

	FLW (lpm)	SPP (bar)	RPM (string)	WOB (kdaN)	TRQ (KN.m)	STRING WEIGHTS ROT (tons)	UP (tons)	DN (tons)
Min:	350	15	0	-	-			
Max:	-	-	-	-	-	67	67	68

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	628.71	0.79	26.97	628.66	4.33	4.33	0.71	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
Seawater	✠		1.03					

RESULTS:

The 12 1/4" assembly was run in to dress the cement plug to 555m prior to opening the hole to 26". First cement was expected at 480m and still not tagged at 555m. The cement was allowed a further 12 hours to harden before continuing to carefully wash and ream into the hole. The cement was tagged 658m. 0.5m was dressed off prior to circulating clean and flow checking. There was no flow so the hole displaced to 1.3sg mud prior pulling the 12 1/4" assembly and running in with the cement stinger to set a further cement plug.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	26
RUN No:	7	**BHA No. 7**		**BIT No:**	3rr4
MD In:	571.0m	**MD Out: 571.0m**		**INTERVAL:**	0m

OBJECTIVE:

General:	Dress off cement plug down to 555m
Inclination:	Vertical
Azimuth:	

BIT No. 3rr4

	#1	#2	#3	#4	#5	#6
Nozzles:	20	20	18	16		

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
12 1/4	Mill Tooth		1 1 7	Smith	FGXiC	MM 3702	1.058	1.5"

Features:	Rock bit							
Condition in:	1-1-NO-A-E-IN-NO-TD							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	42 bar	and H.S.I =	2.80
Dull Grading:	1-1-NO-A-E-IN-NO-TD							

BHA No. 7 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
MM 3702	12 1/4	Bit	-	-	6 5/8 R B	0.33	0.33	
1033	9 5/8	PowerPak Motor	-	6 5/8 R B	6 5/8 R B	8.30	8.63	
30143	8	Float Sub		6 5/8 RP	6 5/8 R B	0.92	9.55	
26123	12 1/8	NM Stab	2 3/4	6 5/8 RP	6 5/8 R B	2.56	12.11	
8200	8 1/8	CDR	-	6 5/8 RP	6 5/8 FH	6.59	18.70	
V799	8 1/8	MWD	-	6 5/8 FH	6 5/8 R B	8.90	27.60	D&I @ 23.74m
26120	12	NM Stab	2 13/16	6 5/8 R P	6 5/8 R B	2.45	30.05	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	39.52	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.86	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	84.56	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	94.21	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	112.28	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF		112.28	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	251.90	

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
A962XP	12 1/8"	0.78	2270 lpm	4540 lpm	0.03	30	1 mm	1 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	17:00; 09/Jun	683.0m						
Out:	23:00; 09/Jun	683.0m	0.9	0.0	0.0	0.9	5.1	6
	ROP:	**0m**	**in**	**0.0hrs**	**=**	**0.0**	**m/hr**	
	Drilled:	0m	Rotated:	0m	#DIV/0!	Oriented:	26m	#DIV/0!

PARAMETERS: *Comments:*

	FLW (lpm)	SPP (bar)	RPM (string)	WOB (kdaN)	TRQ (KN.m)	STRING WEIGHTS ROT (tons)	UP (tons)	DN (tons)
Min:	350	15	0	-	-			
Max:	-	-	-	-	-	67	67	68

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	628.71	0.79	26.97	628.66	4.33	4.33	0.71	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
Seawater	✠		1.03					

RESULTS:

The 12 1/4" assembly was run in to dress the cement plug to 555m prior to opening the hole to 26". First cement was expected at 480m but not tagged until 570.5m. The hole was circulated clean and flow checked prior to displacing to 1.3sg mud and pulling the 12 1/4" assembly. Once the drilling assembly was racked the cement stinger was run in to set a further cement plug to 470m.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	26
RUN No:	8	**BHA No. 8**		**BIT No:**	3rr5
MD In:	513.0m	**MD Out: 558.0m**		**INTERVAL:**	45m

OBJECTIVE:

General:	Dress off cement plug down to 558m
Inclination:	Vertical
Azimuth:	

BIT No. 3rr5	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*		
Nozzles:	20	20	18	16				
Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
12 1/4	Mill Tooth		1 1 7	Smith	FGXiC	MM 3702	1.058	1.5"
Features:	Rock bit							
Condition in:	1-1-NO-A-E-IN-NO-TD							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	42 bar	and H.S.I =	2.80
Dull Grading:	1-1-NO-A-E-IN-NO-TD							

BHA No. 8 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
MM 3702	12 1/4	Bit	-	-	6 5/8 R B	0.33	0.33	
1033	9 5/8	PowerPak Motor	-	6 5/8 R B	6 5/8 R B	8.30	8.63	
30143	8	Float Sub		6 5/8 RP	6 5/8 R B	0.92	9.55	
26123	12 1/8	NM Stab	2 3/4	6 5/8 RP	6 5/8 R B	2.56	12.11	
8200	8 1/8	CDR	-	6 5/8 RP	6 5/8 FH	6.59	18.70	
V799	8 1/8	MWD	-	6 5/8 FH	6 5/8 R B	8.90	27.60	D&I @ 23.74m
26120	12	NM Stab	2 13/16	6 5/8 R P	6 5/8 R B	2.45	30.05	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	39.52	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.86	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	84.56	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	94.21	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	112.28	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF		112.28	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	251.90	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
A962XP	12 1/8"	0.78	2270 lpm	4540 lpm	0.03	30	1 mm	1 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments: Dress cement plug to 558m*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	10:30; 10/Jun	683.0m						
Out:	21:45; 10/Jun	683.0m	1.7	0.0	0.8	1.7	9.6	11.25
	ROP:	**0m**	**in**	**0.0hrs**	**=**	**0.0**	**m/hr**	
	Drilled:	0m	Rotated:	0m	#DIV/0!	Oriented:	0m	#DIV/0!

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	3000	87	45	4	1.2	*(tons)*	*(tons)*	*(tons)*
Max:	3050	91	45	5	2	67	67	68

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	628.71	0.79	26.97	628.66	4.33	4.33	0.71	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Seawater	✠		1.03					

RESULTS:

The 12 1/4" assembly was run in to dress the cement plug to 558m prior to opening the hole to 26". First cement was expected at 470m but not tagged until 513m, the cement was dressed down to 558m. The hole was circulated clean and flow checked prior to displacing to 1.3sg mud. The 12 1/4" assembly was laid out and the 26" holeopening assembly was run in.

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ROTARY BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	26
RUN No:	9	**BHA No. 9**		**BIT No:**	Bullnose
MD In:	461.0m	**MD Out: 558.0m**		**INTERVAL:**	97m

OBJECTIVE:

General:	Open 12 1/4" pilot hole to 26" from 461m to 558m
Inclination:	Vertical
Azimuth:	

Bullnose	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*	*#7*	
Nozzles:	16	16	16	16	16	16	28	
Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
26	Mill Tooth		1 1 7	Red Baron	Hole Opener	DH09342	1.779	1.5"
Features:	bullnose, 17 1/2" hole opener, 26" hole opener							
Condition in:	New							
Hydraulics:	With a MW of	1.03 SG	at	3500 lpm	bit pd =	15 bar	and H.S.I =	0.22
Dull Grading:	26" Hole opener 1-1-WT-A-1-IN-NO-TD							

BHA No. 9 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
	9 9/16	Bullnose	-	-	7 5/8 R B	0.97	0.97	
DH 09342	9 7/8	17 1/2" h/opener	-	7 5/8 R P	7 5/8 R B	1.59	2.56	
	9 1/2	26" h/opener		7 5/8 R P	7 5/8 R B	1.40	3.96	
	9 7/16	Bit sub	3	7 5/8 R P	7 5/8 R B	0.76	4.72	
	9 1/16	NM Pony DC	3	7 5/8 R P	7 5/8 R B	2.87	7.59	
26123	9 1/2	24" NM Stab	3	7 5/8 R P	7 5/8 R B	2.44	10.03	
37608	9 1/2	MWD	-	7 5/8 R P	7 5/8 R B	8.90	18.93	D&I @ 11.60m
504005	9 1/2	DC	3	7 5/8 R P	7 5/8 R B	9.33	28.26	
WH11008	9 3/16	X/O Sub	3 1/8	7 5/8 R P	6 5/8 R B	1.09	29.35	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	38.82	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	48.16	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	83.86	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	93.51	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	111.58	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF	1.06	112.64	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	252.26	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	23:00; 10/Jun	461.0m						
Out:	12:00; 11/Jun	555.0m	7.1	3.8	0.0	3.3	5.9	13
	ROP:	**94m**	**in**	**3.8hrs**	**=**	**24.7**	**m/hr**	
	Drilled:	94m	Rotated:	0m	0%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	3800	104	40	2	3	*(tons)*	*(tons)*	*(tons)*
Max:	4370	142	65	6	5	66	66	65

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	466.54	1.49	6.60	466.53	0.04	0.94	0.04	0.82
Last survey:	541.63	2.67	3.61	541.57	0.29	3.66	0.29	

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Seawater	✠		1.03					

RESULTS:

The 26" hole opener assembly was run in to 450m before slowly wasing down to tag formation. The 30" conductor was set a 458m and some weight was taken at 457m. The assembly was slowly rotated to 461m where the hole had been previosly cleaned out to 26". Flow was increased to 3800lpm and rotation to 40 - 60 rpm. The first metre or two were a little hard but after weights of 5 - 7 kkg were used to open the hole was 20 - 30 m/hr. Surveys showed the inclination very close to those measure with the previous dress-off assembly, although both of these were about a degree higher than the surveys from the original pilot hole drilling.

The hole was opened to 555m then circulated clean and flow checked prior to displacing to 1.3sg mud and pulling out to run the 20" casing.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	17
RUN No:	10	**BHA No. 10**		**BIT No:**	4rr1
MD In:	561.0m	**MD Out: 1326.0m**		**INTERVAL:**	765m

OBJECTIVE:

General:	Drill 17" hole vertical to 1400m
Inclination:	Vertical
Azimuth:	

4rr1	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*
Nozzles:	24	24	22	16		

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
17	Mill Tooth		135	Smith	MSDGHC	MJ6670	1.451	1.5"

Features:	Rock bit							
Condition in:	New							
Hydraulics:	With a MW of	1.13 SG	at	3500 lpm	bit pd =	25 bar	and H.S.I =	0.85
Dull Grading:	2-2-WT-A-E-IN-NO-TD							

BHA No. 10 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
MJ6670	17	Bit	-	-	7 5/8 R P	0.42	0.42	
2131	11 1/4	PowerPak Motor	-	7 5/8 R B	7 5/8 R B	8.43	8.85	
FLX-04	9	Float Sub		7 5/8 R P	7 5/8 R B	1.53	10.38	
25094	16 3/4	NM Stab	3	7 5/8 R P	7 5/8 R B	2.24	12.62	
9552	9 5/8	CDR	-	7 5/8 R P	7 5/8 FH	7.07	19.69	
37608	9 3/16	MWD	-	7 5/8 FH	7 5/8 R B	8.41	28.10	D&I @ 23.78m
35885	16 3/4	NM Stab	3	7 5/8 R P	7 5/8 R B	1.95	30.05	
25566	9	X/O Sub	2 13/16	7 5/8 R P	6 5/8 R B	0.87	30.92	
26073	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.47	40.39	
26075	8 1/8	NM DC	2 3/4	6 5/8 R P	6 5/8 R B	9.34	49.73	
4 x	8	DC's	2 15/16	6 5/8 R P	6 5/8 R B	35.70	85.43	
WHC 0281	8 1/4	Jar	2 15/16	6 5/8 R P	6 5/8 R B	9.65	95.08	
2 x	8	DC's	2 7/8	6 5/8 R P	6 5/8 R B	18.07	113.15	
DOTS 19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF	1.06	114.21	
15 x	5	HWDP		4 1/2 IF	4 1/2 IF	139.62	253.83	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
A1125M	16 3/4"	0.78	3800 lpm	5500 lpm	0.03	30	2 mm	2 mm
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	04:00; 13/Jun	558.0m						
Out:	16:30; 16/Jun	1326.0m	64.5	31.5	1.0	33.0	20.0	84.5
	ROP:	**768m**	**in**	**31.5hrs**	**=**	**24.4**	**m/hr**	
	Drilled:	768m	Rotated:	0m	0%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	3179	87	70	1	1	*(tons)*	*(tons)*	*(tons)*
Max:	3600	111	111	15	7	87	89	87

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	573.77	2.33	0.38	573.68	0.34	5.06	0.34	0.42
Last survey:	1294.07	1.85	27.42	1293.55	1.93	28.81	1.93	

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*
Tertiary	Nordland	Utsira	673 m	Sandstone
Tertiary	Hordaland		770 m	Shales, siltstones and sandstones
Tertiary	Hordaland	Grid	845 m	Loose Sandstone

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Glydrill	✠		1.13	104	17	16	1.40%	25

RESULTS:

After setting the 20" casing shallower than planned the 17" section objective was to drill to 1400m without losses and set 13 3/8" casing. This section was planned to be drilled vertical with a motor included for performance drilling and to give the opportunity to nudge the wellpath if required. Inclination varied between 1.5 and 2.5 degrees generally in a north direction. Due to many sandstones throughout the section the flow was maintained at around 3500lpm to prevent losses and the rate of penetration was controlled to 30m/hr to enable good hole cleaning. The hole was circulated clean several times during the section in addition to a number of stops to change shaker screens due to blinding by the volume of sand. An number of limestone stringers were drilled at the top of the Grid formation requiring up to 15kkg to break through, but generally the formation was soft allowing 30m/hr to be maintained with 2 - 4 kkg. TD was called at 1326m after penetrating the top of the Balder formation.

A wiper trip was made to the shoe without any problems, and after conditioning the mud the drilling assembly was pulled out and racked while the 13 3/8" casing was run.

The bit was in good condition, though starting to show signs of wear on all rows and all cones, most likely as a result of the limestone stringers.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	12.25
RUN No:	11	**BHA No. 11**		**BIT No:**	5
MD In:	1326.0m	**MD Out: 2962.0m**		**INTERVAL:**	1636m

OBJECTIVE:

General:	Drill 12 1/4" hole to top reservoir.
Inclination:	Drill vertical to 2350m, build to 20 degrees inclination by 2750m, then drop back to vertical and build up to 36 degrees at 3400m.
Azimuth:	Initial kick off due 100 degrees azimuth then second build up in direction of 270 degrees aziumth.

BIT No. 5	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*		
Nozzles:	14	14	14	13	13	13		
Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
12 1/4		PDC	M 222	Smith	MRS74PX	JS9847	0.840	1"
Features:	Rotary steerable short gauge profile							
Condition in:	New							
Hydraulics:	With a MW of	1.20 SG	at	3000 lpm	bit pd =	57 bar	and H.S.I =	3.26
Dull Grading:	1-4-WT-G-X-IN-BT-PR							

BHA No. 11 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
JS9847	12 1/4	Bit	-	-	6 5/8 R P	0.24	0.24	
90135	12 1/4	PD Bias Unit	-	6 5/8 R B	7 5/8 R B	0.96	1.20	
40198	9 3/8	PD Extention Sub	4	7 5/8 R P	7 5/8 R P	0.41	1.61	
90028	9 1/16	PD Control Collar	5 1/8	7 5/8 R B	6 5/8 R B	3.08	4.69	
90077	12 1/8	NM Stab *	2 13/16	6 5/8 R P	6 5/8 FH B	1.78	6.47	
90022	6 3/8	In-Line Flex Joint	3 15/16	6 5/8 FH P	6 5/8 FH B	2.89	9.36	
799	8 3/8	MWD	-	6 5/8 FH P	6 5/8 FH B	8.42	17.78	D&I @ 13.48m
8200	8 3/8	CDR	-	6 5/8 FH P	6 5/8 FH P	6.26	24.04	
843	8 1/4	ISONIC	-	6 5/8 FH B	6 5/8 R B	7.49	31.53	
CB001	12	NM Stab	2 15/16	6 5/8 R P	6 5/8 R B	2.08	33.61	
3 x	8	DC's	2 13/16	6 5/8 R P	6 5/8 R B	26.78	60.39	
WHC 0281	7 5/8	Jar	2 13/16	6 5/8 R P	6 5/8 R B	9.65	70.04	
2 x	8	DC's	3	6 5/8 R P	6 5/8 R B	18.07	88.11	
19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF B	1.06	89.17	
15 x	5	HWDP		4 1/2 IF P	4 1/2 IF B	139.62	228.79	

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
PD 900 X	3.31	1.91	Medium	Versavert	76/24	11.7	0.3	No

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	14:00; 18/Jun	1326.0m						
Out:	23:00; 23/Jun	2962.0m	102.2	69.8	3.3	32.4	26.8	129
	ROP:	**1636m**	**in**	**69.8hrs**	**=**	**23.4**	**m/hr**	
	Drilled:	1636m	Rotated:	0m	0%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	2700	164	70	1	2	*(tons)*	*(tons)*	*(tons)*
Max:	3000	234	150	19	15	125	128	122

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	1334.49	2.37	32.99	1333.94	2.69	29.89	2.69	2.60
Last survey:	2945.13	3.64	33.82	2927.98	129.15	8.51	129.15	

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*
Tertiary	Hordaland	Grid	845 m	Shales, siltstones and sandstones
Tertiary	Rogaland	Balder	1336 m	Claystone with tuff and sand lenses
Tertiary	Rogaland	Sele	1385 m	Claystone with limestone stringers
Tertiary	Rogaland	Heimdal	1659 m	Sands
Tertiary	Rogaland	Vaale	1716 m	Claystone
Cretaceous	Shetland	Jorsalfaret	1839 m	Claystone with limestone stringers
Cretaceous	Shetland	Tryggvason	2838 m	Claystone with limestone stringers

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert OBM		✠	1.20	69	23	12	0.30%	76 deg C

RESULTS:

This BHA used the Power Drive PD900 Rotary Steering tool made up to a Smith MRS74SPX PDC bit. MWD, CDR Resistivity and ISONIC LWD tools were run above the Power Drive. After drilling out the cement and cleaning the rathole, 3m of new formation was drilled and an FIT was performed to 1.59 s.g. The mud system was then displaced to 1.20 s.g. Versavert OBM prior to commencing drilling. The Power Drive was set to 180° toolface and 60% efficiency at 1395m, in order to drop the inclination from 2.5° to vertical. The flow was kept at 2700lpm as one nozzle was suspected to be blocked. This setting was held until 2285m, where it was adjusted to 90° magnetic toolface and 60% efficiency in order to kick off the well to 21° inclination in 105° azimuth. This was achieved by 2630m MD. 100% power settings were needed to achieve a 2°/30m build. The low response from the tool could be wash out at the pads or that the nozzle was not plugged and not enough power was routed to the pads. From 2630 the angle was slowly dropped to 3.5° at 2945m and subsequently the tool was set to Magnetic tool face 233° at 100% power with the intention to turn the well to 270 degrees and start the build up to the target. Drilling was very slow the last 140m due to drilling through calcareous formation. The dropping rate was reducing while drilling this formation and at 2831m i was decided to increase the flow to 3000lpm to see if this would have any impact on increasing the drop rate. This could give some information if one of the nozzles was plugged or not which could explain the poor performance in 100% power setting. The drop rate actually increased with 1°/30m. At 2962m it was decided to pull the bit due to continuing low rate of penetration. At surface the bit showed to be well worn on the shoulder/gauge area, but no blocked nozzles, and the seals of the pads of the PD900 were in good shape. A washout was however found in the ISONIC.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	12.25
RUN No:	12	**BHA No. 12**		**BIT No:**	6
MD In:	2962.0m	**MD Out: 3265.0m**		**INTERVAL:**	303m

OBJECTIVE:

General:	Drill 12 1/4" hole to top reservoir.
Inclination:	Build to 36 degrees inclination by top reservoir at estimated 3400m MD.
Azimuth:	Initial drill in 250 degrees azimuth then slowly turn to 270 degrees azimuth at 3400m MD.

BIT No. 6

	#1	#2	#3	#4	#5	#6
Nozzles:	14	14	14	13	13	13

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
12 1/4		PDC	M 222	Smith	MRS74SPX	JS9846A	0.840	1"

Features:	Rotary steerable short gauge profile							
Condition in:	New							
Hydraulics:	With a MW of	1.25 SG	at	3000 lpm	bit pd =	60 bar	and H.S.I =	3.40
Dull Grading:	1-1-WT-A-X-I-NO-TD							

BHA No. 12 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
JS9846A	12 1/4	Bit	-	-	6 5/8 R P	0.23	0.23	
90030	12 1/4	PD Bias Unit	-	6 5/8 R B	7 5/8 R B	0.98	1.21	
40197	9 3/16	PD Extention Sub	4	7 5/8 R P	7 5/8 R P	0.40	1.61	
90175	9 1/8	PD Control Collar	5 1/8	7 5/8 R B	6 5/8 R B	3.08	4.69	
90058	12 1/8	NM Stab *	2 13/16	6 5/8 R P	6 5/8 FH B	1.71	6.40	
90067	6 3/8	In-Line Flex Joint	3 15/16	6 5/8 FH P	6 5/8 FH B	2.92	9.32	
032	8 3/8	MWD	-	6 5/8 FH P	6 5/8 FH B	8.32	17.64	D&I @ 13.34m
8088	8 3/8	CDR	-	6 5/8 FH P	6 5/8 FH P	6.67	24.31	
823	8 1/4	ISONIC	-	6 5/8 FH B	6 5/8 R B	7.41	31.72	
CB001	12	NM Stab	2 15/16	6 5/8 R P	6 5/8 R B	2.08	33.80	
3 x	8	DC's	2 13/16	6 5/8 R P	6 5/8 R B	27.04	60.84	
DAH 1530	7 5/8	Jar	2 13/16	6 5/8 R P	6 5/8 R B	9.66	70.50	
2 x	8	DC's	3	6 5/8 R P	6 5/8 R B	18.07	88.57	
19821	7 7/8	X/O Sub	3	6 5/8 R P	4 1/2 IF B	1.06	89.63	
15 x	5	HWDP		4 1/2 IF P	4 1/2 IF B	139.62	229.25	

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
N/A								
PowerDrive	*Comms Softw.*	*Sensor Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
PD 900 X	3.31	1.91	Medium	Versavert	74/26	14.1	0.3	No

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	01:30; 24/Jun	2962.0m						
Out:	15:00; 25/Jun	3265.0m	22.6	14.7	0.0	7.9	14.9	37.5
	ROP:	**303m**	**in**	**14.7hrs**	**=**	**20.6**	**m/hr**	
	Drilled:	303m	Rotated:	0m	0%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	SPP	RPM	WOB	TRQ	STRING WEIGHTS		
	(lpm)	(bar)	(string)	(kdaN)	(KN.m)	ROT	UP	DN
Min:	3000	277	125	2	8	(tons)	(tons)	(tons)
Max:	3150	305	180	16	15	128	131	125

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	2973.89	4.03	19.67	2956.68	130.00	10.22	130.00	5.37
Last survey:	3250.24	29.58	265.61	3224.20	74.30	13.61	74.30	

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology
Cretaceous	Shetland	Tryggvason	2838 m	Claystone with limestone stringers
Cretaceous	Cromer Knoll	Rodby	3094 m	Claystone with limestone stringers
Cretaceous	Cromer Knoll	Aasgard	3156 m	Claysone
Jurassic	Viking	Draupne	3239 m	Claystone

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
Versavert OBM		✠	1.25	63	26	13	0.30%	86 deg C

RESULTS:

Drilling continued with the PowerDrive adjusted to 233° Magnetic toolface and 100% effect in order to turn the wellpath towards 270° azimuth and build inclination with 3°/30m. At 10° inclination, the setting was changed to 288° gravity toolface and 100% effect. The ROP was held to 30 m/hr in order to obtain 3-3.5°/30m dogleg.

At 3181m, the target TVD was shifted 60m up, from 3358m TVD to 3298m TVD, and the PowerDrive was adjusted to 323° toolface and 100% effect as the azimuth was achieved and only inclination to build. The ROP was held back to 15 m/hr using 180 RPM in order to obtain maximum doglegs due to the target shift. Doglegs of 5°/30m was achieved. Drilling continued to 3265m MD / 3237m TVD, where section TD was called as formations came in 97m TVD higher then first expected. After weighing up the mud to 1.27 s.g and circulating the hole clean, the string was pulled out of the hole.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	13	**BHA No. 13**		**BIT No:**	7
MD In:	3265.0m	**MD Out: 3381.0m**		**INTERVAL:**	116m

OBJECTIVE:

General:	Drill 8 1/2" hole section. Max planned doglegs at 3°/30m.
Inclination:	Build to 36.2° and hold to TD
Azimuth:	Maintain azimuth of 266° to TD

BIT No. 7

	#1	#2	#3	#4	#5	#6
Nozzles:	11	11	11	11	11	11

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
8 1/2		PDC	M 423	Smith	MRS68EPX	JS 7054	0.557	4"

Features:	Rotary Steerable long gauge design							
Condition in:	New							
Hydraulics:	With a MW of	**1.35 SG**	at	**1950 lpm**	bit pd =	**62 bar**	and H.S.I =	**4.76**
Dull Grading:	1-1-NO-A-X-I-NO-CP							

BHA No. 13 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
JS 7054	8 1/2	Bit	-	-	4 1/2 REG P	0.33	0.33	D&I @ 4.23m
2	8 1/2	PD Xceed* w/8 3/8	-	4 1/2 REG B	5 1/2 FH B	7.62	7.95	
1712	6 3/4	Vision675	-	5 1/2 FH P	5 1/2 FH B	5.72	13.67	
109	6 3/4	PowerPulse MWD	-	5 1/2 FH P	5 1/2 FH B	8.36	22.03	D&I @ 17.77m
31151-3	8 1/8	ILS Stab		5 1/2 FH P	5 1/2 FH P	0.94	22.97	
608	6 7/8	ISONIC	-	5 1/2 FH P	5 1/2 FH P	8.26	31.23	
12-03	6 7/8	ADN-675 w/8 1/4"	-	5 1/2 FH B	4 1/2 IF B	6.21	37.44	
26101	6 3/4	NM PONY	2 13/16	4 1/2 IF P	4 1/2 IF B	5.01	42.45	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	88.90	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	98.55	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	238.17	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
N/A								

PowerDrive	Comms Softw.	CPU Softw.	Imp. size	Mud Data	Oil/Water Ratio	% Solids	% Sand	LCM Used
675 Exceed	6.1a-64(01)	6.1x-30c	Med	Versavert	75/25	17	0.3	No

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	05:00; 28/Jun	3265.0m						
Out:	15:45; 29/Jun	3381.0m	17.8	10.0	2.4	7.8	16.9	34.75
	ROP:	**116m**	**in**	**10.0hrs**	**=**	**11.6**	**m/hr**	
	Drilled:	116m	Rotated:	116m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW (lpm)	SPP (bar)	RPM (string)	WOB (kdaN)	TRQ (KN.m)	STRING WEIGHTS ROT (tons)	UP (tons)	DN (tons)
Min:	1950	227	120	5	4			
Max:	1950	235	140	12	7	120	124	116

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	3267.35	32.97	267.44	3238.82	65.44	13.07	65.44	2.73
Last survey:	3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology
Jurassic	Viking	Draupne	3239 m	Claystone
Jurassic	Viking	Oxfordian	3370 m	Sandstone with interbedded siltstone and occasional claystone

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
Versavert		✠	1.35	73	29	13.5	0.30%	95° C

RESULTS:

The Xceed RSS tool was made up and run in hole. The float, cement and shoe was drilled out carefully. 3m of new formation was drilled and an FIT to 1.80 s.g. performed. The Xceed was initialized at surface in 40% highside setting and drilling continued with a controlled ROP of 10 m/hr in order to look for the reservoir while building inclination from 32° to 36° inclination by 3305m using 3°/30m dogleg.

Drilling continued looking for the reservoir with a controlled low ROP and a variation of 0-30% effect was used to hold the inclination close to 36°. At 3381m, bottoms up were circulated to evaluate samples and the decision to POOH in order to core was made.

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CORING BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	14	**BHA No. 14**		**BIT No:**	8
MD In:	3381.0m	**MD Out: 3383.5m**		**INTERVAL:**	3m

OBJECTIVE:

General:	Core 60m.
Inclination:	Hold inclination
Azimuth:	Maintain azimuth.

BIT No. 8

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
8 1/2		PDC		Security DBS	FC284LI	1720365	1.800	4"

Features:	Core Bit							
Condition in:	New							
Hydraulics:	With a MW of	1.35 SG	at	1000 lpm	bit pd =	2 bar	and H.S.I =	0.06
Dull Grading:	1-1-NO-A-X-I-NO-CP							

BHA No. 14 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
1720365	8 1/2	Bit	-	-	-	0.36	0.36	
	6 3/4	180' Corebarrel	-	-	4 1/2 IF B	57.47	57.83	
612-01	6 3/4	Float Sub *	-	4 1/2 IF P	4 1/2 IF B	0.47	58.30	
1 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	9.38	67.68	
24019	8 1/4	NM Stab	2 13/16	4 1/2 IF P	4 1/2 IF B	1.93	69.61	
4 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	37.07	106.68	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	116.33	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	255.95	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
N/A								

PowerDrive	Comms Softw.	CPU Softw.	Imp. size	Mud Data	Oil/Water Ratio	% Solids	% Sand	LCM Used
N/A								

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	17:00; 29/Jun	3381.0m						
Out:	12:00; 30/Jun	3383.5m	6.0	1.1	0.0	4.9	13.0	19
	ROP:	**3m**	**in**	**1.1hrs**	**=**	**2.3**	**m/hr**	
	Drilled:	3m	Rotated:	3m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	SPP	RPM	WOB	TRQ	STRING WEIGHTS		
	(lpm)	(bar)	(string)	(kdaN)	(KN.m)	ROT (tons)	UP (tons)	DN (tons)
Min:	960	76	50	1	2			
Max:	990	89	140	3	6	120	124	116

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology
Jurassic	Viking	Draupne	3239 m	Claystone
Jurassic	Viking	Oxfordian	3370 m	Sandstone with interbedded siltstone and occasional claystone

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
Versavert		✠	1.35	73	29	13	0.30%	N/A

RESULTS:

The 180' Corebarrel was made up and run in hole. Coring was initiated and continued from 3381m to 3383.5m, where the core jammed off. The core assembly was pulled out in order to run core no. 2.

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CORING BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	15	**BHA No. 15**		**BIT No:**	8rr1
MD In:	3383.5m	**MD Out: 3401.5m**		**INTERVAL:**	18m

OBJECTIVE:

General:	Core 20m.
Inclination:	Hold inclination
Azimuth:	Maintain azimuth.

BIT No. 8rr1

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
8 1/2		PDC		Security DBS	FC284LI	1720365	1.800	4"
Features:	Core Bit							
Condition in:	rr							
Hydraulics:	With a MW of	1.35 SG	at	1000 lpm	bit pd =	2 bar	and H.S.I =	0.06
Dull Grading:	1-1-NO-A-X-I-NO-CP							

BHA No. 15 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
1720365	8 1/2	Bit	-	-	-	0.36	0.36	
	6 3/4	60' Corebarrel	-	-	4 1/2 IF B	20.91	21.27	
612-01	6 3/4	Float Sub *	-	4 1/2 IF P	4 1/2 IF B	0.47	21.74	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	68.19	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	77.84	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	217.46	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*CPU Softw.*	*Imp. size*	*Mud Data*	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	18:30; 30/Jun	3383.5m						
Out:	02:30; 02/Jul	3401.5m	12.4	2.0	0.0	10.4	19.6	32
	ROP:	**18m**	**in**	**2.0hrs**	**=**	**9.0**	**m/hr**	
	Drilled:	18m	Rotated:	18m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	950	75	70	2	3	*(tons)*	*(tons)*	*(tons)*
Max:	1050	85	90	4	8	120	124	116

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*
Jurassic	Viking	Draupne	3239 m	Claystone
Jurassic	Viking	Oxfordian	3370 m	Sandstone with interbedded siltstone and occasional claystone

MUD: *Comments: Temp is maximum MWD temperature*

Type	*Water Base*	*Oil Base*	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert		✠	1.35	73	29	13	0.30%	N/A

RESULTS:

The 60' Corebarrel was made up and run in hole. Coring was initiated and continued from 3383.5m to 3401.5m. Due to gas, the mudweight was increased from 1.35 s.g. to 1.50 s.g. prior to pulling out of the hole. The core assembly was pulled out in order to run core no. 3. The core had full recovery.

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CORING BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	16	**BHA No. 16**		**BIT No:**	8rr2
MD In:	3401.5m	**MD Out: 3416.0m**		**INTERVAL:**	15m

OBJECTIVE:

General:	Core 30m.
Inclination:	Hold inclination
Azimuth:	Maintain azimuth.

BIT No. 8rr2

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
8 1/2		PDC		Security DBS	FC284LI	1720365	1.800	4"
Features:	Core Bit							
Condition in:	rr							
Hydraulics:	With a MW of	1.50 SG	at	1000 lpm	bit pd =	2 bar	and H.S.I =	0.07
Dull Grading:	1-1-NO-A-X-I-NO-CP							

BHA No. 16 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
1720365	8 1/2	Bit	-	-	-	0.36	0.36	
	6 3/4	90' Corebarrel	-	-	4 1/2 IF B	30.05	30.41	
612-01	6 3/4	Float Sub *	-	4 1/2 IF P	4 1/2 IF B	0.47	30.88	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	77.33	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	86.98	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	226.60	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*CPU Softw.*	*Imp. size*	*Mud Data*	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	03:30; 02/Jul	3401.5m						
Out:	19:00; 02/Jul	3416.0m	4.4	1.7	0.0	2.7	11.1	15.5
	ROP:	**15m**	**in**	**1.7hrs**	**=**	**8.5**	**m/hr**	
	Drilled:	15m	Rotated:	15m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	950	80	70	2	3	*(tons)*	*(tons)*	*(tons)*
Max:	1050	90	90	4	8	120	124	116

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*
Jurassic	Viking	Draupne	3239 m	Claystone
Jurassic	Viking	Oxfordian	3370 m	Sandstone with interbedded siltstone and occasional claystone

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert		✠	1.50	73	29	13	0.30%	N/A

RESULTS:

The 90' Corebarrel was made up and run in hole. Coring was initiated and continued from 3401.5m to 3416m, where the core jammed off. The core assembly was pulled out in order to run core no. 4

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CORING BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	17	**BHA No. 17**		**BIT No:**	8rr3
MD In:	3416.0m	**MD Out: 3443.0m**		**INTERVAL:**	27m

OBJECTIVE:

General:	Core 30m.
Inclination:	Hold inclination
Azimuth:	Maintain azimuth.

BIT No. 8rr3

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
8 1/2		PDC		Security DBS	FC284LI	1720365	1.800	4"
Features:	Core Bit							
Condition in:	rr							
Hydraulics:	With a MW of	1.50 SG	at	1000 lpm	bit pd =	2 bar	and H.S.I =	0.07
Dull Grading:	1-2-WT-O-X-I-NO-TD							

BHA No. 17 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
1720365	8 1/2	Bit	-	-	-	0.36	0.36	
	6 3/4	90' Corebarrel	-	-	4 1/2 IF B	30.05	30.41	
612-01	6 3/4	Float Sub *	-	4 1/2 IF P	4 1/2 IF B	0.47	30.88	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	77.33	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	86.98	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	226.60	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*CPU Softw.*	*Imp. size*	*Mud Data*	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	20:00; 02/Jul	3416.0m						
Out:	14:00; 03/Jul	3443.0m	3.4	1.8	0.0	1.6	14.6	18
	ROP:	**27m**	**in**	**1.8hrs**	**=**	**15.0**	**m/hr**	
	Drilled:	27m	Rotated:	27m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	1000	94	70	4	6	*(tons)*	*(tons)*	*(tons)*
Max:	1085	98	85	10	9	120	124	116

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*
Jurassic	Viking	Draupne	3239 m	Claystone
Jurassic	Viking	Oxfordian	3370 m	Sandstone with interbedded siltstone and occasional claystone

MUD: *Comments: Temp is maximum MWD temperature*

Type	*Water Base*	*Oil Base*	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert		✠	1.50	81	36	16	0.30%	N/A

RESULTS:

The 90' Corebarrel was made up and run in hole. Coring was initiated and continued from 3416m to 3443m. This completed the coring of the Oxfordian sequence.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	18	**BHA No. 18**		**BIT No:**	9rr1
MD In:	3443.0m	**MD Out: 3845.0m**		**INTERVAL:**	402m

OBJECTIVE:

General:	Drill 8 1/2" hole section. Max planned doglegs at 3°/30m. Continue after 4 coring runs
Inclination:	Build to 36.2° and hold to TD
Azimuth:	Maintain azimuth of 266° to TD

9rr1	*#1*	*#2*	*#3*	*#4*	*#5*	*#6*
Nozzles:	11	11	11	11	11	11

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
8 1/2		PDC	M 423	Smith	MRS68EPX	JS 7054	0.557	4"

Features:	Rotary Steerable long gauge design							
Condition in:	New							
Hydraulics:	With a MW of	1.65 SG	at	1950 lpm	bit pd =	76 bar	and H.S.I =	5.82
Dull Grading:	1-1-NO-A-X-1/16-NO-CP							

BHA No. 18 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
JS 7054	8 1/2	Bit	-	-	4 1/2 REG P	0.33	0.33	D&I @ 4.23m
2	8 1/2	PD Xceed* w/8 3/8	-	4 1/2 REG B	5 1/2 FH B	7.62	7.95	
1712	6 3/4	Vision675	-	5 1/2 FH P	5 1/2 FH B	5.72	13.67	
109	6 3/4	PowerPulse MWD	-	5 1/2 FH P	5 1/2 FH B	8.36	22.03	D&I @ 17.77m
31151-3	8 1/8	ILS Stab		5 1/2 FH P	5 1/2 FH P	0.94	22.97	
608	6 7/8	ISONIC	-	5 1/2 FH P	5 1/2 FH P	8.26	31.23	
12-03	6 7/8	ADN-675 w/8 1/4"	-	5 1/2 FH B	4 1/2 IF B	6.21	37.44	
26101	6 3/4	NM PONY	2 13/16	4 1/2 IF P	4 1/2 IF B	5.01	42.45	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	88.90	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	98.55	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	238.17	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*CPU Softw.*	Imp. size	Mud Data	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
675 Exceed	6.1a-64(01)	6.1x-30c	Med	Versavert	75/25			No

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	18:00; 03/Jul	3443.0m						
Out:	00:00; 06/Jul	3845.0m	36.9	25.2		11.7	17.1	54
	ROP:	**402m**	**in**	**25.2hrs**	**=**	**16.0**	**m/hr**	
	Drilled:	402m	Rotated:	402m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	1820	227	80	5	4	*(tons)*	*(tons)*	*(tons)*
Max:	1950	294	140	15	12	120	124	116

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	2.93
Last survey:	3813.40	36.47	266.44	3679.92	-255.51	-9.04	-255.51	

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert		❄	1.65	73	29	13.5	0.30%	95° C

RESULTS:

This run was used to wash/ream down through the cored section for the LWD logs. A MWD survey at the start of the run showed that the core runs had built the inclination 1deg to 37.1deg and turned the azimuth left from 266 to 263deg. The Xceed tool was left in its neutral mode until 3466m which allowed the inclination to slowly drop to 36.2deg, although azimuth only showed a slight right hand walk. Therefore 20% settings of 66deg toolface were used to bring the azimuth around to 266deg. At 3490m, the tool was set to its Hold-the-Line(HTL) mode that would allow the tool to automatically hold the desired inclination and azimuth of 36.2ege and 266deg respectively. This was the first use of this new development in the tools capability. However, a sudden dropping tendency taking the inclination to 34.4deg caused some concern and after 6m the tool was reset to its manual mode and tool commands sent to bring the wells trajectory back to that planned. Once the well was back on track a further attempt was made to use the HTL mode at a deth of 3469. This time the tool responded very well and from 3569m to 3845m the tool maintained the wellpath automatically with only 3 small 'trimming' courses sent to the tool for fine tuning the wellpath. Some stick/slip problems were seen during the latter stages of the section as hard limestone stringers were encountered. However, this did not detrimentally affect the tools response and the tangent section was held within 0.3m of the planned line. At 3841m a drilling break indicated the top Brent and after drilling to 3845m to confirm the sandstone with the LWD logs, bottoms up was circulated and a trip made to pick up the coring assembly. No problems were encountered on the trip.

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CORING BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	19	**BHA No. 19**		**BIT No:**	8rr4
MD In:	3845.0m	**MD Out: 3856.0m**		**INTERVAL:**	11m

OBJECTIVE:

General:	Core 30m.
Inclination:	Hold inclination
Azimuth:	Maintain azimuth.

BIT No. 8rr3

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
8 1/2		PDC		Security DBS	FC284LI	1720365	1.800	4"
Features:	Core Bit							
Condition in:	RR							
Hydraulics:	With a MW of	**1.65 SG**	at	**1000 lpm**	bit pd =	**2 bar**	and H.S.I =	**0.08**
Dull Grading:	1-4-RO-T-X-I-NO-PR							

BHA No. 19 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
1720365	8 1/2	Bit	-	-	-	0.36	0.36	
	6 3/4	90' Corebarrel	-	-	4 1/2 IF B	30.05	30.41	
612-01	6 3/4	Float Sub *	-	4 1/2 IF P	4 1/2 IF B	0.47	30.88	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	77.33	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	86.98	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	226.60	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*CPU Softw.*	*Imp. size*	*Mud Data*	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	11:30; 06/Jul	3845.0m						
Out:	18:00; 06/Jul	3856.0m	9.2	6.5	0.0	2.7	-2.7	6.5
	ROP:	**11m**	**in**	**6.5hrs**	**=**	**1.7**	**m/hr**	
	Drilled:	11m	Rotated:	11m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	960	102	75	4	3.5	*(tons)*	*(tons)*	*(tons)*
Max:	1000	107	120	12	8.5	120	124	116

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	3813.40	36.47	266.44	3679.92	-255.51	-9.04	-255.51	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert		✠	1.65	81	36	16	0.30%	N/A

RESULTS:

The 90' Corebarrel was made up and run in hole. Coring was initiated and continued from 3845m to 3856m when the assembly was POOH due to low ROP.

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CORING BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	20	**BHA No. 20**		**BIT No:**	10
MD In:	3856.0m	**MD Out: 3883.0m**		**INTERVAL:**	27m

OBJECTIVE:

General:	Core 30m.
Inclination:	Hold inclination
Azimuth:	Maintain azimuth.

BIT No. 8rr3

Size	*Cone*	*Fixed cutter*	*IADC*	*Make*	*Type*	*Ser. No*	*TOTAL TFA*	*Gauge*
8 1/2		PDC		Security DBS	FC284LI	7020363	1.800	4"
Features:	Core Bit							
Condition in:	New							
Hydraulics:	With a MW of	**1.65 SG**	at	**1000 lpm**	bit pd =	**2 bar**	and H.S.I =	**0.08**
Dull Grading:	1-1-NO-N-X-I-PN-TD							

BHA No. 20 **: Non Ported Float*

Serial No	*Size/OD*	*Component*	*ID*	*Con dn*	*Con up*	*Length*	*Acc length*	*Comments*
	8 1/2	Bit	-	-	-	0.36	0.36	
	6 3/4	90' Corebarrel	-	-	4 1/2 IF B	30.05	30.41	
612-01	6 3/4	Float Sub *	-	4 1/2 IF P	4 1/2 IF B	0.47	30.88	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	77.33	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	86.98	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	226.60	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	*Stab*	*Bend*	*Flow (min)*	*Flow (max)*	*rev/litre*	*Opt dp*	*Bear In*	*Bear Out*
N/A								
PowerDrive	*Comms Softw.*	*CPU Softw.*	*Imp. size*	*Mud Data*	*Oil/Water Ratio*	*% Solids*	*% Sand*	*LCM Used*
N/A								

OPERATIONS: *Comments:*

	Time & Date	*MD*	*Cumulative Run Hours*					
			Pump	*Drill*	*Shoe/cement*	*Circ*	*Other*	*TOTAL*
In:	03:30; 07/Jul	3856.0m						
Out:	00:00; 08/Jul	3883.0m	5.2	4.4	0.0	0.8	15.3	20.5
	ROP:	**27m**	**in**	**4.4hrs**	**=**	**6.1**	**m/hr**	
	Drilled:	27m	Rotated:	27m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	*SPP*	*RPM*	*WOB*	*TRQ*	*STRING WEIGHTS*		
	(lpm)	*(bar)*	*(string)*	*(kdaN)*	*(KN.m)*	*ROT*	*UP*	*DN*
Min:	960	102	75	4	3.5	*(tons)*	*(tons)*	*(tons)*
Max:	1000	107	120	12	8.5	120	124	116

SURVEY DATA: *Comments: No surveys taken* VS Azimuth 90.00

	MD	*Inc*	*Azm*	*TVD*	*VS*	*N/-S*	*E/-W*	*Max DLS*
First survey:	3813.40	36.47	266.44	3679.92	-255.51	-9.04	-255.51	
Last survey:								

FORMATION: *Comments: Actual formation tops.*

Age	*Group*	*Formation*	*MD Top*	*Lithology*

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	*Wt*	*FV*	*PV*	*YP*	*Sand*	*DH Temp*
Versavert		✠	1.65	81	36	16	0.30%	N/A

RESULTS:

The 90' Corebarrel was made up and run in hole. Coring was initiated and continued from 3856m to 3883m when assembly was POOH having filled the core barrel.

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STEERABLE BHA REPORT

HYDRO

RIG:	DeepSea Delta	**WELL: 35/8-5 S**		**PHASE:**	8.5
RUN No:	21	**BHA No. 21**		**BIT No:**	10
MD In:	3883.0m	**MD Out: 4000.0m**		**INTERVAL:**	117m

OBJECTIVE:

General:	Ream cored section at max 50m hr. Drill 8 1/2" hole section to TD.
Inclination:	Hold 36.2°
Azimuth:	Maintain azimuth of 266° to TD

BIT No. 10

	#1	#2	#3	#4	#5	#6
Nozzles:	11	11	11	11	11	11

Size	Cone	Fixed cutter	IADC	Make	Type	Ser. No	TOTAL TFA	Gauge
8 1/2		PDC	M 423	Smith	MRS68PX	JS 5576A	0.557	2.0

Features:	Rotary Steerable standard gauge design							
Condition in:	New							
Hydraulics:	With a MW of	1.65 SG	at	1950 lpm	bit pd =	76 bar	and H.S.I =	5.82
Dull Grading:	1-2-WT-T-X-I-NO-TD							

BHA No. 21 **: Non Ported Float*

Serial No	Size/OD	Component	ID	Con dn	Con up	Length	Acc length	Comments
JS 5576A	8 1/2	Bit	-	-	4 1/2 REG P	0.33	0.28	D&I @ 4.17m
2	8 1/2	PD Xceed* w/8 3/8	-	4 1/2 REG B	5 1/2 FH B	7.62	7.90	
1712	6 3/4	Vision675	-	5 1/2 FH P	5 1/2 FH B	5.72	13.62	
109	6 3/4	PowerPulse MWD	-	5 1/2 FH P	5 1/2 FH B	8.36	21.98	D&I @ 17.73m
31151-3	8 1/8	ILS Stab		5 1/2 FH P	5 1/2 FH P	0.94	22.92	
608	6 7/8	ISONIC	-	5 1/2 FH P	5 1/2 FH P	8.26	31.18	
12-03	6 7/8	ADN-675 w/8 1/4"	-	5 1/2 FH B	4 1/2 IF B	6.21	37.39	
26101	6 3/4	NM PONY	2 13/16	4 1/2 IF P	4 1/2 IF B	5.01	42.40	
5 x	6 1/2	DC's	2 13/16	4 1/2 IF P	4 1/2 IF B	46.45	88.85	
DAH2505	6 3/4	Jar	2 23/32	4 1/2 IF P	4 1/2 IF B	9.65	98.50	
15 x	5	HWDP	3	4 1/2 IF P	4 1/2 IF B	139.62	238.12	
To Surface	5	5" DP	4.276	4 1/2 IF P	4 1/2 IF B			

Motor	Stab	Bend	Flow (min)	Flow (max)	rev/litre	Opt dp	Bear In	Bear Out
N/A								

PowerDrive	Comms Softw.	CPU Softw.	Imp. size	Mud Data	Oil/Water Ratio	% Solids	% Sand	LCM Used
675 Exceed	6.1a-64(01)	6.1x-30c	Med	Versavert	75/25			No

OPERATIONS: *Comments:*

	Time & Date	MD	Cumulative Run Hours					
			Pump	Drill	Shoe/cement	Circ	Other	TOTAL
In:	03:30; 08/Jul	3845.0m						
Out:	12:00; 09/Jul	4000.0m	15.3	9.2		6.1	17.2	32.5
	ROP:	**155m**	**in**	**9.2hrs**	**=**	**16.8**	**m/hr**	
	Drilled:	155m	Rotated:	155m	100%	Oriented:	0m	0%

PARAMETERS: *Comments:*

	FLW	SPP	RPM	WOB	TRQ	STRING WEIGHTS		
	(lpm)	(bar)	(string)	(kdaN)	(KN.m)	ROT	UP	DN
Min:	1820	227	80	5	4	(tons)	(tons)	(tons)
Max:	1860	304	150	15	12	120	124	116

SURVEY DATA: *Comments:* VS Azimuth 90.00

	MD	Inc	Azm	TVD	VS	N/-S	E/-W	Max DLS
First survey:	3869.34	35.14	264.50	3725.37	-287.99	-11.87	-287.99	1.55
Last survey:	3981.18	35.99	264.33	3816.53	-352.57	-17.07	-352.57	

FORMATION: *Comments: Actual formation tops.*

Age	Group	Formation	MD Top	Lithology

MUD: *Comments: Temp is maximum MWD temperature*

Type	Water Base	Oil Base	Wt	FV	PV	YP	Sand	DH Temp
Versavert		❄	1.65	73	29	13.5	0.30%	72° C

RESULTS:

This run was used to wash/ream down through the cored section from 3845-3883m for the LWD logs. A MWD survey at the start of the run showed that the core runs had dropped the inclination 1.5 deg to 34.6deg. Consequently, the Xceed tool was set to its manual mode with a steering ratio of 20% and a toolface of 24deg. On previous runs this setting had given a building tendency, but in this case the inclination continued slowly to drop. The tool was therefore set to 50% steering ratio, but after 10m this only gave a holding tendency. A 70% setting was therefore used and built the inclination at 5deg/30m back toward 36deg, over 8m. Steering ratios were then moderated to 30% that showed a slow build at 1-2deg/30m, and then to 20%. However, this Steering ratio did not give the expected holding tendency but again showed a sudden dropping tendency and 70% settings were required to build the inclination back to 36deg. With such a short run and the lack of success in keeping the inclination about 36deg, the Hold-the-Line mode was not employed for this run. Throughout the run intermittent high stick/slip values were seen from the Xceed tool, accompanied by high shock values from the MWD. Over the final 10m of the run, with the tool set in its 30% steering ratio and toolface of 354deg, high stick/slip became almost constant and although several attempts were made to minimise this with parameter changes, high stick/slip persisted until the end of the run. Corresponding with this the inclination started to decrease rapidly and over the final 10m the Xceed inclination and azimuth readings showed that the inclination had decreased from 36.4deg to 34.2deg, with the azimuth turning from 264 to 261deg.

Note that this bit have a 2in shorter gauge than the one used on the previous two drilling runs, and could explain the more responsive nature of the BHA.

5.2. Bit Records

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BIT RECORD

WELL: 35/8-5 S

HYDRO

							MD		TOTAL			DULL CONDITION							
Well No.	Bit No.	Size	Make	Type	Ser. No.	TFA	In	Out	m	hrs	ROP	IR	OR	D	L	B	G	O	R
35/8-5 S	1	17 1/2	Smith	10GMODPD	LW 9922	0.918	399	458	159	17.9	8.9	1	1	WT	A	E	IN	NO	TD
35/8-5 S	2	26	Smith	MSDSSHODC	LW 6136	1.197	553	461	8	0.5	16.0	1	1	NO	A	E	IN	NO	TD
35/8-5 S	3	12 1/4	Smith	FGXiC	MM 3702	1.058	461	683	222	5.3	41.9	1	1	NO	A	E	IN	NO	TD
35/8-5 S	3rr1	12 1/4	Smith	FGXiC	MM 3702	1.058	683	683	0	0.0	0.0	1	1	NO	A	E	IN	NO	TD
35/8-5 S	3rr2	12 1/4	Smith	FGXiC	MM 3702	1.058	675	675	0	0.0	0.0	1	1	NO	A	E	IN	NO	TD
35/8-5 S	3rr3	12 1/4	Smith	FGXiC	MM 3702	1.058	658	658	0	0.0	0.0	1	1	NO	A	E	IN	NO	TD
35/8-5 S	3rr4	12 1/4	Smith	FGXiC	MM 3702	1.058	571	571	0	0.0	0.0	1	1	NO	A	E	IN	NO	TD
35/8-5 S	3rr5	12 1/4	Smith	FGXiC	MM 3702	1.058	513	558	45	0.8	56.3	1	1	NO	A	E	IN	NO	TD
35/8-5 S	-	26	Red Baron	BN / Hole opener	DH 09342	1.779	461	558	97	5.5	17.6	-	-	-	-	-	-	-	TD
35/8-5 S	4	17	Smith	MSDGHC	MJ 6670	1.451	558	1326	768	31.5	24.4	2	2	WT	A	E	IN	NO	TD
35/8-5 S	5	12 1/4	Smith	MRS74SPX	JS 9847	0.840	1326	2962	1636	69.8	23.4	1	4	WT	G	X	IN	BT	PR
35/8-5 S	6	12 1/4	Smith	MRS74SPX	JS 9846A	0.840	2962	3265	303	14.7	20.6	1	1	WT	A	X	IN	NO	TD
35/8-5 S	7	8 1/2	Smith	MRS68EPX	JS 7054	0.557	3265	3381	116	10.0	11.6	1	1	NO	A	X	IN	NO	CP
35/8-5 S	8	8 1/2	Security DBS	FC284LI	1720365	1.800	3381	3383.5	2.5	1.1	2.3	1	1	NO	A	X	IN	NO	CP
35/8-5 S	8rr1	8 1/2	Security DBS	FC284LI	1720365	1.800	3383.5	3401.5	18	2.0	9.0	1	1	NO	A	X	IN	NO	CP
35/8-5 S	8rr2	8 1/2	Security DBS	FC284LI	1720365	1.800	3401.5	3416	14.5	1.7	8.5	1	1	NO	A	X	IN	NO	CP
35/8-5 S	8rr3	8 1/2	Security DBS	FC284LI	1720365	1.800	3416	3443	27	1.8	15.0	1	1	NO	A	X	IN	NO	CP
35/8-5 S	7rr	8 1/2	Smith	MRS68EPX	JS 7054	0.557	3443	3845	402	25.2	16.0	1	1	NO	A	X	1/16	NO	CP
35/8-5 S	8rr4	8 1/2	Security DBS	FC284LI	1720365	1.800	3845	3856	11	6.5	1.7	1	4	RO	T	X	IN	NO	PR
35/8-5 S	9	8 1/2	Security DBS	FC284LI	7020363	1.800	3856	3883	27	4.4	6.1	1	1	NO	N	X	IN	PN	TD
35/8-5 S	10	8 1/2	Smith	MRS68PX	JS 5576 A	0.557	3883	4000	117	9.2	12.7	1	2	WT	T	X	IN	NO	TD

5.3. Drilling Parameters

Schlumberger

BHA #: 3

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Gerdt Widding
Directional Driller: Egil Stranden

Depth In: 461
Inclination In: 0.8
Azimuth In: 0.0

Depth Out: 683
Inclination Out: 0.8
Azimuth Out: 27.0

Tot Distance: 222
Dist Steering: 26
Dist Rotating: 196

% Steer: 12%
% Rot: 88%

Comments: Drill 12 1/4" pilot hole with A962M PowerPak Motor to section TD at 1150m MD. Flow check at 683m on top of Utsira, observe flow from well. Fill hole with 1.3sg mud, before pulling out of hole to set cement plug.

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	461	510	49	---	30	1.5	100	1	3500	128	128	485.93	1.84	7.84	0.41	8.30
S	510	516	6	M 210	35	2	0	0	3900	157	156	514.39	1.80	4.75	-0.04	-3.26
R	516	538	22	---	50	2	100	2	3800	155	155					
S	538	548	10	M 190	45	1	0	0	3800	156	155	543.16	1.25	7.69	-0.57	3.07
R	548	566	18	---	50	2	100	2	3800	157	157	571.85	0.69	20.85	-0.59	13.76
S	566	576	10	M180	35	2	0	0	3500	131	130					
R	576	600	24	---	50	2	100	1	4000	168	167	600.20	0.74	35.68	0.05	15.69
R	600	628	28	---	55	3	100	1	4000	168	168					
R	628	683	55	---	55	1	110	1	4000	171	171	628.71	0.79	26.97	0.05	-9.17

Schlumberger

BHA #: 9

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Gerdt Widding
Directional Driller: Tim Booker

Depth In: 461 **Depth Out:** 558 **Tot Distance:** 97
Inclination In: 1.5 **Inclination Out:** 2.7 **Dist Steering:** 0 **% Steer:** 0%
Azimuth In: 6.6 **Azimuth Out:** 3.6 **Dist Rotating:** 97 **% Rot:** 100%

Comments: Open 12 1/4" pilot hole from 461m to 558m prior to running 20" casing

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	461	471	10	---	10	3	60	3	3800	104	104	466.54	1.49	6.60	0.87	8.18
R	471	490	19	---	35	6	65	6	3800	105	105	495.96	1.81	5.32	0.33	-1.31
R	490	520	30	---	20	6	65	5	4370	142	142	525.39	2.61	5.47	0.82	0.15
R	520	558	38	---	25	7	65	6	4400	147	147	541.63	2.67	3.61	0.11	-3.44

Schlumberger

BHA #: 10

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Gerard van Ditshuizen
Directional Driller: Tim Booker

Depth In: 555 **Depth Out:** 1326 **Tot Distance:** 771
Inclination In: 2.3 **Inclination Out:** 1.9 **Dist Steering:** 0 **% Steer:** 0.0
Azimuth In: 0.4 **Azimuth Out:** 27.4 **Dist Rotating:** 771 **% Rot:** 100.0

Comments: Drill 17" hole vertically to 1400m

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	561	600	39	---	30	2	105	2	3500	89.0	87.0	573.77	2.33	0.38	0.11	-3.44
R	600	629	29	---	25	4	101	2.2	3561	90.3	89.0	602.42	2.25	359.70	-0.08	-0.72
R	629	658	29	---	30	4	103	2.9	3455	91.4	90.0	632.04	2.31	358.37	0.06	-1.35
R	658	687	29	---	25	3	100	2.2	3516	92.0	90.8	661.08	2.26	358.93	-0.05	0.58
R	687	716	29	---	21	2	102	1.9	3600	91.4	90.0	690.26	2.16	348.57	-0.10	-10.65
R	716	745	29	---	30	2	100	2	3500	95.0	93.0	718.73	2.21	344.78	0.05	-3.99
R	745	773	28	---	30	3	101	3	3450	98.0	97.0	746.53	2.11	343.83	-0.11	-1.03
R	773	801	28	---	29	3	80	1.8	3400	99.0	97.0	775.90	2.11	345.46	0.00	1.66
R	801	830	29	---	31	2	95	2.1	3400	98.0	96.0	804.57	2.23	345.79	0.13	0.35
R	830	859	29	---	30	2	103	2	3500	101.0	100.0	833.20	2.27	344.27	0.04	-1.59
R	859	888	29	---	2 - 30	2 - 15	100	3	3500	101.0	100.0	862.03	2.15	347.67	-0.12	3.54
R	888	917	29	---	2 - 30	2 - 15	70 - 100	3	3500	101.0	100.0	890.48	1.98	353.74	-0.18	6.40
R	917	946	29	---	2 - 30	2 - 15	70 - 100	2.5	3600	104.0	102.0	918.07	1.95	358.16	-0.03	4.81
R	946	974	28	---	30	4	100	2.2	3550	102.0	101.0	946.89	1.88	5.97	-0.07	8.07
R	974	1003	29	---	30	3	100	2.6	3248	96.0	95.0	977.43	1.79	9.10	-0.09	3.07
R	1003	1032	29	---	30	5	100	3.2	3534	103.0	102.0	1006.59	1.68	12.9	-0.11	3.91

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	1032	1061	29	---	30	5	100	3	3500	102.0	101.0	1035.64	1.59	13.79	-0.09	0.92
R	1061	1090	29	---	32	6	108	3	3500	103.0	101.0	1064.70	1.66	16.68	0.07	2.98
R	1090	1118	28	---	34	6	113	4	3500	114.0	112.0	1091.5	1.79	20.07	0.15	3.79
R	1118	1146	28	---	35	3	106	2	3500	113.0	112.0	1121.35	1.86	20.93	0.07	0.86
R	1146	1176	30	---	33	5	108	2	3440	115.0	113.0	1149.71	1.72	22.87	-0.15	2.05
R	1176	1206	30	---	29	6	100	3	3398	108.0	106.0	1179.72	1.74	24.42	0.02	1.55
R	1206	1235	29	---	36	7	110	3	3400	109.0	106.0	1208.02	1.88	26.95	0.15	2.68
R	1235	1264	29	---	29	12	90	7.6	3277	111.0	110.0	1237.09	1.75	29.58	-0.13	2.71
R	1264	1293	29	---	30	2	104	4	3179	104.0	103.0	1265.15	1.74	25.85	-0.01	-3.99
R	1293	1326	33	---	35	3	100	4	3293	111.0	110.0	1294.07	1.85	27.42	0.11	1.63

BHA #: 11

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Alf Lindgren
Directional Driller: Gerard van Ditshuizen

Depth In: 1326 **Depth Out:** 2962 **Tot Distance:** 1636
Inclination In: 1.85 **Inclination Out:** 3.64 **Slide:** - **%Slide:** -
Azimuth In: 27.42 **Azimuth Out:** 33.82 **Rotate:** 1636 **% Rot:** 100

Comments: Drill 12.25" hole section with PD900X RSS tool. Susp[ected one nozzle blocked while circulating for FIT test
POOH due to low ROP.

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	1326	1351	25	0	0	60	3	130	3	2700	177	177	1334.49	2.37	32.99	0.39	4.13
R	1351	1380	29	0	0	60	3	130	3	2700	174	174	1362.91	2.39	34.34	0.02	1.43
R	1380	1395	15	0	0	60	3	130	3	2700	172	172	1391.67	2.23	30.56	-0.17	-3.94
R	1395	1409	14	G 180	60	60	3	130	4	2700	169	169					
R	1409	1437	28	G 180	60	55	2	130	3	2700	164	164	1420.26	0.32	326.14	-2.00	310.16
R	1437	1466	29	G 180	60	60	3	130	4	2700	165	165	1448.85	0.24	258.31	-0.08	-71.18
R	1466	1494	28	G 180	60	60	3	125	4	2750	170	170	1477.77	0.13	301.98	-0.11	45.30
R	1494	1523	29	G 180	60	60	3	130	4	2700	165	165	1506.18	0.18	278.44	0.05	-24.86
R	1523	1552	29	G 180	60	60	3	130	4	2700	171	171	1534.83	0.20	266.46	0.02	-12.54
R	1552	1580	28	G 180	60	60	3	125	4	2700	171	171	1563.97	0.09	288.90	-0.11	23.10
R	1580	1609	29	G 180	60	55	3	125	4	2700	171	171	1593.01	0.12	319.60	0.03	31.71
R	1609	1637	28	G 180	60	55	2	125	3	2700	171	171	1621.62	0.15	27.29	0.03	-306.51
R	1637	1667	30	G 180	60	50	2	120	2	2700	173	173	1650.76	0.15	27.87	0.00	0.60
R	1667	1696	29	G 180	60	60	2	125	4	2700	170	170	1680.61	0.09	24.04	-0.06	-3.85
R	1696	1725	29	G 180	60	40	6	130	5	2700	174	174	1709.10	0.13	319.79	0.04	311.43

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	1725	1753	28	G 180	60	40	5	125	5	2700	174	174	1737.40	0.18	285.19	0.05	-36.68
R	1753	1781	28	G 180	60	30	2	123	3	2700	175	175	1766.30	0.24	96.09	0.06	-196.30
R	1781	1810	29	G 180	60	60	3	121	6	2700	176	176	1794.90	0.24	353.19	0.00	269.69
R	1810	1839	29	G 180	60	60	2	130	5	2700	177	177	1823.75	0.14	159.12	-0.10	-201.81
R	1839	1868	29	G 180	60	50	3	125	4	2700	178	178	1852.48	0.24	112.78	0.10	-48.39
R	1868	1897	29	G 180	60	60	4	125	5	2700	180	180	1880.90	0.12	188.84	-0.13	80.29
R	1897	1926	29	G 180	60	60	5	130	5	2700	181	181	1909.67	0.11	297.32	-0.01	113.12
R	1926	1955	29	G 180	60	55	5	125	5	2700	182	182	1938.80	0.12	326.33	0.01	29.88
R	1955	1984	29	G 180	60	60	5	120	6	2700	184	184	1967.90	0.21	155.31	0.09	-176.31
R	1984	2013	29	G 180	60	60	5	130	5	2700	184	184	1996.70	0.12	214.20	-0.09	61.34
R	2013	2042	29	G 180	60	60	5	125	5	2700	188	188	2025.50	0.18	286.98	0.06	75.81
R	2042	2071	29	G 180	60	55	5	130	5	2700	190	190	2054.84	0.17	204.59	-0.01	-84.24
R	2071	2100	29	G 180	60	50	6	130	6	2700	191	191	2083.11	0.13	140.69	-0.04	-67.81
R	2100	2129	29	G 180	60	55	6	130	6	2700	193	193	2111.53	0.10	133.12	-0.03	-7.99
R	2129	2158	29	G 180	60	50	6	130	6	2700	194	194	2140.22	0.22	25.96	0.13	-112.05
R	2158	2187	29	G 180	60	50	7	125	8	2700	195	195	2169.18	0.19	242.57	-0.03	224.39
R	2187	2216	29	G 180	60	50	7	125	9	2700	196	196	2198.04	0.15	314.79	-0.04	75.07
R	2216	2245	29	G 180	60	50	7	130	10	2700	196	196	2227.33	0.11	100.12	-0.04	-219.87
R	2245	2274	29	G 180	60	50	7	130	10	2700	198	198	2255.48	0.13	323.83	0.02	238.41
R	2274	2303	29	M 90	60	50	3	125	9	2700	197	197	2284.47	0.38	103.41	0.26	-228.10
R	2303	2330	27	M 90	60	50	4	120	9	2700	200	200	2313.14	1.92	111.84	1.61	8.82
R	2330	2359	29	M 90	60	50	6	120	10	2720	200	200	2343.83	4.13	106.04	2.16	-5.67
R	2359	2388	29	M 90	60	45	3	125	6	2687	202	202	2371.46	5.32	105.84	1.29	-0.22
R	2388	2417	29	M 90	60	50	5	125	7	2687	202	202	2400.18	7.24	105.81	2.01	-0.03
R	2417	2446	29	G 340	80	55	9	130	8	2652	206	206	2428.86	8.98	106.95	1.82	1.19
R	2446	2475	29	G 340	80	55	9	130	8	2652	206	206	2457.50	11.21	106.92	2.34	-0.03
R	2475	2503	28	G 340	80	55	10	130	9	2680	204	204	2486.38	13.27	110.58	2.14	3.80
R	2503	2531	28	G 340	80	50	9	125	10	2719	205	205	2515.26	14.52	110.63	1.30	0.05
R	2531	2560	29	G 340	100	30	3	120	7	2687	204	204	2542.74	16.54	109.00	2.21	-1.78
R	2560	2588	28	G 340	100	60	7	115	10	2690	204	204	2571.64	18.17	109.24	1.69	0.25

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	2588	2616	28	G 340	100	35	7	130	11	2630	207	207	2600.18	19.71	106.79	1.62	-2.58
R	2616	2634	18	G 340	100	50	7	130	11	2630	207	207	2630.64	21.34	104.35	1.61	-2.40
R	2634	2645	11	0	0	50	6	125	11	2670	208	208					
R	2645	2674	29	0	0	50	7	130	11	2700	208	208	2658.11	20.11	103.17	-1.34	-1.29
R	2674	2703	29	0	0	45	7	135	11	2700	207	207	2687.29	17.95	102.08	-2.22	-1.12
R	2703	2725	22	0	0	25	8	150	10	2700	207	207	2716.13	16.35	101.39	-1.66	-0.72
R	2725	2732	7	G 180	60	35	10	150	10	2700	208	208					
R	2732	2761	29	G 180	60	25	12	160	12	2700	207	207	2745.24	14.47	96.99	-1.94	-4.53
R	2761	2790	29	G 180	60	15	15	130	15	2700	205	205	2773.79	12.34	92.90	-2.24	-4.30
R	2790	2818	28	G 180	60	15	15	130	15	2700	205	205	2802.26	10.89	87.62	-1.53	-5.56
R	2818	2853	35	G 180	60	6	16	140	15	2700	195	195	2831.39	9.19	83.34	-1.75	-4.41
R	2853	2881	28	G 143	100	5	16	135	15	2700	196	196	2859.20	7.93	78.89	-1.36	-4.80
R	2881	2905	24	G 162	100	5	17	130	17	3000	234	234	2887.47	5.80	73.58	-2.26	-5.63
R	2905	2940	35	G 162	100	7	19	150	15	3000	228	228	2916.07	3.92	54.30	-1.97	-20.22
R	2940	2962	22	M 233	100	3	17	150	15	3000	228	228	2945.13	3.64	33.82	-0.29	-21.14

BHA #: 12

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Alf Lindgren
Directional Driller: Gerard van Ditshuizen

Depth In: 2962 **Depth Out:** 3265 **Tot Distance:** 303
Inclination In: 3.64 **Inclination Out:** 29.58 **Slide:** - **%Slide:** -
Azimuth In: 33.82 **Azimuth Out:** 265.61 **Rotate:** 303 **% Rot:** 100

Comments: Drill 12.25" hole section to TD with PD900X RSS tool.

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	2962	2990	28	M 233	100	10-20	12	150	8	3000	281	281	2973.89	3.77	19.67	0.14	-14.76
R	2990	3019	29	M 233	100	20	13	170	12	2992	279	279	3002.95	3.60	331.95	-0.18	322.38
R	3019	3048	29	M 233	100	30	12	180	16	3000	278	278	3031.84	5.02	308.06	1.20	-24.81
R	3048	3077	29	M 233	100	30	11	130	18	3100	294	294	3061.29	6.56	289.15	1.57	-19.26
R	3077	3105	28	M 233	100	25	15	130	17	3150	300	300	3088.87	9.05	282.36	2.71	-7.39
R	3105	3134	29	G 288	100	30	11	170	14	3150	302	302	3119.28	11.39	276.85	2.31	-5.44
R	3134	3163	29	G 288	100	30	9	170	13	3150	301	301	3146.83	13.97	268.97	2.81	-8.58
R	3163	3181	18	G 288	100	30	5	170	11	3150	300	300	3175.95	16.77	262.69	2.88	-6.47
R	3181	3192	11	G 323	100	15	2	180	9	3150	305	305					
R	3192	3221	29	G 323	100	15	2	180	8	3150	303	303	3205.05	21.56	263.42	4.94	0.75
R	3221	3250	29	G 323	100	15	2	180	8	3150	305	305	3233.61	26.63	265.01	5.33	1.67
R	3250	3265	15	G 323	100	17	3	180	9	3150	305	305	3250.24	29.58	265.61	5.32	1.08

BHA #: 13

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Alf Lindgren
Directional Driller: Egil Stranden

Depth In: 3265 **Depth Out:** 3381 **Tot Distance:** 116
Inclination In: 29.58 **Inclination Out:** 36.33 **Slide:** - **%Slide:** -
Azimuth In: 265.61 **Azimuth Out:** 265.55 **Rotate:** 116 **% Rot:** 100

Comments: Drill 8.5" hole section to corepoint with Xceed RSS tool.

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	3265	3268	3	G 0	40							0	3267.35	32.97	267.44	5.94	3.21
R	3268	3288	20	G6	40	10	5	135	6	1950	230	230					
R	3288	3305	17	G0	40	10	10	130	5	1950	228	228	3296.49	35.58	268.30	2.69	0.89
R	3305	3321	16	G0	0	11	12	131	6	1950	229	229					
R	3321	3331	10	G0	20	12	10	131	5	1950	228	228	3324.70	35.57	268.29	-0.01	-0.01
R	3331	3341	10	G0	30	11	10	130	5	1950	229	229					
R	3341	3365	24	G282	30	12	10	141	6	1940	228	228	3353.92	36.33	265.55	0.78	-2.81
R	3365	3369	4	G282	10	20	11	141	7	1940	228	228					
R	3369	3381	12	G282	0	21	12	131	7	1940	228	228					

BHA #: 18

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure:

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Perter Roberts
Directional Driller: Egil Stranden

Depth In: 3443 **Depth Out:** 3845 **Tot Distance:** 402
Inclination In: 36.64 **Inclination Out:** 35.64 **Slide:** - **%Slide:** -
Azimuth In: 263.73 **Azimuth Out:** 265.01 **Rotate:** 402 **% Rot:** 100

Comments: Drill 8.5" hole section to corepoint with Xceed RSS tool.

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	3443	3466	23	G 0	10												
R	3466	3472	6	96	10								3468.59	36.06	264.22	-0.60	0.50
R	3472	3476	4	78	10												
R	3476	3483	7	72	10	20	8	120	7	2000	290						
R	3483	3488	5	72	20												
R	3488	3490	2	66	20												
R	3490	3496	6	HTL(36.4)	HTL(265.5)												
R	3496	3502	6	18	30								3498.13	33.89	265.78	-2.20	1.62
R	3502	3519	17	18	60	25	7	125	10	1950	279						
R	3519	3524	5	18	20												
R	3524	3528	4	0	20								3526.47	36.43	267.78	2.69	2.07
R	3528	3530	2	354	20												
R	3530	3542	12	248	20	20	9	120	8	1936	285						
R	3542	3544	2	248	10												
R	3544	3569	25	242	10	15	12	120	7	1940	284		3554.9	36.5	266.84	0.07	-0.99
R	3569	3590	21	HTL(36.4)	HTL(267.3)	10	15	120	6	1936	285		3583.46	35.86	267.14	-0.36	0.92
R	3590	3615	25	HTL	HTL	20	13	120	7	1940	291		3612.62	36.22	267.00	0.06	-0.74
R	3615	3640	25	HTL	HTL(-1°AZ)	17	6	123	7	1889	289						

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	3640	3660	20	HTL	HTL	18	11	121	6	1925	291		3641.65	36.39	266.38	0.18	-0.64
R	3660	3682	22	HTL	HTL	18	8	121	6	1925	291		3670.76	36.24	264.64	-0.15	-1.79
R	3682	3700	18	HTL	HTL(+0.6°AZ)	12	12	120	6	1911	290		3702.17	36.28	265.07	0.04	0.41
R	3700	3730	30	HTL	HTL(+0.6°AZ)	4-20	5-15	80-140	6	1840	280		3727.00	36.68	265.61	0.48	0.65
R	3730	3750	20	HTL	HTL	6	10	80	6	1890	294						
R	3750	3770	20	HTL	HTL	3-30	13	120	5	1890	295		3756.72	36.49	266.67	-0.19	1.07
R	3770	3800	30	HTL	HTL	10-30	15	120-170	7-10	1880	294-300		3785.85	36.41	267.09	-0.08	0.43
R	3800	3830	30	HTL	HTL	20	12	135-170	9	1890	300		3813.4	36.47	266.44	0.07	-0.71
R	3830	3845	15	HTL	HTL	25	13	141	11	1870	297		3835.77	35.64	265.01	-1.11	-1.92

BHA #: 21

Slide Sheet

Client: Norsk Hydro
Field: Sogn
Structure: Deep Sea Delta

Well: 35/8-5 S
Borehole: 35/8-5 S

Directional Driller: Perter Roberts
Directional Driller: Egil Stranden

Depth In: 3845 **Depth Out:** 4000 **Tot Distance:** 155
Inclination In: 35.64 **Inclination Out:** 35.99 **Slide:** - **%Slide:** -
Azimuth In: 265.01 **Azimuth Out:** 264.33 **Rotate:** 155 **% Rot:** 100

Comments: Drill 8.5" hole section until OWC, then drill 50m rathole for wireline with Xceed RSS tool.

Rot/Slid (R/S)	Md From (m)	Md To (m)	Course (m)	TF (°)	Setting (%)	ROP (m/h)	WOB (1000 kgf)	RPM (c/min)	Torq On (kNm)	Flow (L/min)	SPP On (bar)	SPP Off (bar)	Svy Md (m)	Incl (°)	Azmth (°)	BR (°/30 m)	TR (°/30 m)
R	3845	3883	38	Reaming cored section		50	0	40	2	1820	297		3869.34	35.14	264.50	-0.37	-0.03
R	3883	3890	7	24	20	20	14	105	12	1850	295						
R	3890	3904	14	24	50	20	12	110	12	1820	295		3898.85	34.53	265.00	-0.62	0.51
R	3904	3910	6	24	70	15	7	120	7	1865	302						
R	3910	3928	18	24	30												
R	3928	3932	4	24	20	13	13	121	11	1866	306		3929.19	35.71	266.79	1.17	1.77
R	3932	3942	10	354	20												
R	3942	3951	9	354	40												
R	3951	3962	11	354	70	3-18	3-15	80-150	7-13	1865	296		3959.03	35.96	265.18	0.25	-1.62
R	3962	4000	38	354	30	3-18	3-15	80-151	7-14	1865	296		3981.18	35.99	264.33	0.04	-1.15

5.4. Run Details

5.4.1. MWD Run #1

BHA No.	:	1
Depth in	:	398m MD
Depth out	:	458m MD
Drilled	:	60
MWD Elec No.	:	1234
MWD Collar No.	:	HB-37608
Bit to Survey Depth	:	13.65m
Pumping Hours	:	10.1 hrs
Operating Hours	:	10.1 hrs
% Operating	:	100 %
Sensor Failure	:	No
RPM	:	60(bit)
Flow Rate	:	4500 lpm
Inclination	:	0°- 1.24°

COMMENTS:

The 36" section was drilled with a 17 ½" bit and a 26x36" hole opener in one bit run from 399m MD to 458m MD (17 ½" bit to 462 mMD).

The BHA incorporated a 9" PowerPulse MWD tool.
The tool behaved well throughout the section, with good signal quality.

POOH due to section TD at 458 mMD

5.4.2. MWD Run #2

BHA No.	:	2	CDR Collar	:	8200
Depth in	:	458m MD	CDR Electronics	:	834
Depth out	:	683m MD	Bit to GR	:	17.98m
Drilled	:	225m	Bit to Resistivity	:	14.63m
MWD Elec No.	:	1330	Bit to APRS	:	15.16m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	23.74m	Meters Logged	:	225m
Pumping Hours	:	8.2 hrs			
Operating Hours	:	8.2 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	100 (bit)			
Flow Rate	:	4000 lpm			
Inclination	:	1.45°- 0.78°			

COMMENTS:

The 12 1/4" pilot section was drilled from 458m MD to 683m MD in one bit run and no problems.

A 8 1/4" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH due to well was flowing.

5.4.3. MWD Run #3

BHA No.	:	3	CDR Collar	:	8200
Depth in	:	683m MD	CDR Electronics	:	834
Depth out	:	683m MD	Bit to GR	:	17.98m
Drilled	:	0m	Bit to Resistivity	:	14.63m
MWD Elec No.	:	1330	Bit to APRS	:	15.16m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	23.74m	Meters Logged	:	0m
Pumping Hours	:	1.5 hrs			
Operating Hours	:	1.5 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	100 (bit)			
Flow Rate	:	4000 lpm			
Inclination	:	1.45°- 0.78°			

COMMENTS:

In run # 3, the intention was to dress off the cement, but hardly any cement found.

A 8 1/4" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH to set another cement plug as the well was flowing after drilling through the initial cement plug.

5.4.4. MWD Run #4

BHA No.	:	4	CDR Collar	:	8200
Depth in	:	683m MD	CDR Electronics	:	834
Depth out	:	683m MD	Bit to GR	:	17.98m
Drilled	:	0m	Bit to Resistivity	:	14.63m
MWD Elec No.	:	1330	Bit to APRS	:	15.16m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	23.74m	Meters Logged	:	0m
Pumping Hours	:	2.2 hrs			
Operating Hours	:	2.2 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	100 (bit)			
Flow Rate	:	4000 lpm			
Inclination	:	1.45°- 0.78°			

COMMENTS:

In run # 4, the intention was to dress off the cement, but hardly any cement found.

A 8 1/4" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH to set another cement plug as the well was flowing after drilling through the initial cement plug.

5.4.5. MWD Run #5

BHA No.	:	5	CDR Collar	:	8200
Depth in	:	683m MD	CDR Electronics	:	834
Depth out	:	683m MD	Bit to GR	:	17.98m
Drilled	:	0m	Bit to Resistivity	:	14.63m
MWD Elec No.	:	1330	Bit to APRS	:	15.16m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	23.74m	Meters Logged	:	0m
Pumping Hours	:	1.9 hrs			
Operating Hours	:	1.9 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	100 (bit)			
Flow Rate	:	4000 lpm			
Inclination	:	1.45°- 0.78°			

COMMENTS:

In run # 5, the intention was to dress off the cement, but hardly any cement found.

A 8 1/4" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH to set another cement plug as the well was flowing after drilling through the initial cement plug.

5.4.6. MWD Run #6

BHA No.	:	6	CDR Collar	:	8200
Depth in	:	683m MD	CDR Electronics	:	834
Depth out	:	683m MD	Bit to GR	:	17.98m
Drilled	:	0m	Bit to Resistivity	:	14.63m
MWD Elec No.	:	1330	Bit to APRS	:	15.16m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	23.74m	Meters Logged	:	0m
Pumping Hours	:	0.9 hrs			
Operating Hours	:	0.9 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	100 (bit)			
Flow Rate	:	4000 lpm			
Inclination	:	1.45°- 0.78°			

COMMENTS:

In run # 6, the intention was to dress off the cement, but hardly any cement found.

A 8 1/4" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH to set another cement plug as the well was flowing after drilling through the initial cement plug.

5.4.7. MWD Run #7

BHA No.	:	7	CDR Collar	:	8200
Depth in	:	683m MD	CDR Electronics	:	834
Depth out	:	683m MD	Bit to GR	:	17.98m
Drilled	:	44m (cmt)	Bit to Resistivity	:	14.63m
MWD Elec No.	:	1330	Bit to APRS	:	15.16m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	23.74m	Meters Logged	:	0m
Pumping Hours	:	1.7 hrs			
Operating Hours	:	1.7 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	100 (bit)			
Flow Rate	:	4000 lpm			
Inclination	:	1.45°- 0.78°			

COMMENTS:

In run # 7, the intention was to dress off the cement.

A 8 1/4" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH after dressed 44m of cement.

5.4.8. MWD Run #8

BHA No.	:	8
Depth in	:	461m MD
Depth out	:	555m MD
Drilled	:	94m (cmt)
MWD Elec No.	:	1234
MWD Collar No.	:	HB-37608
Bit to Survey Depth	:	11.60m
Pumping Hours	:	6.5 hrs
Operating Hours	:	6.5 hrs
% Operating	:	100 %
Sensor Failure	:	No
RPM	:	67
Flow Rate	:	3700 lpm
Inclination	:	1.45°- 0.78°

COMMENTS:

The 26" section was drilled with a 17 ½" x 26" hole opener in one bit run from 461m MD to 555m MD (12 ¼" bit to 683 mMD).

The BHA incorporated a 9" PowerPulse MWD tool.
The tool behaved well throughout the section, with good signal quality.

POOH due to section TD at 555m MD

5.4.9. MWD Run #9

BHA No.	:	9	CDR Collar	:	9552
Depth in	:	555m MD	CDR Electronics	:	415
Depth out	:	1326m MD	Bit to GR	:	18.00m
Drilled	:	771m	Bit to Resistivity	:	14.52
MWD Elec No.	:	1234	Bit to APRS	:	15.23
MWD Collar No.	:	Hb-37608	Sensor Failure	:	No
Bit to Survey Depth	:	23.78m	Meters Logged	:	756.48m
Pumping Hours	:	64.5 hrs			
Operating Hours	:	64.5 hrs			
% Operating	:	100 %			
Sensor Failure	:	No			
RPM	:	102			
Flow Rate	:	3464 lpm			
Inclination	:	2.67°- 1.85°			

COMMENTS:

The 17" section was drilled from 555m MD to 1326m MD in one bit run and no problems.

A 9 1/2" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys and a CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements. Both tools behaved well throughout the section, with good signal quality and real time data acquisition.

POOH due to section TD at 1326m MD

5.4.10. MWD Run #10

BHA No.	:	10	CDR Collar	:	8200
Depth in	:	1326m MD	CDR Electronics	:	834
Depth out	:	2962m MD	Bit to GR	:	22.40m
Drilled	:	1636m	Bit to Resistivity	:	19.05m
MWD Elec No.	:	1330	Bit to APRS	:	19.58m
MWD Collar No.	:	DE-V799	Sensor Failure	:	No
Bit to Survey Depth	:	13.48m	Meters Logged	:	1616.95m (cmt)
Pumping Hours	:	102.3hrs			
Operating Hours	:	102.3 hrs	ISonic Collar	:	843
% Operating	:	100 %	ISonic Electronics	:	843
Sensor Failure	:	No	Bit to ARRAY	:	28.48
			Sensor Failure	:	No
RPM	:	115 (bit)	Meters Logged	:	1607.52m
Flow Rate	:	2750 lpm			
Inclination	:	1.85°- 3.64°			

COMMENTS:

Drilled from 1326m to 2962m MD. A 8.25" CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements whilst a 8.25" ISonic tool was used to provide porosity and pore pressure analysis data. These were used to evaluate formation geology and pore pressure trends.

A 8.25" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys

Drilling was completed in with 100% data acquisition, real time and memory.

POOH due to low rate of penetration and hence TD at 2962m MD

5.4.11. MWD Run #11

BHA No.	:	11	CDR Collar	:	8088
Depth in	:	2962m MD	CDR Electronics	:	574
Depth out	:	3265m MD	Bit to GR	:	22.62m
Drilled	:	303m	Bit to Resistivity	:	19.27m
MWD Elec No.	:	568	Bit to APRS	:	19.80m
MWD Collar No.	:	DC-032	Sensor Failure	:	No
Bit to Survey Depth	:	13.34m	Meters Logged	:	303m
Pumping Hours	:	22.6 hrs			
Operating Hours	:	22.6 hrs	ISonic Collar	:	823
% Operating	:	100 %	ISonic Electronics	:	823
Sensor Failure	:	No	Bit to ARRAY	:	28.72
			Sensor Failure	:	No
RPM	:	180	Meters Logged	:	303m
Flow Rate	:	3000 lpm			
Inclination	:	3.64°- 29.58°			

COMMENTS:

Drilled in 2 runs from 1326m to 3265m MD. A 8.25" CDR tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements whilst a 8.25" ISonic tool was used to provide porosity and pore pressure analysis data. These were used to evaluate formation geology and pore pressure trends.

A 8.25" PowerPulse MWD tool programmed with 12Hz/6bps was provided to obtain borehole surveys

Drilling was completed in with 100% data acquisition, real time and memory.

POOH due to section TD at 3265m MD

5.4.12. MWD Run #12

BHA No.	:	12	ARC Collar	:	1712
Depth in	:	3265m MD	ARC Electronics	:	1712
Depth out	:	3381m MD	Bit to GR	:	10.34m
Drilled	:	116m	Bit to Resistivity	:	10.29m
MWD Elec No.	:	1351	Bit to APRS	:	9.58m
MWD Collar No.	:	MDC-AB-109	Sensor Failure	:	No
Bit to Survey Depth	:	17.77m	Meters Logged	:	116m
Pumping Hours	:	17.9 hrs			
Operating Hours	:	17.9 hrs	ISonic Collar	:	608
% Operating	:	100 %	ISonic Electronics	:	608
Sensor Failure	:	No	Bit to ARRAY	:	27.89m
			Sensor Failure	:	No
RPM	:	130	Meters Logged	:	116m
Flow Rate	:	1811 lpm			
Inclination	:	29.58°- 36.21°	VADN Collar	:	12-03
			ISonic Electronics	:	242
			Bit to Neutron	:	35.44m
			Bit to Density	:	34.44m
			Sensor Failure	:	No
			Meters Logged	:	116m

COMMENTS:

This is the first run for 8.5" section. Drilled in from 3265m to 3381m MD. A 6.75" ARC tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements; A 6.75" VADN was used to provide Neutron Porosity and density whilst a 6.75" ISonic tool was used to provide porosity and pore pressure analysis data. These were used to evaluate formation geology and pore pressure trends.

A 6.75" PowerPulse MWD tool programmed with QPSK 12Hz/6bps was provided to obtain borehole surveys.
Drilling was completed in with 100% data acquisition, real time and memory.

POOH to perform coring.

5.4.13. MWD Run #13

BHA No.	:	13	ARC Collar	:	1712
Depth in	:	3381m MD	ARC Electronics	:	1712
Depth out	:	3845m MD	Bit to GR	:	10.34m
Drilled	:	402m	Bit to Resistivity	:	10.29m
MWD Elec No.	:	1351	Bit to APRS	:	9.58m
MWD Collar No.	:	MDC-AB-109	Sensor Failure	:	No
Bit to Survey Depth	:	17.77m	Meters Logged	:	464m
Pumping Hours	:	17.9 hrs			
Operating Hours	:	17.9 hrs	ISonic Collar	:	608
% Operating	:	100 %	ISonic Electronics	:	608
Sensor Failure	:	No	Bit to ARRAY	:	27.89m
			Sensor Failure	:	No
RPM	:	120	Meters Logged	:	464m
Flow Rate	:	1880lpm			
Inclination	:	36.21°- 36.00°	VADN Collar	:	12-03
			VADN Electronics	:	242
			Bit to Neutron	:	35.44m
			Bit to Density	:	34.44m
			Sensor Failure	:	No
			Meters Logged	:	464m

COMMENTS:

This is the second run for 8.5" section. Drilled in from 3881m to 3845m MD. A 6.75" ARC tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements; A 6.75" VADN was used to provide Neutron Porosity and density whilst a 6.75" ISonic tool was used to provide porosity and pore pressure analysis data. These were used to evaluate formation geology and pore pressure trends.

A 6.75" PowerPulse MWD tool programmed with QPSK 12Hz/6bps was provided to obtain borehole surveys.

Drilling was completed in with 100% data acquisition, real time and memory.

POOH to perform coring.

5.4.14. MWD Run #14

BHA No.	:	14	ARC Collar	:	1712
Depth in	:	3845m MD	ARC Electronics	:	1712
Depth out	:	4000m MD	Bit to GR	:	10.29m
Drilled	:	117m	Bit to Resistivity	:	10.24m
MWD Elec No.	:	1351	Bit to APRS	:	9.53m
MWD Collar No.	:	MDC-AB-109	Sensor Failure	:	No
Bit to Survey Depth	:	17.72m	Meters Logged	:	155m
Pumping Hours	:	9.2			
Operating Hours	:	9.2	ISonic Collar	:	608
% Operating	:	100%	ISonic Electronics	:	608
Sensor Failure	:	No	Bit to ARRAY	:	27.84m
			Sensor Failure	:	No
RPM	:	120	Meters Logged	:	155m
Flow Rate	:	1850lpm			
Inclination	:	36.00°- 35.99°	VADN Collar	:	12-03
			VADN Electronics	:	242
			Bit to Neutron	:	35.39m
			Bit to Density	:	34.39m
			Sensor Failure	:	No
			Meters Logged	:	155m

COMMENTS:

This is the second run for 8.5" section. Drilled in from 3881m to 3845m MD. A 6.75" ARC tool was used to provide resistivity, gamma ray, annular pressure and temperature measurements; A 6.75" VADN was used to provide Neutron Porosity and density whilst a 6.75" ISonic tool was used to provide porosity and pore pressure analysis data. These were used to evaluate formation geology and pore pressure trends.

A 6.75" PowerPulse MWD tool programmed with QPSK 12Hz/6bps was provided to obtain borehole surveys.

Drilling was completed in with 100% data acquisition, real time and memory.

POOH at well TD.

6. Service Quality Reports & Performance Summary

6.1. MWD Configuration

Schlumberger

HYDRO

Rig: Deepsea Delta

Well : 35/8-5 S

Hole Size: 36", 26", 17", 12 1/4", 8 1/2"

Job Type: MWD/CDR/ADN/ARC/ISONIC

TOOL CONFIGURATIONS

RUN No.	MWD No.	CDR/ARC No.	CDN/ADN No.	ISONIC No.	PowerPulse Flow range (lpm)	Res tool Flowrate (lpm)	ISonic/ADN Flowrate (lpm)	Bit-Survey (m)	Bit-GR (m)	Bit-Res (m)	Bit-Por (m)	Bit-Dens (m)	Bit-Delta T (m)	Bitrate bps
1	37608	n/a	n/a	n/a	2271-4540	n/a	n/a	13.65	n/a	n/a	n/a	n/a	n/a	6
2	V799	8200	n/a	n/a	2271-4540	2250-4540	n/a	23.74	17.98	14.63	n/a	n/a	n/a	6
3	V799	8200	n/a	n/a	2271-4540	2250-4540	n/a	23.74	17.98	14.63	n/a	n/a	n/a	6
4	V799	8200	n/a	n/a	2271-4540	2250-4540	n/a	23.74	17.98	14.63	n/a	n/a	n/a	6
5	V799	8200	n/a	n/a	2271-4540	2250-4540	n/a	23.74	17.98	14.63	n/a	n/a	n/a	6
6	V799	8200	n/a	n/a	2271-4540	2250-4540	n/a	23.74	17.98	14.63	n/a	n/a	n/a	6
7	V799	8200	n/a	n/a	2271-4540	2250-4540	n/a	23.74	17.98	14.63	n/a	n/a	n/a	6
8	37608	n/a	n/a	n/a	2271-5300	2250-5300	n/a	11.60	n/a	n/a	n/a	n/a	n/a	6
9	37608	9552	n/a	n/a	2271-5300	2250-5300	n/a	23.78	18	14.52	n/a	n/a	n/a	6
10	V799	8200	n/a	843	2271-4542	2271-4542	2271-4542	13.48	12.83	19.05	n/a	n/a	28.48	6
11	032	8088	n/a	823	2271-4543	2271-4543	2271-4543	13.34	22.62	19.27	n/a	n/a	28.72	6
12	109	1712	1203	608	1514-3028	1514-3028	1514-3028	17.77	10.34	10.29	35.44	34.44	27.89	6
13	109	1712	1203	608	1514-3028	1514-3028	1514-3028	17.77	10.34	10.29	35.44	34.44	27.89	6
14	109	1712	1203	608	1514-3028	1514-3028	1514-3028	17.72	10.29	10.24	35.39	34.39	27.84	6

6.2. MWD Performance

Schlumberger

HYDRO

TOOL PERFORMANCE

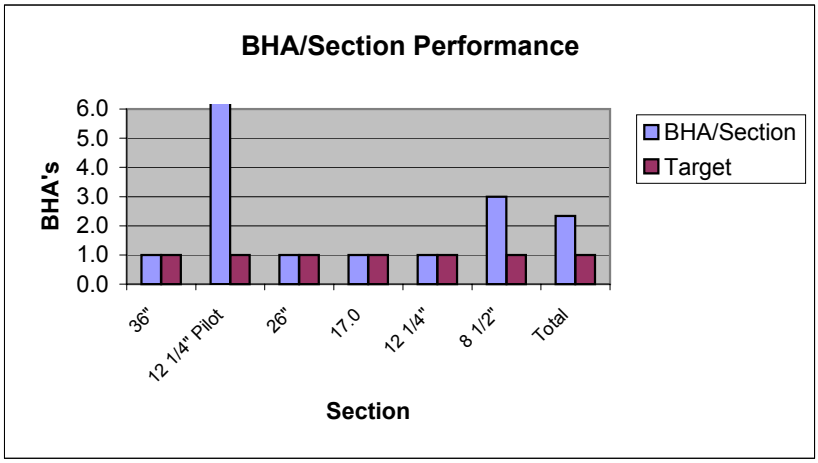
Rig:	Deepsea Delta	**WELL NUMBER:**	35/8-5 S
Hole Size:	36", 26", 17", 12 1/4", 8 1/2"	**1st RUN DATE:**	1-Jun-03
Job Type:	MWD/CDR/ADN/ARC/ISONIC	**LAST RUN DATE:**	9-Jul-03
		MUD TYPE:	Seawater/Versavert OBM

RUN	CIRC	TRAN	D&I	Gamma	Gamma	Resist	Resist	ECD	ECD	Density	Density	Porosity	Porosity	Delta T	Delta T	LOGGED	Comments.
NO	HRS	HRS	HRS	HRS	Lost(m)	HRS	Lost(m)	HRS	Lost(m)	HRS	Lost(m)	HRS	Lost(m)	HRS	Lost(m)	(m)	
1	24.5	24.5	24.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	59	Good run, D&I only. TD 36" section
2	8.2	8.2	8.2	8.2	0	8.2	0	8.2	0	n/a	n/a	n/a	n/a	n/a	n/a	574	Good run. Good RT and RM data. Well flowing
3	1.5	1.5	1.5	1.5	0	1.5	0	1.5	0	n/a	n/a	n/a	n/a	n/a	n/a	0	Good run. Well flowing, no cement.
4	2.2	2.2	2.2	2.2	0	2.2	0	2.2	0	n/a	n/a	n/a	n/a	n/a	n/a	0	Good run. Well flowing, no cement.
5	1.9	1.9	1.9	1.9	0	1.9	0	1.9	0	n/a	n/a	n/a	n/a	n/a	n/a	0	Good run, but no cement.
6	0.9	0.9	0.9	0.9	0	0.9	0	0.9	0	n/a	n/a	n/a	n/a	n/a	n/a	0	Good run, but no cement.
7	1.7	1.7	1.7	1.7	0	1.7	0	1.7	0	n/a	n/a	n/a	n/a	n/a	n/a	44	Good run, dressed cement.
8	6.5	6.5	6.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	94	Good run, D&I only. 26" HO section
9	64.5	64.5	64.5	64.5	0	64.5	0	64.5	0	n/a	n/a	n/a	n/a	n/a	n/a	771	Good run. Good real time and recorded data
10	102.3	102.3	102.3	102.3	0	102.3	0	102.3	0	n/a	0	n/a	0	102.3	187	1636	Good run, found wash out on ISONIC tool
11	22.6	22.6	22.6	22.6	0.0	22.6	0.0	22.6	0.0	22.6	0.0	22.6	0.0	22.6	0	303	Good run, POOH at section TD
12	17.9	17.9	17.9	17.9	0.0	17.9	0.0	17.9	0.0	17.9	0.0	17.9	0.0	17.9	0	116	POOH to cut core
13	37.0	37.0	37.0	37.0	0.0	37.0	0.0	37.0	0.0	37.0	0.0	37.0	0.0	37.0	0	464	Good run, ream cored section, drill to corepoint
14	15.3	15.3	15.3	15.3	0.0	15.3	0.0	15.3	0.0	15.3	0.0	15.3	0.0	15.3	0	155	Good run, logg cored secttion, drill to TD
TOTAL	307	307	307	276	0	276	0	276	0	92.8	0	92.8	0	195.1	187	4216	

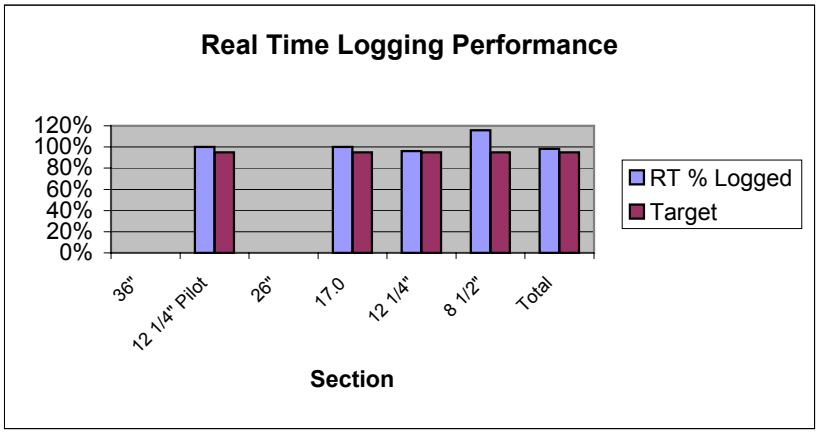
Rig:	**Deepsea Delta**	**Well: 35/8-5 S**
Operator:	**Norsk Hydro**	

Key Performance Indicators (KPI) by Section

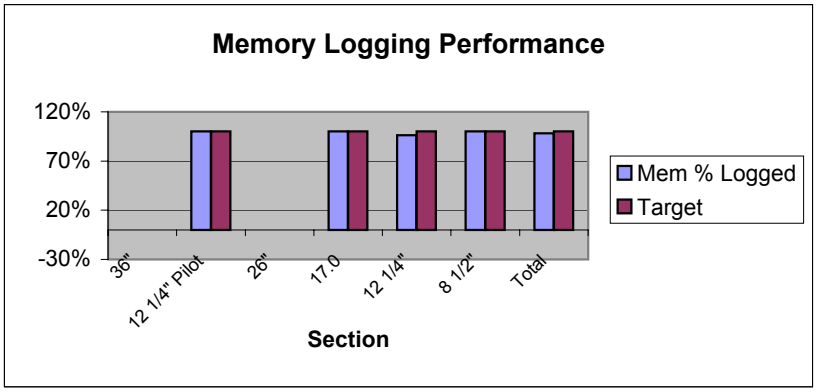
Section	36"	12 1/4" Pilot	26"	17.0	12 1/4"	8 1/2"	**Total**
Meters	59.0	528.0	94.0	771.0	1636.0	635.0	**3723.0**
Meters logged	0.0	528.0	0.0	771.0	1636.0	735.0	**3670.0**
Hours drilling	17.9	20.6	3.8	31.5	69.8	44.4	**188.0**
Hours BRT	40.5	98.0	13.5	108.0	128.0	121.5	**509.5**
days BRT	1.7	4.1	0.6	4.5	5.3	5.1	**21.2**
Hours pumping	24.5	39.0	6.5	64.5	102.3	70.1	**306.9**
Av. of sensors RT	0.0	528.0	0.0	771.0	1573.7	735.0	**3607.7**
Av. of sensors M	0.0	528.0	0.0	771.0	1573.7	735.0	**3607.7**
MWD failures	0	0	0	0	0	0	**0.0**
LWD RT failures	0	0	0	0	1	0	**1.0**
LWD mem. Failures	0	0	0	0	1	0	**1.0**
Motor / PD failures	0	0	0	0	0	0	**0.0**
Surface failures	0	0	0	0	0	1	**1.0**
Rig down time	0.0	0.0	0.0	0.0	0.0	1.0	**1.0**
m/BHA	**59.0**	**75.4**	**94.0**	**771.0**	**1636.0**	**211.7**	**265.9**
Av. ROP	**3.3**	**25.6**	**24.7**	**24.5**	**23.4**	**14.3**	**19.8**
m/day BRT	**35.0**	**129.3**	**167.1**	**171.3**	**306.8**	**125.4**	**175.4**
BHA/Section	**1.0**	**7.0**	**1.0**	**1.0**	**1.0**	**3.0**	**2.3**
Target	1.0	1.0	1.0	1.0	1.0	1.0	1.0
RT % Logged	**-**	**100.0%**	**-**	**100.0%**	**96.2%**	**115.7%**	**98.3%**
Target	**-**	95.0%	**-**	95.0%	95.0%	95.0%	95.0%
Mem % Logged	**-**	**100.0%**	**-**	**100.0%**	**96.2%**	**100.0%**	**98.3%**
Target	-	100.0%	-	100.0%	100.0%	100.0%	100.0%



12.25in pilot: 5 runs to dress cement
8.5in setion: POOH twice for coring



Target = 95%
Result =



Target = 100%
Result =

7. Failure Reports

7.1. ISONIC failure in 12.25in Section

MWD Run no:	10	Date:	24-June-03
Tool no:	843	% Operating:	96.2 %
Transmission failure:	No	Meters Drilled:	1636 m
Circulating hrs:	102.3	Meters operational:	1449 m
Operating hrs:	102.3		
Drilling parameters:			
WOB:	7 tons	Flow rate:	2850 lpm
RPM:	110	Inclination:	3.64 deg

Description of failure:

At surface it was discovered that the ISONIC tool was washed out; it had a hole on the body. However, it wasn't reason for POOH. The ISONIC RT log behaved unusually from about 2800mMD and to TD, the washout will be investigated to see if it could have caused the unusual response.

Remedial actions:

Picked up new tool for next run and back-loaded damaged tool.

Failure Diagnostics:

Might be caused by debris caught in side of collar causing turbulent flow that then washed out collar. The collar has been sent back to SPC (SugarLand Product Centre) for analysis & will take some time to deliver a verdict.

Correction:

Relog the 12 ¼" section from 2876mMD. And Sonic data has been reprocessed by Schlumberger DCS.

7.2. Ultrasonic failure in 8.5in Section

MWD Run no:	13	Date:	6-July-03
Tool no:	BA-324	% Operating:	2.6 %
Transmission failure:	No	Meters Drilled:	402 m
Circulating hrs:	2	Meters operational:	10 m
Operating hrs:	2		
Drilling parameters:			
WOB:	9 tons	Flow rate:	1870 lpm
RPM:	120	Inclination:	36 deg

Description of failure:

On the tech logs after dumping the tool, the ultrasonic caliper front-end status is flagging 190VDC failure. No sensible caliper log could be produced.

Remedial actions:

Client is not concerned with caliper as hole will be plugged and abandoned after wireline logging. OK to run same tool for last run, which is to log cored interval and drill through OWC.

Failure Diagnostics:

Awaiting result from workshop in town.

Correction:

None

8. Survey Details

8.1. MWD Survey Hold File – Raw & Corrected

Schlumberger

HYDRO

36" Section

MWD RUN 1
1 July - 3 July 2003
MWD TOOL NUMBER: MDC HB 37608 MEA 1236

Acceptance Criteria:
Tool G = 1002.07 +/- 2.50 counts.
Tool H = 1017.17 +/- 6.00 counts
Dip = 73.41deg +/- 0.45 deg

Magnetic Declination = -2.29 deg
Grid Correction = 0.58 deg
Sag Correction = None

Raw values						Temperature Corrected													
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Azi (deg)	Tool	Qual
-2003.00	-1.00	1.00	1436.00	-384.00	-250.00	1001.50	0.50	-0.50	919.00	-245.80	-160.00	1001.50	964.70	72.30	391.88	0.04	278.80	MWD	6-axis
-2005.00	5.00	7.00	1433.00	-443.00	-126.00	1002.50	-2.50	-3.50	917.10	-283.50	-80.60	1002.50	963.30	72.40	399.82	0.25	215.81	MWD	6-axis
-2007.00	1.00	2.00	1431.00	95.00	441.00	1003.50	-0.50	-1.00	915.80	60.80	282.20	1003.50	960.30	72.40	409.01	0.06	342.39	MWD	6-axis
-2004.00	2.00	-5.00	1435.00	200.00	-401.00	1002.00	-1.00	2.50	918.40	128.00	-256.60	1002.00	962.10	72.50	418.82	0.15	352.08	MWD	6-axis
-2006.00	3.00	-13.00	1439.00	230.00	-375.00	1003.00	-1.50	6.50	921.00	147.20	-240.00	1003.00	963.00	72.60	426.45	0.38	338.61	MWD	6-axis
-2006.00	34.00	0.00	1453.00	409.00	-116.00	1003.00	-17.00	0.00	929.90	261.80	-74.20	1003.10	968.90	72.80	436.45	0.97	11.73	MWD	6-axis
-2006.00	17.00	22.00	1452.00	402.00	166.00	1003.00	-8.50	-11.00	929.30	257.30	106.20	1003.10	970.10	72.60	442.34	0.79	25.35	MWD	6-axis

Tool H and Dip out of range due to magnetic interference from hole opener

Schlumberger

HYDRO

12 1/4" Pilot Section

MWD RUN 2
4 July - 5 July 2003
MWD TOOL NUMBER: **MDC DE-V799 MEA 1330**

Acceptance Criteria:
Tool G = 1002.07 +/- 2.50 counts.
Tool H = 1017.17 +/- 6.00 counts
Dip = 73.41deg +/- 0.45 deg

Magnetic Declination = -2.29 deg
Grid Correction = 0.58 deg
Sag Correction = None

Raw values						Temperature Corrected													
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Azi (deg)	Tool	Qual
-2004.00	-27.00	43.00	-1734.00	20.00	214.00	1002.00	13.50	-21.50	-1109.80	12.80	137.00	1002.30	1118.30	-84.00	457.59	1.45	42.66	MWD	6-axis
-2003.00	-61.00	21.00	1546.00	-345.00	211.00	1001.50	30.50	-10.50	989.40	-220.80	135.00	1002.00	1022.70	73.50	485.93	1.84	7.84	MWD	6-axis
-2005.00	-55.00	-31.00	1544.00	-386.00	-144.00	1002.50	27.50	15.50	988.20	-247.00	-92.20	1003.00	1022.70	73.30	514.39	1.80	4.75	MWD	6-axis
-2004.00	-43.00	-7.00	1543.00	-426.00	19.00	1002.00	21.50	3.50	987.50	-272.60	12.20	1002.20	1024.50	73.30	543.16	1.25	7.69	MWD	6-axis
-2003.00	10.00	-22.00	1537.00	-5.00	-446.00	1001.50	-5.00	11.00	983.70	-3.20	-285.40	1001.60	1024.30	73.20	571.85	0.69	20.85	MWD	6-axis
-2003.00	-26.00	0.00	1536.00	-334.00	286.00	1001.50	13.00	0.00	983.00	-213.80	183.00	1001.60	1022.50	73.50	600.20	0.74	35.68	MWD	6-axis
-2004.00	-21.00	18.00	1535.00	-133.00	415.00	1002.00	10.50	-9.00	982.40	-85.10	265.60	1002.10	1021.20	73.50	628.71	0.79	26.97	MWD	6-axis

Schlumberger

HYDRO

26" Hole Opener

MWD RUN 8
10 July - 11 July 2003
MWD TOOL NUMBER: **MDC HB-37608 MEA 1234**

Acceptance Criteria:
Tool G = 1002.07 +/- 2.50 counts.
Tool H = 1017.17 +/- 6.00 counts
Dip = 73.41deg +/- 0.45 deg

Magnetic Declination = -2.29 deg
Grid Correction = 0.58 deg
Sag Correction = None

Raw values						Temperature Corrected												
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Azi (deg)	Tool	Qual
-2005.00	41.00	32.00	1511.00	368.00	189.00	1002.50	-20.50	-16.00	967.00	235.50	121.00	1002.80	1002.60	73.20	466.54	1.49	6.60	MWD	6-axis
-2004.00	54.00	-33.00	1469.00	305.00	-265.00	1002.00	-27.00	16.50	940.20	195.20	-169.60	1002.50	975.10	72.80	495.96	1.81	5.32	MWD	6-axis
-2003.00	-65.00	64.00	1473.00	-223.00	316.00	1001.50	32.50	-32.00	942.70	-142.70	202.20	1002.50	974.70	72.70	525.39	2.61	5.47	MWD	6-axis
-2004.00	71.00	61.00	1475.00	321.00	205.00	1002.00	-35.50	-30.50	944.00	205.40	131.20	1003.10	975.00	72.90	541.63	2.67	3.61	MWD	6-axis

Schlumberger

HYDRO

17" Section

MWD RUN 9
13 July - 16 July 2003
MWD TOOL NUMBER: MDC HB-37608 MEA 1234

Acceptance Criteria:
Tool G = 1002.07 +/- 2.50 counts.
Tool H = 1017.17 +/- 6.00 counts
Dip = 73.41deg +/- 0.45 deg

Magnetic Declination = -2.29 deg
Grid Correction = 0.58 deg
Sag Correction = None

	Raw values					Temperature Corrected												
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Azi (deg)	Tool	Qual
-2006.00	80.00	17.00	1544.00	388.00	53.00	1003.00	-40.00	-8.50	988.20	248.30	33.90	1003.80	1019.40	73.40	573.77	2.33	0.38	MWD	6-axis
-2001.00	76.00	-20.00	1540.00	375.00	-123.00	1000.50	-38.00	10.00	985.60	240.00	-78.70	1001.30	1017.40	73.40	602.42	2.25	359.70	MWD	6-axis
-2005.00	-66.00	-47.00	1535.00	-330.00	-219.00	1002.50	33.00	23.50	982.40	-211.20	-140.20	1003.30	1014.60	73.20	632.04	2.31	358.37	MWD	6-axis
-2001.00	-17.00	77.00	1534.00	-67.00	383.00	1000.50	8.50	-38.50	981.80	-42.90	245.10	1001.30	1012.80	73.50	661.08	2.26	358.93	MWD	6-axis
-2004.00	64.00	40.00	1539.00	294.00	259.00	1002.00	-32.00	-20.00	985.00	188.20	165.80	1002.70	1016.40	73.60	690.26	2.16	348.57	MWD	6-axis
-2005.00	-45.00	-63.00	1536.00	-149.00	-372.00	1002.50	22.50	31.50	983.00	-95.40	-238.10	1003.20	1015.90	73.20	718.73	2.21	344.78	MWD	6-axis
-2005.00	-40.00	62.00	1536.00	-292.00	267.00	1002.50	20.00	-31.00	983.00	-186.90	170.90	1003.20	1015.10	73.50	746.53	2.11	343.83	MWD	6-axis
-2003.00	-64.00	37.00	1537.00	-379.00	117.00	1001.50	32.00	-18.50	983.70	-242.60	74.90	1002.20	1015.90	73.50	775.90	2.11	345.46	MWD	6-axis
-2003.00	-25.00	74.00	1537.00	-204.00	336.00	1001.50	12.50	-37.00	983.70	-130.60	215.00	1002.30	1015.30	73.50	804.57	2.23	345.79	MWD	6-axis
-2005.00	-46.00	-65.00	1538.00	-141.00	-369.00	1002.50	23.00	32.50	984.30	-90.20	-236.20	1003.30	1016.30	73.40	833.20	2.27	344.27	MWD	6-axis
-2004.00	25.00	71.00	1539.00	62.00	393.00	1002.00	-12.50	-35.50	985.00	39.70	251.50	1002.70	1017.30	73.40	862.03	2.15	347.62	MWD	6-axis
-2004.00	-49.00	-49.00	1539.00	-270.00	-304.00	1002.00	24.50	24.50	985.00	-172.80	-194.60	1002.60	1018.80	73.20	890.49	1.98	353.74	MWD	6-axis
-2004.00	-6.00	68.00	1537.00	-24.00	400.00	1002.00	3.00	-34.00	983.70	-15.40	256.00	1002.60	1016.60	73.40	918.07	1.95	358.16	MWD	6-axis
-2004.00	36.00	55.00	1536.00	277.00	291.00	1002.00	-18.00	-27.50	983.00	177.30	186.20	1002.50	1016.10	73.50	946.89	1.88	5.97	MWD	6-axis
-2005.00	61.00	15.00	1534.00	404.00	0.00	1002.50	-30.50	-7.50	981.80	258.60	0.00	1003.00	1015.20	73.50	977.43	1.79	9.10	MWD	6-axis
-2004.00	10.00	58.00	1534.00	190.00	362.00	1002.00	-5.00	-29.00	981.80	121.60	231.70	1002.40	1016.00	73.50	1006.59	1.68	12.90	MWD	6-axis
-2004.00	-14.00	-54.00	1533.00	-228.00	-347.00	1002.00	7.00	27.00	981.10	-145.90	-222.10	1002.40	1016.50	73.30	1035.64	1.59	13.79	MWD	6-axis
-2004.00	49.00	31.00	1534.00	403.00	73.00	1002.00	-24.50	-15.50	981.80	257.90	46.70	1002.40	1016.10	73.50	1064.70	1.66	16.68	MWD	6-axis
-2004.00	-58.00	24.00	1534.00	-272.00	307.00	1002.00	29.00	-12.00	981.80	-174.10	196.50	1002.50	1016.20	73.40	1091.50	1.79	20.07	MWD	6-axis
-2005.00	-25.00	-60.00	1535.00	-312.00	-265.00	1002.50	12.50	30.00	982.40	-199.70	-169.60	1003.00	1016.70	73.40	1121.35	1.86	20.93	MWD	6-axis
-2005.00	-32.00	-51.00	1534.00	-363.00	-201.00	1002.50	16.00	25.50	981.80	-232.30	-128.60	1003.00	1017.00	73.30	1149.71	1.72	22.87	MWD	6-axis
-2004.00	-51.00	33.00	1534.00	-185.00	372.00	1002.00	25.50	-16.50	981.80	-118.40	238.10	1002.50	1017.10	73.30	1179.72	1.74	24.42	MWD	6-axis
-2005.00	-46.00	-47.00	1535.00	-407.00	-86.00	1002.50	23.00	23.50	982.40	-260.50	-55.00	1003.00	1017.80	73.20	1208.02	1.88	26.95	MWD	6-axis
-2004.00	49.00	-37.00	1534.00	119.00	-399.00	1002.00	-24.50	18.50	981.80	76.20	-255.40	1002.50	1017.30	73.40	1237.09	1.75	29.58	MWD	6-axis
-2005.00	35.00	-50.00	1535.00	20.00	-415.00	1002.50	-17.50	25.00	982.40	12.80	-265.60	1003.00	1017.80	73.40	1265.15	1.74	25.85	MWD	6-axis
-2008.00	-60.00	-25.00	1534.00	-406.00	83.00	1004.00	30.00	12.50	981.80	-259.80	53.10	1004.50	1017.00	73.30	1294.07	1.85	27.42	MWD	6-axis

Schlumberger

HYDRO

12 1/4"" Section

MWD RUN 10
18 June - 25 June 2003
MWD TOOL NUMBER: MDC DE-V799 MEA 1330

Acceptance Criteria:
Tool G = 1002.07 +/- 2.50 counts.
Tool H = 1017.17 +/- 6.00 counts
Dip = 73.41deg +/- 0.45 deg

Magnetic Declination = -2.29 deg
Grid Correction = 0.58 deg

Sag Correction

Build	Drop
0 deg - 5 deg = 0	0 deg - 5 deg = -0.23
5 deg - 10 deg = -0.22	5 deg - 10 deg = -0.27
10 deg - 15 deg = -0.24	10 deg - 15 deg = -0.28
15 deg - 25 deg = -0.26	15 deg - 20 deg = -0.29
25 deg - 35 deg = -0.27	
35 deg - 90 deg = -0.31	

	Raw values					Temperature Corrected													
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Sag Corr	Azi (deg)	Tool	Qual
-2004.00	25.00	80.00	1542.00	349.00	197.00	1002.00	-12.50	-40.00	986.90	223.40	126.10	1002.90	1019.70	73.60	**1362.91**	2.39	**2.39**	**34.34**	MWD	6-axis
-2001.00	-69.00	36.00	1545.00	-164.00	370.00	1000.50	34.50	-18.00	988.80	-105.00	236.80	1001.30	1022.20	73.50	**1391.67**	2.23	**2.23**	**30.56**	MWD	6-axis
-2007.00	-11.00	-1.00	1532.00	-363.00	-267.00	1003.50	5.50	0.50	980.50	-232.30	-170.90	1003.50	1022.00	73.30	**1420.26**	0.32	**0.32**	**326.14**	MWD	6-axis
-2003.00	-8.00	-2.00	1529.00	180.00	-419.00	1001.50	4.00	1.00	978.60	115.20	-268.20	1001.50	1021.20	73.40	**1448.85**	0.24	**0.24**	**258.31**	MWD	6-axis
-2007.00	-4.00	-2.00	1524.00	-66.00	-451.00	1003.50	2.00	1.00	975.40	-42.20	-288.60	1003.50	1018.00	73.30	**1477.77**	0.13	**0.13**	**301.98**	MWD	6-axis
-2004.00	-6.00	-2.00	1527.00	58.00	-451.00	1002.00	3.00	1.00	977.30	37.10	-288.60	1002.00	1019.70	73.40	**1506.18**	0.18	**0.18**	**278.44**	MWD	6-axis
-2001.00	-7.00	-1.00	1529.00	72.00	-450.00	1000.50	3.50	0.50	978.60	46.10	-288.00	1000.50	1021.10	73.40	**1534.83**	0.20	**0.20**	**266.46**	MWD	6-axis
-2006.00	-3.00	0.00	1530.00	-170.00	-423.00	1003.00	1.50	0.00	979.20	-108.80	-270.70	1003.00	1021.70	73.40	**1563.97**	0.09	**0.09**	**288.90**	MWD	6-axis
-2005.00	-4.00	-1.00	1530.00	-284.00	-356.00	1002.50	2.00	0.50	979.20	-181.80	-227.80	1002.50	1021.70	73.30	**1593.01**	0.12	**0.12**	**319.60**	MWD	6-axis
-2005.00	-5.00	1.00	1531.00	-333.00	301.00	1002.50	2.50	-0.50	979.80	-213.10	192.60	1002.50	1021.10	73.50	**1621.62**	0.15	**0.15**	**27.29**	MWD	6-axis
-2001.00	-5.00	-1.00	1530.00	-424.00	155.00	1000.50	2.50	0.50	979.20	-271.40	99.20	1000.50	1020.90	73.40	**1650.71**	0.15	**0.15**	**27.87**	MWD	6-axis
-2006.00	-3.00	-1.00	1529.00	-448.00	71.00	1003.00	1.50	0.50	978.60	-286.70	45.40	1003.00	1020.70	73.40	**1680.61**	0.09	**0.09**	**24.04**	MWD	6-axis
-2005.00	-4.00	-2.00	1530.00	-201.00	-408.00	1002.50	2.00	1.00	979.20	-128.60	-261.10	1002.50	1021.60	73.30	**1709.10**	0.13	**0.13**	**319.79**	MWD	6-axis
-1999.00	-5.00	-4.00	1529.00	161.00	-424.00	999.50	2.50	2.00	978.60	103.00	-271.40	999.50	1020.70	73.40	**1737.40**	0.18	**0.18**	**285.19**	MWD	6-axis
-2005.00	-8.00	-3.00	1529.00	-81.00	442.00	1002.50	4.00	1.50	978.60	-51.80	282.90	1002.50	1019.90	73.70	**1766.30**	0.24	**0.24**	**96.09**	MWD	6-axis
-2005.00	-6.00	-6.00	1530.00	-298.00	-338.00	1002.50	3.00	3.00	979.20	-190.70	-216.30	1002.50	1020.80	73.30	**1794.90**	0.24	**0.24**	**353.19**	MWD	6-axis
-2003.00	-5.00	0.00	1529.00	432.00	136.00	1001.50	2.50	0.00	978.60	276.50	87.00	1001.50	1020.60	73.60	**1823.75**	0.14	**0.14**	**159.12**	MWD	6-axis
-2005.00	-8.00	-3.00	1529.00	49.00	449.00	1002.50	4.00	1.50	978.60	31.40	287.40	1002.50	1020.40	73.70	**1852.48**	0.24	**0.24**	**112.78**	MWD	6-axis
-2008.00	-4.00	-1.00	1530.00	453.00	16.00	1004.00	2.00	0.50	979.20	289.90	10.20	1004.00	1021.30	73.60	**1880.90**	0.12	**0.12**	**188.84**	MWD	6-axis
-2008.00	-4.00	0.00	1530.00	-231.00	-396.00	1004.00	2.00	0.00	979.20	-147.80	-253.40	1004.00	1022.20	73.30	**1909.67**	0.11	**0.11**	**297.32**	MWD	6-axis
-2011.00	-4.00	-1.00	1531.00	-324.00	-320.00	1005.50	2.00	0.50	979.80	-207.40	-204.80	1005.50	1022.30	73.30	**1938.80**	0.12	**0.12**	**326.33**	MWD	6-axis
-2009.00	-7.00	-2.00	1530.00	362.00	274.00	1004.50	3.50	1.00	979.20	231.70	175.40	1004.50	1021.40	73.70	**1967.90**	0.21	**0.21**	**155.31**	MWD	6-axis
-2011.00	-4.00	-1.00	1530.00	418.00	-179.00	1005.50	2.00	0.50	979.20	267.50	-114.60	1005.50	1021.50	73.50	**1996.70**	0.12	**0.12**	**214.20**	MWD	6-axis
-2007.00	-5.00	-4.00	1530.00	148.00	-430.00	1003.50	2.50	2.00	979.20	94.70	-275.20	1003.50	1021.50	73.40	**2025.50**	0.18	**0.18**	**286.98**	MWD	6-axis
-2005.00	-6.00	-1.00	1529.00	434.00	-142.00	1002.50	3.00	0.50	978.60	277.80	-90.90	1002.50	1021.30	73.50	**2054.84**	0.17	**0.17**	**204.59**	MWD	6-axis
-2004.00	-4.00	-2.00	1528.00	210.00	401.00	1002.00	2.00	1.00	977.90	134.40	256.60	1002.00	1019.90	73.60	**2083.11**	0.13	**0.13**	**140.69**	MWD	6-axis
-2005.00	-3.00	-2.00	1530.00	101.00	440.00	1002.50	1.50	1.00	979.20	64.60	281.60	1002.50	1020.90	73.60	**2111.53**	0.10	**0.10**	**133.12**	MWD	6-axis
-2006.00	-7.00	-3.00	1531.00	-447.00	50.00	1003.00	3.50	1.50	979.80	-286.10	32.00	1003.00	1021.30	73.40	**2140.22**	0.22	**0.22**	**25.96**	MWD	6-axis
-2006.00	-6.00	-3.00	1529.00	356.00	-285.00	1003.00	3.00	1.50	978.60	227.80	-182.40	1003.00	1021.20	73.50	**2169.18**	0.19	**0.19**	**242.57**	MWD	6-axis
-2004.00	-5.00	-1.00	1525.00	-267.00	-362.00	1002.00	2.50	0.50	976.00	-170.90	-231.70	1002.00	1017.60	73.50	**2198.04**	0.15	**0.15**	**314.79**	MWD	6-axis

Raw values						Temperature Corrected													
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Sag Corr	Azi (deg)	Tool	Qual
-2005.00	-4.00	0.00	1526.00	106.00	433.00	1002.50	2.00	0.00	976.60	67.80	277.10	1002.50	1017.50	73.70	**2227.33**	0.11	**0.11**	**100.12**	MWD	6-axis
-2000.00	-4.00	-2.00	1528.00	-229.00	-392.00	1000.00	2.00	1.00	977.90	-146.60	-250.90	1000.00	1020.20	73.30	**2255.48**	0.13	**0.13**	**323.83**	MWD	6-axis
-2006.00	-10.00	-9.00	1528.00	-185.00	414.00	1003.00	5.00	4.50	977.90	-118.40	265.00	1003.00	1020.10	73.60	**2284.47**	0.38	**0.38**	**103.41**	MWD	6-axis
-2002.00	-34.00	58.00	1522.00	472.00	-3.00	1001.00	17.00	-29.00	974.10	302.10	-1.90	1001.60	1019.80	73.70	**2313.14**	1.92	**1.92**	**111.84**	MWD	6-axis
-2003.00	-141.00	32.00	1513.00	344.00	354.00	1001.50	70.50	-16.00	968.30	220.20	226.60	1004.10	1018.50	73.70	**2343.83**	4.13	**4.13**	**106.04**	MWD	6-axis
-1993.00	193.00	8.00	1507.00	-277.00	-440.00	996.50	-96.50	-4.00	964.50	-177.30	-281.60	1001.20	1020.30	73.50	**2371.46**	5.54	**5.32**	**105.84**	MWD	6-axis
-1985.00	-256.00	-45.00	1498.00	265.00	475.00	992.50	128.00	22.50	958.70	169.60	304.00	1001.00	1020.00	73.70	**2400.18**	7.46	**7.24**	**105.81**	MWD	6-axis
-1978.00	299.00	115.00	1486.00	-220.00	-540.00	989.00	-149.50	-57.50	951.00	-140.80	-345.60	1001.90	1021.60	73.50	**2428.86**	9.20	**8.98**	**106.95**	MWD	6-axis
-1957.00	-170.00	-358.00	1469.00	-186.00	593.00	978.50	85.00	179.00	940.20	-119.00	379.50	998.40	1020.80	73.60	**2457.50**	11.45	**11.21**	**106.92**	MWD	6-axis
-1951.00	334.00	329.00	1445.00	-90.00	-673.00	975.50	-167.00	-164.50	924.80	-57.60	-430.70	1003.30	1021.80	73.40	**2486.38**	13.51	**13.27**	**110.58**	MWD	6-axis
-1939.00	445.00	251.00	1432.00	-290.00	-644.00	969.50	-222.50	-125.50	916.50	-185.60	-412.20	1002.60	1021.90	73.30	**2515.26**	14.76	**14.52**	**110.63**	MWD	6-axis
-1915.00	-159.00	-556.00	1414.00	-235.00	697.00	957.50	79.50	278.00	905.00	-150.40	446.10	1000.20	1020.10	73.60	**2542.74**	16.80	**16.54**	**109.00**	MWD	6-axis
-1903.00	-566.00	286.00	1398.00	764.00	78.00	951.50	283.00	-143.00	894.70	489.00	49.90	1002.90	1020.80	73.70	**2571.64**	18.43	**18.26**	**109.24**	MWD	6-axis
-1885.00	-677.00	105.00	1386.00	724.00	314.00	942.50	338.50	-52.50	887.00	463.40	201.00	1002.80	1020.70	73.70	**2600.18**	19.97	**19.71**	**106.79**	MWD	6-axis
-1865.00	377.00	-635.00	1370.00	-727.00	372.00	932.50	-188.50	317.50	876.80	-465.30	238.10	1002.90	1020.80	73.40	**2630.64**	21.60	**21.34**	**104.35**	MWD	6-axis
-1880.00	336.00	-612.00	1390.00	-701.00	362.00	940.00	-168.00	306.00	889.60	-448.60	231.70	1002.70	1022.90	73.30	**2658.11**	20.37	**20.11**	**103.17**	MWD	6-axis
-1905.00	615.00	-121.00	1417.00	-668.00	-319.00	952.50	-307.50	60.50	906.90	-427.50	-204.20	1002.70	1023.20	73.30	**2687.29**	18.21	**17.95**	**102.08**	MWD	6-axis
-1922.00	451.00	354.00	1434.00	-159.00	-685.00	961.00	-225.50	-177.00	917.80	-101.80	-438.40	1002.80	1022.20	73.40	**2716.13**	16.61	**16.35**	**101.39**	MWD	6-axis
-1940.00	-394.00	323.00	1459.00	641.00	47.00	970.00	197.00	-161.50	933.80	410.20	30.10	1002.90	1020.30	73.60	**2745.24**	14.71	**14.47**	**96.99**	MWD	6-axis
-1958.00	-385.00	207.00	1484.00	546.00	212.00	979.00	192.50	-103.50	949.80	349.40	135.70	1003.10	1021.10	73.70	**2773.79**	12.58	**12.34**	**92.90**	MWD	6-axis
-1968.00	-349.00	-168.00	1500.00	77.00	537.00	984.00	174.50	84.00	960.00	49.30	343.70	1002.90	1020.90	73.60	**2802.26**	11.13	**10.89**	**87.62**	MWD	6-axis
-1978.00	293.00	-151.00	1514.00	-409.00	-303.00	989.00	-146.50	75.50	969.00	-261.80	-193.90	1002.60	1022.30	73.40	**2831.39**	9.46	**9.19**	**83.34**	MWD	6-axis
-1985.00	-285.00	25.00	1524.00	196.00	429.00	992.50	142.50	-12.50	975.40	125.40	274.60	1002.80	1021.00	73.70	**2859.20**	8.20	**7.93**	**78.89**	MWD	6-axis
-1994.00	-121.00	174.00	1534.00	395.00	202.00	997.00	60.50	-87.00	981.80	252.80	129.30	1002.60	1022.00	73.60	**2887.47**	6.07	**5.80**	**73.58**	MWD	6-axis
-2000.00	145.00	-7.00	1542.00	113.00	-388.00	1000.00	-72.50	3.50	986.90	72.30	-248.30	1002.60	1020.20	73.50	**2916.07**	4.15	**3.92**	**54.30**	MWD	6-axis
-2001.00	-52.00	125.00	1552.00	152.00	337.00	1000.50	26.00	-62.50	993.30	97.30	215.70	1002.80	1021.10	73.70	**2945.13**	3.87	**3.64**	**33.82**	MWD	6-axis
-2002.00	111.00	87.00	1559.00	354.00	52.00	1001.00	-55.50	-43.50	997.80	226.60	33.30	1003.50	1023.70	73.50	**2973.89**	4.03	**3.77**	**19.67**	MWD	6-axis
-2003.00	-66.00	-118.00	1558.00	16.00	-359.00	1001.50	33.00	59.00	997.10	10.20	-229.80	1003.80	1023.30	73.60	**3002.95**	3.86	**3.60**	**331.95**	MWD	6-axis
-1999.00	-180.00	-34.00	1558.00	-92.00	-364.00	999.50	90.00	17.00	997.10	-58.90	-233.00	1003.70	1025.70	73.60	**3031.84**	5.24	**5.02**	**308.06**	MWD	6-axis
-1993.00	-236.00	23.00	1544.00	-31.00	-418.00	996.50	118.00	-11.50	988.20	-19.80	-267.50	1003.50	1023.90	73.50	**3061.29**	6.78	**6.56**	**289.15**	MWD	6-axis
-1981.00	-113.00	303.00	1533.00	-363.00	-271.00	990.50	56.50	-151.50	981.10	-232.30	-173.40	1003.60	1023.10	73.60	**3088.87**	9.27	**9.05**	**282.36**	MWD	6-axis
-1966.00	378.00	-144.00	1518.00	-56.00	501.00	983.00	-189.00	72.00	971.50	-35.80	320.60	1003.60	1023.70	73.50	**3119.28**	11.63	**11.39**	**276.85**	MWD	6-axis
-1946.00	-413.00	-269.00	1491.00	550.00	-186.00	973.00	206.50	134.50	954.20	352.00	-119.00	1003.70	1024.00	73.40	**3146.83**	14.21	**13.97**	**268.97**	MWD	6-axis
-1919.00	-577.00	112.00	1455.00	384.00	-537.00	959.50	288.50	-56.00	931.20	245.80	-343.70	1003.50	1022.60	73.40	**3175.95**	17.03	**16.77**	**262.69**	MWD	6-axis
-1863.00	-464.00	584.00	1413.00	17.00	-745.00	931.50	232.00	-292.00	904.30	10.90	-476.80	1003.40	1022.40	73.60	**3205.05**	21.82	**21.56**	**263.42**	MWD	6-axis
-1790.00	-335.00	-844.00	1360.00	685.00	487.00	895.00	167.50	422.00	870.40	438.40	311.70	1003.60	1023.20	73.40	**3233.61**	26.90	**26.63**	**265.01**	MWD	6-axis
-1741.00	-539.00	-841.00	1325.00	801.00	402.00	870.50	269.50	420.50	848.00	512.60	257.30	1003.60	1023.80	73.40	**3250.24**	29.85	**29.58**	**265.61**	MWD	6-axis

Schlumberger

HYDRO

8.5" Section

MWD RUN 12
28 June - 9 July 2003
MWD TOOL NUMBER: MDC AB-109 MEA 1351

Acceptance Criteria: **Tool G = 1002.07 +/- 2.50 counts.** **Tool H = 1017.17 +/- 6.00 counts** **Dip = 73.41deg +/- 0.45 deg**

Magnetic Declination = -2.68 deg **Grid Correction = 0.58 deg** **Sag Correction = 0.12**

Raw values						Temperature Corrected													
Sgx_t	Sgy_t	Sgz_t	Shx_t	Shy_t	Shz_t	Sgx	Sgy	Sgz	Shx	Shy	Shz	Tool G	Tool H	Dip	Depth (m)	Incl (deg)	Sag Corr	Azi (deg)	Tool	Qual
-1686.00	-344.00	1033.00	1297.00	-172.00	-933.00	843.00	172.00	-516.50	830.10	-110.10	-597.10	1003.50	1028.40	73.40	**3267.35**	32.85	**32.97**	**267.44**	MWD	6-axis
-1635.00	-471.00	1065.00	1251.00	-62.00	-985.00	817.50	235.50	-532.50	800.60	-39.70	-630.40	1003.70	1019.80	73.40	**3296.49**	35.46	**35.58**	**268.30**	MWD	6-axis
-1636.00	-953.00	-670.00	1249.00	976.00	132.00	818.00	476.50	335.00	799.40	624.60	84.50	1004.20	1018.00	73.40	**3324.70**	35.45	**35.57**	**268.29**	MWD	6-axis
-1619.00	1151.00	284.00	1228.00	-993.00	222.00	809.50	-575.50	-142.00	785.90	-635.50	142.10	1003.30	1020.70	73.50	**3353.92**	36.21	**36.33**	**265.55**	MWD	6-axis
-1608.00	964.00	716.00	1213.00	-1021.00	-194.00	804.00	-482.00	-358.00	776.30	-653.40	-124.20	1003.40	1022.30	73.50	**3382.34**	36.75	**36.87**	**263.75**	MWD	6-axis
-1605.00	-990.00	-691.00	1211.00	1025.00	161.00	802.50	495.00	345.50	775.00	656.00	103.00	1004.20	1020.60	73.40	**3410.36**	36.95	**37.07**	**264.55**	MWD	6-axis
-1614.00	384.00	-1132.00	1213.00	130.00	1024.00	807.00	-192.00	566.00	776.30	83.20	655.40	1004.20	1019.40	73.50	**3439.43**	36.52	**36.64**	**263.73**	MWD	6-axis
-1626.00	285.00	-1144.00	1225.00	218.00	995.00	813.00	-142.50	572.00	784.00	139.50	636.80	1004.20	1019.60	73.50	**3468.59**	35.94	**36.06**	**264.22**	MWD	6-axis
-1669.00	-973.00	-547.00	1266.00	969.00	22.00	834.50	486.50	273.50	810.20	620.20	14.10	1003.90	1020.40	73.40	**3498.13**	33.77	**33.89**	**265.82**	MWD	6-axis
-1618.00	-861.00	-820.00	1237.00	964.00	291.00	809.00	430.50	410.00	791.70	617.00	186.20	1003.90	1020.80	73.50	**3526.47**	36.31	**36.43**	**267.78**	MWD	6-axis
-1616.00	1179.00	-164.00	1232.00	-836.00	570.00	808.00	-589.50	82.00	788.50	-535.00	364.80	1003.50	1020.30	73.60	**3554.90**	36.38	**36.50**	**266.84**	MWD	6-axis
-1629.00	-658.00	970.00	1245.00	122.00	-995.00	814.50	329.00	-485.00	796.80	78.10	-636.80	1003.40	1023.00	73.40	**3583.46**	35.74	**35.86**	**267.14**	MWD	6-axis
-1621.00	1035.00	571.00	1239.00	-1008.00	-38.00	810.50	-517.50	-285.50	793.00	-645.10	-24.30	1003.10	1022.50	73.50	**3612.62**	36.10	**36.22**	**267.00**	MWD	6-axis
-1618.00	-1050.00	554.00	1233.00	589.00	-830.00	809.00	525.00	-277.00	789.10	377.00	-531.20	1003.40	1023.20	73.30	**3641.65**	36.27	**36.39**	**266.38**	MWD	6-axis
-1621.00	-517.00	1064.00	1227.00	-11.00	-1024.00	810.50	258.50	-532.00	785.30	-7.00	-655.40	1003.40	1022.80	73.40	**3670.76**	36.12	**36.24**	**264.64**	MWD	6-axis
-1620.00	-846.00	828.00	1225.00	333.00	-963.00	810.00	423.00	-414.00	784.00	213.10	-616.30	1003.20	1019.80	73.40	**3702.17**	36.16	**36.28**	**265.07**	MWD	6-axis
-1612.00	1079.00	-515.00	1220.00	-633.00	800.00	806.00	-539.50	257.50	780.80	-405.10	512.00	1003.50	1017.80	73.60	**3727.00**	36.56	**36.68**	**265.61**	MWD	6-axis
-1616.00	-1164.00	247.00	1230.00	792.00	-634.00	808.00	582.00	-123.50	787.20	506.90	-405.80	1003.40	1020.40	73.40	**3756.72**	36.37	**36.49**	**266.67**	MWD	6-axis
-1618.00	-382.00	-1125.00	1233.00	720.00	708.00	809.00	191.00	562.50	789.10	460.80	453.10	1003.70	1020.00	73.40	**3785.85**	36.29	**36.41**	**267.09**	MWD	6-axis
-1616.00	-662.00	988.00	1231.00	127.00	-1009.00	808.00	331.00	-494.00	787.80	81.30	-645.80	1003.20	1021.90	73.40	**3813.40**	36.35	**36.47**	**266.44**	MWD	6-axis
-1637.00	-1159.00	-77.00	1237.00	927.00	-395.00	818.50	579.50	38.50	791.70	593.30	-252.80	1003.60	1021.10	73.40	**3842.07**	35.36	**35.48**	**264.58**	MWD	6-axis
-1644.00	-685.00	926.00	1243.00	164.00	-989.00	822.00	342.50	-463.00	795.50	105.00	-633.00	1003.70	1022.00	73.40	**3869.34**	35.02	**35.14**	**264.50**	MWD	6-axis
-1654.00	-540.00	-1001.00	1252.00	816.00	557.00	827.00	270.00	500.50	801.30	522.20	356.50	1003.70	1020.70	73.50	**3898.85**	34.51	**34.63**	**265.00**	MWD	6-axis
-1632.00	-321.00	-1123.00	1243.00	681.00	730.00	816.00	160.50	561.50	795.50	435.80	467.20	1003.40	1020.30	73.40	**3929.19**	35.59	**35.71**	**266.79**	MWD	6-axis
-1626.00	930.00	717.00	1234.00	-995.00	-194.00	813.00	-465.00	-358.50	789.80	-636.80	-124.20	1002.90	1022.10	73.50	**3959.03**	35.84	**35.96**	**265.18**	MWD	6-axis
-1625.00	895.00	761.00	1229.00	-988.00	-246.00	812.50	-447.50	-380.50	786.60	-632.30	-157.40	1002.60	1021.40	73.50	**3981.18**	35.87	**35.99**	**264.33**	MWD	6-axis

8.2. DD Survey Report

Schlumberger

35_8_5 S Survey Report

Report Date:	July 9, 2003	**Survey / DLS Computation Method:**	Minimum Curvature / Lubinski
Client:	Norsk Hydro	**Vertical Section Azimuth:**	90.000°
Field:	Exploration 35_8-5, Sogn	**Vertical Section Origin:**	N 0.000 m, E 0.000 m
Structure / Slot:	35_8-5 / 35_8-5 Actual	**TVD Reference Datum:**	RKB
Well:	35_8-5 S	**TVD Reference Elevation:**	29.0 m relative to MSL
Borehole:	35_8-5 S	**Sea Bed / Ground Level Elevation:**	-370.000 m relative to MSL
UWI/API#:		**Magnetic Declination:**	-2.673°
Survey Name / Date:	Survey file / June 4, 2003	**Total Field Strength:**	50862.017 nT
Tort / AHD / DDI / ERD ratio:	117.919° / 655.34 m / 5.422 / 0.172	**Magnetic Dip:**	73.414°
Grid Coordinate System:	UTM Zone 31 on ED50 Datum	**Declination Date:**	June 18, 2003
Location Lat/Long:	N 61 22 40.497, E 3 39 13.223	**Magnetic Declination Model:**	BGGM 2002
Location Grid N/E Y/X:	N 6805219.600 m, E 534935.000 m	**North Reference:**	Grid North
Grid Convergence Angle:	+0.57379895°	**Total Corr Mag North -> Grid North:**	-3.247°
Grid Scale Factor:	0.99961495	**Local Coordinates Referenced To:**	Well Head

Comments	Measured Depth (m)	Inclination (deg)	Azimuth (deg)	TVD (m)	Vertical Section (m)	NS (m)	EW (m)	DLS (deg/30 m)	Tool Face (deg)	Build Rate (deg/30 m)	Walk Rate (deg/30 m)
Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00M	0.00	0.00
Sea bed	399.00	0.00	0.00	399.00	0.00	0.00	0.00	0.00	0.00M	0.00	0.00
36 in hole opener, no AZ	409.01	0.06	0.00	409.01	0.00	0.01	0.00	0.18	0.00M	0.18	0.00
36 in hole opener, no Az	442.34	0.79	0.00	442.34	0.00	0.25	0.00	0.66	6.60M	0.66	0.00
26 in hole opener	466.54	1.49	6.60	466.53	0.04	0.73	0.04	0.88	5.32M	0.87	8.18
	495.96	1.81	5.32	495.94	0.12	1.57	0.12	0.33	5.47M	0.33	-1.31
	525.39	2.61	5.47	525.35	0.23	2.70	0.23	0.82	3.61M	0.82	0.15
last survey 26 in h/opener	541.63	2.67	3.61	541.57	0.29	3.45	0.29	0.19	0.38M	0.11	-3.44
	573.77	2.33	0.38	573.68	0.34	4.85	0.34	0.34	-0.30M	-0.32	-3.01
	602.42	2.25	359.70	602.31	0.34	6.00	0.34	0.09	-1.63M	-0.08	-0.71
	632.04	2.31	358.37	631.91	0.32	7.17	0.32	0.08	-1.07M	0.06	-1.35
	661.08	2.26	358.93	660.92	0.29	8.33	0.29	0.06	-11.43M	-0.05	0.58
	690.26	2.16	348.57	690.08	0.17	9.44	0.17	0.42	-15.22M	-0.10	-10.65
	718.73	2.21	344.78	718.53	-0.08	10.50	-0.08	0.16	-16.17M	0.05	-3.99
	746.53	2.11	343.83	746.31	-0.36	11.51	-0.36	0.11	-14.54M	-0.11	-1.03
	775.90	2.11	345.46	775.66	-0.65	12.55	-0.65	0.06	-14.21M	0.00	1.67
	804.57	2.23	345.79	804.31	-0.91	13.60	-0.91	0.13	-15.73M	0.13	0.35
	833.20	2.27	344.27	832.92	-1.21	14.69	-1.21	0.08	-12.33M	0.04	-1.59
	862.03	2.15	347.67	861.73	-1.48	15.77	-1.48	0.18	-6.26M	-0.12	3.54
	890.49	1.98	353.74	890.17	-1.64	16.78	-1.64	0.29	-1.84M	-0.18	6.40
	918.07	1.95	358.16	917.73	-1.71	17.72	-1.71	0.17	5.97M	-0.03	4.81
	946.89	1.88	5.97	946.54	-1.68	18.68	-1.68	0.28	9.10M	-0.07	8.13
	977.43	1.79	9.10	977.06	-1.55	19.65	-1.55	0.13	12.90M	-0.09	3.07
	1006.59	1.68	12.90	1006.21	-1.38	20.52	-1.38	0.16	13.79M	-0.11	3.91
	1035.64	1.59	13.79	1035.24	-1.19	21.32	-1.19	0.10	16.68M	-0.09	0.92
	1064.70	1.66	16.68	1064.29	-0.97	22.12	-0.97	0.11	20.07M	0.07	2.98
	1091.50	1.79	20.07	1091.08	-0.72	22.88	-0.72	0.18	20.93M	0.15	3.79
	1121.35	1.86	20.93	1120.92	-0.39	23.77	-0.39	0.08	22.87M	0.07	0.86
	1149.71	1.72	22.87	1149.26	-0.06	24.59	-0.06	0.16	24.42M	-0.15	2.05
	1179.72	1.74	24.42	1179.26	0.31	25.42	0.31	0.05	26.95M	0.02	1.55
	1208.02	1.88	26.95	1207.54	0.70	26.23	0.70	0.17	29.58M	0.15	2.68
	1237.09	1.75	29.58	1236.60	1.13	27.04	1.13	0.16	25.85M	-0.13	2.71
	1265.15	1.74	25.85	1264.65	1.53	27.80	1.53	0.12	27.42M	-0.01	-3.99
Last survey 17in hole	1294.07	1.85	27.42	1293.55	1.93	28.61	1.93	0.12	32.99M	0.11	1.63
	1334.49	2.37	32.99	1333.94	2.69	29.89	2.69	0.41	34.34M	0.39	4.13
	1362.91	2.39	34.34	1362.34	3.34	30.87	3.34	0.06	30.56M	0.02	1.43
	1391.67	2.23	30.56	1391.08	3.97	31.85	3.97	0.23	-33.86M	-0.17	-3.94
	1420.26	0.32	326.14	1419.66	4.21	32.39	4.21	2.22	-101.69M	-2.00	-67.60
	1448.85	0.24	258.31	1448.25	4.10	32.44	4.10	0.34	-58.02M	-0.08	-71.18
	1477.77	0.13	301.98	1477.17	4.02	32.45	4.02	0.18	-81.56M	-0.11	45.30
	1506.18	0.18	278.44	1505.58	3.94	32.47	3.94	0.08	-93.54M	0.05	-24.86
	1534.83	0.20	266.46	1534.23	3.85	32.48	3.85	0.05	-71.10M	0.02	-12.54
	1563.97	0.09	288.90	1563.37	3.78	32.48	3.78	0.13	-40.40M	-0.11	23.10
	1593.01	0.12	319.60	1592.41	3.74	32.51	3.74	0.06	27.29M	0.03	31.71
	1621.62	0.15	27.29	1621.02	3.73	32.57	3.73	0.16	27.87M	0.03	70.98
	1650.71	0.15	27.87	1650.11	3.77	32.64	3.77	0.00	24.04M	0.00	0.60
	1680.61	0.09	24.04	1680.01	3.80	32.69	3.80	0.06	-40.21M	-0.06	-3.84
	1709.10	0.13	319.79	1708.50	3.78	32.74	3.78	0.13	-74.81M	0.04	-67.66

1737.40	0.18	285.19	1736.80	3.72	32.77	3.72	0.11	96.09M	0.05	-36.68
1766.30	0.24	96.09	1765.70	3.74	32.78	3.74	0.43	-6.81M	0.06	177.40
1794.90	0.24	353.19	1794.30	3.79	32.83	3.79	0.39	159.12M	0.00	-107.94
1823.75	0.14	159.12	1823.15	3.80	32.86	3.80	0.39	112.78M	-0.10	172.54
1852.48	0.24	112.78	1851.88	3.86	32.80	3.86	0.18	-171.16M	0.10	-48.39
1880.90	0.12	188.84	1880.30	3.91	32.75	3.91	0.25	-62.68M	-0.13	80.29
1909.67	0.11	297.32	1909.07	3.88	32.73	3.88	0.19	-33.67M	-0.01	113.12
1938.80	0.12	326.33	1938.20	3.84	32.77	3.84	0.06	155.31M	0.01	29.88
1967.90	0.21	155.31	1967.30	3.85	32.75	3.85	0.34	-145.80M	0.09	-176.31
1996.70	0.12	214.20	1996.10	3.85	32.67	3.85	0.19	-73.02M	-0.09	61.34
2025.50	0.18	286.98	2024.90	3.79	32.66	3.79	0.19	-155.41M	0.06	75.81
2054.84	0.17	204.59	2054.24	3.73	32.64	3.73	0.24	140.69M	-0.01	-84.24
2083.11	0.13	140.69	2082.51	3.73	32.57	3.73	0.17	133.12M	-0.04	-67.81
2111.53	0.10	133.12	2110.93	3.77	32.53	3.77	0.04	25.96M	-0.03	-7.99
2140.22	0.22	25.96	2139.62	3.81	32.56	3.81	0.28	-117.43M	0.13	-112.05
2169.18	0.19	242.57	2168.58	3.80	32.59	3.80	0.40	-45.21M	-0.03	-148.54
2198.04	0.15	314.79	2197.44	3.73	32.60	3.73	0.21	100.12M	-0.04	75.07
2227.33	0.11	100.12	2226.73	3.73	32.62	3.73	0.25	-36.17M	-0.04	148.85
2255.48	0.13	323.83	2254.88	3.74	32.64	3.74	0.24	103.41M	0.02	-145.25
2284.47	0.38	103.41	2283.87	3.81	32.64	3.81	0.50	111.84M	0.26	144.44
2313.14	1.92	111.84	2312.53	4.35	32.44	4.35	1.62	106.04M	1.61	8.82
2343.83	4.13	106.04	2343.18	5.89	31.95	5.89	2.18	105.84M	2.16	-5.67
2371.46	5.32	105.84	2370.71	8.08	31.32	8.08	1.29	0.00G	1.29	-0.22
2400.18	7.24	105.81	2399.26	11.10	30.47	11.10	2.01	5.85G	2.01	-0.03
2428.86	8.98	106.95	2427.65	14.98	29.32	14.98	1.83	0.00G	1.82	1.19
2457.50	11.21	106.92	2455.84	19.78	27.86	19.78	2.34	22.44G	2.34	-0.03
2486.38	13.27	110.58	2484.07	25.57	25.88	25.57	2.29	0.57G	2.14	3.80
2515.26	14.52	110.63	2512.10	32.06	23.44	32.06	1.30	-12.98G	1.30	0.05
2542.74	16.54	109.00	2538.58	38.98	20.95	38.98	2.26	2.63G	2.21	-1.78
2571.64	18.17	109.24	2566.16	47.13	18.12	47.13	1.69	-28.47G	1.69	0.25
2600.18	19.71	106.79	2593.15	55.94	15.27	55.94	1.82	-28.84G	1.62	-2.58
2630.64	21.34	104.35	2621.68	66.23	12.41	66.23	1.81	-161.80G	1.61	-2.40
2658.11	20.11	103.17	2647.37	75.67	10.09	75.67	1.42	-171.17G	-1.34	-1.29
2687.29	17.95	102.08	2674.96	84.95	8.01	84.95	2.25	-173.08G	-2.22	-1.12
2716.13	16.35	101.39	2702.51	93.28	6.28	93.28	1.68	-150.23G	-1.66	-0.72
2745.24	14.47	96.99	2730.58	100.90	5.03	100.90	2.28	-157.98G	-1.94	-4.53
2773.79	12.34	92.90	2758.35	107.49	4.44	107.49	2.45	-146.32G	-2.24	-4.30
2802.26	10.89	87.62	2786.23	113.22	4.40	113.22	1.89	-158.40G	-1.53	-5.56
2831.39	9.19	83.34	2814.92	118.28	4.78	118.28	1.91	-154.46G	-1.75	-4.41
2859.20	7.93	78.89	2842.42	122.37	5.41	122.37	1.53	-166.03G	-1.36	-4.80
2887.47	5.80	73.58	2870.48	125.65	6.19	125.65	2.36	-148.35G	-2.26	-5.63
2916.07	3.92	54.30	2898.98	127.83	7.17	127.83	2.59	33.82M	-1.97	-20.22
2945.13	3.64	33.82	2927.98	129.15	8.51	129.15	1.42	19.67M	-0.29	-21.14
2973.89	4.03	19.67	2956.68	130.00	10.22	130.00	1.06	-28.05M	0.41	-14.76
3002.95	3.86	331.95	2985.67	129.88	12.05	129.88	3.30	-51.94M	-0.18	-49.26
3031.84	5.02	308.06	3014.48	128.43	13.69	128.43	2.24	-60.75G	1.20	-24.81
3061.29	6.56	289.15	3043.78	125.83	15.03	125.83	2.48	-23.71G	1.57	-19.26
3088.87	9.05	282.36	3071.10	122.22	16.01	122.22	2.88	-25.40G	2.71	-7.39
3119.28	11.39	276.85	3101.03	116.90	16.88	116.90	2.50	-37.73G	2.31	-5.44
3146.83	13.97	268.97	3127.91	110.87	17.15	110.87	3.38	-33.79G	2.81	-8.58
3175.95	16.77	262.69	3155.99	103.19	16.55	103.19	3.35	3.21G	2.88	-6.47
3205.05	21.56	263.42	3183.46	93.71	15.40	93.71	4.94	8.03G	4.94	0.75
3233.61	26.63	265.01	3209.53	82.11	14.24	82.11	5.37	5.74G	5.33	1.67
3250.24	29.58	265.61	3224.20	74.30	13.61	74.30	5.35	16.44G	5.32	1.08
3267.35	32.97	267.44	3238.82	65.44	13.07	65.44	6.17	10.87G	5.94	3.21
3296.49	35.58	268.30	3262.89	49.04	12.47	49.04	2.73	-149.86G	2.69	0.89
3324.70	35.57	268.29	3285.84	32.64	11.98	32.64	0.01	-65.82G	-0.01	-0.01
3353.92	36.33	265.55	3309.50	15.51	11.05	15.51	1.83	-64.01G	0.78	-2.81
3382.34	36.87	263.75	3332.31	-1.36	9.47	-1.36	1.27	67.75G	0.57	-1.90
3410.36	37.07	264.55	3354.70	-18.12	7.76	-18.12	0.56	-131.49G	0.21	0.86
3439.43	36.64	263.73	3377.96	-35.47	5.98	-35.47	0.67	153.60G	-0.44	-0.85
3468.59	36.06	264.22	3401.45	-52.65	4.16	-52.65	0.67	157.74G	-0.60	0.50
3498.13	33.89	265.82	3425.65	-69.52	2.69	-69.52	2.39	24.76G	-2.20	1.62
3526.47	36.43	267.78	3448.82	-85.81	1.78	-85.81	2.94	-83.24G	2.69	2.07
3554.90	36.50	266.84	3471.68	-102.69	0.99	-102.69	0.59	164.65G	0.07	-0.99
3583.46	35.86	267.14	3494.73	-119.53	0.10	-119.53	0.70	-12.95G	-0.67	0.32
3612.62	36.22	267.00	3518.31	-136.66	-0.77	-136.66	0.38	-65.40G	0.37	-0.14
3641.65	36.39	266.38	3541.71	-153.82	-1.76	-153.82	0.42	-98.98G	0.18	-0.64
3670.76	36.24	264.64	3565.16	-171.00	-3.11	-171.00	1.07	81.24G	-0.15	-1.79
3702.17	36.28	265.07	3590.49	-189.51	-4.78	-189.51	0.25	38.97G	0.04	0.41
3727.00	36.68	265.61	3610.46	-204.22	-5.98	-204.22	0.62	107.16G	0.48	0.65
3756.72	36.49	266.67	3634.32	-221.89	-7.17	-221.89	0.67	107.94G	-0.19	1.07
3785.85	36.41	267.09	3657.75	-239.17	-8.11	-239.17	0.27	-81.43G	-0.08	0.43
3813.40	36.47	266.44	3679.92	-255.51	-9.04	-255.51	0.43	-132.93G	0.07	-0.71
3842.07	35.48	264.58	3703.12	-272.30	-10.35	-272.30	1.54	-172.29G	-1.04	-1.95

	3869.34	35.14	264.50	3725.37	-287.99	-11.85	-287.99	0.38	155.12G	-0.37	-0.09
	3898.85	34.53	265.00	3749.59	-304.78	-13.39	-304.78	0.68	41.85G	-0.62	0.51
	3929.19	35.71	266.79	3774.41	-322.18	-14.64	-322.18	1.55	-75.80G	1.17	1.77
	3959.03	35.96	265.18	3798.60	-339.61	-15.86	-339.61	0.98	-86.91G	0.25	-1.62
Final MWD Survey	3981.18	35.99	264.33	3816.53	-352.57	-17.05	-352.57	0.68	0.00G	0.04	-1.15

Survey Type: Raw Survey

Survey Error Model: **SLB ISCWSA 3-D 95.00% Confidence 2.7955 sigma**

Surveying Prog:

MD From (m)	MD To (m)	EOU Freq	Survey Tool Type
0.00	399.00	Act-Stns	SLB_ZERO
399.00	3981.18	Act-Stns	SLB_MWD+SAG

**Italicized stations are NOT used in position calculations.*

8.3. BHA Sag Corrections

MWD run	Inclination	Sag correction
1-9	**0.00– 5.00**	**n/a**
10, 11	**Build** **0.0 – 5.00** **5.00 – 10.00** **10.00-15.00** **15.00 – 25.00** **25.00-35.00** **35.00-90.00** **Drop** **0.00– 5.00** **5.00 – 10.00** **10.00-15.00** **15.00 – 20.00**	 **-0.00** **-0.22** **-0.24** **-0.26** **-0.27** **-0.31** **-0.01** **-0.23** **-0.27** **-0.28** **-0.23**
12,13,14	**30 - 40**	**0.12**

9. Logs

The following table specifies the end of well logs from 35/8-5 S Please note that all logs are only given in digital format, i.e. no paper copies are distributed.

35/8-5 S	**Combined**	**Interval 458m – 4000m**
CDR – VISION Resistivity	1:200 & 1:500 MD 1:200 & 1:500 TVD	GR, Resistivity 2 MHz
	12.25in & 8.5in	**Interval 1326m – 4000m**
CDR - VISION Res – ISONIC	1:200 & 1:500 MD 1:200 & 1:500 TVD	GR, Resistivity 2 MHz, Delta-T Compressional
ISONIC STC	1:200 & 1:500 MD	STC Projection
	8.5in	**Interval 3265m – 4000m**
VISION Service	1:200 & 1:500 MD 1:200 & 1:500 TVD	GR, Resistivity 2 MHz, Density, Neutron
VISION Dual Frequency	1:200 & 1:500 MD 1:200 & 1:500 TVD	GR, Resistivity 2 MHz & 400 kHz