

**Final Well Report
Well 34/7-32**

01c94*4488

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ENCLOSURES

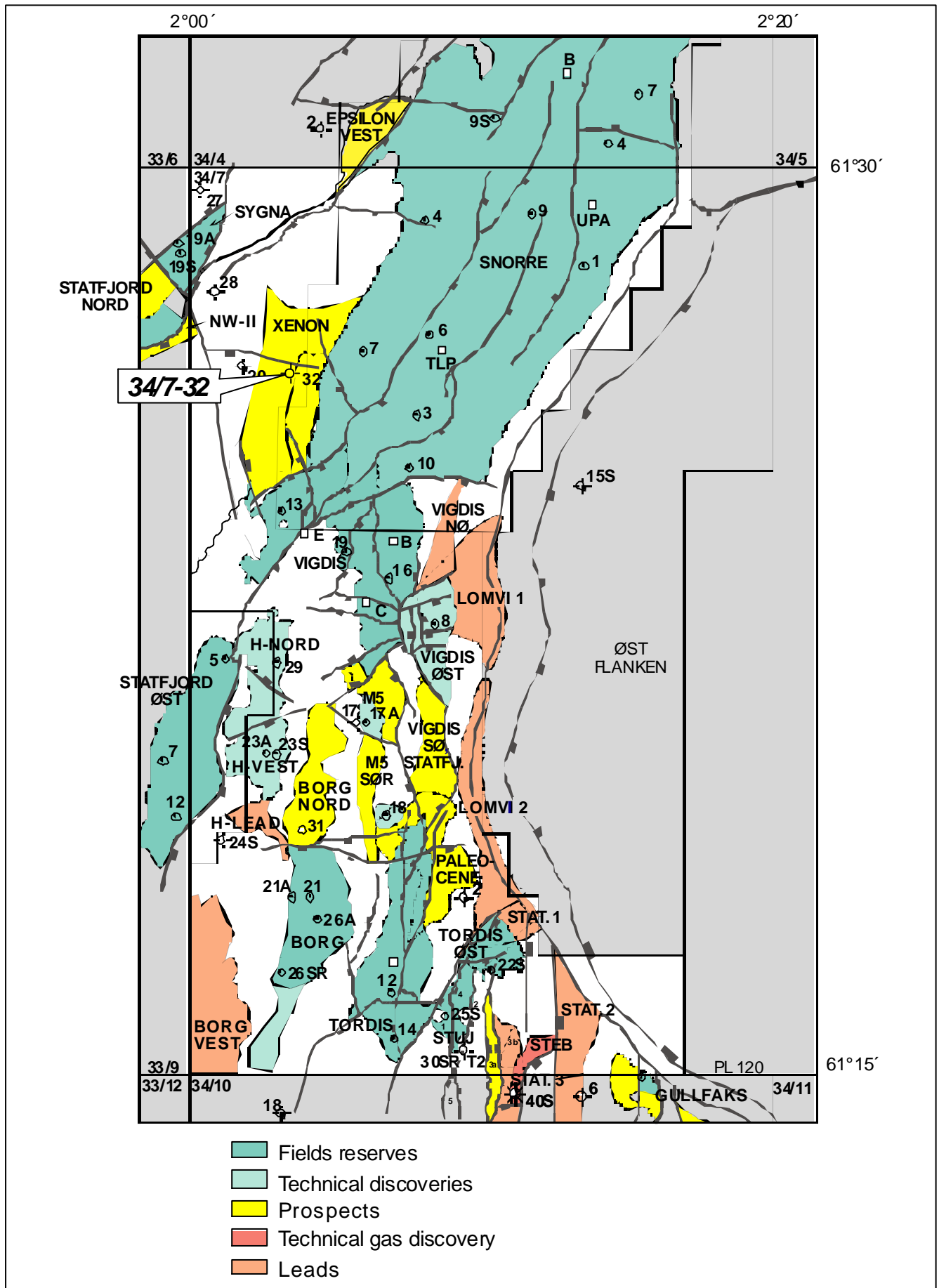
- Composite log
- Formation evaluation log (Geoservices)
- Pressure evaluation log (Geoservices)

1 General well data

1.1 Well data record

Well name	:	34/7-32	
Type of well	:	Exploration Well	
Prospect	:	Xenon	
Country	:	Norway	
Area	:	North Sea	
License	:	PL 089	
Licensees	:	Norsk Hydro ASA (operator)	13.28 %
		Statoil ASA (executor)	28.22 %
		Petoro AS	30 %
		ExxonMobil a.s.	10.5 %
		Idemitsu Petroleum Norge a.s.	9.6 %
		TotalFina Elf	5.6 %
		RWE-DEA Norge AS	2.8 %
Drilling rig	:	Byford Dolphine	
Water depth	:	296.5 m	
Air gap	:	25 m	
Total depth of well (Drillers depth)	:	2651 m MD RKB/ 2651 m TVD RKB	
On licenses	:	04.10.2001 at 19:00 hrs	
Rig release	:	27.10.2001 at 09:30 hrs	
Formation at TD	:	Dunlin Group/ Drake Formation	
Geographic co-ordinates: (surface)	:	61° 26' 50,26" N 02° 03' 16.19" E	
Datum/Spheroid	:	ED1950/Int. 1924	
UTM	:	UTM Zone 31, CM 03° 6 813 139 N 449 581 E	
Seismic location	:	Seismic survey SG9701 Inline 4240, Crossline: 6554	

All depths are in meters measured depth (MD) with rotary table (RKB) as datum, unless otherwise stated



1.2 Purpose of the well

Norsk Hydro ASA as operator delegated, on behalf of the PL 089 licence, to Statoil to execute well 34/7-32 as a turn key well.

The purpose of the well was to test the hydrocarbon potential of the Xenon structure. The target was the sandstones of the Brent Group.

1.3 Results of the well

The well was drilled to a total depth of 2651 m MD RKB/ 2651 m TVD RKB, and was terminated approximately 15 m into the Dunlin Group.

The sandstones in the Brent Group proved to be water bearing, with a water gradient of 1.00 g/cm³.

The well was permanently plugged and abandoned.

1.4 Well history

1.4.1 Casing

Casing	Shoe depth (mMD)	LOT /FIT (Equivalent Mud Weight)
30"	381 m	N/A
13 3/8"	1378 m	1.62 sg

1.4.2 Conventional cores

No cores were cut in this well.

1.4.3 Side wall cores

No side wall cores were shot in this well

1.4.4 Mud logging

A standard Noh Sea Mud logging unit, running Geoservices ALS level 5 software, was used for the well (details in the "End of Well Report," Geoservices).

1.4.5 Logging

1.4.5.1 Electrical logging

Run no.	Tool combination	Interval (m MD)	Comments
1A	MDT-GR-ECRD	2616 – 2538	7 pressure points.

1.4.5.2 MWD logging

Run no.	Interval (m MD)	Collar diam.	Tool	Comments
Baker Hughes Inteq				
1	378 – 700	8 ¼"	MPR Lite	Tool worked OK. 9 7/8" pilot hole.
2	378 - 1385	8 ¼"	MPR Lite	Tool worked OK, except from some problems with the depth line. 17 ½" hole.
3	1385 – 2651	6 ¾"	MPR Lite	Incl. DCP* sub. Tool worked OK. 9 ½" hole.
				* Downhole Pressure

1.4.6 Velocity survey

No VSP was logged in this well.

1.4.7 Sampling programme

Cuttings were sampled at every 10 m from the 13 3/8" casing to 2450 m, then for every 3 m down to TD. 1 x 1ltr. mud samples were collected at every 200 m from 13 3/8" casing to 2450 m, then 2 x 1ltr. for every 20 m down to TD (see figure 1.2)

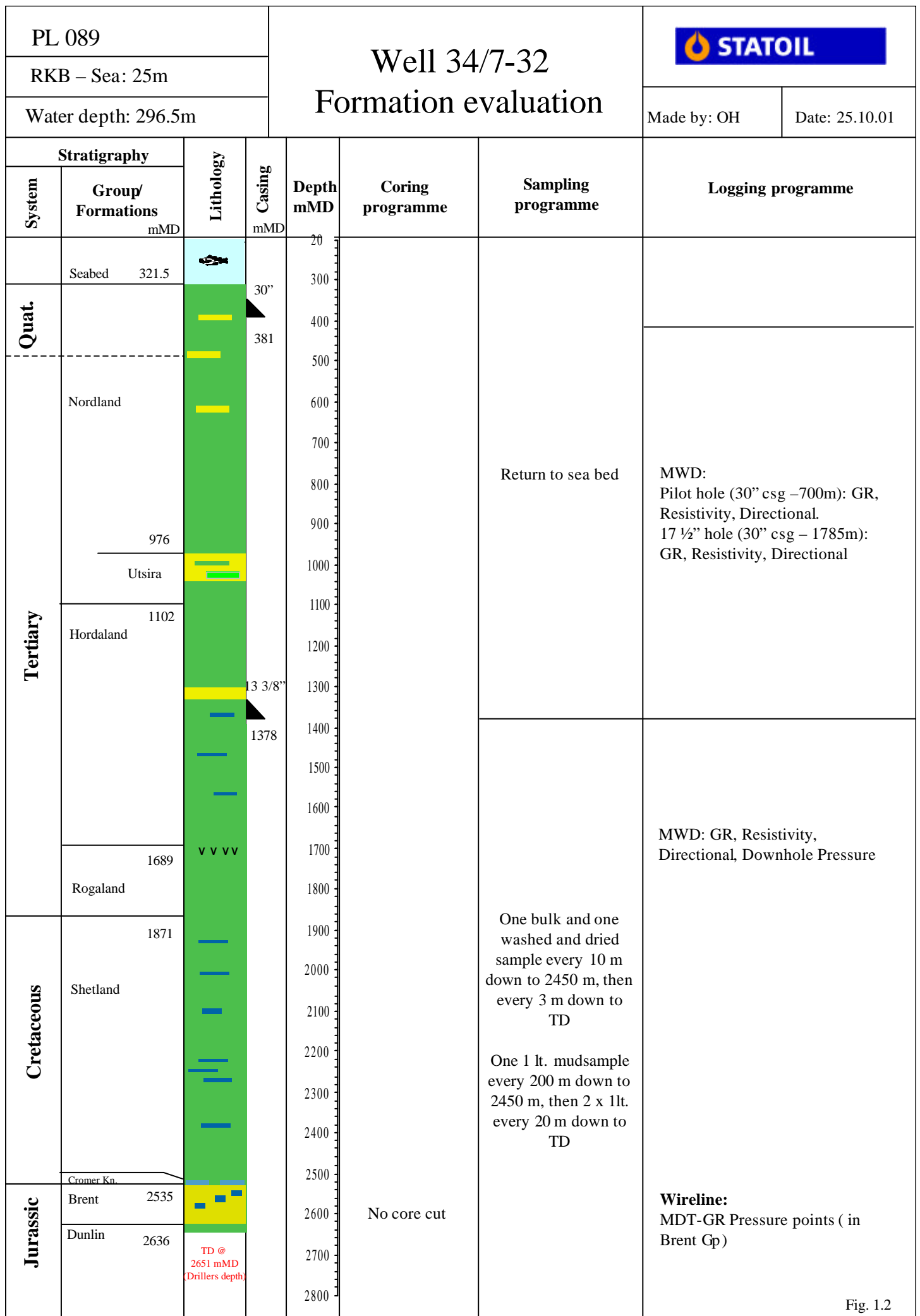


Fig. 1.2

2 Exemptions and non-conformance

2.1 Exemptions

The following exemptions were approved during the planning/operation phase. Exemption No.2 was presented to NPD in a separate letter with a follow-up meeting, and approved by NPD in writing.

Exemption No.	Exemption From	Description
No.1	KP-10/K-410 (4.4) TB-10-05 (2.2.3)	Too low kick tolerance when drilling 9 1/2" Reservoir section (> 8 1/2" = 8 m3)
No.2	NPD Regulations Drilling and Well Activities (§42)	9 7/8" pilot hole will only be drilled to 700 m, not to 13 3/8" Casing depth
No.3	KP-10/K-110 (4.2)	Drilling Class 1 sand with seawater
No.4	KP-10/K-110 (4.2)	Pilot hole BHA not including Circ.Sub
No.5	*** Health damaging solvent ***	Use of Safe Solve solvent during displacement from OBM in P&A phase
No.6	KP-10/K-110 (4.6.2)	Not tagging of Cement Plug in OH/Csg
No.7	KP-10/K-410 (4.4) TB-10-05 (2.2.3)	Too low kick tolerance when drilling 9 1/2" Reservoir section (due to LOT)

2.2 Non-Conformance reports

Synergi No.	Title	Status / Closed date
99917	Wrong lifting sub supplied for BHI MWD tool	Closed 26.10.2001
99967	Guide pipe from BHI Depth line system fell down	Closed 26.10.2001
100018	Havila Lista came alongside without cargo manifest	Closed 29.10.2001
101270	Leak on lines #2 and #6 in Schlumberger logging head	Closed 05.11.2001

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

3.1 Time Distribution – Downtime and Waiting time

Distribution of Down time	Hrs	Distribution of Wating time (WOW)	Hrs
Statoil operations ¹⁾	1,0	WOW during anchor handling	24,5
Dolphin operations	0,0	WOW to land BOP	13,5
Schlumberger W&T ²⁾	2,5	WOW to pull BOP	24,5
Baker Hughes Inteq operations ³⁾	2,5	WOW to pull PGB	1,5
Total Downtime	6,0	Total WOW time	64,0

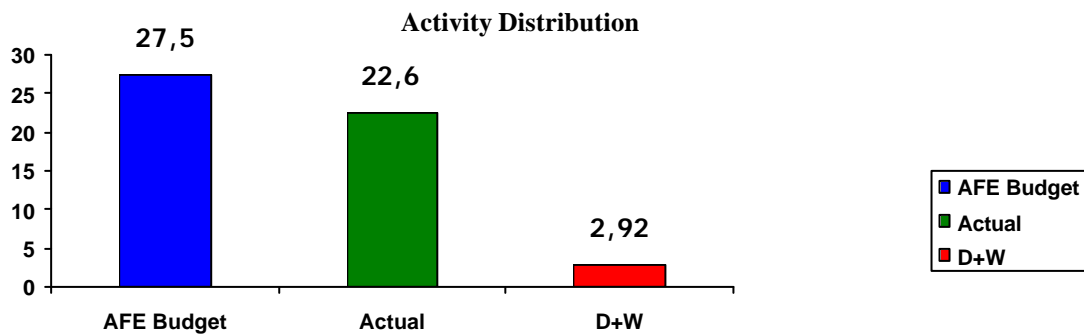
- 1) Replaced 30" Conductor shoe joint due to damaged snap ring.
- 2) Re-build rope socket due to loss of insulation on lines #6 and #1.
- 3) Depth line problem (1.0 hr) & Wrong type lifting sub supplied (1.5 hr)



3.2 Activity distribution

Activity description	Days	Comment	%
AFE Budget time ⁴⁾	27,50		
Actual time	22,60	At end of operation	
Days ahead of AFE budget	4,90	At end of operation	
Total D+W time	2,92	Down: 6,0 Hrs / Waiting: 64,0 Hrs	12,9 %
Efficiency		(Total time-Downtime-WOW) / (Total time-WOW)	98,7 %

⁴⁾ Revised P-50 estimate – corrected for shorter pilot hole.



3.3 Experience listing table

System / Event	Down time (hrs)	Experience Description	Immediate Solution	Recommended Solution	Ref.
Anchor Handling					
Slow Anchor handling	N/A	The anchor handling operation was time consuming. Several anchors slipped on seabed. Slow handling on boat. Very time-consuming operation. The anchor operation took a total of 57 Hrs eff.	Set anchors with piggyback and re-sat anchors.	Extra personnel was demobilized before the anchors were tested. Wait until operation finished. Piggyback anchors should be set at a earlier stage, rather than re-setting anchors again. Utilize 4 boats if available.	
36" Hole Section / 9 7/8" Pilot hole					
HO assembly	N/A	The flow was divided with 40% on the 17 1/2" Bit and 60% on the two-stage hole opener. The BHA drilled well.	None.	Implement as Local Best Practise.	
30" Elevators	N/A	The two elevators supplied were of a slightly different make. On one of them the padeye was smaller, leading to the bails getting caught. Not able to close elevator.	Installed 2x shackles on each bail, to give flexibility to close the elevator.	Inform Weatherford about the problem. Perform pre-job checks on conductors.	
X-Lite Cement & Conductor set on bottom.	N/A	1.52 sg X-Lite blend was used for cementing of conductor, with 400% excess. Conductor set on bottom after job, and R/T was released. No WOC.	None.	Positive improvement. Section time 25 Hrs. The conductor was set on bottom after the job, tension was pulled on the guidewires to keep conductor straight, and R/T released. Inclination on PGB bullseye < 1.0 Deg after operation.	
30" Conductor	1.0	Rig motions damaged the snap ring on the shoe joint during running of conductor	Removed the shoe joint, and replaced same.	None.	
9 7/8" Pilot Bit	N/A	Graded 6-6-WT-A. The bit was washed out. The bit would not have lasted a "standard" pilot hole to next shoe depth.	None.	Investigation after the job shows that the HIS was in the order of 7 HP/SqIn. Improve hydraulic simulation up-front.	

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17 1/2" Hole section					
LOT value	N/A	The minimum LOT required for kick margin was 1.58 sg. The first LOT showed 1.57 sg. Repeated same – with same result.	Wrote exemption to B&B regulations. Continued operation.	Investigation after the job shows that the down hole recorded LOT value was 1.62 sg. Due to decoding problems this was not received on surface. The values from the MWD shows that the hole might not have been thoroughly cleaned prior to the LOT.	
9 1/2" Hole section					
Reaming	N/A	No reaming on the stand was implemented as standard procedure. Reamed only when deemed necessary.	None. No reaming was performed.	Based on the limited margin between Frac and PP, it was decided to avoid any reaming prior to connections. This should not be necessary with OBM. Saves time, and reduces risk of losses.	
Shoetrack drilling	N/A	Remnants of 13 3/8" Wiper plugs (assumption) prevented W/L entrance to Open Hole section.	Performed wiper trip. Pushed junk to Bottom. Found remnants of wiper plug in diverter during P&A.	If utilizing a slender well design, consider drilling out the shoe with fullbore bit. As a minimum/preventive measure, the shoetrack should be as short as reasonable possible, and only one plug should be run (behind the cement).	
P&A					
Cutting of wellhead	N/A	Timeconsuming operation. Cause believed to be the excellent X-Lite cement job.	Repeated cut. Retrieved WH.	Utilize rubber sleeve on Wellhead assembly (with grease behind) to prevent to good bond between conductor and cement.	

4 Geology and formation data report

4.1 Geological setting

The Xenon structure is situated as a northern extension of the Vigdis Field and directly west of the Snorre Field (Fig. 1.1). The prospect is defined by top Dunlin erosion line to the east, faults to the South (outer Snorre Fault) and the South- West (Sygna Vigdis Fault) and a structural dip to the West and to the North.

Well 34/7-32 was drilled up-dip of well 34/7-20 and the well proved the expected geological model. Top Brent Group (top reservoir) was penetrated 26 m deeper than the prognosis but within the expected uncertainties. Fig. 4.1 summarize the prognosed tops compared to the observed tops.

4.2 Stratigraphy

The stratigraphy is based on the sample descriptions, the biostratigraphic report and correlation with nearby wells.

4.2.1 *Table of chronostratigraphy*

STRATIGRAPHIC TOPS	TOP DEPTH (m MD)	BASE DEPTH (m MD)
Tertiary		
Middle Eocene (top not seen)	1390	1590
Lower Eocene	1610	1730
----- Stratigraphic break ----- ----		
Upper Paleocene	1740	1850
----- Stratigraphic break ----- ----		
Cretaceous		
Upper Cretaceous		
Upper Maastrichtian	1871	1990
Lower Maastrichtian	2010	2120
Upper Campanian	2130	2190
Middle Campanian	2210	2290
Lower Campanian	2310	2310
Upper Santonian	2330	2430
Lower Santonian	2451	2451
Upper Coniacian	2454	2463
Middle Coniacian	2469	2490
Upper Turonian	2493	2520
----- Stratigraphic break ----- ----		
Lower Cretaceous Lower Barremian	2529	2535
----- Stratigraphic break ----- ----		
Jurassic		
Middle Jurassic		
Middle Jurassic	2535	2613
Lower Bajocian	2616	2631
----- Stratigraphic break ----- ----		
?Aalenian	2434	2651
Note! Paleodatings are not corrected to match wireline depths, except top/base Lower Barremian		

4.2.2 *Table of lithostratigraphy*

LITHOSTRATI- GRAPHIC TOPS	DEPTH (m MD)	DEPTH TVD		DIFF. FROM PROGNOSIS (m TVD)
		(m RKB)	(mMSL)	
Nordland Gp. (seabed)	321.5	321.5	296.5	-3.5
Utsira Fm	976	976	951	-9
Hordaland Gp.	1102	1102	1077	-13
Rogaland Gp.	1689	1689	1664	+ 9
Balder Fm.	1689	1689	1664	+ 9
Sele/Lista Fm.	1732	1732	1707	+ 2
Shetland Gp.	1871	1871	1846	+ 11
Cromer Knoll Gp.	2526.5	2526.5	2501.5	+31.5
Mime Fm.	2526.5	2526.5	2501.5	+31.5
Brent Gp.	2535	2535	2510	+30
Etive Fm.	2535	2535	2510	+30
Rannoch Fm.	2556.5	2556.5	2531.5	+46.5
Dunlin Gp.	2636	2636	2611	+ 11
Drake Fm.	2636	2636	2611	+ 11
TD*	2651	2651	2626	-24
* Drillers depth. TD was not tagged by wireline logs				

4.3 Lithological description

4.3.1 General information

System, Series and Stage: Partly based on log interpretation and correlation with nearby wells

Lithology: The lithological description is based on the cuttings descriptions, see Appendix 5.

Depositional environment: Based on the biostratigraphic report and regional reports.

4.3.2 Geological summary

NORDLAND GROUP 321.5 - 1102.0 m MD (296.5 – 1077.0 m TVD MSL)

System: Quaternary - Tertiary

The 36" and the 17 ½" hole sections were drilled with returns to seabed. A MWD service was run below the 30" casing (at 381m), and the lithology down to 1385 m was interpreted from the MWD gamma ray and resistivity logs.

The Nordland Group includes a Quaternary and an Upper Tertiary succession, including the Utsira Formation in the lower part.

Based on log character, the section between the 30" casing shoe and the Utsira Formation is interpreted to consist of uniform claystone with a few thin stringers of sandstone (thickness of approximately 1 - 2 m).

Utsira Formation 976.0 - 1102.0 m MD (951.0 – 1077.0 m TVD MSL)

System : Tertiary

The top of the Utsira Formation is defined by a sharp decrease in the gamma ray and the resistivity values, indicating a transition from claystone to the Utsira sandstones. The formation comprises interbedded sandstones and claystones, where sand is the dominant sediment in the upper part.

HORDALAND GROUP 1102.0 – 1689.0 m MD, (1077.0 – 1664.0 m TVD MSL)

System: Tertiary
Series: Middle to Lower Eocene
Depositional environment: Upper bathyal

The boundary to the overlying Nordland Group / Utsira Formation is picked on the MWD log. The resistivity shifts to a decreasing trend with a more even signature, whilst the gamma ray shows a minor shift to lower values.

The uppermost section of the Hordaland Group down to 1385m MD was drilled with returns to seabed.

The formation seems to consist of claystone, except from an interval from 1304 m to 1355 m that consists of interbedded sandstone and claystone. Traces of limestone are also observed, and marl/ calcareous claystone is seen in the lowermost part of the formation.

The claystone below 1385m is dark grey to olive black to greenish black, firm, occasionally moderately hard, blocky, silty and non calcareous. Traces of glauconite are observed in the lower part of the Group.

The limestone is described as brownish grey to dark yellowish brown, blocky, firm to occasionally moderately hard and argillaceous.

The marl is olive black, blocky and firm.

ROGALAND GROUP 1689.0 – 1871.0 m MD, (1664.0 – 1846.0 m TVD MSL)

System: Tertiary
Series: Lower Eocene – Upper Palaeocene
Depositional environment : Upper Bathyal

Only the Balder and the Lista / Sele Formations are defined within the Rogaland Group in this well.

BALDER FORMATION 1689.0 – 1732.0 m MD, (1664.0 – 1707.0 m TVD MSL)

System: Tertiary
Series: Lower Eocene
Depositional environment: Upper Bathyal

The top of the Balder Formation is defined by an increase in the resistivity and a corresponding decrease in the gamma ray readings.

The Balder Formation consists of tuffaceous claystone with minor stringers of limestone.

The tuffaceous claystone is described as varicoloured, predominantly olive grey to medium dark grey, also greyish red to dark greenish grey and slightly black speckled. It is blocky, firm, silty, occasionally glauconitic and non calcareous.

The limestone is described as brownish grey to dark yellowish brown, blocky, firm, micritic and slightly argillaceous. Traces of calcareous fossil fragments are also observed.

LISTA / SELE FORMATION 1732.0 - 1871.0 m MD, (1707.0 – 1846.0 m TVD MSL)

System: Tertiary
Series: Upper Palaeocene
Depositional environment: Upper Bathyal

The top of the Lista / Sele Formation is defined by a marked increase in the gamma ray readings and a corresponding shift in the resistivity readings to a lower level.

The Lista / Sele Formation is dominated by claystone that is described as olive grey, blocky, firm, slightly silty and non calcareous. Traces of light grey to light brown, firm, micritic limestone and occasional calcareous fossil fragments are also recorded.

SHETLAND GROUP 1871.0 – 2526.5 m MD, (1846.0 – 2501.5 m TVD MSL)

System: Cretaceous
Series: Upper Cretaceous
Stage: Upper Maastrichtian – Upper Turonian
Depositional environment: Outer Shelf – Upper Bathyal

The top of the Shetland Group is defined by an increase in the resistivity and the gamma ray log readings. No division on formation level is done within the Shetland Group.

The uppermost part of the group, approximately 70 m, display slightly lower gamma ray and higher resistivity readings than further down. This is an effect of high content of marl.

The marl is described as olive grey, blocky, soft to firm and slightly silty.
The claystone is olive grey, blocky, soft to firm, silty and predominantly calcareous.

The remaining part of the Shetland Group consists of uniform claystone with some thin stringers of limestone. Traces of sandstone are observed in some samples. Occasional calcareous fossil fragments are also seen.

The claystone is described as olive grey, also medium dark grey to olive black, occasionally dark greenish grey, blocky and soft to firm. It is slightly silty, occasionally glauconitic and calcareous to very calcareous, in part grading to marl. It becomes non-to slightly calcareous towards the base of the group.

The limestone is moderately yellowish brown, blocky, firm and argillaceous in part.

The sandstone is described as clear to translucent quartz, very fine, well sorted, and in part glauconitic. It is seen as loose grains in the cuttings.

CROMER KNOLL GROUP 2526.5 - 2535.0 m MD, (2501.5 – 2510.0 m TVD MSL)

System: Cretaceous
Series: Lower Cretaceous
Stage: Lower Barremian

The Cromer Knoll Group comprises only the Mime Formation in this well.

MIME FORMATION 2526.5 - 2535.0 m MD, (2501.5 – 2510.0 m TVD MSL)

System: Cretaceous
Series: Lower Cretaceous
Stage: Lower Barremian
Depositional environment:

A distinct drop in gamma ray- and an increase in the resistivity log readings define the top of the Mime Formation.

The formation consists of limestone described as light grey to medium light grey, light bluish grey, firm to moderately hard and micritic to microcrystalline. It is argillaceous in part, occasionally grading to marl.
It is occasionally very pyritic and in the lower part it becomes very glauconitic.

BRENT GROUP 2535.0 - 2636.0 m MD, (2510.0 – 2611.0 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Depositional environment: Deltaic – Marginal Marine

The Brent Group comprises only the Etive and the Rannoch Formations in the well position.

The top of the Brent Group is seen as a clear change in the lithology from the limestone of the overlying Mime Formation to the sandstone of the Etive Formation. On the logs the top of the Brent Group is picked on an increase in the gamma ray log readings and a sharp decrease in the resistivity log readings.

ETIVE FORMATION 2535.0 – 2556.5 m MD, (2510.0 – 2531.5 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Depositional environment: Deltaic – Marginal Marine

The Etive Formation consists of sandstone.

The sandstone is described as greenish grey to white loose quartz grains, predominantly very fine to fine grained, also medium grained in the upper part, moderately sorted and subrounded. It is calcite cemented, friable and very glauconitic in the upper part, becoming non-to slightly glauconitic towards the base of the Formation. Traces of pyrite are also recorded.

RANNOCH FORMATION 2556.5 – 2636.0 m MD, (2531.5 – 2611.0 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Stage: ? – Lower Bajocian
Depositional environment: Deltaic – Marginal Marine

The top of the Rannoch Formation is picked at an increase in the gamma ray readings and a slight increase in the resistivity readings. The pick of the Rannoch Formation has also been compared with wells in the vicinity.

The Rannoch Formation consist of sandstone with hard stringers of limestone / calcareous cemented sandstone. Beds of claystone and traces of coal occur in the lower part of the formation.

The sandstone is described as light grey to brownish grey. The quartz is very fine to fine grained, well sorted, subrounded and calcite cemented, in part grading sandy limestone. Traces of glauconite are observed.

The limestone is light grey to medium light grey, blocky, firm to moderately hard and micritic. It is very sandy, grading to sandstone in parts and argillaceous in part.

The claystone is olive black, blocky, firm to moderately hard, silty in part and non-calcareous.

The coal is described as black, shiny, blocky, moderately hard and brittle.

DUNLIN GROUP 2636.0 – 2651.0 m MD, (2611.0 – 2626.0 m TVD MSL)

System: Jurassic

Series: Middle Jurassic

Stage: ? Aalenian

Depositional environment: Deltaic – Marginal Marine

Only the Drake Formation is seen in this well. The well was terminated approximately 15 m into the Dunlin Group

The top of the Dunlin Group is defined on the logs by a sharp increase in the gamma ray log readings.

DRAKE FORMATION 2636.0 – 2651.0 m MD, (2611.0 – 2626.0 m TVD MSL)

System: Jurassic

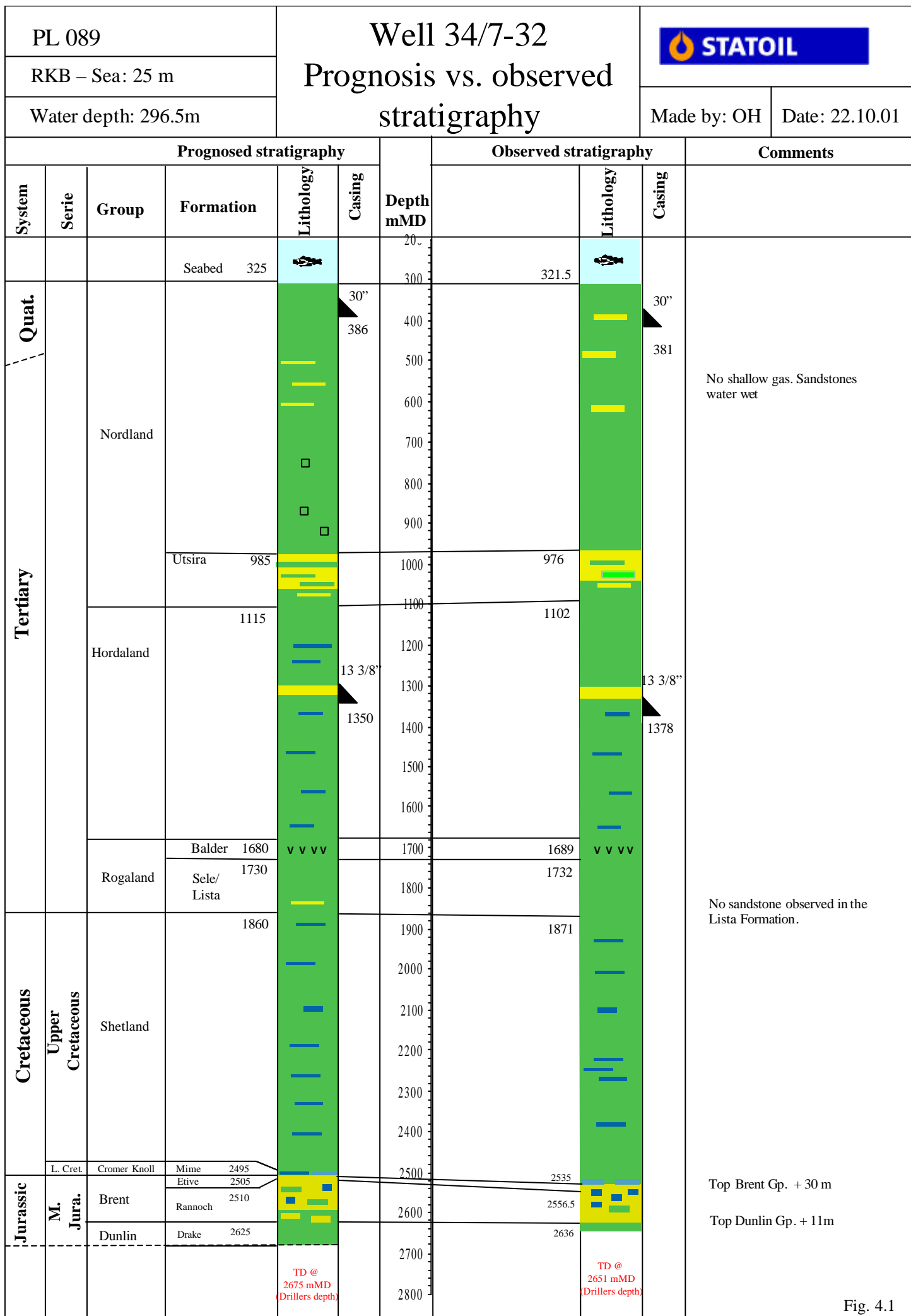
Series: Middle Jurassic

Stage: ? Aalenian

Depositional environment: Deltaic – Marginal Marine

The Drake Formation consist of claystone

The claystone is described as brownish black, occasionally brownish grey to olive grey, blocky and firm. It is also silty to very silty, sandy in parts, micropyrritic, carbonaceous and non-calcareous.



No shallow gas. Sandstones water wet

No sandstone observed in the Lista Formation.

Top Brent Gp. + 30 m

Top Dunlin Gp. + 11m

Fig. 4.1

4.4 Hydrocarbon indications

No indications of hydrocarbons have been observed in the well. Fig. 4.2 summarise the gas readings recorded.

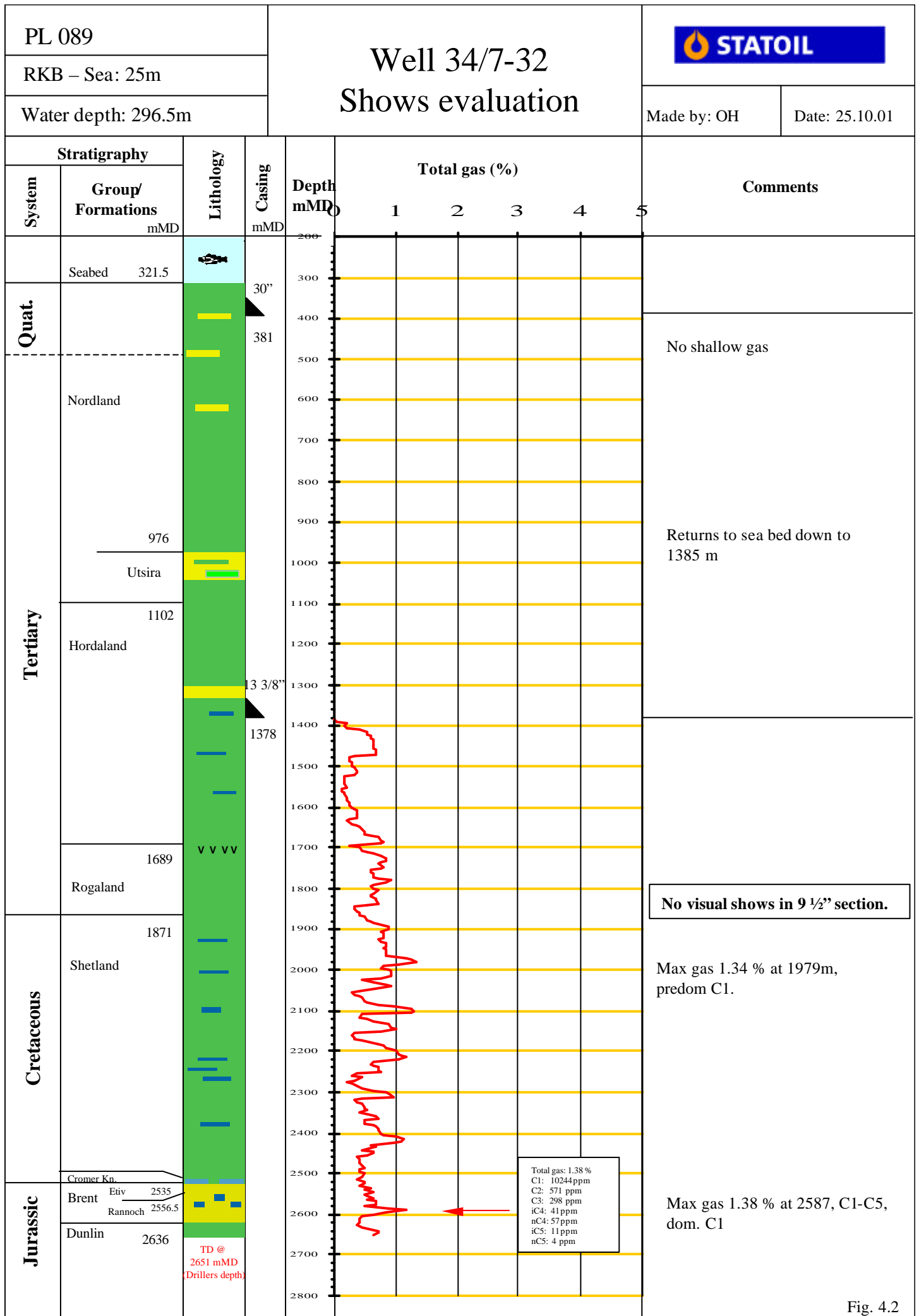


Fig. 4.2

4.5 Geophysical Results

The well proved the expected geological model. The top of the Brent Group and the top of the Dunlin Group were found respectively 26 m and 7 m deeper than the prognosis, but well within the uncertainties given in the Well Programme. A comparison of the prognosis and the observed formation tops is given in Fig. 4.1.

4.6 NPD standard form for reporting shallow gas

1. Avstand fra boredekk til havnivå: 25m
2. Vanndyp: 296.5m
- 3a. Settedyp for lederør: 381 MD RKB
- 3b. Evt. formasjonstyrketest (g/cc): -----
- 4a. Settedyp for foringsrør hvorpå BOP settes: 1378 mMD RKB
- 4b. Formasjonstyrketest (g/cc): 1.57 g/cm³
6. *Dybdeintervall (mRKB og mTVD) og alder for sandlag grunnere enn 1000 m under havbunnen. Oppgi hvilke lag som evt. inneholder gass. (eks. Kvartær 175-177 mRKB, Pliocene 341-343 mRKB)*
 - Kvartær/tertiær sandlag 399 - 401m, 484 – 486m og 619 – 620m MD RKB, vannvåte.
 - Sandig del av Utsiraformasjonen 977 - 1048m MD, vannvåt.
 - Sandlag i Hordalandgruppen, 1305 – 1338m MD RKB, vannvåt.
7. Grunn gass er ikke påvist i brønnen.
8. Sammensetning og opprinnelse til gassen: N/A
9. Beskriv alle målinger i gassførende lag: N/A
10. *Angi dyp (mRKB og TVG) til inkonformiteter i borehullsposisjonen.*
 - Topp Hordalandgruppen: 1102 mRT (formasjons / gruppegrense, men trolig ikke inkonformitet).
11. Angi utbredelsen av sandlagene (kommunikasjon, kontinuitet, trunkering, etc.): -----
12. Angi utbredelsen av evt. gass- skygging ("gas blanking"): -----
13. Angi evt seismiske indikasjoner på at gassen stammer fra dypere nivå.
Beskrivelse dersom gassen stammer fra dypere nivå: -----
14. *Hvordan samsvarer tolkingen av borestedundersøkelsen med borehullsdata mht. :*
 - *grunn gass*
Stemmer bra. Ingen grunn gass prognosert og ingen grunn gass observert.
 - *sandlag*
Stemmer bra. Prognoserte sandlag på 550 m og 620 m observert på tilsvarende dyp. Topp Utsiraformasjonen prognosert på 985 m og observert på 976 m.

- *inkonformiteter*

Refererer til punkt 10.

- *korrelasjon til nærliggende borehull*

God korrelasjon til nærmeste referansebrønn 34/7-20 som ligger ca. 1.3 km mot vest.
Kvaliteten på loggene i korrelasjonsbrønnen og i vår brønn er brukbare.

4.7 Formation Pressure

The pore pressure gradient, mud weight, overburden gradient and relevant drilling- and log data are presented graphically in the Figures 4.3, 4.4a and 4.4b. Gas readings have been listed in Chapter 4.4. Gradients are presented in g/cm^3 equivalent mud weight (EMW).

The pore pressure gradient is mainly based on a pore pressure study done by Norsk Hydro in the Tampen area. The resistivity log and drilling parameters (D-exponent and gas readings) from this well have been used to verify the generic pore pressure gradient from this study and to evaluate possible discrepancies.

The overburden gradient is calculated based on the density logs from well 34/7-7 down to 1250 m, and well 34/7-20 from 1250 m to TD. No density log was run in this well.

The pore pressure gradient is normal hydrostatic through the Oligocene and into the upper part of the Eocene. At approximately 1390 m, the pressure gradient starts to increase, and a gradient of 1.40 g/cm^3 is calculated in the Balder and Sele Formations. Near the top Shetland Group, the pressure gradient decreases to 1.22 g/cm^3 . According to the pressure study on the Tampen area, the generic pore pressure gradient through the lower part of the Shetland Group increases to 1.40 g/cm^3 . This section was drilled with a mud weight of 1.48 g/cm^3 , and there were no indications of a near balance situation. Sonic log was not run in this well, but the resistivity and Dxc data indicate a pressure gradient decrease to 1.32 g/cm^3 at approximately 2275 m and an increase up to approximately 1.47 g/cm^3 at the base of the Shetland Group. This discrepancy with the generic pore pressure gradient in the area is marked as shaded areas on the figures.

The formation pressure in the Brent Group was measured by MDT, and showed a pressure gradient of 1.30 g/cm^3 at the top of the reservoir. These measurements indicate that the reservoir pressure has been depleted due to production in nearby fields.

4.7.1 Reservoir Pressure Summary

One MDT run was performed during the TD logging. Seven pressure measurements were taken, and all of them showed good reservoir properties and gave a reliable water gradient of 1.00 g/cm^3 through the Etive and Rannoch Formations. No fluid samples were taken.

The results from the MDT measurements are listed in Table 4.3. The pressure measurements and the calculated water gradient is plotted in Figure 4.5.

**Final Well Report
Well 34/7-32**

Doc. no.
01c94*4488
Date
2002-20-05



Rev. no.
0

FORMATION PRESSURE -MDT WELL: 34/7-32 RKB=25.0 m				RUN: 1A DATE: 21.10.01								
Test #	Zone name	Depth m MD RKB	Depth m TVD RKB	Depth m TVD MSL	Formation pressure (bar)	Formation pressure (g/cm ³ EMW)	Hydrostatic pressure Before (bar)	Hydrostatic pressure After (bar)	Mobility mD/cP	Good seal (Y/N)	Temp. °C	Comments
1	Etive	2538.0	2537.8	2512.8	325.01	1.304	369.99	369.91	750.3	Y	74.9	Very good
2	Etive	2546.0	2545.8	2520.8	325.80	1.303	371.16	371.07	166.5	Y	76.2	Very good
3	Etive	2553.5	2553.3	2528.3	326.55	1.303	372.25	372.13	315.9	Y	76.9	Very good
4	Rannoch	2564.0	2563.8	2538.8	327.57	1.301	373.75	373.64	121.3	Y	77.6	Very good
5	Rannoch	2583.0	2582.8	2557.8	329.43	1.299	376.49	376.38	140.2	Y	78.3	Very good
6	Rannoch	2596.5	2596.3	2571.3	330.76	1.298	378.43	378.32	25.0	Y	79.2	Good
7	Rannoch	2616.0	2615.8	2590.8	332.67	1.295	381.26	381.08	20.2	Y	79.8	Good

Table 4.3: MDT pressure measurements, Run 1A

PL 089

RKB - Sea: 25 m

Water Depth: 296.5 m

Well 34/7-32 Pressure plot



Made by: ANy

Date:22.03.02

Stratigraphy		Lithology
Group	Formation	
	m RKB	
	Seabed 321.5	
Nordland		30" @ 381 m
	Utsira 976	
Hordaland		13 3/8" @ 1378 m
Rogaland	Balder 1689	
	Sele/Lista 1732	
Shetland		
Cromer Knoll	Mime	
Brent	Etive 2535	
	Rannoch 2556.5	
Dunlin	Drake 2636	

TD 2651 m (drillers depth)

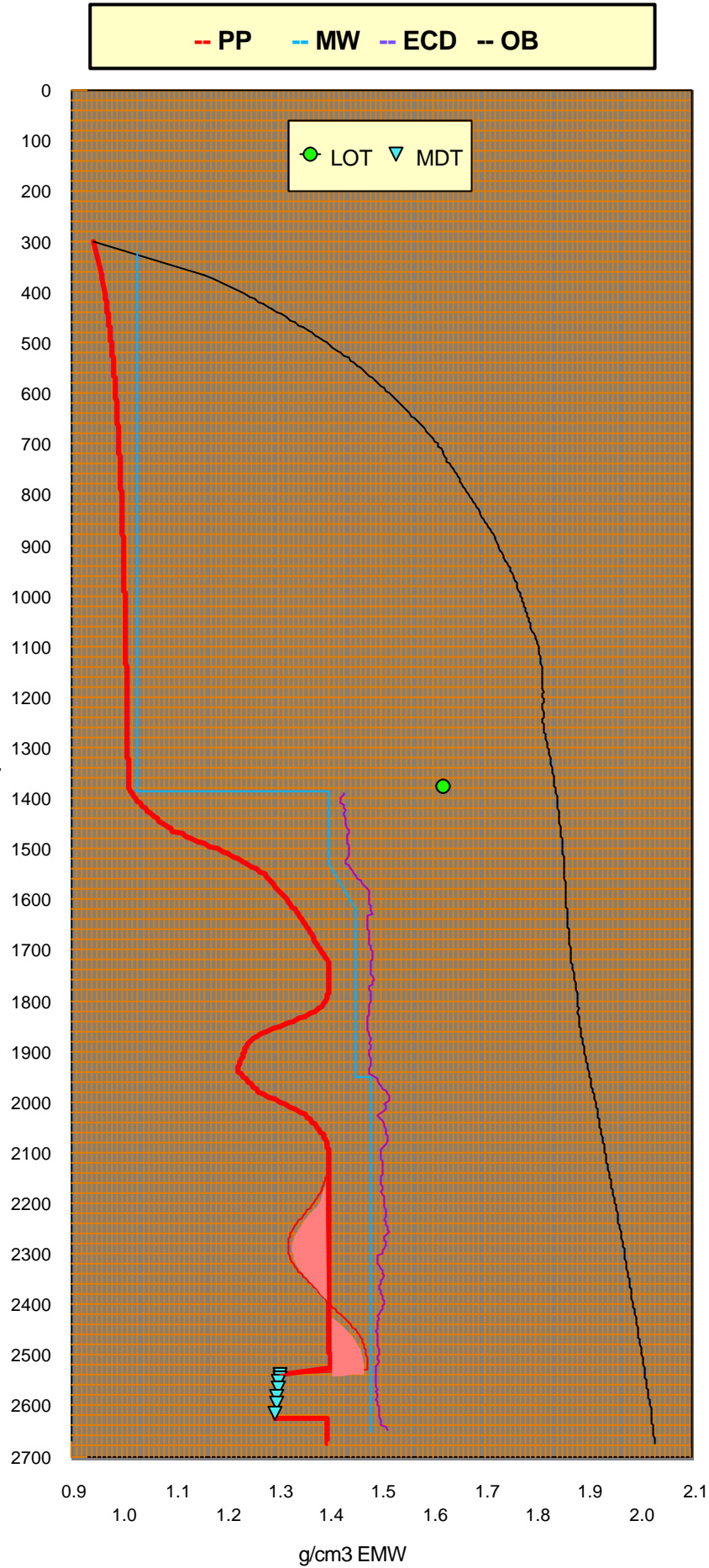


Figure 4.3

PL 089
 RKB - Sea: 25 m
 Water Depth: 296.5 m

WELL 34/7-32 - COMPOSITE PLOT



Made by: ANv
 Date: 22.03.02

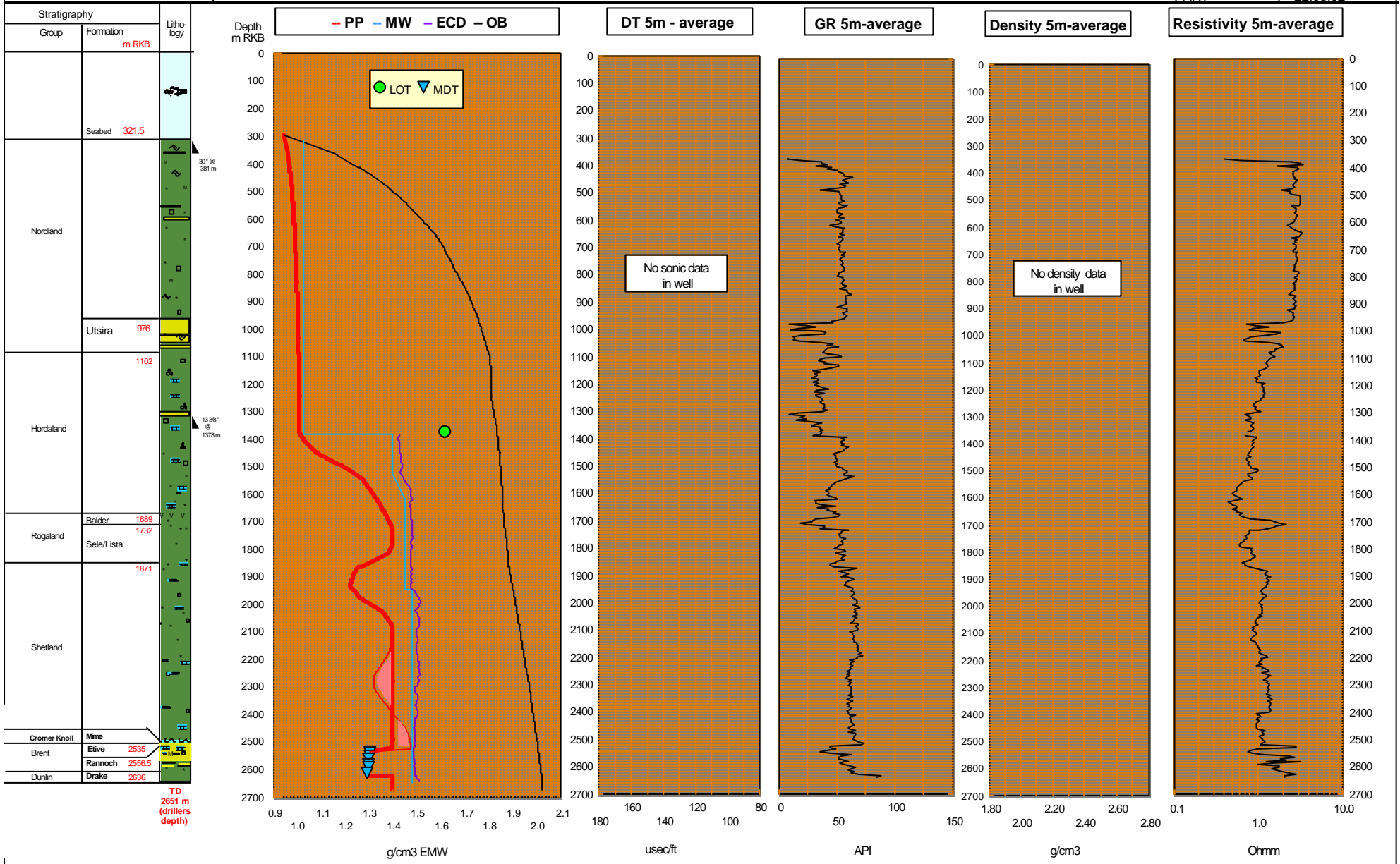


Figure 4.4.a

PL 089
RKB - Sea: 25 m
Water Depth: 296.5 m

WELL 34/7-32 - COMPOSITE PLOT



Made by: ANY	Date: 22.03.02
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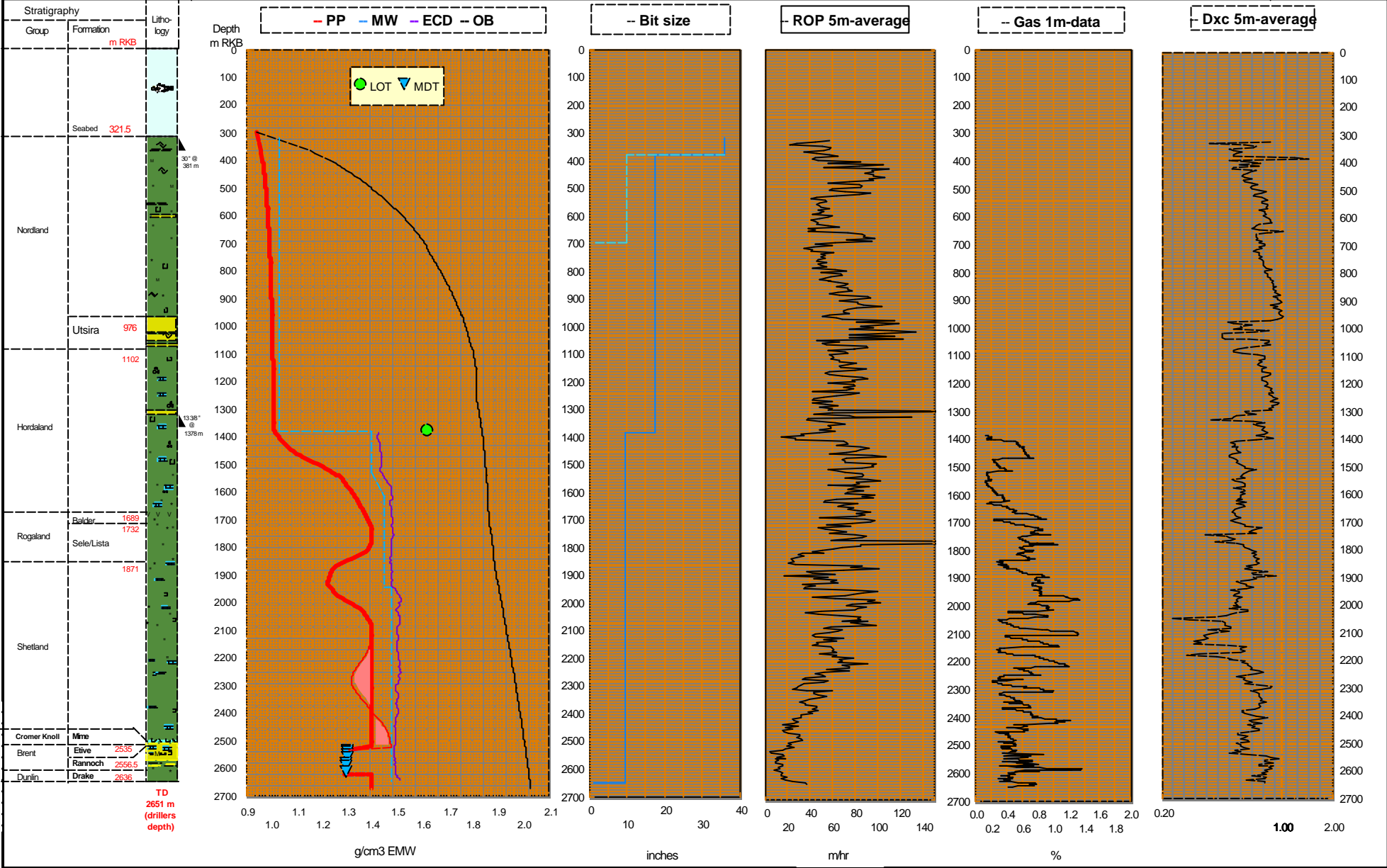


Figure 4.4.b

Well 34/7-32 Formation Pressures

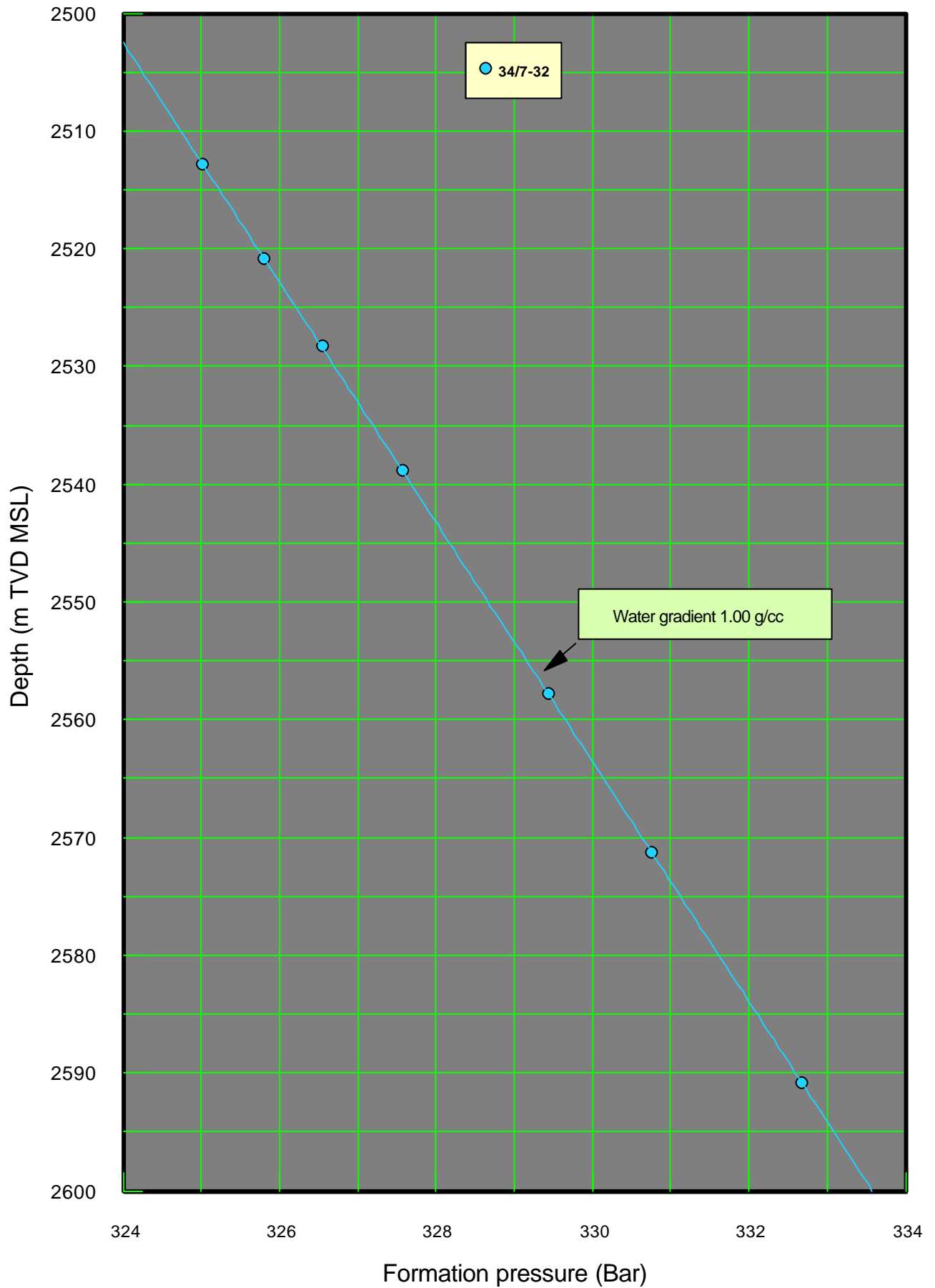


Figure 4.5

4.8 Formation Temperature

The temperatures measured by the MDT tool are listed in Table 4.3. Due to the limited amount of temperature data in this well, the temperature profile has been based on DST and wireline log temperatures from offset wells. The estimated temperature profile and the temperatures measured in this well are plotted in Figure 4.6.

PL 089

RKB - Sea: 25 m

Water Depth: 296.5 m

Well 34/7-32 Temperature plot



Made by: ANy

Date:22.03.02

Stratigraphy		Lithology
Group	Formation	
	m RKB	
	Seabed 321.5	
Nordland		
	Utsira 976	
Hordaland		
Rogaland	Balder 1689	
	Sele/Lista 1732	
Shetland		
Cromer Knoll	Mime	
Brent	Etive 2535	
	Rannoch 2556.5	
Dunlin	Drake 2636	

TD 2651 m (drillers depth)

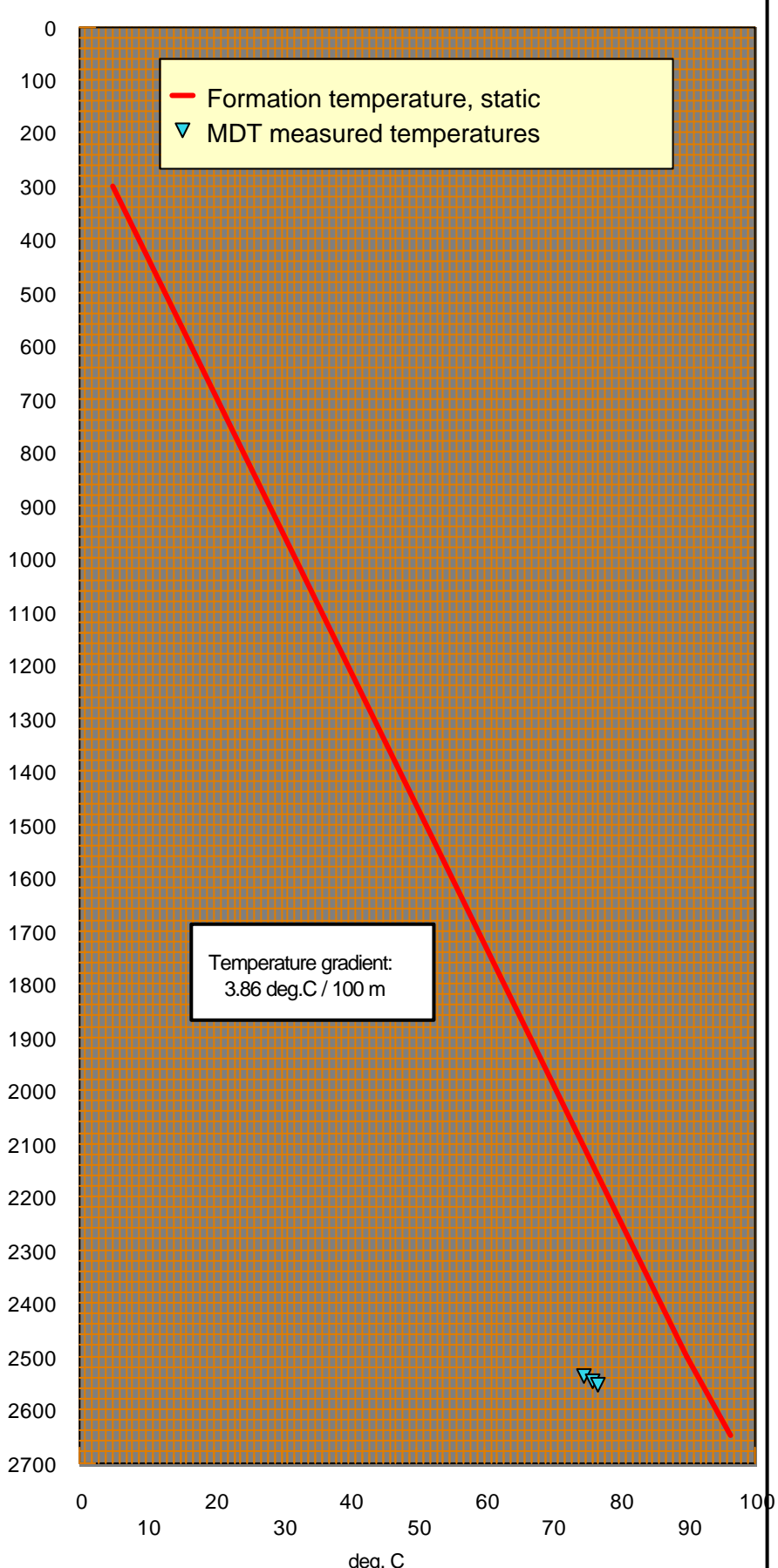


Figure 4 6

5 Drilling Operation Report

5.1 Rig move and positioning

5.1.1 Summary

The rig was moved from location 16/2-2, Skuld, to location 34/7-32, Xenon. Start of operations on well after last anchor bolstered on well 16/2-2, was at 19:00 hrs 04.10.2001.

The transit went according to the plan, with an average speed over the 152 nm of 3,7 knots, with AHT Boa Queen in the towing gear.

Arrived on location at 12:00 hrs 06.10.2001. Ran anchor spread. 3 anchors had to be re-set due to slippage. Placed piggy back anchor on one chain.

5.1.2 Experiences/Recommendations

- The extra personnel for anchor handling was demobilized after the initial phase, as were two of the anchor handlers. This led to a slow remedial operation after initial setting of anchors. Testing and re-setting of anchors took a total of 33 hrs.

5.2 36" Hole section

5.2.1 Summary

The section was drilled from seabed at 321.5 m to 384 m (26" HO depth - 381 m) with a standard two-stage IPE HO assembly, and a used 17 1/2" Hughes MT-X1 milled tooth bit (IADC 115).

The section was drilled with seawater and Hi-Vis pills (Bentonite/ CMC). Pills were swept around twice pr. stand (7-10 m³). The hole was displaced to 1.35 g/cm³ Bentonite mud at TD.

No boulders were experienced during drilling of the section. The inclination was measured with a Anderdrift (0.25 Deg) tool at 30 m, 45 m and 60 m. Inclination at TD of hole at 384 m was 1.5 degree.

5.2.2 *Experiences/Recommendations*

- **Drilling:** 62,5 m was drilled in 5.0 hrs - overall ROP of 12.5 m/hr (23 m/hr on bottom). Drilling parameters used after the first 10 m: 5000 LPM, 140 RPM, 0-2 ton WOB. The formation was very soft, and very drillable.
- A standard 5 Jts 30" conductor was run to 381 m. Verified inclination 1.0 Deg. Pumped 62 m³ X-LITE slurry and cemented conductor in place (+/- 400% OH excess to clear tanks of blend). The conductor was set back on bottom and the guide wires tensioned to 5000 PSI. The Running tool was then released without WOC. POOH and L/D the CART. The section time was only 23.5 hrs.
- X-LITE cement was used for the cementing operation. The slurry is only 1.52 sg on surface, but gives the same compressional strength as traditional 1.92 sg slurry. The lighter weight of the cement increases the weight of the conductor from 0 MT (Neutral weight) to 10 MT. In addition the PGB weighs +/- 5 MT. The available down weight makes releasing of running tool possible, as well as allows for setting the conductor on bottom with tension on the guidewires.

5.3 9 7/8" Pilot hole

5.3.1 *Summary*

The 9 7/8" pilot hole was drilled from 384 m down to 700 m, through possible shallow gas reflectors R5 at 552 m and R6 at 626 m. A Reed Hycalog MHT11GTPKT bit was used with a MPR Lite MWD Logging suite. No shallow gas was observed. No boulders were experienced.

5.3.2 *Experiences/Recommendations*

- **Drilling:** 316 m was drilled in 7,5 hrs - overall ROP of 42,5 m/hr (54,5 m/hr on bottom). The section was drilled with seawater and Hi-Vis sweeps (CMC). Pills were swept around once every stand. Limited Instant ROP to 50 m/hr through potential gas zones.
- The length of the pilot hole was reduced from 1350 m to 700 m based on a discussion with NPD for an exemption to the regulations. The exemption was accepted. This removed the potential danger of stuck pipe in unconsolidated Utsira, and reduced costs.
- The cutting structure on the Rock bit was worn down to a grading of 6-6-WT-A. Investigation after the job showed that the flow rate had been too high for the nozzle configuration of 3x 20/32" nozzles. With a flow rate in the range of 4500 lpm, the resulting output HSI is in the range of 7 HP/SqI. The high HSI led to a washed out bit.

5.4 17 1/2" Hole section

5.4.1 Summary

The 17 1/2" hole was drilled in one run with a packed BHA from 384 m down to 1385 m. The BHA incorporated a MPR Lite MWD logging suite, and a Reed Hycalog EMS13GKC Rock Bit. No PWD sub was run.

The hole was drilled with seawater in combination with Hi-Vis sweeps. At TD, the hole was displaced to 1,25 sg WBM prior to POOH. No wiper trip was performed.

A 13 3/8, 72 #/ft, P-110, New Vam casing string was run with a MS-700 18 3/4" wellhead swaged over to a 13 3/8" pup. Casing shoe set at 1378 m. The casing was cemented in place over the entire string length, with returns to seabed.

The BOP was run and landed on the wellhead. The shoe track was drilled out as well as 3 m new formation. An un-weighted Hi-Vis pill was placed at bottom, and a LOT to 1,57 sg performed. The well was thereafter displaced to 1,48 sg OBM.

5.4.2 Experiences/Recommendations

- **Drilling:** 1001 m was drilled in 26 hrs - overall ROP of 38,6 m/hr (53,5 m/hr on bottom).
- An investigation of the LOT value has been performed. Due to decoding problems, the maximum value from the PWD sub during the LOT was not transmitted to surface. Based on the downhole measurement after the job, the LOT is in the range of 1.60–1.62 sg.

5.5 9 1/2" Hole section

5.5.1 Summary

The 9 1/2" was drilled in one run, with a packed BHA, from 1385 m to 2651 m. The BHA incorporated a MPR Lite MWD logging suite, and a Reed Hycalog 6-bladed DS163 PDC Bit. A PWD sub was run for ECD measurements while drilling. Oil based mud was used for drilling the section, with initial mud weight of 1.40 sg increased in steps to 1.48 sg at TD.

A MDT wire line tool string was run for establishing gradient/pore pressure. A solid restriction was tagged at 1371 m, i.e. inside the casing. Attempted working tool string past obstruction. Performed a wipertrip to TD, and pushed fill/obstruction down from 1371 m to TD. RIH and took 7 pressure points with the MDT. Established pore pressure equivalent to 1.31 sg.

5.5.2 Experiences/Recommendations

- **Drilling:** 1266 m was drilled in 56 hrs - overall ROP of 22,6 m/hr (33,7 m/hr on bottom). The hole was drilled with OBM (EDC99 base oil). The MW was increased to 1.45 sg prior to drilling into Balder, and 1.48 sg prior to drilling into the reservoir.
- The 9 1/2" bit size was selected based on having a large as possible wellbore, without exceeding the maximum allowable blow-out rates for kick/blow-out scenario. The HSE department was challenged to raise the maximum rate from 8000 Sm³/d to 12000 Sm³/d, and gave permission for this based on the conditions for this specific location.
- The ECD through Balder was a focal point. Max ECD (with 1.48 sg MW) measured from the PWD in drilling mode was 1.54 sg. At one stage the BHA was tripped in too fast, resulting in a maximum ECD of 1.57 sg. Good routines were established, and the MWD engineer called the driller with the pump-off reading for every connection.
- Based on the ECD criticality it was decided to avoid all reaming & wiping on connections to reduced/remove ECD surges on the Balder formation. This did not seem to have a negative impact on hole cleaning.
- The well design with a 13 3/8" casing being drilled out with a 9 1/2" bit is a weak link when it comes to well entrance. On Xenon the upper wiper plug (with a 9 1/2" hole in center) was found in the Diverter during the P&A phase. Both the plug and cement from the shoetrack may fall into the wellbore and prevent entrance for e.g. W/L tools.
- The remnants of the upper wiper plug was found in the Diverter:



5.6 Permanent Abandonment & Anchor handling

5.6.1 Summary

Reference is made to chapter 5.6.3 "*P&A Well Schematic*" and chapter 5.7.6 "*Cementing Program*".

The reservoir section was plugged back by placing a cement plug (Plug #1) in OH from TD at 2651 m to 2400 m, a casing/open hole cement plug (Plug #2) from 1450 m to 1200 m, and thereafter a Halliburton 13 3/8" mechanical plug (EZSV) at 605 m. Due to the reservoir being water wet, a non-gastight slurry design was utilized.

Cement plug #2 was pressure tested to 90 Bar (70 Bar above LOT at shoe). The 13 3/8" EZSV was pressure tested to 90 Bar (70 Bar above LOT at shoe).

The well was displaced from oilbased mud to seawater at 600 m, and a surface cement plug (Plug #3) was placed from 605 m to 350 m.

The BOP was un-latched and the riser/BOP pulled. RIH with Weatherford 20" x 30" cutting assembly on motor and MOST tool. Cut 20" and 30" casings. Two cuts were required to retrieve the casing. The cause is believed to be the good X-lite cement job. The WH/PGB was retrieved on most tool. L/D remaining drill pipe.

Pulled anchors. Ended operations on well 34/7-32 09:30 hrs 27.10.2001.

5.6.2 Experiences/Recommendations

- The wearbushing was planned retrieved on the same run as setting the 13 3/8" EZSV. Due to taking weight in BOP area while laying down drill pipe, this plan was abandoned. A jet sub was run and the BOP/WH was jetted/washed. The wearbushing was afterwards retrieved on a separate run. The potential time saving is small – hence doing the operation in two runs is ok.
- Utilize rubber sleeve on wellhead assembly (with grease behind) to prevent too good bound between conductor and cement.

5.6.3 *Permanent P&A well schematic*

Well: 34/7-32
 Field: Xenon
 Rig: Byford Dolphin

WELL SCHEMATIC - PLUGGED WELL

Purpose of plugging: Permanent P&A - Final version / As-Run
 Date of abandonment: October, 2001

HOLE		CASING and FORMATION				LOT / FIT	TOC		CSG. and PLUGS		RT	TESTS	CUT
SIZE	TVD MD	SIZE	CASING TYPE	PERMEABLE HC BEARING ZONES	Mud [g/cm3]	s.g.	TVD	MD	TVD	MD			
Sea Bed	321,5												
36"	380	30"	X-52, 309 lb/ft, ST-2 4 jnts 30" # 309,7, X-52, ST-2 + Housing jnt.	None	1.03 s.g.	N/A	345	345	381	381			326
17 1/2"	1385	20"x 13 3/8"	P110, 72 lb/ft, New Vam (Housing ext. joint: 20", X-65)	None	1.03 s.g.	1.57 s.g.	1200	1200	605	605		70 bar above LOT	
9 1/2"	2651			None	1,48 s.g.	N/A	1450	1450	1378	1378		70 bar above LOT	
							1600	1600					
							2430	2430					
									2651	2651			

5.7 Figures and Tables

5.7.1 *Time/Depth Curve*

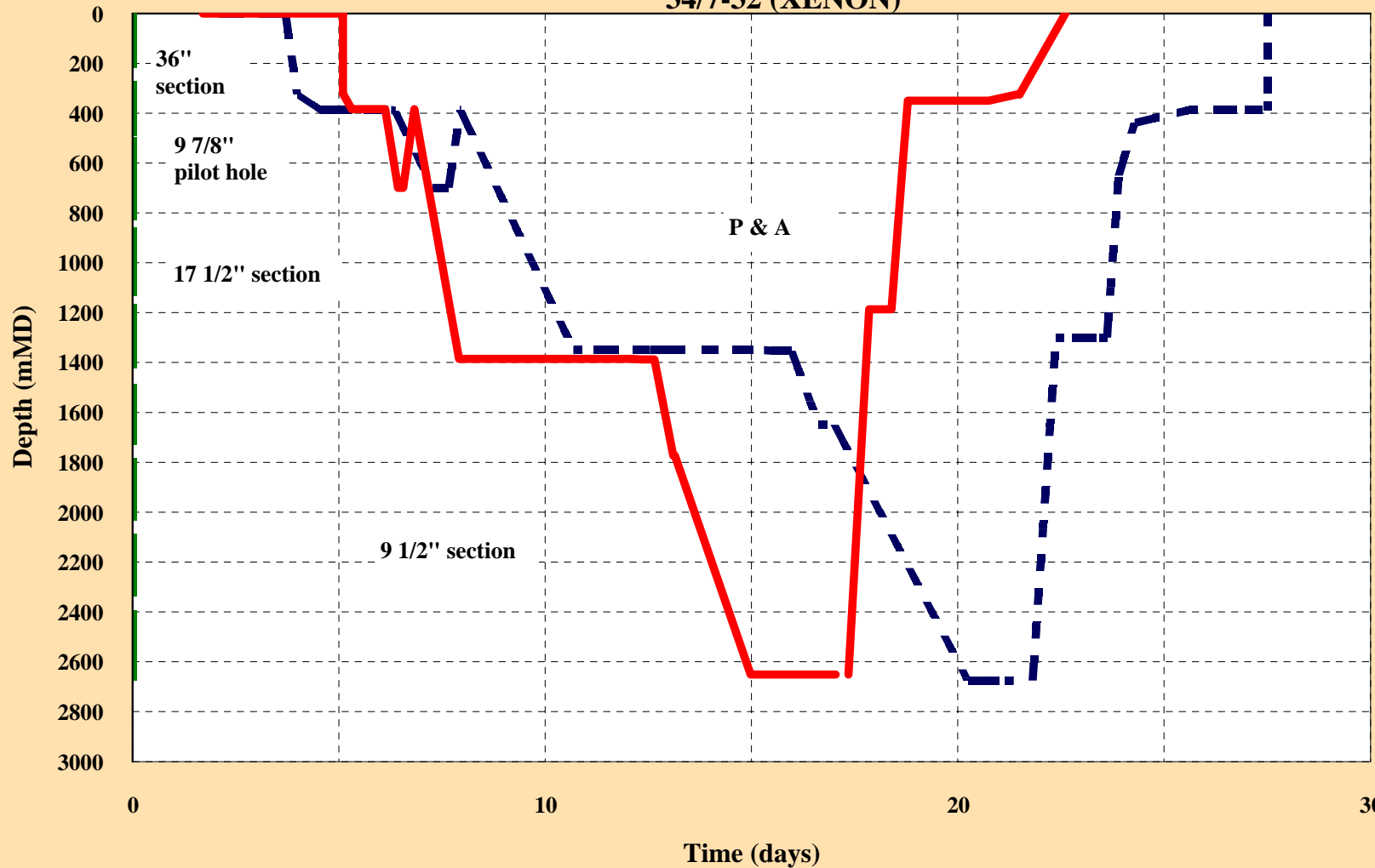


Time - Depth Plot

Byford Dolphin

34/7-32 (XENON)

- Budget time (days)
- Optimum time (days)
- Actual time (days)



Updated date/time:

Date: 15.05.2002

Time: 16:28

Start date/time:

Date: 04.10.2001

Time: 19:00

Est. finish date/time:

Date: 27.10.2001

Time: 09:30

Total budget time:

27,5 days

Time used:

22,6 days

Time ahead of budget:

4,9 days

Comments:

Rushmore : 198 m/D
Opr. factor : 98.7 %
D-time : 6 h (1.1 %)
WOW : 64.5 h (12 %)

5.7.2 *Time Planner*

5.7.3 *Bit summary*

Bit record

Wellbore: 0034/07-032

Run No	Bit Size	Bit No	BHA No	Bit Type	IADC code	Bit manufacturer	Serial	Nozzles (n/32")				Flow Area in2
								no x n	no x n	no x n	no x n	
1	17 1/2"	1RR	1	MXT1	115	Hughes Christensen	G69DS	3 x 13	1 x 14	x	x	,540
1	26"/36"	HO	1	HO2STAGE	135	IPE	ADB951	3 x 13	3 x 11	x	x	,668
2	9 7/8"	2	2	MHT11GTKPR	115	REED	J12988	3 x 20	x	x	x	,921
3	17 1/2"	3	3	EMS13GKC	135	REED	D83488	4 x 18	x	x	x	,995
4	9 1/2"	4	4	RS163	M342	Reed-Hycalog	24418	6 x 14	x	x	x	,902
5	9 1/2"	4RR	5	RS163	M342	Reed-Hycalog	24418	6 x 14	x	x	x	,902

Run No	Bit Size	Pump Rate l/min	Pump Press bar	Depth in mMD	Depth Drilled out mMD	Hours Drilled m	ROP	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	17 1/2"	5000	206	322	384	62	5	12,4	0	3	50	140	4000	8000	
1	26"/36"	5000	206	322	384	62	5	12,4	0	3	50	140	4000	8000	
2	9 7/8"	3700	170	384	700	316	5,8	54,5	1	5	50	160	2000	4000	
3	17 1/2"	4400	225	384	1385	1001	17,8	56,2		15	150	203	2600	13900	
4	9 1/2"	2350	214	1385	2651	1266	37,6	33,7	1	10	80	190	2	14	
5	9 1/2"	2500	200												

Run No	Bit Size	IADC dull grading								Remarks
		I	O	DC	L	B	G	OC	RP	
1	17 1/2"									
1	26"/36"									26" Holeopener 3 x 11 nozzles, 36" Holeopener 3 x 13" nozzles.
2	9 7/8"	6	6	WT	A	E		NO	TD	
3	17 1/2"	1	2	WT	H	E		BT	TD	Preliminary grading (BHA & bit racked in derrick). 1 broken tooth on outer row, cone #1.
4	9 1/2"	1	2	WT	S	X	i	CT	TD	
5	9 1/2"	1	2	WT	S	X	i	CT	TD	

5.7.4 *Bottomhole assemblies (BHAs)*

BHA report

Wellbore: 0034/07-032

BHA seq:	1	BHA category:	Drilling	BHA description:	36" drilling assembly.			
BHA no:	1	String component	OD	ID	Length	Acc length		
			in	in	m	m		
		BIT	17,5		0,4	0,4		
		FLOAT SUB	9,5		1,06	1,46		
		HOLE OPENER	36		3,95	5,41		
		BIT SUB	9,5		1,1	6,51		
		ANDERDRIFT	9,5		2,42	8,93		
		SAVER SUB	9,5		0,62	9,55		
		X-OVER	9,5		0,77	10,32		
		DRILL COL	8	3	83,7	94,02		
		X-OVER	8		0,91	94,93		
		HW DRILL PIPE	5		83,15	178,08		

BHA seq:	2	BHA category:	Drilling	BHA description:	9 7/8" pilot hole assembly			
BHA no:	2	String component	OD	ID	Length	Acc length		
			in	in	m	m		
		BIT	9,875		0,28	0,28		
		BIT SUB	8	2,75	0,68	0,96		
		SUB PIN X PIN	8,25	2,813	0,8	1,76		
		MWD MPR	8,25	2,813	5,1	6,86		
		MWD TOOL	8,25	2,813	11,23	18,09		
		SAVER SUB	8,25	2,813	0,94	19,03		
		DRIL COL	8	3	92,9	111,93		
		JAR	8,25	3	9,73	121,66		
		DRILL COL	8	3	18,44	140,1		
		X-OVER	8	3	0,91	141,01		
		HW DRILL PIPE, FLEX	5	3	83,15	224,16		

BHA seq:	3	BHA category:	Drilling	BHA description:	17 1/2" hole assembly			
BHA no:	3	String component	OD	ID	Length	Acc length		
			in	in	m	m		
		BIT	17,5		0,4	0,4		
		NB STAB W/FL	17,5	3	2,45	2,85		
		PONY COLLAR	9,5	3	3,77	6,62		
		STAB STRING	17,5	3	2,33	8,95		
		X-OVER	9,5	3	0,77	9,72		
		PIN X PIN SUB	8,25	2,813	0,8	10,52		
		MWD MPR	8,25	2,813	5,1	15,62		
		MWD TOOL	8,25	2,813	11,23	26,85		
		SAVER SUB	8,25	2,813	0,94	27,79		
		STAB STRING	17,5	3	2,45	30,24		
		DRILL COLLAR	8	3	83,68	113,92		
		JAR	8,25	3	9,73	123,65		
		DRILL COL	8	3	18,44	142,09		
		X-OVER	8	3	0,91	143		
		HW DRILL PIPE	5	3	83,15	226,15		

Wellbore: 0034/07-032


BHA seq:	4	BHA category:	Drilling	BHA description:	9 1/2" hole assembly			
BHA no:	4	String component	OD	ID	Length	Acc length		
			in	in	m	m		
		BIT	9,5		0,23	0,23		
		NB STAB W/FL	9,5	2,813	2,15	2,38		
		PONY COLLAR	6,5	2,75	3,22	5,6		
		STAB STRING	9,5	2,813	2,09	7,69		
		PIN X PIN SUB	6,75	2,813	0,84	8,53		
		MWD MPR	6,75	2,813	5	13,53		
		MWD TOOL	6,75	2,813	11,65	25,18		
		STAB STRING	9,5	2,813	1,97	27,15		
		DRILL COLLAR	6,5	2,875	74,42	101,57		
		JAR	6,625	2,52	9,72	111,29		
		DRILL COL	6,5	2,875	27,25	138,54		
		HW DRILL PIPE	5	3	82,89	221,43		

BHA seq:	5	BHA category:	Drilling	BHA description:	9 1/2" hole assembly			
BHA no:	5	String component	OD	ID	Length	Acc length		
			in	in	m	m		
		BIT	9,5		0,23	0,23		
		NB STAB W/FL	9,5	2,813	2,15	2,38		
		PONY COLLAR	6,5	2,75	3,22	5,6		
		STAB STRING	9,5	2,813	2,09	7,69		
		DRILL COLLAR	6,5	2,875	74,42	82,11		
		JAR	6,625	2,52	9,72	91,83		
		DRILL COL	6,5	2,875	27,25	119,08		
		HW DRILL PIPE	5	3	82,89	201,97		

BHA seq:	6	BHA category:		BHA description:				
BHA no:	6	String component	OD	ID	Length	Acc length		
			in	in	m	m		
		BULL NOSE	8		0,38	0,38		
		CASING CUTTER	12		1,83	2,21		
		TOP SUB	8		0,9	3,11		
		MUD MOTOR	9,5		8,7	11,81		
		DRILL COLLAR	8	3	55,72	67,53		
		X-OVER	8	3	0,91	68,44		
		HW DRILL PIPE	5		82,89	151,33		

5.7.5 *Drilling fluids program*

36 Section: 36" Seawater/Bentonite - Spud SPEC # 1														Product usage				Conc. (unit/m3)			Volumes													
Depth meters	Inclination deg.	MW sg	FV sec	YP Pa	PV cP	Gel 10s Pa.	Gel 10m Pa.	3 rpm lb100sqft	pH [-lg[H+]]					TYPE: SW/Bentonite	Unit	New	Maint	Tot Unit		m3														
324	0	1,03	> 200						8					Barite	mt	0,417		127	SURFACE	100														
386		1,35							9					Soda Ash	kg	1		305	RISER	0														
														Bentonite	kg	76		23 200	CASING/LINER	0														
														Fres water	m3	0,89		272	OPEN HOLE	47														
Length:	COMMENTS:																																	
62	Ref. Anchor/M-I, Operational Procedures - Rev. 1 - 18.08.00: This section will be drilled using seawater with Bentonite havis sweeps. Mix havis Bentonite mud according to programmed specifications. Prehydrate Bentonite in freshwater for at least 6 hours before blending with the seawater. Pump 5 - 10 m3 havis pills every 15 m. At TD the hole will be displaced to 1.35 sg by pumping two times the hole volume. If a wipertrip is performed a 30 m3 havis Bentonite pills will be swept around the hole before the hole is displaced to 1.35 sg. Prepare at least 100 m3 1.35 sg Bentonite mud for the displacement. NOTE: Prior to spud - or at least before start drilling 9 7/8" pilot hole, mix up 100 m3 1,6 sg kill mud As a contingency in case bulk Bentonite can not be used - or the time don't allow to mix Bentonite mud, 14-16 kg/m3 CMC EHV is a sacked viscosifying alternative.																																	
17 1/2 Section: 9 7/8" pilot hole - 17 1/2" Seawater/Bentonite/CMC-EHV SPEC # 1														Product usage				Conc. (unit/m3)			Volumes													
Depth meters	Inclination deg.	MW sg	FV sec	YP Pa	PV cP	Gel 10s Pa.	Gel 10m Pa.	3 rpm lb100sqft	pH [-lg[H+]]					TYPE:	Unit	New	Maint	Tot Unit		m3														
386	0	1,03	> 200						8					Barite	mt	0,417		400	SURFACE	200														
1 350		1,25							9					Soda Ash	kg	1		950	RISER	0														
														Bentonite	kg	76		72 080	CASING / LINER	153														
														CMC EHV	kg	3		2 850	OPEN HOLE	165														
														Fresh water	m3	0,89		840	DILUTION	444														
Length:	COMMENTS:																																	
964	Ref. Anchor/M-I, Operational Procedures - Rev. 1 - 18.08.00: This section will be drilled using seawater with Bentonite havis sweeps. Mix havis Bentonite mud according to programmed specifications. Prehydrate Bentonite in freshwater for at least 6 hours before blending with the seawater. Pump 5 - 10 m3 havis pills every 15 m. At TD the hole will be displaced to 1.25 sg by pumping two times the hole volume. If a wipertrip is performed a 30 m3 havis Bentonite pills will be swept around the hole before the hole is displaced to 1.25 sg. Prepare at least 300 m3 1.25 sg Bentonite mud, added 3 kg/m3 CMC-EHV for extra fluid loss control. If the well allows it, the kill mud can be diluted back for this purpose. Note: A pilot hole will be drilled to approx. 700 m, drilling with SW and CMC-EHVsweeps . The pilot hole will be displaced to 1,25 sg Bentonite mud with 3 kg/m3 CMC for fluid loss control. As a contingency in case bulk Bentonite can not be used, 14-16 kg/m3 CMC EHV is a sacked viscosifying alternative - NOTE: Only CMC-EHV sweeps while drilling pilot hole. Plan for and prepare a high visc. water based pill - 5-10 m3. to be pumped and placed before performing the LOT after drilled out of the 13 3/8" shoe.																																	
9 1/2 Section: Versavert drilling fluid (OBM) SPEC # 41														Product usage				Conc. (unit/m3)			Volumes													
Depth meters	Inclination deg.	MW sg	PV mPaS	YP Pa	Gel 10s Pa.	Gel 10m Pa.	100 rpm lb100sqft	3 rpm lb100sqft	HTHP ml	Activity	ES volt	OWR	LGS kg/m3	TYPE: Water based kill fluid	Unit	New	Maint	Tot Units		m3														
1 350	0	1,40	alap	10	8	< 25	<30	9	< 2	0.88	> 600	70/30	< 200	M-I Bar	mt	0,627		226	SURFACE	60														
2 675		1,50		16	15			12		0.94		75/25		EDC 99	l	0,582	0,1	266	RISER	64														
														Versavert PE	l	20		7 200	CASING / LINER	105														
														Versavert SE	l	8		2 900	OPEN HOLE	64														
														Versavert F	l	6		2 200	DILUTION	216														
Length:	COMMENTS:																																	
1 325	This section will be drilled with Versavert OBM drilling fluid. A start out volume of used mud will be shipped to the rig when needed. Adjust to drilling spec within the first circulation. Maintain properties and volume with premixes utilizing used mud. Avoid direct additions of chemicals to active. Dress shakers with coarser screens when displacing/breaking circulations after trips. Run finest possible shaker screens and optimise the solids removal equipment in order to reduce solids build-up and dilution. NOTE: Maintain CaCl2 at +/- 120 kg/m3 CaCl2. If the mud received from shore has higher CaCl2 content, add water and emulsifiers and shear the fluid. O/W ratio down to 70/30 can be accepted. Watch cutting quality at all time and adjust CaCl2 content if cutting quality require. Special attention to fluid logistics must be paid. Run the system with a 3 rpm Fann reading at the low side of spec. also maintain PV as low as possible in order to optimize low ECD. Note: Use "Manual 73.00 - Operational Procedures Manual" as a reference in the operation.																																	
Total Length																																		
2 351																																		
														Lime	kg	15	4	7 600	HOLE TOT	233														
														VG-Plus	kg	22	1	8 500	LOST ON CUTTINGS	64														
														Versatrol	kg	10		3 600	LEFT BEHIND CSG.	50														
														CaCl2	kg	48		17 280	TOT. VOL.	560														
														Water	m3	0,2		70	RECEIVED	200														
																		0	MIXED	360														
														Mud Received	m3			200	MUD LEFT	446														
														Mud returned	m3			433	BACKLOADED	446														
																			Dilution OH (m3/m3)	3,4														
																			Recap cost per m	678														

	Framework contract: SAP4600002159	Drilling Fluids Program Rev: 5 Priced version WELL: 34/7-32-Xenon RIG: Byford Dolphin		STATOIL	
		Invoice cost, NOK: 1 341 546	Recap cost per m, NOK: 563		
Prepared date/by: Project Leader 08.10.2001 Jan Moe	Verified and Approved by: Project Leader	HS&E Approved date/by: HS & E Dept.	STATOIL approval date/by: 08.10.2001 Ketil Vestbakke	Field	

5.7.6 *Cement program*

Cementing Casing / Liner

Wellbore: 0034/07-032

Report date: 11.10.2001

Casing size: 30" Stage cementing: No Stage no:

Fluid	Density kg/m3	Thicken time		Vol m3	Yield l/100kg	Cement tot qty kg	Type	Mix water	Mix rate l/min	Disp rate l/min	Disp press bar	Return
		30 Bc hh:mm	100 Bc hh:mm									
Lead	1,52	03:15	05:50	61,8	106,8	54000,0	X-lite	SW	640	1300	19,0	F

Description:

Report date: 14.10.2001

Casing size: 13 3/8" Stage cementing: No Stage no:

Fluid	Density kg/m3	Thicken time		Vol m3	Yield l/100kg	Cement tot qty kg	Type	Mix water	Mix rate l/min	Disp rate l/min	Disp press bar	Return
		30 Bc hh:mm	100 Bc hh:mm									
Lead	1,56	08:40	09:39	148,0	129,9	113770,0	Norcem "G"	98,81	1200	3000	111,0	F
Tail	1,92	03:00	04:40	15,0	76,2	19700,0	Norcem "G"	45,10	650	3000	111,0	F

Description:

Plugging

Wellbore: 0034/07-032

Report date: 22.10.2001

Plug top: 2430,0 mMD Plug no: 1 Plug type: OPEN HOLE

Plug bot: 2651,0 mMD Hole size: 9 1/2" Csg size: and

Fluid	Density kg/m3	Thicken time		Vol m3	Yield l/100kg	Cement tot qty kg	Type	Mix water	Mix rate l/min	Disp rate l/min	Disp press bar
		30 Bc hh:mm	100 Bc hh:mm								
Slurry	1,90	04:45	05:03	13,1	77,2	17012,0	G	DW	750	2700	264,0

Description:

Report date: 23.10.2001

Plug top: 1200,0 mMD Plug no: 2 Plug type: OPEN HOLE/CSG

Plug bot: 1450,0 mMD Hole size: 9 1/2" Csg size: 13 3/8" and

Fluid	Density kg/m3	Thicken time		Vol m3	Yield l/100kg	Cement tot qty kg	Type	Mix water	Mix rate l/min	Disp rate l/min	Disp press bar
		30 Bc hh:mm	100 Bc hh:mm								
Slurry	1,95	02:37	03:14	18,2	72,7	25016,0	G	DW	700	2700	265,0

Description:

Report date: 24.10.2001

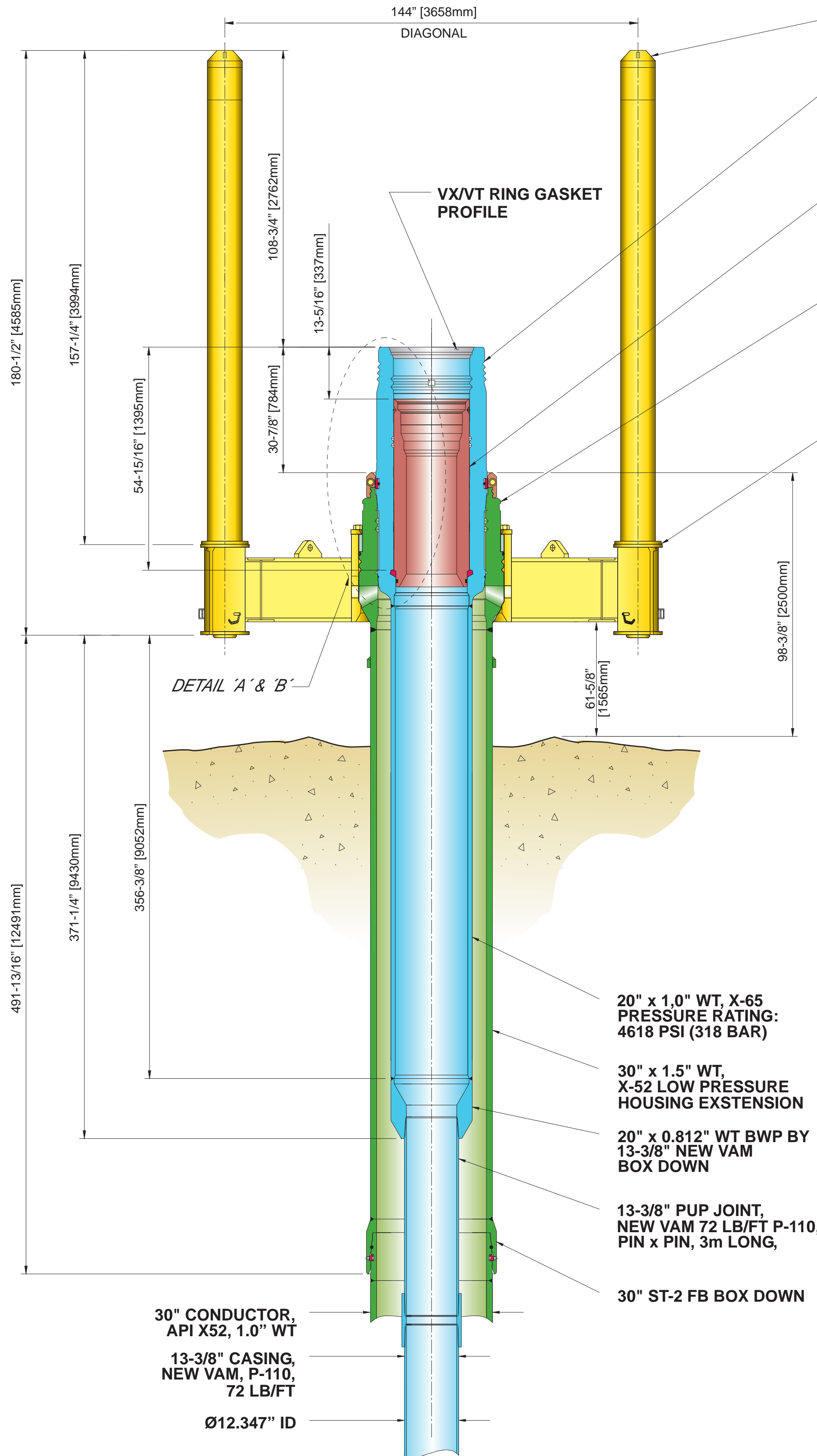
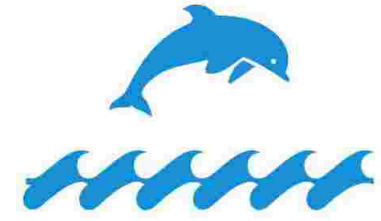
Plug top: 350,0 mMD Plug no: 3 Plug type: CASING

Plug bot: 600,0 mMD Hole size: Csg size: 13 3/8" and

Fluid	Density kg/m3	Thicken time		Vol m3	Yield l/100kg	Cement tot qty kg	Type	Mix water	Mix rate l/min	Disp rate l/min	Disp press bar
		30 Bc hh:mm	100 Bc hh:mm								
Slurry	1,90	04:00		19,5	77,9	25077,0	G	SW	750	1200	30,0

Description:

5.7.7 *Wellhead system drawing*



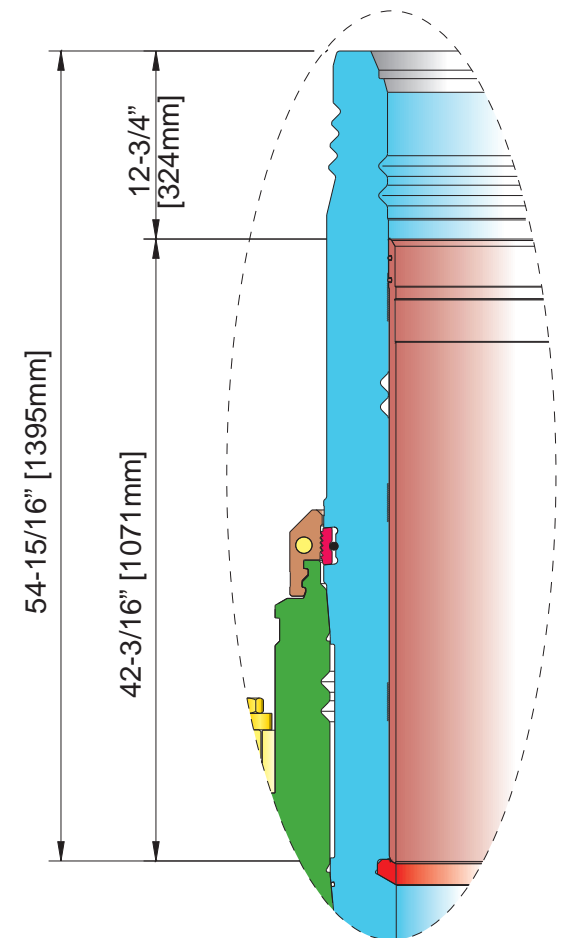
WPCO/IMENCO POST TOPS

18-3/4" WELLHEAD HOUSING UNIT
C/W VX/VT RING GROOVE
P/N N50410-1

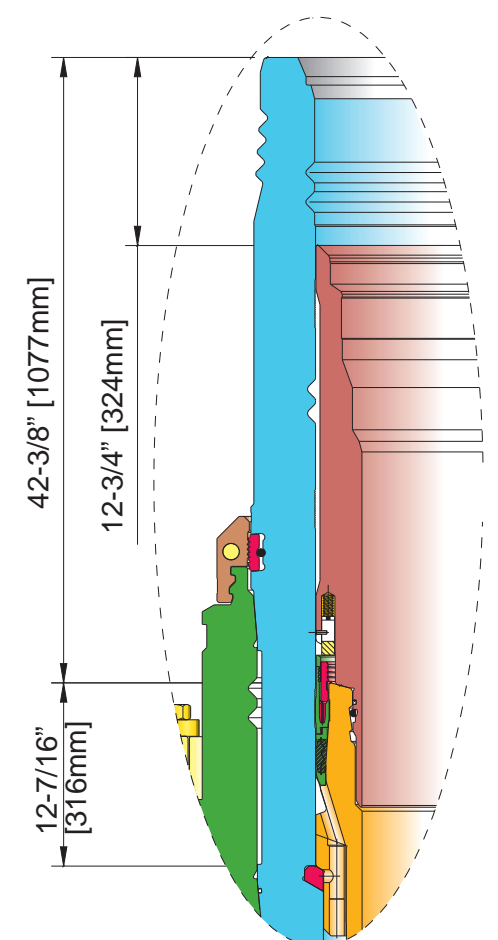
SLIMHOLE SEAT PROTECTOR
P/N A50344-2

30" LOW PRESSURE WELLHEAD
HOUSING UNIT,
P/N A50392-47

PERMANENT GUIDE BASE
RADIUS FOR 30" HOUSING
P/N N50270-1



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



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

- 20" x 1,0" WT, X-65
PRESSURE RATING:
4618 PSI (318 BAR)
- 30" x 1.5" WT,
X-52 LOW PRESSURE
HOUSING EXTENSION
- 20" x 0.812" WT BWP BY
13-3/8" NEW VAM
BOX DOWN
- 13-3/8" PUP JOINT,
NEW VAM 72 LB/FT P-110,
PIN x PIN, 3m LONG,
- 30" ST-2 FB BOX DOWN
- 30" CONDUCTOR,
API X52, 1.0" WT
- 13-3/8" CASING,
NEW VAM, P-110,
72 LB/FT
- Ø12.347" ID

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

Drawing Number: N601016-1

Appendix 1

Activity summary listing

Summary of Activities

Well: 34/007-032

Summary of Activities	
Well: 34/007-032	
05.10.2001	Rig on contract for 34/7-32 project at 19:00 hrs. In transit to new location.
06.10.2001	Rig in transit from 16/2-2 to 34/7-32
07.10.2001	In transit from 16/2-2 to 34/7-32. Waiting on weather for anchor handling.
08.10.2001	Waited on weather. Ran anchors. Ballasted rig
09.10.2001	Ballasted rig to drilling draft. Cross tensioned anchors. Moved rig into well location.
10.10.2001	Set piggy back on anchor no 7. Cross tensioned anchor no 1 and no 7. Spudded well. Drilled 36" hole to 381 m. POOH. Started to run 30" conductor.
11.10.2001	Ran and cemented 30" conductor. Drilled 9 7/8" pilot hole.
12.10.2001	Displaced pilot hole to 1,20 sg WBM and POOH. M/up 17 1/2" BHA. RIH and drilled shoe track. Drilled 17 1/2" hole from 382m to 962m.
13.10.2001	Drilled 17 1/2" hole from 962m to section TD at 1385m. Displaced to 1,25 sg WBM and POOH. R/up and started running 13 3/8" casing to 40m.
14.10.2001	Completed running of 13 3/8" casing and landed wellhead housing. Cemented casing and released running tool.
15.10.2001	L/down cement head and 17 1/2" BHA. Rigged up and ran BOP/riser to 175m.
16.10.2001	Continued running BOP/riser. WOW to work with slip joint over open sea. Continued running BOP/riser after WOW. Moved rig back onto location. Prepared to land BOP.
17.10.2001	Landed BOP. Tested casing and BOP. RIH with 9 1/2" BHA. Drilled shoe track and 3m formation. Took LOT to 1,57 sg EMW.
18.10.2001	Displaced to 1,40 sg OBM. Drilled/surveyed 9 1/2" hole from 1388m to 2000m.
19.10.2001	Drilled/surveyed 9 1/2" hole from 2000m to 2535m.
20.10.2001	Flow checked drilling break at 2535m. Drilled/surveyed 9 1/2" to well TD at 2651m. Circulated clean and POOH. Rigged up Schlumberger. RIH with MDT/GR.
21.10.2001	Attempted RIH with MDT/GR. Could not pass 1371m. POOH, repaired and modified tool. RIH to 1371m, unable to pass. POOH. RIH with 9 1/2" BHA. Worked obstruction at 1371m. RIH to bottom, several tight spots/obstructions. Circulated hole clean and POOH to 2112m.
22.10.2001	Cont. POOH with BHA after wiper trip to bottom. Rigged up and ran MDT/GR. Slipped'n'cut drill line. RIH with cement stinger. Set cement plug no.1. Pulled back for cement plug no.2.
23.10.2001	Pulled back to 1600m. Pumped hi-vis pill as foundation for cement. Pulled back to 1450m. Set cement plug #2. POOH, l/d 5" DP. Took weight inside BOP. RIH and jetted BOP/wellhead and pushed obstruction into 13 3/8" casing. Retrieved wear bushing. Tested cement plug "2. RIH with 13 3/8" EZSV.
24.10.2001	Set 13 3/8" EZSV at 605m. Tested same. Displaced to SW. Set cement plug #3 from 600m to 350m. POOH. Pulled BOP and riser to 120m. WOW.
25.10.2001	WOW to pull BOP from 120m. Pulled BOP and landed BOP on beams. WOW to split the BOP.
26.10.2001	Split and moved BOP to set back area. Cut 20" and 30" casings. WOW. Retrieved WH and PGB.
27.10.2001	L/down DC in derrick. Deballasted rig. Pulled anchors (2,3,4,5,8,9 and 10 on bolster - and 1,7 and 11 secured on anchor boats).
28.10.2001	Pulled anchors 6 and 12 (secured on anchor boats). Operation of well 34/7-32 ended 27th of October 2001 at 09:30. Rig on tow to Veslefrikk (30/3-4B).

Appendix 2

Directional survey listing



Statoil, Slot #1
34/7 Exploration,
EXPLORATION ZONE 31, Norway

Wellbore: 34/7-32
Wellpath: 34/7-32 Definitive
(TD@2651)
Date Printed: 18-Dec-2001



INTEQ

Wellbore

Name	Created	Last Revised
34/7-32	7-Dec-2001	10-Dec-2001

Well

Name	Government ID	Last Revised
34/7-32		

Slot

Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Slot #1	6813139,0000	449581,0000	N61 26 50,2723	E2 3 16,1862	0,00N	0,00E

Installation

Name	Easting	Northing	Coord System Name	North Alignment
34/7 Exploration	449581,0000	6813139,0000	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Field

Name	Easting	Northing	Coord System Name	North Alignment
EXPLORATION ZONE 31	0,0000	0,0000	ED50-UTM-31N on EUROPEAN DATUM 1950 datum	Grid

Created By

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Comments

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All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Byford Dolphin 25.0m above Mean Sea Level)
Vertical Section is from 0,00N 0,00E on azimuth 106,20 degrees
Bottom hole distance is 9,28 Metres on azimuth 106,20 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by BHI



Statoil, Slot #1
34/7 Exploration,
EXPLORATION ZONE 31, Norway

Wellbore: 34/7-32
Wellpath: 34/7-32 Definitive
(TD@2651)
Date Printed: 18-Dec-2001



INTEQ

Wellpath (Grid) Report									
MD[m]	Inc[deg]	Dir[deg]	TVD[m]	North[m]	East[m]	Dogleg [deg/30m]	Vertical Section[m]	Easting	Northing
321.50	0.00	0.00	321.50	0.00N	0.00E	0.00	0.00	449581.00	6813139.00
407.00	1.70	217.20	406.99	1.01S	0.77W	0.60	-0.45	449580.23	6813137.99
436.00	1.50	212.00	435.98	1.68S	1.23W	0.26	-0.71	449579.77	6813137.33
465.00	1.30	219.90	464.97	2.25S	1.64W	0.29	-0.95	449579.36	6813136.75
494.00	1.20	221.40	493.96	2.73S	2.05W	0.11	-1.21	449578.95	6813136.27
523.00	1.00	203.10	522.96	3.19S	2.35W	0.42	-1.37	449578.65	6813135.81
552.00	0.90	229.20	551.95	3.57S	2.62W	0.46	-1.52	449578.38	6813135.43
609.00	0.60	216.50	608.95	4.10S	3.14W	0.18	-1.87	449577.86	6813134.90
637.00	0.70	165.60	636.95	4.39S	3.19W	0.61	-1.83	449577.82	6813134.61
665.00	0.50	294.50	664.94	4.50S	3.25W	1.16	-1.87	449577.75	6813134.50
695.00	0.80	156.20	694.94	4.64S	3.29W	1.22	-1.86	449577.71	6813134.36
723.00	0.80	133.30	722.94	4.95S	3.07W	0.34	-1.56	449577.93	6813134.05
752.00	0.90	125.70	751.94	5.22S	2.73W	0.16	-1.17	449578.27	6813133.78
781.00	0.80	133.30	780.93	5.50S	2.40W	0.16	-0.77	449578.60	6813133.51
810.00	0.80	134.00	809.93	5.78S	2.11W	0.01	-0.41	449578.89	6813133.23
838.00	0.80	136.60	837.93	6.05S	1.84W	0.04	-0.07	449579.17	6813132.95
867.00	0.90	132.20	866.93	6.35S	1.53W	0.12	0.31	449579.47	6813132.65
896.00	0.90	142.00	895.92	6.69S	1.22W	0.16	0.70	449579.78	6813132.32
925.00	1.00	144.40	924.92	7.07S	0.93W	0.11	1.08	449580.07	6813131.93
953.00	1.10	144.00	952.91	7.49S	0.63W	0.11	1.48	449580.37	6813131.52
982.00	0.60	166.20	981.91	7.86S	0.43W	0.61	1.78	449580.57	6813131.14
1011.00	0.40	180.60	1010.91	8.11S	0.40W	0.24	1.88	449580.61	6813130.89
1039.00	0.70	159.00	1038.91	8.37S	0.34W	0.39	2.01	449580.67	6813130.64
1068.00	0.70	136.80	1067.91	8.66S	0.15W	0.28	2.27	449580.85	6813130.34
1097.00	1.00	130.50	1096.90	8.95S	0.16E	0.32	2.65	449581.16	6813130.05
1127.00	0.90	121.70	1126.90	9.25S	0.56E	0.18	3.12	449581.56	6813129.76
1155.00	0.90	138.20	1154.90	9.53S	0.90E	0.28	3.52	449581.90	6813129.48
1182.00	0.70	133.60	1181.89	9.80S	1.16E	0.23	3.84	449582.16	6813129.20
1212.00	0.70	135.40	1211.89	10.06S	1.42E	0.02	4.17	449582.42	6813128.95
1241.00	0.70	143.40	1240.89	10.32S	1.65E	0.10	4.46	449582.65	6813128.68
1268.00	0.90	141.50	1267.89	10.62S	1.88E	0.22	4.77	449582.88	6813128.38
1298.00	0.70	126.50	1297.88	10.92S	2.17E	0.29	5.13	449583.17	6813128.09
1326.00	0.40	49.10	1325.88	10.95S	2.38E	0.78	5.35	449583.38	6813128.05
1355.00	0.40	343.90	1354.88	10.79S	2.43E	0.45	5.35	449583.43	6813128.21
1412.00	0.10	78.50	1411.88	10.59S	2.43E	0.22	5.28	449583.43	6813128.41
1497.00	0.10	297.60	1496.88	10.54S	2.43E	0.07	5.28	449583.43	6813128.46
1585.00	0.00	283.90	1584.88	10.50S	2.37E	0.03	5.20	449583.36	6813128.50
1669.00	0.10	311.50	1668.88	10.46S	2.31E	0.04	5.14	449583.31	6813128.55
1755.00	0.20	347.40	1754.88	10.26S	2.22E	0.05	5.00	449583.22	6813128.74
1812.00	0.20	356.30	1811.88	10.06S	2.19E	0.02	4.91	449583.19	6813128.94
1899.00	0.20	22.20	1898.88	9.77S	2.24E	0.03	4.88	449583.24	6813129.23
1984.00	0.50	3.50	1983.88	9.26S	2.32E	0.11	4.81	449583.32	6813129.74
2071.00	0.60	14.20	2070.87	8.44S	2.46E	0.05	4.71	449583.45	6813130.56
2159.00	0.60	25.20	2158.87	7.58S	2.76E	0.04	4.77	449583.76	6813131.42
2244.00	0.90	20.00	2243.86	6.55S	3.18E	0.11	4.88	449584.18	6813132.45
2330.00	1.00	38.10	2329.85	5.32S	3.88E	0.11	5.21	449584.87	6813133.68
2417.00	0.90	62.20	2416.84	4.41S	4.95E	0.14	5.98	449585.95	6813134.59
2503.00	1.00	60.40	2502.83	3.72S	6.20E	0.04	6.99	449587.20	6813135.28
2589.00	1.20	69.70	2588.81	3.04S	7.70E	0.09	8.24	449588.69	6813135.96
2651.00	1.20	69.70	2650.80	2.59S	8.91E	0.00	9.28	449589.91	6813136.41

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Byford Dolphin 25.0m above Mean Sea Level)
Vertical Section is from 0,00N 0,00E on azimuth 106,20 degrees
Bottom hole distance is 9,28 Metres on azimuth 106,20 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by BHI

Hole Sections									
Diameter [in]	Start MD[m]	Start TVD[m]	Start North[m]	Start East[m]	End MD[m]	End TVD[m]	End North[m]	Start East[m]	Wellbore
36,000	321,50	321,50	0,00N	0,00E	384,00	384,00	0,54S	0,41W	34/7-32
17 1/2	384,00	384,00	0,54S	0,41W	1385,00	1384,88	10,64S	2,40E	34/7-32
9 1/2	1385,00	1384,88	10,64S	2,40E	2651,00	2650,80	2,59S	8,91E	34/7-32

Casings									
Name	Top MD[m]	Top TVD[m]	Top North[m]	Top East[m]	Shoe MD[m]	Shoe TVD[m]	Shoe North[m]	Shoe East[m]	Wellbore
30,000in Conductor	321,50	321,50	0,00N	0,00E	381,00	381,00	0,49S	0,37W	34/7-32
13 3/8in Casing	321,50	321,50	0,00N	0,00E	1378,10	1377,98	10,66S	2,41E	34/7-32

All data is in Metres unless otherwise stated
 Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Byford Dolphin 25.0m above Mean Sea Level)
 Vertical Section is from 0,00N 0,00E on azimuth 106,20 degrees
 Bottom hole distance is 9,28 Metres on azimuth 106,20 degrees from Wellhead
 Calculation method uses Minimum Curvature method
 Prepared by BHI

Appendix 3

Contractor list

Service	Company	Telephone main office
Casing/ Liner hanger	Weatherford Norge AS	51 81 44 00
Cementing	Halliburton AS	51 83 70 00
Directional drilling	Baker Hughes INTEQ	51 71 75 00
Helicopters	Norsk Helikopter AS	51 64 66 00
	Helikopter Service AS	51 94 10 00
Diving	Oceaneering AS	51 82 51 00
Drilling contractor	Dolphin a.s	51 69 43 00
Electric logging	Schlumberger Offshore Service NV	51 69 50 00
Helicopter booking	Lufttransport (Statoil)	55 14 39 10
Mud	Anchor/M-I Drilling Fluids AS	51 57 73 00
Mud logging	Geoservices	51 63 78 50
MWD	Baker Hughes INTEQ	51 71 75 00
Rig positioning	Racal Survey Norge AS	55 34 94 00
Site survey	Fugro-Geoteam AS	22 13 46 00
Wellhead system	ABB Offshore System AS	51 63 44 00

Appendix 4

13 3/8" LOT Information

Appendix 5

Wellsite sample description

WELLSITE SAMPLE DESCRIPTION

Page 1 of 13

Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T. Svånå, T-A. Johnsen		Date: 17.10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.
1390	100	Clst: med dk gry – dk gry, olv gry, also dk gnsh grey, sft – frm, blk, slty i.p., non calc			No shows, Tr cmt cont
1400	90	Clst: occ mod hd else a.a			a.a
	10	Ls: brnsh gry – dk yel brn, sft – frm, blk, arg i.p			
1410	95	Clst: a.a			a.a
	5	Ls: occ v lt gry – off wh, else a.a			
1420	100	Clst: dk gry – olv blk, gnsh blk, frm, blk, occ mod hd, slty, non calc			a.a
	Gd Tr	Ls: a.a			
1430	100	Clst: a.a			a.a
	Tr	Ls: a.a			
1440	100	Clst: a.a			a.a
1450	100	Clst: a.a			a.a
	Sl Tr	Ls: a.a			
1460	95	Clst: a.a			a.a
	5	Ls: a.a			
1470	100	Clst: Glauc i.p., else a.a			a.a
	Tr	Ls: a.a			
1480	100	Clst: a.a			a.a
1490	100	Clst: a.a			a.a
	Gd Tr	Ls: a.a			
1500	100	Clst: med dk gry – dk gry, also gnsh blk, sft – frm, occ mod hd, blk, slty, glauc i.p., non calc			a.a
	Tr	Ls: brnsh gry – dk yel brn, arg, else a.a			
1510	100	Clst: a.a			a.a
	Gd Tr	Ls: brnsh gry – dk yel brn, frm, occ mod hd, arg			
1520	100	Clst: a.a			a.a
	Gd Tr	Ls: a.a			
1530	100	Clst: a.a			a.a
	Sl Tr	Ls: a.a			
1540	100	Clst: dk gry – olv blk, occ dk gnsh gry, frm, occ mod hd, blk, slty, glauc i.p., non calc			a.a
	Tr	Ls: a.a			

WELLSITE SAMPLE DESCRIPTION

Page 2 of 13

Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T. Svånå, T-A. Johnsen		Date: 17.10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			
1550	100	Clst:	dk gry – olv blk, occ dk gnsh gry, frm, occ mod hd, blk, slty, glauc i.p., non calc		No shows
	Tr	Ls:	brnsh gry – dk yel brn, frm, occ mod hd, arg		Tr cmt.
1560	100	Clst:	a.a		a.a
	Gd Tr	Ls:	a.a		
1570	100	Clst:	a.a		a.a
	Gd Tr	Ls:	a.a		
1580	100	Clst:	a.a		No shows
	Tr	Ls:	a.a		
1590	100	Clst:	med dk gry – dk gry, else a.a		a.a
	Gd Tr	Ls:	a.a		
1600	100	Clst:	med dk gry - dk gry, also med blsh gry, sft – frm, blk – amor, slty i.p., non calc		a.a
	Tr	Ls:	a.a		
1610	100	Clst:	med dk gry - olv blk, med blsh gry else a.a		a.a
	Tr	Ls:	a.a		
1620	100	Clst:	a.a		a.a
	Tr	Ls:	a.a		
1630	100	Clst:	a.a		a.a
	Tr	Ls:	a.a		
1640	100	Clst:	a.a		a.a
	Tr	Mrl:	olv blk, blk, frm		
	Tr	Ls:	a.a		
1650	90	Clst:	a.a		a.a
	10	Mrl:	a.a.		
	Gd tr	Ls:	a.a		
1660	90	Clst:	a.a., also brn gry – dk gn gry - gn blk, i.p. glauc		a.a
	10	Mrl:	a.a.		
	Gd tr	Ls:	a.a		
1670	90	Clst:	pred brn gry, also com gn blk – dk gn gry, else a.a.		a.a
	10	Mrl:	a.a.		
	Gd tr	Ls:	a.a		
1680	100	Clst:	pred olv gry, else a.a.		a.a
	Tr	Mrl:	a.a.		
	Gd tr	Ls:	a.a		
1690	100	Clst/Tuff:	varicol, olv gry – m dk gry, gry rd, dk gn gry, sl blk spkld, blk, frm, slty, occ glauc, non calc		a.a

WELLSITE SAMPLE DESCRIPTION

Page 3 of 13

Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T. Svånå, T-A. Johnsen		Date: 17 – 18. 10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.
1700	100	Clst/Tuff: varicol, olv gry – m dk gry, gry rd, dk gn gry, sl blk spkld, blk, frm, slty, occ glauc, non calc			No shows
	Tr	Ls: brnsh gry – dk yel brn, frm, frm, arg			
1710	100	Clst/Tuff: pred m dk gry, else a.a.			a.a.
	Tr	Ls: a.a.			
	Sl tr	Calc foss frag			
1720	100	Clst/Tuff: pred m dk gry, else a.a.			a.a.
	Tr	Ls: a.a.			
	Sl tr	Calc foss frag			
1730	100	Clst/Tuff: a.a.			a.a.
1740	100	Clst: olv gry, blk, frm, sl slty, non calc			a.a.
	Sl tr	Calc foss frag			
1750	100	Clst: a.a.			a.a.
	Sl tr	Dol: dsky yel brn, blk – ang, hd, f xln			
1760	100	Clst: a.a.			a.a.
1770	100	Clst: a.a.			a.a.
	Sl tr	Dol: a.a.			
1780	100	Clst: a.a.			a.a.
	Sl tr	Dol: a.a.			
	Sl tr	Ls: lt gry – lt brn, blk, frm, f xln			
1790	100	Clst: a.a., occ dk gn gry			a.a.
1800	100	Clst: a.a.			a.a.
	Sl tr	Ls: a.a.			
	Sl tr	Calc foss frag			
1810	100	Clst: a.a.			a.a.
1820	100	Clst: a.a.			a.a.
	Tr	Ls: a.a.			
1830	100	Clst: a.a.			a.a.
1840	100	Clst: bcm pred dk gn gry, else a.a.			a.a.
1850	100	Clst: a.a.			a.a.
1860	100	Clst: a.a.			a.a.

WELLSITE SAMPLE DESCRIPTION

Page 4 of 13

Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T. Svånå, T-A. Johnsen		Date: 18. 10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.
1870	70 30	Clst:	olv gry, blk, sft – frm, sl slty, pred calc		No shows
		Mrl:	olv gry, blk, sft – frm, sl slty		
1880	100 Tr	Mrl:	a.a.		a.a.
		Clst:	a.a.		
1890	100 Tr	Mrl:	a.a.		a.a.
		Clst:	a.a.		
1900	100 Tr	Mrl:	a.a.		a.a.
		Clst:	a.a.		
1910	100 Tr	Mrl:	a.a.		a.a.
		Clst:	a.a.		
1920	100 Tr	Mrl:	a.a.		a.a.
		Clst:	a.a.		
1930	100	Mrl:	a.a.		a.a.
1940	100	Mrl:	a.a.		a.a.
1950	70 30	Clst:	olv gry, blk, sft – frm, sl slty, calc – v calc		a.a.
		Mrl:	a.a.		
1960	70 30	Clst:	a.a.		a.a.
		Mrl:	a.a.		
1970	70 30	Clst:	a.a.		a.a.
		Mrl:	a.a.		
1980	90 10	Clst:	a.a.		a.a.
		Mrl:	a.a.		
1990	100 Tr	Clst:	a.a.		a.a.
		Mrl:	a.a.		
2000	100 Tr	Clst:	dk gry – olv gry, sft – frm, blk, slty i.p., calc – v calc		a.a.
		Mrl:	a.a.		
2010	100 Tr Sl Tr	Clst:	a.a.		a.a.
		Ls:	mod yelsh brn, frm, blk, arg i.p.		
		Mrl:	a.a.		
2020	100 Tr Tr Tr	Clst:	a.a.		a.a.
		Mrl:	a.a.		
		Ls:	a.a.		
		Glau:			

WELLSITE SAMPLE DESCRIPTION			Page 5 of 13
Country: Norway	Area: North Sea		Field: Xenon structure
Well no: 34/7-32			
R.T.: 25 meters	Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWEDEA Norge AS		
Hole size: 9 1/2 "	Geologist: T. Svånå, T-A. Johnsen		Date: 18. 10. 2001
Depth (m RT)	Lithology (%)	Lithological Description	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks Shows, cavings, mud additives, etc.

2030	100 10 Tr	Clst: dk gry – olv gry, sft – frm, blk, slty i.p., calc – v calc Mrl: olv gry, blk, sft – frm, sl slty Ls: glauc	No shows
2040	100 Tr Tr	Clst: grdg Mrl, else a.a. Mrl: a.a. Ls: mod yelsh brn, frm, blk, arg i.p.	a.a.
2050	100 Tr Tr	Clst: med dk gry – olv blk, occ dk gnsh gry, sft – frm, slty i.p., grdg Mrl i.p., calc – v calc Ls: lt olv gry, mod yelsh brn, sft – frm, blk, arg i.p. Mrl: med dk gry, olv gry, blk, sft, sl slty	a.a.
2060	100 Tr Tr	Clst: a.a. Mrl: a.a. Ls: a.a.	a.a.
2070	100 Tr Tr	Clst: a.a. Mrl: a.a. Ls: a.a.	a.a.
2080	100 Tr	Clst: a.a. Mrl: a.a.	a.a.
2090	100 Tr	Clst: a.a. Mrl: a.a.	a.a.
2100	90 10 Tr	Clst: occ non calc, else a.a. Mrl: a.a. Ls: a.a.	a.a.
2110	70 30 Tr	Clst: also v dsky rd, sft, grdg mrl, else a.a. Mrl: a.a. Ls: a.a.	a.a.
2120	60 40 Tr	Clst: a.a. Mrl: a.a. Ls: a.a.	a.a.
2130	60 40 Tr Tr	Clst: a.a. Mrl: a.a. Ls: a.a. pyr, glauc	a.a.
2140	Lost!		

WELLSITE SAMPLE DESCRIPTION			Page 6 of 13
Country: Norway		Area: North Sea	Field: Xenon structure
Well no: 34/7-32			
R.T.:	25 meters	Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWEDEA Norge AS	
Hole size:	9 1/2 "	Geologist: T. Svånå, T-A. Johnsen	Date: 18. 10. 2001
Depth (m RT)	Lithology (%)	Lithological Description	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks
2150	50	Clst: med dk gry – olv blk, occ dk gnsh gry, sft – frm, slty i.p., grdg Mrl i.p., calc – v calc, tr v dsky rd grdg mrl	No shows
	20	Mrl: med dk gry, olv gry, blk, sft, sl slty	
	25	Ls: lt olv gry, mod yelsh brn, sft – frm, blk, arg i.p.	
	5	Sst: clr – trnsl qtz, vf, wl srt, app lse	
2160	Lost!		
2170	70	Clst: a.a	a.a
	30	Mrl: a.a	
	10	Ls: a.a	
	Tr	Sst: a.a	
2180	80	Clst: a.a	a.a
	20	Mrl: a.a	
	Gd Tr	Ls: a.a	
2190	80	Clst: dk gry – olv blk, sft – frm, blk, slty i.p., non calc	a.a
	20	Ls: a.a	
2200	95	Clst: also dk gnsh gry, else a.a.	a.a
	5	Ls: a.a	
2210	100	Clst: a.a	a.a
	Tr	Ls: a.a	
2220	95	Clst: med dk gry – dk gry, olv gry, dk gnsh gry, sft – frm, blk, slty i.p., non calc	a.a
	5	Ls: a.a	
2230	100	Clst: a.a	a.a
	Tr	Ls: a.a	
2240	100	Clst: a.a	a.a
	Tr	Ls: a.a	
2250	95	Clst: pred olv blk, frm, else a.a	In Lst: weak slow strmg
	5	Ls: a.a	yel wh cut fluor, prob from oil based mud.
2260	90	Clst: a.a	a.a
	10	Ls: lt gry – lt brn, blk, frm, arg i.p., f xln	
2270	90	Clst: a.a	a.a
	10	Ls: a.a	
2280	100	Clst: a.a	a.a
	Gd tr	Ls: a.a	
2290	90	Clst: a.a	a.a
	10	Ls: a.a	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svånå		Date: 18. 10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.
2300	100 Tr	Clst:	olv blk, blk, frm, slty i.p., non – sl calc		In Lst: weak slow strmg yel wh cut fluor, prob from oil based mud.
		Ls:	brn gry – lt gry, blk, frm, arg i.p., f xln		
2310	100 Gd tr	Clst:	a.a		a.a.
		Ls:	a.a		
2320	100 Tr	Clst:	a.a		a.a.
		Ls:	a.a		
2330	90 10	Clst:	a.a		a.a.
		Ls:	a.a		
2340	100 Tr Sl tr	Clst:	a.a		a.a.
		Ls:	a.a		
		Dol:	dk yel brn, blk – ang, hd, f xln		
2350	90 10	Clst:	a.a		a.a.
		Ls:	a.a		
2360	100 Tr Sl tr	Clst:	a.a		In Ls & Sst: shows a.a., prob from oil based mud.
		Ls:	a.a		
		Sst:	gn gry, v f, sbmd, wh ?kao mtrx, calc cmt, pred lse g, occ fri agg, glauc, no vis por		
2370	100 Tr Sl tr	Clst:	olv gry, blk, sft – frm, slty i.p., non calc		a.a.
		Ls:	a.a.		
			calc foss frag		
2380	100 Tr	Clst:	olv gry a.a		a.a.
		Ls:	a.a		
2390	100 Sl tr	Clst:	med gry – med dk gry, frm, amor – blk, slty i.p., occ slily sdy, occ slily glauc, non – slily calc		No shows
		Ls:	lt gry – lt brn gry, frm, micr, arg		
2400	100 Gd tr	Clst:	sdy i.p., else a.a.		a.a.
		Sst:	clr – trnsl qtz, v f – f, wl srt, sbrn, app as lse grns		
2410	100	Clst:	med gry – med dk gry, occ gn gry, frm, amor – blk, slty i.p., occ slily sdy, occ slily glauc, non calc		a.a.
2420	100 Sl tr	Clst:	a.a.		a.a.
		Ls:	lt brn gry, frm, micr, arg		
2430	100 Tr	Clst:	non – slily calc, else a.a.		a.a.
		Ls:	a.a.		
2440	100 Tr	Clst:	a.a.		a.a.
		Ls:	lt gry, lt brn gry – brn gry, frm, micr, arg		

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svånå		Date: 19. 10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.
2451	100	Clst: med lt gry – med dk gry, frm, amor – blkly, slty i.p., occ slily sdy, tr glauc, non – slily calc			No shows
2454	100 Tr	Clst: a.a. Ls: lt brn gry – brn gry, frm, micr, arg			a.a.
2457	100 Tr	Clst: a.a. Ls: a.a.			a.a.
2460	100 Tr	Clst: a.a. Ls: a.a.			a.a.
2463	100	Clst: a.a.			a.a.
2466	100 Sl tr	Clst: med lt gry – med gry, med dk gry, gn gry, frm, amor – blkly, slty i.p., occ slily sdy, tr glauc, non – slily calc Ls: lt brn gry, frm, micr, arg			a.a.
2469	100 Sl tr	Clst: olv gry i.p., else a.a. Ls: a.a.			a.a.
2472	100 Sl tr	Clst: a.a. Ls: a.a.			a.a.
2475	100 Sl tr	Clst: a.a. Ls: a.a.			a.a.
2478	100 Sl tr	Clst: med gry – med dk gry, olv gry, else a.a. Ls: a.a.			a.a.
2481	100 Sl tr Sl tr	Clst: a.a. Ls: a.a. Pyr			a.a.
2484	100 Sl tr	Clst: a.a. Ls: a.a.			a.a.
2487	100 Tr	Clst: a.a. Ls: occ yel brn, hd microxln, else a.a.			a.a.
2490	100 Tr	Clst: a.a. Ls: a.a.			a.a.
2493	100 Tr	Clst: a.a. Ls: a.a.			a.a.
2496	100 Tr	Clst: a.a. Ls: a.a.			a.a.

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: North Sea		Field: Xenon structure		
Well no: 34/7-32						
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS				
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svånå		Date: 19. 10. 2001		
Depth (m RT)	Lithology (%)	Lithological Description			Remarks	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.	
2499	100	Clst:	med gry – med dk gry, occ olv gry, frm, amor – blk, slty i.p., occ slily sdy,			No shows
	S1 tr	Ls:	lt brn gry, frm, micr, arg			
2502	100	Clst:	a.a.			a.a.
	S1 tr	Ls:	a.a.			
2505	100	Clst:	a.a.			a.a.
	Tr	Ls:	lt gry – yel gry, lt brn gry, frm – occ mod hd, pred micr, occ microxln, arg i.p.			
2508	100	Clst:	a.a.			a.a.
	Tr	Ls:	a.a.			
2511	100	Clst:	occ micropyr – pyr, else a.a.			a.a.
	Tr	Ls:	a.a.			
2514	100	Clst:	a.a.			a.a.
	Tr	Ls:	a.a.			
2517	100	Clst:	a.a.			a.a.
	Tr	Ls:	yel gry – lt brn gry, frm – occ mod hd, pred micr, occ microxln – xln, arg i.p.			
2520	100	Clst:	a.a.			a.a.
	S1 tr	Ls:	a.a.			
2523	100	Clst:	med gry – med dk gry, occ med lt gry, occ gn gry, frm, amor – blk, occ slily slty, pred non – slily calc, occ mod calc			a.a.
	Tr	Ls:	lt gry, frm, micr, slily arg			
2526	70	Ls:	lt gry – med lt gry, frm – mod hd, micr – microxln, arg i.p., i.p. grdg Mrl, occ micropyr			a.a.
	30	Clst:	a.a.			
2529	90	Ls:	lt gry – med lt gry, lt bl gry, frm – mod hd, occ hd, micr – microxln, arg i.p., occ grdg Mrl, v pyr i.p.			a.a.
	10	Clst:	olv gry – olv blk, frm, blk, slily micropyr, mod calc			
2532	90	Ls:	a.a.			a.a.
	10	Clst:	a.a.			
2535	70	Ls:	i.p. v glauc, else a.a.			Weak slow strmg yel wh cut fluor in Sst, prob from oil based mud.
	20	Clst:	a.a.			
	10	Sst:	pred lse, occ agg: gn gry, f – occ m, mod srted, sbrnd, calc cmt, fri, v glauc, no vis por			
2538	50	Ls:	pred v glauc a.a.			a.a.
	30	Clst:	a.a.			
	20	Sst:	a.a.			

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svånå		Date: 19. 10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.
2541	60	Sst:	pred lse, occ agg: gn gry, pred v f – f, occ m, mod srtd, sbrnd, calc cmt, fri, sl – occ v glauc, occ pyr, no vis por		Weak slow strmg yel wh cut fluor in Sst, prob from oil based mud.
	20	Ls:	lt gry – med lt gry, frm – mod hd, v glauc i.p., arg i.p., , micr – microxln		
	20	Clst:	olv gry – olv blk, blk, frm, slty i.p., non - mod calc		
2544	70	Sst:	a.a.		a.a.
	20	Clst:	a.a.		
	10	Ls:	a.a.		
2547	80	Sst:	a.a.		a.a.
	20	Clst:	a.a.		
	Gd tr	Ls:	a.a.		
2550	70	Sst:	a.a.		a.a.
	20	Clst:	a.a.		
	10	Ls:	a.a.		
2553	80	Sst:	a.a.		a.a.
	20	Clst:	a.a.		
	Gd tr	Ls:	a.a.		
2556	80	Sst:	a.a.		a.a.
	20	Clst:	a.a.		
	Tr	Ls:	a.a.		
2559	80	Sst:	i.p. v calc cmt, else a.a.		a.a.
	10	Clst:	a.a.		
	10	Ls:	i.p. sdy grad calc Sst, else a.a.		
2562	50	Sst:	a.a.		a.a.
	40	Ls:	a.a.		
	10	Clst:	a.a.		
2565	60	Ls:	i.p. v f sdy, bcm non glauc, else a.a.		a.a.
	30	Sst:	i.p. v calc, bcm non glauc, else a.a.		
	10	Clst:	a.a.		
2568	50	Ls:	a.a.		a.a.
	40	Sst:	a.a.		
	10	Clst:	a.a.		
2571	50	Ls:	a.a.		a.a.
	50	Sst:	a.a.		
	Gd tr	Clst:	a.a.		
2574	50	Ls:	a.a.		a.a.
	50	Sst:	a.a.		
	Gd tr	Clst:	a.a.		

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: North Sea		Field: Xenon structure		
Well no: 34/7-32						
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS				
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svånå		Date: 19. 10. 2001		
Depth (m RT)	Lithology (%)	Lithological Description			Remarks	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.	
2577	60	Ls:	lt gry – med lt gry, blk, frm – mod hd, v f sdy grad Sst i.p. arg i.p., micr			Weak slow strmg yel wh cut fluor in Sst, prob from oil based mud.
	40	Sst:	lt gry – brn gry, v f – f, w srtd, sbrnd, calc cmt, i.p. grad sdy Ls, tr glauc, no vis por			
	Gd tr	Clst:	olv gry – olv blk, blk, frm, slty i.p., non - mod calc			
2580	70	Sst:	a.a.			a.a.
	30	Ls:	a.a.			
	Gd tr	Clst:	a.a.			
2583	90	Sst:	a.a.			a.a.
	10	Ls:	a.a.			
	Tr	Clst:	a.a.			
2586	100	Sst:	a.a.			a.a.
	Gd tr	Ls:	a.a.			
	Tr	Clst:	a.a.			
2589	80	Ls:	a.a.			a.a.
	20	Sst:	a.a.			
	Tr	Clst:	a.a.			
2592	60	Ls:	a.a.			a.a.
	40	Sst:	a.a.			
	Tr	Clst:	a.a.			
2595	60	Ls:	a.a.			a.a.
	40	Sst:	a.a.			
	Tr	Clst:	a.a.			
2598	60	Sst:	a.a.			a.a.
	30	Ls:	a.a.			
	10	Clst:	a.a.			
2601	50	Sst:	a.a.			a.a.
	30	Ls:	a.a.			
	20	Clst:	a.a.			
2604	90	Sst:	a.a.			a.a.
	10	Ls:	a.a.			
	Tr	Clst:	a.a.			
2607	90	Sst:	a.a.			a.a.
	10	Ls:	a.a.			
	Gd tr	Clst:	a.a.			
2610	40	Sst:	a.a., tr glauc			a.a.
	30	Ls:	a.a.			
	30	Clst:	olv blk, blk, frm – mod hd, slty i. p., non calc			

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: North Sea		Field: Xenon structure		
Well no: 34/7-32						
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS				
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svånå		Date: 19. 10. 2001		
Depth (m RT)	Lithology (%)	Lithological Description			Remarks	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.	
2613	70	Sst:	lt gry – brn gry, v f – f, w srted, sbrnd, calc cmt, i.p. grad sdy Ls, tr glauc, no vis por			Weak slow strmg yel wh cut fluor in Sst, prob from oil based mud.
	20	Clst:	olv blk, blk, frm – mod hd, slty i. p., non calc			
	10	Ls:	lt gry – med lt gry, blk, frm – mod hd, v f sdy grad Sst i.p. arg i.p., micr			
2616	60	Sst:	a.a.			a.a.
	30	Ls:	a.a.			
	10	Clst:	a.a.			
2619	60	Ls:	a.a.			a.a.
	30	Sst:	a.a.			
	10	Clst:	a.a.			
2622	50	Ls:	a.a.			a.a.
	40	Sst:	a.a.			
	10	Clst:	a.a.			
2625	40	Clst:	olv gry, blk, frm, slty, i.p. grad Sst, non calc			a.a.
	30	Ls:	a.a.			
	30	Sst:	a.a.			
	S1 tr	Coal:	blk, shny, mod hd, blk, brit			
2628	40	Clst:	a.a.			a.a.
	30	Ls:	a.a.			
	30	Sst:	a.a.			
	S1 tr	Coal:	a.a.			
2631	40	Clst:	olv gry, blk, frm, slty, i.p. grad Sst, non calc			a.a.
	40	Ls:	a.a.			
	20	Sst:	a.a.			
2634	70	Clst:	brn gry, frm, blk, slty, i.p. v f sdy, non calc			a.a.
	20	Sst:	a.a.			
	10	Ls:	a.a.			
	S1 tr	Coal:	a.a.			
2637	100	Clst:	brn blk, occ brn gry – olv gry, frm, blk, slty – occ v slty, sdy i.p., micropyr, carb, non calc			a.a.
	Tr	Ls:	a.a.			
	Tr	Sst:	a.a.			
2640	100	Clst:	a.a.			a.a.
	Tr	Ls:	a.a.			
	Tr	Sst:	clr – trnsl qtz, v f – med, pr srt, sbang – sbrndd, app as lse grns			
2643	100	Clst:	a.a.			a.a.
	Gd tr	Ls:	lt gry, yel brn – dk yel brn, frm, micr, arg, com sdy			
	Tr	Sst:	a.a.			

WELLSITE SAMPLE DESCRIPTION

Country: Norway		Area: North Sea		Field: Xenon structure	
Well no: 34/7-32					
R.T.: 25 meters		Company: Statoil ASA, Norsk Hydro ASA, Petoro AS, ExxonMobil a.s., Idemitsu petroleum Norge a.s., TotalFina Elf, RWE-DEA Norge AS			
Hole size: 9 1/2 "		Geologist: T.F. Kristensen / T.A. Svåná		Date: 19. 10. 2001	
Depth (m RT)	Lithology (%)	Lithological Description			Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Shows, cavings, mud additives, etc.

2646	100	Clst:	brn blk – brn gry, olv gry, frm, blk, slty – v slty, sdy – v sdy i.p., micropyr, slily carb, non calc	a.a.
	Gd tr	Ls:	lt gry, yel brn – dk yel brn, frm, micr, arg, com sdy	
	Gd tr	Sst:	med gry, clr – trnsl qtz, v f – f, mod srt, sbang – sbrn, sft – lse, tr calc cmt, arg, v mic, slily micropyr	
2649	100	Clst:	a.a.	a.a.
	Gd tr	Sst:	a.a.	
	Tr	Ls:	a.a.	

TD of well at 2651m

ENCLOSURES

Composite log
Formation Evaluation log (Geoservices)
Pressure Evaluation log (Geoservices)