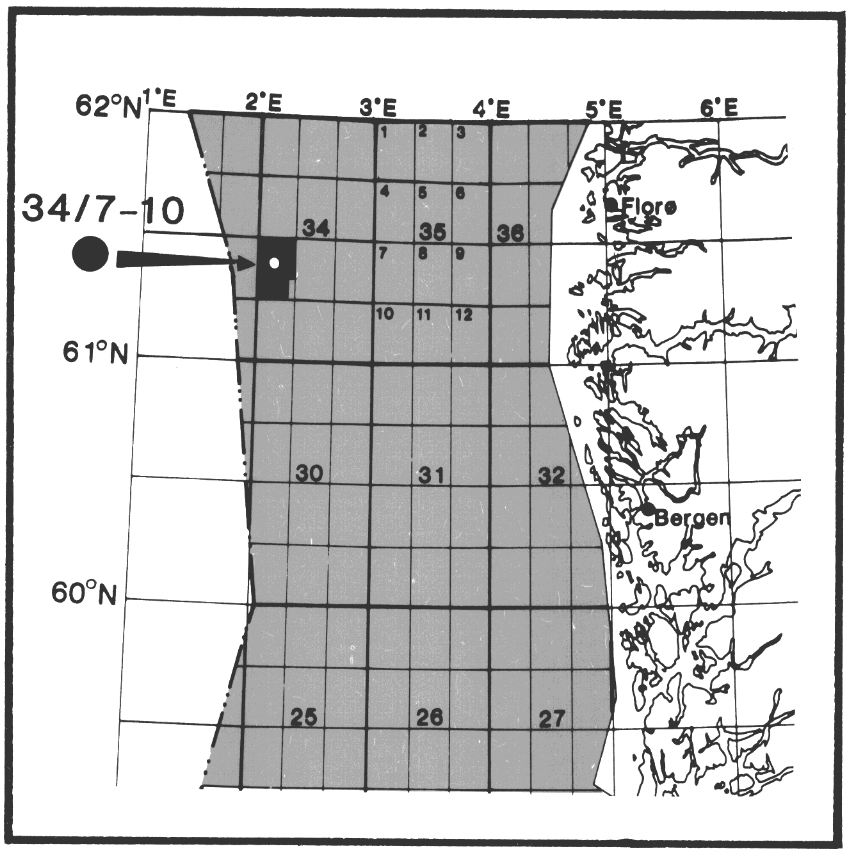
Saga
Petroleum a.s.



FINAL WELL REPORT

34/7-10

April 1987

Saga
Petroleum a.s.

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Partners	:	SAGA/ESSO/STATOIL/NORSK HYDRO/ELF/DEMINEX/DNO
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FINAL WELL REPORT

34/7-10

Norwegian Continental Shelf

Classification / Distribution

[x] Saga and partners

	Exploration	Petr.Tech.	Drilling	34/7 T.O.Expl.Dep
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2. SUMMARY

2.1 Exploration

The primary purpose of the well 34/7-10 was to prove the Statfjord Formation reserves in the south of the Snorre Field. Further objectives were to test the extend and quality of the middle Statfjord member and to establish a Statfjord Formation OWC. Further purposes of the well were to assess the reservoir parameters of the Statfjord and the underlying Lunde units.

The final depth (T.D.) of 3000 m RKB was reached in the sandstones/ claystones of the Late Triassic age. Apart from the sandy Utsira Formation of Late Miocene age, a Late Oligocene (1314 - 1324 m RKB) and a Late Eocene (1377 - 1387 m RKB) sandstone unit within the Hordaland Group, the upper section down to Jurassic proved mainly claystones. The Jurassic consists of a silty Dunlin Group and a sandy Statfjord Formation. The Triassic consists of claystones with minor sandstones in the upper part and alternating sandstones/ claystones from 2800 m RKB and down to T.D.

The Statfjord Formation was encountered at 2531.5 m RKB with a gross thickness of 105 m and 33 m net sand. Twelve cores totalling 119.5 m were cut (recovered 101.2 m, 84.7%) in this section and across the stratigraphic border zone of the Lunde Formation. Hydrocarbons were encountered in the section belonging to the Statfjord Formation. OWC was calculated to be at 2621 m RKB.

Cores 13 and 14 (cut 21.5 m, recovered 100%) were cut further down in the upper member of the Lunde Formation. This formation showed claystone with trace of sandstones and siltstones. Porosity was poor in the sandstones.

The well was drilled to 3000 m RKB (driller's depth) into the upper member of the Triassic Lunde Formation. It was plugged and abandoned after testing as an oil discovery.

2.2 Operation

The drilling rig "Treasure Saga" arrived on location August 23, 1986, and the well was spudded August 26 at 10.25 hrs.

The 36" hole was drilled from 326 m RKB (Seabed) to 428 m RKB. It was not possible to stab in the 30" casing so the well was respudded 20 m north of first location.

The hole was drilled down to 428 m RKB, and the 30" casing was run and cemented with the shoe at 423 m RKB. The seabed diverter was run on riser before a 17 1/2" pilot hole was drilled down to 918 m RKB. The hole was opened to 26" with an underreamer. The seabed diverter was pulled, and the 20" casing was run and cemented with the shoe at 901 m RKB. The BOP was then installed. The 20" casing shoe was drilled out with a 17 1/2" bit, and the section drilled to 1920 m RKB. The 17 1/2" section was logged.

The 13 3/8" casing was run and cemented with the shoe at 1907 m RKB. Cement was drilled out and a leak-off test performed. The formation fractured, and the fractured zone was cemented before the 12 1/4" hole was continued to 2413 m RKB where the mud was displaced to a KCL system.

14 cores were cut from 2522 to 2663 m RKB, and the hole was intermediately logged before the section was drilled to T.D. at 3000 m RKB. The 12 1/4" section was logged, and the 9 5/8" casing run and cemented with the shoe at 2755 m RKB. 4 DSTs were performed. The well was plugged, and the casing was cut before the rig left the location on November 1, 1986, at 18.15 hrs.

2.3 Testing and Formation Evaluation

Well 34/7-10 penetrated the reservoir at 2531.5 m RKB. The oil water contact (OWC) was defined in the Statfjord Formation at 2621 m RKB. The average log porosity in the oil zone was 22.1%, the net/gross was 0.33 and the average water saturation was 32%.

A total of 14 cores were cut and recovered during drilling of the well. The cores were cut in the interval 2522 - 2663 m RKB (driller's depth). A total of 122.3 m of cores were recovered, corresponding to an average recovery of 86.7%.

Four production tests were carried out in the Statfjord Formation. All four produced oil. The maximum oil rate was 973 Sm^3/D. This rate was obtained during production test No. 3, while producing through a 12.7 mm fixed choke, the corresponding wellhead pressure was 107.5 bar.

Further information on testing and formation evaluation is presented in section 5.

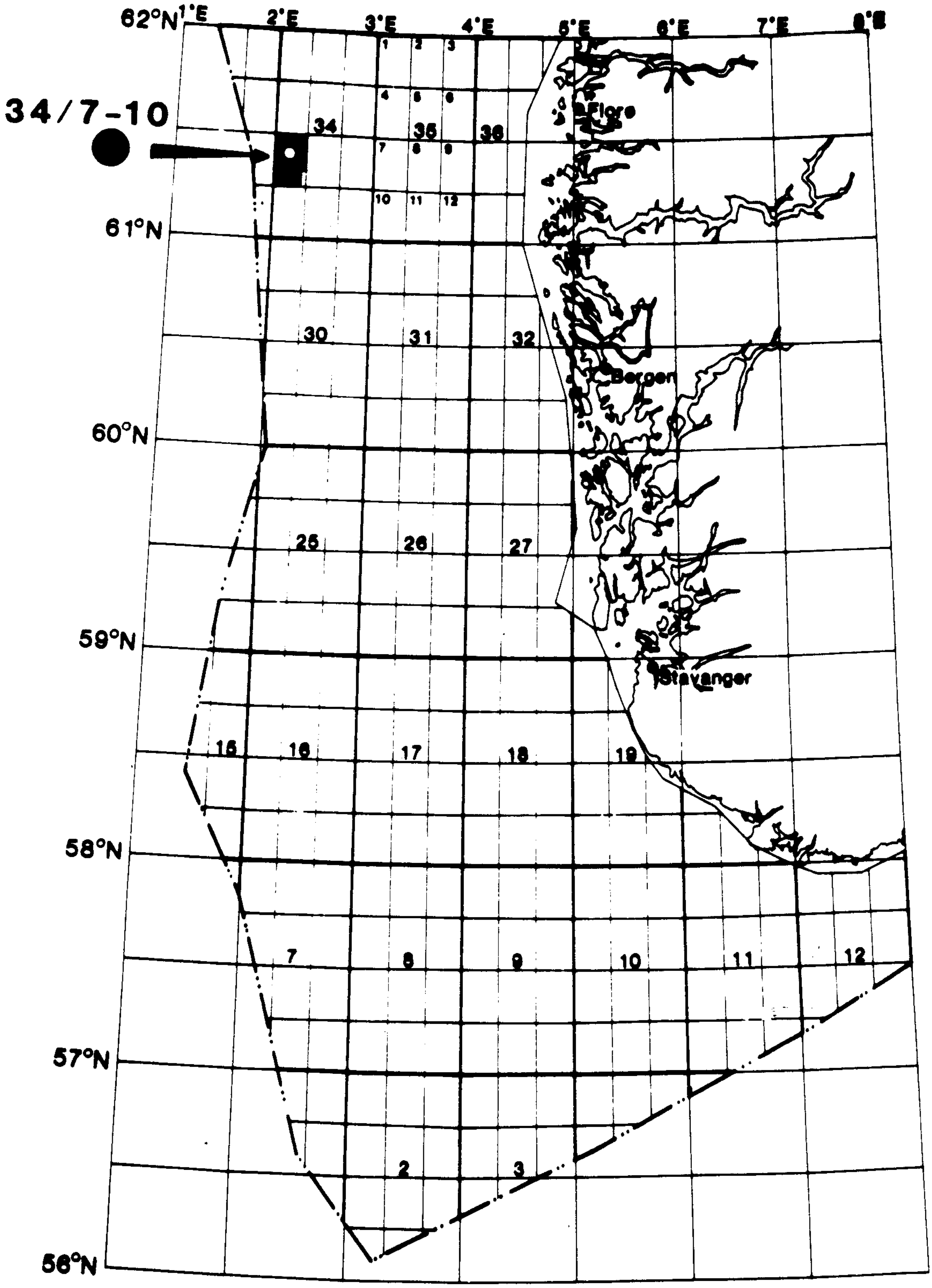
3. GENERAL INFORMATION

3.1 Licence and General Well Information

Licence 089, awarded on March 9, 1984, covers most of block 34/7 on the Tampen Spur, approximately 240 km northwest of Bergen (fig. 3.1).

Group Members	Working Interest	Net Interest
Saga Petroleum a.s. (operator)	10%	10%
Esso	30%	15%
Statoil	23%	50%
Norsk Hydro	12%	12%
Elf Aquitaine	16%	8%
Deminex	8%	4%
DNO	1%	1%

Rig taken over by PL 089:	August 23, 1986.
Spud date:	August 26, 1986.
T.D. date:	September 28, 1986.
Rig released from PL 089:	November 1, 1986.
Completion status:	Plugged and abandoned as an oil discovery.
Final location coordinates:	Latitude 61° 25' 02.64" N Longitude 02° 07' 36.23" E
UTM-coordinates:	6809 754.9 m N 453 388.1 m E
Seismic position:	Line G/E-185, SP 445
Rig:	"Treasure Saga"
RKB - MSL:	26 m
MSL - Seabed (water depth):	300 m
RKB - Seabed:	326 m
RKB - T.D.	3000.0 m RKB (driller's depth) 2999.3 m RKB (logger's depth)



Small scale map, showing the position of well 34/7-10

Fig. 3.1

3.2 Saga Personnel

3.2.1 Drilling

Onshore:

Vice President, Drilling Department:	Reidar O. Nyvik
Senior Manager, Drilling Operations:	Terje Vatn
Senior Drilling Engineers:	Kristian Sirevaag
	Svein Å. Sætervik

Offshore:

Drilling Supervisors:	Tom Bjerke
	Leif A. Johnsen
	Kjell Randulff
	Jan Petter Røed
	Morten Sæbø
	Jon Arne Aase
Assistant Drilling Supervisors:	Ole Kristian Brobakk
	Johan Bysveen
	Einar Framnes
	Øivind Holte

3.2.2 Engineering

Onshore:

Senior Manager, Engineering:	Paul T. Klavenes
Chief Engineer, Engineering:	Tor Stein Ølberg
Senior Drilling Engineers:	Svein Bjørheim
	Jarle Haga
	Helge Varhaug
Drilling Engineers:	Frode Leraand
	Hilde Ødegaard
Chief Engineer Well Testing:	Anders P. Hjellen
Senior Engineer Well Testing:	Yngve Andbo

3.2.3 Geology

Onshore:

Exploration Department

Vice President, Exploration:	Hans Chr. Rønnevik
Senior Manager, Operation Geology:	Bjørn Gustavsen
Operation Geologist:	Terje Solli
Operation Engineer:	Jan Egil Pedersen
Senior Manager, Geophysical Laboratory:	Karl A. Berteussen
Geophysicist:	Kai Hogstad
Geologist:	Kirsten Tibballs
Senior Manager, Geological Laboratory:	Arvid Elvsborg
Micropaleontologist:	Sven A. Bäckström
Palynologist:	Frøydis Eide
Sedimentologists:	Per Bakøy
Geochemist:	Ellen Sofie Mo
Sample distribution:	Kari Chruchow

Offshore:

Well-site Geologists:	Per Bakøy
	Carl W. Carstens
	Geir Dalen
	Brit Riise Fredheim
	Bjørn Karlstad
	Øystein Mjelde
	Terje Solli

34/7 Team Organization, Exploration Department:

Exploration Manager:	Nils B. Hollander
Exploration Deputy Manager:	Bryan G. Pryce
Senior Geological Manager:	Chris P. Stockbridge
Licence Geologists:	Geir W. Diesen
	Knut Jorde
	Nils Ræstad
Senior Geophysical Manager:	Kari Bøyum
Licence Geophysicists:	John Battie
	Atle Edvardsen
	Mark Gorski
	Mona Kjølseth

3.2.4 Petroleum Technology

Onshore:	
Vice President, Petroleum Technology:	Hugo Sandal
Senior Manager, Formation Evaluation:	Bjørn A. Rasmussen
Offshore:	
Petrophysicists:	Jens Bang
	Tormod Førland
Test Engineers:	Bård Beldring
	Sven-Ove Brandvold
	Bengt Hultberg
	Gabriel Jensen
	Robert Nygård
	Thor Sollie
	Ingeborg Vrenne

3.3 Contractors and Service Companies

Drilling Contractor:	Wilh. Wilhelmsen
Mud Logging:	Exploration Logging Norge A/S
Wireline Services:	Dresser Atlas
Mud Engineering:	Dresser Norway A/S, Magcobar
Mud Tracer:	IFE
Cement and Pumping Services:	B.J. Hughes B.V.
Casing Services:	Weatherford Norge A/S
Cutting Services:	Salvesen
Coring Services:	Diamond Boart
Underreaming:	Tri-State
MWD Logging:	Anadrill Schlumberger
ROV Service:	Bergen Underwater Services
Well Head System:	Vetco
Jarring Services:	Eastman Christensen
Stabilizers:	Eastman Christensen
Surface Test Equipment:	Flopetrol
Production Testing:	Flopetrol
DST-Equipment:	Flopetrol
Pressure Recording:	Flopetrol/Matre/Lasalle
Perforating:	Schlumberger/Dresser Atlas
Supply Boats:	"Nordfonn" and "Skandi Beta"
Standby Boat:	"Standby Master"
Helicopter Service:	Helicopter Service A/S
Catering Service:	Wilh. Wilhelmsen

4. GEOLOGY AND GEOPHYSICS

4.1 Geographic and Structural Setting

The 34/7-10 well was drilled in the northern part of the block towards the southern limit of the Snorre Field (fig. 4.1). The Late Triassic - Early Jurassic reservoars of the Snorre Field are made up of a complete series of rotated fault blocks dipping between 5 and 12 degrees to the west and northwest. The structure is divided into elongated fault blocks by major NNE-SSW trending faults. The structure map is defined at the Base Cretaceous/Top Statfjord Formation.

4.2 Purpose of the Well

The primary purpose of well 34/7-10 was to prove Statfjord Formation reserves in the south-east Snorre. Further objectives were to test the Statfjord Formation thickness and sand distribution, to test the extent and quality of the middle Statfjord member and to establish a Statfjord Formation OWC and reservoar parameters of the Statfjord Formation and underlying upper Lunde member.

TOP RESERVOIR SUBCROP MAP

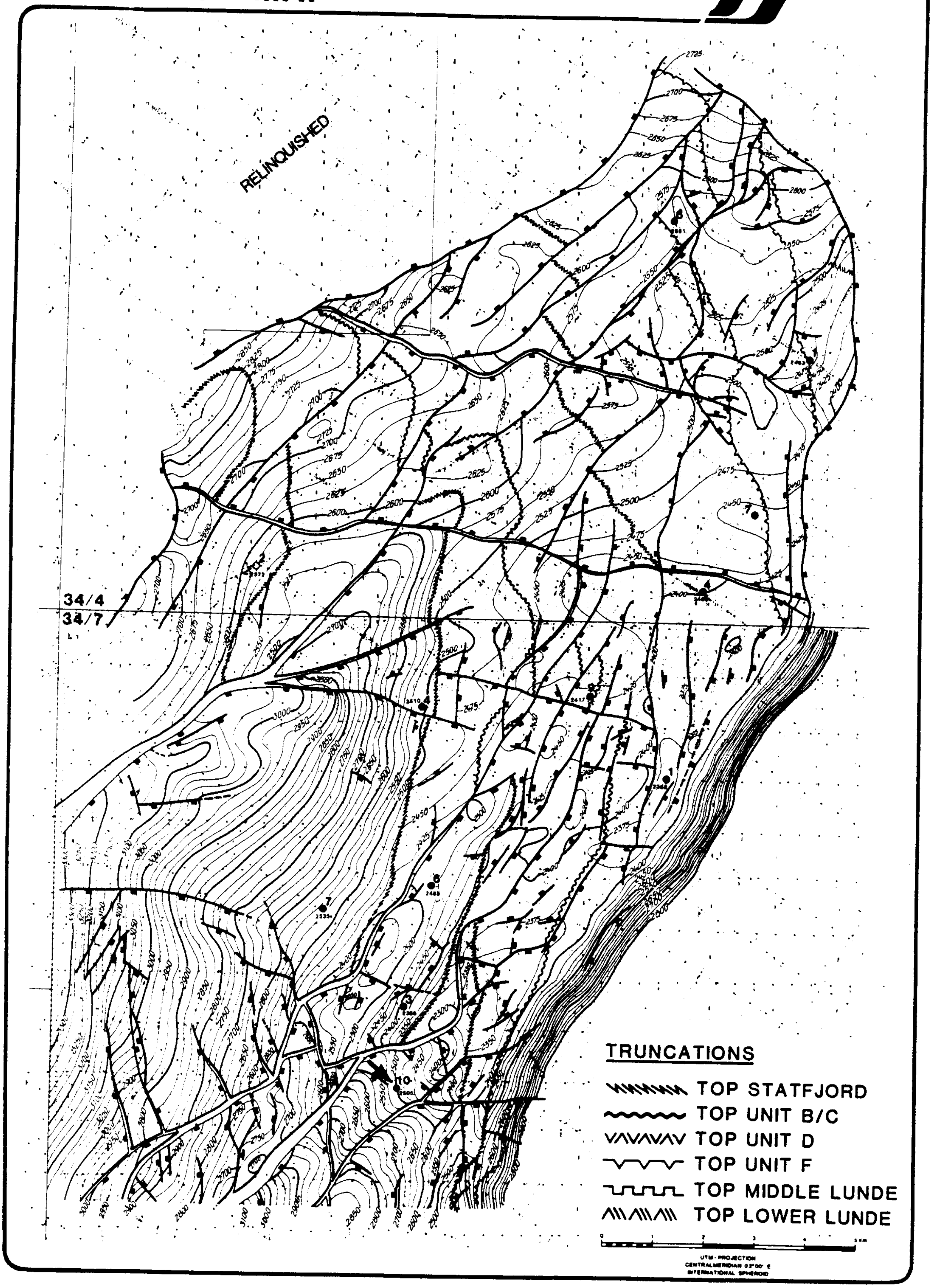


Fig. 4.1

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4.3 Sampling

4.3.1 Routine Samples

The following routine samples were collected:

a) Six sets of wet ditch cuttings (a 1/2 kg).

b) Two sets of well-site washed and dried cuttings.

No returns:	326 (Seabed) - 428 m RKB
10 m intervals:	430 - 2090 m RKB
5 m intervals:	2090 - 2780 m RKB
3 m intervals:	2780 - 3000 m RKB

c) One set of canned composite wet samples for geochemical analyses.

10 m intervals:	430 - 2780 m RKB
9 m intervals:	2780 - 3000 m RKB

4.3.2 Distribution and Analyses of Samples

Six sets of wet cutting samples, two sets of washed and dried samples, and one set of canned samples were collected from first sample return to total depth. These samples were distributed in the following way:

Wet samples:

a) Sent to Robertson Research for paleodating. The rest material was returned to Saga.

b) Treated according to NPD regulations by Geco and sent to NPD.

c) Washed and divided into 10 splits by Geco and transferred to Statoil as trade sets.

d) Washed and dried by Geco, and sent to Saga, Høvik.

e) Sent to Saga, Høvik, for paleontological and mineralogical analyses.

f) Washed and divided into 6 splits by Geco. One split containing one half of this set was transferred to Statoil, and the other splits were sent to partners.

Washed and dried samples directly from the rig:

a) One set transferred to Saga, Høvik.
b) One set transferred to NPD.

Canned samples were sent to Saga, Arkivrommet, Hamang Næringssenter, Eyvind Lychesvei 21C, 1300 Sandvika.

The petrophysical measurements and the slabbing of the cores were carried out by Geco. Cut C was sent to Statoil and cut D to NPD. Cuts A and B were transferred to Arkivrommet, Sandvika, for detailed sedimentological and structural description together with petrographical and paleontological analysis. The A and B cuts will be stored at Arkivrommet, Hamang Næringssenter, Eyvind Lychesvei 21C, 1300 Sandvika, when the analyses are completed.

The sidewall cores (SWC) were sent to Saga, Høvik, for paleontological, geochemical and petrographical analysis. Selected SWC were sent to Robertson Research for paleodating.

4.3.3 Conventional Cores

Core No. 1	Cut	:	2522.0 - 2540.5 m RKB
	Recovered	:	2522.0 - 2539.1 m RKB
	Recovery	:	17.1 m (92.4%)
	Correction factor	:	0
	Recovered interval, log	:	2522.0 - 2539.1 m RKB
Core No. 2	Cut	:	2540.5 - 2552.5 m RKB
	Recovered	:	2540.5 - 2551.6 m RKB
	Recovery	:	11.1 m (93%)
	Correction factor	:	0.5 m
	Recovered interval, log	:	2441.0 - 2552.1 m RKB
Core No. 3	Cut	:	2552.5 - 2558.5 m RKB
	Recovered	:	2552.5 - 2558.4 m RKB
	Recovery	:	5.9 m (98.3%)
	Correction factor	:	0
	Recovered interval, log	:	2552.5 - 2558.4 m RKB
Core No. 4	Cut	:	2558.5 - 2574.0 m RKB
	Recovered	:	2558.5 - 2573.9 m RKB
	Recovery	:	15.4 m (99.4%)
	Correction factor	:	0
	Recovered interval, log	:	2558.5 - 2573.9 m RKB
Core No. 5	Cut	:	2574.0 - 2592.0 m RKB
	Recovered	:	2574.0 - 2577.7 m RKB
	Recovery	:	3.7 m (21%)
	Correction factor	:	0
	Recovered interval, log	:	2574.0 - 2577.7 m RKB
Core No. 6	Cut	:	2592.0 - 2599.5 m RKB
	Recovered	:	2592.0 - 2598.0 m RKB
	Recovery	:	6 m (80%)
	Correction factor	:	1 m
	Recovered interval, log	:	2593.0 - 2599.0 m RKB

Core No. 7	Cut	:	2599.5 - 2602.0 m RKB
	Recovered	:	2599.5 - 2602.0 m RKB
	Recovery	:	2.5 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2599.0 - 2601.5 m RKB
Core No. 8	Cut	:	2602.0 - 2608.5 m RKB
	Recovered	:	2602.0 - 2608.5 m RKB
	Recovery	:	6.5 m (100%)
	Correction factor	:	0
	Recovered interval, log	:	2602.0 - 2608.5 m RKB
Core No. 9	Cut	:	2608.5 - 2617.5 m RKB
	Recovered	:	2608.5 - 2617.5 m RKB
	Recovery	:	9 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2608.0 - 2617.0 m RKB
Core No. 10	Cut	:	2617.5 - 2624.0 m RKB
	Recovered	:	2617.5 - 2624.0 m RKB
	Recovery	:	6.5 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2617.0 - 2623.5 m RKB
Core No. 11	Cut	:	2624.0 - 2635.5 m RKB
	Recovered	:	2624.0 - 2635.5 m RKB
	Recovery	:	11.5 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2623.5 - 2635.0 m RKB
Core No. 12	Cut	:	2635.5 - 2641.5 m RKB
	Recovered	:	2635.5 - 2641.5 m RKB
	Recovery	:	6 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2635.0 - 2641.0 m RKB

Core No. 13	Cut	:	2641.5 - 2655.0 m RKB
	Recovered	:	2641.5 - 2655.0 m RKB
	Recovery	:	13.5 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2641.0 - 2654.5 m RKB
Core No. 14	Cut	:	2655.0 - 2663.0 m RKB
	Recovered	:	2655.0 - 2663.0 m RKB
	Recovery	:	8 m (100%)
	Correction factor	:	-0.5 m
	Recovered interval, log	:	2654.5 - 2662.5 m RKB

Comments:

All core depths (cut) in section 4.3.3 correspond to driller's depth. The log depths correspond to the DIFL-LSBHC logs. The wellsite core descriptions are presented in Enclosure III, and the core analyses are given in chapter 5.2.

4.3.4 Sidewall Cores

Three runs were made with coregun, attempting a total of 125 sidewall cores.

98 cores were recovered (78%), 16 were lost, 9 were empty and 2 were misfires.

The geological descriptions are given in table 4.1.

Table 4.1: Sidewall Core Description, well 34/7-10

No. on log	Depth m RKB	Lithology
1	980.9	Clyst, sl aren, sl slty, m-dk gy - olv gy, stc, sl mic-mica, sl calc
2	988.9	Sample as above
3	998.0	Ss, qtz, clr-lt gy, vf-f, w srtd, sbrnd, lse, sl mic- mica, glauc, calc
4	1002.9	Ss, v arg, olv gy - m dk gy, clr qtz grn, lse-fri, sl mic-mica, glauc, mic fos, calc
5	1119.9	Clyst, v slty - v aren, brn blk - olv gy, stc, glauc, sl mic-mica, sl calc
6	1131.9	Sltst, arg-aren, olv gy, fri, sl mic-mica, glauc, sl calc
7	1136.5	Sltst, v arg - aren, olv gy, frm, sl mic-mica, glauc, calc
8	1142.9	Clyst, v slty, olv gy, frm, sl mic-mica, non calc
9	1151.9	Sltst, arg, olv gy - brn gy, sl mic-mica, non-sl calc
10	1670.9	Clyst, m gy - gn gy, stc, gsy surf, non-sl calc
11	1678.5	Sltst, v arg, mod brn /blk specs, frm-hd, v calc
12	1680.9	Sltst, v arg, m gy - gn gy, fri-frm, sl-non calc
13	1684.4	Clyst, tuf, v slty, m-dk gy - olv gy /specs, frm, non calc
14	1692.4	Clyst, tuf, sl slty, m-dk gy - olv gy /specs, stc, non calc
15	1719.5	Clyst, v slty, else as above
16	1722.9	Clyst, v slty, gn gy - bl gy, frm, gsy surf, sl calc
17	17228.4	Clyst, olv gy - m dk gy, stc, non calc
18	1735.9	Clyst, olv gy - m dk gy, stc, non calc
19	1851.9	Clyst, as above
20	1859.4	Clyst, v slty, m gy - gn gy, stc, v calc
21	1863.4	Clyst, frm, else as above
22	1867.4	Clyst, sl slty, m gy - gn gy, stc, v calc
23	1875.5	Clyst, m-dk gy - olv gy, stc, v calc
24	1930	Clyst, dk gy - m dk gy, sft, v calc
25	1955	Clyst, as above
26	1975	Clyst, m-dk gy, sft, non fis, calc
27	1995	Clyst, m-dk gy, sft, wxy, non fis, glauc, non calc
28	2025	Clyst, dk gy, sft, non fis, non calc

No. on log	Depth m RKB	Lithology
29	2042	Clyst, dk gy, sft, non fis, calc
30	2065	Clyst, dk gy, sft, non fis, sl calc
31	2085	Clyst, dk gy, sft, wxy, non fis, non calc
32	2105	Clyst, dk gy, sft-frm, non fis, sl calc - non calc
33	2125	Clyst, dk gy, sft-frm, non fis, non calc
34	2143.6	Clyst, dk gy, frm, non-sl fis, occ blky, non calc
35	2145	Clyst, dk gy, frm, non fis, sl calc
36	2205	Clyst /lent slty lam (1 mm) Clyst, dk gy, frm, non fis, non calc
37	2225	Clyst, dk gy, v sft, v stc, calc
38	2246.2	Clyst, dk gy, sft-frm, non fis, v calc
39	2265	Clyst /thin slty lam (white) Clyst, dk gy, frm, non fis, non calc Shows in thin slty lam, w weak hc od, sl brn o stn, 100% str-mod yel-wh flor, str m yel wh cut
40	2305	Clyst, as above
41	2365	Clyst, dk gy, frm, non fis, calc
42	2385	Clyst, dk gy, frm, calc
43	2393	Clyst, dk gy, sft-frm, sl stc, v calc
44	2394	Mrl, dk rd brn, sft-frm, sl stc
45	2395	Mrl, lt olv gy, frm, sl stc, occ carb
46	2396	Mrl, as above
47	2398	Mrl, gn gy, frm
48	2400	Sltst, v arg, gn gy, sbang, frm-hd, sl mica, non calc Shows, fr-p hc od, g (80%) lt brn o stn, gold yel gn weak flor, fast-inst streaming milky wh flor
49	2402	Sltst, as above Shows, fr-p hc od, g lt brn o stn, gold yel gn weak flor, fast-slow strmg weak milky wh cut
50	2404	Sltst, v arg, gn gy, sbang, frm, occ sl stc, mica, sl calc Shows, p hc od, p o stn, weak gold yel gn flor, slow streaming, cloudy-streaming weak milky wh cut
51	2407	Sltst, olv gy, frm, v mica, calc
52	2423	Sltst, as above

No. on log	Depth m RKB	Lithology
53	2425	Clyst, slty, olv gy, frm, sbfis, mica, sl calc
54	2427	Sltst, olv gy, frm, mica, sl calc Shows, p hc od, p o stn, weak gold yel gn flor, slow streaming, cloudy-streaming weak milky wh cut
55	2430	Clyst, slty, olv gy, frm, sbfis, mica, sl calc
56	2439	Clyst /thn strg of wh sltst, else as above Shows in sltst, p hc od, p o stn, weak gold yel gn flor, slow streaming, cloudy-streaming weak milky wh cut
57	2439.8	Clyst grdg sh, dk gy, frm-hd, sbfis, sl-non mica, calc
58	2441.5	Ss, sl arg, olv gy, qtz, clr, vf-f, w srtd, ang-sbang, fri, sl mica, calc, fr por Shows, g hc od, g o stn, 75% mod yel flor, fast strmg wh bl cut
59	2442.5	Sample, as above
60	2470	Clyst, sdy, dk gy, frm-hd, fis, sl mica, v calc, tr of shows
61	2512	Ss, v arg, olv gy, vf-f, w srtd, sbang-ang, frm, v mic-mica, v calc, fr por Shows, fr-g hc od, fr o stn, strg (10-15%) of mod-weak yel flor, slow strm yel-wh cut
62	2513	Sample, as above
63	2514	Sample, as above
64	2515	Sample, as above
65	2584.5	Ss, arg, lt gn gy, qtz, clr, vf-c, p srtd, sbang, fri-frm, mica, non calc, p por
66	2586.5	Ss, qtz, lt yel gy, vf-f, occ m, mod srtd, sbang, fri- frm, sl mica, sl calc, fr por Shows, g hc od, 100% lt yel brn o stn, 100% mod yel flor, sl strmg wh yel cut
67	2683.2	Clyst, dk rd brn, occ mod olv brn, frm, sbfis, calc
68	2683.3	Sample, as above
69	2685.8	Ss, qtz, lt gn gy, vf, w srtd, sbang, frm-hd, v mica, sl-non calc, p por
70	2701	Sltst, v arg, dk rd brn, frm, occ hd, sbfis, v mic-mica, calc

No. on log	Depth m RKB	Lithology
71	2701.1	Clyst, slty, dk rd brn, frm, occ sft, v calc
72	2709.8	Clyst, dk rd brn, frm-hd, fis, non calc
73	2726.8	Ss, qtz, lt gn gy, vf-f, w srtd, sbrnd-sbang, fri-frm, v mica, non calc, p por
74	2744	Clyst, dk rd, occ lt olv brn, sl stc, frm, sbfis, mic-mica, v calc
75	2768.4	Sltst, dk rd brn - dsk rd, frm, occ hd, v mic-mica, sl-non calc
76	2785	Sltst, sdy, dk rd brn, frm, occ v hd, blky, v calc
77	2789	Clyst, dk rd, occ lt olv brn, frm-hd, blk, sl-non calc
78	2802.1	Ss, qtz, lt gn gy - wh, vf-f, w srtd, sbang, fri, sl calc cmt, mica, p por
79	2812	Ss, qtz, arg, v dsk rd, clr-lt brn rd, vf-f, occ m, mod srtd, frm, v mica, sl-non calc
80	2814	Sample, as above
81	2816	Ss, qtz, arg, gy rd, vf, occ f, w srtd, sbang, fri- frm, mica, sl-non calc
82	2818	Ss grdg sltst, arg, dk rd brn, vf, sbang, frm, v mica, sl-non calc, p por
83	2820	Ss, qtz, lt gn gy - wh, pred f, occ vf and m, w-mod srtd, ang-sbang, fri-frm, sl calc cmt, mica, p-fr por
84	2822.5	Sltst /thn strng of ss Sltst, dk rd brn, frm, mica, non-sl calc Ss, lt gn gy, vf, frm, mica, non-sl calc
85	2824	Ss, lt gn gy, vf-f, occ m, mod srtd, frm, mica, sl calc cmt, p por
86	2828	Sltst grdg ss, dk rd brn, fri, mica, calc
87	2833	Ss, gy rd, lt brn - orng yel, vf-f, occ m, mod srtd, frm, v mica, calc, p por
88	2837.5	Sample as above, but sl arg
89	2867.1	Clyst grdg to mrl, dk rd brn, occ lt gn gy, frm, occ hd, v calc
90	2875.1	Ss, sl arg, lt gy rd, lt brn - orng yel, vf-f, occ m, mod srtd, frm, mica, sl calc cmt, fr por

No. on log	Depth m RKB	Lithology
91	2886	Clyst, dk rd brn, occ lt olv brn, frm-hd, blky, sl calc
92	2875.1	Ss, sl arg, lt gy rd, lt brn - orng yel, vf-f, occ m, mod srtd, frm, mica, sl calc cmt, fr por
93	2896.2	Clyst and ss Clyst, m gn gy, wxy, sft, non calc Ss, wh, vf, hd, tt calc cmt
94	2922	Ss, arg, lt gy rd - brn rd, lt brn - yel orng, vf-f, w srtd, sbang, frm, mica, calc cmt, p por
95	2925	Sample, as above
96	2926.2	Sample, as above
97	2928.5	Sample, as above
98	2946.2	Clyst, v col, dk brn rd, mod yel-brn, m gn gy, frm, occ v hd, calc - v calc
99	2965.5	Sltst, dk rd brn, frm-hd, blk, v mic-mica, sl-non calc

4.4 Open Hole Logs

Casing Record	Hole Size	Logged Interval (m RKB)	Type of Log	Run No.	Date
30" 423 m	36" to 428 m		GR to surface	1A	07.09.86
20" 901 m	26" to 918 m		MWD (GR, Res) GR	1A	07.09.86
13 3/8" 1907 m	17 1/2" to 1920 m	 901 - 1905 23 samples rec. 400 - 1904	MWD (GR, Res) DIFL-LSBHC-GR COREGUN CBL	 1A 1A 2B	 07.09.86 07.09.86 23.09.86
9 5/8" 2755 m	12 1/4" to 3000 m	 2700 - 1906 2700 - 1906 2700 - 1906	MWD (GR, Res) DIFL-LSBHC-GR CDL-CNL-GR DLL-MLL-GR FMT/RFL	 2B 2A 2A 2A-E	 23.09.86 23.09.86 24.09.86 25.09.86
T.D. 2999.3 m (logger's depth)		 3000 - 2500 3000 - 2500 3000 - 2500 3000 - 1906 76 samples rec.	MWD (GR, Res) DIFL-LSBHC-GR CDL-CNL-GR ZCDL DIPLOG RFT VSP COREGUN	 3C 3C 3A 3A 3F 3A 3B-C	 28.09.86 28.09.86 28.09.86 28.09.86 28.09.86 29.09.86 29.09.86

4.5 Well Velocity Survey

A zero offset VSP was acquired and processed by GWS.

Two Bolt 1500-airgun, 268 cu.in. capacity each, a Teledyne Fjord Instruments hydrophone and a Geosource VSP tool were used during acquisition.

The gun offset was 35 m at 280 deg. The gun depth was 5 m, and the hydrophone depth was 3 m.

The spatial sampling rate was 20 m while the time sampling rate was 1 ms. Total recording length was 4 sec. Number of shots at each level varied between 4 and 10.

The VSP started at 3000 m RKB (actual 2990 m RKB) and was then shot every twenty meter up to 1500 m RKB. Checkshots were shot at 1400, 1300, 1040, 1100, 1000 and 900 m RKB.

The corrected velocity and density data were used in the production of the synthetic seismograms by GWS. Frequency tests were performed, using a minimum and a zero phase Ricker wavelet with center frequencies at 15, 20, 25, 30 and 35 Hz. Synthetic seismograms were produced for the frequency of a 25 Hz Ricker wavelet. All synthetic seismograms were displayed in both normal and reverse polarity with both minimum and zero phase Ricker wavelets. The display scales were 10 cm/sec.

Fig. 4.2 shows the lithological colum, the VSP, the synthetic seismogram and a selection of the seismic line G/B-185 around the well location.

A seismic summary is given in table 4.2. The composite well log also shows the travel times to the different geological units and reflectors.

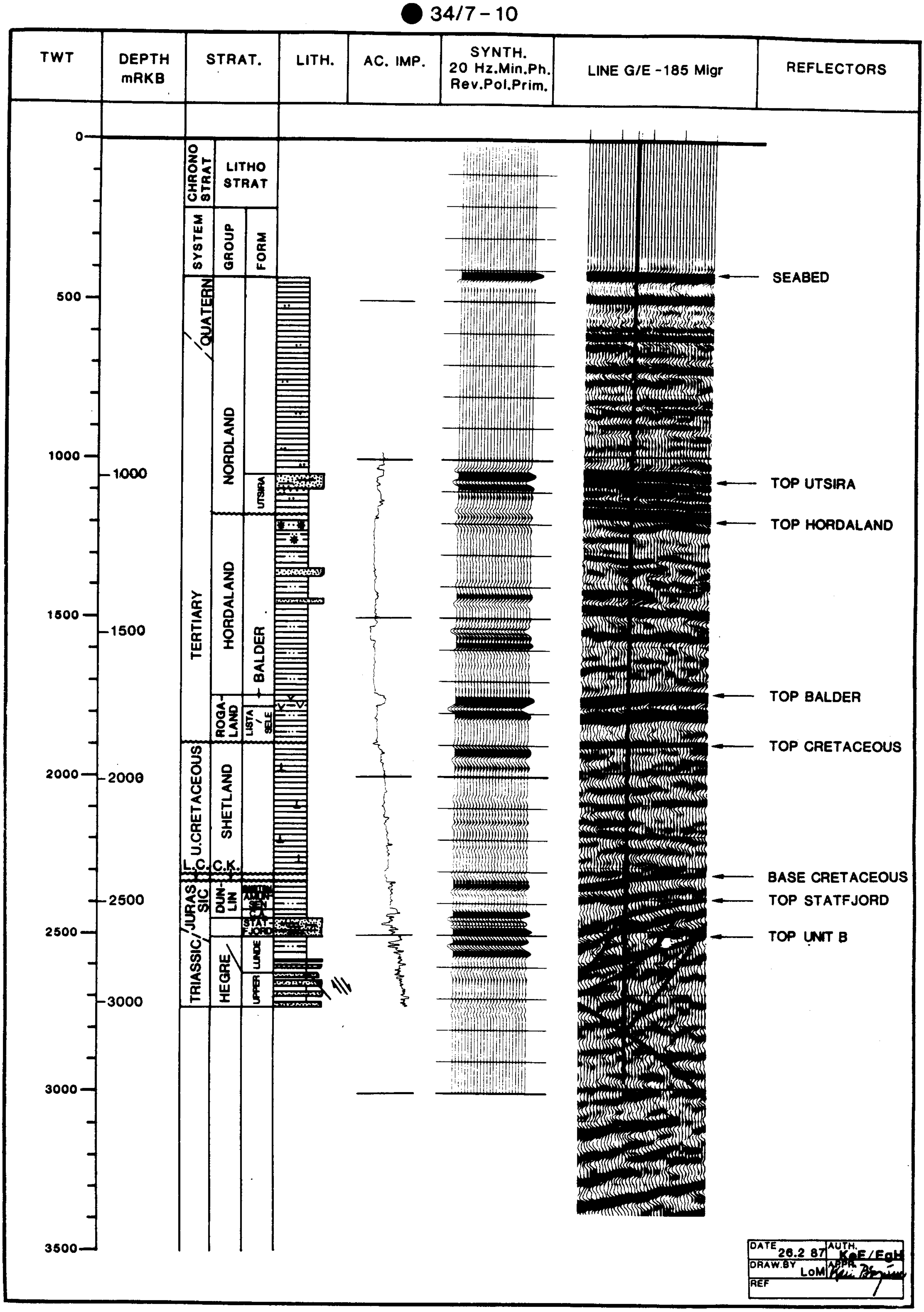
34/7 - 10
TWT
DEPTH mRKB
STRAT.
LITH.
AC. IMP.
SYNTH. 20 Hz.Min.Ph. Rev.Pol.Prim.
LINE G/E -185 Migr
REFLECTORS
CHRONO STRAT
LITHO STRAT
SYSTEM
GROUP
FORM
QUATERN
TERTIARY
U.CRETACEOUS
L.C.
JURASSIC
TRIASSIC
NORDLAND
UTSIRA
HORDALAND
BALDER
ROGALAND
LISTA / SELE
SHETLAND
C.K.
DUNLIN
STATFJORD
HEGRE
LUNDE
UPPER
SEABED
TOP UTSIRA
TOP HORDALAND
TOP BALDER
TOP CRETACEOUS
BASE CRETACEOUS
TOP STATFJORD
TOP UNIT B
0
500
1000
1500
2000
2500
3000
3500
DATE 26.2 87
AUTH. KeE/EgH
DRAW.BY LoM
APPR.
REF

Fig. 4.2

Table 4.2: Seismic summary, line G/E-185, SP 445.

HORIZONS	TWT ms	DEPTH m MSL	DEPTH m RKB	Δz m	ΔT ms	VINT m/s
				300.0	0.405	1480
Seabed	0.4054	300.0	326.0			
				667.0	0.647	2063
T. Utsira	1.0520	967.0	993.0			
				100.0	0.090	2232
T. Hordaland	1.1416	1067.0	1093.0			
				33.0	0.030	2171
Intra Oligocene Unc.	1.1720	1100.0	1126.0			
				556.0	0.563	1974
T. Balder	1.7353	1656.0	1682.0			
				46.0	0.037	2500
Lista/Sele	1.7721	1702.0	1728.0			
				180.5	0.164	2208
T. Cretaceous	1.8988	1836.5	1862.5			
				531.5	0.431	2465
Cromer Knoll	2.3301	2368.0	2394.0			
				537.5	0.435	2469
B. Cretaceous	2.3342	2374.0	2400.0			
				131.5	0.096	2745
T. Statfjord	2.4300	2505.5	2531.5			
				105.0	0.075	2796
T. Upper Lunde	2.5051	2610.5	2636.5			
				363.5	0.230	3159
T.D.	2.7352	2974.0	3000.0 (driller's depth)			

4.6 Formation Temperature

The maximum recorded temperatures (BHT) obtained during logging have been converted to static formation temperatures (T_f) using a Horner plot technique. The recorded BHTs and the estimated static formation temperatures are listed in table 4.3. The data used for the calculations are listed in table 4.4.

All the data have been plotted in fig. 4.3.

In addition to the calculated static formation temperatures, bottom hole temperatures were measured during testing:

m RKB	Temp. °C
2609.8	81.7
2583.9	95.0
2534.5	95.0
2517.0	92.3

Table 4.3: Average bottom hole temperatures (BHT) and static formation temperatures (T_f).

Depth m RKB	No. of BHT readings	Average BHT °C	T_f °C
1887	3	43	56.5
2678	3	54	
2689.5	3	68	81
2685.5	3	71	
2978.5	3	58	
2989.7	3	69	92
2989.5	3	78	
2985.6	3	79	

Table 4.4: Temperature Data

Log	Date	Run No.	Btm log interval (m RKB)	Avg. rec. temp. °C (BHT)	Time since circ. hrs. (d t)	Circ. time hrs. (t)
DIFL-LSBHC-GR	07.09.86	1A	1905	43	4.9	5.6
DIFL-LSBHC-GR	23.09.86	2B	2700	54	4.8	6.8
CNL-CDL-GR	23.09.86	2A	2699.5	68	10.8	4.0
DLL-MLL-GR	24.09.86	2A	2699.5	71	16.4	5.6
DIFL-LSBHC-GR	28.09.86	3C	2999.5	58	4.8	3.2
CDL-CNL	28.09.86	3B	2998.5	69	8.2	3.2
Z DENS	29.09.86	3A	2998.5	78	12.9	3.2
DIPLOG	29.09.86	3A	2998.0	79	17.9	3.2

FORMATION TEMPERATURE

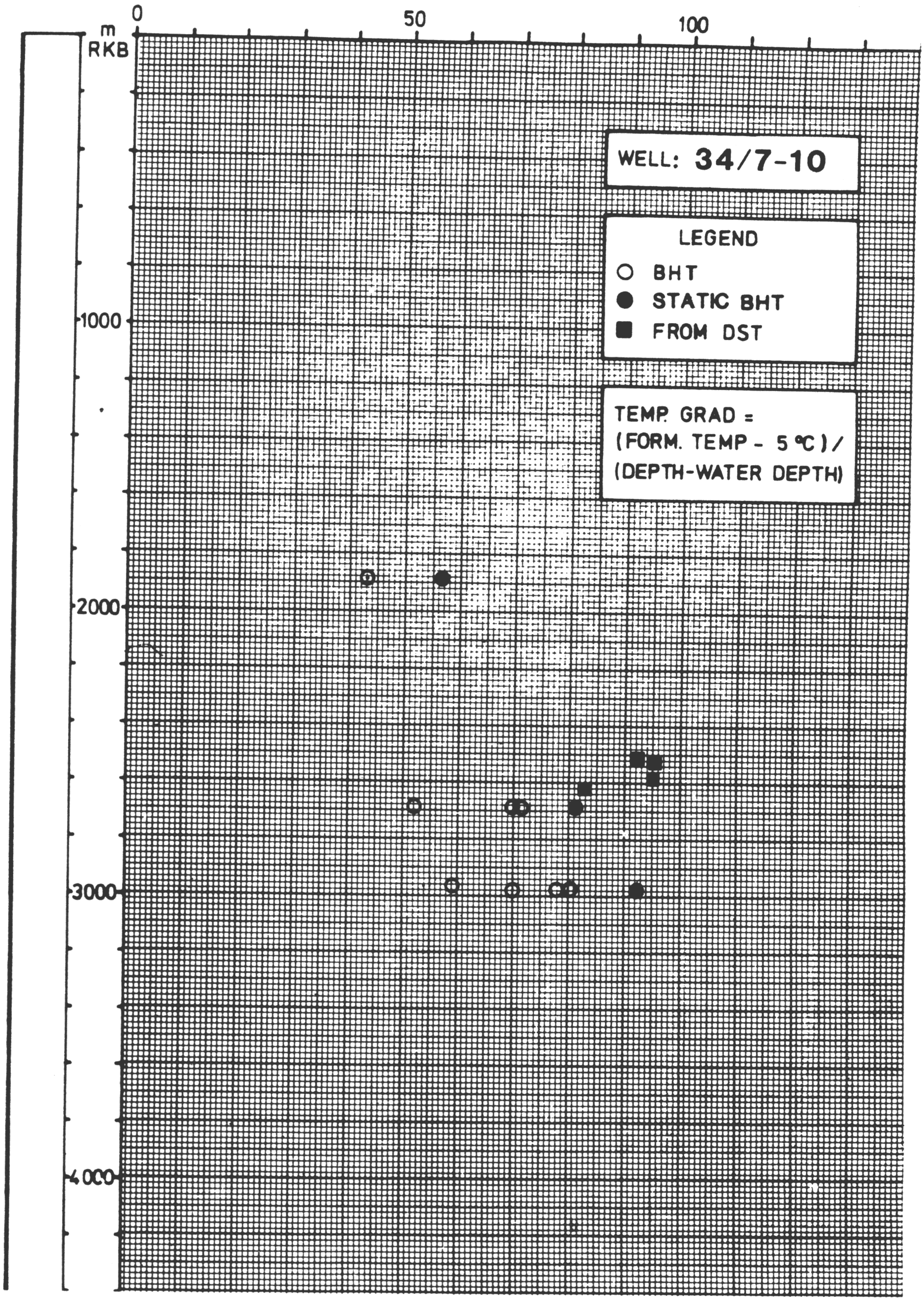

Fig. 4.3

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Draw by RHK	Ref	

4.7 Formation Pressure

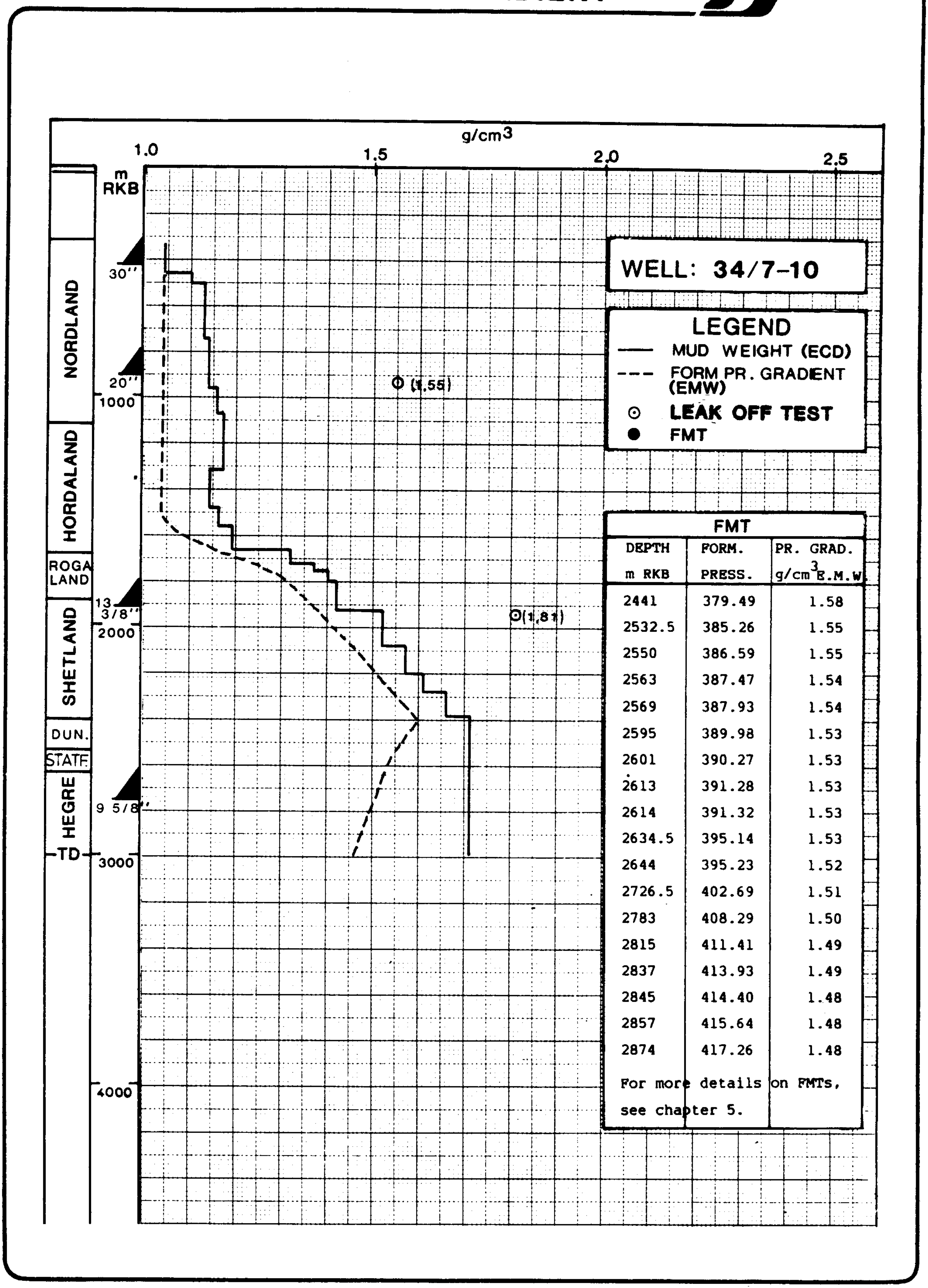
The most relevant pressure parameters are plotted in the Formation Pressure Evaluation Sheet (Enclosure II). A formation pressure gradient summary, including mud weights (ECD), leak-off test data, stratigraphy and FMT results, is given in fig. 4.4.

The sediments of the Nordland Group seem to have normal pressure conditions throughout the entire sequence, i.e. a pressure gradient of 1.04 g/cm^3 (E.M.W. = 1.01 g/cm^3 at 800 m RKB). This is confirmed by the d_c-exponent which plots on a good normal compaction trend at least below 700 m RKB. In the lower part of the Nordland Group deviations to the left are seen on the d_c-exponent, which is caused by the Utsira sands. Background gas is rather constant for the upper part of the interval averaging 0.4%, but in the lower part the gas values drop to around 0.2% in spite of a more sandy formation. Maximum mud weight (ECD) over this section is 1.17 g/cm^3. Sonic log was run from 900 m RKB and confirms normal pressure conditions in the Nordland Group.

The upper part of the Hordaland Group down to approximately 1530 m RKB gives no sign of overpressure. The d_c-exponent plots on a trend clearly shifted to the left compared to the trend established in the Nordland Group, which is looked upon as an effect of a new type of formation (i.e. change in clay mineralogy) and not any changes in pore pressure gradient. Background gas plots close to zero over this interval although the mud weight (ECD) is reduced to 1.14 g/cm^3. The sonic log trend is also shifted when entering the sediments of the Hordaland Group for the same reason as for the d_c-exponent. Minor deviations around 1375 m RKB and 1475 m RKB are caused by lithology changes.

Below 1530 m RKB both the d_c-exponent and the sonic log give clear indications of a build-up in pressure gradient. A very slight increase is also seen in the background gas with a stepwise increase in mud weight (ECD) to 1.19 g/cm^3. From this level the pressure gradient rises steadily throughout the rest of the Hordaland Group. At the base (1682 m RKB) the pressure gradient can be estimated to 1.18 g/cm^3 (E.M.W. = 1.16 g/cm^3).

FORMATION PRESSURE GRADIENT



FMT		
DEPTH m RKB	FORM. PRESS.	PR. GRAD. g/cm^3 E.M.W
2441	379.49	1.58
2532.5	385.26	1.55
2550	386.59	1.55
2563	387.47	1.54
2569	387.93	1.54
2595	389.98	1.53
2601	390.27	1.53
2613	391.28	1.53
2614	391.32	1.53
2634.5	395.14	1.53
2644	395.23	1.52
2726.5	402.69	1.51
2783	408.29	1.50
2815	411.41	1.49
2837	413.93	1.49
2845	414.40	1.48
2857	415.64	1.48
2874	417.26	1.48

For more details on FMTs, see chapter 5.

Fig. 4.4

Date April.87	Auth. JEP	Appr TSo
Draw by RHK	Ref	

The increase in pressure gradient also continues throughout the Rogaland Group. Trend shifts both in the d_c-exponent curve and the sonic log complicate the pressure evaluation in the Rogaland Group. By shifting normal trend lines according to shifts in the actual curves, pressure estimates can be performed also over this section. At 1750 m RKB, in the Rogaland Group, the pressure gradient is estimated to be 1.30 g/cm^3 (E.M.W. = 1.28 g/cm^3).

The mud weight (ECD) was increased from 1.19 g/cm^3 to 1.42 g/cm^3 when drilling the Rogaland Group. In spite of this a very slight increase is seen in the background gas data, specially at the base of the section. This is interpreted as an evidence of a steady increasing pressure gradient.

The pressure parameters indicate an increasing pressure gradient also in the sediments of the Shetland Group.

Again clear trend shifts are displayed both in the d_c-exponent and in the sonic log when entering the Shetland Group sediments. Therefore the normal trend lines have to be shifted accordingly.

In the upper part of the Shetland Group the sonic log plots on a close to vertical trend which is taken as a sign of undercompacted sediments. In the lower part minor trend shifts towards lower Δts are observed. This is looked upon as formation effects rather than any regression in pressure gradient.

Background gas data support this by displaying increasing values below 2150 m RKB towards Top Dunlin Group at 2400 m RKB with a gradual increase in mud weight (ECD) from 1.56 to 1.67 g/cm^3. Pressure estimates, based on the sonic log, at 2050 m RKB in the Shetland Group give pressure gradients of 1.46 g/cm^3 (E.M.W. = 1.44 g/cm^3) and 1.57 g/cm^3 (E.M.W. = 1.55 g/cm^3) respectively.

In the Dunlin Group and downwards throughout the Statfjord and Lunde (Hegre Group) Formations towards T.D. several measurements (FMTs) were performed. The shallowest reading at 2441 m RKB (in the Dunlin Group) gives a pressure gradient of 1.60 g/cm^3 (E.M.W. = 1.58 g/cm^3) which is maximum in the well.

In the Statfjord Formation (reservoir) a reading at 2532.5 m RKB yields a pressure gradient of 1.57 g/cm^3 (E.M.W. = 1.55 g/cm^3). Vertical pressure communication exists throughout the Statfjord and Lunde Formations towards T.D. at 3000 m RKB.

Therefore the pressure gradient decreases towards T.D. according to an oil gradient of 0.073 bar/m and a water gradient of 0.099 bar/m (for more details on FMTs see fig. 4.4 and chapter 5).

The pressure gradient at the well's T.D. (3000 m RKB) can be calculated to 1.47 g/cm^3 (E.M.W. = 1.46 g/cm^3) using the mentioned water gradient.

4.8 Shallow Gas

4.8.1 Site Survey

Shallow gas has been interpreted based on amplitude anomalies and diffraction patterns. Amplitude anomalies have been observed on the seismic sections at or close to the well-site at 466 m RKB (= Base Quaternary sand layer) 582 m RKB (= Intra Pliocene reflector) and 635 m RKB. The upper of the three levels displayed the strongest anomaly (fig. 4.5).

4.8.2 Well Logs

Well logs confirmed that shallow gas was present in the sand at 466 m RKB (~1.35% gas). There was, however, a decrease in resistivity (MWD log) at this point, contrary to anticipated log response.

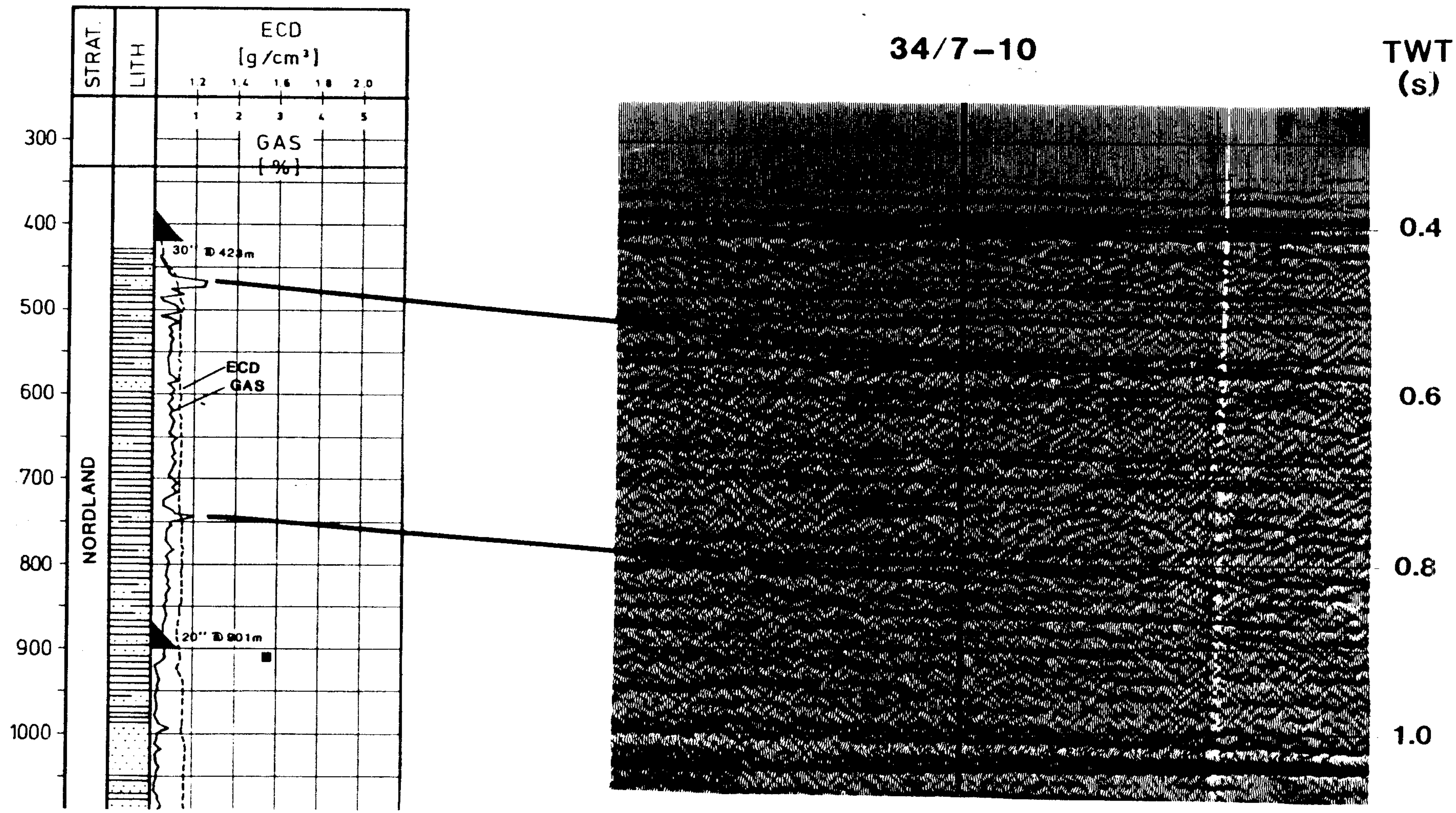
The sand layer at the Intra Pliocene reflector did not contain gas, nor did the anomaly at 635 m RKB.

There was, however, a small gas peak (~1.0%) at 745 m RKB which cannot be related at any significant seismic signal, nor to any other well log response.

Correlation between the seismic section and the well observation of gas is seen on fig. 4.5.

Fig. 4.6 correlates shallow gas observations at or close to the Snorre Field to the main seismic reflectors in the area. Only increased gas readings which cannot be related to operational procedures are included in this summary. Higher levels of background gas readings have not been interpreted as a shallow gas readings on this figure.

Well Data and Shallow Seismic



Seismic line SG 8431-718

Fig. 4.5

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SNORRE – Shallow Gas Correlation

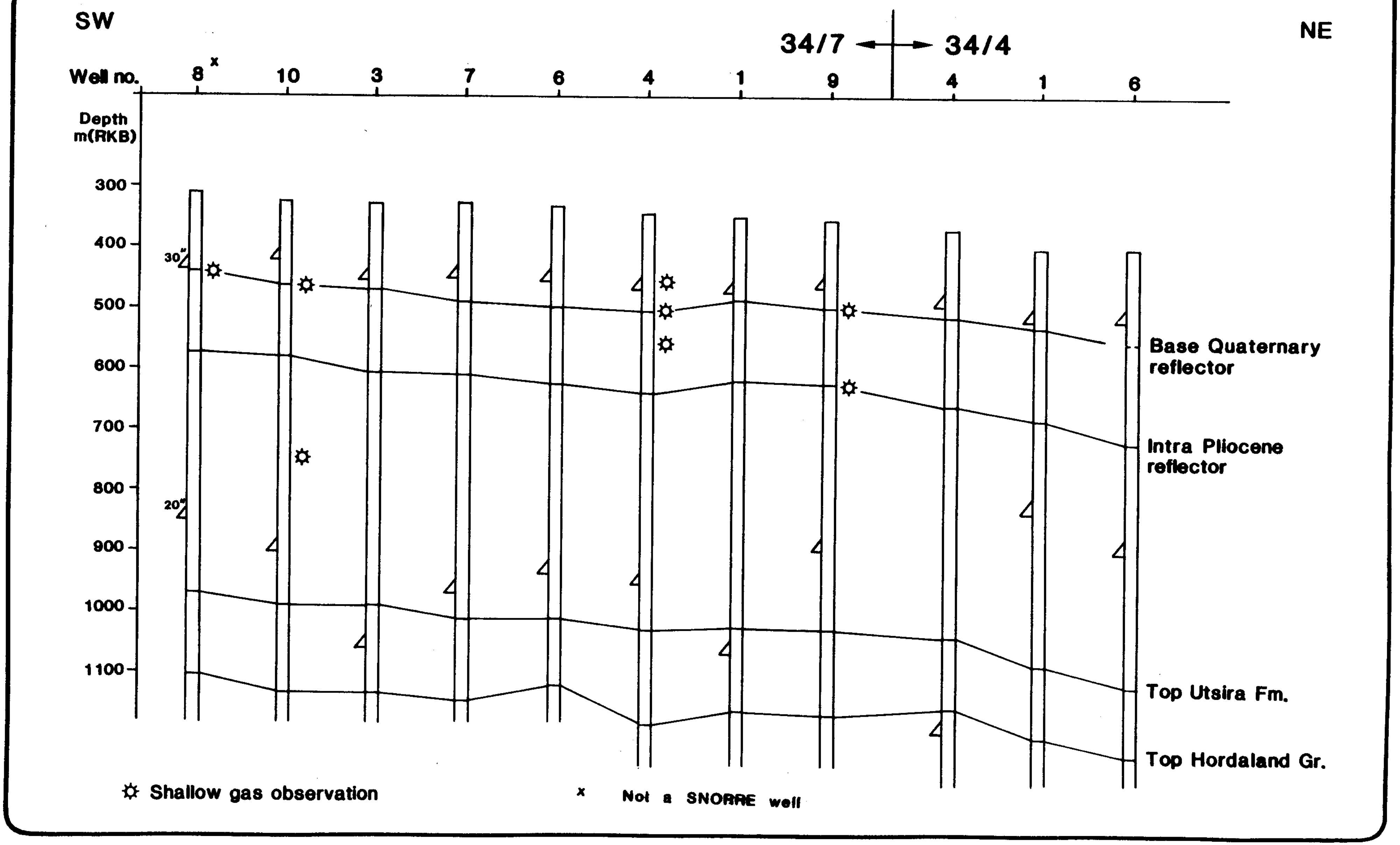

Fig. 4.6

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4.9 Stratigraphy

4.9.1 Lithostratigraphic Summary

The lithostratigraphic subdivision of well 34/7-10 (table 4.5) is based on wireline log responses, conventional cores, sidewall cores and cutting descriptions, supported by the biostratigraphic breakdown prepared by Robertson Research and Saga.

Table 4.5: Lithostratigraphic Summary, well 34/7-10

Formation Tops	Depths (m RKB)	Thickness m
Nordland Group (Seabed)	326.0	+801.0
Utsira Formation	993.0	+100.0
Hordaland Group	1093.0	589.0
Rogaland Group	1682.0	180.5
Balder Formation	1682.0	46.0
Lista/Sele Formation	1728.0	134.5
Shetland Group	1862.5	531.5
Cromer Knoll Group	2394.0	6.0
Dunlin Group	2400.0	131.5
Burton Formation	2400.0	41.0
Amundsen Formation	2441.0	64.0
Calc. Amundsen	2505.0	26.5
Statfjord Formation	2531.5	105.0
Hegre Group	2636.5	+363.5
Upper Lunde	2636.5	+363.5
T.D.	3000.0 (driller's depth)	

4.9.2 Biostratigraphic Summary

The biostratigraphic interpretation was prepared by Robertson Research in co-operation with Saga. The following analyses were carried out:

1. Robertson Research:

Micropaleontology:	255 ditch cutting samples and 10 sidewall core samples.
Palynology:	75 ditch cutting samples, 26 sidewall core samples and 7 core samples.

2. Saga:

Micropaleontology:	18 sidewall core samples.
Palynology:	20 core samples.

The biostratigraphic breakdown is given in table 4.6. The Cainozoic and Mesozoic stratigraphic history is given in figs. 4.7 and 4.8.

Table 4.6: Biostratigraphic Summary, well 34/7-10

Age	Depth m RKB	Thick- ness m	Remarks
Seabed	326.0		
Pleistocene	430.0	+ 40	Top not seen
Pliocene	470.0	540	
Late Miocene	1010.0	90	
UNCONFORMITY			
Late Oligocene	1100.0	130	
Early Oligocene	1230.0	20	
?UNCONFORMITY			
Late Eocene	1350.0	120	
Middle Eocene	1470.0	140	
Early Eocene	1610.0	72	
UNCONFORMITY			
Late Paleocene	1682.0	180.5	Log
UNCONFORMITY			
Late Cretaceous	1862.5	531.5	Log
Latest Maastrichtian	1862.5	37.5	
Late Maastrichtian	1880.0	50	
Early Maastrichtian	1930.0	45	
Late Campanian	1975.0	95	
Early Campanian	2070.0	270	
Santonian/Coniacian	2340.0	54	
UNCONFORMITY			
Early Cretaceous	2394.0	6	Log
Early Aptian	2394.0	2	
UNCONFORMITY			
Early Barremian/Hauterivian	2396.0	4	
UNCONFORMITY			
Early Jurassic	2400.0	236.5	Log
Late Toarcian	2400.0	25	
?UNCONFORMITY			
Late Pliensbachian	2435.0	35	
Early Late Pliensbachian	2470.0	103	
Early Pliensbachian - ?Sinemurian	2490.0	41.5	
Sinemurian - ?Hettangian	2531.5	105	Log
Late Triassic	2636.5	363.5	Log
?Rhaetian	2636.5	363.5	
T.D.	3000.0 (driller's depth)		

Well 34/7-10

CAINOZOIC STRATIGRAPHIC HISTORY

PAGE ONE OF TWO

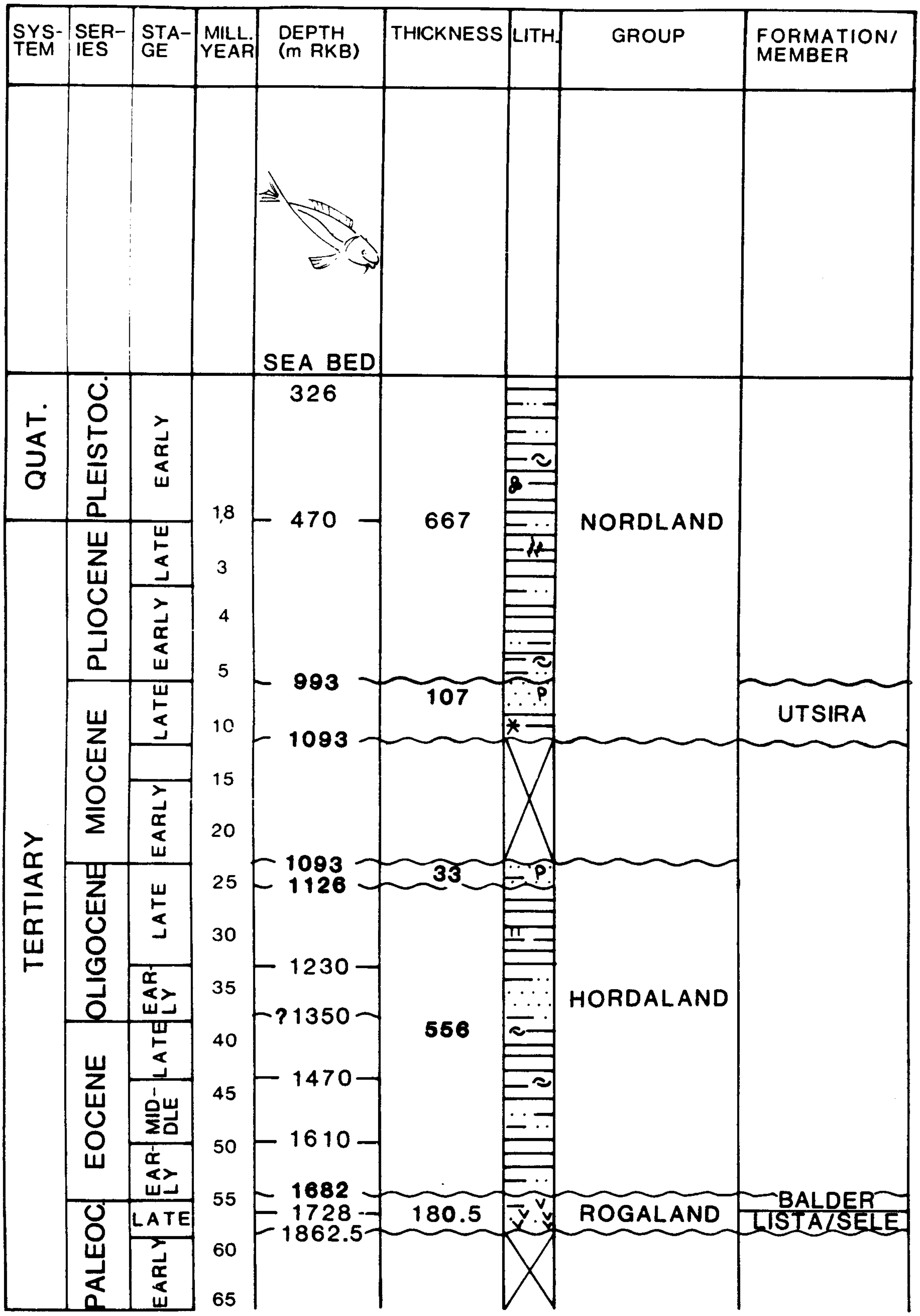

Fig. 4.7

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Well 34/7-10

MESOZOIC STRATIGRAPICH HISTORY

PAGE TWO OF TWO

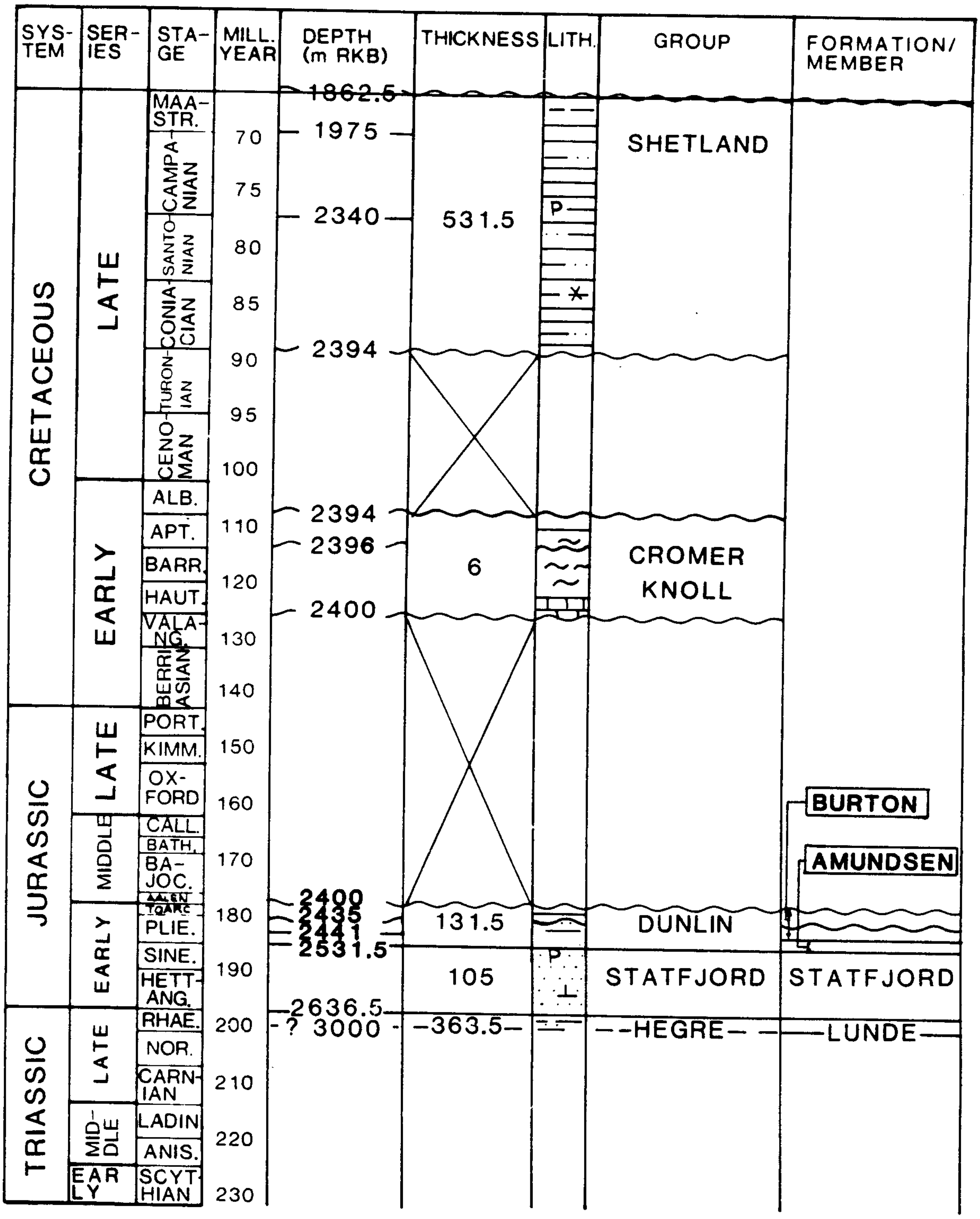

Fig. 4.8

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4.9.3 Hegre Group

Lunde Formation
Upper Lunde

Depth interval:	2636.5 - 3.000 m RKB (T.D. driller's depth)
Thickness:	Minimum 363.5 m
Age:	?Rhaetian

The upper member of the Lunde Formation is mainly composed of sandstone alternating with claystone and trace of limestone and marl. The uppermost 150 m are silty claystone with minor siltstone and sandstone.

The sandstones are clear to light green grey. They are very fine to coarse, predominantly very fine to fine and grading to siltstone in the uppermost part, angular to subangular and moderately to well sorted. In consistency they are mainly friable but hard when calcite cemented. They contain some mica and are non to slightly calcareous.

The claystones are silty and mainly dark red brown in colour. They are firm, subfissile, slightly calcareous and micromicaceous.

The limestones are argillaceous and grade occasionally to marl. The colour is white to white grey and orange white and hard in consistency.

Upper boundary

The overlying Statfjord Formation is recognized on wireline logs by slightly decreasing gamma readings in the sandstones. It is difficult to determine the boundary exactly due to tight silty sandstones below and above.

4.9.4 Statfjord Formation

Depth interval: 2531.5 - 2636.5 m RKB
Thickness: 105 m
Age: Sinemurian - ?Hettangian

The Statfjord Formation consists mainly of sandstones alternating with claystone. Traces of coal occur throughout the unit.

The sandstones are light brown, predominantly medium, occasionally fine to coarse. They are poor to moderately sorted, subangular to subrounded and friable. The porosity is dominantly good, but occasionally the sandstones are calcareous and kaolinite cemented. The sandstones are dominantly micaceous.

The claystones are shaly and grading to silstone. In colour they are dark grey to medium dark grey and occasionally grey brown and grey green. Dark red brown colour is becoming more abundant towards bottom. They are firm, subfissile, occasionally very micaceous and non calcareous.

Upper boundary

The overlying Dunlin Group is recognized on wireline logs by increasing gamma ray and density readings.

4.9.5 Dunlin Group

Burton and Amundsen Formations

Depth interval: 2400 - 2531.5 m RKB
Thickness: 131.5 m
Age: Late Toarcian - Early Pliensbachian

The lithology in the Burton and Amundsen Formations is mainly siltstone alternating with claystone and minor sandstone.

The siltstones are argillaceous, medium light grey to dark grey, firm to hard, micromicaceous and calcareous.

The claystones are silty, olive grey to dark grey, firm, subfissile and slightly calcareous.

The sandstones are silty and olive grey in colour. In consistency they are friable, and they are well sorted and angular to subangular. Generally they are calcareous and micaceous.

Upper boundary

The overlying Cromer Knoll Group is recognized on all wireline logs. Gamma readings and sonic transit time decrease when resistivity and density increase.

4.9.6 Cromer Knoll Group

Depth interval:	2394 - 2400 m RKB
Thickness:	6 m
Age:	Early Aptian - Hauterivian/Early Barremian

Alternating marl and limestone are the main lithology of the Cromer Knoll Group.

The marl is dark red brown to light olive grey and soft to firm.

The limestone is argillaceous, white to light grey and soft to firm.

Upper boundary

The overlying Shetland Group is recognized on wireline logs by increasing gamma ray and sonic transition time and the decrease in resistivity.

4.9.7 Shetland Group

Depth interval: 1862.5 - 2394 m RKB
Thickness: 531.5 m
Age: Latest Maastrichtian - Santonian/Coniacian

The Shetland Group consists of very uniform claystone lithology. It is occasionally silty, especially in the lower section, mainly medium to dark grey, soft to firm, occasionally sticky and non to slightly calcareous.

Throughout the group there are minor stringers of limestone and dolomite. The carbonates are argillaceous, light grey to pale yellow orange and soft to firm.

The lowest 170 m contain minor thin sandstone/siltstone stringers. These are sandstone grading to siltstone. They are very fine, subangular to subrounded and medium sorted. In consistency they are mainly loose. Glauconite and pyrite are noticed in accessial amounts.

Upper boundary

The boundary to the overlying Rogaland Group (Lista/Sele Formation) is seen on wireline logs by a decrease in gamma ray and resistivity and an increase of the sonic transit time.

4.9.8 Rogaland Group

Lista/Sele Formation

Depth interval: 1728 - 1862.5 m RKB
Thickness: 134.5 m
Age: Late Paleocene

The Lista/Sele Formation is composed of a silty olive grey to medium dark grey claystone. The claystones are soft to firm and non to slightly calcareous.

Traces of sandstones can be seen. These are mainly very fine to fine, occasionally medium to coarse, poor sorted, subangular to subrounded and loose in consistency.

Upper boundary

The boundary to the overlying Balder Formation is well defined on the logs by a decrease in the gamma ray, the sonic transit time and an increase in the resistivity.

Balder Formation

Depth interval:	1682 - 1728 m RKB
Thickness:	46 m
Age:	Late Paleocene

The Balder Formation consists of tuffaceous claystone. It is varigated coloured in dark grey and olive grey to grey brown, mottled with white and black specs, firm and non to slightly calcareous.

Upper boundary

The overlying Hordaland Group is marked by an increase in the gamma ray and the sonic transit time and a decrease in the resistivity on the wireline logs.

4.9.9 Hordaland Group

Depth interval:	1093 - 1682 m RKB
Thickness:	589 m
Age:	Late Oligocene - Early Eocene

The Hordaland Group is composed of glauconitic sand from the top and down to the Intra Oligocene Unconformity at 1126 m RKB. The rest of the sequence is mainly claystone and two thick sandstone layers, each about 10 m.

The glauconitic sand is clear to black, very fine to fine, moderately to well sorted, moderately to well rounded and loose.

The claystones are silty, occasionally very silty, brown grey to olive grey in colour, soft to firm, micromicaceous and non to slightly calcareous.

The upper 220 m of the Hordaland Group is claystone with trace of thin sandstone layers. The sandstones are very silty. They are very fine in grain size and often grading to siltstone. They are clear, well sorted, subrounded and loose in consistency. Throughout the rest of the claystone sequence some limestone stringers are seen. The limestone is argillaceous, white to light grey and brown grey.

The thicker sandstone layers and the sandstones in the lower part of the Hordaland Group are clear, very fine to medium, occasionally coarse, moderately sorted, subangular to subrounded and predominantly loose in consistency.

Traces of pyrite, glauconite and mica occur throughout the whole group.

Upper boundary

The Utsira Formation of the Nordland Group above is recognized by increase in gamma readings and decrease in sonic transit time.

4.9.10 Nordland Group

Depth interval: 326 (Seabed) - 1093 m RKB
Thickness: 767 m (minimum)
Age: Pleistocene - Late Miocene

Utsira Formation

Depth interval: 993 - 1093 m RKB
Thickness: 100 m
Age: Late Miocene

The Utsira Formation is composed of sand with minor clay.

The sand is clear, predominantly fine to coarse but very fine to fine towards the bottom. It is poor to moderately sorted, moderately to well rounded and loose.

The clay is arenaceous, medium grey to green grey, soft, sticky and slightly calcareous.

Traces of glauconite, pyrite, mica, shell fragments and rock fragments are common. The sands are very glauconitic, especially in the lowest 80 m.

Upper boundary

The Nordland Group above is characterized by an increase in gamma, resistivity and density readings. Sonic transition time is decreasing on wireline logs.

Nordland Group above the Utsira Formation

Depth interval: 326 (Seabed) - 993 m RKB

Thickness: 667 m (minimum)

Age: Pleistocene - Pliocene

The lithology of the Nordland Group above the Utsira Formation is mainly clay. The clay is arenaceous and two sand horizons of about 10 m are seen.

The clay is arenaceous, medium grey, soft, sticky and slightly to very calcareous.

The sand is clear, very fine to medium, occasionally coarse, dominantly poorly sorted and angular to subrounded. In the thicker sand layers the sand is well sorted and better rounded, else as described above.

There are also traces of pyrite, rock and shell fragments, foraminifers and mica.

4.9 Hydrocarbon Indications

From the 30" casing at 423 m RKB and down to 918 m RKB the mud weight was gradually increased from 1.03 g/cc to 1.09 g/cc. From 918 m RKB and down to 1508 m RKB the mud weight was 1.11 to 1.12 g/cc. Background gas was low in the interval, in average 0.3%. Some peaks from thin sand layers were recorded. Maximum value was 1.44% from 468 m RKB. There was no connection gas. Trip gas at 1323 m RKB was 0.2%.

In accordance with the prognosed pore pressure the mud weight was progressively increased from 1.12 g/cc at 1508 m RKB to 1.70 g/cc at 2355 m RKB. From 2355 m RKB and down to T.D. at 3000 m RKB the mud weight was kept constant at 1.70 g/cc.

From 1508 m RKB and down to 1820 m RKB the gas values were low, generally being less than 0.08% with occasional peaks up to 0.18%. Down to 2390 m RKB gas levels are higher and more variable, from 0.04% to 0.42% and increasing with depth. Trip gases were low with maximum 0.28% at 1968 m RKB.

C2 was detected from 1810 m RKB, C3 and nC4 from 1970 m RKB and iC4 from 2080 m RKB. First traces of shows were seen at 2120 m RKB in silty laminas of the Shetland Group. These are decribed as weak dark yellow fluorescence with slowly streaming light yellow cut. From 2250 m RKB and down to 2531.5 m RKB silt and sandstone show weak to moderate dull yellow to bright yellow fluorescence and slowly streaming blue white to milky white cut. The residue is yellow to light brown in colour. Light brown oil stain and good odour are observed from Top Statfjord reservoir at 2531.5 m RKB. The Statfjord reservoir in general shows strong bright yellow fluorescence, instant blue white to milky cut and pale yellow to yellow residue upon evaporation.

Below 2635 m RKB both shows and cut became poorer. The interval from 2390 m RKB to 2660 m RKB showed low ditch gas, in average 0.15%. Several gas peaks from sand intervals were seen, maximum was 9.5% at 2438 m RKB. Trip gases were low in the section. Average was 0.45%

with maximum 1.64% at 2522 m RKB. C2 to nC4 were present over the whole section, including iC4 much of the time.

From 2660 m RKB and down to T.D. at 3000 m RKB ditch gas was low, between 0.01% and 0.10%. C1 was generally the only gas present, but traces of C2 were seen down to 2728 m RKB and between 2850 and 2888 m RKB. Trip gases were low and no shows seen.

5. FORMATION EVALUATION

5.1 Logging

The logging programme included 3 runs (section 4.4). The logs were of good quality.

The logs have been analysed with a computer model based on the complex lithology method. Net sand averages have been calculated using a porosity cutoff of 12% in the Statfjord Formation and 15% in the upper Lunde. The shale volume cutoff used is 40% (refer also to Petrophysical Report R-EPF 0039 34/7-10, March 1987).

An oil water contact of 2621 m RKB (2595 m MSL) has been defined. The net sand averages for the separate zones are given in table 5.1.

There is a good agreement between the core and the log porosities.

5.2 Core Analyses

During drilling of the well, 14 cores were cut in the Amundsen, Statfjord and Lunde Formations. The cores were taken in the interval 2522.0 - 2662.5 m RKB (driller's depth 2522.0 - 2663.0 m RKB). A total of 122.3 m of cores were recovered, corresponding to an average recovery of 86.7%.

Conventional core analyses were performed on all cores except core Nos. 5, 10 and 14. Horizontal air permeability, helium porosity and grain density were measured every 0.25 meter while vertical permeability, summation porosity and pore saturation were measured every meter. The analysis results are listed in table 5.2 as a function of driller's depth. Due to the unconsolidated nature of the sediments, the interval 2562 - 2574 m RKB had to be frozen.

5.3 Formation Pressure Measurements

A Dresser-Atlas Formation Multi Tester (FMT) with a Hewlett Packard crystal gauge was used to obtain formation pressure measurements. The objectives for running the FMT were:

- To determine the oil water contact.
- To verify oil or water in the sand at 2634.5 m RKB.
- To collect segregated samples for fluid analysis.

A total of 6 runs with the FMT tool were made (table 5.3).

The FMT pressure measurements were plotted versus depth (fig. 5.1). In the oil zone a pressure gradient of 0.073 bar/m was found while in the water leg a gradient of 0.099 bar/m was determined.

The oil and water gradients intersect at 2600 m RKB. This indicates that there is no pressure communication between the Statfjord Formation and the upper Lunde as oil is tested down to 2615 m RKB (oil is also tested from an isolated sand at 2634.5 to 2636.5 m RKB).

Assuming pressure communication between the Statfjord Formation in well 34/7-10 and the upper Lunde in 34/7-3 gives a most likely oil water contact at 2621 m RKB (2595 m MSL).

5.4 Testing

Four production tests were carried out in the Statfjord Formation. The following intervals were perforated and tested:

Production test No. 1: 2632.7 - 2636.7 m RKB
Production test No. 2: 2609.4 - 2614.9 m RKB
Production test No. 3: 2561.0 - 2570.5 m RKB
Production test No. 4: 2548.4 - 2551.9 m RKB

The depths refer to the CDL-CNL-GR log run No. 2A of September 24, 1986.

The test objectives were to:

Test No. 1

- Determine the nature of the formation fluid
- Sample the formation fluid
- Investigate formation heterogeneities
- Measure the formation pressure

Test No. 2

- Determine the production behaviour of a sand close to the prognosed OWC with a high water saturation
- Investigate formation heterogeneities
- Estimate the formation properties
- Sample the reservoir fluid
- Investigate cusping behaviour (if test No. 1 produces water)
- Investigate the sealing properties and/or extent of the shale separating the tested sand from the overlaying sand.

Test No. 3

- Investigate formation heterogeneities for a thick sand located in a low net/gross Statfjord unit
- Measure the formation productivity
- Estimate the formation properties
- Sample the reservoir fluid

Test No. 4

- Investigate formation heterogeneities for a thin sand located in a low net/gross Statfjord unit
- Measure the formation productivity
- Estimate the formation properties
- Sample the reservoir fluid

Operations:

Production test No. 1

The interval 2632.7 - 2636.7 m RKB was perforated underbalanced with a 5" Schlumberger tubing conveyed perforation gun, 12 shots/ft. The well was opened on a 6.4 mm fixed choke for a twenty minutes long initial flow. A total of 0.17 m^3 cushion water was flowed back. A two hours initial build-up was performed. The well was then opened for an approximately fourteen hours main flow (6.4 mm fixed choke). The last recorded rate was 4 m^3/D with a corresponding wellhead pressure of 1.4 bar. At surface a mixture of water and oil was produced. The tubing content was reversed out, and the total oil produced was measured after the main build-up. A total of 2.75 m^3 oil was produced during the test. The bottomhole sample taken during the main flow contained clean oil.

The pressures and rates are plotted versus time in fig. 5.2. A summary of flow periods and flow data is presented in table 5.4. The main build-up pressures are listed in table 5.5. The flowrates are listed in table 5.6.

Production test No. 2

The interval 2609.4 -2614.9 m RKB was perforated underbalanced with a 5" Schlumberger tubing conveyed perforation gun, 12 shots/ft.

The well was opened for a combined clean-up and main flow with a duration of 26.5 hours. A 12.7 mm fixed choke was used during the major part of the flow. The last flowing rate was 222 Sm^3/D with a corresponding wellhead pressure of 23 bar. The well was then shut in for the main build-up (approximately 30 hours) followed by a bottomhole sampling flow. Two bottomhole samples were recovered. The last flowing rate during the sampling flow was 73 Sm^3/D with a corresponding wellhead pressure of 122 bar (3.2 mm fixed choke).

The pressures and rates versus time are shown in fig. 5.3. A summary of the flow periods and the flow data are listed in table 5.7. The main build-up pressures are listed in table 5.8. The flow rates are listed in table 5.9.

Production test No. 3

The interval 2561.0 - 2570.5 m RKB was perforated overbalanced with a Dresser 5" perforation gun, 12 shots/ft, run on wireline. The well was opened for an initial flow of 10 minutes duration on a 12.7 mm fixed choke. A total of 5.6 m^3 was produced. An initial build-up of approximately two hours was performed.

The main flow had a duration of approximately 26 hours mainly on a 12.7 mm fixed choke. The last recorded rate was 961 Sm^3/D with a corresponding wellhead pressure of 105 bar.

It was decided to have a short flow after the main build-up to verify the unexpected high draw down calculated from the main flow. This flow had a duration of approximately one hour.

A final rate of 692 Sm^3/D was measured while flowing through a 12.7 mm fixed choke. The wellhead pressure was 72 bar.

The pressures and rates versus time are shown in fig. 5.4. A summary of the flow periods and the flow data are listed in table 5.10. The main build-up pressures are listed in table 5.11. The flowrates are given in table 5.12.

Production test No. 4

The interval 2548.4 - 2551.9 m RKB was perforated underbalanced with a 5" tubing conveyed perforation gun, 12 shots/ft.

The well was opened for a ten minutes initial flow on a 44.5 mm fixed choke, and 4.9 m^3 of cushion water was produced. The main flow was started on a 11.1 mm choke which was reduced to 6.4 mm in order to get monophasic flow at the wellhead. The flow had a duration of 30 hours. The final rate was 273 Sm^3/D with a corresponding wellhead pressure of 114 bar.

After the main build-up a short minifracture test was performed to determine the formation strength.

The pressures and rates versus time are shown in fig. 5.5. A summary of the flow periods and the flow data are presented in table 5.13. The main build-up pressures are listed in table 5.14. The flowrates are given in table 5.15.

5.5 Fluid Analyses

FMT samples

Fluid samples from three FMT-chambers collected at two different depths were analyzed (table 5.16). Analysis of the water indicates that the fluid was mudfiltrate. The pressurized oil samples were analysed and the main results are listed in table 5.16.

Test samples

During production test No. 1, one bottom hole sample with oil was collected. This sample was, however, damaged during transfer of the fluid from the bottom hole sampler to the storage bottle, and therefore no PVT-analysis is available.

Analyses of water samples collected at surface during the main flow while reversing out the tubing content, show that the water produced in the beginning of the test is mainly sea water from the pressure testing. However, the impact of sea water is rapidly diminishing and is negligible approximately two hours after perforation when the produced water is mainly cushion water.

Analyses of parameters specific for formation water do not indicate that formation water has flowed into the test string.

During production test No. 2 both monophasic wellhead samples and bottomhole samples were collected, while during production tests Nos. 3 and 4 monophasic fluid samples were collected at the wellhead. PVT-analyses have been performed on monophasic oil samples from the three tests and the main results are presented in tables 5.17, 5.18, 5.19 and 5.20.

Trace element analyses were performed on oil and gas produced during production tests Nos. 2, 3 and 4. The results from these analyses are listed in fig. 5.21.

Log Analysis, Well 34/7-10

Formation	Statfjord Formation	Top Statfjord to OWC	Upper Lunde
Top (mRKB)	2531.5	2531.5	2636.5
Bottom (mRKB)	2636.5	2621.0	2995.0
Gross (m)	105.0	89.5	358.5
Net sand (m)	33.0	29.5	83.4
Net/Gross	0.31	0.33	0.23
Porosity (%)	21.7	22.1	18.7
Water Saturation (%)	-	32	-

Cut off parameters:

Porosity (%)	12	12	15
Shale volume (%)	40	40	40

Table 5.1 Log analysis, Results, 34/7-10

Date 1/2/87	Auth JB	Appr RM
Draw by	Ref	

Core data listing, Well 34/7-10

Depth (m RKB)	Core porosity (%)	Core horiz. permeability (mD)	Core vert. permeability (mD)	Grain density (g/cc)
2523.00	17.7	0.155	0.066	2.73
2523.25	18.5	0.182		2.70
2523.50	19.2	0.182		2.71
2523.75	19.7	0.20		2.71
2524.00	21.2	0.23	0.076	2.93
2524.25	17.7	0.160		2.71
2524.50	17.9	0.122		2.71
2524.75	18.9	0.35		2.74
2525.00	18.7	0.192	0.043	2.72
2525.25	16.4	0.150		2.76
2525.50	14.2	0.073		2.70
2525.75	16.6	0.158		2.71
2526.00	15.7	0.24	0.055	2.73
2526.25	15.0	0.142		2.71
2526.50	16.8	0.25		2.70
2526.75	16.5	0.27		2.70
2527.00	13.3	0.134	<0.04	2.69
2527.25	11.9	0.091		2.68
2527.50	13.8	0.100		2.67
2527.75	13.7	0.088		2.70
2528.00	12.1	0.088	0.060	2.69
2528.25	13.4	0.073		2.92
2528.50	12.6	0.088		2.69
2528.75	12.6	0.108		2.68
2529.00	4.4	<0.04	<0.04	2.96
2529.25	4.8	<0.04		2.95
2529.50	12.6	0.061		2.71
2529.75	9.8	0.057		3.13
2530.00	12.5	0.067	<0.04	2.73
2530.25	13.2	0.109		2.67
2530.50	15.6	0.21		2.66
2530.75	16.6	0.36		2.65
2531.00	14.3	0.177	0.113	2.65
2531.25	14.6	0.21		2.65
2531.50	13.4	0.37		2.66
2531.75	30.3	515		2.64
2532.00	31.5	1397	197	2.64
2532.25	28.1	131		2.63
2532.50	26.0	nmp		2.66
2532.75	22.9	46.6		2.55

Table 5.2 Conventional core analysis, well 34/7-10

Date 1/2/87	Auth	Appr. IMH
Draw by	Ref	

Core data listing, Well 34/7-10

Depth (m RKB)	Core porosity (%)	Core horiz. permeability (mD)	Core vert. permeability (mD)	Grain density (g/cc)
2533.00	28.0	591	4.95	2.64
2533.25	25.6	381		2.59
2533.50	28.6	84.7		2.62
2533.75	26.7	59.5		2.64
2534.00	31.8	1723	13.4	2.65
2534.25	30.3	725		2.65
2534.50	26.9	249		2.64
2534.75		npp		
2535.00		npp		
2535.50		npp		
2539.10				
2540.50	11.8	0.124	0.127	2.65
2543.50	10.6	0.122		2.67
2543.75	12.6	0.048	0.063	2.60
2548.00	11.9	0.180		2.63
2548.25	18.6	14.6		2.71
2548.60	25.7	117	33.3	2.65
2549.00	22.9	29.9		2.65
2549.25	28.4	236		2.64
2549.75	25.5	311	497	2.64
2550.00	26.5	516		2.64
2550.20	28.5	797		2.64
2550.50	27.9	318	236	2.64
2550.80				
2551.60				
2552.50				
2553.50	20.9	16.3		2.66
2553.75	21.6	24.4		2.65
2554.00	17.8	3.86	0.53	2.66
2554.50	22.8	22.1		2.65
2554.75	25.5	141		2.76
2557.75	6.7	nmp	<0.04	2.75
2558.40				
2558.50				
2560.00	8.4	0.072	0.43	2.70
2560.25	15.9	0.19		2.67

Table 5.2 Conventional core analysis, well 34/7-10

Date /2.87	Auth.	Appr. JMH
Draw by	Ref.	

Core data listing, Well 34/7-10

Depth (m RKB)	Core porosity (%)	Core horiz. permeability (mD)	Core vert. permeability (mD)	Grain density (g/cc)
2560.50	5.7	0.060		2.70
2560.75	13.4	0.134		2.67
2561.00	13.8	0.066	0.115	2.68
2561.25	13.7	0.20		2.68
2561.50	20.6	5.45		2.67
2561.75	nmp	nmp		
2562.00	nmp	nmp	nmp	
2562.50	nmp	nmp		
2562.75	nmp	nmp		
2563.00	34.3	24422	nmp	2.66
2563.25	35.7	12638		2.65
2563.50	32.9	5324		2.65
2563.75	32.7	7467		2.65
2564.00	nmp	nmp	nmp	
2564.30	29.2	10673		2.65
2564.50	17.1	0.94		2.65
2564.75	19.6	19.5		2.64
2565.00	27.9	271	nmp	2.68
2565.25	27.2	616		2.65
2566.50	28.4	1131		2.67
2566.75	39.1	3592		2.65
2567.00	35.5	10581	nmp	2.65
2567.25	33.9	14192		2.65
2567.50	25.9	11219		2.64
2567.75	32.4	3909		2.65
2568.00	34.2	11522	nmp	2.65
2568.25	29.0	nmp		2.65
2568.50	24.9	181		2.65
2568.75	32.7	20724		2.65
2569.00	38.6	17619	nmp	2.65
2569.50	35.1	5701		2.66
2569.75	39.2	11055		2.65
2570.00	26.1	832	nmp	2.65
2573.99				
2574.00				
2577.70				
2592.00				
2592.50	10.0	0.74		2.64
2592.75	25.8	310		2.64
2593.00	25.7	187	242	2.64

Table 5.2 Conventional core analysis, well 34/7-10

Date 1/2 87	Auth. ABN	Appr. IMH
Draw by	Ref	

Core data listing, Well 34/7-10

Depth (m RKB)	Core porosity (%)	Core horiz. permeability (mD)	Core vert. permeability (mD)	Grain density (g/cc)
2593.25	12.2	0.82		2.63
2593.50	24.0	72.9		2.64
2593.75	25.6	321		2.64
2594.00	9.9	1.40	1.12	2.66
2594.25	23.7	71.0		2.64
2594.50	26.9	591		2.64
2594.75	27.3	703		2.63
2595.00	15.8	34.3	20.6	2.65
2595.25	15.3	11.6		2.65
2595.50	14.2	9.10		2.65
2595.75	27.0	2993		2.64
2596.00	26.1	1003	885	2.64
2596.25	23.3	433		2.64
2598.00				
2599.50				
2600.00	15.2	27.2	4.11	2.64
2600.25	20.0	28.4		2.64
2600.55	25.0	220		2.64
2601.00	26.9	779	nmp	2.64
2602.00	21.7	28.7	415	2.64
2602.25	26.8	961		2.64
2602.50	25.4	490		2.64
2602.75	19.7	81.7		2.65
2603.00	2.2	0.054	<0.04	2.66
2603.30	10.5	0.29		2.64
2603.50	17.7	1.86		2.64
2603.75	19.8	3.61		2.64
2604.00	20.8	6.99	52.4	2.64
2604.25	26.0	138		2.64
2604.50	17.3	209		2.64
2608.50				
2609.75	14.3	1.11		2.62
2610.00	15.6	0.93	0.27	2.62
2610.25	21.0	35.3		2.67
2610.50	13.8	nmp		2.61
2611.00	19.5	2.81	3.55	2.64
2611.20	23.2	18.4		2.66
2611.50	22.5	nmp		2.67

Table 5.2 Conventional core analysis, well 34/7-10

Date /.. ..7	Auth. ABN	Appr. JMH
Draw by	Ref	

Core data listing, Well 34/7-10

Depth (m RKB)	Core porosity (%)	Core horiz. permeability (mD)	Core vert. permeability (mD)	Grain density (g/cc)
2611.75	21.9	14.1		2.65
2612.00	21.7	16.8	11.5	2.65
2612.25	21.3	15.2		2.65
2612.50	21.9	26.6		2.64
2612.75	23.9	31.8		2.64
2613.00	21.6	22.3	20.3	2.65
2613.50	22.5	25.1		2.64
2613.75	24.4	91.7		2.64
2614.00	18.8	37.0	50.3	2.65
2614.20	23.2	99.8		2.65
2614.50	24.3	128		2.64
2614.75	24.8	124		2.66
2615.00	24.2	88.3	85.6	2.65
2615.20	21.7	57.6		2.63
2617.50				
2624.00				
2626.00	6.4	0.176	0.20	2.63
2626.25	7.0	0.40		2.63
2626.50	13.6	11.9		2.62
2626.75	16.6	nmp		2.62
2627.00	17.1	nmp	18.3	2.62
2627.25	6.0	0.37		2.66
2627.50	5.9	0.37		2.66
2627.75	6.4	0.32		2.66
2628.00	4.8	0.114	0.140	2.67
2628.25	7.7	0.38		2.66
2628.50	19.2	18.2		2.64
2628.75	13.6	3.67		2.64
2629.00	16.9	21.3	19.6	2.64
2634.50	15.5	3.42		2.63
2635.00	24.2	415	519	2.65
2635.50	13.3	6.32		2.66
2635.75	5.5	0.132		2.67
2636.00	24.7	62.7	72.5	2.64
2636.25	25.3	33.8		2.64
2636.60	5.9	0.083		2.67
2637.00	8.7	0.96	3.43	2.65
2641.50				

Table 5.2 Conventional core analysis, well 34/7-10

Date 1/2-83	Auth. ABN	Appr. JMH
Draw by	Ref	

Core data listing, Well 34/7-10

Depth (m RKB)	Core porosity (%)	Core horiz. permeability (mD)	Core vert. permeability (mD)	Grain density (g/cc)
2641.50				
2643.60	12.7	1.16		2.62
2643.75	17.6	1.51		2.65
2644.00	19.4	8.31	7.70	2.66
2644.25	3.3	0.046		2.68
2644.50	3.3	0.081		2.67
2644.75	9.1	1.09		2.66
2645.00	18.9	26.1	38.2	2.65
2645.20	20.1	24.7		2.65
2645.50	17.2	1.84		2.65
2655.00				
2663.00				

Table 5.2 Conventional core analysis, well 34/7-10

Date	Auth. ABN	Appr JMH
Draw by	Ref	

Formation pressures

Run 2A

Depth	Hydrostatic mud pressure		Temperature Corrected Formation Pressure	
	before	after		
mRKB	PSIA	PSIA	PSIA	BAR
2532.5	5965.2	5964.8	5587.7	385.26
2550.0	6016.6	6015.1	5607.0	386.59
2563.0	6052.1	6050.5	5619.8	387.47
2569.0	6066.5	6065.5	5626.5	387.93
2595.0	6141.1		5656.2	389.98
2601.0	6152.4	6151.4	5660.4	390.27
2613.0	6187.1	6183.2	5675.1	391.28
2614.0	6185.5	6184.4	5675.6	391.32
2628.0	6217.5	-	Tight	-
2628.0	6217.5	6213.4	Tight	-
2634.5	6233.5	6231.5	5731.1	395.14
2644.0	6257.4	6254.1	5732.3	395.23
2644.3	6254.1	-	Tight	-
2671.0	6335.6	-	Tight	-
2670.9	6333.4	6333.8	Tight	-
2684.5	6372.5	6372.5	Tight	-
2532.5*	5951.8	5951.0	5585.8	385.13
2441.0	5732.8	5731.0	5504.0	379.49

*Sample

- 2 3/4 gallon chambre recovered : 8.8 l of oil
  2.8 l of mudfiltrate
- 1 gallon chambre to PVT analysis

Table 5.3 FMT - formation pressures, 34/7-10

Date 1/2/87	Auth JB	Appr Bott
Draw by	Ref	

Formation pressures

Depth	Hydrostatic mud pressure		Temperature Corrected Formation Pressure	
	before	after		
mRKB	PSIA	PSIA	PSIA	BAR
Run 2E				
2634.5	6218.1		5715.9	394.10
Sample				
Before plugging 2 3/4 gallon chambre:			2 l mudfiltrate Traces of oil	
Run 3F				
2532.5	5948.6	5947.9	5588.1	385.29
2569.0	6044.6	6042.6	5626.5	387.93
2613.0	6151.6	6149.8	5672.4	391.10
2634.5	6204.6	6202.8	5728.2	394.94
2726.5	6429.8	6427.8	5840.5	402.69
2783.0	6568.6	6566.4	5921.8	408.29
2815.0	6646.3	6643.7	5967.0	411.41
2837.0	6700.8	6698.2	6003.4	413.93
2845.0	6716.4	6715.0	6010.4	414.40
2857.5	6747.6	6746.2	6028.4	415.64
2874.0	6788.1	6786.1	6051.8	417.26

Table 5.3 FMT - formation pressures, 34/7-10

Date 1/2.87	Auth JB	Appr BAH
Draw by	Ref	

Formation pressures

The following runs and formation pressures are used to evaluate the oil water contact, oil gradients and water gradients

RUN 2A (Corrected formation pressure: -2.5 psi compared to log)

Depth (mRKB)	Formation (PSIA)	Pressures (BAR)	Quality
2532.5	5585.2	385.09	m-e
2550.0	5604.5	386.42	m
2563.0	5617.3	387.30	m
2569.0	5624.0	387.76	m
2595.0	5653.7	389.81	m-d
2601.0	5657.9	390.10	m
2613.0	5672.6	391.11	m
2614.0	5673.1	391.15	m

RUN 3F

Depth (mRKB)	Formation (PSIA)	Pressures (BAR)	Quality
2726.5	5838.0	402.52	m
2783.0	5919.3	408.12	m
2815.0	5964.5	411.24	m
2837.0	6000.9	413.75	m
2845.0	6007.9	414.23	m
2857.5	6025.9	415.47	m
2874.0	6049.3	417.08	m

Table 5.3 FMT - formation pressures, 34/7-10

Date 1/2-87	Auth JB	Appr TeH
Draw by	Ref	

Formation pressures

Depth	Hydrostatic mud pressure before	Hydrostatic mud pressure after	Temperature Corrected Formation Pressure	
mRKB	PSIA	PSIA	PSIA	BAR

Run 2B

2601.0	6128.1	6121.2	5860.4	404.06

Sample
- 2 3/4 gallon chambre recovered: 9 l of mudfiltrate
  0.7 l of oil
- 1 gallon chambre to PVT analysis

Run 2C

2601.0	6129.1	6122.5	5661.0	390.31

Sample
- 2 3/4 gallon chambre recovered: 8.8 l of mudfiltrate
  0.8 l of oil
- 1 gallon chambre to PVT analysis

Run 2D

2634.5*	6216.8	6198.1	5728.8	394.99
2644.1	6225.5	6226.5	Tight	
2643.9	6223.2	6225.4	Tight	

*Sample
- 2 3/4 gallon chambre recovered: 9.5 l of mudfiltrate
  0.1 l of oil
- 1 gallon chambre recovered: 2.8 l of mudfiltrate
  traces of oil

Table 5.3 FMT - formation pressures, 34/7-10

Date 1/2.87	Auth JB	Appr [illegible]
Draw by	Ref	

Formation pressures

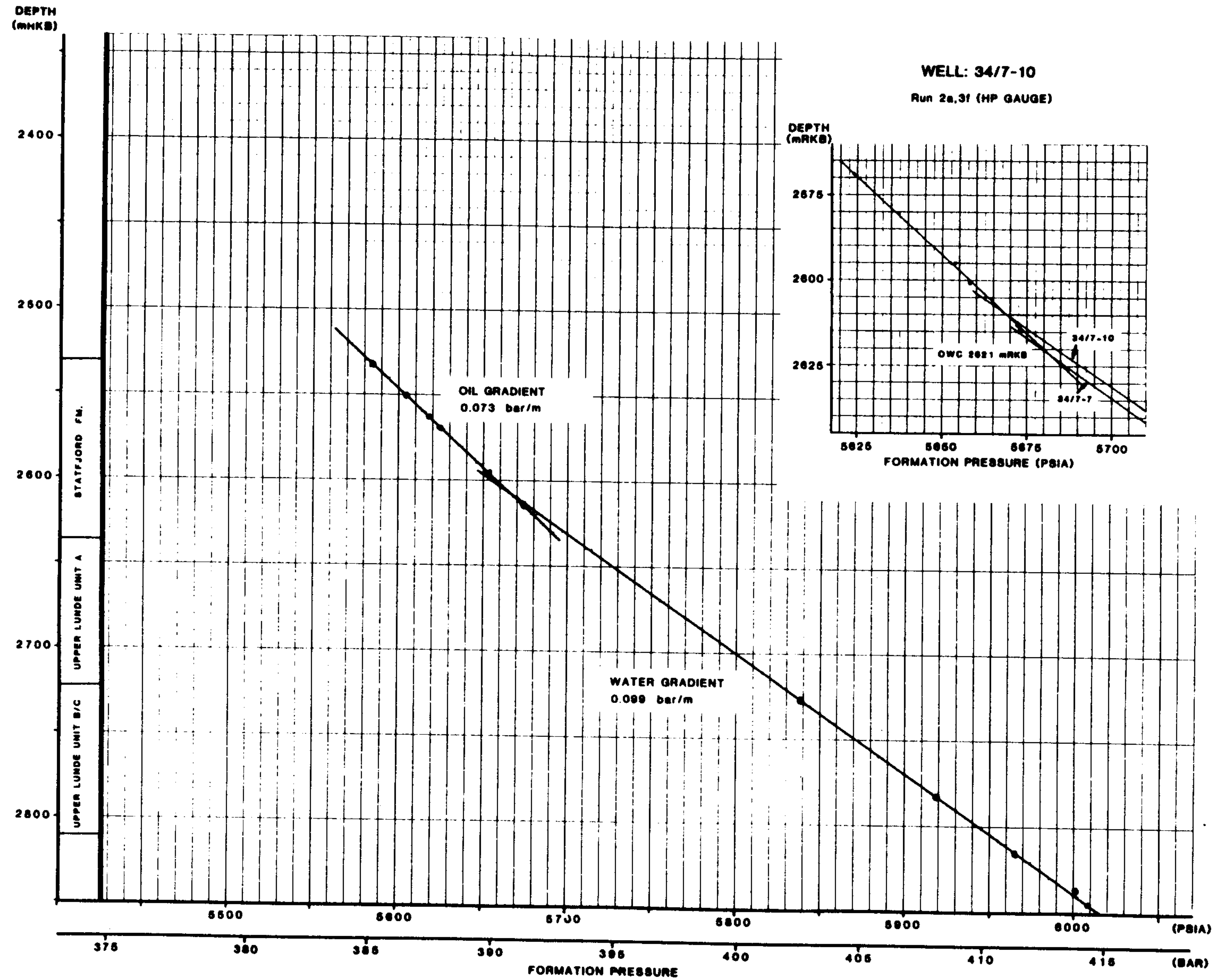
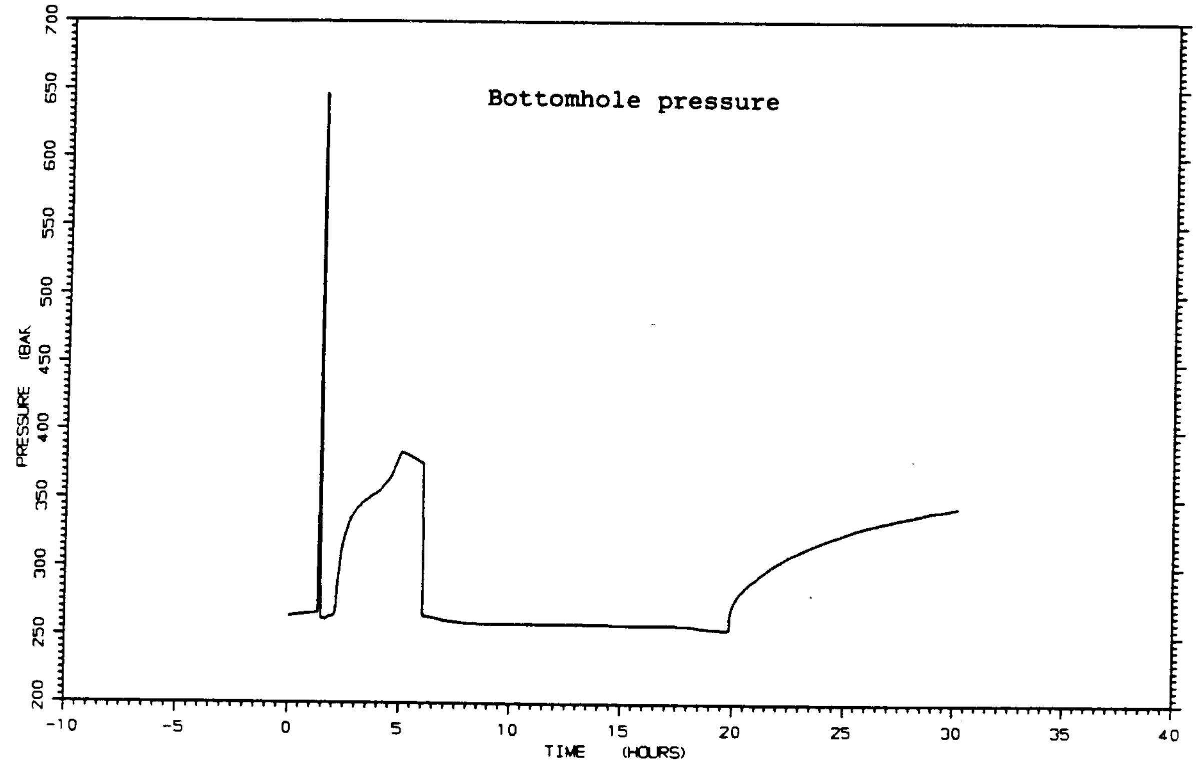


Fig. 5.1 Formation pressure vs depth, 34/7-10

Date 1/2-87	Auth JB	Appr Fett
Draw by	Ref	

Test Performance, Production Test no. 1



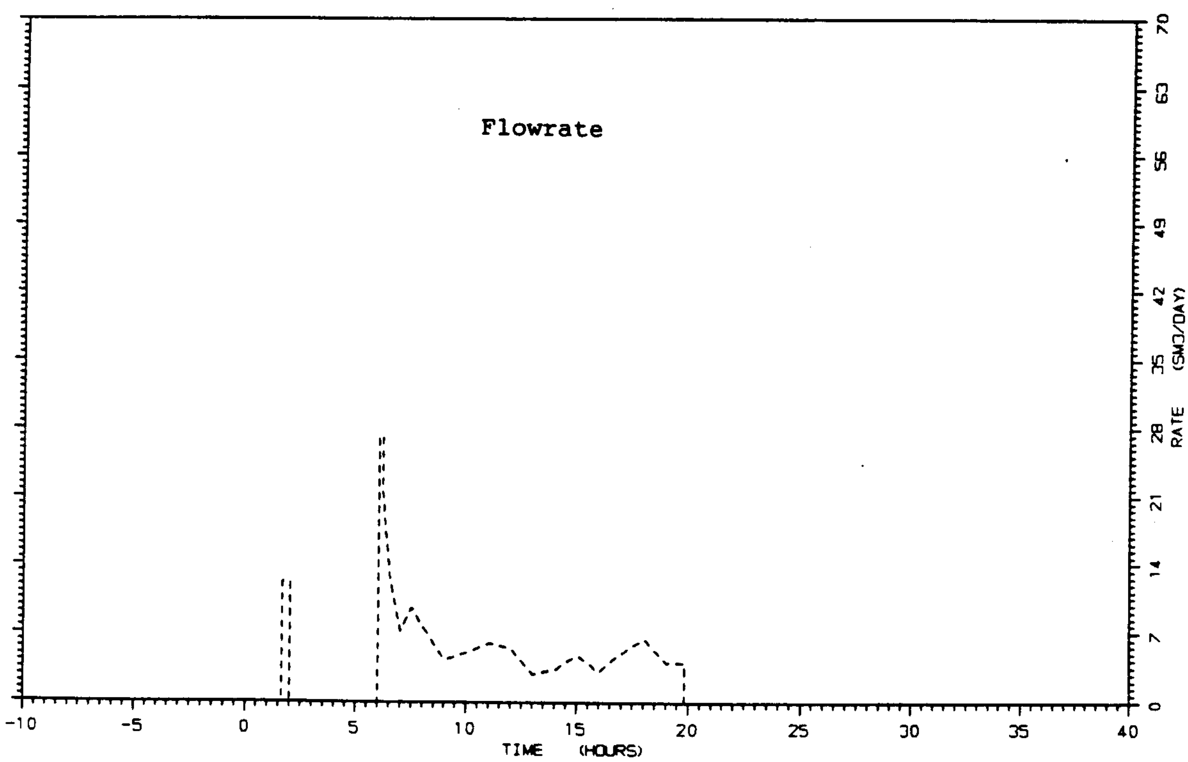


Fig. 5.2 Bottomhole pressure and flowrate vs time, 34/7-10

Date 1/2-87	Auth. Beh	Appr. Beh
Draw by	Ref	

Summary of Flowperiods, Production Test no 1

Event	Date	Time (hrs. min)	Flowrate (SM^3/day)	Bottomhole Pressure/temp (bar) (deg c)	Wellhead pressure/temp (bar) (deg C)	GOR (SM^3/SM^3)	Separator pressure/temp (bar) (deg C)	Choke (mm)
Initial flow (01:38-01:58)	6.10	01:58	40	263.9 / 79.5	1.0 / 12.0	-	-	6.4
Main flow (06:01-19:50)	6.10	10:00	5.4	258.3 / 81.2	1.0 / 11.0	-	-	6.4
		15:00	2.7	257.9 / 81.4	1.5 / 10.0	-	-	6.4
		19:00	4.0	254.6 / 81.8	1.4 / 10.5	-	-	6.4

Remarks: The bottomhole pressures are measured at 2609.8 mRKB.
The flowrate was measured on the tank. The rig heave in combination with the low flowrate makes these measurements fluctating.

Table 5.4 Flowperiods and flow data, 34/7-10

Date 1/2-87	Auth BtH	Appr BtH
Draw by	Ref	

Production Test no. 1

TIME (HOURS)	PRESSURE (BAR)	TIME (HOURS)	PRESSURE (BAR)
19.842	254.57	20.250	280.26
19.844	256.40	20.333	282.03
19.847	257.92	20.417	283.62
19.850	259.19	20.500	285.09
19.853	260.28	20.583	286.43
19.856	261.22	20.667	287.69
19.858	262.01	20.750	288.88
19.861	262.70	20.833	290.25
19.864	263.29	20.917	291.33
19.867	263.81	21.000	292.40
19.869	264.28	21.167	294.57
19.872	264.71	21.333	296.60
19.875	265.11	21.500	298.48
19.878	265.48	21.667	300.25
19.881	265.82	21.833	301.95
19.883	266.16	22.000	303.56
19.889	266.74	22.250	305.89
19.894	267.26	22.500	308.10
19.900	267.73	22.750	310.23
19.906	268.14	23.000	312.20
19.911	268.54	23.250	314.09
19.917	268.92	23.500	315.80
19.925	269.43	23.750	317.46
19.933	269.94	0.000	319.03
19.950	270.83	0.500	322.05
19.967	271.62	1.000	324.84
19.983	272.33	1.500	327.51
20.000	273.01	2.000	329.94
20.017	273.63	2.500	332.12
20.033	274.20	3.000	334.10
20.050	274.79	3.500	335.61
20.067	275.40	4.000	337.37
20.083	275.94	4.500	339.24
20.117	276.93	5.000	340.86
20.150	277.85	5.500	341.99
20.183	278.69	6.167	343.96
20.217	279.50		

Gauge no. SDP 85373 at 2609.8 mRKB

Table 5.5 Main build-up, bottom hole pressures, 34/7-10

Date 1/2.87	Auth Kel	Appr Bef6
Draw by	Ref	

Production Test no. 1

MEASURED RATE DATA

TIME (HOURS)	RATE (SM3/DAY)
0.000	0.00
1.633	0.00
1.633	12.24
1.983	12.24
1.983	0.00
6.017	60.80
6.167	60.80
6.167	21.60
6.333	17.28
6.500	12.96
7.000	7.20
7.500	9.60
8.000	7.68
9.000	4.32
10.000	5.08
11.000	6.00
12.000	5.52
13.000	2.88
14.000	3.36
15.000	4.80
16.000	3.12
17.000	5.04
18.000	6.48
19.000	4.03
19.842	4.03
19.842	0.00
0.000	0.00
6.167	0.00

Table 5.6 Flowrates, 34/7-10

Date 1/2.87	Auth BeH	Appr BeH
Draw by	Ref	

Test Performance, Production Test no. 2

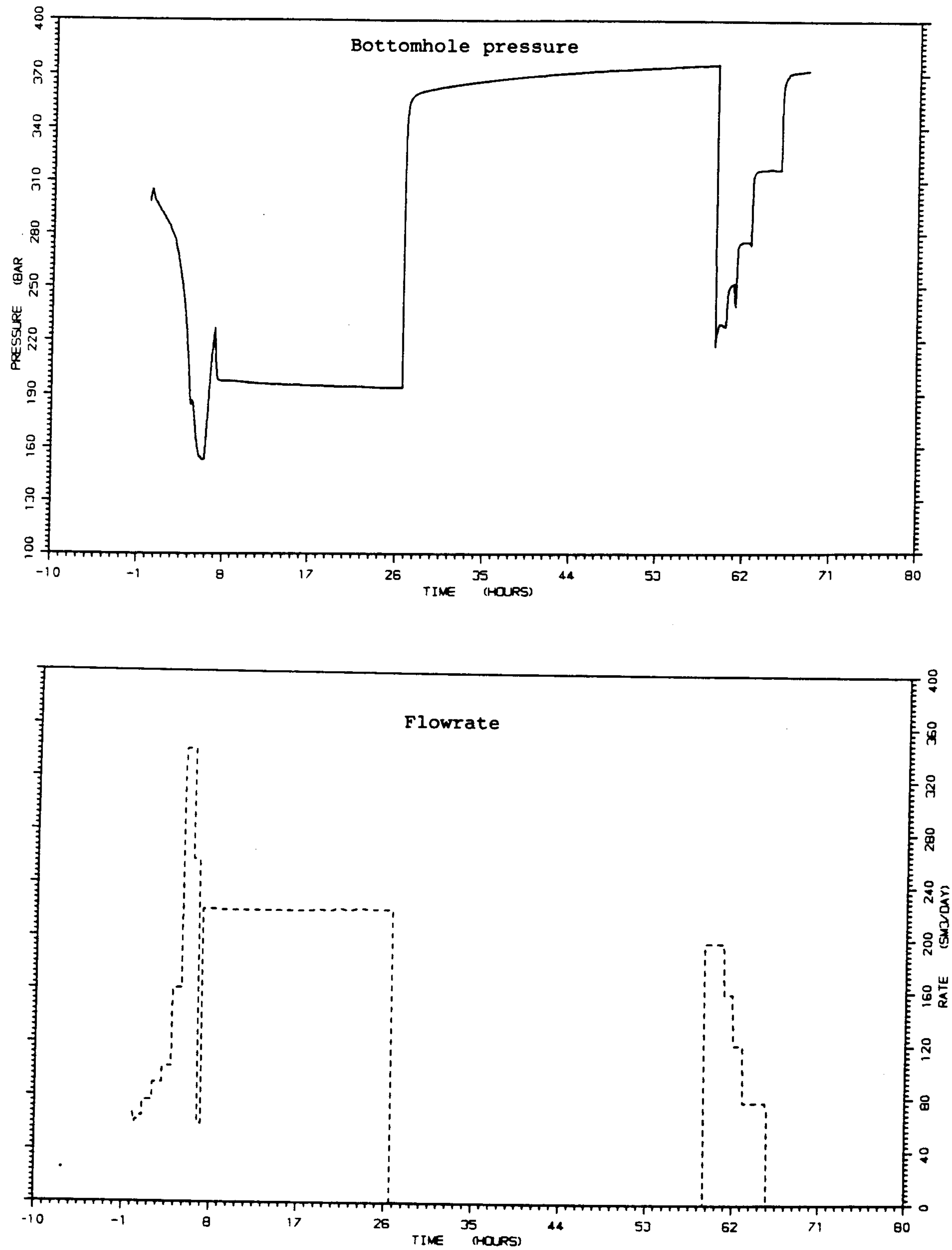


Fig. 5.3 Bottom hole pressure and flowrate vs time, 34/7-10

Date /2-87	Auth. B.eH	Appr. ExH
Draw by	Ref	

Event	Date	Time (hrs. min)	Flowrate (SM^3/day)	Bottomhole pressure/temp (bar) (deg c)	Wellhead pressure/temp (bar) (deg C)	GOR (SM^3/SM^3)	Separator pressure/temp (bar) (deg C)	Choke (mm)
Main flow	10.10	15:00	99	284.7 / 84.5	2.0 / 11.0	-	-	22.2
12:56(10.10)-		19:00	254	153.0 / 91.0	9.7 / 12.5	-	-	22.2
15:30(11.10)	11.10	01:00	187	195.9 / 93.1	22.6 / 12.0	88.6	5.7 / 48	12.7
10.10		06:00	212	195.1 / 94.1	22.8 / 14.0	78.6	5.7 / 49	12.7
11.10		12:00	222	194.4 / 94.8	23.0 / 15.0	77.1	5.8 / 52	12.7
		15:30	222	194.1 / 95.0	23.0 / 15.0	77.1	5.8 / 52	12.7
Bottomhole	13.10	03:00	138	276.0 / 93.0	83.0 / 11.0	-	-	4.8
sampling flow		06:00	81	316.9 / 92.6	122.5 / 11.0	-	-	3.2
23:55 (12.10)-								
06:30 (13.10)								
12.10								
13.10								

Remarks: The bottomhole pressures are measured at 2583.9 mRKB

Table 5.7 Flowperiods and flow data,
34/7-10

Date 1/2. 87 Auth [illegible] Appr [illegible]
Drawn by Ref

Production Test no. 2

TIME (HOURS)	PRESSURE (BAR)	TIME (HOURS)	PRESSURE (BAR)
15.514	194.01	16.633	359.36
15.517	233.39	16.667	359.45
15.533	311.07	16.700	359.52
15.550	322.60	16.733	359.60
15.567	329.20	16.767	359.68
15.583	333.82	16.800	359.74
15.600	337.30	16.833	359.81
15.617	340.07	16.867	359.88
15.633	342.32	16.900	359.94
15.650	344.18	16.933	360.01
15.667	345.76	16.967	360.07
15.683	347.09	17.000	360.13
15.700	348.24	17.033	360.18
15.717	349.23	17.067	360.24
15.733	350.10	17.100	360.30
15.750	350.86	17.133	360.36
15.767	351.53	17.167	360.41
15.783	352.12	17.233	360.51
15.800	352.65	17.267	360.57
15.817	353.13	17.333	360.66
15.833	353.56	17.400	360.76
15.850	353.95	17.467	360.85
15.867	354.30	17.533	360.95
15.883	354.63	17.600	361.04
15.900	354.92	17.667	361.12
15.917	355.19	17.733	361.21
15.933	355.44	17.800	361.29
15.950	355.67	17.867	361.37
15.967	355.88	17.933	361.45
15.983	356.08	18.000	361.53
16.000	356.27	18.067	361.62
16.017	356.44	18.133	361.69
16.033	356.60	18.200	361.77
16.050	356.75	18.267	361.84
16.067	356.90	18.333	361.91
16.083	357.03	18.400	361.99
16.100	357.16	18.467	362.06
16.117	357.27	18.533	362.13
16.133	357.39	18.600	362.20
16.150	357.50	18.667	362.28
16.167	357.60	18.733	362.34
16.200	357.80	18.800	362.41
16.233	357.98	18.867	362.48
16.267	358.13	18.933	362.55
16.283	358.21	19.000	362.62
16.300	358.28	19.067	362.68
16.317	358.36	19.133	362.75
16.333	358.42	19.217	362.83
16.350	358.49	19.267	362.87
16.367	358.55	19.317	362.93
16.383	358.61	19.367	362.97
16.400	358.67	19.417	363.02
16.433	358.79	19.467	363.06
16.467	358.90	19.517	363.11
16.500	359.00	19.567	363.16
16.533	359.10	19.617	363.20
16.567	359.19	19.667	363.25
16.600	359.28	19.717	363.30

Gauge no. SDP 85412 at 2583.9 mRKB

Table 5.8 Main build-up, bottom hole pressures, 34/7-10

Date 1/2-87	Auth BCH	Appr BCH
Draw by	Ref	

Production Test no. 2

TIME (HOURS)	PRESSURE (BAR)	TIME (HOURS)	PRESSURE (BAR)
19.767	363.34	0.000	366.53
19.817	363.39	0.083	366.58
19.867	363.43	0.167	366.63
19.917	363.48	0.250	366.69
19.967	363.52	0.333	366.73
20.017	363.57	0.417	366.79
20.067	363.61	0.500	366.84
20.117	363.65	0.667	366.95
20.167	363.70	0.850	367.06
20.217	363.74	1.000	367.14
20.267	363.78	1.167	367.25
20.333	363.84	1.333	367.34
20.417	363.91	1.500	367.44
20.500	363.98	1.667	367.54
20.583	364.05	1.833	367.64
20.667	364.12	2.000	367.73
20.750	364.19	2.167	367.83
20.833	364.25	2.333	367.92
20.917	364.32	2.500	368.02
21.000	364.39	2.667	368.11
21.100	364.47	2.833	368.20
21.167	364.53	3.000	368.29
21.250	364.59	3.167	368.38
21.333	364.65	3.333	368.47
21.417	364.72	3.500	368.55
21.500	364.78	3.667	368.64
21.583	364.85	3.833	368.72
21.667	364.91	4.000	368.81
21.750	364.97	4.167	368.90
21.833	365.04	4.333	368.98
21.917	365.10	4.500	369.06
22.000	365.16	4.667	369.15
22.083	365.22	4.833	369.23
22.167	365.28	5.000	369.31
22.250	365.34	5.167	369.39
22.333	365.40	5.500	369.56
22.417	365.46	5.833	369.71
22.500	365.51	6.167	369.86
22.583	365.58	6.500	370.02
22.667	365.64	6.833	370.17
22.750	365.70	7.167	370.31
22.833	365.75	7.500	370.46
22.917	365.81	7.900	370.63
23.000	365.87	8.250	370.78
23.083	365.92	8.667	370.95
23.167	365.98	9.000	371.09
23.250	366.04	9.350	371.23
23.333	366.09	9.683	371.36
23.417	366.15	10.017	371.49
23.500	366.20	10.517	371.68
23.583	366.25	11.000	371.87
23.667	366.31	11.500	372.05
23.750	366.37	12.000	372.24
23.833	366.42	12.500	372.42
23.917	366.47	13.000	372.60

Table 5.8 Main build-up, bottom hole pressures, 34/7-10

Date 1/2-82	Auth BeH	Appr BeH
Drawn by	Ref	

Production Test no. 2

TIME (HOURS)	PRESSURE (BAR)
13.500	372.78
14.000	372.95
14.533	373.13
15.000	373.29
15.500	373.46
16.000	373.62
16.517	373.79
17.000	373.95
17.500	374.10
18.000	374.25
18.500	374.40
19.033	374.56
19.500	374.70
20.000	374.84
20.500	374.98
21.050	375.14
21.500	375.26
22.000	375.39
22.500	375.53
23.000	375.65
23.500	375.78
23.617	375.81
23.917	375.88

Table 5.8 Main build-up, bottom hole pressures, 34/7-10

Date 1/2-87	Auth BeH	Appr BeH
Draw by	Ref	

Production Test no. 2

TIME (HOURS)	RATE (SM3/DAY)
12.933	67.20
12.983	67.20
13.050	60.48
13.250	62.40
13.500	65.28
14.000	77.28
15.000	90.24
16.000	102.48
17.000	160.80
18.000	341.04
19.000	258.48
19.167	258.48
19.617	59.55
19.983	59.50
20.000	221.00
21.000	221.00
22.000	220.00
23.000	220.00
0.000	220.00
7.000	220.00
7.750	221.00
9.000	220.00
10.000	222.00
11.000	220.00
12.000	222.00
13.000	221.00
14.000	221.00
15.514	221.00
15.514	0.00
0.000	0.00
23.917	0.00
23.917	197.00
1.000	197.00
2.000	158.40
3.000	120.00
3.500	120.00
4.000	77.00
5.000	77.00
6.500	72.00
6.500	0.00
9.250	0.00

Table 5.9 Flowrates, 34/7-10

Date 1/2.82	Auth. BeH	Appr BeH
Draw by	Ref	

Test Performance , Production Test no. 3

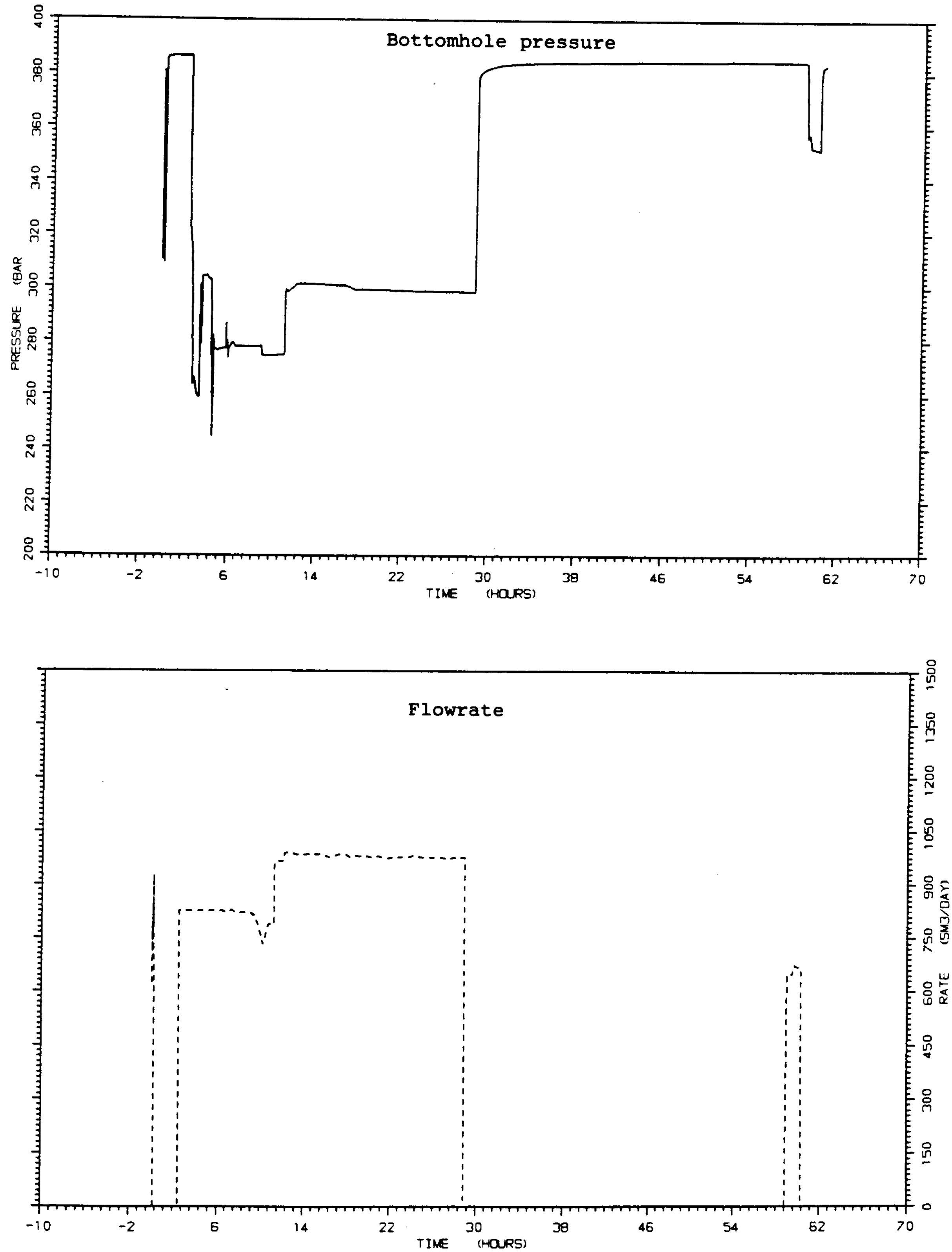


Fig. 5.4 Bottom hole pressure and flowrate vs time, 34/7-10

Date 1/2-82	Auth BeH	Appr
Draw by	Ref	

Summary of Flowperiods, Production Test no. 3

Event	Date	Time (hrs. min)	Flowrate (SM^3/day)	Bottomhole pressure/temp (bar) (deg c)	Wellhead pressure/temp (bar) (deg C)	GOR (SM^3/SM^3)	Separator pressure/temp (bar) (deg C)	Choke (mm)
Initial flow (01:18-01:28)	17.10	01:28	847	308.7 / 80.5	52.5 / 11.0	-	-	12.7
Main flow 03:45(17.10)-06:10(18.10)	17.10	10:00	821	277.6 / 94.0	86.7 / 32.5	57	19.0 / 55.6	12.7
		14:00	973	300.9 / 94.0	107.5 / 38.5	38	39.4 / 55.0	12.7
		18:00	966	300.2 / 94.0	107.0 / 36.5	39	39.2 / 56.0	12.7
		22:00	965	298.5 / 94.5	105.0 / 36.0	47	30.0 / 54.4	12.7
	18.10	02:00	961	298.0 / 95.0	104.8 / 36.0	48	30.8 / 53.9	12.7
		06:00	961	297.9 / 95.0	104.8 / 36.0	47	31.0 / 55.6	12.7
Verification flow 12:21-13:35	19.10	13:30	692	351.9 / 92.0	72.0 / 19.0	51	26.6 / 59.0	12.7

Remark: The bottomhole pressures are measured at 2533.5 mRKB

Table 5.10 Flowperiods and flow data, 34/7-10

Date	Auth	Appr
1/2-87	ReH	ReH
Drawn by	Ref	

Production Test no. 3

TIME (HOURS)	PRESSURE (BAR)	TIME (HOURS)	PRESSURE (BAR)
6.175	298.55	7.667	382.72
6.178	376.68	7.750	382.80
6.183	377.88	7.833	382.88
6.189	378.11	7.917	382.94
6.194	378.28	8.000	383.01
6.200	378.43	8.083	383.07
6.206	378.56	8.167	383.13
6.211	378.67	8.250	383.18
6.217	378.77	8.333	383.23
6.222	378.85	8.417	383.28
6.228	378.94	8.500	383.32
6.233	379.01	8.583	383.37
6.239	379.08	8.667	383.41
6.244	379.14	8.833	383.48
6.250	379.20	9.000	383.55
6.256	379.25	9.167	383.62
6.267	379.36	9.333	383.67
6.283	379.49	9.500	383.72
6.300	379.61	9.667	383.77
6.317	379.71	9.833	383.82
6.333	379.81	10.000	383.86
6.350	379.90	10.250	383.91
6.367	379.99	10.500	383.96
6.383	380.07	10.750	384.01
6.400	380.15	11.000	384.05
6.417	380.22	11.250	384.08
6.433	380.29	11.500	384.12
6.450	380.36	11.750	384.15
6.467	380.43	12.000	384.18
6.483	380.49	12.500	384.23
6.500	380.55	13.000	384.27
6.517	380.61	13.500	384.31
6.533	380.67	14.000	384.34
6.550	380.73	14.500	384.37
6.567	380.78	15.000	384.40
6.583	380.83	15.500	384.43
6.600	380.89	16.000	384.45
6.617	380.93	16.500	384.48
6.633	380.98	17.000	384.50
6.650	381.03	17.500	384.52
6.667	381.08	18.000	384.54
6.700	381.17	18.500	384.56
6.733	381.26	19.000	384.58
6.767	381.34	20.000	384.63
6.800	381.42	21.000	384.66
6.833	381.49	22.000	384.70
6.867	381.57	23.000	384.72
6.900	381.64	0.000	384.75
6.933	381.70	1.000	384.77
6.967	381.77	2.000	384.79
7.000	381.83	3.000	384.80
7.083	381.98	4.000	384.82
7.167	382.11	4.300	384.82
7.250	382.23	5.301	384.84
7.333	382.35	7.134	384.88
7.417	382.45	10.134	384.94
7.500	382.55	12.133	384.97
7.583	382.64		

Gauge no. MURR-13 at 2555.2 mRKB

Table 5.11 Main build-up, bottom hole pressures, 34/7-10

Date 1/2-87	Auth [signature]	Appr [signature]
Draw by	Ref	

Production Test no. 3

MEASURED RATE DATA

TIME (HOURS)	RATE (SM3/DAY)	TIME (HOURS)	RATE (SM3/DAY)
1.300	625.00	1.500	984.00
1.317	625.00	2.000	979.00
1.333	786.00	2.500	976.00
1.350	726.00	3.000	978.00
1.367	806.00	3.500	978.00
1.383	806.00	4.000	978.00
1.400	847.00	4.500	972.00
1.417	766.00	5.000	977.00
1.433	927.00	5.500	978.00
1.467	685.00	6.000	977.00
1.467	0.00	6.175	977.00
3.756	0.00	6.175	0.00
3.756	827.00	0.000	0.00
7.750	827.00	12.267	0.00
8.000	822.00	12.267	649.00
8.500	829.00	12.917	674.00
9.000	822.00	13.000	672.00
10.000	820.00	13.250	669.00
10.500	816.00	13.600	666.00
11.000	790.00	13.600	0.00
11.500	733.00	14.050	0.00
12.000	790.00		
12.539	792.00		
12.544	950.00		
12.567	965.00		
12.750	966.00		
13.500	990.00		
14.000	989.00		
14.500	986.00		
15.000	984.00		
15.500	986.00		
16.000	986.00		
16.500	986.00		
17.000	985.00		
17.500	977.00		
18.000	981.00		
18.500	986.00		
19.000	986.00		
19.500	978.00		
20.000	982.00		
20.500	981.00		
21.000	980.00		
21.500	978.00		
22.000	980.00		
22.500	979.00		
23.000	974.00		
23.500	979.00		
0.000	977.00		
0.500	980.00		
1.000	979.00		

Table 5.12 Flowrates, 34/7-10

Date 1/2-87	Auth. BeH	Appr. BeH
Draw by	Ref	

Test Performance, Production Test no. 4

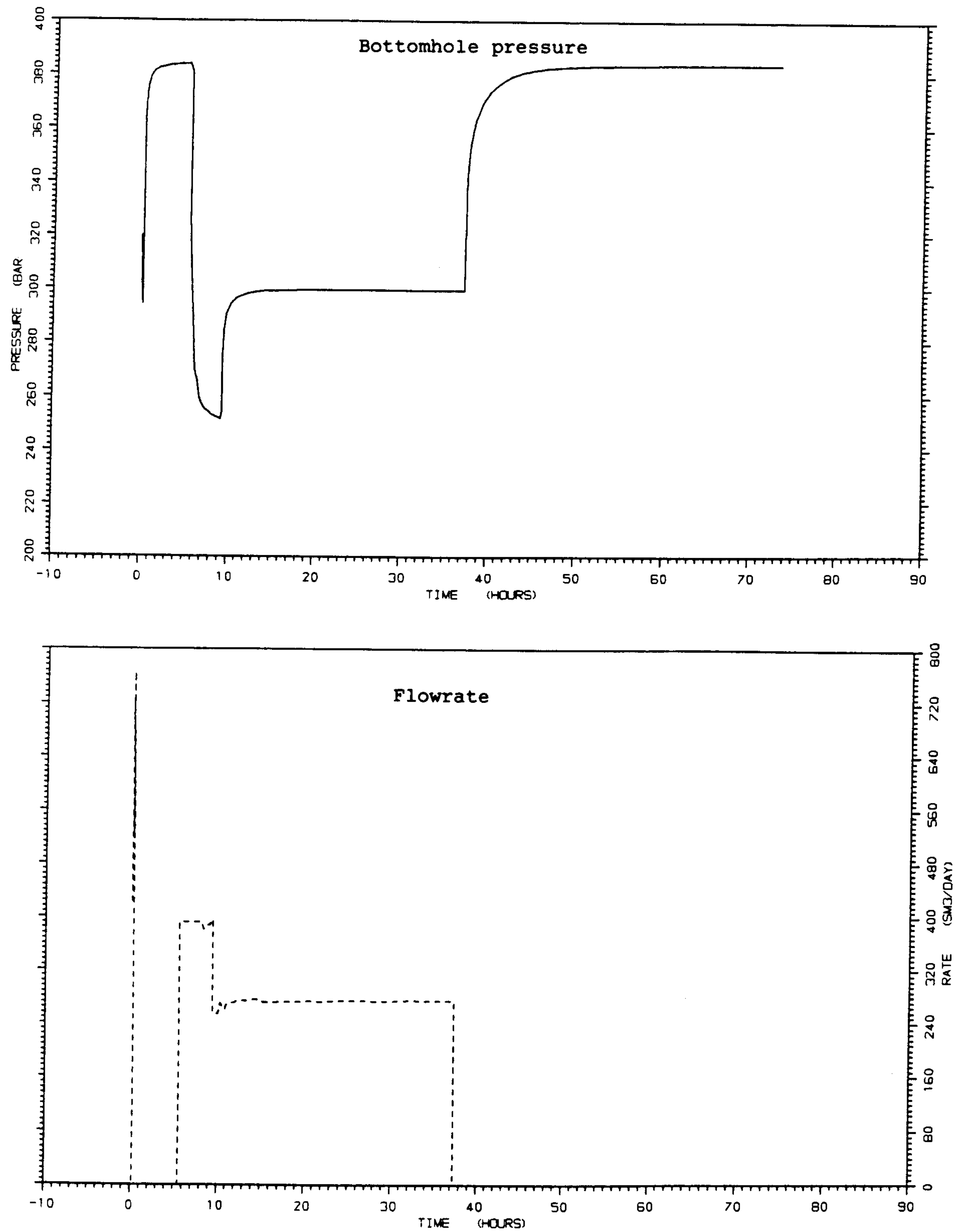


Fig. 5.5 Bottom hole pressure and flowrate vs time, 34/7-10

Date 1/2-87	Auth B-H	Appr BeH
Draw by	Ref	

Summary of Flowperiods, Production Test no. 4

Event	Date	Time (hrs. min)	Flowrate (SM^3/day)	Bottomhole pressure/temp (bar) (deg c)	Wellhead pressure/temp (bar) (deg C)	GOR (SM^3/SM^3)	Separator pressure/temp (bar) (deg C)	Choke (mm)
Initial flow 19:45-19:55	21.10	19:55	565	292.7/80.5	2.9/-	-	-	44.5
Main flow 01:15(22.10)-09:04(23.10)	22.10	05:00	395	250.3 / 91.2	66.2 / 18.0	80	15.2 / 55.6	11.1
		08:00	274	297.0 / 91.2	111.5 / 16.0	68	14.5 / 56.7	6.4
		12:00	271	298.1 / 91.6	113.0 / 17.0	67	13.0 / 56.7	6.4
		16:00	273	298.2 / 91.7	113.3 / 18.0	68	13.0 / 56.7	6.4
		20:00	273	298.3 / 92.0	113.5 / 19.0	67	13.0 / 56.1	6.4
	23.10	02:00	273	298.3 / 92.2	113.8 / 19.0	69	13.7 / 56.1	6.4
		09:00	273	298.3 / 92.3	113.8 / 19.0	69	14.3 / 55.0	6.4

Remark: The bottomhole pressures are measured at 2516.8 mRKB.

Table 5.13 Flowperiods and flow data, 34/7-10

Date	Auth	Appr
1/12-87	RuH	RuH
Draw by	Ref	

Production Test no. 4

TIME (HOURS)	PRESSURE (BAR)	TIME (HOURS)	PRESSURE (BAR)
9.048	299.65	14.500	380.18
9.050	307.26	14.750	380.46
9.067	332.07	15.000	380.72
9.083	336.04	15.500	381.17
9.100	338.35	16.000	381.55
9.117	340.02	16.500	381.87
9.133	341.36	17.000	382.14
9.150	342.53	17.500	382.36
9.167	343.56	18.000	382.56
9.183	344.51	18.500	382.72
9.200	345.39	19.000	382.87
9.217	346.21	19.500	383.00
9.233	346.97	20.000	383.10
9.250	347.69	20.500	383.20
9.267	348.38	21.000	383.28
9.283	349.02	21.500	383.36
9.300	349.64	22.000	383.42
9.317	350.22	22.500	383.48
9.333	350.78	23.000	383.53
9.350	351.32	23.500	383.58
9.367	351.84	0.000	383.62
9.400	352.80	1.000	383.69
9.433	353.70	2.000	383.74
9.467	354.54	3.000	383.79
9.500	355.32	4.000	383.83
9.750	359.96	5.000	383.85
10.000	363.26	6.000	383.88
10.250	365.80	7.000	383.90
10.500	367.84	8.000	383.92
10.750	369.54	9.000	383.94
11.000	370.98	10.000	383.96
11.250	372.23	11.000	383.98
11.500	373.33	12.000	383.99
11.750	374.29	13.000	384.01
12.000	375.15	14.000	384.02
12.250	375.92	15.000	384.03
12.500	376.61	16.000	384.04
12.750	377.22	17.000	384.05
13.000	377.79	18.000	384.05
13.250	378.29	19.000	384.06
13.500	378.74	20.000	384.07
13.750	379.16	21.000	384.07
14.000	379.53		
14.250	379.87		

Gauge no. 85349 at 2516.8 mRKB

Table 5.14 Main Build-up, bottomhole pressures, 34/7-10

Date 7/2-87	Auth BCH	Appr BCH
Draw by	Ref	

Production Test no. 4

TIME (HOURS)	RATE (SM3/DAY)
19.750	423.00
19.767	423.00
19.783	726.00
19.800	645.00
19.817	766.00
19.833	766.00
19.850	685.00
19.867	565.00
19.883	524.00
19.900	645.00
19.917	565.00
19.917	0.00
1.250	0.00
1.250	392.00
3.750	392.00
4.000	381.00
4.500	387.00
5.000	395.00
5.133	395.00
5.150	254.00
5.500	254.00
6.000	270.00
6.500	260.00
6.750	269.00
7.000	271.00
7.500	270.00
8.000	274.00
9.000	273.00
10.000	276.00
11.000	271.00
12.000	271.00
13.000	272.00
14.000	272.00
15.000	272.00
16.000	273.00
17.000	272.00
19.000	273.00
21.000	273.00
23.000	273.00
0.000	272.00
2.000	273.00
4.000	274.00
6.000	273.00
9.048	273.00
9.048	0.00
0.000	0.00
21.000	0.00

Table 5.15 Flowrates, 34/7-10

Date 1/2 87	Auth. BrH	Appr. BrH
Draw by	Ref	

Fluid Analysis, Well 34/7-10

Sampling depth (mRKB)	Chamber volume (gall)	Content
2532,5	1	64,8 l gas 945 cc HC Liquid 440 cc water/mudfiltrate
2601	1	3,3 l gas 2150 cc water/mudfiltrate
2601	1	5,8 l gas 60 cc HC liquid 2065 water/mudfiltrate

Analysis of pressurized oil sample

Sampling depth (mRKB)	: 2532,5
Temperature used in analysis (°C)	: 93
Bubble point pressure (bar)	: 112,9
Reservoir oil density (kg/m^3)	:
Oil formation volume factor (Rm^3/Sm^3) 1	: 1,29
Gas oil ratio (Sm^3/Sm^3) 1	: 89,7
Stock Tank oil density (kg/m^3) 2	: 836,5

1) From single stage flash separator conditions = 1 atm and 15°C

2) After single stage flash.

Table 5.16 Fluid analysis of FMT samples.

Date 1/2-87	Auth. [illegible]	Appr. [illegible]
Draw by	Ref	

Fluid Analysis, Well 34/7-10

	Test no 2	Test no 3	Test no4
Mid perf. interval (mRKB)	2612	2566	2550
Reservoir temperature (°C)	96.8	95.4	95.0
Bubble point pressure (bar)	106.0	114.0	114.2
Reservoir oil density (kg/m^3)	729.0	717.5	739.3
Reservoir oil viscosity (m Pa.s)	0.61	0.57	0.86
Oil formation volume factor (Rm^3/Sm^3)[1]	1.233	1.251	
Gas oil ratio (Sm^3/Sm^3)[1])	64.2	71.2	
Stock tank oil density (kg/m^3)[1]	827.8	827.7	

1) From four stage flash separator conditions:

1. 63 bar 66°C
2. 31 bar 60°C
3. 14 bar 59°C
4. atm. 15°C

Table 5.17 Fluid analysis of test sample

Date /2.87	Auth JMH	Appr JMH
Draw by	Ref	

Fluid Analysis, Well 34/7-10

Reservoir fluid (wellhead sample) compositions test No. 2

Components	Wt %	MW	Mol %	Density (kg/m^3)
CO_2	0.01		0.04	
N_2	0.24		1.10	
C_1	2.81		22.40	
C_2	1.51		6.42	
C_3	3.02		8.75	
i-C_4	0.61		1.34	
n-C_y	2.41		5.31	
i-C_5	1.09		1.94	
n-C_5	1.55		2.75	
C_6	2.39	84,4	3.62	671
C_7	3.86	93,1	5.30	730
C_8	4.44	107,3	5,29	752
C_9	2.84	120.8	3.01	766
C_{10+}	73.22	286	32.73	880

	Measured	Calculated
Molecular weight stock tank oil	201	
Density stock tank oil (kg/m^3) (after single stage flash)	838.5	
Molecular weight C7+		233
Density C7+ (kg/m^3)		860
Molecular weight C10+		286
Density C10+ (kg/m^3)		880

Table 5.18 Reservoir fluid composition, production test no 2

Date	Auth	Appr
Draw by	Ref	

Fluid Analysis, Well 34/7-10

Reservoir fluid (wellhead sample) compositions test No. 3

Components	Wt %	MW	Mol %	Density (kg/m^3)
CO_2	0.08		0.24	
N_2	0.24		1.06	
C_1	3.09		23.63	
C_2	1.67		6.85	
C_3	3.20		8.91	
$i\text{-}C_4$	0.63		1.33	
$n\text{-}C_4$	2.44		5.15	
$i\text{-}C_5$	1.10		1.87	
$n\text{-}C_5$	1.58		2.69	
C_6	2.41	84.3	3.51	671
C_7	3.94	93.2	5.19	730
C_8	4.46	107.3	5.11	752
C_9	2.94	120.9	2.99	766
C_{10+}	72.22	282	31.47	882

	Measured	Calculated
Molecular weight stock tank oil	201	196
Density stock tank oil (kg/m^3) (after single stage flash)	837.7	
Molecular weight C7+		229
Density C7+ (kg/m^3)		861
Molecular weight C10+	282	
Density C10+ (kg/m^3)		882

Table 5.19 Reservoir fluid composition, production test no 3

Date ..-87	Auth. JM 17	Appr. JMH
Draw by	Ref	

Fluid Analysis, Well 34/7-10

Reservoir fluid (wellhead sample) compositions test No. 4

Components	Wt %	MW	Mol %	Density (kg/m^3)
CO_2	0.11		0.29	
N_2	0.27		1.14	
C_1	3.25		24.42	
C_2	1.80		7.23	
C_3	3.34		9.13	
$i\text{-}C_4$	0.59		1.22	
$n\text{-}C_4$	2.17		4.51	
$i\text{-}C_5$	0.82		1.37	
$n\text{-}C_5$	1.09		1.81	
C_6	1.87		2.68	
C_7	5.33	93.2	5.85	719.1
C_8	5.18	107.7	5.10	746.7
C_9	4.80	120.2	4.35	766.6
C_{10+}	69.38	280.2	30.90	877.6

	Measured	Calculated
Molecular weight stock tank oil	204	
Density stock tank oil (kg/m^3) (after single stage flash)	840.6	
Molecular weight C7+	221	
Density C7+ (kg/m^3)	851.4	
Molecular weight C10+	280.2	
Density C10+ (kg/m^3)	877.6	

Table 5.20 Reservoir fluid composition, production test no 4

Date	Auth	Appr
Draw by	Ref	

Fluid Analysis, Well 34/7-10

Trace element analysis

<u>Gas</u>

Hydrogen sulfide (H_2S)	<0.1	ppm-Mol
Mercaptans (R-SH)	<0.1 - Trace	ppm-Mol
Total mercury (Hg)	15 - 36.0	$\mu g/m^3$
Radon - 222	0.06 - 0.49	Bq/lit.
Water (H_2O)	0.78	mg/lit
Water vapour dew point	(-20) - (-40)	deg C
Carbon dioxide (CO_2)	0.3 - 0.7	mol %
Helium (He)	0.008 - 0.010	mol %

<u>Oil</u>

Mercury (Hg)	0.0008 - 0.0025	ppm-weight
Total sulfur	0.12 - 0.13	weight %
Polonium)Po-210)	0.10 - 0.29	Bq/litre
Nickel (Ni)	0.8 - 1.1	ppm-weight
Vanadium (V)	1.8 - 2.0	ppm-weight

The results given are the lowest and highest values measured during tests no 2,3 and 4.

Table 5.21 Trace element analysis

Date	Auth	Appr
Draw by	Ref	

6. DRILLING DATA

If not otherwise mentioned, all depths in this chapter refer to m RKB (Rotary Kelly Bushing).

Date	Stop	Operational Description
23.08.86	2400	On tow to location. Speed 7.9 kts. Position at 2400 hrs: N 65 deg. 12 min., E 07 deg. 12 min.
24.08.86	2400	On tow to location. Speed 7.5 kts. Position at 24:00 hrs: N 62 deg. 43 min., E 03 deg. 43 min.
25.08.86	1230	Rig on tow to 34/7-10 location.
	2400	Anchor handling: 1215 hrs-no 5 on bttm 1440 hrs no 1 on bttm,1455 hrs off tow-line, 1650 hrs no 8 on bttm, 1705 hrs no 4 on bttm, 1815 hrs no 2 on bttm,2030 hrs no 6 on bttm, 2220 hrs no 3 on bttm,2325 hrs no 7 on bttm,
26.08.86	0500	Ballasted rig down to drilling draft.piggy-back anchor no 5 on bttm 0220 hrs.
	0600	Pretensioned all anchors to 160 m/t-ok.
	0700	Landed tgb at 0615 hrs.pulled landing string, rkb-seabed 326 m.
	0930	M/u 36" bha, rih to seabed
	1000	Ran single shot survey.
	1100	Spudded in at 1025 hrs. drilled 36" hole fm 326 m to 341 m
	1130	Ran survey.
	1230	Drilled 36" hole fm 341 m to 350 m.
	1300	Ran survey.
	1400	Drilled 36" hole fm 350 m to 360 m.
	1430	Ran survey.
	1600	Drilled 36" hole fm 360 m to 388 m.
	1630	Ran survey.
	2400	Drilled 36" hole fm 388 m to 428 m.

Date	Stop	Operational Description
27.08.86	0030	Pumped 16 cum. high-visc. pill to sweep hole.
	0130	Dropped survey. pooh to seabed,retrieved survey. rih.
	0200	Displaced hole with 125 cum. spud mud.
	0400	Pooh. 36" h.o hung up in tilted tgb,tensioned up two guide lines to level up same.pooh.
	0830	M/u 30" csg.r/t ,set same back in derrick. r/u to and ran 8 jnt.s 30" csg.and 8 std.s of dp in landing string.
	1200	Stabbed 30" csg. into tgb by moving rig.attempted to stab into 36" hole -no success. tensioned up on guide lines to move tgb - no success. guide-line no 1 broke
	1500	Waiting on bus.malfunction in fibre-optics on unit, unable to dive.
	1730	Attempted to stab 30" csg. into 36" hole while pumping -worked csg. fm 326 m to 341 m. taking weight.
	1930	Pulled 30" csg. to surface, hung off same on trolley.
	2130	M/u tgb r/t,ran same and attempted to retrieve tgb-no success.
	2400	Hooked up wire sling on tgb r/t. ran same and hooked sling onto J-slot on tgb.p/u tgb. and moved rig 20 m north.landed tgb on seabed angle 1 deg.
28.08.86	0030	Released wire sling on tgb r/t fm J-slot on tgb pulled r/t.
	0330	Changed out 36" h.o. m/u new 36" bha . rih.
	0400	Dropped and retrieved survey.
	0430	Washed and drilled 36" hole fm 326 m to 342 m
	0500	Dropped and retrieved survey.
	0600	Drilled 36" hole fm 342 m to 351 m
	0630	Dropped and retr. survey.
	1030	Drilled 36" hole fm 351 m to 380 m.
	1100	Dropped and retr. survey.
	1800	Drilled 36" hole fm 380 m to 428 m.
	1830	Sweeped hole with 16 cum. high-visc.mud. dropped survey.
	1900	Pooh to seabed ,retr. survey. rih.
	2000	Pumped 127 cum. spud mud to displace mud.
	2130	Pooh.
	2200	M/u 30" csg. r/t with stinger to 30" hsg.
	2400	While preparing to observe slope indicator on tgb with rov, umbilical mingled with utv-guide line, freed same

Date	Stop	Operational Description
29.08.86	0230	Ran 30" csg.with 5" dp stinger. observed tgb with utv and rov. positioned rig and stabbed into 36" hole. landed 30" csg with pgb in tgb. csg. shoe at 423 m.
	0400	Circ. casing volume. mix and pump 44.2 cum 1.56 sg lead slurry and 16.3 cum.1.92 sg tail slurry. displaced cmt. with seawater.
	0430	Released 30" csg. r/t. pooh.
	1200	R/u to and ran sbd and marine riser. press. tested k/c lines every third joint.latched onto 30" wh hsg overpull tested with 10 m/t-ok.
	1930	L/d 26" bit and 36" ho.m/u 17-1/2" bit 26" u.r. tested same-ok.rih.
	2000	Closed sbd.press.tested sbd and 30" csg,to 35 bar -ok.function tested surface diverter system. flushed through surface lines.
	2230	Tagged cmt. at 419 m.drilled cmt. to 428 m.
	2300	Drilled to 430 m,suspecting cmt. below u.r.cutters due to high torque
	2330	Displaced hole with 111 cum. bent. mud.
	2400	Pooh.
30.08.86	0130	Cont. pooh.l/d 9-1/2" dc,s and 26" u.r.
	0600	M/U new BHA .MWD tool malfunctioned when tested on surface. L/D same.P/U MWD back up tool & test OK. RIH.
	2030	Drilled fm 430 to 720 m. Flowcheck at 450,468,583, 638 m.
	2130	Pump viscous pill. Circ. hole clean.
	2230	Wipertrip to shoe,no drag.
	2300	Drill fm 720 to 725 m. Sub rod piston on mud pump # 1 broke.
	2330	Change sub rod piston on mud pump # 1
	2400	Drill fm 725 to 730 m.
31.08.86	0900	Drill fm 730 to 918 m.
	1000	Pump 8 cum visc.pill and circ. btms up
	1030	Close bag on SBD. Open dumpvalve.Flowcheck 30 min, neg.
	1100	Circ btms up.
	1400	Drop survey.POOH.L/D excess DP on way out.retrieve survey.
	1530	M/U new BHA w/26" UR and RIH.
	2300	Open hole to 26" fm 430 to 592 m. Leak in pop-off valve on mud pump # 1.
	2400	Change pop-off valve on mud pump # 1.

Date	Stop	Operational Description
01.09.86	1530	Open hole to 26" from 592 to 918 m.
	1730	Pump hi-visc. pill. Circ. hole clean.
	1830	Drop survey. POOH to seabed.
	1900	Close SBD around monel. Open dumpvalve.Flowcheck 30 min,ok.
	1930	Close dumpvalve. Open SBD. Displace riser to seawater. Open dumpvalve . Flowcheck for 10 min,ok
	2100	Retrieve survey. Cont POOH. L/D bit and UR.
	2400	R/U and pull seabed diverter.
02.09.86	0400	Cont. pull seabed diverter.
	0500	P/U 18-3/4" WH to M/U to R/T. Found scratches in seal area. L/D same.
	0730	M/U 26" bit and RIH to TD. Drop survey.
	0930	POOH to 345 m.Pump 10 cum mud to fill hole. Retrieve survey,misrun. Cont. POOH.
	2100	Make up running tool to 18-3/4" housing.L/D same. R/U and run 49 jts of 20" csg. DP in landing string.
	2400	Hold 18-3/4" WH 1 m above 30" housing.Break circ. w/rig pumps,pumping 16 cum mud.BJ pump 5 cum of seawater spacer.Mix and pump 139 cum 1.56 SG lead slurry and 16 cum 1.92 SG tail slurry.Drop dart and shear top plug w/80 bar after pumping 3 cum.
03.09.86	0200	Displace slurry w/SW.Land 20" csg & O/P test to 10 MT,ok,after pumping 4000 stk.Bump plug at 4870 stk.Change to BJ & pressure up to 117 bar to test csg.Pressure dropped to 90 bar in 10 min.Bleed off pressure & check for backflow,neg,release R/T.
	0300	L/D cmt.kelly & POOH. L/D 18-3/4" R/T.
	1630	R/U and run BOP on riser.Pressure test choke/kill lines every 3rd jts to 345 bar.Land BOP and O/P test to 20 MT.Hook up flexible lines and install diverter.
	2130	RIH w/BOP test plug. Test BOP to 117 bar,POOH. Close shear ram w/acoustic.Pressure test 20" csg to 117 bar,ok. Pressure test kelly w/valves and surface equipment to 345 bar,ok.
	2230	RIH and set 18-3/4"seat protector.POOH with R/T.
	2400	Rearrange BHA in derrick. M/U new bit and BHA. Test MWD tool in rotary. RIH.
04.09.86	0130	Rih
	0430	Drilled cmt. fm 886 m to 901 m. cleaned rathole to 916 m. displaced hole to 1.1 sg. mud.
	0600	Drilled 17-1/2" hole fm 916 m to 923 m.
	0630	Slip drlg. line
	0730	Performed leak-off test.emw-1.55 sg.
	1730	Drilled 17-1/2" hole fm 923 m to 1197 m.
	1800	Repaired pop-off valve on mud pump no 2. circ and cond mud.
	2230	Drilled 17-1/2" hole fm 1197 m to 1323 m.
	2400	Circ. prior to wiper trip

Date	Stop	Operational Description
05.09.86	0030	Circ.
	0200	Wipertrip to 20" csg. shoe.max o.p. 50 m/t at 1170 m.
	1000	Drilled 17-1/2" hole fm 1323 m to 1508 m.
	1030	Changed suction valve on mud pump no 2.
	1700	Drilled 17-1/2" hole fm 1508 m to 1665 m.
	2000	Changed suction module on mud pump no 1.circ. with one pump, increased mudweight to 1.30 sg.
	2230	Pooh.max. o.p. 50 m/t at 1288 m.
	2400	Changed bit. rih.
06.09.86	0200	Rih to 1642 m
	0230	Washed/reamed fm 1642 m to 1665 m. 3 m fill.
	1730	Drilled 17-1/2" hole fm 1665 m to 1920 m. flowchecked at 1690 m and 1838 m. well static.
	1900	Circ.and cond. mud.
	2100	Wipertrip to 20" csg. shoe
	2300	Circ. and cond. mud prior to logging.
	2400	Pooh.
07.09.86	0030	Circ. cleaned rathole below 20" csg.
	0230	Pooh. l/d mwd-tool.
	1000	R/u d.a. run no 1: difl-lsbhc-gr. in at 0315 hrs, out at 0645 hrs. log run no 2: side wall cores, in at 0730 hrs,out at 0950 hrs.--2 misfire 23 rec.
	1100	M/u 13-3/8" csg.hgr.to r/t with cmt. plugs. set same back in derrick.
	1230	Rih with bit to 20" csg. shoe.
	1330	Slip and cut drlg. line
	1400	Cont.rih.
	1600	Circ. and cond, mud.
	1630	Pooh to 1875 m-tight hole. max o.p. 60 m/t.
	1800	Reamed tight hole fm 1875 m to 1920 m
	2000	Circ. increased mw to 1.45 sg.
	2200	Pooh to run 13-3/8" csg.
	2400	Rih with jet sub and w.b. r/t. washed w.h. retrieved seat protector
08.09.86	0830	R/u to and ran 133 joints 13-3/8" csg.
	1000	M/u landing string .cont. roh. tight hole at 1865 m.
	1530	Washed and worked csg. fm 1865 m to 1907 m
	2000	Mix and pump cmt. 61.7 m/t lead slurry at weight 1.56 sg. 21.3 m/t tail slurry at weight 1.90 sg. displaced cmt. with 1.45 sg. mud.bumped cmt. plug lost a total of 5.2 cum. during cmt. job. press. tested csg. to 310 bar-ok.
	2300	Set seal assy. press. tested bop as per program
	2400	Pooh with landing string

Date	Stop	Operational Description
09.09.86	0130	Set wear bushing.
	0200	Press. tested kelly valves to 310 bar-ok.
	0300	Pooh with w.b. r/t.
	0630	M/u 12-1/4" bha. rih tagged toc at 1878 m
	1100	Drilled cmt. plugs ,float collar,cmt, and shoe. cleaned out rat hole to 1920 m.
	1130	Drilled 12-1/4" hole fm 1920 m to 1924 m
	1230	Circ. cond mud.
	1330	Performed leak-off test. formation was fracked. holding press. equiv to 1.72 sg
	1600	Drilled 12-1/4" hole fm 1924 m to 1963 m
	1730	Circ. cond mud.
	1830	Performed leak off test. emw 1.74 sg.
	2100	Pooh.
	2300	Rih with oedp.
	2400	Set balanced cmt. plug fm 1963 m to 1846 m.
10.09.86	0030	Pooh to 1780 m. rev. circ.
	0300	Hesitation squeezed 2.6 cum. cmt. final squeeze press. 241 bar.
	0430	Pooh
	0700	Rih with 12-1/4" bha. to 1790 m.
	0730	Slip drlg. line
	0800	Cont. rih tagged toc at 1877 m.
	1400	Drilled cmt. fm 1877 m to 1963 m
	1430	Drilled 12-1/4" hole fm 1963 m to 1968 m.
	1530	Circ.
	1700	Performed leak-off test . emw-1.77 sg
	1900	Drilled 12-1/4" hole fm 1968 m to 2010 m.
	1930	Circ.
	2030	Performed leak-off test . emw 1.81 sg.
	2400	Drilled 12-1/4" hole fm 2010 m to 2058 m.hole packed off,worked pipe free. established circ. lost a total of 10 cum. to formation.
11.09.86	1100	Drilled 12-1/4" hole fm 2058 m to 2202 m
	1130	Circ.
	1300	Wipertrip to 13-3/8" csg. shoe. max o.p. 20 m/t.
	1600	Drilled 12-1/4" hole fm 2202 m to 2231 m.
	1630	Circ. while changing out swiwel on wash pipe
	2400	Drilled 12-1/4" hole fm 2231 m to 2300 m.
12.09.86	1630	Drilled 12 1/4" hole from 2300 to 2413 m.
	1800	Circulated.
	2030	POOH. L/D excess drillpipe.
	2330	Made up new bit and junk sub. RIH to 2413 m.
	2400	Displaced hole to KCl mud.

Date	Stop	Operational Description
13.09.86	0130	Displaced hole to kcl-mud.
	1600	Drilled 12-1/4" hole fm 2413 m to 2522 m.
	1800	Circ. for samples
	2030	Pooh.
	2200	M/u 60 ft. core barrel(fibreglass) -serviced same
	2400	Rih.
14.09.86	0130	Rih. ream/washed fm 2269 m to 2290 m and fm 2385 m to 2410 m
	0800	Cut core fm 2522 m to 2540.5 m
	1100	Pooh.
	1200	Recovered core - 92% recovery.
	1300	M/u 90 ft. core barrel
	1430	Rih to 1900 m
	1530	Slip and cut drlg. line
	1600	Cont. rih to 2534 m.
	1700	Reamed fm 2534 m to 2540.5 m. space out ,dropped ball.
	2400	Cut core no 2 fm 2540.5 m to 2552 m.
15.09.86	0200	Ream/washed fm 2500 m to 2522 m. circ. spaced out dropped ball, recorded scr.
	0400	Pooh
	0500	Recovered core-92.5% recovery.serviced corebarrel
	0730	Rih
	0800	Circ. spaced out. dropped ball
	1230	Cut core no 3 fm 2552.5 m to 2558.5 m.core jammed
	1500	Pooh
	1600	Recovered core-98% recovery.M/u 60 ft. barrel
	1800	Rih
	1830	Circ. spaced out, dropped ball.
	2400	Cut core no 4 fm 2558.5 m to 2572 m.
16.09.86	0500	Cut core no.4 from 2572 to 2574 m. Core jammed.
	0730	POOH.
	0830	Recovered core, 100 % recovery. Serviced core barrel.
	0900	Made up jet sub and bullnose. RIH and washed well-head area.
	1230	Made up test tool, continued RIH. Tested BOP stack
	1430	POOH with test plug, jet sub and bullnose. Tested kelly cocks.
	1630	RIH with core barrel.
	1700	Slipped 56 ft of drilline.
	1800	RIH to 2563 m.
	1830	Reamed and washed from 2563 to 2574 m.
	1900	Circulated, spaced out and dropped ball.
	2400	Cut core no. 5 from 2574 to 2578 m.

Date	Stop	Operational Description
17.09.86	1500	Cut core no. 5 from 2578 to 2592 m.
	1730	POOH.
	1830	Recovered core, 21 % recovery.
	1930	Serviced core barrel. Found inner barrel bearings broken.
	2200	RIH.
	2230	Circulated and spaced out. Dropped ball.
	2400	Cut core no.6 from 2592 to 2596 m.
18.09.86	0400	Cut core no.6 from 2596 to 2599.5 m, core jammed.
	0630	POOH.
	0800	Recovered core, 80 % recovery. Serviced corebarrel
	1030	RIH.
	1130	Circulated. Spaced out and dropped ball.
	1430	Cut core no.7 from 2599.5 to 2602 m, core jammed.
	1700	POOH.
	1830	Recovered core, 100 % recovery. Serviced core barrel. Made up 30 ft corebarrel.
	1930	RIH.
	2030	Cut 112 ft and slipped 56 ft of drilline.
	2130	RIH to 2590 m.
	2230	Reamed and washed from 2590 to 2602 m. Spaced out and dropped ball.
	2400	Cut core no. 8 from 2602 to 2605 m.
19.09.86	0500	Cut core no.8 from 2605 to 2608.5 m, core jammed.
	0730	POOH.
	0900	Recovered core, 100 % recovery. Serviced corebbl.
	1200	RIH. Changed jar.
	1230	Reamed and washed from 2590 to 2608.5 m.
	1300	Circulated and spaced out. Dropped ball.
	1730	Cut core no.9 from 2608.5 to 2617.5 m.
	2000	POOH.
	2130	Recovered core, 100 % recovery. Made up 60 ft core barrel. Serviced corebarrel.
	2230	Repaired leak on lower racking arm.
	2400	RIH.
20.09.86	0100	RIH to 2605 m.
	0130	Reamed and washed from 2605 to 2617.5 m. Spaced out and dropped ball.
	0830	Cut core no.10 from 2617.5 to 2624 m, core jammed.
	1100	POOH.
	1200	Recovered core, 100 % recovery. Serviced corebbl.
	1330	RIH to 13 3/8" csg. shoe.
	1400	Slipped 56 ft of drilline.
	1430	RIH to 2605 m.
	1500	Reamed and washed from 2605 to 2624 m. Circulated and spaced out. Dropped ball.
	2230	Cut core no.11 from 2624 to 2635.5 m, core jammed.
	2400	POOH.

Date	Stop	Operational Description
21.09.86	0030	POOH.
	0100	Checked damage on air/oil reservoir bottle on drill string compensator.
	0130	POOH.
	0330	Recovered core no.11, 100 % recovery. Serviced corebarrel.
	0400	Inspected kelly for damage. Checked damage on DSC bottle, no leak.
	0630	RIH.
	0700	Circulated and spaced out. Dropped ball. Took SCR.
	1230	Cut core no. 12 from 2635.5 to 2641.5 m, core jammed.
	1500	POOH.
	1630	Recovered core no.12, 100 % recovery. Serviced corebarrel.
	1800	RIH with corebarrel to 13 3/8" csg. shoe.
	1900	Slipped 56 ft and cut 112 ft of drilline.
	1930	Cont. RIH.
	2000	Circulated and spaced out. Dropped ball.
	2400	Cut core no. 13 from 2641.5 to 2648.5 m.
22.09.86	0630	Cut core no.13 from 2648.5 to 2655 m, core jammed.
	0900	POOH.
	1100	Recovered core, 100 % recovery. Serviced corebbl.
	1330	RIH.
	1400	Circulated and spaced out. Dropped ball.
	2000	Cut core no.14 from 2655 to 2663 m, core jammed.
	2230	POOH.
	2300	Recovered core, 100 % recovery. Set back corebbl.
	2400	RIH with jet sub and bullnose sub. Washed wellhead and cont. RIH with test plug.
23.09.86	0030	Rih with bop test plug
	0230	Press.tested bop to 310 bar-ok.
	0330	Pooh with test plug and jetsub/bullnose,
	0430	Press.tested kelly valves and hose to 345 bar-ok
	0830	M/u 12-1/4" bha and mwd-tool,tested same-ok.rih
	1930	Drilled 12-1/4" hole fm 2663 m to 2700 m
	2400	Pooh for logging.
24.09.86	2400	Rigged up Dresser Atlas for logging. Run no.1: DIFL-LSBHC-GR-ACBL Run no.2: CDL-CNL-GR Run no.3: DLL-MLL-GR Run no.4 & 5: FMT

Date	Stop	Operational Description
25.09.86	1100	Logging: fmt no 2: out at 0200 hrs. fmt no 3: in at 0255 hrs-out at 0425 hrs fmt no 4: in at 0530 hrs-out at 0745 hrs. fmt no 5: in at 0830 hrs-out at 1015 hrs. r/d d.a.
	1200	B/o and l/d kelly spinner. changed out upper kelly cock due to damage
	1500	M/u 12-1/4" bit and mwd-tool. tested same-ok. rih to 1900 m
	1530	Slip drlg. line.
	1630	Cont. rih to 2690 m.
	1700	Reamed tight hole fm 2690 m to 2700 m.
	2400	Drilled 12-1/4" hole fm 2700 m to 2721 m.
26.09.86	2400	Drilled 12-1/4" hole fm 2721 m to 2823 m
27.09.86	2400	Drilled 12-1/4" hole fm 2823 m to 2973 m.
28.09.86	0400	Drilled 12-1/4" hole fm 2973 m to 3000 m
	0430	Circ.
	0500	Black out due to power failure
	0630	Circ bttms up.
	0730	Pulled out to 2472 m. tight hole fm 3000 m to 2506 m. max o.p. 97 m/t.
	0800	Rih to 3000 m.
	1130	Circ. hole clean.
	1430	Pooh - hole ok.
	2400	R/u d.a. Logging:Run no 1: difl-lsbhc-gr. in at 1525 hrs-out at 1755 hrs run no 2: cdl-cnl-gr. in at 1835 hrs-out at 2130 run no 3: Z-dens. in at 2310 hrs.
29.09.86	0830	Logging. Run no.3: Z DENS - GR Run no.4: DIPLOG
	1130	Made up bit and RIH to 2989 m.
	1200	Reamed and washed from 2989 to 3000 m.
	1400	Circulated hole clean.
	1630	POOH. Displaced riser to seawater.
	2400	Rigged up for logging. Run no.5: FMT Run no.6: VSP
30.09.86	1830	Logging. Run no.6: VSP Run no.7: CST,recovered 37, lost 8 and 5 empty. Run no.8: CST,recovered 36, lost 8 and 6 empty. Rigged down Dresser Atlas.
	2000	RIH with OEDP. Displaced riser to mud.
	2100	Cut 112 ft and slipped 56 ft of drilline.
	2300	Cont. RIH to 2995 m.
	2400	Circulated bottoms up.

Date	Stop	Operational Description
01.10.86	0100	Circulated bottoms up.
	0200	Set balanced cement plug from 2995 to 2880 m.
	0400	POOH to 2875 m. Attempted to reverse circulate at 8 SPM/ 14 bar. Circulated long way.
	0500	POOH to 2870 m. Set balanced cement plug from 2870 to 2755 m.
	0730	POOH to 2740 m, circulated long way.
	0900	POOH.
	1000	L/D core barrel.
	1030	Made up 9 5/8" casing hanger and set back in derrick.
	1330	Made up new bit and RIH. Tagged cement at 2750 m.
	1430	Drilled cement from 2750 to 2770 m.
	1630	Circulated hole clean, total of 12460 strokes. Treated mud system with corrosion inhibitor.
	1930	POOH, no drag.
	2000	Repaired hydr. hose on guide dolly retract system.
	2300	RIH with jet sub and wear bushing R/R tool. Washed wellhead. Retrieved wear bushing, washed wellhead and POOH.
	2400	Rigged up to and started to run 9 5/8" casing.
02.10.86	1200	Ran 9 5/8" casing, total of 195 joints. Filled every 5th joint with 1.70 s.g. mud. Radioactive tag set at 2399 m. No mud losses during casing running.
	1400	Made up 9 5/8" csg. hanger. Ran landing string.
	1630	Broke circulation. Landed casing with shoe at 2755 m, partially loss of returns while circ. Lifted hanger off seat and completed circ., no losses. Landed casing.
	1700	Hooked up BJ. Pressure tested line to 345 bar.
	1800	Pumped 6.4 m3 seawater spacer. Dropped ball. Mixed and pumped 49 m3 of 1.89 s.g. cement slurry. Dropped dart. Sheared top plug with 117 bar.
	2000	Displaced cement with rig pumps at 40-50 SPM. Bumped plug after 4435 strokes . No mud losses during cement job and displacement. Pressure tested casing to 345 bar. Bled off pressure and checked floats, ok.
	2030	Set seal assembly with 12000 ft-lbs.
	2230	Pressure tested BOP to 345 bar. Tested shear ram with accoustic to 35 bar.
	2400	L/D cement kelly. POOH with casing running tool and layed down same.
03.10.86	0200	Set wear bushing. POOH.
	0330	L/D excess 8" DC, jar, 8" NMDC and stabilizers.
	0700	Made up 8 1/2" bit, 9 5/8" casing scraper, 4 stds of 6 1/2" DCs and tubing. RIH.
	0730	Lost drift in tubing. POOH, retrieved drift. RIH.
	2030	Made up tubing and RIH.
	2100	Cont. RIH with drillpipe.
	2400	Tagged plugs at 2724 m. Circulated hole clean.

Date	Stop	Operational Description
04.10.86	0030	Slip 56' drill line.
	0400	POOH.L/D bit and casing scraper.
	0930	R/U and run CBL. In 0440 - Out 0915. R/D Dresser atlas.
	1100	M/U flowhead,SSTT and lubricator.L/D same.
	2400	M/U and RIH w/test string for DST #1. Fill string w/drillwater. Pressure test string below LPR-N valve to 207 bar/10 min.P-test down hole tools to 415 bar.P-test string to 415 bar halfway. RIH to fluted hanger. P-test string to 415 bar.
05.10.86	0130	Run test string belpw fluted hanger. Pressure test as per program. Run drillpipe landing string.
	0400	Land fluted hanger in wearbushing. Close MPR. R/U and run GR-log for depth correlation. In 0140 - Out 0400.
	0430	POOH. Strap landing string.
	0730	M/U and function test SSTT. Pressure test as per programme.
	0900	Run tubing landing string.
	1000	M/U lubricator valve. Pressure test body and string against LPR-N. 415 bar/10 min.
	1300	P/U flowhead. N/U kill and flow lines.
	1600	Pressure test as per program.
	1730	P/U 2.13 m and set packer.
	2130	R/U and run GR-log for depth correlation. In 1750 - Out 2110.
	2400	R/U Flopetrol samplers and install in lubricator section. Pressure test same to 415 bar/10 min.
06.10.86	0100	Position bottom hole samplers.
	0130	Open LPR-N valve. Observe for 10 min to check for packer leak.
	0200	Perforate at 0138 hrs. Initial flow through 16/64" fixed choke. Produced 0.2 m3 fluid.
	0600	Shut in well on Flopetrol choke at 0158 hrs. Pwh = 112 barg at 0559 hrs.
	2000	Open well on 16/64" fixed choke. Produced 3.84 m3 fluid. Bottom hole sampling
	2400	Close LPR-N at 1950 hrs. Close choke manifold and retrieve bottom hole samplers. Samples contained mud and oil.

Date	Stop	Operational Description
07.10.86	0600	Well shut in on LPR-N valve and choke manifold
	0730	Attempt to cycle OMNI-APR valve to circulating position.Tried pressures f/105 to 150 bar.No go. Shear APR-M valve at 172 bar.
	1030	Reverse out string volume with rig pumps. Return flow to Flopetrol tank. Got 2.87 m3 oil.
	1130	Reverse circ through rig choke/degasser. Circ until MW was even and mud gas free.
	1330	Release packer. 22 tonnes overpull.Bullhead 0.5 m3 mud down annulus at 207 bar surface pressure. Circ until mud was gas free.
	1400	Close mastervalve. Flush flowhead and surface equipment.
	1600	L/D flowhead. Observe well for flow.
	2400	POOH with teststring. Flowcheck 2 times on way out
08.10.86	0130	L/D downhole tools.
	0400	Rigged up and ran Dresser Atlas perf. gun. Perforated interval 2608.5 to 2609.5 m.
	0730	Made up 9 5/8" cement retainer on drillpipe and RIH.
	0830	Slipped 56 ft and cut 112 ft of drilline.
	1130	Cont. RIH and set cement retainer at 2631 m.
	1400	Established injection rate. Mixed and pumped cmt. Sting into retainer and squeezed 0.7 m3 at 82 bar. Pulled out of retainer. Set 60 m balanced cmt.plug Pulled 3 stds and squeezed 1m3 into upper perfs.at 96 bar. Bled off .4 m3 backflow. Reverse circ.
	1630	POOH.
	1900	Made up bit and csg. scraper. RIH.
	2330	Tagged cement at 2586 m. Drilled cement from 2586 to 2627 m.
	2400	Circulated bottoms up.
09.10.86	0100	Circulated bottoms up.
	0330	POOH.
	0730	Tested BOP stack.
	0800	POOH with test plug.
	1100	Waited on cement to set.
	1330	Rigged up Dresser Atlas and ran CBL.
	2400	RIH with DST string no.2. Pressure tested DST string to 414 bar. Filled 48 stds of tubing with brine, rest with seawater.

Date	Stop	Operational Description
10.10.86	0600	RIH with DST string no.2. Made up SSTT to test string, pressure tested to 410 bar. Installed lubricator and flowhead. Hooked up surface equipment.
	0900	Pressure tested all surface equipment.
	0930	Set packer.
	1030	Rigged up Dresser Atlas. RIH for packer depth correlation, packer 1 m too high.
	1100	Reset packer. New depth correlation, packer .5 m too high.
	1130	Reset packer. Depth correlation ok. Final packer depth 2591.5 m.
	1200	POOH with Dresser Atlas wireline.
	1300	Prepared to drop bar. Dropped bar. Guns fired at 1256 hrs.
	2400	Flowed well.

Time	WHP	Oil(m3/D)	Gas(m3/D)	GOR(m3/m3)	Choke
2030	22.68	191	13704	71.5	32/64"
2200	22.22	203	15943	78.5	32/64"
2400	22.57	218	15880	72.6	32/64"

Date	Stop	Operational Description
11.10.86	1530	Main flow on 32/64" choke.

Time	WHP(bar)	Oil(m3/d)	Gas(m3/d)	GOR
0200	22.6	187.8	15969	85
0800	22.8	227.3	15296	67
1500	22.9	211.7	16100	71

Date	Stop	Operational Description
	2400	Closed well on LPR-N valve for main build up.
12.10.86	2400	Main build-up. Rigged up Bottom hole samplers from 20.00 hrs. WOW for 3 hrs. Pressure tested wireline stuffing box to 345 bar. Opened LPR-N valve at 2338 hrs. Opened well on 6.4 mm choke at 2355 hrs. RIH with Bottom hole samplers.
13.10.86	0700	Flowing well for sampling.rih with bttm.hole samplers. changed choke fm 6.4 m/m to 4.8 m/m at 0151 hrs.decreased choke to 3.2 m/m at 0330 hrs bttm.hole samplers fired at 0416 hrs.at 2400 m. w.h sampling
	0900	Closed well on lpr-n valve.pooh with bttm hole samplers.r/d wire line equipm. two samplers ok-one failed.
	1100	Cycled omni-valve into circ. position.rev. circ volume of tbg.
	1300	Attempted to close circ. ports on omni-valve-no success.
	1400	Unseated rtts packer.o.p 17 m/t.Bullheaded mud down annulus-0.72 cum. max press. 76 bar
	1630	Circ. long way.through omni-valve.max gas-92%.
	1800	Observed well. r/d surface equipm,stt and lubr. valve.
	2400	Pooh with test-string.

Date	Stop	Operational Description
14.10.86	0300	Pooh. l/d test-tools.
	0430	M/u 8-1/2" bit and csg. scraper.rih .worked csg.scraper fm 2590 m to 2605 m.
	0700	Circ.cond mud.max gas-23%.
	0830	Pooh.
	1230	R/u d.a. rih with cased hole fmt.took sample at 2601m.
	1300	Slip drlg. line
	1530	M/u cmt. retainer. rih on dp. set same at 2595 m
	1600	Circ. volume of dp prior to inj. test.
	1700	Attempted to establish inj. rate -press. 250 bar. no success. pulled out of retainer. press.tested annulus to 360 bar-ok.sting into retainer. established inj. perfs. opened at 331 bar.inj. rate at 138 bar-1bbls/min.
	1800	Mix and pump cmt. squeezed 3.3 cum.cmt thruogh perfs. max press. 150 bar. dumped 0.97 cum cmt. on top of retainer
	1900	Pooh to 2575 m.rev. circ.
	2030	Pooh
	2230	M/u bit and csg. scraper. rih. tagged toc at 2581 m.
	2330	Circ, bttms. up .cond mud.
	2400	Pooh.
15.10.86	0130	Cont. pooh.
	0300	Rih with jet sub. Washed w,h. cont. rih with bop test tool.
	0500	Press. tested bop acc. to program.
	0600	Pooh with test tool and jet sub.
	0900	R/u d.a. Rih with cased hole fmt. tool failed While rih at 2000 m. Gauge failure. Pooh.
	1300	Rih with 5" perf gun.perforated 9-5/8" csg. fm 2561 m to 2570.5m. r/d d.a.
	1700	M/u test String BHA. Placed a hec pill on top of lpr-n valve, filled rest of string with SW. Pressure tested string to 414 bar,ok.
	2230	Rih with 5" test tbg.
	2400	Installed sstt.function test same-ok.press. tested string and sstt to 414 bar-ok.

Date	Stop	Operational Description
16.10.86	0300	Rih with landing string
	0500	M/u stt and surface lines.
	0900	Press.tested surface lines and test string as per program-ok.
	0930	Set rtts packer.
	1100	R/u must.
	1330	Attempted to press. test stuffing box against lubr. valve-no success.lubr valve leaking.
	1800	R/d must.unseated rtts packer.l/d stt.changed out lubr.valve. m/u stt.
	2000	Press. tested surface lines,test string and lubr. valve-ok.
	2030	Set rtts packer
	2230	R/u must.press. tested stuffing box-ok
	2400	Rih with must.
17.10.86	0030	Rih with MUST.
	0330	Opened LPR-N valve,landed MUST,function tested same. Initial flow period-start 0117 hrs. Initial build up 0127 hrs.
	2400	Main fliw period, start 0345 hrs 1/2" choke,1030 cum/d, GOR 44
18.10.86	0600	Main flow period.
	2400	Main shut in period,started 0610 hrs. fire alarm at 1930 hrs-closed LPR-N valve, released MUST,prepared to secure well, pulled must.
19.10.86	1200	Main shut in period
	1330	Flowed well on 1/2" choke.
	1400	Build up period.
	1600	Bullheaded 27.6 cum 1.70 SG mud down test string. Sheared APR-M valve. Rev. circ.
	1730	Unseated RTTS packer.Bullheaded down annulus. Rev. circ.
	1830	Flushed surface lines with seawater. L/d same.
	2400	L/d STT . POOH with test string.

Date	Stop	Operational Description
20.10.86	0230	POOH with DST string no.3.
	0300	Rigged up Dresser
	0500	Set cement retainer at 2558 m.
	0530	Rigged down Dresser.
	0600	RIH with cement stinger.
	0700	Slipped and cut drilline.
	0800	Cont. RIH with cement stinger.
	0830	Circulated.
	0900	Established injection rate, 1/2 bbl/min. at 62 bar
	1030	Squeezed 100 sxs of cement. Pulled out of retainer and reverse circulated.
	1300	POOH with stinger. Tested retainer to 345 bar, ok.
	1530	RIH with bit and casing scraper.
	1700	Circulated and worked scraper.
	1830	POOH to wellhead and washed same.
	1900	RIH with test plug.
	2200	Tested BOP stack.
	2230	POOH with test plug.
	2400	RIH with DST string no.4.
21.10.86	1200	RIH with DST string no.4. Installed flowhead.
	1500	Pressure tested string and surface program.
	1900	Set packer. Ran Dresser for depth correlation. Re-set packer and rigged down Dresser.
	2000	Opened LPR-N valve and perforated interval from 2548.4 to 2551.9 m.
	2400	Initial flowperiode for 10 mins. Initial build-up. Run in hole with MUST.
22.10.86	0100	Initial build up. RIH with MUST.
	2400	Main flow periode.

Time	WHP(bar)	Oil rate(m3/d)	GOR	Choke
0800	111	278	65	16/64"
1600	113	279	65	16/64"
2400	114	281	64	16/64"

Date	Stop	Operational Description
23.10.86	0900	Main flow on 16/64" choke. Oil rate - 272 sm3/d, GOR = 67, BHP = 293 bar, WHP = 114 bar.
	2400	Shut well in on LPR-N valve for final build-up. Unable to shut MUST due to leak in flapper.
24.10.86	2100	Well shut in at LPR-N valve for final build-up.
	2400	Performed frac.test by bullheading oil back to formation with H.E.C. hi-vis mud.

Date	Stop	Operational Description
25.10.86	0400	Bullheaded H.E.C. in string back to formation with mud.
	0700	Released MUST and pulled same.
	0800	Reverse circulated.
	0830	Jarred packer loose. Released packer with 45 tons overpull.
	0900	Bullheaded volume below packer.
	1030	Reverse circulated, slugged string and flowchecked
	1430	L/D flowhead. Pulled landing string and L/D lubricator valve and SSTT.
	2100	Pulled and layed down tubing.
	2400	L/D test tools.
26.10.86	0100	L/D test tools.
	0330	Made up 9 5/8" cement retainer on drillpipe and RIH. Retainer set at 1645 m while RIH.
	0500	Sting into retainer and tested annulus to 207 bar. Established injection rate.
	0600	Mixed and displaced 12.7 m3 cement.
	0730	Sting into retainer and squeezed 6.4 m3 cement into perforations. Left 6.4 m3 cement inside 9 5/8" casing from perforations to 2375 m.
	0830	Pulled out of retainer and reverse circulated.
	0900	Tested retainer to 345 bar, ok.
	1330	POOH laying down excess drillpipe.
	1600	Ran OEDP through BOP stack. Rigged up Dresser Atlas and perforated 9 5/8" csg. at 350 m with 35 bar on annulus.
	2000	Made up cuttting assembly. RIH and cut 9 5/8" csg. at 908 m. POOH.
	2400	Made up spear and RIH. Pulled csg. free. POOH and L/D csg.

Date	Stop	Operational Description
27.10.86	0130	Cont. l/d 9-5/8" csg.
	0200	Rih with OEDP to 335 m.
	0330	R/u D:A. Rih with perf. gun. Perforated 13-3/8" csg. at 352 m with 35 bar on annulus.
	0400	Pooh with OEDP.
	0700	R/u D.A. Rih with perf. gun. Perforated 13-3/8" csg. from 885m-886 m , and from 785m-787m,with 4SPF. Rih with cmt. retainer on wire line. Set same at 880m.
	0800	M/u cmt. stinger on DP. Rih.
	0930	Established inj. rate.Squeezed 10 cum.cmt. through perfs. No returns. Dumped 2 cum. cmt. on top of retainer.
	1000	Pulled back to 805 m.Rev. circ.
	1100	Pooh.
	1430	M/U csg. cutting assy.Rih. Cut 13-3/8" csg.at 400m. Pooh with cutting assy.
	1630	M/u csg. spear. rih. Attempted to pull 13-3/8" csg. -no success.
	1900	Redressed cutting assy,found FLO-TELL washed out. Rih with cutting assy. Cut 13-3/8" csg. at 392m.
	2000	Rih with csg. spear. Pulled 13-3/8" csg. free.
	2130	L/d 13-3/8" csg.Press. tested 13-3/8"by 20" annulus to 35 bar.ok
	2400	Rih eith OEDP to 565m. Set a balanced cmt. plug from 565m-365m.Pooh to 345 m.Rev.circ.
28.10.86	0030	Pooh with OEDP.
	0100	Slip drlg. line.
	0430	Prepared to pull bop. Displaced riser to S:W. L/d diverter,cllapsed slip joint.Two DSC hoses bursted while pressuring up DSC.
	0930	Unlatched & pulled on BOP with DSC closed. HWDP parted above tool joint with 135 m/t tension in string.Retrieved lift nipple. Changed out HWDP with S-135 pipe.Nippled down goosenecks. Pulled BOP.Rack back slip jnt. in derrick
	1000	Repaired hydraulic pump for manipulator arm on rig floor.
	1600	Pulled riser and BOP. Landed BOP on carrier.
	1930	M/u Cut & Pull tool. Rih.Stabbed into WH.
	2230	Cut 20" and 30" csg at 331 m. Nozzle in cutting tool plugged.
	2400	Pulled 20" and 30" csg,s free with 15 m/t over-pull. Pooh with TGB/PGB.

Date	Stop	Operational Description
29.10.86	0330	Landed TGB/PGB on trolley. L/d CUT & PULL tool. M/u 18-3/4" running tool. Pull cut off csg,s and l/d same
	0600	Shut down diesel engines.Cleaned out piping to cooling water heat exchanger.
	1000	Anchor handling. Deballasted rig to survival draft. L/d excess DP & DC,s. Anchor no 2 on bolster at 0855 hrs Anchor no 6 on bolster at 1005 hrs
	2400	Wow for anchor handling.
30.10.86	2400	Wow for anchor handling.
31.10.86	2400	Wow for anchor-handling.
01.11.86	0800	Wow
	1800	Anchor handling.Last anchor on bolster at 1815 hrs.

SAGA PETROLEUM A.S.

6.1.1 BIT RECORD PART 1
Well no: 34/7-10

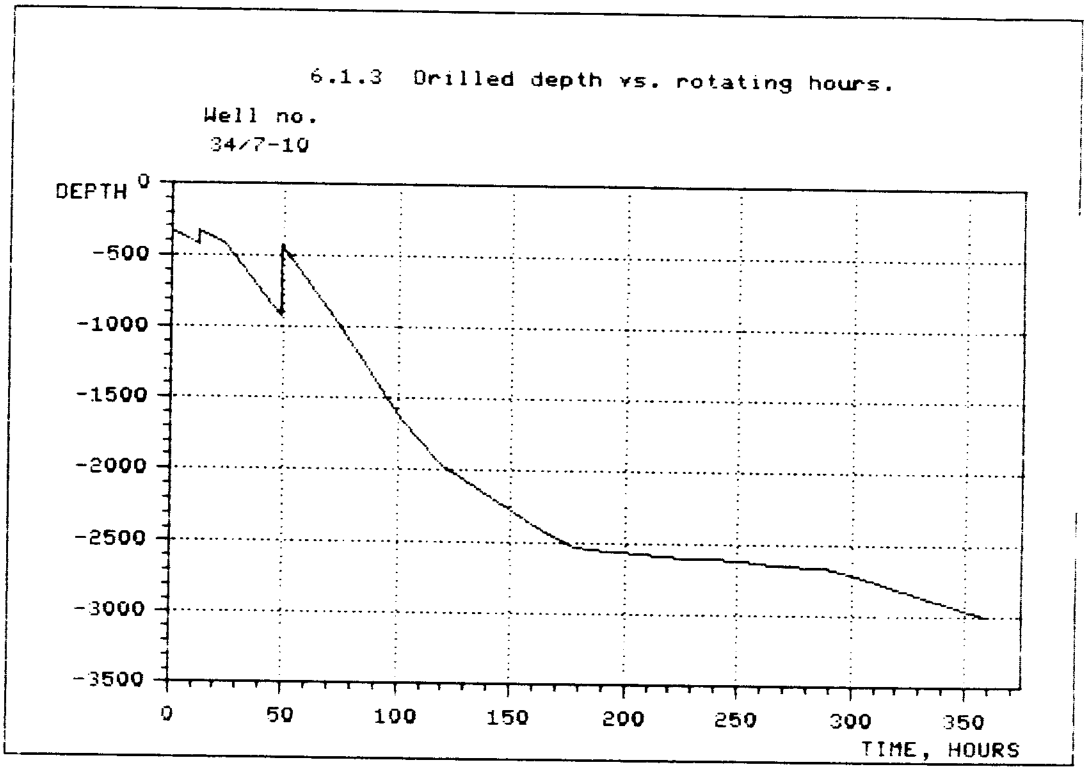
No	Size	Make	Type	Ser.no.	Jets 32 inch	Depth out	Drld depth	Hrs	m/HR	WOB tons	RPM	Dull.cond. T B	G	Other	Bitactivity	Rem
1 RR	26	SMITH	DSJ	ER1636	24-24-24	428.0	102.0	12.0	8.5	5/8	80/80	3 3	I		DRILLING	*
1 RR	26	SMITH	DSJ	ER1636	24-24-24	428.0	102.0	12.0	8.2	2/8	60/80	4 4	I		DRILLING	*
2 RR	17-1/2	SMITH	SDS	XE6874	16-20-20-20	430.0	11.0	.5	22.0	0/0	0/0	4 3	I		DRLG CMT	*
3	17-1/2	SMITH	DTJ	XA345	24-24-24	918.0	488.0	24.5	20.0	0/0	0/0	3 4	I		DRILLING	
4 RR	26	KWB	LOCOMA	TSN3147	6 X 16	918.0	488.0	23.0	21.2	2/7	100/100	6 8	I		U REAMING	*
4 RR	26	VAREL	L2JM	18641	24-24-24	.0	.0	.0	.0	0/0	0/0	3 3	I		CIRC	*
5	17-1/2	SMITH	SDGH	XF2899	24-24-24	1665.0	749.0	30.5	24.5	10/20	115/115	4 3	1/16		DRILLING	
6	17-1/2	HTC	X1G	752FL	24-24-28	1920.0	255.0	15.0	17.0	15/25	90/120	3 5	I		DRILLING	
5 RR	17-1/2	SMITH	SDGH	XF2899	OPEN	.0	.0	.0	.0	0/0	0/0				CIRC	*
7	12-1/4	REED	HP11	AAF071	18-18-18	1963.0	43.0	3.0	14.4	10/15	130/130	1 1	I		DRILLING	
7 RR	12-1/4	REED	HP11	AAF071	18-18-18	2413.0	450.0	44.0	6.8	23/23	130/130	5 6	I		DRILLING	
8	12-1/4	REED	HP11	ULY861	18-18-18	2522.0	109.0	14.5	7.5	18/18	150/150	2 3	I		DRILLING	
9	12-1/4	D.BOAR	CT 303	7860347		2540.5	18.5	6.0	3.1	10/10	80/80			15%	CORING	
9 RR	12-1/4	D.BOAR	CT 303	7860347		2552.5	12.0	8.5	1.5	10/10	80/80			15%	CORING	
9 RR	12-1/4	D.BOAR	CT 303	7860347		2558.5	6.0	4.5	1.4	10/10	80/80			40%	CORING	
10	12-1/4	D.BOAR	CT 303	7860351		2574.0	15.5	9.5	1.7	20/20	85/80			10%	CORING	
10RR	12-1/4	D.BOAR	CT 303	7860351		2592.0	18.0	20.0	.9	10/10	90/90			40%	CORING	
11	12-1/4	D.BOAR	CT 17	7850584		2599.5	7.5	5.5	1.4	20/20	60/60			10%	CORING	
11RR	12-1/4	D.BOAR	CT 17	7850584		2602.0	2.5	8.0	.4	20/20	60/60			40%	CORING	
12	12-1/4	D.BOAR	CT 303	7860228		2608.5	6.5	6.5	1.0	12/12	90/90			20%	CORING	
12RR	12-1/4	D.BOAR	CT 303	7860228		2617.5	9.0	4.5	2.0	12/12	90/90			50%	CORING	
9 RR	12-1/4	D.BOAR	CT 303	7860347		2624.0	6.5	7.0	1.0	15/15	90/90			50%	CORING	
9 RR	12-1/4	D.BOAR	CT 303	7860347		2635.5	11.5	7.5	1.6	15/15	90/90			55%	CORING	
13	12-1/4	D.BOAR	CT 303	7860155		2641.5	6.0	5.5	1.1	12/15	90/90			20%	CORING	
13RR	12-1/4	D.BOAR	CT 303	7860155		2655.0	13.5	10.5	1.3	15/15	90/120			30%	CORING	
13RR	12-1/4	D.BOAR	CT 303	7860155		2663.0	8.0	6.0	1.4	15/15	90/120			50%	CORING	
14	12-1/4	REED	HP12	AAG497	18-18-18	2700.0	37.0	11.0	3.4	20/25	85/85	2 3	I		DRILLING	
15	12-1/4	REED	HP51	C84874	18-18-18	3000.0	300.0	59.0	5.1	20/25	80/80	1 4	I		DRILLING	
15RR	12-1/4	REED	HP51	C84874	18-18-18	.0	.0	.0	.0	0/0	0/0				CIRC	*
8 RR	12-1/4	REED	HP11	ULY861	18-18-18	2770.0	20.0	.8	25.0	0/0	0/0	2 6	I		DRLG CMT	*
16RR	8-1/2	HTC	JD3	839JK	OPEN	.0	.0	.0	.0	0/0	0/0				CIRC	*
16RR	8-1/2	HTC	JD3	839JK	OPEN	2627.0	41.0	4.0	10.3	0/0	0/0				DRLG CMT	

6.1.1 BIT RECORD PART 2
Remarks
Well no: 34/7-10

No	Size	Make	Type	Ser.no.	Remarks
1 RR	26	SMITH	DSJ	ER1636	Run with 36" hole opener (SERVCO GTA).
1 RR	26	SMITH	DSJ	ER1636	Run with 36" hole opener (SERVCO GTA).
2 RR	17-1/2	SMITH	SDS	XE6874	Drilled 9 m cement.Run with 26" under reamer.
4 RR	26	KWB	LOCOMA	TSN31475	Run with 17-1/2" pilot bit (RR 3).
4 RR	26	VAREL	L2JM	18641	Check trip prior to 20" casing job.
5 RR	17-1/2	SMITH	SDGH	XF2899	Wiper trip before 13 3/8" casing job.
15RR	12-1/4	REED	HP51	C84874	Clean up trip during final logging.
8 RR	12-1/4	REED	HP11	ULY861	Drilled cmt and cleaned hole prior to 9 5/8" csg.
16RR	8-1/2	HTC	JD3	839JK	Run below casing scraper.

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
26/36"	326 - 428	26" Bit - 36" H.O. - Bit Sub - Monel - 2 x 9 1/2" DC - XO - 15 x 8" DC - XO - 15 x HWDP	
26"/36"	326 - 428	26" Bit - 36" H.O. - Bit Sub - 9 1/2" Monel - 2 x 9 1/2" DC - XO - 15 x HWDP	Respud
17 1/2"/26"	419 - 430	17 1/2" Bit - 26" U.R. - Bit Sub - 9 1/2" Monel - 2 x 9 1/2" DC - XO - 15 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	Drilled cmt in 30" csg. + 2 m new formation
17 1/2"	430 - 918	Bit - NB Stab - 9" MWD - Stab - 8" Monel - 8" DC - Stab - 11 x 8" DC - 7 3/4" jar - 3 x 8" DC - XP - HWDP - Dart Sub - 14 x HWDP	Pilothole
17 1/2"/26"	430 - 918	17 1/2" Bit - 26" U.R. - XO - 8" Monel - Stab - 11 x 8" DC - 7 3/4" Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
26"	430 - 918	Bit - Bit Sub - 8" Monel - Stab - 11 x 8" DC - 7 3/4" Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	Check trip prior to running 20" casing
17 1/2"	886 - 1920	Bit - NB Stab - 9" MWD - Stab - 8" Monel - 8" DC - Stab - 14 x 8" DC - 7 3/4" Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	Drilled plug & shoe + cmt in csg.

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
12 1/4"	1920 - 2413	Bit - NB Stab - 8 MWD - PRS - Stab - Monel - 1 x 8 " DC - Stab - 14 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2413 - 2522	Bit - Junk Sub - NB Stab - 8 MWD - PRS - Stab - Monel - 1 x 8" DC - Stab - 14 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2522 - 2540,5	Corehead - 60' Corebbl. - 2 x 8" DC - Stab - 12 X 8" DC - Jar - 3 x 8" DC XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2540,5 - 2552,5	Corehead - 90' Corebbl. - 2 x 8" DC - Stab - 12 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2552,5 - 2602	Corehead - 60' Corebbl. - 2 x 8" DC - Stab - 12 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2602 - 2617,5	Corehead - 30' Corebbl. - 2 x 8" DC - Stab - 12 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2617,5 - 2663	Corehead - 60' Corebbl. - 2 x 8" DC - Stab - 12 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	
12 1/4"	2663 - 3000	Bit - NB Stab - MWD - PRS - Stab - Monel - 1 x 8" DC - Stab - 14 x 8" DC - Jar - 3 x 8" DC - XO - HWDP - Dart Sub - 14 x HWDP	



Saga Petroleum a.s.

DATE	3.3.87	AUTH.	FL
DRAW BY	FL	APPR.	TSØ
REF.	6.1.3	34/7-10	

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/7-10

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
860823		.0	1.03										WATER BASED
860824		.0	1.03										WATER BASED
860825		.0	1.03										WATER BASED
860826	36	428.0	1.07										SPUD MUD
860827	36	326.0	1.07										SPUD MUD
860828	36	428.0	1.07										SPUD MUD
860829	36	430.0	1.07										SPUD MUD
860830	17-1/2	730.0	1.11	7	37	24/27	9.5						GEL MUD
860831	17-1/2	918.0	1.13	8	39	30/34	9.5			10000	0.2	8.0	GEL MUD
860901	26	918.0	1.15	9	52	39/42	9.5		480	12000	0.2	9.0	GEL MUD
860902	26	918.0	1.11										GEL MUD
860903	26	918.0	1.11	21	23	2/2	9.5	0.1/0.6	1460	500		4.0	GYP/POLYMER MUD
860904	17-1/2	1323.0	1.11	18	20	2/2	9.1	0.1/0.5	1680	1900	1.0	4.0	GYP/POLYMER MUD
860905	17-1/2	1665.0	1.30	24	30	3/11	9.0	0.1/0.2	1720	2000	1.5	11.0	GYP/POLYMER MUD
860906	17-1/2	1920.0	1.40	29	24	3/9	8.9	0.1/0.3	1600	2500	1.5	14.0	GYP/POLYMER MUD
860907	17-1/2	1920.0	1.45	20	12	2/6	8.8	0.1/0.2	1720	2700	1.0	15.5	GYP/POLYMER MUD
860908	12-1/4	1920.0	1.45	16	10	2/3	8.8	0.1/0.2	1680	2700	1.0	15.5	GYP/POLYMER MUD
860909	12-1/4	1963.0	1.50	19	14	3/14	11.0	0.3/0.7	1500	2800	0.5	17.0	GYP/POLYMER MUD
860910	12-1/4	2058.0	1.50	20	18	3/30	10.8	0.3/0.5	1000	3000	1.0	18.5	GYP/POLYMER MUD
860911	12-1/4	2300.0	1.65	24	18	5/45	9.2	0.1/0.7	1320	4000	1.0	22.5	GYP/POLYMER MUD
860912	12-1/4	2413.0	1.70	35	18	5/55	9.0	0.1/0.6	1600	4000	1.5	23.0	GYP/POLYMER MUD
860913	12-1/4	2522.0	1.70	28	16	3/10	8.0	0.1/0.4		64000	1.0	25.0	KCL MUD
860914	12-1/4	2552.0	1.70	33	16	4/14	8.9	0.0/0.5		60000	1.0	26.0	KCL MUD
860915	12-1/4	2572.0	1.70	28	14	4/12	8.6	0.1/0.5		60000	1.5	25.0	KCL MUD
860916	12-1/4	2578.0	1.70	29	11	3/10	8.6	0.1/0.4		65000	1.0	26.0	KCL MUD
860917	12-1/4	2596.0	1.70	28	15	3/14	8.8	0.1/0.5		62000	1.0	26.0	KCL MUD
860918	12-1/4	2605.0	1.70	33	16	5/18	8.4	0.0/0.4		66000	1.0	26.0	KCL MUD
860919	12-1/4	2617.5	1.70	29	13	4/17	8.5	0.0/0.6		66000	1.0	26.0	KCL MUD
860920	12-1/4	2635.5	1.70	30	18	5/25	8.6	0.0/0.5		62000	1.0	26.0	KCL MUD
860921	12-1/4	2648.5	1.70	27	14	4/22	8.6	0.1/0.5		60000	1.0	26.0	KCL MUD
860922	12-1/4	2663.0	1.70	27	11	4/15	8.4	0.1/0.6	960	60000	1.0	25.0	KCL MUD

SAGA PETROLEUM A.S.

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/7-10

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
860923	12-1/4	2700.0	1.70	32	18	4/28	8.6	0.1/0.5	1120	60000	1.0	25.5	KCL MUD
860924	12-1/4	2700.0	1.70	32	18	4/28	8.6	0.1/0.5	1120	60000	1.0	25.5	KCL MUD
860925	12-1/4	2721.0	1.70	29	18	6/30	8.6	0.1/0.5	1000	59000	1.5	25.0	KCL MUD
860926	12-1/4	2823.0	1.70	27	16	5/32	9.1	0.1/0.6	1000	58000	0.5	25.5	KCL MUD
860927	12-1/4	2973.0	1.70	28	16	5/32	9.6	0.1/0.6	780	53000	1.0	26.0	KCL MUD
860928	12-1/4	3000.0	1.71	26	17	5/29	9.7	0.3/0.7	720	50000	1.0	26.0	KCL MUD
860929	12-1/4	3000.0	1.71	29	14	5/24	10.0	0.1/0.6	680	50000	0.5	26.0	KCL MUD
860930	12-1/4	3000.0	1.71	35	19	7/36	9.6	0.1/0.6	720	49000	1.0	26.0	KCL MUD
861001	PB	2770.0	1.70	25	15	3/25	10.3	0.3/1.1	800	47000	0.8	24.5	KCL MUD
861002	PB	2728.0	1.70	28	17	4/30	11.7	0.4/1.1	880	47000	0.5	24.5	KCL MUD
861003	PB	2728.0	1.70	27	18	4/26	10.8	0.7/1.5	800	55000	0.5	24.5	KCL MUD
861004	PB	2724.0	1.70	29	18	4/27	10.9	0.8/1.5	800	55000	0.5	24.5	KCL MUD
861005	PB	2724.0	1.70	29	18	4/27	10.9	0.8/1.5	800	55000	0.5	24.5	KCL MUD
861006	PB	2724.0	1.70	29	18	4/27	10.9	0.8/1.5	800	55000	0.5	24.5	KCL MUD
861007	PB	2724.0	1.70	27	17	4/25	10.6	0.6/1.4	880	55000	0.5	24.5	KCL MUD
861008	PB	2627.0	1.70	24	15	3/17	11.4	0.9/1.6	420	39000	0.2	24.0	KCL MUD
861009	PB	2627.0	1.70	24	15	3/17	11.4	0.9/1.6	420	39000	0.2	24.0	KCL MUD
861010	PB	2627.0	1.70	24	15	3/17	11.4	0.9/1.6	420	39000	0.2	24.0	KCL MUD
861011	PB	2627.0	1.70	24	15	3/17	11.4	0.9/1.6	420	39000	0.2	24.0	KCL MUD
861012	PB	2627.0	1.70	22	16	3/16	11.4	0.9/1.6	420	39000	0.2	24.0	KCL MUD
861013	PB	2627.0	1.70	26	18	3/19	10.7	0.5/1.2	800	34000	0.2	24.0	KCL MUD
861014	PB	2581.0	1.70	31	18	3/17	9.0	0.3/0.7	880	31000	0.2	24.0	KCL MUD
861015	PB	2581.0	1.70	36	17	3/16	10.5	0.5/1.0	900	33000	0.5	23.0	KCL MUD
861016	PB	2581.0	1.70	35	18	3/18	10.5	0.4/1.0	900	35000	0.5	23.0	KCL MUD
861017	PB	2581.0	1.70	35	19	6/18	10.8	0.3/0.7	900	34000	0.5	23.0	KCL MUD
861018	PB	2581.0	1.70	35	19	6/18	10.8	0.3/0.7	900	34000	0.5	23.0	KCL MUD
861019	PB	2581.0	1.70	35	19	6/18	10.8	0.3/0.7	900	34000	0.5	23.0	KCL MUD
861020	PB	2558.0	1.70	34	18	6/15	10.8	0.3/0.7	1000	34000	0.5	23.0	KCL MUD
861021	PB	2558.0	1.70	34	18	6/15	10.8	0.3/0.7	1000	34000	0.5	23.0	KCL MUD
861022	PB	2558.0	1.70	34	18	6/15	10.7	0.3/0.7	1000	34000	0.5	23.0	KCL MUD
861023	PB	2558.0	1.70	34	18	6/15	10.7	0.3/0.7		34000	0.5	23.0	KCL MUD

SAGA PETROLEUM A.S.

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/7-10

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
861024	PB	2558.0	1.70	34	18	6/15	10.7	0.3/0.7		34000	0.5	23.0	KCL MUD
861025	PB	2558.0	1.70	34	18	6/15	10.7	0.3/0.7		34000	0.5	23.0	KCL MUD
861026	PB	1645.0	1.70	34	18	6/15	10.7	0.3/0.7		34000	0.5	23.0	KCL MUD
861027	PB	365.0	1.03										WATER BASED

SAGA PETROLEUM A.S.

6.2.2 MUD MATERIALS USED

Well no: 34/7-10

Materials	Unit	36 in hole	26 in hole	17-1/2 hole	12-1/4 hole	8-1/2 hole	Total
BARITE	M/T	0	43	355	986	0	1384
BICARBONATE	50 KG	1	0	0	7	0	8
CAUSTIC SODA	25 KG	8	40	5	0	0	53
GYPSUM	50 KG	0	0	404	40	0	444
LIME	40 KG	3	0	0	0	0	3
KOH -POTASS.	50KG	0	0	0	6	0	6
SODA ASH	50 KG	7	0	0	16	0	23
BENTONITE	M/T	25	39	0	6	0	70
BENTONITE	50 KG	0	0	40	0	0	40
CACL2	25 KG	0	0	0	630	0	630
ANTISOL FL 10	25 KG	0	0	27	130	0	157
ANTISOL FL 30	25 KG	0	0	256	209	0	465
BORREWELL C	25KG	0	0	0	98	0	98
DOWICIL 75	55GAL	0	0	0	2	0	2
MAGCO 101 INH	55 GA	0	0	0	21	0	21
OS-1L	55GAL	0	0	0	1	0	1
XC-POLYMER	25 KG	0	0	23	32	0	55
KCL - SXS	50 KG	0	0	0	300	0	300
KCL - BRINE	BBL	0	0	0	1200	0	1200

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6.3. Casing Data

Well no: 34/7-10

SIZE inches	DATE RUN	GRADE	NO OF JOINTS	TOTAL LENGTH m	WEIGHT kg/m (lbs/ft)	COUPLINGS	SHOE DEPTH m-RKB	FLOAT COLL DEPTH m-RKB	CENTRALIZERS		REMARKS
									type	depth m	
30	29/8	B	8	100,13	460	ST-2	423	-	-	-	30" Casing was made up & hung off on trolley since 27/8 due to hole stabbing problems which required respud
20	2/9	X-56	49	579,08	198	RL-45	901	888	rigid bow	416 834 846 858 870 883 898	
13 3/8	8/9	N-80	133	1584	107	Buttress	1907	1881	rigid bow	890 1903 1888 1875 1863 1851	
9 5/8	2/10	N-80	195	2428,9	70	Buttress	2755	2728	rigid bow 2506, 2531, 2556, 2581, 2606, 2631, 2656, 2682, 2708, 2735,	1886 1899 2494, 2518, 2543, 2568, 2593, 2618, 2643, 2669, 2695, 2721, 2752	

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6.4. Cement Data

Well no: 34/7-10

DATE	JOB DESCRIPTION	SHOE DEPTH m-RKB	CEMENT TYPE	SLURRY WEIGHT SG	SLURRY VOLUME USED m^3	ADDITIVES L/100kg CEMENT	MIX WATER L/100 kg CEMENT	LOSSES m^3	REMARKS
29.8.86	30" csg.	423	G	Lead: 1.56 Tail: 1.92	44.2 16.3	A-3L: 4.0 A-7L: 3.55	SW: 93.65 SW: 41.1	- -	30" casing was landed on DP w/PGB in TGB (PGB angle 1^{o}). Circ. casing volume prior to mixing & pumping cement slurries. Displaced cement w/7.3 m^3 of sea-water. Bled of pressure & checked for back flow. Negative, i.e float shoe was holding. R/T was finally released w/3 righthand rotations.
2.9.86	20" csg.	901	G	Lead: 1.56 Tail: 1.92	139.7 16.1	A-3L:3.55 R-12L: 1.78	SW: 91.39 SW: 44.0	-	Cfr. remarks in casing/cementing report.
8.9.86	13 3/8" csg.	1907	G	Lead: 1,56 Tail: 1.90		D-31LN:1.78 Bent: 2.25% D-31LN:0.89 R-12L: 0.40	FW: 90.12 FW: 43.09	-	Se remarks: casing data.
2.10.86	9 5/8" csg.	2755	G	Tail: 1.89	49.0	D-19LN:2.66 D-47: 0.18 R-12L: 0.62	FW: 41.42	-	Total losses during circ. prior to cement job was10 m^3. Ref. casing data. Pumped 6.4 m^3 seawater-spacer. Tested surface lines to 345 bar. MIxed & pumped 49 m^3 of 1.89 SG slurry, 0.8 m^3/min. Displaced same w/1.7 SG mud. BJ pumped 3.0 m^3 to shear top plug. Sheared at 117 bar after 2.7 m^3 pumped. Rigpumps were used for rest of displacement. Pumprate was 40-50 SPM. Had full returns during cementjob & displacement.
8.10.86	Squeeze DST-no 1 perforations	-	G	1.90	4.2	D-19LN:1.78 R-12L: 0.62	FW: 42.12	-	Squeezed 0.7 m^3 through retainer at 2631 m. Perforation interval: 2632.7 - 2636.7 m.

Saga Petroleum a.s.

6.4. Cement Data

Well no: 34/7-10

DATE	JOB DESCRIPTION	SHOE DEPTH m-RKB	CEMENT TYPE	SLURRY WEIGHT SG	SLURRY VOLUME USED m^3	ADDITIVES L/100kg CEMENT	MIX WATER L/100 kg CEMENT	LOSSES m^3	REMARKS
8.10.86	Balanced cmt. plug	-	G	1.90	2.3	D-19LN:1,78 R-12L: 0.62	FW: 42.12	-	Squeezed 0.6 m^3 into perforations at 2608.5 - 2609.5 m to improve 9 5/8" casing cement bond. Interval covered: 2620 - 2560 m. Dressed off cement from 2586 to 2627 m.
14.10.86	Squeeze DST- no 2 perforations	-	G	1.90	4.2	D-19LN:1.78 R-12L: 0.62	FW: 42.12	-	Squeezed 3.3 m^3 through cement retainer at 2595 m. Perforation interval: 2609.4 - 2614.4 m.
20.10.86	Squeeze DST no.3 perforations	-	G	1.90	3.3	D-19LN:1.78 R-12L: 0.62	FW: 42.12	-	Squeezed 3.3 m^3 through cement retainer at 2558 m. Perforation interval: 2561 - 2570.5 m.
26.10.86	Squeeze DST no. 4 perforations	-	G	1.90	12.8	D-19LN:1.78 R-12L: 0.62	FW: 42.12	-	Cement retainer prematurely set at 1645 m. Squeezed 6.4 m^3 through perforation.6.4 m^3 cement left in casing. Perforation interval: 2549 - 2551.5 m.
27.10.86	Squeeze 20" x 13 3/8" annulus	-	G	1.90	12.0	D-19LN:1.78 D-31LN:0.89 D-47L: 0.09	FW: 42.02	-	Perforation interval: 885 - 886 m & 785 - 787 m. Cement retainer set at 880 m. Squeeze 10 m^3 through perforation at 885 - 886 m. Dump 2 m^3 on top of retainer. No returns.
27.10.86	Balanced cement plug	-	G	1.92	18.2	A-7L: 3.55	SW: 40.96	-	Set balanced cement plug from 565 - 365 m.

SAGA PETROLEUM A.S.

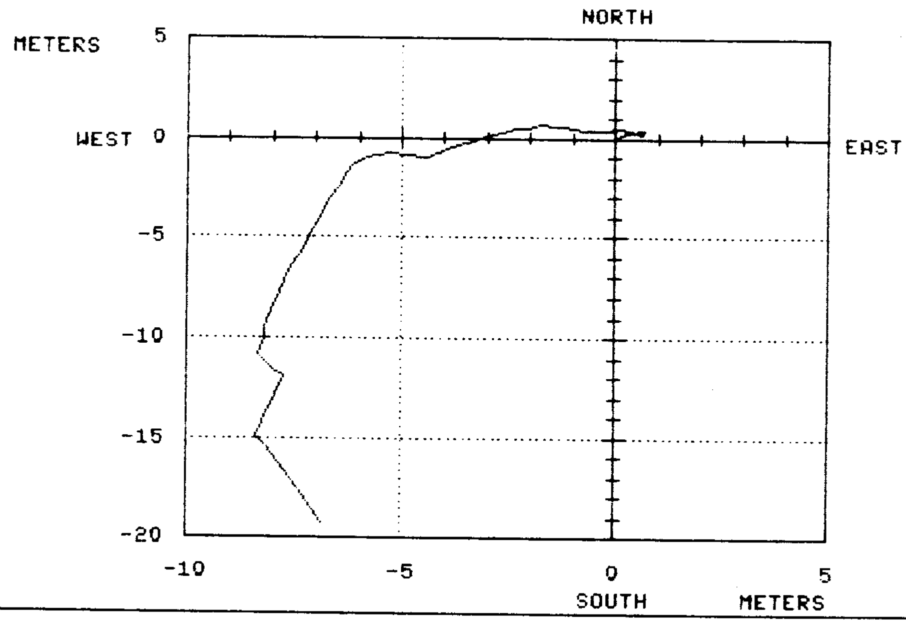
6.5 DEVIATION DATA

Well no: 34/7-10

MD meter	TVD meter	INCLIN. deg.	AZIMUT deg.	DOGLEG deg/30m	+N,-S meter	+E,-W meter
326.0	326.0	1.50	45.0	.00	.00	.00
336.0	336.0	1.00	45.0	1.50	.15	.15
345.0	345.0	1.00	70.0	1.44	.24	.29
374.0	374.0	.75	70.0	.26	.39	.70
428.0	428.0	.75	340.0	.59	.20	.61
441.0	441.0	.30	291.0	1.38	.28	.53
493.0	493.0	.60	300.0	.18	.46	.16
549.0	549.0	.40	256.0	.22	.39	-.31
596.0	596.0	.50	301.0	.23	.34	-.67
643.0	643.0	.30	286.0	.14	.47	-.97
691.0	691.0	.30	291.0	.02	.55	-1.20
739.0	739.0	.30	273.0	.06	.60	-1.45
790.0	790.0	.40	244.0	.12	.66	-1.75
835.0	835.0	.40	250.2	.03	.54	-2.04
883.0	883.0	.20	256.8	.13	.47	-2.28
909.0	909.0	.20	260.4	.01	.45	-2.37
928.0	928.0	.50	263.0	.47	.43	-2.48
1024.0	1024.0	.50	215.0	.13	-.01	-3.18
1119.0	1119.0	.50	248.0	.09	-.50	-3.82
1217.0	1217.0	.40	219.0	.08	-.95	-4.43
1312.0	1312.0	.30	292.0	.13	-.82	-4.95
1361.0	1361.0	.30	264.0	.09	-.78	-5.21
1457.0	1457.0	.20	250.1	.04	-.87	-5.61
1551.0	1551.0	.10	236.4	.03	-.98	-5.83
1647.0	1647.0	.20	222.5	.03	-1.15	-6.02
1696.0	1696.0	.10	215.4	.06	-1.24	-6.10
1789.0	1789.0	.10	201.9	.01	-1.39	-6.18
1886.0	1886.0	.20	187.8	.03	-1.63	-6.24
1912.0	1912.0	.30	184.0	.12	-1.74	-6.25
1967.0	1967.0	.90	205.0	.34	-2.30	-6.40
2021.0	2021.0	.90	195.0	.09	-3.09	-6.69
2066.0	2065.9	.90	193.0	.02	-3.78	-6.86
2114.0	2113.9	1.10	194.0	.13	-4.59	-7.05
2164.0	2163.9	1.30	196.0	.12	-5.60	-7.32
2211.0	2210.9	1.40	196.0	.06	-6.67	-7.63
2259.0	2258.9	1.20	188.0	.17	-7.73	-7.85
2306.0	2305.9	1.00	195.0	.15	-8.62	-8.03
2356.0	2355.9	1.00	183.0	.13	-9.48	-8.17
2385.0	2384.9	.90	185.0	.11	-9.96	-8.20
2440.0	2439.9	1.00	161.0	.22	-10.86	-8.31
2490.0	2489.9	.90	149.0	.13	-11.61	-7.96
2511.0	2510.9	.90	135.0	.31	-11.87	-7.76
2653.0	2652.8	.60	205.5	.19	-13.58	-8.06
2693.0	2692.8	1.30	184.0	.58	-14.22	-8.22
2740.0	2739.8	.50	150.0	.59	-14.93	-8.39
2789.0	2788.8	.70	159.4	.14	-15.39	-8.17
2933.0	2932.8	1.40	162.9	.15	-17.89	-7.32
2990.0	2989.8	1.40	157.0	.08	-19.20	-6.84

6.5.1 HORIZONTAL PROJECTION

Well no. 34/7-10



Saga Petroleum a.s.

DATE 3.3.87	AUTH. FL
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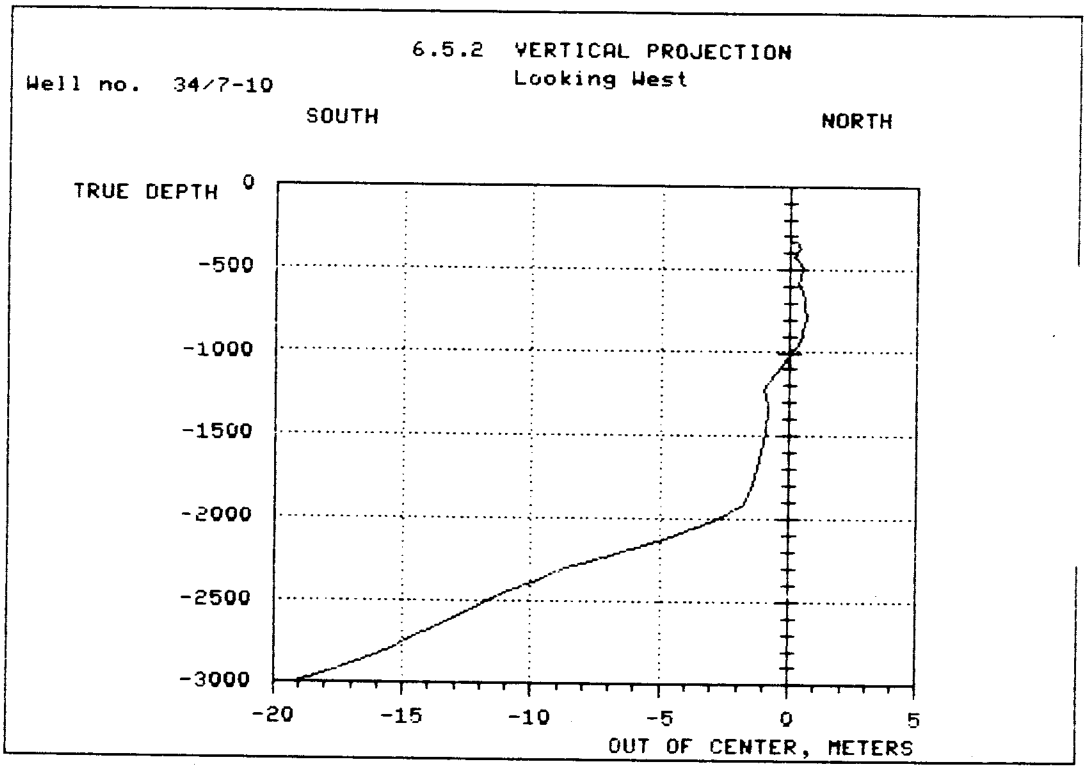

Saga Petroleum a.s.

DATE 3.3.87	AUTH. FL
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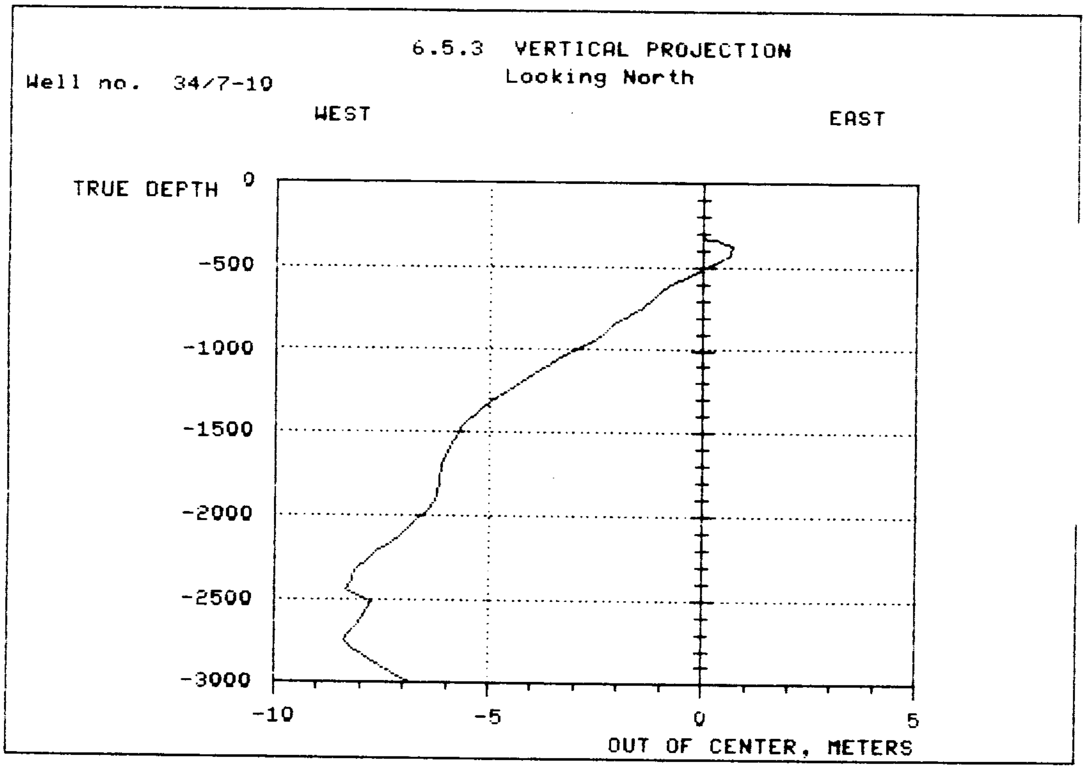

Saga Petroleum a.s.

DATE 3.3.87	AUTH. FL
DRAW. BY FL	APPR. TSØ
REF. 6.5.3 34/7-10	

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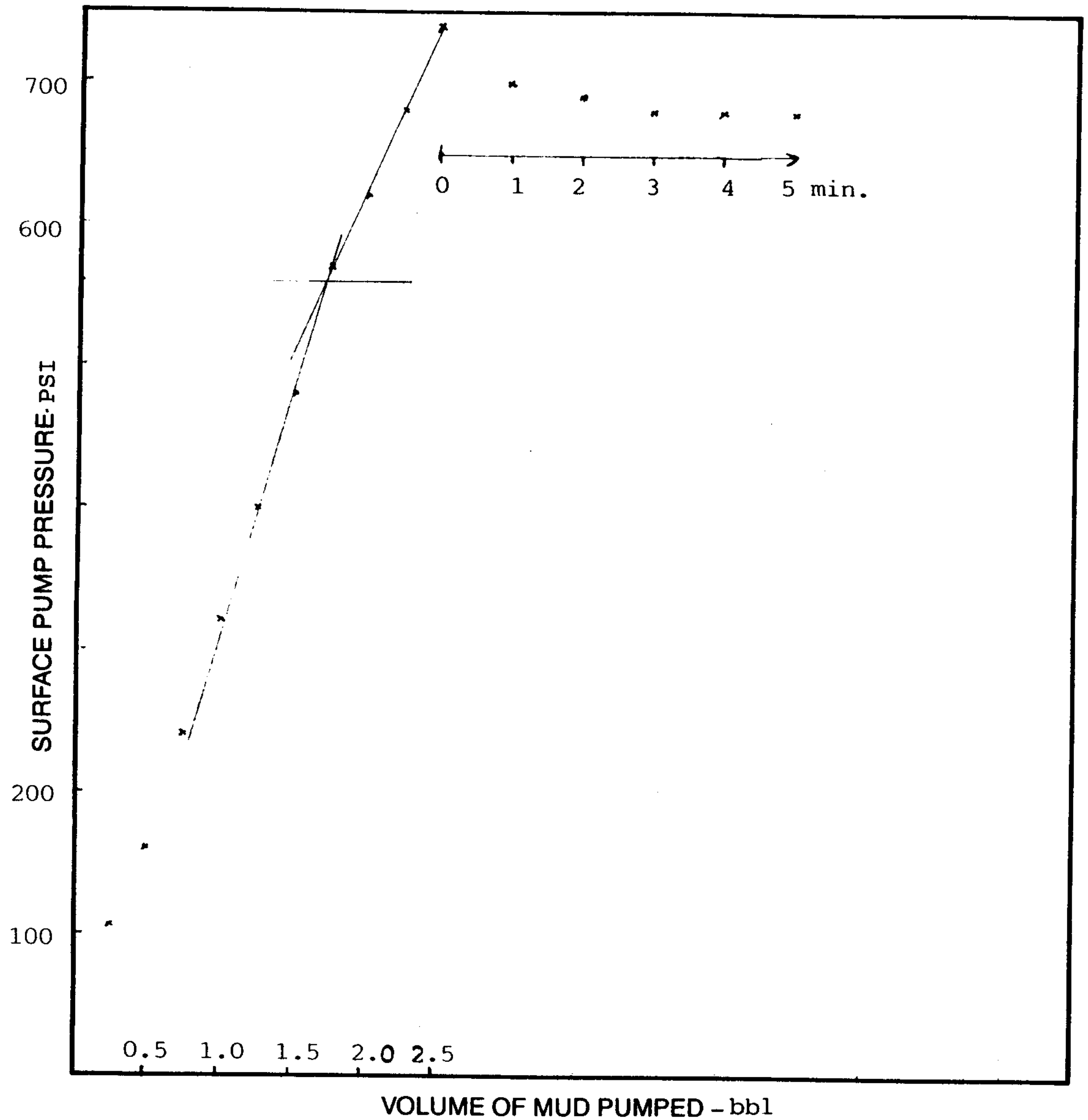
6.6. Formation Leak off Test Data

Well no: 34/7-10



WELL	DATE
34/7-10	4/9-86

CSG. SIZE 20"	VOLUME PUMPED 2.5 bbl
CSG. SHOE DEPTH 901 m	VOLUME RECOVERED 2.5 bbl
WATER DEPTH 300 m	FORMATION TYPE Claystone
HOLE SIZE 17 1/2"	LEAK OFF PRESSURE 560 psi
HOLE DEPTH 923 m	SHUT-IN PRESSURE 680 psi
MUD WEIGHT 1.11 SG	SHUT-IN TIME 5 min.
PUMP RATE 1/8 BPM	

EQV. MUD WEIGHT AT CSG. SHOE: 1.55 SG

bbl	PRESSURE	bbl	PRESSURE
0.25	80	2.00	620
0.50	160	2.25	680
0.75	240	2.50	740
1.00	320		
1.25	400		
1.50	480		
1.75	560		

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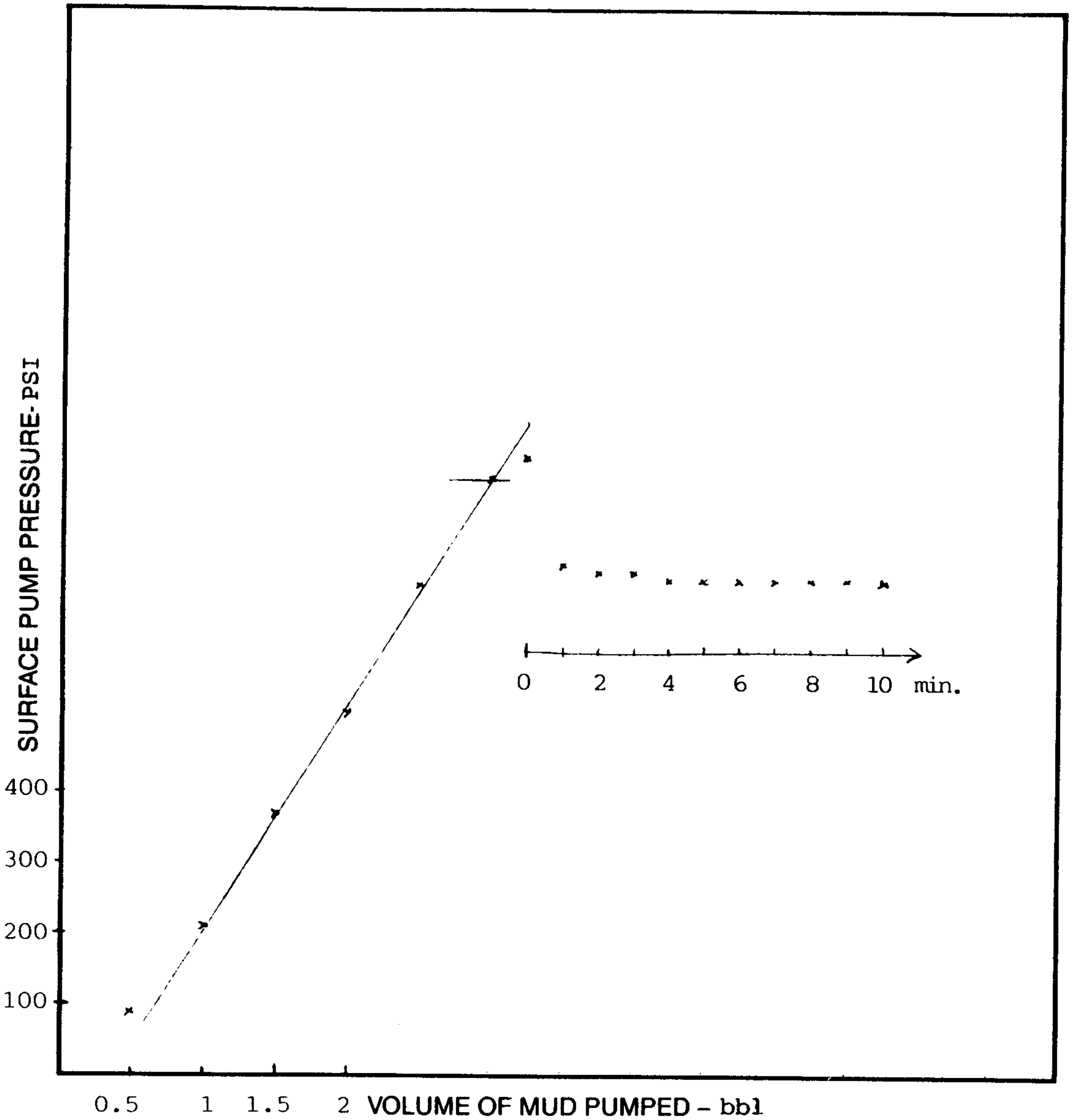
6.6. Formation Leak off Test Data

Well no: 34/7-10



WELL	DATE
34/7-10	10/9-86

CSG. SIZE 13 3/8"	VOLUME PUMPED 3 1/4 bbl
CSG. SHOE DEPTH 1907 m	VOLUME RECOVERED 2 1/4 bbl
WATER DEPTH 300 m	FORMATION TYPE Claystone
HOLE SIZE 12 1/4"	LEAK OFF PRESSURE 840 psi
HOLE DEPTH 2010 m	SHUT-IN PRESSURE 700 psi
MUD WEIGHT 1,50	SHUT-IN TIME 10 min.
PUMP RATE 0.5 BPM	

EQV. MUD WEIGHT AT CSG. SHOE: 1.81 SG

bbl	PRESSURE	min.	PRESSURE
0.5	90	1	720
1.0	210	2	710
1.5	370	3	710
2.0	510	4	700
2.5	690		
3.0	840		
3.25	860	10	700

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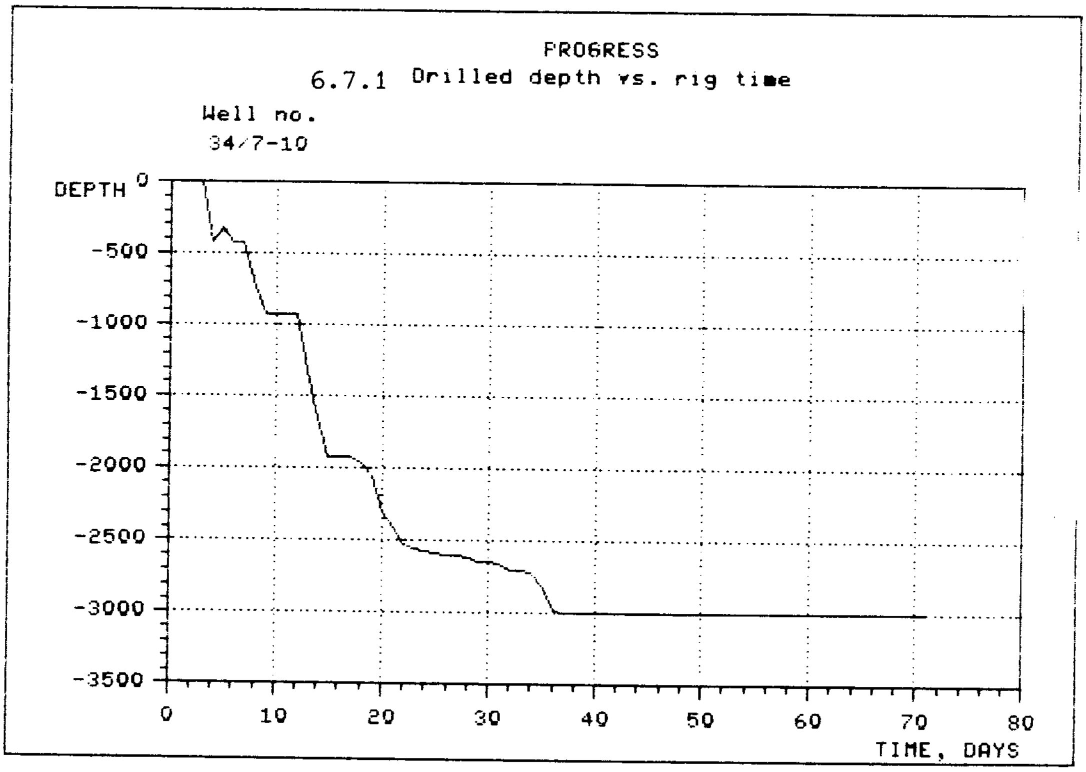
6.7. RIG TIME DISTRIBUTION

Well no: 34/7-10

Mainoperation	Suboperation	Hours		% of total rig time	
MOVING	ANCHOR	31.5		1.9	
MOVING	TRANSIT	40.0		2.4	
Sum :			71.5		4.3
DRILLING	BOP ACTIVITIES	35.5		2.1	
DRILLING	BOP/WELLHEAD EQ	61.0		3.6	
DRILLING	CASING	126.0		7.5	
DRILLING	CIRC/COND	31.0		1.8	
DRILLING	DRILL	227.5		13.6	
DRILLING	OTHER	1.5		0.1	
DRILLING	PRESS DETECTION	1.5		0.1	
DRILLING	REAM	1.0		0.1	
DRILLING	SURVEY	4.5		0.3	
DRILLING	TRIP	88.5		5.3	
DRILLING	UNDERREAM	23.0		1.4	
Sum :			601.0		35.8
FORMATION EVAL	CIRC/COND	23.0		1.4	
FORMATION EVAL	CORE	127.0		7.6	
FORMATION EVAL	DST	352.5		21.0	
FORMATION EVAL	LOG	86.5		5.2	
FORMATION EVAL	TRIP	239.5		14.3	
FORMATION EVAL	WAIT	3.0		0.2	
Sum :			831.5		49.6
INTERRUPTION	MAINTAIN/REP	15.5		0.9	
INTERRUPTION	OTHER	2.0		0.1	
INTERRUPTION	SURFACE EQ/F	23.0		1.4	
INTERRUPTION	WAIT	70.0		4.2	
Sum :			110.5		6.6
PLUG & ABANDON	CEMENT PLUG	4.5		0.3	
PLUG & ABANDON	CIRC/COND	7.0		0.4	
PLUG & ABANDON	CUT	13.0		0.8	
PLUG & ABANDON	EQUIP RECOVERY	15.0		0.9	
PLUG & ABANDON	PERFORATE	7.0		0.4	
PLUG & ABANDON	SQUEEZE	1.5		0.1	
PLUG & ABANDON	TRIP	15.0		0.9	
Sum :			63.0		3.8
Total rig time :		1677.5		100.0	



Saga Petroleum a.s.

DATE	3.3.87	AUTH.	FL
DRAW. BY	FL	APPR.	TSØ
REF.	6.7.1		34/7-10

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 1 of 6 Well no: 34/7-10

Dato	Mainoperation	Suboperation	Hours	
23.08.86	MOVING	TRANSIT	3.5	
	Sum :			3.5
24.08.86	MOVING	TRANSIT	24.0	
	Sum :			24.0
25.08.86	MOVING	ANCHOR	11.5	
	MOVING	TRANSIT	12.5	
	Sum :			24.0
26.08.86	DRILLING	BOP/WELLHEAD EQ	1.0	
	DRILLING	DRILL	12.0	
	DRILLING	SURVEY	2.5	
	DRILLING	TRIP	2.5	
	MOVING	ANCHOR	6.0	
	Sum :			24.0
27.08.86	DRILLING	BOP/WELLHEAD EQ	4.5	
	DRILLING	CASING	12.5	
	DRILLING	CIRC/COND	1.0	
	DRILLING	TRIP	3.0	
	INTERRUPTION	SURFACE EQ/F	3.0	
	Sum :			24.0
28.08.86	DRILLING	BOP/WELLHEAD EQ	0.5	
	DRILLING	CASING	0.5	
	DRILLING	CIRC/COND	1.5	
	DRILLING	DRILL	12.5	
	DRILLING	SURVEY	2.0	
	DRILLING	TRIP	5.0	
	INTERRUPTION	OTHER	2.0	
	Sum :			24.0
29.08.86	DRILLING	BOP/WELLHEAD EQ	8.0	
	DRILLING	CASING	7.0	
	DRILLING	CIRC/COND	0.5	
	DRILLING	DRILL	0.5	
	DRILLING	TRIP	8.0	
	Sum :			24.0
30.08.86	DRILLING	CIRC/COND	1.0	
	DRILLING	DRILL	15.5	
	DRILLING	TRIP	7.0	
	INTERRUPTION	SURFACE EQ/F	0.5	
	Sum :			24.0
31.08.86	DRILLING	CIRC/COND	1.5	
	DRILLING	DRILL	9.0	
	DRILLING	PRESS DETECTION	0.5	
	DRILLING	TRIP	4.5	
	DRILLING	UNDERREAM	7.5	
	INTERRUPTION	SURFACE EQ/F	1.0	
	Sum :			24.0
01.09.86	DRILLING	BOP/WELLHEAD EQ	3.0	
	DRILLING	CIRC/COND	2.0	
	DRILLING	PRESS DETECTION	1.0	
	DRILLING	TRIP	2.5	
	DRILLING	UNDERREAM	15.5	
	Sum :			24.0
02.09.86	DRILLING	BOP/WELLHEAD EQ	4.0	
	DRILLING	CASING	20.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

 Well no: 34/7-10

Dato	Mainoperation	Suboperation	Hours	
03.09.86	DRILLING	BOP ACTIVITIES	5.0	
	DRILLING	BOP/WELLHEAD EQ	14.5	
	DRILLING	CASING	4.5	
	Sum :			24.0
04.09.86	DRILLING	BOP ACTIVITIES	1.0	
	DRILLING	CASING	3.0	
	DRILLING	CIRC/COND	1.5	
	DRILLING	DRILL	16.0	
	DRILLING	TRIP	1.5	
	INTERRUPTION	MAINTAIN/REP	0.5	
	INTERRUPTION	SURFACE EQ/F	0.5	
	Sum :			24.0
05.09.86	DRILLING	CIRC/COND	0.5	
	DRILLING	DRILL	14.5	
	DRILLING	TRIP	5.5	
	INTERRUPTION	SURFACE EQ/F	3.5	
	Sum :			24.0
06.09.86	DRILLING	CIRC/COND	3.5	
	DRILLING	DRILL	15.0	
	DRILLING	REAM	0.5	
	DRILLING	TRIP	5.0	
	Sum :			24.0
07.09.86	DRILLING	CASING	13.0	
	DRILLING	CIRC/COND	0.5	
	DRILLING	TRIP	2.0	
	FORMATION EVAL	LOG	7.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
08.09.86	DRILLING	BOP/WELLHEAD EQ	3.0	
	DRILLING	CASING	21.0	
	Sum :			24.0
09.09.86	DRILLING	BOP ACTIVITIES	2.0	
	DRILLING	BOP/WELLHEAD EQ	2.5	
	DRILLING	CASING	5.5	
	DRILLING	CIRC/COND	2.5	
	DRILLING	DRILL	3.0	
	DRILLING	OTHER	0.5	
	DRILLING	TRIP	8.0	
	Sum :			24.0
10.09.86	DRILLING	BOP ACTIVITIES	2.5	
	DRILLING	CASING	10.5	
	DRILLING	CIRC/COND	1.5	
	DRILLING	DRILL	6.0	
	DRILLING	TRIP	3.0	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
11.09.86	DRILLING	CIRC/COND	0.5	
	DRILLING	DRILL	21.5	
	DRILLING	TRIP	1.5	
	INTERRUPTION	SURFACE EQ/F	0.5	
	Sum :			24.0
12.09.86	DRILLING	CIRC/COND	2.0	
	DRILLING	DRILL	16.5	
	DRILLING	TRIP	5.5	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

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Dato	Mainoperation	Suboperation	Hours	
13.09.86	DRILLING	CIRC/COND	3.5	
	DRILLING	DRILL	14.5	
	DRILLING	TRIP	2.5	
	FORMATION EVAL	CORE	1.5	
	FORMATION EVAL	TRIP	2.0	
	Sum :			24.0
14.09.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	15.5	
	FORMATION EVAL	TRIP	6.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
15.09.86	FORMATION EVAL	CIRC/COND	3.0	
	FORMATION EVAL	CORE	12.0	
	FORMATION EVAL	TRIP	9.0	
	Sum :			24.0
16.09.86	DRILLING	BOP ACTIVITIES	6.0	
	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	11.0	
	FORMATION EVAL	TRIP	5.5	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
17.09.86	FORMATION EVAL	CIRC/COND	0.5	
	FORMATION EVAL	CORE	18.5	
	FORMATION EVAL	TRIP	5.0	
	Sum :			24.0
18.09.86	FORMATION EVAL	CIRC/COND	2.0	
	FORMATION EVAL	CORE	11.5	
	FORMATION EVAL	TRIP	9.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
19.09.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	12.5	
	FORMATION EVAL	TRIP	9.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
20.09.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	15.5	
	FORMATION EVAL	TRIP	7.0	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
21.09.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	13.0	
	FORMATION EVAL	TRIP	8.0	
	INTERRUPTION	MAINTAIN/REP	2.0	
	Sum :			24.0
22.09.86	DRILLING	BOP ACTIVITIES	1.0	
	FORMATION EVAL	CIRC/COND	0.5	
	FORMATION EVAL	CORE	15.0	
	FORMATION EVAL	TRIP	7.5	
	Sum :			24.0
23.09.86	DRILLING	BOP ACTIVITIES	3.5	
	DRILLING	DRILL	11.0	
	DRILLING	OTHER	1.0	
	DRILLING	TRIP	8.5	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

 Well no: 34/7-10

Dato	Mainoperation	Suboperation	Hours	
24.09.86	FORMATION EVAL	LOG	24.0	
	Sum :			24.0
25.09.86	DRILLING	DRILL	7.0	
	DRILLING	REAM	0.5	
	DRILLING	TRIP	4.0	
	FORMATION EVAL	LOG	11.0	
	INTERRUPTION	MAINTAIN/REP	0.5	
	INTERRUPTION	SURFACE EQ/F	1.0	
	Sum :			24.0
26.09.86	DRILLING	DRILL	24.0	
	Sum :			24.0
27.09.86	DRILLING	DRILL	24.0	
	Sum :			24.0
28.09.86	DRILLING	CIRC/COND	5.5	
	DRILLING	DRILL	4.0	
	DRILLING	TRIP	4.5	
	FORMATION EVAL	LOG	9.5	
	INTERRUPTION	SURFACE EQ/F	0.5	
	Sum :			24.0
29.09.86	FORMATION EVAL	CIRC/COND	2.5	
	FORMATION EVAL	LOG	16.0	
	FORMATION EVAL	TRIP	5.5	
	Sum :			24.0
30.09.86	FORMATION EVAL	LOG	18.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	PLUG & ABANDON	CIRC/COND	1.0	
	PLUG & ABANDON	TRIP	3.5	
	Sum :			24.0
01.10.86	DRILLING	BOP/WELLHEAD EQ	3.0	
	DRILLING	CASING	1.5	
	DRILLING	CIRC/COND	2.0	
	DRILLING	DRILL	1.0	
	DRILLING	TRIP	3.0	
	FORMATION EVAL	CORE	1.0	
	INTERRUPTION	SURFACE EQ/F	0.5	
	PLUG & ABANDON	CEMENT PLUG	2.0	
	PLUG & ABANDON	CIRC/COND	5.5	
	PLUG & ABANDON	TRIP	4.5	
	Sum :			24.0
02.10.86	DRILLING	BOP ACTIVITIES	2.0	
	DRILLING	BOP/WELLHEAD EQ	0.5	
	DRILLING	CASING	21.5	
	Sum :			24.0
03.10.86	DRILLING	BOP/WELLHEAD EQ	2.0	
	DRILLING	TRIP	1.5	
	FORMATION EVAL	CIRC/COND	3.0	
	FORMATION EVAL	TRIP	17.5	
	Sum :			24.0
04.10.86	DRILLING	CASING	5.5	
	FORMATION EVAL	TRIP	18.0	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
05.10.86	FORMATION EVAL	DST	16.5	
	FORMATION EVAL	TRIP	7.5	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

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Dato	Mainoperation	Suboperation	Hours	
06.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
07.10.86	FORMATION EVAL	DST	14.0	
	FORMATION EVAL	TRIP	10.0	
	Sum :			24.0
08.10.86	FORMATION EVAL	CIRC/COND	0.5	
	FORMATION EVAL	DST	18.5	
	FORMATION EVAL	TRIP	4.0	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
09.10.86	DRILLING	BOP ACTIVITIES	4.0	
	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	DST	2.5	
	FORMATION EVAL	TRIP	13.5	
	FORMATION EVAL	WAIT	3.0	
	Sum :			24.0
10.10.86	FORMATION EVAL	DST	18.0	
	FORMATION EVAL	TRIP	6.0	
	Sum :			24.0
11.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
12.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
13.10.86	FORMATION EVAL	DST	18.0	
	FORMATION EVAL	TRIP	6.0	
	Sum :			24.0
14.10.86	FORMATION EVAL	CIRC/COND	3.5	
	FORMATION EVAL	DST	11.5	
	FORMATION EVAL	TRIP	8.5	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
15.10.86	DRILLING	BOP ACTIVITIES	4.5	
	FORMATION EVAL	DST	7.0	
	FORMATION EVAL	TRIP	12.5	
	Sum :			24.0
16.10.86	FORMATION EVAL	DST	3.0	
	FORMATION EVAL	TRIP	9.5	
	INTERRUPTION	SURFACE EQ/F	11.5	
	Sum :			24.0
17.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
18.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
19.10.86	FORMATION EVAL	DST	18.5	
	FORMATION EVAL	TRIP	5.5	
	Sum :			24.0
20.10.86	DRILLING	BOP ACTIVITIES	4.0	
	FORMATION EVAL	CIRC/COND	1.5	
	FORMATION EVAL	DST	9.5	
	FORMATION EVAL	TRIP	8.0	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
21.10.86	FORMATION EVAL	DST	5.0	
	FORMATION EVAL	TRIP	19.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

 Well no: 34/7-10

Dato	Mainoperation	Suboperation	Hours	
22.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
23.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
24.10.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
25.10.86	FORMATION EVAL	DST	10.5	
	FORMATION EVAL	TRIP	13.5	
	Sum :			24.0
26.10.86	FORMATION EVAL	DST	8.0	
	FORMATION EVAL	TRIP	5.5	
	PLUG & ABANDON	CUT	4.0	
	PLUG & ABANDON	EQUIP RECOVERY	4.0	
	PLUG & ABANDON	PERFORATE	2.5	
	Sum :			24.0
27.10.86	PLUG & ABANDON	CEMENT PLUG	2.5	
	PLUG & ABANDON	CIRC/COND	0.5	
	PLUG & ABANDON	CUT	6.0	
	PLUG & ABANDON	EQUIP RECOVERY	6.0	
	PLUG & ABANDON	PERFORATE	4.5	
	PLUG & ABANDON	SQUEEZE	1.5	
	PLUG & ABANDON	TRIP	3.0	
	Sum :			24.0
28.10.86	DRILLING	BOP/WELLHEAD EQ	14.5	
	INTERRUPTION	MAINTAIN/REP	0.5	
	INTERRUPTION	SURFACE EQ/F	0.5	
	PLUG & ABANDON	CUT	3.0	
	PLUG & ABANDON	EQUIP RECOVERY	1.5	
	PLUG & ABANDON	TRIP	4.0	
	Sum :			24.0
29.10.86	INTERRUPTION	MAINTAIN/REP	2.5	
	INTERRUPTION	WAIT	14.0	
	MOVING	ANCHOR	4.0	
	PLUG & ABANDON	EQUIP RECOVERY	3.5	
	Sum :			24.0
30.10.86	INTERRUPTION	WAIT	24.0	
	Sum :			24.0
31.10.86	INTERRUPTION	WAIT	24.0	
	Sum :			24.0
01.11.86	INTERRUPTION	WAIT	8.0	
	MOVING	ANCHOR	10.0	
	Sum :			18.0

7. OPERATIONAL DATA

If not otherwise mentioned, all depths in this chapter refer to m RKB (Rotary Kelly Bushing).

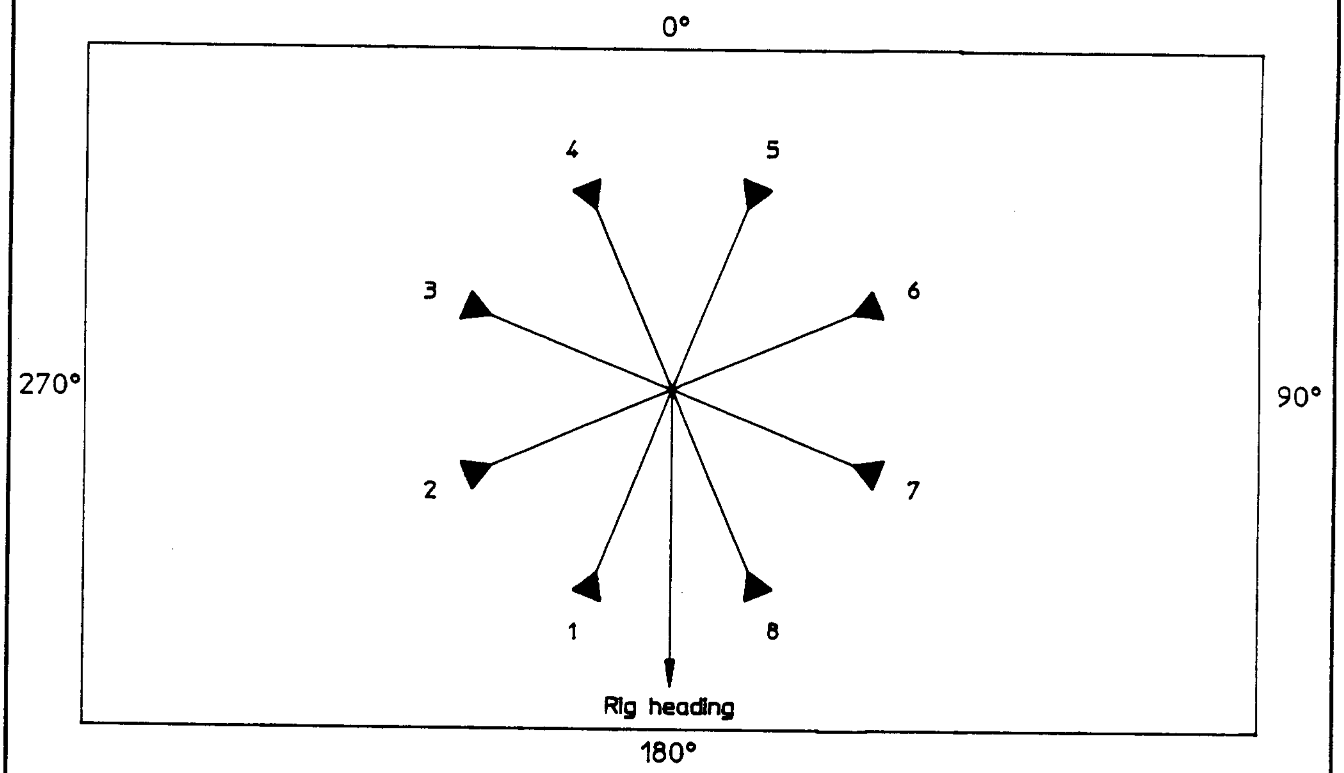
Saga Petroleum a.s.

7.1 Anchor Pattern

Anchor no :	1	2	3	4	5	6	7	8
Compass direction :	202	247	292	337	022	067	112	157
Length of chain out (m) :	1380	1355	1395	1400	1450	1390	1385	1360
Max. initial tension (MT) :	160	160	160	160	160	160	160	160

Remarks :

Chain	Main anchor	Piggy back
1	518 m	457 m
2	518 m	457 m
3	518 m	457 m
4	518 m	457 m
5	518 m	457 m
6	518 m	457 m
7	518 m	457 m
8	518 m	457 m



DATE	3.3.87	AUTH.	FL
DRAW.BY	FL	APPR.	TSØ
REF.	7.1 34/7-10		

Saga Petroleum a.s.

7.2 Helicopter and Charter Flights

Well no: 34/7-10

NO OF FLIGHT		FLIGHT ROUTE	PASSENGERS OUT	PASSENGERS IN	DESCRIPTION OF CARGO	REMARKS
30	SCHEDULED HELICOPTER FLIGHTS	BGO-TS-BGO	429	440	Mail bags, Oil-equipment.	
	SCHEDULED CHARTER FLIGHTS		-	-		
12	Extra Helicopter flights	BGO-TS-BGO	81	90	" "	
4	" "	BGO-TS-BGO	4	5		Mobile Flights

Industritrykk 31/25

Saga Petroleum a.s.

Occupational Accidents. Incident/Profession
Arbeidsulykker. Skadehendelse/Yrke

Well no: 34/7-10

Incident / Skadehendelse \ Profession / Yrke	Administration – Administrasjon	Roughneck – Boredekksarbeider	Driller – Borer	Electrician – Elektriker	Catering – Forpleining	Roustabout – Hjelpearbeider	Electronic technician – Instrumenttekniker	Crane operator – Kranfører	Derrikman – Tårnmann	Painter Sandblaster worker – Maler Sandblåser	Mechanic/ Repairer – Mekaniker/Motormann/ Reparatør	Operator – Operatør	Plumber – Rørlegger	Service technichan – Servicetekniker	Scaffolding worker – Stillasbygger	Welder – Sveiser	Unspecified – Uspesifisert	Total – Totalt	%	Year – år
Contact with machinery in motion Kontakt med maskindel i bevegelse																				
Fire, explosion, etc. Brann, eksplosjon e.l.											1							1		
Fall to same level Fall til samme nivå																				
False step Tråkk på ujevnheter, feiltråkk																				
Falling objects Fallende gjenstander																				
Contact with stationary objects Kontakt med gjenstander i ro																				
Accident of handling mobile units Håndteringsulykker									2									2		
Chemicals Kontakt med kjemiske forbindelser																				
Body overload Overbelastning av kroppsdeler																				
Splinter, spurt Splinter, sprut																				
Electricity Elektrisk strøm																				
Extreme temperatures Ekstreme tempraturer																				
Occupational disease Yrkessykdommer																				
Man overboard Mann overbord																				
Other Annet																				
Total Totalt									2		1							3		

Saga Petroleum a.s.

7.3.2 Occupational Accidents. Incid./injur. part of the body
Arbeidsulykker. Skadehendelse/skadet legemsdel
Well no: 34/7-10

Injured part of the body / Skadet legemsdel — Incident / Skadehendelse	Eye – Øye	Back – Rygg	Toe/foot – Tå/fot	Hip/leg – Hofte/bein	Abdomen/chest – Mage/bryst	Arm/shoulder – Arm/skulder	Head – Hode	Tooth – Tann	Hand/finger – Hånd/finger	Other – Annet	Total – Totalt	%	Year – År
Contact with machinery in motion Kontakt med maskindel i bevegelse													
Fire, explosion, etc. Brann, eksplosjon e.l.										1	1		
Fall to lower level Fall til lavere nivå													
Fall to the same level Fall til samme nivå													
False step Tråkk på ujevnheter, feiltråkk													
Falling objects Fallende gjenstander													
Contact with stationary objects Kontakt med gjenstander i ro													
Accident of handling mobile units Håndteringsulykker			2								2		
Chemicals Kontakt med kjemiske forbindelser													
Bodity overload Overbelastning av kroppsdeler													
Splinter, spurt Splinter, sprut													
Electricity Elektrisk strøm													
Extreme tempratures Ekstreme temperaturer													
Occupational disease Yrkessykdommer													
Man overboard Mann overbord													
Other Annet													
Total Totalt			2							1	3		

Industritrykk 31725

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7.3.3 Occupational Accidents. Incid./extern. influence
Arbeidsulykker. Skadehendelse/ytre faktor

Well no: 34/7-10

External influence / Ytre faktor — Incident / Skadehendelse	Chemical, physical, biological influence / Kjemisk, fysisk, biologisk faktor	Cooling, pressure, wormth, ventilation / Kjøling, trykk, varme, ventilasjon	Material, goods, packing / Materiale, gods, emballasje	Electric equipment / Elektrisk utrustning	Other machine / Annen maskin	Drilling tools / Boretenger	Handcraft tool, machines, instruments / Håndverktøy, maskiner, instrumenter	Movable/fixed arrangements of the constr. / Løs/fast innretning på bygning, konstruksjon	Lifting-/transport equipment / Løfte-/transport anordning	Other / Annet	Total / Totalt	%	Year / År
Contact with machinery in motion / Kontakt med maskindel i bevegelse													
Fire, explosion, etc. / Brann, eksplosjon e.l.		1									1		
Fall to lower level / Fall til lavere nivå													
Fall to same level / Fall til samme nivå													
False step / Tråkk på ujevnheter, feiltråkk													
Falling objects / Fallende gjenstander													
Contact with stationary objects / Kontakt med gjenstander i ro													
Accident of handling mobile units / Håndteringsulykker						1			1		2		
Chemicals / Kontakt med kjemiske forbindelser													
Bodity overload / Overbelastning av kroppsdeler													
Splinter, spurt / Splinter, sprut													
Electricity / Elektrisk strøm													
Extreme tempratures / Ekstreme temperaturer													
Occupational disease / Yrkessykdommer													
Man overboard / Mann overbord													
Other / Annet													
Total / Totalt		1				1			1		3		

SAGA PETROLEUM A.S.

7.4 DAILY OPERATING CONDITIONS

Well no: 34/7-10

	WIND		SEAS		SWELL			RIG MOVEMENT				ANCHOR		RISER	
Date	speed m/s	dir deg	height m	dir deg	height m	dir deg	periode sec	heave m	roll deg	pitch deg	head deg	tons min	tons max	max	Remarks
860823	6	45	2.0	45											
860824	7	23	2.0	360							180	0	0	0	
860825	5	20	1.3	20							180	0	0	0	
860826	8	360	1.3	300				0.2	1.0	1.2	180	0	0	0	
860827	10	45	2.0	45				0.1	1.1	2.0	180	105	118	0	
860828	8	0	2.0	0				0.5	2.0	3.0	180	105	140	0	
860829	8	0	1.5	0				0.3	1.5	1.8	180	100	116	0	
860830	10	315	2.0	315				0.2	1.4	1.6	180	100	114	72	
860831	23	52	6.0	180				0.3	2.0	2.0	180	101	118	78	
860901	8	270	4.0	225				0.6	4.0	3.0	180	100	125	78	
860902	10	315	3.0	315				1.4	3.0	3.0	180	101	118	0	
860903	12	315	2.8	315				1.0	4.0	1.4	180	101	111	0	
860904	17	230	5.0	230				1.0	2.4	1.6	180	102	113	96	
860905	15	200	4.5	230				0.5	3.2	2.0	180	100	114	97	
860906	13	315	4.5	315				1.3	2.6	1.4	180	100	110	96	
860907	9	340	4.0	340				1.2	3.2	2.0	180	100	116	103	
860908	11	340	2.5	5				0.7	2.0	1.4	180	100	109	112	
860909	14	340	2.5	340				0.3	2.8	1.6	180	100	113	112	
860910	12	360	3.0	360				0.5	1.8	1.6	180	100	107	113	
860911	10	350	1.4	360				0.6	2.4	2.0	180	100	111	120	
860912	7	270	.8	270				0.6	2.2	1.6	180	100	109	128	
860913	5	270	1.4	270				0.3	1.0	1.0	180	100	107	132	
860914	8	90	1.3	100				0.2	1.6	1.2	180	100	107	138	
860915	12	310	3.0	300				0.6	2.6	1.2	180	100	106	140	
860916	6	300	1.2	290				0.9	2.2	2.0	180	100	109	136	
860917	8	310	1.0	310				0.2	1.2	1.6	180	100	109	136	
860918	6	240	1.0	270				0.2	1.4	1.6	180	100	108	136	
860919	15	220	2.7	260				0.1	2.0	1.0	180	100	110	136	
860920	15	245	2.5	250				0.8	5.4	1.8	180	100	112	137	
860921	11	260	1.5	260				0.5	3.2	1.8	180	100	114	139	
860922	4	260	1.0	270				1.2	5.0	1.8	180	100	112	139	
860923	5	265	.9	270				0.6	1.6	1.2	180	100	108	141	

Well no: 34/7-10

Date	WIND speed m/s	WIND dir deg	SEAS height m	SEAS dir deg	SWELL height m	SWELL dir deg	SWELL periode sec	RIG MOVEMENT heave m	RIG MOVEMENT roll deg	RIG MOVEMENT pitch deg	RIG MOVEMENT head deg	ANCHOR tons min	ANCHOR tons max	RISER max	Remarks
860924	4	250	1.5	250				0.4	1.8	1.6	180	100	106	138	
860925	5	350	2.0	350				0.4	1.6	2.0	180	100	107	137	
860926	4	150	1.6	150				0.4	1.2	1.1	180	100	106	136	
860927	20	180	3.0	180				0.6	2.4	4.0	180	101	108	138	
860928	12	230	3.0	190				0.7	4.0	2.5	180	100	116	139	
860929	17	190	3.0	195				0.5	2.0	3.0	180	100	114	136	
860930	12	200	2.7	200				0.7	4.0	3.0	180	100	119	139	
861001	12	225	2.8	270				1.0	3.0	2.0	180	100	118	137	
861002	18	340	5.0	270				2.5	4.0	4.0	180	100	120	145	
861003	10	340	7.0	340				2.0	3.0	3.0	180	100	114	144	
861004	6	180	3.0	180				0.8	2.0	1.6	180	100	113	142	
861005	12	180	7.0	180				0.9	3.0	2.6	180	100	116	141	
861006	10	270	3.6	270				0.6	3.0	1.4	180	100	114	141	
861007	10	0	4.0	0				0.8	1.4	1.4	180	100	108	139	
861008	20	160	4.8	160				2.8	1.2	2.0	180	100	114	140	
861009	17	180	4.0	180				1.4	2.0	1.6	180	100	111	140	
861010	16	230	4.6	230				1.6	3.2	2.0	180	100	114	142	
861011	20	225	5.4	225				1.6	4.6	2.0	180	100	117	141	
861012	24	200	7.8	200				2.3	3.2	4.1	180	100	111	142	
861013	14	180	3.5	180				1.4	2.2	1.8	180	100	111	141	
861014	10	115	2.3	225				0.9	2.8	2.0	180	100	111	141	
861015	21	200	3.2	215				1.5	4.4	3.0	180	100	112	141	
861016	10	270	3.5	260				2.5	3.8	1.8	180	100	110	141	
861017	21	180	3.9	180				1.0	3.6	3.4	180	100	108	140	
861018	18	147	5.8	147				1.9	4.4	3.2	180	100	109	142	
861019	11	218	3.2	225				2.3	3.0	1.4	180	100	110	139	
861020	9	214	2.4	210				1.0	2.8	1.4	180	100	128	135	
861021	5	167	2.3	200				0.9	2.0	1.4	180	100	125	138	
861022	4	300	1.6	280				0.6	2.2	1.0	180	100	125	137	
861023	16	292	3.4	300				0.8	3.6	1.8	180	100	125	135	
861024	12	150	2.6	190				0.9	2.8	1.4	180	100	121	136	
861025	17	110	4.1	130				1.2	2.2	2.6	180	100	115	137	

7.4 DAILY OPERATING CONDITIONS

Well no: 34/7-10

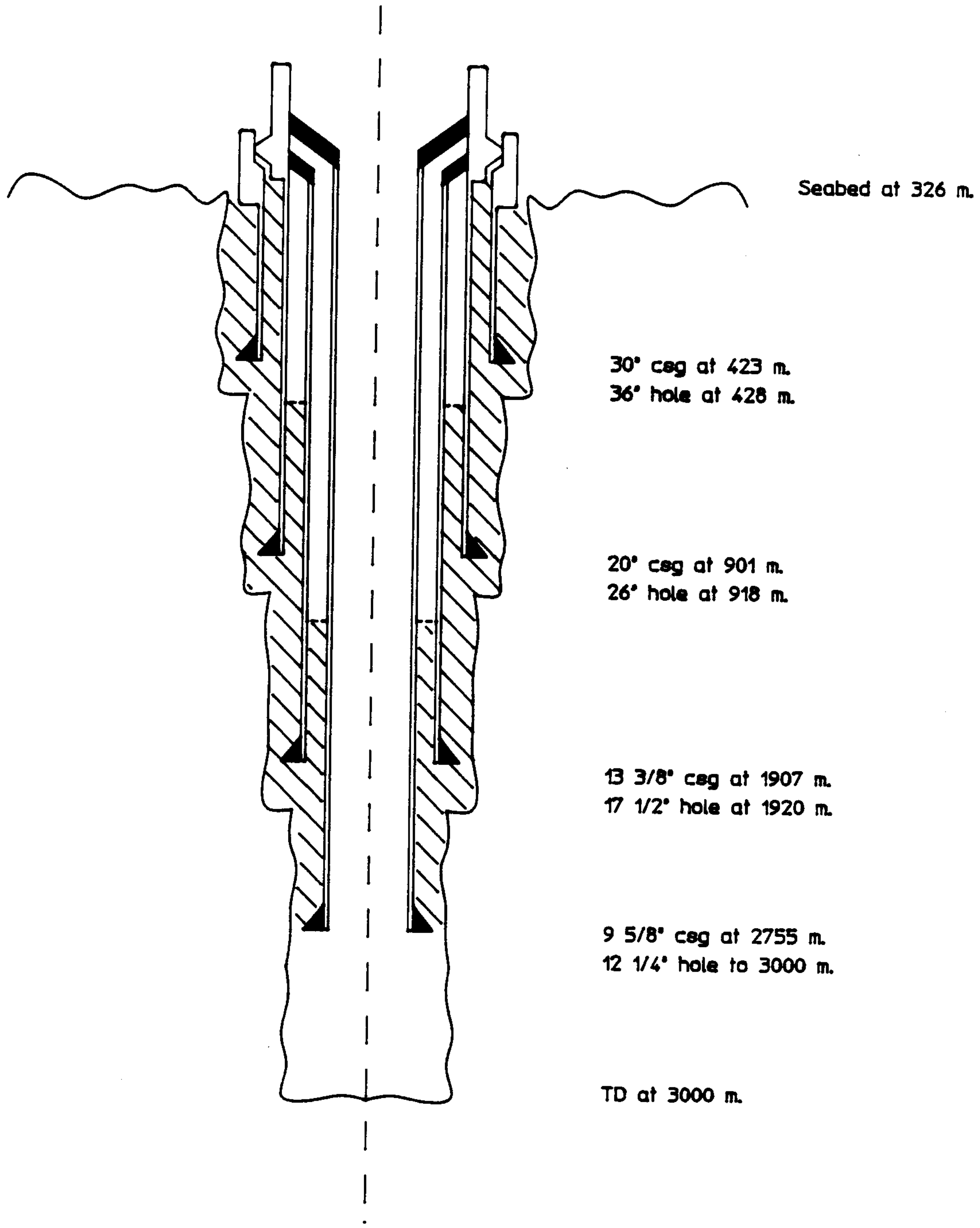
	WIND		SEAS		SWELL			RIG MOVEMENT				ANCHOR		RISER	
Date	speed m/s	dir deg	height m	dir deg	height m	dir deg	periode sec	heave m	roll deg	pitch deg	head deg	tons min	tons max	max	Remarks
861026	12	290	2.3	240				0.6	2.6	1.2	180	100	124	137	
861027	13	220	4.6	190				1.2	3.4	2.0	180	100	125	139	
861028	12	220	2.4	190				0.5	1.8	1.6	180	100	124	0	
861029	24	240	5.2	240				3.5	6.0	4.0	180	0	0	0	
861030	20	225	5.5	200				3.0	6.0	4.0	180	0	0	0	
861031	22	320	8.5	300				1.6	5.0	3.0	180	0	0	0	
861101	11	300	6.7	300					5.0	6.0	180	0	0	0	

8. WELL PROFILES

If not otherwise mentioned, all depths in this chapter refer to m RKB (Rotary Kelly Bushing).

Saga
Petroleum a.s.

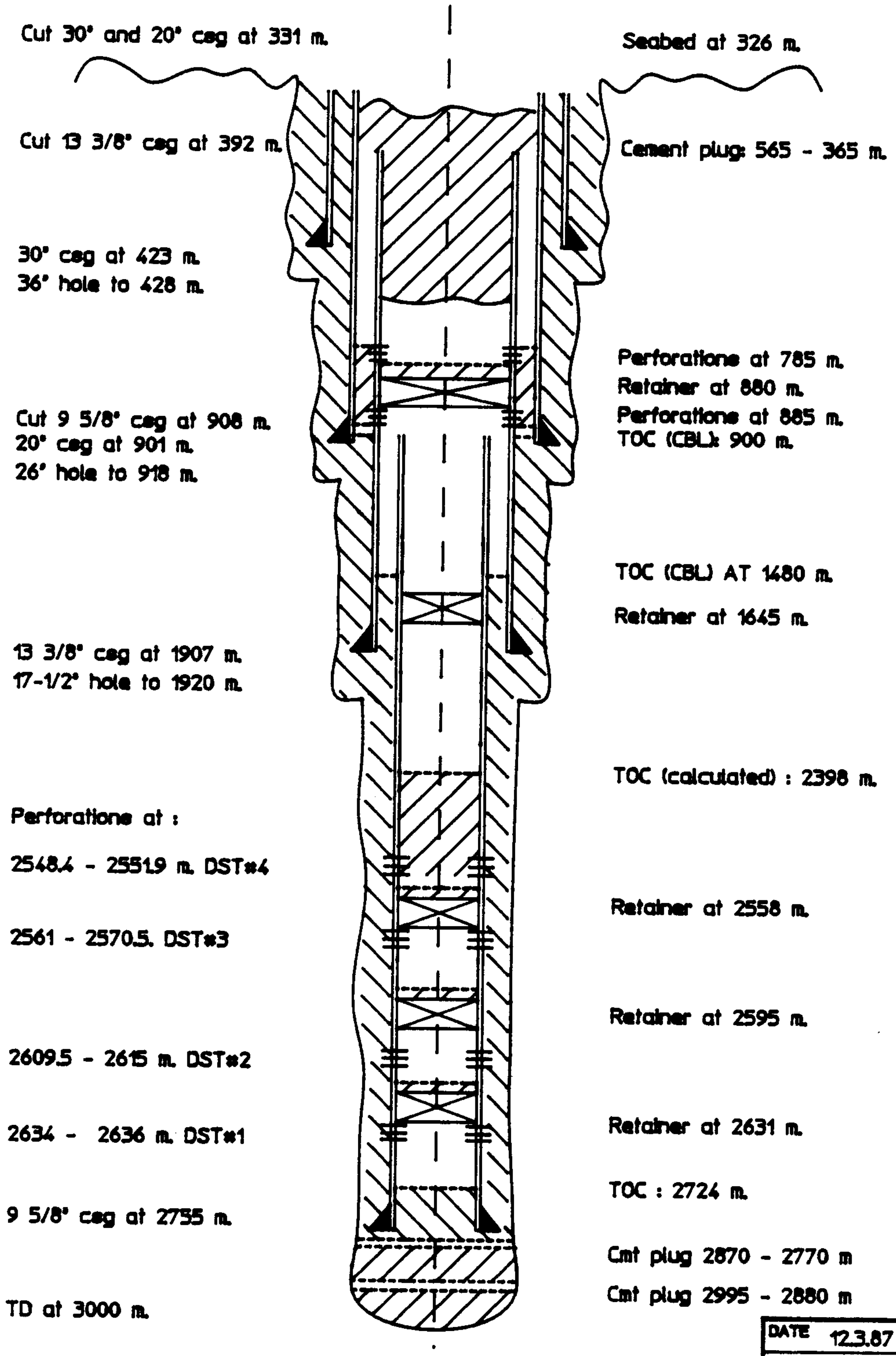
8.1 Wellbore Schematic



DATE 3.3.87	AUTH. FL
DRAW.BY FL	APPR. TSØ
REF. 8.1 34/7-10	

Saga Petroleum a.s.

8.2 Abandonment Profile



DATE	12.3.87	AUTH.	FL
DRAW.BY	FL	APPR.	TSØ
REF.	8.2 34/7-10		

Enclosure I

ESSO / STATOIL / NORSK HYDRO / ELF
DEMINEX / DNO

Saga Petroleum a.s.

Composite Well Log

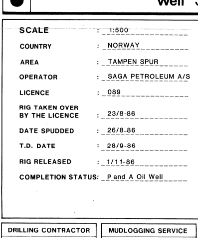
Well 34/7-10

SCALE	: 1:500	RIG	: TREASURE SAGA
COUNTRY	: NORWAY	LOCATION COORDINATES	
AREA	: TAMPEN SPUR	LATITUDE	: 61°25' 2,64"
OPERATOR	: SAGA PETROLEUM A/S	LONGITUDE	: 2°07' 36,23"
LICENCE	: 089	UTM COORDINATES	6809 754.9mN 453 388.1mE
RIG TAKEN OVER BY THE LICENCE	: 23/8-86	ELEVATIONS	
DATE SPUDDED	: 26/8-86	RKB-MEAN SEA LEVEL:	26m
T.D. DATE	: 28/9-86	RKB-SEA FLOOR	: 326m
RIG RELEASED	: 1/11-86	WATER DEPTH	: 300m
COMPLETION STATUS:	P and A Oil Well	TOTAL DEPTH driller's depth	: 3000m
		logger's depth	: 2999,3m

DRILLING CONTRACTOR	MUDLOGGING SERVICE
WILH. WILHELMSEN	EXPLORATION LOGGING

CASING	SHOE (mRKB)	HOLE SIZE	INTERVALL (mRKB)
30"	423	36"	326-428
20"	901	26"	428-918
13 3/8"	1907	17.5"	918-1920
9 5/8"	2755	12.25"	1920-3000

LOCATION MAP



OPEN HOLE LOGS

ANADRILL(MWD)/DRESSER ATLAS(WIRE LINE LOGS)

Casing Record	Hole Size	Logged Interval (m RKB)	Type of Log	Run No.	Date
30" 423 m	36" to 428 m		GR to surface	1A	07.09.86
20" 901 m	26" to 918 m		MWD (GR, Res) GR	1A	07.09.86
13 3/8" 1907 m	17 1/2" to 1920 m	901 - 1905 23 samples rec. 400 - 1904	MWD (GR, Res) DIFL-LSBHC-GR COREGUN CBL	1A 1A 2B	07.09.86 07.09.86 23.09.86
9 5/8" 2755 m	12 1/4" to 3000 m	2700 - 1906 2700 - 1906 2700 - 1906	MWD (GR, Res) DIFL-LSBHC-GR CDL-CNL-GR DLL-MLL-GR FMT/RFL	2B 2A 2A 2A-E	23.09.86 23.09.86 24.09.86 25.09.86
T.D. 2999.3 m (logger's depth)		3000 - 2500 3000 - 2500 3000 - 2500 3000 - 1906 76 samples rec.	MWD (GR, Res) DIFL-LSBHC-GR CDL-CNL-GR ZCDL DIPLOG RFT VSP COREGUN	3C 3C 3A 3A 3F 3A 3B-C	28.09.86 28.09.86 28.09.86 28.09.86 28.09.86 29.09.86 29.09.86

AUTHOR: C. CARSTENS Ø. MJELDE APPR: T. SOLLI DRAFTED BY: R. KJØLSTAD DATE: MARCH 1987

GEOLOGICAL SYMBOLS

CLAY/ CLAYSTONE, BRECCIA, SALT, SHALE, LIMESTONE, ANHYDRITE/ GYPSUM, SILTSTONE, CHALK, VOLCANICS, SAND/ SANDSTONE, DOLOMITE, COAL, CONGLOMERATE, MARL, GNEISSEOUS/ BASEMENT

LITH.PREFIXES

CALCAREOUS, DOLOMITIC, ARGILLACEOUS, CHERTY, GLAUCONITIC, MICACEOUS, PYRITIC, TUFFACEOUS, METAMORPHICS, SIDERITE

FOSSILS

FORAMINIFERA, SHELL DEBRIS, MACROFOSSILS, FOSSILS IN GENERAL

WELL LOG SYMBOLS

SIDEWALL CORE, SIDEWALL CORE, NO RECOVERY, CORE, RFT, SHOWS, FLUORESCENCE AND CUT, SHOWS STAIN FLUORESCENCE, AND CUT, GAS, ON LOGS, CASING SHOE, DRILL STEM TEST

CHRONOSTRATIGRAPHY | LITHOSTRATIGRAPHY | LOG SCALES | LITH. | LOG SCALES | DESCRIPTION AND REMARKS

MWD DOWN TO 20" CASING SHOE (901m)

WELL 34/7-10 - CORE SUMMARY

Core No.	Cut Interval m RKB	m	Recovered Interval m RKB	m	%	Correction Factor m	Recovered interval log m RKB
1	2522.0 - 2540.5	18.5	2522.0 - 2539.1	17.1	92.4	0	2522.0 - 2539.1
2	2540.5 - 2552.5	12.0	2540.5 - 2551.6	11.1	93	0.5	2441.0 - 2552.1
3	2552.5 - 2558.5	6.0	2552.5 - 2558.4	5.9	98.3	0	2552.5 - 2558.4
4	2558.5 - 2574.0	15.5	2558.5 - 2573.9	15.4	99.4	0	2558.5 - 2573.9
5	2574.0 - 2592.0	18.0	2574.0 - 2577.7	3.7	21	0	2574.0 - 2577.7
6	2592.0 - 2599.5	7.5	2592.0 - 2598.0	6.0	80	1	2593.0 - 2599.0
7	2599.5 - 2602.0	2.5	2599.5 - 2602.0	2.5	100	-0.5	2599.0 - 2601.5
8	2602.0 - 2608.5	6.5	2602.0 - 2608.5	6.5	100	0	2602.0 - 2608.5
9	2608.5 - 2617.5	9.0	2608.5 - 2617.5	9.0	100	-0.5	2608.0 - 2617.0
10	2617.5 - 2624.0	6.5	2617.5 - 2624.0	6.5	100	-0.5	2617.0 - 2623.5
11	2624.0 - 2635.5	11.5	2640.0 - 2635.5	11.5	100	-0.5	2623.5 - 2635.0
12	2635.5 - 2641.5	6.0	2635.5 - 2641.5	6.0	100	-0.5	2635.0 - 2641.0
13	2641.5 - 2655.0	13.5	2641.5 - 2655.0	13.5	100	-0.5	2641.0 - 2654.5
14	2655.0 - 2663.0	8.0	2655.0 - 2663.0	8.0	100	-0.5	2654.5 - 2662.5

WELL 34/7-10 - FORMATION MULTI TESTER

Depth m RKB	Hydrostatic Mud Pressure Before psia	After psia	Temperature Corrected Formation Pressure (HP-gauge) psia	bar	Remarks
2A					
2532.5	5965.2	5964.8	5587.7	385.26	
2550.0	6016.6	6015.1	5607.0	386.59	
2563.0	6052.1	6050.5	5619.8	387.47	
2569.0	6066.5	6065.5	5626.5	387.93	
2595.0	6141.1		5656.2	389.98	
2601.0	6152.4	6151.4	5660.4	390.27	
2613.0	6187.1	6183.2	5675.1	391.28	
2614.0	6185.5	6184.4	5675.6	391.32	
2628.0	6217.5				Tight
2628.0	6217.5	6213.4			"
2634.5	6233.5	6231.5	5731.1	395.14	
2644.0	6257.4	6254.1	5732.3	395.23	
2644.3	6254.1				Tight
2671.0	6335.6				"
2670.9	6333.4	6333.8			"
2684.5	6372.5	6372.5			"
2532.5	5951.8	5951.0	5585.8	385.13	Sample
2441.0	5732.8	5731.0	5504.0	379.49	
Run 2B					
2601.0	6128.1	6121.2	5860.4	404.06	Sample
Run 2C					
2601.0	6129	6122.5	5661.0	390.31	Sample
Run 2D					
2634.5	6216.8	6198.1	5728.8	394.99	Sample
2644.1	6225.5	6226.5			Tight
2643.9	6223.2	6225.4			"
Run 2E					
2634.5	6218.1		5715.9	394.10	Sample/plugging 2 3/4 gallon chamber
Run 3F					
2532.5	5948.6	5947.9	5588.1	385.29	
2569.0	6044.6	6042.6	5626.5	387.93	
2613.0	6151.6	6149.8	5672.4	391.10	
2634.5	6204.6	6202.8	5728.2	394.94	
2726.5	6429.8	6427.8	5840.5	402.69	
2783.0	6568.6	6566.4	5921.8	408.29	
2815.0	6646.3	6643.7	5967.0	411.41	
2837.0	6700.8	6698.2	6003.4	413.93	
2845.0	6716.4	6715.0	6010.4	414.40	
2857.5	6747.6	6746.2	6028.4	415.64	
2874.0	6788.1	6786.1	6051.8	417.26	

WELL 34/7-10 - DST SUMMARY

Test No.	Interval m RKB (logged)	BHP bar	BHT °C	Reference depth m RKB	WHP bar	WHT °C	Choke size mm	Flow rate Sm^3/day
1	2632.7 - 2636.7	255	81.7	2609.8	1.4	10	6.4	2.7
2	2609.4 - 2614.9	194	95.0	2583.9	23	15	12.7	222
3	2561.0 - 2570.5	298	95.0	2534.5	105	36	12.7	961
4	2548.4 - 2551.9	298	92.3	2517	114	19	6.4	273

All values are from the end of the main flow in each test.
Reference depth: Measuring depth for BHP and BHT.

Enclosure II

FORMATION PRESSURE EVALUATION SHEET

WELL: 34/7-10

Enclosure III

SAGA PETROLEUM

WELLSITE CORE DESCRIPTION

FIELD: SNORRE | WELL NO 34/7-10 | CORE NO 1 | PAGE 1 of 3

FROM 2522.0 | TO 2540.5 | CORED 18.5 m | REC 17.1 m | 92.4 %

FORMATION: Amundsen | GEOL: CWC/OM | DATE: 14/9-86

CORING RATE 8 6 4 2 | LITHOLOGY GRAIN SIZE | CORE | POROSITY 10 20 30 | STAIN 25 50 75 | FLUOR 25 50 75 | CUT | DESCRIPTION

DESCRIPTION Fiberglas core barrel is used
1 m intervals is examinated.

Top core no. 1: 2522 m
Siltstone 2522 - 2531 m
Slts: Sl aren, m ltgy-m gy, frm-hd, v mica, calc-v calc.

Shows: 2522 - 2526 m
No ostn, 30 % dul yel flor. Slow strmg mlky wh cut, yel wh-yel res no od.
From 2527 m: occurence of m-c qtz grns in slts

Siltstone as above
From 2529 m: occurence of pbly qtz grns

Top Statfjord fm 2531 m

Sandstone 2531 - 2536 m
SS: clr with brn o stn, fining upwards, vf on top pbly at btm. pred mod srtd, sbrnd-rnd, lse-fri, sl mica. pred g por.

Tr of coal

Shows: Exc brn stn, Strong bright yel flor, fast-inst strmg bl wh cut, pale yel res, g od.

Shale 2536 - 2538 m
Sh: mdkgy, occ gyblk, frm, mic mica, non calc.

Sandstone 2538 - 2538.5 m
SS: Clr with ltbrn o stn, m, poor-mod srtd, sbrnd, fri, mica, fr por.
Shows: Fr o stn else as above
Shale: 2538.5 - 2539.1 m
Sh: occ with rd brn specs else as above.
Bottom core no 1: 2540.5 m

TOP CORE no. 2:2540.5m
Shale:2540.5-2542.5m
Sh:dk gy-blk,lse-frm,frequent sks,sl mic mica,non calc

Siltstone:2542.5-2544.5m
Sltst:shy,m dk gy-gn gy,frm-hd,v mica, non calc

Shale:2544.4-2546.5m
Sh:as sh ab

Siltstone:2546.5-2548.5m
Siltst:lt oliv gy,else as ab

Sandstone:2548.5-2550.7m
Ss:slty on top,clr/brn o stn,vf-c,pred m, fri,p-mod srtd,sbang-sbrnd,mica,sl kaol,sl lam,g por
Shows:exc brn o stn,100% strong bright yel flor,fast-inst strmg mlky wh cut,pale yel-yel res,g od

Siltstone:2550.7-2551,1m
Siltst:lt gy-m lt gy,slk,else as ab

BOTTOM CORE no. 2:2552.5m

TOP CORE no. 3:2552.5m
Shale:2552.5-2553.5m
Sh:dk gy,gsy surf,frm,sks,mic mica,non calc
Sandstone:2253.5-2554.5m
Ss:qtz,brn o stn,f,p-mod srtd, sbrnd-sbang, fr,occ kao,occ sh lam,non calc,g por
Shows:exc brn o stn,100-90% strong bri yel flor,fast-inst strmg mlky wh cut,pale yel-yel res,g od

Shale:2554.5-2558.4m
Sh:occ slty,dk gy/rd brn spec,occ brn gy-gy gn,gsy surf,frm,sks,mic mica,non calc

BOTTOM CORE no. 3:2558.5m

TOP CORE no. 4:2558.5m

Shale:2558.5-2560.5m
Sh:dk gy-olv gy,frm,occ gry surf,sks,mic mica,non calc

Sandstone:2560.5-2564.3m
Ss(2560.5-2561.5):m lt gy,vf-f.mod srtd. sbrnd-sbang,frm-hd,calc cmtd,mic mica, tr por

Ss(2561.5-2564,3):brn o stn,dom c-vc,tr pbls,mod srtd,sbrnd-sbang,lse-frm,occ coal,occ kaol,mic mica,non calc,g por
Shows:exc stn,100% strong bri yel flor,inst strmg bl wh-mlky cut,pale yel-yel res upon evap,g od

Shale:2564.3-2564.5m
Sh:a/a

Sandstone:2564.5-2570m
Ss:dom m-vc,else a/a
Shows:a/a

Shale:2570-2573.2m
Sh:a/a

Sh:a/a

Sandstone:2573.2-2573.6m
Ss:sl calc,fr por,else a/a
Shows:g stn,dull yel flor,else a/a
Shale:2573.6-2573.9m-a/a Bottom core 4:2574m

TOP CORE NO 5:2574m

Shale: 2574-2575.5m
Sh:dkgy-brnblk,lse-frm,v sks,non calc

Siltstone:2575.5-2577.7m.
Slts:shy,dkgngy-gnblk,frm-hd,pred hd,occ sl calc

NO SHOWS

BOTTOM CORE NO 5:2592m

TOP CORE no. 6:2592m
Siltstone:2592.0-2592.5m
Sltst:aren,m gy,frm,mica,non calc

Sandstone:2592.5-2596.5m
Ss:brn o stn,dom f-m,occ c,m srtd,sbrnd-sbang,fri-frm,tr kaol,mica,f-por
From 2993.9 to 2594.2:hd,calc cmtd,no por
Shows:exc stn,100% strong bri yel flor, inst-fast strmg bl wh-mlky cut,pale yel-yel res epon ev,g od

Shale:2596.5-2598.0m
Sh:sl slty,vcol gy gn-dk rd brn,gsy srf, frm,non calc

BOTTOM CORE no. 6:2599.5m

Concretionary shale. TOP CORE No 7=2599.5m
SH:aren,dkrd-gyrd,frm-hd,non-slcalc.
Sandstone 2600-2602m
SS:clr with brn ostn,slty on top,arg on btm else f-c occ vc,sbang-sbrnd,pred sbang,m srtd,fri,kaol,sl mica,fr-g por.
SHOWS:g-exc brn stn,90-100% bri yel flor, pred fast strmg mlkywh-blwh cut,pale yel-yel res,pred g od. BTM CORE NO 7=2602

TOP CORE NO 8=2602m

Sandstone 2602-2604.5m
SS:v arg on top,clr pred with o stn,pred f-c but vf-m on btm,p-mod srtd,sbang-sbrnd,fri fri-hd when calc cmt,kaol,mica,p-fr por.
SHOWS:trwhen v calc cmt,else pale brn-ltbrn stn,80-100%mod-strong yel-bri-yel flor,pred mod strmg mlky wh cut, pale yel-yel res,g od.

Shale 2604,5-2608,5m
SH:sl slty,v col dkrdbrn-gngy-gnblk,frm-hd mic mica,occ calc.

BOTTOM CORE NO 8=2608,5m

Top core no.9 = 2608.5m

Shale:2608.5-2610m
Sh:slty, v slty on btm, vcol dk rd brn-gn gy-m dk gy, hd, mic-mica, non calc

Sandstone:2610-2615m
Ss:sl slty, clr with o stn, vf-c occ v c pred m, p-mod srtd, sbang, fri, kao, sl mica, pred g vis por.
Shows:pred g lt brn o stn, 90-100% strong yel-bri yel flor, mod-fast strmg mlky wh-bl wh cut,(fast towards btm), pale yel-yel res, g od.

Siltstone:2615-2616.5m
Sltst:v aren on top, gy gn-dsk gn, hd, mica, non calc.
SHOWS:TR o stn(o seeping)50% weak yel brn flor,no significant cut, p od.
Shale 2616,5-2617,5m
SH:sl slty,mdkgy-gybrn,frm-hd,mic mica,sl sks, non calc.

Bottom core no.9 = 2617.5m

TOP CORE NO 10=2617,5m

Shale 2617,5-2624m
SH:sl slty,vcol mdkgy-gybrn sl more gybrn vdskyrd towards btm,frm-hd,mic mica, sl sks,occ sl calc.

BOTTOM CORE NO 10=2624m

Top core no.11 = 2624m
Shale:2624-2625.5m
Sh: aren, vcol dk brn rd-v dsk rd-m gy, frm-hd, non calc

Sandstone:2625.5-2629.5m
Ss: qtz, clr-lt gy, vf-f occ m on top, bec f-m occ c, mod srtd, ang-sbang, hd-v hd, tt calc cmt, at btm sl kao, non calc, tr of mica and pyr

Shows:2628.5-2629.5m
fair hc od, g lt brn o stn, 100% mod-strong yel flor, inst strmg wh-yel cut, yel res upon evap

Siltstone:2629.5-2630.5m
Sltst: vcol dk gy-gn gy-dk rd brn, frm-hd

Shale:2630.5-2634.5m
Sh: v slty at btm, dk brn rd-v dsk rd, frm, non calc, sl mic-mica, occ sks

Sandstone:2634.5-2635.5m
Ss: qtz, clr-lt brn, f-m occ c, mod srtd, ang-sbang, ~~frm occ fri~~, tr of kao cmt, mica, pyr, non calc, g por
Shows: strong hc od, exc lt brn o stn, 100% strong yel-orng flor, inst strmg wh-yel cut, yel res upon evap

Bottom core no.11 = 2635.5m

TOP CORE NO 12=2635,5m
Sandstone 2635,5-2637m
SS:clr pred with o stn,vf-m,occ c,mod srtd, sbang,fri-hd,v calc cmt on top,else sl calc,sl mica,abundant sh lam at btm.p-fr por.
Shows:g lt brn o stn,50-100% yel orng-pale brn flor,slow-fast strmg mlky wh cut,yel-lt brn res, fr-g od.
Siltstone 2637-2638m
Slts:aren ,dk gn gy,frm-hd,mica,calc.

Shale 2638-2641m
Sh:sl slty,gy oliv gn and dk rd brn-v dsky rd,latter col more pred towards btm,frm but hd at btm where there occur abundant ls precipitations.sks.

BOTTOM CORE NO 12=2641,5m

TOP CORE NO 13=2641,5m.

Shale:2641.5-2643,5m
SH:sl slty,m dk gy-dk gy,frm,mic mica,occ calc,sl sks,

Sandstone:2643,5-2646m
SS:slty,arg,lt gy-wh on top,lt gy-m lt gy at btm,pred vf-f occ m-c,p-mod srtd,sbang-sbrnd,hd-vhd on top when v calc cmt, else fri-hd , sl calc,mica,p por.
SHOWS:tr at btm:p o stn,20-50% orng-lt brn flor,non-v slow strmg mlky wh cut,lt yel-lt brn res,p od.

Siltstone 2646-2647m
SLTS:aren,m dk gy-lt gy,hd,sl calc,sil cmt, v mica.
SHALE:2647-2653,5m
SH:slty,occ sl aren,v col m dk gy-dk rd brn,frm-hd,mic mica,occ calc

Sandstone:2653,5-2654,5m
SS.slty,m dk gy-gy brn,vf-f,occ m,mod srtd, sbang,hd,sil/calc cmt,mica.

Shale:2654,5-2655m BTM CORE NO 13=2655m
SH:v slty,col a/a frm,mic mica.

Top core no.14 =2655m
Siltstone:2655-2658.5m

Sltst grdg to sh and occ some ss
Sltst: pred dk rd brn, frm, sl-non calc
Ss: v arg, dk gy-brn gy, vf-f occ m, mod srtd, ang-sbang, hd, tt cmt, sl calc, p por
Sh: dk gy-brn gy, frm, non calc
No shows

Shale:2658.5-2663m
Sh: vcol dk rd brn-dk gy brn-gy blk, frm-hd occ fri, mic-mica, calc with occ some ls nod, v sks

Bottom core no.14 = 2663m