Final Well Report

Well: 30/9-19

PL079

HYDRO

STATOIL

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NORSK HYDRO

FINAL WELL REPORT

WELL 30/9-19

JUNE 1999

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PREFACE

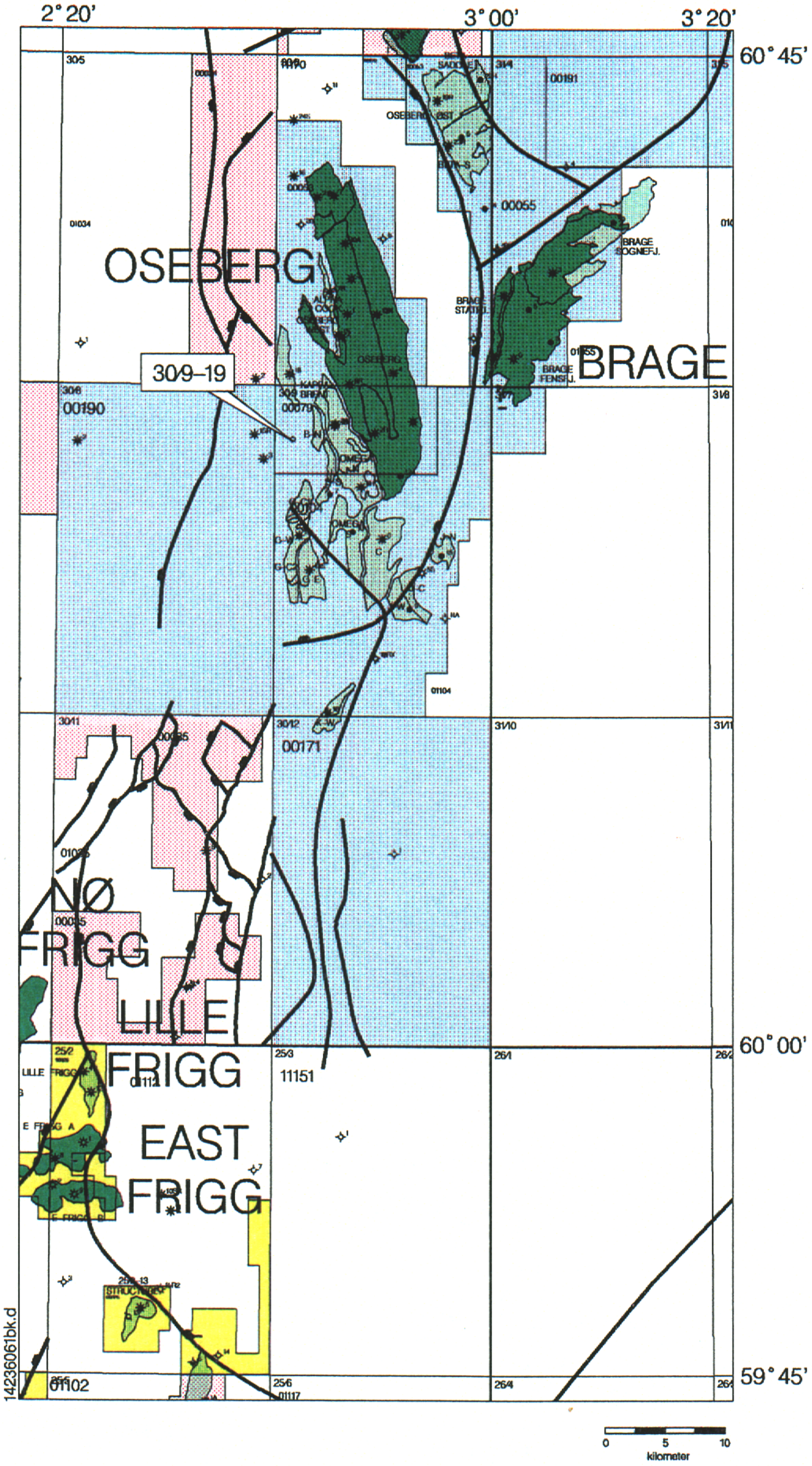
License PL 079 was awarded to the Norsk Hydro PL 079 license group in 1982 with Norsk Hydro as the operator.

The licensees' percentage share of the block is as follows:

Den Norske Stats Oljeselskap a.s. (Statoil)	73.5%
Norsk Hydro ASA (operator)	16%
Saga Petroleum ASA	10.5%

The well was drilled by Norsk Hydro ASA., on behalf of the group, during September-October 1998 (see Location Map, page II).

All depths in this report are mMD RKB unless otherwise stated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3° 00'
3° 20'
60° 45'
60° 00'
59° 45'
30/5
30/6
31/4
31/5
31/8
00191
00190
00055
01034
OSEBERG
BRAGE
BRAGE SOGNEFJ.
BRAGE STATFJ.
BRAGE FENSFJ.
OSEBERG ØST
30/9–19
30/11
30/12
31/10
31/11
00171
01104
NØ FRIGG
LILLE FRIGG
EAST FRIGG
25/2
25/3
26/1
26/2
11151
25/6
26/4
01102
01117
25/3–13 STRUCTURE
0
5
10
kilometer
14236061bk.d

SUMMARY OF WELL DATA

SUMMARY OF WELL DATA	
LOCATION:	60° 27' 35.38"N 02° 41' 38.94" E UTM 6702 819.9mN 483 176.9mE ED 50, UTM Zone 31, CM 03°E
OPERATOR: RIG: CONTRACTOR:	Norsk Hydro a.s West Delta Smedvig
KB ELEVATION (to MSL): WATER DEPTH (MSL):	29m 105m
START OF OPERATIONS: WELL SPUDDED: REACHED TD ON: COMPLETED: STATUS: FORMATION AT TD:	06.09.1998 09.09.1998 17.10.98 25.10.98 P&A, oil and gas discovery. Well sidetracked as 30/9-19 A Drake Fm. (Dunlin Gp.)
TD DRILLER (mRKB): TD LOGGER (mRKB):	3560 m 3556,5 m
DRILLING DEPTHS:	36" to 231m 9 7/8" to 1202m (pilot hole) 26" to 1205m (hole opening) 17 1/2" to 2329m 12 1/4" to 2922m 8 1/2" to 3560m
CASING DEPTHS:	30" to 231m 20" to 1198m 13 3/8" to 2318.5m 9 5/8" to 2907m

SECTION A

GEOLOGY

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SECTION A: LIST OF FIGURES, TABLES AND APPENDICES

1 OBJECTIVES

The 30/9-19 well was the sixth well in PL 079, but the first to be drilled on the Delta structure. The well tested the DeltaN1 compartment in the northern part of the Delta structure, i.e. between the 30/9 B-structure and the A-Structure in Block 30/8. The main target of the well was the Brent deltaic sands of the Tarbert Fm., but the well was also planned to test additional potential within the Ness and Oseberg-Rannoch-Etive (ORE) formations.

The primary objectives were to:

- Test the potential of the Delta N1 prospect in an area of good seismic control/quality
- Identify fluid types and distribution in an optimal position balancing a potentially shallow and deep filling respectively
- Confirm the geological model with respect to reservoir quality
- Gather vital pressure data to help identify likely pressure cell boundaries

2 RESULTS

The well was spudded 9.Sept. 1998 and reached a total depth of 3560 m RKB in Dunlin Gp. on 17.Oct. 1998. The well was permanently plugged and abandoned as a gas/oil discovery 22.Dec. 1998.

The main results were as follows:

- The Tarbert 2 main reservoir was penetrated at 3138 mRKB, 22 m shallower than prognosed. A total of 66.5 m net reservoir was calculated between 3138 mRKB and 3216 mRKB, giving a net/gross ratio of 0.85. The well confirmed the geological reservoir model. The reservoir properties are fairly good with average porosity about 19%, and permeability measurements generally ranging between 10 mD and 1000 mD.

- The Tarbert 2 main reservoir is filled by gas showing internal static pressure communication throughout the whole unit.

- The Tarbert 1 reservoir was penetrated at 3238 mRKB, 27 m shallower than prognosed. A total of 12 m of net sand was calculated including a sand layer within the lowermost Tarbert 2 unit (otherwise a non-reservoir), assumed to be in static pressure communication with the Tarbert 1 sand. Measured permeabilities are between 100-1000 mD for the Tarbert 1 sand and about 1-60 mD for the overlying sand.

- The Tarbert 1 sand together with the overlying sand unit contains oil throughout, interpreted to be in static pressure communication. There is no direct pressure communication between the Tarbert 1 oil and the gas within the main Tarbert 2 reservoir above.

- An allochthonous Ness block (3062.5 - 3087 mRKB) has been interpreted from within the Lower Cretaceous section, supposed to be a slide associated with degradation of the major fault zone to the east. This "block" contains a thin sand layer (3072-3075 mRKB) which is filled by gas.

- Gas was also encountered in a channel sand within the lowermost Ness (3452 - 3456.5 mRKB).

- Top ORE was penetrated at 3484.5 mRKB, 62.5m shallower than prognosed. The unit was thinner and of less reservoir quality than prognosed. Permeability measured within the lower Rannoch/Oseberg are mostly between 0.02 - 2 mD. The uppermost 5.5 m of Etive is of better quality but no cores were obtained from this part.

- Three cores were cut in the well. Core no 1 (3184 - 3240 m) and core no 2 (3240 - 3247 m) were cut from Tarbert 2 and Tarbert 1, while core no 3 (3494 - 3522 m) was cut from ORE.

- The Tarbert reservoir is overpressured by around 15 bar. The overpressure is increasing downwards through the Ness Formation to about 80 bar within the ORE unit.

3 BIOSTRATIGRAPHY

The biostratigraphical analysis of well 30/9-19 was carried out by Stratlab AS. The analysed interval was 1530m - 3560mRKB (TD). The results are documented in the 30/9-19 Routine Biostratigraphical Report (REF YYY) The results have further been evaluated and interpreted according to Norsk Hydro internal biozonation system and are presented in Fig.3.1.

The main results of the analysis can be summarised as follows:

- The youngest sediments analysed (at 1530m) are claystones from the Hordaland Gp of Early Oligocene age.

- The Late Eocene interval is thin in this well, suggesting a truncation or condensing towards the top of the Eocene.

- There is also a small unconformity at the Cretaceous - Tertiary transition, in that the lowermost biozones of the Paleocene (PT1A and PT1B) are not identified in the well.

- The oldest sediments of the Late Cretaceous are of Turonian age (possible Early Turonian).

- Sediments of Cenomanian age are not identified in this well.

- The thickness from the top of the Early Cretaceous Cromer Knoll Gp to the top of the Draupne Fm ("Base Cretaceous") is approximately 50m in this well. The upper part (3040m - 3062.5m) consists of in situ sediments of Late Albian and Late Aptian age, separated by unconformities. The lower part consists of an allochthonous block of Ness Fm sediments, of Bajocian age, located at the top of the Viking Gp / Draupne Fm.

- The Viking Gp/Draupne Fm consists of sediments of Ryazanian and Kimmeridgian ages, separated by an unconformity, covering the Volgian and probably parts of Kimmeridgian and Ryazanian.

There is a major unconformity between the Kimmeridgian and the underlying Middle Jurassic, Early Bathonian sediments of the Brent Gp / Tarbert Fm, implying that no Heather Fm sediments are present in the well.

- The main reservoir interval in this well is of Bajocian age.

- At 3512.55m (core) sediments of Late Toarcian age was reached.

REF/YYY/: Well 30/9-19, Biostratigraphy, Interval 1530m - 3560m, April 1999, Stratlab AS.

HYDRO

WELL: 30/9-19

NB! NOT TO SCALE

ALL DEPTHS IN METERS (mRKB)

DEPTH RKB 134 m

ELEVATION KB: 29m

CHRONOSTRATIGRAPHY				LITHOSTRATIGRAPHY	
SYSTEM	SERIES/ STAGE	DEPTH m	THICKNESS m	GROUP	FORMATION/ MEMBER
	SEABED 134 m				
QOATERNARY			799 m	NORDLAND 933	644.5
					UTSIRA 933
					977.5
TERTIARY		933	1186	HORDALAND	SKADE 998.5
					1257
					GRID 1380.5
					2119
		2119	290	ROGALAND	BALDER 2172
					SELE 2249
					LISTA 2339
				2409	VAALE 2409
CRETACEOUS	UPPER CRETACEOUS	2409	627	SHETLAND	HARDRÅDE 2418
					TOR 2438.5
					JORSALFARE 2652
					KYRRE 2954
				3036	TRYGGVASON 3036
	L. CRETACEOUS	3036	51	CROMER KNOLL 3087	3087
JURASSIC	LATE JURASSIC	3087	5.5	VIKING 3092.5	DRAUPNE 3092.5
	MIDDLE JURASSIC	3092.5	467.5	BRENT	TARBERT 4 3113
					TARBERT 3 3138
					TARBERT 2 3238
					TARBERT 1 3264.5
					NESS 3484.5
					ETIVE 3490
				3510	OR 3510
			50	DUNLIN 3560	DRAKE 3560
		3560 m TD			

4 LITHOSTRATIGRAPHY

All depths are in mMD RKB (RKB elevation is 29m). At levels where the well is deviated the depths are also given in mTVD RKB.

This summary is compiled predominantly from ditch cuttings descriptions. A total of 3 conventional cores were cut in the interval from 3184m to 3522 m in the well, see Table 6.1.

Wireline and MWD logs were used to aid lithological interpretation and the placement of formation boundaries.

The well was drilled with returns to seabed from the seafloor at 134 m to 1205 m before setting 20" casing at 1198m. Lithology interpretation through this interval is based on MWD logs and drilling parameters. The first drill cuttings samples were taken at 1210 m.

4.1 Nordland Group (134-933m)

134-292.5m

This interval comprises Sand with minor Clay, and traces of Boulders from 217 to 231m.

Age: Quaternary

292.5-586.5m

This interval comprise Clay, silty Clay and traces of Sand.

Age: Undifferentiated Quaternary - Tertiary

586.5-622.5m

This interval comprises Sand.

Age Undifferentiated Tertiary

622.5-644.5

This interval consists of Clay with minor Sand.

Age: Undifferentiated Tertiary

Utsira Formation (644.5-933m)

This interval comprises Sandstone.

Age: Miocene

4.2 Hordaland Group (933-2119m)

933-1205m

This interval comprises alternating Sandstone and Claystone

Age: Undifferentiated Tertiary

1205-1257m

This interval consists of Claystone

CLAYSTONE:	medium - dark yellowish brown, soft - firm, subblocky - subtabular, non - slightly calcareous, non - slightly silty, rare - trace glauconite, rare carbonaceous material, rare micropyrite

Age:Oligocene

Grid Formation (1257 - 1380.5m)

This interval comprises Sandstone

SANDSTONE:	clear - translucent quartz, fine - medium, rounded - subangular, trace angular, predominantly loose grains, non calcareous, glauconitic in part

Age: Oligocene

1380.5 -1520m

This interval comprises Claystone with minor Sandstone

CLAYSTONE:	medium - dark yellowish brown grey, light olive grey, soft - firm - non calcareous, slightly silty - silty, rare glauconite, rare carbonaceous material
SANDSTONE:	clear - translucent quartz, very fine - medium, locally coarse, subrounded - rounded, moderate - good sphericity, bimodal, moderate - well sorted, locally very poor sorted, common loose grains, locally intercal with claystone and argillaceous siltstone

Age: Oligocene

1520-1552m

This interval comprises Sandstone

SANDSTONE:	clear - translucent occasionally opaque quartz, dominantly fine - medium, locally very fine, occasionally coarse, subrounded - subangular, occasionally well rounded, moderate sphericity, dominantly moderate - well sorted, rare weak silica/dolomite cement, common weak white amorphous soft kaolin matrix, occasionally red hematite coated grains, locally common glauconite, pyrite, citrine, rare calcareous sponge spicules

Age: Oligocene

1552-1613m

This interval comprises Sandstone with minor Claystone

SANDSTONE:	light grey - off white, occasionally pale yellowish grey - pale dusky yellowish brown, clear - translucent quartz, dominantly medium - locally fine, rare coarse, with dominantly argillaceous/calcareous matrix
CLAYSTONE:	olive grey - dusky yellowish brown, firm, moderately hard in parts, subblocky - subtabular, hygroclastic, becoming moderate - slightly calcareous, with abundant loose sand and glauconit included, common micromica

Age: Oligocene

1613-2119m

This interval comprises varicoloured Claystone with stringers of Limestone and Dolomitic Limestone

(1613-1700m) CLAYSTONE:	olive grey, dusky yellowish brown, firm, occasionally moderate hard, subblocky - subplaty, non - slightly calcareous, slightly silty, glauconitic, with included sand grains in part
DOLOMITIC LIMESTONE:	moderate - dark yellowish brown, greyish orange, firm - hard, occasionally very hard, blocky, microcrystalline, occasionally cryptocrystalline

(1700-1950m)

CLAYSTONE: dark greenish grey, olive grey, occasionally dusky yellowish brown, rare medium bluish grey, firm - hard, subblocky - subtabular, non calcareous, slightly silty, glauconit

DOLOMITIC LIMESTONE: moderate brown, hard - very hard, blocky, sharp breaks, cryptocrystalline

LIMESTONE: moderate yellowish brown, firm, blocky, earthy texture, microcrystalline, slightly dolomitic in parts, grading dolomitic limestone

(1950-2119m)

CLAYSTONE: dark greenish grey - olive grey, occasionally dusky yellowish brown, becoming light brownish grey - pale reddish brown, from 1974m: becoming dominant dusky yellowish brown - pale reddish brown, with common dark greenish grey, firm, subblocky - subtabular, homogenous, moderate calcareous, trace micromica, locally very fine sandy grains included, interbedded with thin limestone/dolomitic limestone stringers

DOLOMITIC LIMESTONE: light brown - dark yellowish orange, occasionally moderate brown, hard - very hard, blocky, sharp breaks, cryptocrystalline, grading dolomite in parts

LIMESTONE: dark orange yellow - light brown, firm - soft, blocky, earthy texture, microcrystalline, interbedded with claystone

Age: Eocene

4.3 Rogaland Group (2119-2409m)

The Rogaland Group consists of the Balder, Sele, Lista and Våle Formations.

Balder Formation (2119-2172m)

This interval comprises Claystone with minor Tuff and stringers of Limestone.

CLAYSTONE: olive grey - brownish grey, greenish grey - dark greenish grey, subblocky - subplaty, soft - firm, slightly calcareous, slightly silty, rare micromica, micropyrite

TUFF: various colours, greyish orange, bluish grey, occasionally pale reddish purple - pale purple, very pale greenish blue - very pale bluegrey, locally common cream, rare medium dark greyish green, soft, rounded ctgs, ashy appearance common silty, black speckles, locally abundant lith deb, corroded feldspars, very rare trace lapilli, very rare clay flasers

LIMESTONE: pinkish grey, greyish orange, soft - moderately hard, microcrystalline.

Age: Early Eocene - Late Paleocene

Sele Formation (2172-2249m)

This interval comprises Claystone with trace of Sandstone and Limestone

CLAYSTONE: medium dark grey, brownish grey - olive black, soft - firm, slightly hygroclastic - hygroturgid, subblocky, locally common very fine sand and silt grains included, locally abundant very fine disseminated micropyrite, non - slightly calcareous, occasionally moderate calcareous, common micromica, pyrite

SANDSTONE: light olive grey, clear - translucent quartz, fine - medium, common lose

LIMESTONE: white - light brown, soft - firm, occasionally hard, brittle, sharp breaks, occasionally earthy texture, microcrystalline - cryptocrystalline, silty, dolomitic in parts

Age: Late Paleocene - Earliest Eocene

Lista Formation (2249-2339)

This interval comprises Claystone with stringers of Limestone and trace Sandstone

CLAYSTONE: varicoloured, greenish grey - dark greenish grey, olive black, dusky brown, moderate brown , light grey, reddish grey, medium - dark grey, bluish grey becoming predominantly olive black, olive grey, greyish brown, soft - firm, blocky - subblocky, non - slightly calcareous, locally silty - very fine sandy, rare pyrite nodules

LIMESTONE: white, soft, blocky, earthy texture, microcrystalline

SANDSTONE: clear - translucent quartz, fine - medium, subangular - subrounded, .occasionally angular, loose

Våle Formation (2339-2409)

This interval comprises Claystone with stringers of Limestone and Dolomite

CLAYSTONE:	olive black - olive grey, friable - moderate hard, blocky, non calcareous, slightly silty, trace carbon/glauconite, trace very fine sandy, rare micromica, locally rare pyrite nodules
CLAYSTONE:	olive grey, firm - moderate hard, blocky, moderate - very calcareous, slightly silty, trace carbonaceous/glauconitic, rare micromicaceous.
LIMESTONE:	very light - light grey, minor pale yellow brown, light brownish grey, moderate hard - friable, blocky, crypto - microcrystalline, locally sucrosic, locally argillaceous, locally dolomitic
DOLOMITE:	dark - pale yellowish brown, hard, brittle, blocky, cryptocrystalline, slightly argillaceous, slightly calcareous
Age:	Late Paleocene

4.4 Shetland Group (2409-3036m)

The Shetland Group consists of Ekofisk, Tor, Jorsalfare, Kyrre, and Tryggvason Formations.

Hardråde/Tor Formation (2409 - 2438,5 m)

This interval comprises Limestone with stringers of Claystone.

LIMESTONE:	white to very light grey, moderately hard - friable, blocky, micro - predominantly cryptocrystalline, locally common glauconitic.
CLAYSTONE:	olive grey - dark greenish grey, firm - soft, sub blocky, slightly - very calcareous, silty, carbonaceous/glauconitic.
Age:	Late Maastrichtian

Jorsalfare Formation (2438,5 - 2652m)

This interval comprises Claystone with minor Limestones.

CLAYSTONE:	olive grey - dark greenish grey, olive black, firm - soft, sub blocky, slightly - very calcareous, silty, carbonaceous/glauconitic.

LIMESTONE:	white to very light grey, trace light olive grey, moderately hard - friable, blocky, micro - predominantly cryptocrystalline, locally common glauconitic.
Age:	Early - Late Maastrichtian

Kyrre Formation (2652-2954 m)

This interval comprises Claystone with Limestone stringers.

(2652-2830M) CLAYSTONE:	olive grey - dark greenish grey, local trace dark greenish grey, firm - moderately hard, locally sticky, locally soluble, sub blocky - amorphous, non - very calcareous, predominantly slightly - moderately calcareous, trace very fine sandy, carbonaceous/glauconitic, rare pyrite, rare micromicaceous.
(2660M) TRACE CLAYSTONE:	dusky brown - moderate brown, firm - moderately hard, sub blocky, very - moderately calcareous, carbonaceous/glauconitic.
LIMESTONE:	white - very light grey, moderately hard, brittle, blocky - platy, micro - predominantly cryptocrystalline, local trace glauconitic.

This interval comprises Claystone with Limestone and Dolomite stringers.

(2830-2954M) CLAYSTONE:	olive grey - olive black, dark greenish grey, firm - moderate hard, locally soft, locally soluble, blocky - amorphous, slightly - predominantly non calcareous, slightly silty - silty, trace very fine sandy, carbonaceous/glauconitic, locally rare pyrite nodules/micropyrite, rare micromica
LIMESTONE:	white - very light grey, moderately hard - firm, brittle, blocky - platy, micro - predominantly cryptocrystalline, clean, local trace glauconitic.
DOLOMITE:	dark - yellow brown, hard, brittle, blocky, crystalline - cryptocrystalline
Age:	Late Campanian - Late Turonian

Tryggvason Formation (2954-3036 m)

This interval comprises Claystone, Marl and Limestone

(2954-3036M)

CLAYSTONE:	olive black, firm - moderate hard, blocky - subblocky, slightly calcareous, slightly silty, micromicaceous
MARL:	medium grey - medium light grey, soft, subblocky, fissile, rare carbonaceous material, slightly silty, rare pyrite, rare glauconitic
CLAYSTONE:	dark - medium dark grey, medium grey - olive grey, trace light olive grey - medium light grey, soft - firm, occasionally moderate hard, subblocky, partly plastic, partly brittle, slightly - very calcareous, trace grading marl, partly carbonaceous, partly glauconitic, partly micropyritic, rare micromica
LIMESTONE:	light - very light grey, medium light grey - medium dark grey, soft - moderate hard, friable, blocky, microcrystalline, partly suc, partly glauconitic, partly argillaceous grading claystone, partly clean
Age:	Coniacian - Early Turonian

4.5 Cromer Knoll Group (3036 - 3087 m)

Rødby Formation (3036-3062.5m)

This interval comprises claystone.

(3036-3062.5M)

CLAYSTONE:	predominantly olive grey, minor medium dark grey, soft - moderate hard, predominantly firm, subblocky, moderate - very calcareous, partly grading marl, slightly - very silty, locally glauconitic, locally micropyr
Age:	Late Albian - Late Aptian

Allochthonous Ness Block (3062.5-3087m)

This interval comprises alternating claystones with coal stringers.

(3062.5-3087M)

CLAYSTONE:	olive black - olive grey, soft - moderate hard, predominantly firm, subblocky, non - slightly calcareous, partly grading marl, slightly - very silty, locally glauconitic, locally micropyritic

CLAYSTONE:	moderate brown, soft - firm - sticky, subblocky - amorphous, sol, moderate - predominantly non calcareous, slightly silty, rare micromica
COAL:	black, hard - brittle, blocky, silty texture, trace micropyr, slightly argillaceous

Age: Bajocian - ?Early Bajocian

4.6 Viking Group (3087 - 3092.5 m)

The Viking Group consists of the Draupne Formation.

Draupne Formation (3087- 3092.5 m)

This interval consists of Siltstone and Sandstone as below.

Age: Ryazanian - ??Early Kimmeridgian

4.7 Brent Group (3092.5-3510m)

Tarbert 4 Formation (3092.5 - 3113 m)

This interval consists of Siltstone and Sandstone.

SILTSTONE:	olive black - brown black, dusky yellow brown, moderate hard - friable becoming predominantly soft at bottom, blocky, non calcareous - very calcareous becoming non calcareous at bottom, argillaceous grading claystone, common micromica, common micropyrite, carbonaceous, very fine sandy, locally platy fragments, rare glauconit
SANDSTONE:	Quartz, very fine - fine, subangular, spherical, moderately sorted, as loose grains

Age: Early Bathonian

Tarbert 3 Formation (3113 - 3138 m)

This interval consists of Siltstone Sandstone and minor Limestone.

SILTSTONE:	olive black - brown black - dusky yellow brown, moderate hard - friable - soft, blocky, brittle - friable, non - very calcareous, argillaceous grading claystone common micromica, common micropyrite, cardonasceous, very fine sandy, locally platy fragments, rare glauconit

SANDSTONE:	dusky yellow brown - olive black, clear quartz, very fine - fine, subangular, spherical, moderately sorted, friable - loose, non calcareous, very argillaceous/silty matrix, grading siltstone, mica, carbon, rare glauconite, no visible porosity
LIMESTONE:	medium light grey, firm - soft, cryptocrystalline, argillaceous partly grading claystone.
Age:	Bajocian (?Late)

Tarbert 2 Formation (3138 - 3238m)

This interval consists of sandstone, siltstone, coals and limestone.

SANDSTONE:	dusky yellow brown - olive black, clear translucent quartz, fine - medium, trace coarse, subangular - subrounded, moderately sorted, mica, pyrite, partly cemented, firm - hard, poor visible porosity
SILTSTONE:	olive black - brown black - dusky yellow brown, moderate hard - friable, blocky, brittle - friable, non - very calcareous, argillaceous grading claystone, common micromica, common micropyrite, carbon, very fine sandy, locally platy fragments, rare glauconite
LIMESTONE:	white - medium bluish, soft - firm, argillaceous, cryptocrystalline
COAL:	black, hard, shiny, conchoidal, pyritic, laminated
Age:	Bajocian (?Late)

Tarbert 1 Formation (3238 - 3264.5 m)

This interval consists of sandstone and claystone.

SANDSTONE:	brown black - dusky yellow brown becoming pale yellow brown - pale yellow, grey brown, clear - opaque and translucent quartz grains, predominantly medium -fine, rare coarse - very coarse, subangular - subrounded, moderate spherical, moderately - well sorted, friable becoming moderately - well silica cemented, in parts slightly calcite cemented, abundant oil stain, rare massive pyrite, trace mica, locally argillaceous - carbonaceous, moderate - poor intergranular porosity, commonly carbonaceous coated grains

CLAYSTONE:	olive grey - olive black, becoming greyish brown - light greyish brown, firm - moderately hard, blocky, non calcareous
Age:	Bajocian (?Late)

Ness Formation (3264.5 - 3484.5 m)

This interval consists of claystone and sandstone with siltstone, occasional coal interbeds.

(3264.5-3417.5m)

CLAYSTONE:	olive grey - olive black, becoming greyish brown - light greyish brown, firm - moderately hard, blocky, non calcareous
SANDSTONE:	light - medium grey, clear - translucent quartz, fine - very fine, locally medium, firm, subangular - subrounded, moderate - well sorted, non calcareous, trace coal, pyrite, rare mica
SILTSTONE	olive black - olive grey, medium grey - dark grey, soft - firm, blocky
COAL:	black, hard - very hard, brittle, pyrite

This interval consists of sandstone with claystone, and minor siltstone and thin coaly interbed.

(3417.5-3450m)

SANDSTONE:	dominantly white - slightly pale yellowish grey, common translucent - opaque, dominantly very fine - fine, locally becoming medium, subangular, subrounded, well sorted, slightly dolomitic cement, common argillaceous matrix, kaolin, abundant mica flakes, locally abundant coal fragments
CLAYSTONE:	pale yellowish grey, brownish grey, becoming medium black - reddish black, mica flakes, becoming silty, in parts grading argillaceous siltstone.
SILTSTONE:	pale yellowish brown, firm, blocky, locally abundant carbonaceous material and micromica, occasionally very fine sand grains

COAL: black - reddish black, firm - soft in parts, subblocky - subfissile, occasionally micropyrite

This interval consists of sandstone with claystone, siltstone, thin coals and minor limestone

(3450-3484.5m)
SANDSTONE: milky white, milky white - clear quartz, occasionally opaque, dominantly fine - very fine, locally becoming medium - rare coarse, very rare very coarse, bimodal, subangular - angular, common subangular - subrounded, poor - moderate sorted, silica and rare pyrite cement, hard - locally friable, kaolin matrix common, locally abundant coal fragments

CLAYSTONE: pale yellowish grey - brownish grey, brownish black - greyish black, common pale yellowish brown - dusky yellowish brown, firm - moderately hard, brittle in parts, occasionally earthy texture, locally sharp breaks, micromicaceous and coaly debris, becoming silty in parts, grading argillaceous siltstone

SILTSTONE: dusky yellowish brown, becoming light grey in parts, firm - soft, blocky, locally abundant coal fragments and mica flakes, common very fine sand grains, very argillaceous, earthy texture

COAL: black - blackish brown, hard - firm, brittle, conchoidal fracture, shiny lustre, v argillaceous grading carbonaceous claystone

LIMESTONE: white, soft - firm, blocky, chalky texture, microcrystalline

Age: Early - ?Late Bajocian

Etive Formation (3484.5 - 3490 m)

This interval consists of sandstone with claystone.

SANDSTONE: milky white - common pale yellowish brown (oil stain), dominantly milky - translucent quartz, common opaque, medium - fine, locally coarse, bimodal, locally very fine - fine, moderate well - poorly sorted, angular - subangular, loose in parts, silica cement, moderate - poor intergranulated porosity, else as above.

CLAYSTONE: pale yellowish grey - brownish grey, brownish black - greyish black, common pale yellowish brown - dusky yellowish brown, firm - moderately hard, brittle in parts, earthy texture

	occasionally, locally sharp breaks, micromicaceous and coaly debris, becoming silty in parts, grading argillaceous siltstone
Age:	?Aalenian

OR Formations (3490 - 3510m)

This interval consists of sandstone with claystone as above.

Age: ?Aalenian

4.8 Dunlin Group (3510 - 3560 m; TD)

Drake Formation (3510 - 3560m)

This interval consists of claystone and siltstone, with minor sandstone and limestone

CLAYSTONE:	greyish black - brownish black, becoming dusky yellowish brown - pale yellowish brown, firm - soft, locally slightly sol, generally subblocky - subfissile, earthy texture in parts, grad very silty claystone, very micaceous, locally abundant pyrite, coaly and carbonaceous debris, very micropyrithic in parts, becoming intercal with very thin sandy beds
SILTSTONE:	brownish black - greyish black occasionally, becoming dusky yellowish brown, hard - very hard, becoming firm - hard, blocky - subfissile, very micaceous, with abundant very sand grains, occasionally with massive crystalline pyrite, trace coaly plant remnants, coal debris common, locally calcareous, very argillaceous grading claystone in parts
SANDSTONE:	milky white - clear sandstone, milky - clear - translucent quartz, fine . very fine, firm - hard, calcite cemented, common loose, becoming silty grading siltstone
LIMESTONE:	white, firm - soft, blocky, chalky texture, microcrystalline
Age:	Late Toarcian

5 HYDROCARBON SHOWS

The evaluation of hydrocarbon shows at the wellsite was carried out in a conventional manner. A standard (Geoservices) hydrocarbon total gas detector system together with a gas chromatograph for automatic and continuous gas analysis, recorded as ppm by volume of C1 through nC4, were operational below 1205 m down to the TD of the well.

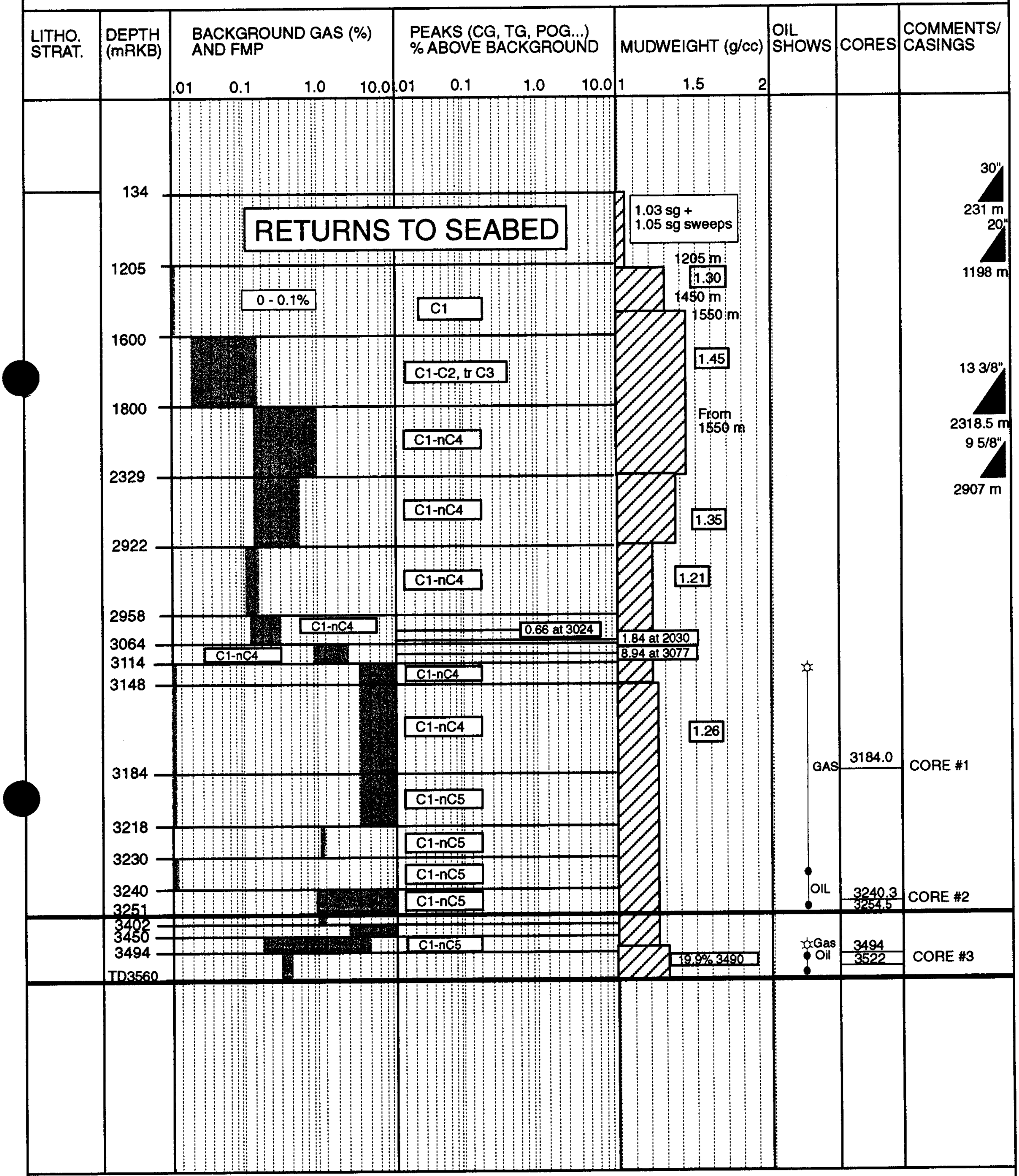
Hydrocarbon shows on ditch cuttings, cores and sidewall cores were evaluated according to procedures described in Norsk Hydro's "Wellsite Geologist's Manual".

5.1 Gas Record

134 - 1205m: This interval was drilled with returns to sea bed.

The gas summary for the well is presented in the Figure 5.1 on the next page.

GAS SUMMARY WELL: 30/9-19



NOTE: NOT TO SCALE

Fig. 5.1: Gas summary

CG=CONNECTION GAS, TG=TRIP GAS, WTG=WIPER TRIP GAS,
POG=PUMP OFF GAS, SWG=SWABBED GAS, FMP=FORMATION GAS PEAK

5.2 Oil stain and fluorescence

A summary of the observed shows is given in Table 5.1 below:

INTERVAL (mRKB)	SOURCE	LITHOLOGY	SHOWS DESCRIPTION
3087 - 3184	Cuttings	Siltstone and Sandstone	No direct fluorescence, slow streaming to blooming blue white to yellow fluorescent cut, no visible cut, no to trace yellow fluorescent residue, no to trace yellow visible residue.
3184 - 3217	Core	Siltstone and Sandstone	Weak to moderate petroleum odour, no to locally yellowish or dusky brown oil stain, no to local trace direct fluorescence, trace blue white to milky white fluorescent cut, no visible cut, no to local trace blue white fluorescent residue, no visible residue.
3232 - 3247	Core	Sandstone	Moderate petroleum odour, brown oil stain, fair uniform yellow direct fluorescence, instant blooming blue white fluorescent cut, no visible cut, moderate even blue white to green fluorescent residue, yellow visible residue.
3408 - 3450	Cuttings	Sandstone	On less than 5% of aggregates: bright yellow direct fluorescence, slow blooming to streaming yellow to yellow white fluorescent cut, no visible cut, yellow white fluorescent residue.
3486 - 3500	Cuttings/core	Sandstone	10-60% dull to bright yellow direct fluorescence, moderately fast blooming white to pale yellowish green fluorescent cut, white streaming fluorescent cut, no or rarely pale straw visible cut, white to cream fluorescent residue, no visible residue.

Table 5.1. Shows summary 30/9-19

6 CORING

6.1 Conventional cores

A total of 3 cores was cut at different intervals throughout the well. A summary of the cores is presented in the Tables 6.1 below and the core descriptions can be found in Appendix I.

No	C: Cut(m) R: Recovery(m)	Rec. %	Lithology	Formations
1	C:3184 - 3240.3 R:3184 - 3240.3	100	Sandstone	Tarbert 2/1
2	C:3240.3 - 3254.5 R:3240.3 - 3246.7	45,1	Sandstone	Tarbert 1
3	C:3494 - 3522 R:3494 - 3521.3	97,6	Sandstone, Claystone	ORE

Table 6.1: Conventional cores 30/9-19

6.2 Sidewall cores

Sidewall cores were taken from 2975 m to 3136.5 m. Details of recovery are given in Table 6.2 below.

Descriptions of the sidewall cores can be found in Appendix II, and gross lithology is reported on the Completion Log.

Run	Requested	Misfired	Lost	Empty	Recovered	Rec %
2A	30	-	3	-	27	86,7

Table 6.2: Sidewall cores

7 LOGGING

7.1 Wireline logs

The following table is a summary of wireline logs run in the well and shows log type, date run, logged intervals and run number for each log.

Logs	Date	Logged interval (mRKB)	Run
MDT/GR/ACST	8-12.10.98	3247-3247	1A
HALS/TLD/HGNS/GPIT/ACTS	8.10.98	3255-134	1A
FMI/NGT/DSI/ACTS	17-18.10.98	3556.5-2907	2A
HALS/TLD/HGNS/GPIT/ACTS	17.10.98	3556.5-3200	2B
CMR/GR	18-19.10.98	3515-3065	2A
MDT/GR/ACST	20-21.10.98	3029-3497	2B
VSP/GR	20.10.98	3198-2530	2A
VSP/GR	20.10.98	3520-3190	2B
CST/GR	21-22.10.98	3136.5-2975	2A

Table 7.1: Wireline logs 30/9-19

7.2 MWD logs

A MWD service (Anadrill) yielding gamma ray, resistivity and survey measurements was run in the following section:

134-233m	(survey only)
233-3560m	

Detailed MWD results can be found in the report "End of Well Report, MWD, for Norsk Hydro, Well 30/9-19."

7.3 Bottom hole temperatures from wireline logs

The table below gives a summary of the bottom hole temperatures measured from wireline logs.

Log suite	Run	Depth (mRKB)	Temp ° C	Time since circ. (hrs)	Circ. time (hrs)
MDT/GR/ACST	1A	3 247	98,1	9:55	6
HALS/TLD/HGNS/GPIT/ACTS	1A	3 253	98,1	9:55	6
FMI/NGT/DSI/ACTS	2A	3 556,5	-	-	4:35
HALS/TLD/HGNS/GPIT/ACTS	2B	3 556,5	126	12:50	4:35
CMR/GR	2A	3 515	-	-	4:35
MDT/GR/ACST	2B	3 029	122	39	3:30

Table 7.2: Bottom hole temperatures from logs

8 PETROPHYSICAL RESULTS

Petrophysics

The petrophysical evaluation is based on wireline log data, logging while drilling data, conventional core data and formation pressure data. The details in the petrophysical interpretation are described in "Well 30/9-19 and 30/9-19 A, Formation Evaluation Report (FER)".

Formation Pressure Data

Two MDT (Modular formation Dynamics Tester) runs covered the reservoir section of the well with a total attempt of 43 pressure points. Six pretests were tight and ten pressure points were believed to have a supercharged effect. Gas, oil and water, not in pressure communication are present in the 30/9-19 well. A gas down to is situated at depth 3216 m MD RKB, and the oil down to is set to 3247 m MD RKB. The Tarbert gas and the Ness water are evaluated from best fit quartz gauge which gave densities of respectively 0.25 g/cc and 0.99 g/cc. Based on preliminary results from the PVT analysis and MDT pressure points an oil density of 0.66 g/cc was interpreted. All zones are above hydrostatic pressure.

Petrophysical Zone Averages

The petrophysical interpretation is presented in figure 8.1. This CPI utilises high quality wireline data.

Zone Averages				
Zone	**Interval [m MD RKB]**	**Net Pay [m MD]**	**Porosity [%]**	**Water Saturation [%]**
Draupne	3087-3092.5	0	-	-
Tarbert 4	3092.5-3113	0	-	-
Tarbert 3	3113-3138	1,1	9,8	53,2
Tarbert 2eu-g	3138-3164.5	25,2	19,5	14,6
Tarbert em	3164.5-3165.5	0	-	-
Tarbert 2el	3165.5-3184.5	18	17,8	18,7
Tarbert 2d	3184.5-3191	0,3	10,2	62,5
Tarbert 2c	3191-3216	23,5	18,8	20,3
Tarbert 2a	3216-3238	5,2	15,6	53,1
Tarbert 1b	3238-3245.5	7	15,9	37,3
Tarbert 1a	3245.5-3264.5	2	14,9	46
Ness	3264.5-3484.5	3,8	17,3	84,2
Etive	3484.5-3490	5,2	17,9	39,9
Rannoch-Oseberg	3490-3510	0	12,6	70,6

Table 8.1: Petrophysical zone averages for the 30/9-19 net reservoir

Three core were cut in the 30/9-19 well in the Tarbert and Rannoch-Oseberg Formations. The porosity is overburden with a factor of 0.97. The match between the calculated total porosity and overburden corrected porosity is good and the core measurements is considered to have a high quality.

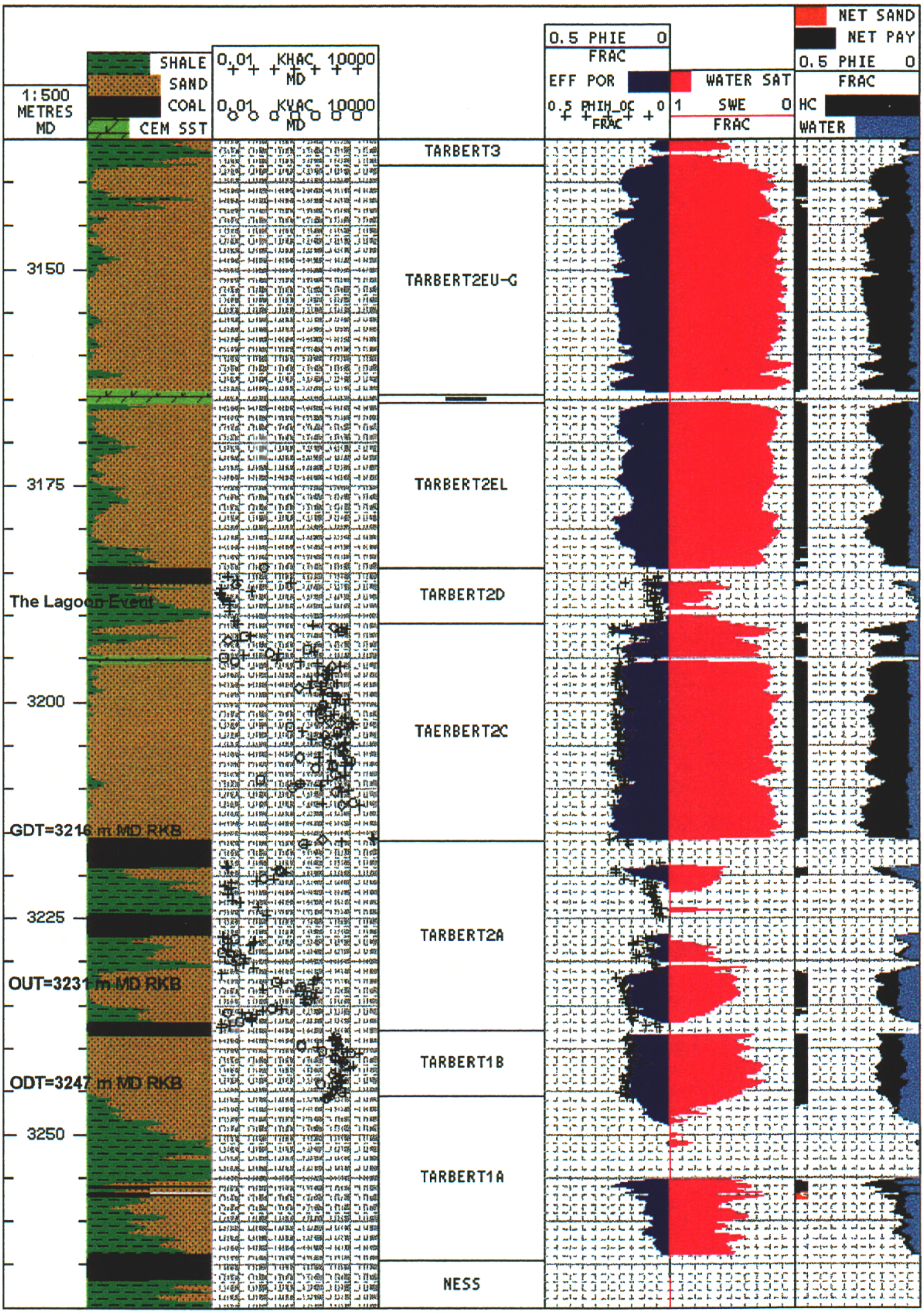


Figure 8.1: The petrophysical interpretation from the Tarbert Formation

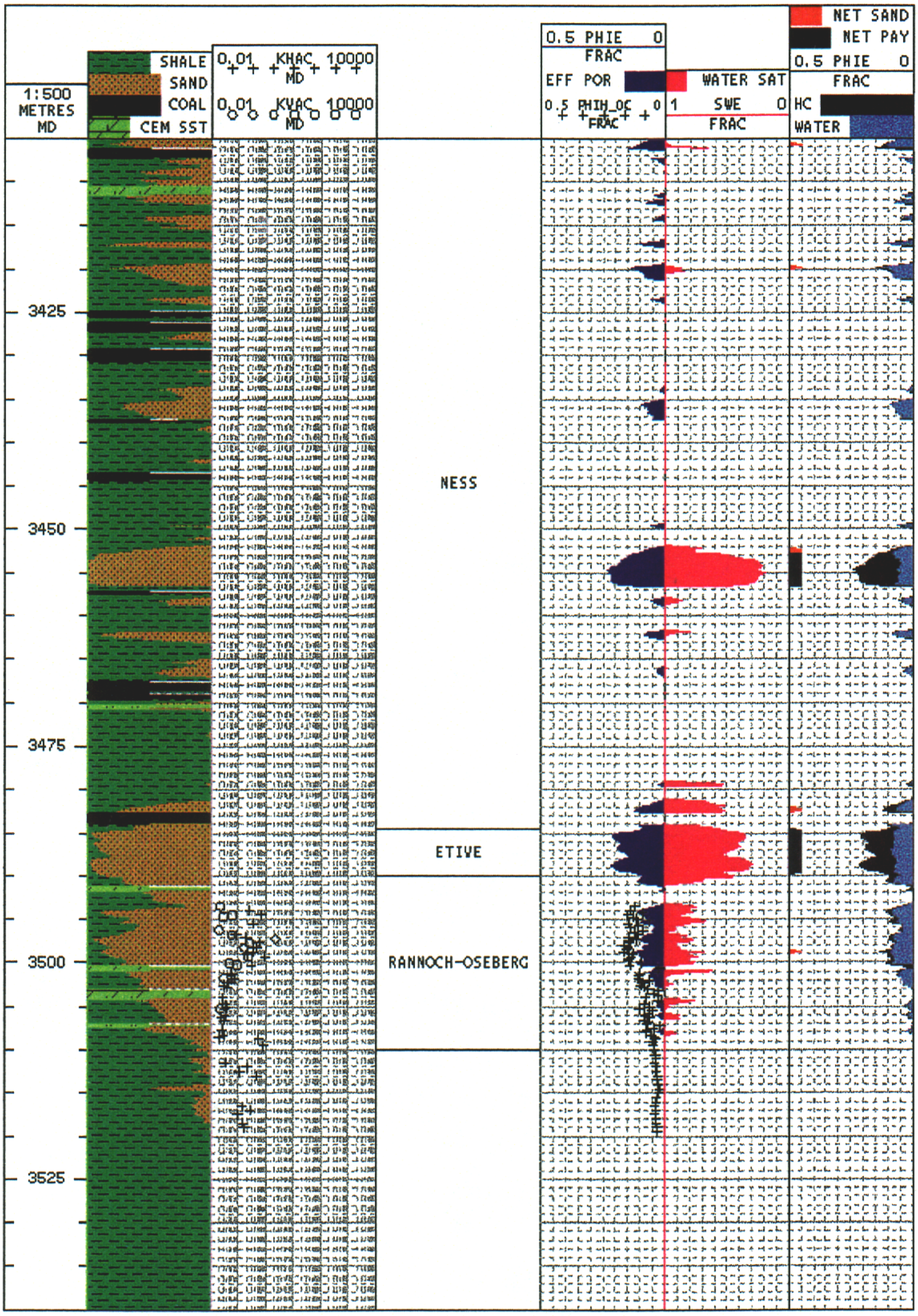


Figure 8.2: The petrophysical interpretation from the Ness and ORE Formations

8.3 Estimated Pore Pressure, Fracture, Overburden and Temperature Gradients

Pore pressure

The pore pressure in well 30/9-19 are based on MWD resistivity log, MDT pressure readings, and DXC.
It is very difficult to calculate pore pressure in Hordaland Group when drilling with high overbalance and PDC bit. Lithological variations makes it difficult to estimate pore pressure decrease in Rogaland Gp and pressure development over the boundary to Shetland Gp.

No shallow gas occurs in the upper sediments. Down to 1700m the pore pressure is normal and increase rapidly to max pore pressure 1,32 +/- 0,05 sg. The pore pressure stays constant down to top Rogaland and is evaluated to decrease to 1.10 sg at the top of Shetland Gp. The pore pressure follows a 1.10 sg trend down to a sandstone interval between 3072 - 3075 mTVD. The pore pressure is measured with MDT to 1,14 sg Results from MDT measurement, in the Brent Gp, shows that the pressure in Tarbert 3 is 1.11 sg and decreasing to 1,07 in Tarbert 1. The gas, down to Tarbert 2C, has a gradient of 0,025 bar/m. The oil gradient in Tarbert 2A and Tarbert 1 is 0,065 bar/m. An isolated sandbody in Tarbert 1, at 3255 mTVD, has a pore pressure of 1, 22 sg. The pore pressure in Ness formation increases from 1.10 sg to1,22 sg. The pore pressure in ORE formation is measured to 1,26 sg.There are no indications of pressure alteration in Dunlin Gp. down to TD.

Formation strength

Leak off tests was performed to 1,62 sg @ 1208m, 1,70 sg @ 2332m and 1,81 sg @2924,5m. Breckels & van Eekelen formula for fracture gradient indicate lower value in Hordaland and Shetland than LOT.
There was no hole problem in the well during drilling.

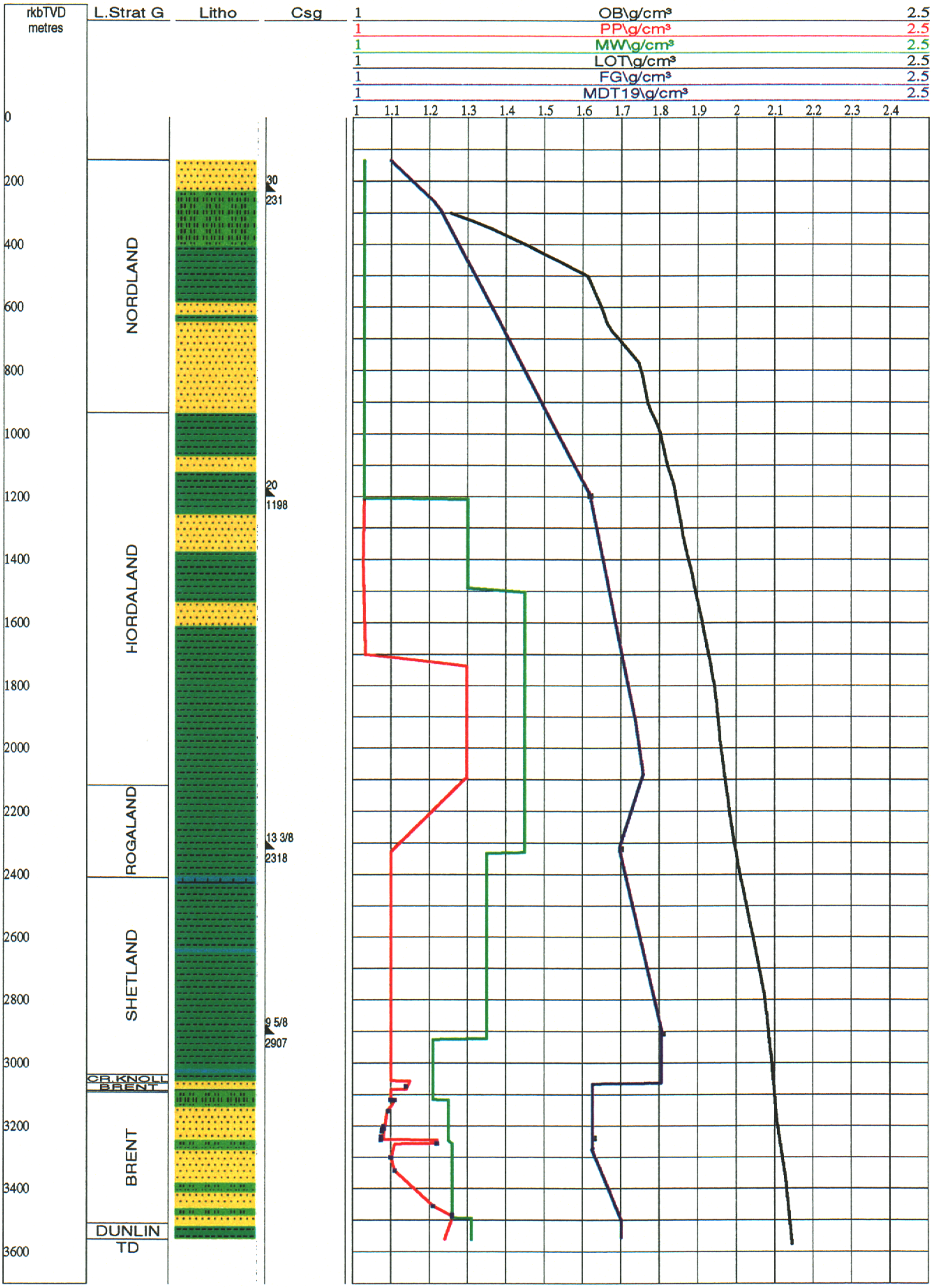
Overburden gradient

Overburden Gradient is taken from prognosis in Drilling program due to absence of density log above reservoar.

Temperature Gradient

Bottom hole static temperature is taken from DST in well 30/9-19A and measured to 121 deg C from the perforated interval 3242 - 3258 mTVD. The temperaure at TD, 3560m TVDKB, was estimated to 133 deg C with a gradient of 3,73 deg/100m.

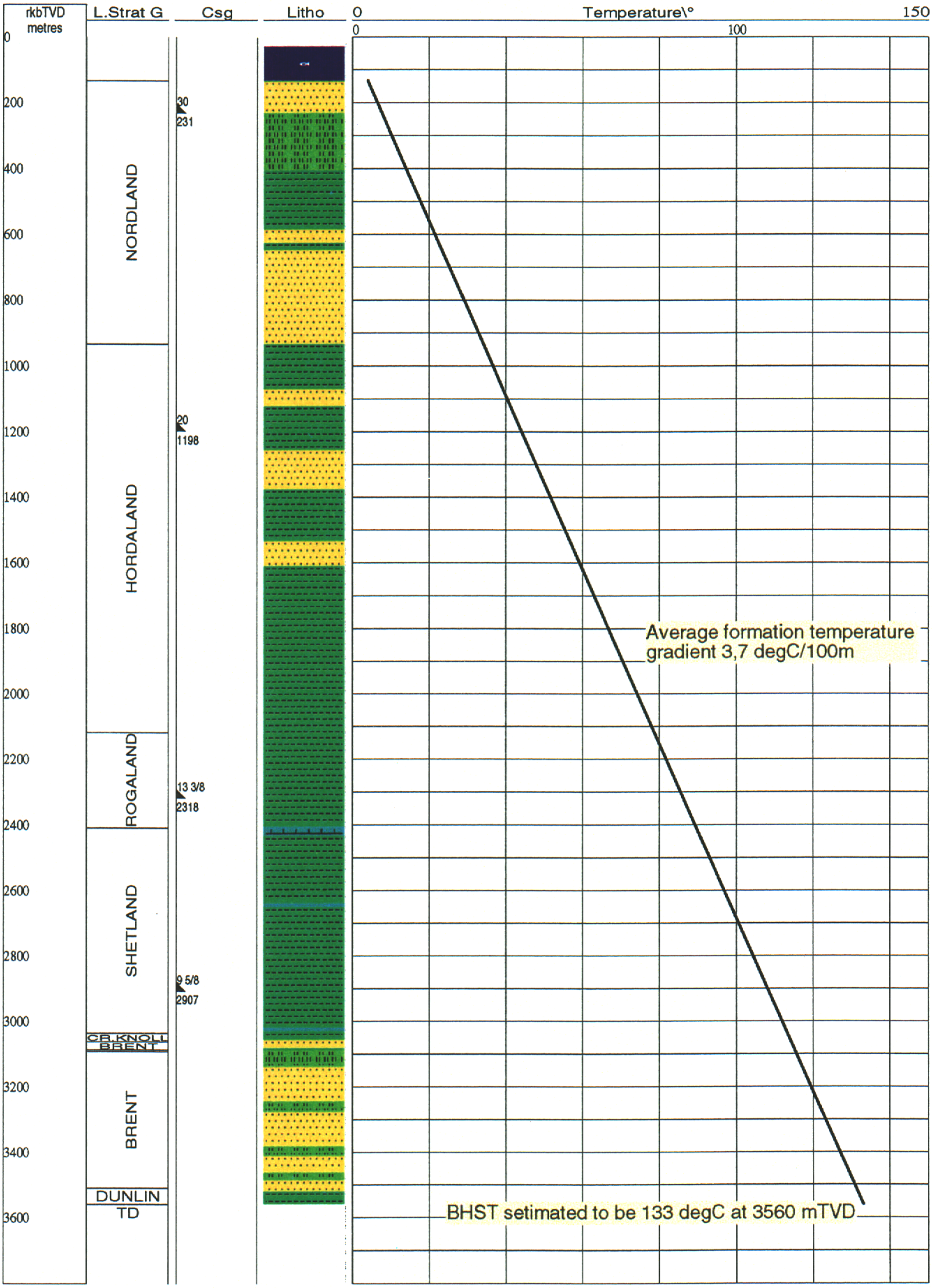
Fig.8.3



Estimated Pore pressure, Fracture and Overburden Gradient

Well: 30/9-19

Fig.8.4



Average formation temperature gradient 3,7 degC/100m

BHST setimated to be 133 degC at 3560 mTVD

Formation Temperature Gradient

9 GEOPHYSICAL RESULTS

In the prognosis a seismic event interpreted to represent the base of Tarbert 2 Fm. A static shift of +8 ms was found between the seismic picks and the well.

The prognosed depths were encountered within the given uncertainties except for the Top Grid sand. However, top Grid in the well is not associated with any seismic event and is therefore difficult to pick. The results are presented in Figure 9.1 and Table 9.1.

The Draupne Fm. was overlain by an unexpected allochtonous Ness block which together with the static shift caused the base Cretaceous to be picked 28 ms too shallow (ca. 47 m), on the top of this block. However, a slightly lower velocity from MSL to base Cretaceous than prognosed (0,6 % = 26 m) reduced the error giving an observed error of +21 m in the well relative to the prognosis (47 m - 26 m = 21 m).

In the prognosis a seismic event interpreted to represent the base of Tarbert 2 Fm. sand was picked, and the formations between this and base Cretaceous was prognosed based on a geological model.

The base Tarbert 2 Fm. sand was encountered 25 m shallower than prognosed which is mainly caused by a shallower velocity down to base Cretaceous than prognosed.

The top Tarbert 2 Fm. reservoir was encountered 22 m shallower than prognosed due to a 3 m thinner T2 sand than the geomodel.

Top Tarbert 3 Fm. was encountered 15 m shallower due to a 7 m thinner T3 Fm. than the geomodel.

Top Tarbert 4 Fm. was encountered 18 m deeper due to a 33 m thinner T4 Fm. than prognosed.

The Draupne Fm. was encountered 21 m deeper due to a 3 m thinner Draupne Fm. than prognosed.

The Top Ness Gp. was encountered 30 m shallower than the prognosis. Top Ness was modelled down from the picked base Tarbert 2 reservoir and came in 5 m shallower than the geomodel.

Top ORE Fms. was encountered 63 m shallower than prognosed. This is mainly due to a too shallow seismic pick.

Top Dunlin Gp. was encountered 77 m too shallow, also because of a too shallow seismic pick.

Table 9.1 Geophysical Summary

Well 30/9-19

HORIZON	TWT (ms)	Uncert. (ms)	V. Int. (m/s)	Uncert. (m/s)	Depth TVD (m MSL)	Depth TVD (m RKB)	Uncert. (+/- m)	Corrected uncert. depth (+/- m)									Actual ±	(m RKB)	msTWT
Seabed	141	1	1485	5	105	134	1										-1	133	
Base Pleistocene	327	10	1885	80	280	309	17										1	310	
Top Early Pliocene Sand	606	10	2072	80	569	598	38										-12	586,5	
Base Early Pliocene Sand	627	10	2190	80	592	621	39										2	623	
Top Utsira Fm	642	10	2133	80	608	637	40										8	644,5	
Base Utsira Fm.	946	20	2000	80	912	941	50										-8	933	
Top Skade	983	15	2108	80	951	980	53										-3	977,5	
Base Skade	997	30	2143	100	966	995	61										4	998,5	
Top Grid	1397	50	2085	100	1383	1412	88										-155	1257	
Base Grid	1436	50	2000	100	1422	1451	103										-71	1380,5	
Top Balder Fm	2040	15	2123	100	2063	2092	40										27	2119	
Top Sele Fm	2093	15	2642	60	2133	2162	45										10	2172	
Top Lista Fm	2145	15	2500	60	2198	2227	50										22	2249	
Top Vaale	2267	20	2393	60	2344	2373	60										-34	2339	
Top Shetland Gp.	2297	10	2800	60	2386	2415	60										-6	2409	
B. Cretaceous/T. Draupne	2700	10	3231	31	3037	3066	45	0									21	3087	2736
B. Draupne/Tarbert 4	2706	10	3000	50	3046	3075	49	20	0								18	3092,5	2739
Top Tarb. 3	2734	15	3786	50	3099	3128	56	33	10	0							-15	3113	2750
Top Tarb. 2 Reservoir	2751	15	3765	50	3131	3160	63	44	15	10	0						-22	3138	2763
Top Lagune																		3184,5	
Base Lagune																		3191	
Base Tarb. 2 Reservoir	2797	10	3522	50	3212	3241	65	47	20	15	10	0					-25	3216	2805
Top Tarb. 1	2812	10	3200	100	3236	3265	67	50	36	27	20	10	0				-27	3238	2818
Top Ness Fm	2830	15	3222	100	3265	3294	72	56	42	35	30	20	20	0			-30	3264,5	2832
Top ORE Fms	2980	30	3373	100	3518	3547	103	92	90	86	81	79	78	73	0		-63	3484,5	2959
Top Dunlin Gp/ Drake Fm	3000	30	4000	100	3558	3587	120	111	110	106	102	101	100	96	50	0	-77	3510	2972
TD					3608	3637	120	111	110	106	102	101	100	96	50	0			

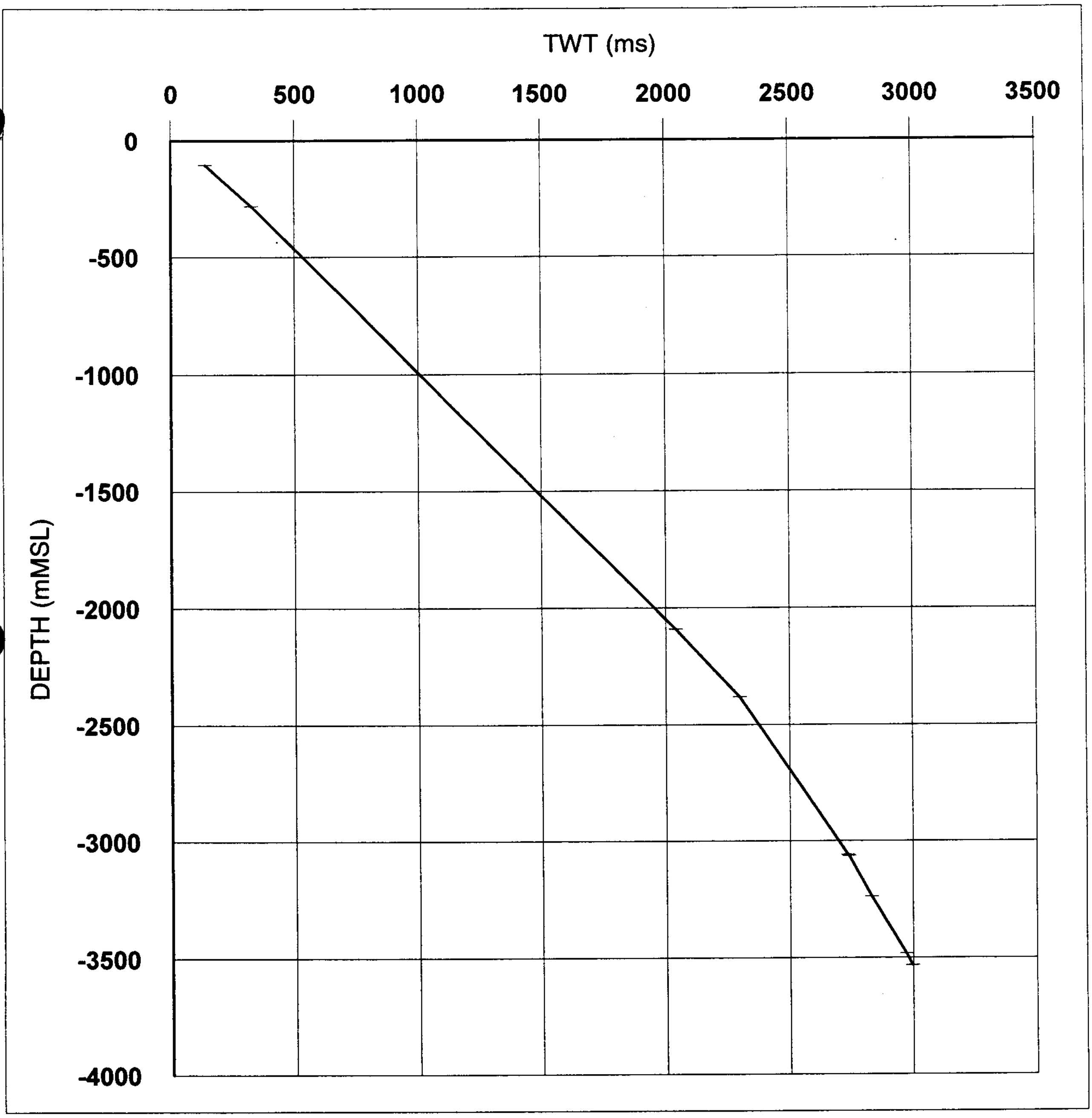


Fig. 9.1 Time versus Depth plot

10 POST SITE SURVEY REPORT

WELL DATA :

1 **Distance from rig floor to sea level:** 29 m

2 **Water depth (MSL):** 105 m

3a **Setting depth for conductor (m RKB):** 231 m

3b **Leak Off / Formation Integrity Test (g/cc):** N/A

4a **Setting depth (m RKB TVD) for casing on which BOP mounted:** 1198 m

4b **Formation Integrity Test (g/cc):** 1.62 sg (LOT)

5 **Depth (m RKB (TVD) & Two Way Time) to formation/section/layer tops:**

Seabed : 134.0 m (141 ms)
Base Pleistocene : 311.0 m (327 ms)
Intra Pliocene Anomaly 1 (IPAN1) : 339.5 m (357 ms)
Intra Pliocene Anomaly 2 (IPAN2) : 404.5 m (427 ms)
Intra Pliocene Anomaly 3 (IPAN3) : 501.5 m (522 ms)
Top Early Pliocene Sand (IP3) : 586.5 m (606 ms)
Base Early Pliocene Sand (IP3) : 623.0 m (627 ms)
Top Usira Sand : 644.5 m (642 ms)
Base Usira Sand : 933 m (946 ms)
Top Skade : 977.5 m (980 ms)
Base Skade : 998.5 m (995 ms)
Top Intra Hordaland Sand : 1070 m (c. 1060 ms)
Base Intra Hordaland Sand : 1125 m (c. 1125 ms)
Top Grid Sand : 1257 m (c. 1267 ms)

Note:

No chronostratigraphic information was collected in the tophole section of the well (from seabed down to 1205 m RKB TVD). Consequently, the interpretation of the different formations in this area is based on the MWD logs, seismic character and previous work.

Mud logging commenced at 1205 m. Samples for description were taken at 10 m intervals to 2950 m RKB TVD except for the interval between 2000 m and 2450 m RKB TVD where samples were taken every fifth meter. All formation tops are based upon MWD logs and cuttings analysis.

6 Depth interval (m RKB (TVD) & Two Way Time) and age of sand bodies shallower than 1000 m under the seabed. Note which layers if any contain gas:

No data exists on background gas levels from seabed down to 1205 m (section drilled with returns to seabed). However, no gas-related incidents were reported over this interval.

Several sand bodies have been identified in well 30/9-19:

Pleistocene Interval:

134 m - 217 m
289.5 m - 292 m

Pliocene Interval:

339 m - 340 m
379.5 m - 380.5 m
477 m - 478 m
586.5 m - 623 m

Lower Miocene Interval (Utsira Fm):

644.5 m - 933 m

Oligocene Interval:

954 m - 955 m
967.5 m - 968.5 m
971 m - 973.5 m
977.5 m - 998.5 m
1040 m - 1041 m
1042.5 m - 1044.5 m
1052.5 m - 1055.5 m
1070 m - 1125 m

7 By what means is the presence of gas proven:

An 8 1/2" pilot hole was run from 233 m down to 1202 m to obtain good log quality in response to potential shallow gas between 338 m (IPAN1) and 508 m (IPAN3). No firm clear log indications of shallow gas were recorded, but minor increase in the resistivity response and decrease in the gamma response have been observed at 379.5-380.5 m, 471-474 m, and 477-478 m RKB TVD (see Post Site Survey Log).

Gass bubbles were observed at seabed when circulating 'bottums up' after the drill break at 413 m RKB TVD. The gas origo is uncertain, but may have been air bubbles created when circulating the Hi-Vis pill.

Below 1205 m RKB TVD gas analyses were accomplished using flame ionisation detectors (FID) with gas measured as percentage methane (C1) equivalent in air, and chromatographic analyses expressed in parts per million.

8 **Composition and origin of gas:** Methane (C_1)

9 **Describe all measurements taken in gas bearing layers:** N/A

Chromatographic Breakdown of background Gas:

Depth m RKB MD	Background %	Composition
1205-1610	0-0.01	C_1
1610-1800	0.03-0.25	C_1-C_2 to C_3

SEISMIC DATA:

10 **Given depth (m RKB & ms TWT) and extent of sand layers (communication, continuity, truncation etc.):**

Pleistocene Interval:

134 m - 217 m:	Laterally extensive channel sand covering the eastern part of block 30/8 and western part of blocks 30/6 and 30/9.
289.5 m - 292 m:	Thin sand found within well stratified unit near Base Pleistocene. The sand unit extends across entire survey area and a similar sand layer was recorded in the 30/8-3 tie well. The sand is thought to have good continuity.

Pliocene Interval:

339 m - 340 m	
379.5 m - 380.5 m	
477 m - 478 m	
586.5 m - 623 m	Laterally extensive sand layer

Lower Miocene Interval (Utsira Fm):

644.5 m - 933 m	Laterally extensive sand layer

Oligocene Interval:

954 m - 955 m	
967.5 m - 968.5 m	
971 m - 973.5 m	
977.5 m - 998.5 m	Laterally extensive sand layer
1040 m - 1041 m	
1042.5 m - 1044.5 m	
1052.5 m - 1055.5 m	
1070 m - 1125 m	

11 **Given depth and extent of any gas blanking ("gass-skygging"), seismic anomalies etc.:**

Amplitude anomalies indicative of shallow gas were mapped at three levels in the area of well 30/9-19:

IPAN1: 338 m ± 20 m RKB TVD, no anomaly segments close to the well location.
IPAN2: 406 m ± 30 m RKB TVD, minor segment approximately 10 m south-east of the well location.
IPAN3: 508 m ± 36 m RKB TVD, 200 m south-west of the well location

Based on experience from wells 30/8-3, 30/5-2 and 30/9-2 wek gas warnings were given for the three levels at the planned well 30/9-19 location.

Due to shallow gas warning a 8 1/2" pilot hole was drilled to 1202 m. The tophole section of the well was drilled with returns to seabed to 1205 m RKB TVD. Background gas levels were consequently not monitored. No firm clear log indications of shallow gas were recorded.

12 Note any indication of gas originating from deeper levels. Give description in cases where gas comes from deeper layers: N/A

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

13a Shallow Gas:

Due to shallow gas warning, a 8 1/2" pilot hole was drilled from 233 m down to 1202 m. The tophole section of the well was drilled with returns to seabed to 1205 m RKB TVD. Background gas levels were consequently not monitored. No firm clear log indications of shallow gas were recorded, but minor increase in the resistivity response and decrease in the gamma response have been observed at 379.5-380.5 m, 471-474 m, and 477-478 m RKB TVD (see Post Site Survey Log).

Gass bubbles were observed at seabed when circulating 'bottums up' after the drill brake at 413 m RKB TVD. The gas origo is uncertain, but may have been air bubbles created when circulating the Hi-Vis pill.

No gas-related problems were experienced in the well.

13b Sand Bodies:

The Pleistocene sand layers were predicted, but the deepest layer (289.5 m - 292 m) was not annotated with exact depth. The encountered sand layers correspond with the interpretation.

One of the three predicted thin sand layers (IPAN1) in the Pliocene section were observed. The predicted sand layer at IPAN3 represents most likely a silty mud/mudstone. The thick Early Pliocene sand layer at 586.5 m to 623 m appeared 13.5 m thicker than predicted.

The Utsira Sand occurred as predicted but due to the seismic pick and correlation to tie-well 30/6-18, the Top Utsira Sand is placed 7.5 m deeper and the Base Utsira Sand is placed 8 m shallower than indicated in the Formation Tops prognoses. The upper part of the Utsira Sand is interpreted as being a transitional zone which grades into silt and clay as the overlaying sequence is approached.

The sandy Skade Formation occurred as predicted, but the formation appeared 6 m thicker than predicted. The reason for this is probably wrong seismic picks of the formation boundaries.

The sand layer in Oligocene at 1070 m to 1125 m was not predicted.

13c Boulders:

Scattered boulders were predicted in the shallow section between approximately 223 m and 282 m RKB TVD. No boulder layers were observed in the predicted interval, but boulders were encountered between 217 m and 231 m RKB TVD.

13d Unconformities (depths in metres RKB (TVD)) :

Horizon		Prognosed	Observed	Difference
Seabed	:	134 ± 1	134	0
Base Pleistocene	:	309 ± 17	311	2 (deeper)
Top Early Pliocene Sand	:	598 ± 38	586.5	11.5 (shallower)
Base Early Pliocene Sand	:	621 ± 39	623	2 (deeper)
Base Pliocene	:	637 ± 40	644.5	7.5 (deeper)
Base Utsira	:	941 ± 50	933	8 (shallower)
Top Skade	:	980 ± 53	977.5	2.5 (shallower)
Base Skade	:	995 ± 61	998.5	3.5 (deeper)
Top Intra Hordaland s.	:	1284 ± 69	1070	214 (shallower)
Base Intra Hordaland s.	:	1338 ± 75	1125	213 (shallower)
Top Grid	:	1412 ± 90	1257	155 (shallower)

The differences between the prognosed and observed depths to different formation tops were within the uncertainty limits, except for Top/Base Intra Hordaland Sand and Top Grid Fm. The difference between the predicted and observed depths are most likely due to wrong seismic picks. The seismic interpretation work in this area is very much hampered by diapirs that occur in the Oligocene section.

13e Correlation to Nearby Wells:

In general, the drilling conditions experienced in well 30/9-19 are as predicted and similar to those encountered in tie-wells 30/8-3 and 30/9-2.

11 STANDARD AND SPECIAL STUDIES

- **Norsk Hydro, 1999:** Petroleum Geochemistry of Well 30/9-19
- **Anadrill Schlumberger, 1998:** End of Well Report, 30/9-19
- **Norsk Hydro and GeoQuest, 1999:** Well 30/9-19 FMI Image Processing and Quality control
- **Norsk Hydro, 1998:** Site Survey at location 30/9-19
- **Norsk Hydro, 1999:** Standard Core Description well 30/9-19
- **Oilphase, 1998:** Core Photographs, well 30/9-19
- **Oilphase, 1998:** Conventional Core Analysis, well 30/9-19
- **Geoservice, 1999:** Final Well Report for well 30/9-19
- **Institutt for Energiteknikk, 1999:** Datareport on Stable Isotopes, Gas samples from well 30/9-19
- **Institutt for Energiteknikk, 1999:** Vitrinite Reflectance well 30/9-19 offshore Norway
- **Read Well Services, 1999:** Zero Offset VSP report, well 30/9-19, Sonic Calibration, Synthetic Seismograms, Checkshot report

APPENDIX I

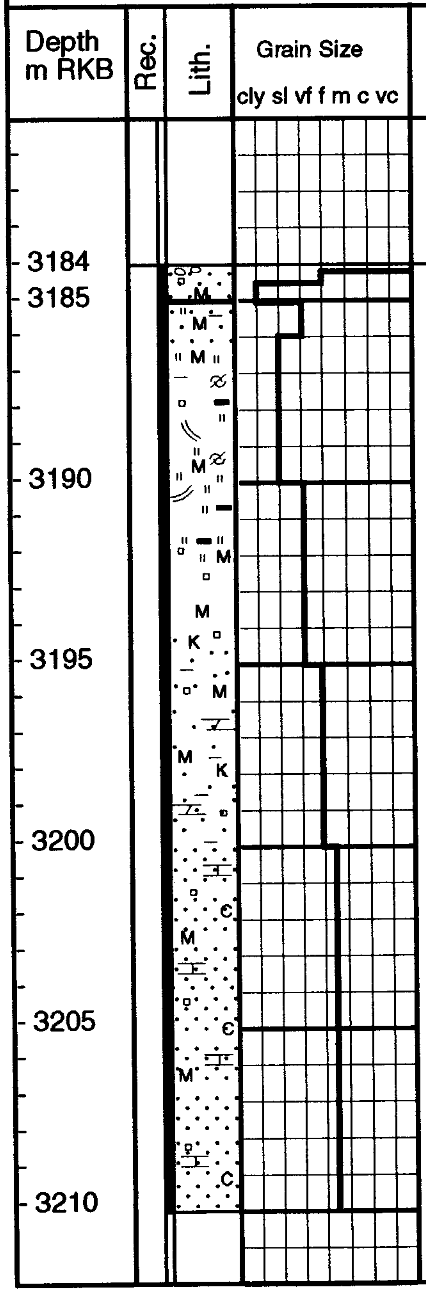
CORE DESCRIPTIONS

1 of 2

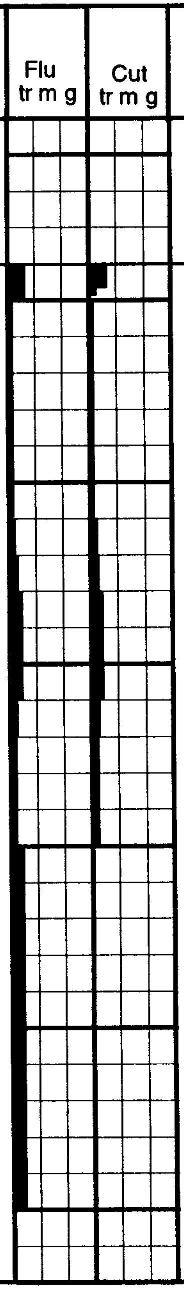
CORE REPORT

WELL: **30/9-19** DATE: 06.10.99 GEOL: B. Schønningsen/A. Hay SCALE: 1:200

CORE NO: 1 FROM: 3184 m TO: 3240.3 m CORED: 56.3 m REC: 100%



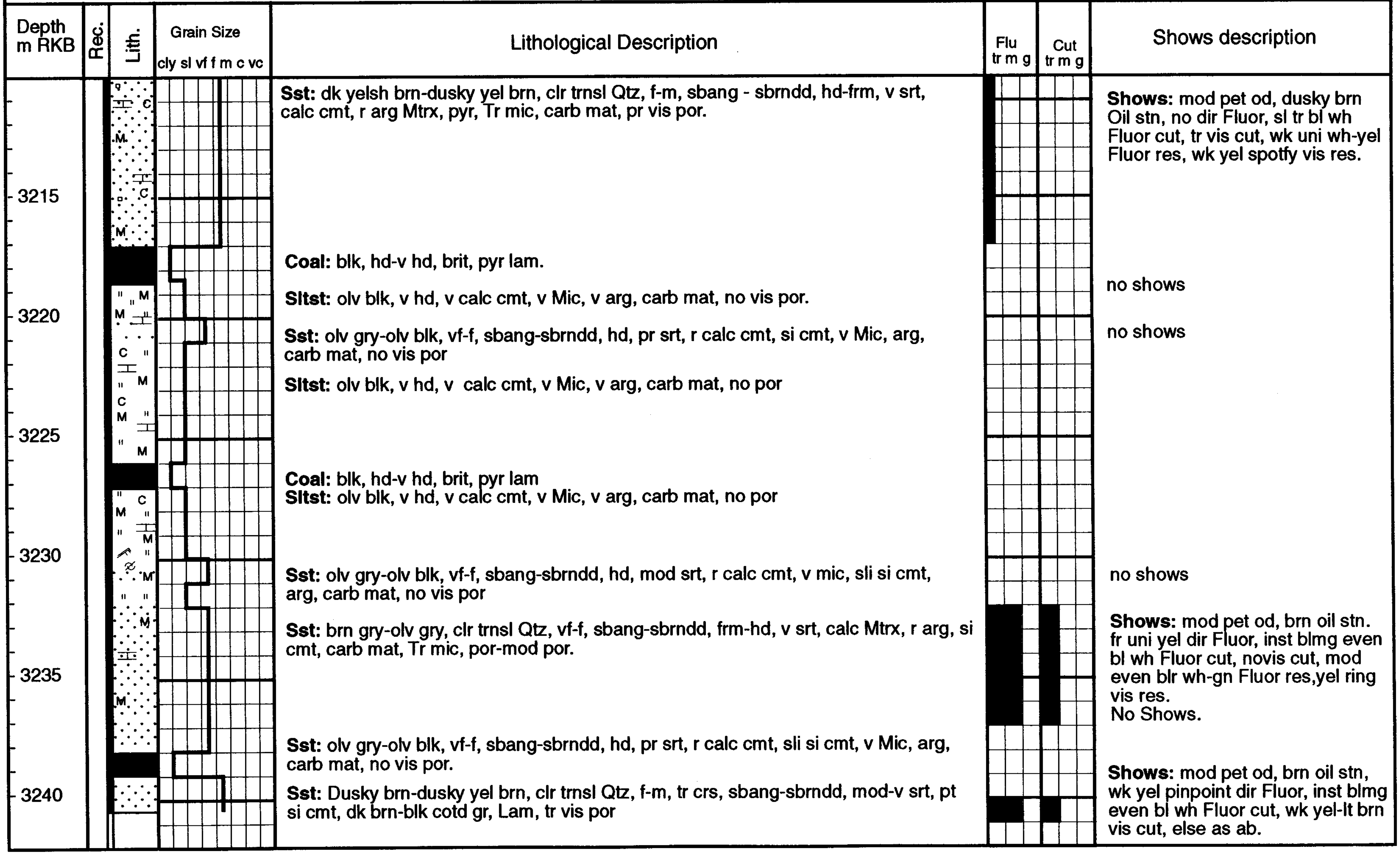
Lithological Description	Shows description
Sst: m-dk gry, v pl yel-wh Qtz, clr-trnsl com, vf-m, sbrndd-sbang, mod-wl srt, arg & carb Mtrx, occ Pyr cmtd, w/abd coaly Mat, v r boulders & lge Clst rip-up clast, abd Mic flks, pr-mod pr intgran por.	**Shows:** mod strg HC od, yelsh brn-dusky yelsh brn O stn, no dir fluor, abd pin pt slow strmg cut fluor, v wk pl Straw vis cut fluor, wk pl yel res ring fluor, no vis res, mod-pr show
Sltst: dk yelsh brn-brnsh gry, brnsh blk-olv blk, occ grysh blk, v mic&micromic w/abd **C** frag's, com Pyr plnt rems, com arg Mat, w/mic ptg, parallel x-lams vis I.P., com bioturbation, Tr graded bdg.	**Shows:** v fnt HC od, no HC stn, non-v r Tr carb fluor, v slow pl gnsh wh-mky wh wk blmg cut fluor, no vis fluor, no res fluor, no vis res, v pr show.
Sst: pl yelsh brn-dk yelsh brn, clr-mky Qtz, com trnsl-Opq, vf-f, bcm dom f, loc grad **Sltst**, sbang-sbrndd, mod-wl srt, firm-fri, mod w/cmtd, w/slily Dol cmt, com Kao&arg Mtrx, loc abd Mic flks, abd O stn gr's, micropyr, mod-pr intgran por.	
Sst: dk yelsh brn-dusky yel brn, clr trnsl Qtz, f-m, sbang-sbrndd, frm-hd, occ v hd, v srt, calc cmt, arg Mtrx, v pyr, Tr Mic, r carb mat., pr - mod vis por	**Shows:** wk-mod pet od, dusky brn Oil stn, no dir Fluor, slo tr bl wh Fluor cut, no vis cut, wk-v wk spotty bl wh Fluor Res. no - wk yel spotty-ring vis Res.



CORE REPORT

WELL: 30/9-19 DATE: 08.10.98 GEOL: B. Schønningsen/A. Hay SCALE: 1:200

CORE NO: 1 FROM: 3184 m TO: 3240.3 m CORED: 56.3 m REC: 100%



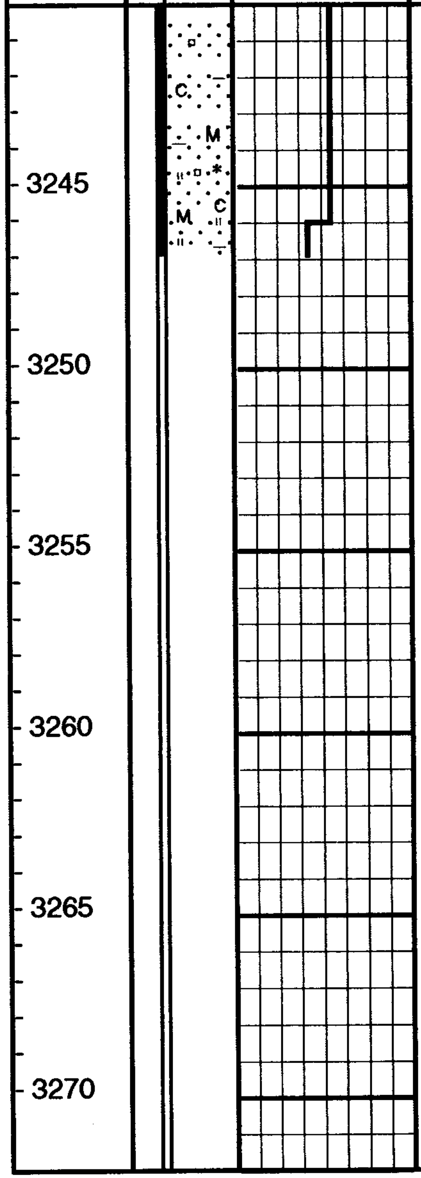
Lithological Description	Shows description
Sst: dk yelsh brn-dusky yel brn, clr trnsl Qtz, f-m, sbang - sbrndd, hd-frm, v srt, calc cmt, r arg Mtrx, pyr, Tr mic, carb mat, pr vis por.	**Shows:** mod pet od, dusky brn Oil stn, no dir Fluor, sl tr bl wh Fluor cut, tr vis cut, wk uni wh-yel Fluor res, wk yel spotfy vis res.
Coal: blk, hd-v hd, brit, pyr lam.	
Sltst: olv blk, v hd, v calc cmt, v Mic, v arg, carb mat, no vis por.	no shows
Sst: olv gry-olv blk, vf-f, sbang-sbrndd, hd, pr srt, r calc cmt, si cmt, v Mic, arg, carb mat, no vis por	no shows
Sltst: olv blk, v hd, v calc cmt, v Mic, v arg, carb mat, no por	
Coal: blk, hd-v hd, brit, pyr lam	
Sltst: olv blk, v hd, v calc cmt, v Mic, v arg, carb mat, no por	
Sst: olv gry-olv blk, vf-f, sbang-sbrndd, hd, mod srt, r calc cmt, v mic, sli si cmt, arg, carb mat, no vis por	no shows
Sst: brn gry-olv gry, clr trnsl Qtz, vf-f, sbang-sbrndd, frm-hd, v srt, calc Mtrx, r arg, si cmt, carb mat, Tr mic, por-mod por.	**Shows:** mod pet od, brn oil stn. fr uni yel dir Fluor, inst blmg even bl wh Fluor cut, novis cut, mod even blr wh-gn Fluor res,yel ring vis res. No Shows.
Sst: olv gry-olv blk, vf-f, sbang-sbrndd, hd, pr srt, r calc cmt, sli si cmt, v Mic, arg, carb mat, no vis por.	
Sst: Dusky brn-dusky yel brn, clr trnsl Qtz, f-m, tr crs, sbang-sbrndd, mod-v srt, pt si cmt, dk brn-blk cotd gr, Lam, tr vis por	**Shows:** mod pet od, brn oil stn, wk yel pinpoint dir Fluor, inst blmg even bl wh Fluor cut, wk yel-lt brn vis cut, else as ab.

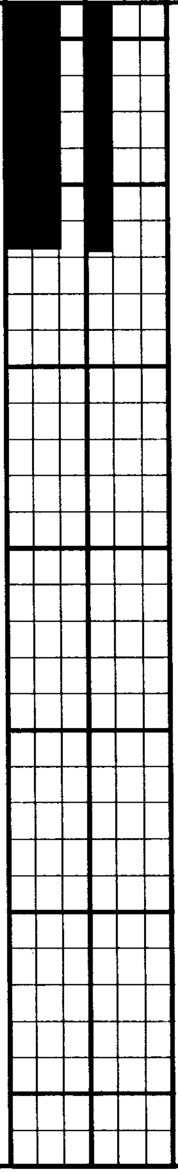
CORE REPORT

WELL: **30/9-19** DATE: 08.10.98 GEOL: B. Schønningsen/A.M.Hay SCALE: 1:200

CORE NO: 2 FROM: 3240.3 m TO: 3254.5 m CORED: 6.4 m REC: 45.1%

Depth m RKB	Rec.	Lith.	Grain Size cly sl vf f m c vc	Lithological Description	Flu tr m g	Cut tr m g	Shows description
				Sst: brnsh blk-dusky yelsh brn, bcm pl dusky yelsh brn-pl yel, dom f-m, loc crs, sbang-sbrndd, mod spher, mod wl srt, fri I.P., wl cmtd gen, slily calc cmt, occ mass pyr, loc arg/carb, abd O stn gr's, v com carb cotgd gr's, mic I.P., mod-pr intgran por.			**Shows:** Dom strg HC od, yelsh brn O stn, pch dir fluor, instant bri wh blmg cut fluor mod strg yelsh gn vis fluor, mod strg wh-v pl gnsh yel res fluor, v pl straws vis res, mod show



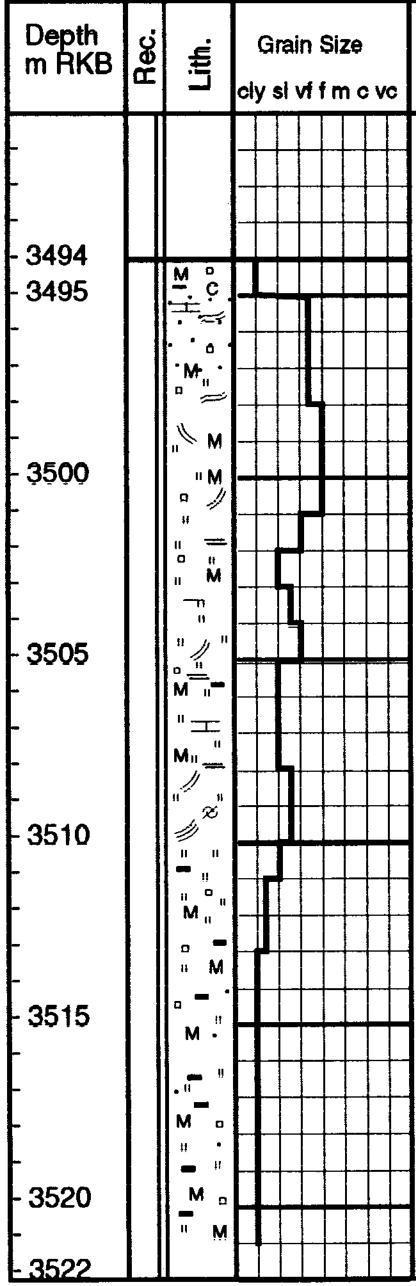


CORE REPORT

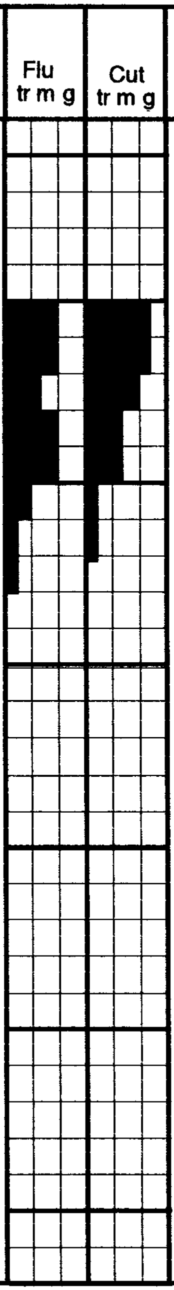
HYDRO

WELL: 30/9-19　DATE: 16.10.98　GEOL: A.M. Hay/C.E. Dons　SCALE: 1:200

CORE NO: 3　FROM: 3494 m　TO: 3522 m　CORED: 28 m　REC: 3494-3521.3m (97.6%)



Lithological Description	Shows description
Clst: dusky yelsh brn-brnsh blk, hd-v hd, blky-sbtab, w/shp brk, slty app, w/loc abd micromic microlams, abd micropyr, tr carb, coaly deb, gen non-calc.	
Sst: gen homog slily mic Sst, w/occ wvy&planar Mic/arg ptgs& r cly flks dk yelsh brn-yelsh brn, yelsh brn-trnsl/opg Qtz, dom f-vf, sbang-sbrndd, mod wl srt, hd, loc fri, mod wl-wl cmtd, calc cmtd, w/abd mic flks, arg frag's, w/r pl gn Glauc gr's, pr-mod por.	Mod strg pet od, 90 - 100% gen homog slily pch bri yel-dull yel gn dir fluor, mod fast pl wh-mky wh blmg cut, mod fast strg wh-pl yel strmg cut, no vis cut, wk-mod strg pl yel-crm res fluor cut, no vis res, mod gd shows.
Sltst: brnsh blk-m dk gry, bcm v pl yelsh gry-v lt gry, m-lt gry w/v wl der Mic planar lams, grad vf sol I.P. w/slily aren sdy lenses, w/r blk/carb/plnt rems, w/r micro-trough x bdg, occ lge cly flks, occ bioturb.	No pet od, no dir fluor, slow v pl wh diffuse, blmg fluor cut, no vis cut, no res fluor cut, no vis res, vpr-pr show
Clst: brnsh blk-olv blk, hd-v hd, brit, shp brk, v wl ind, v hvly Mic, w/abd vf dissem micropyr, loc lge Pyr wd frags, coaly deb, & r vf sd gr's incld, grad slty, **Clst** loc v carb.	No shows.



APPENDIX II

SIDEWALL CORE DESCRIPTIONS

NORSK HYDRO

SIDE WALL CORE DESCRIPTION

WELL: 30/9-19
RIG : West Delta

Run: 2A | Date 21-22.10.98 | Logging Co Schlumberger Eng. T.Barr | Page : 1 of 3
Shot: 30 | Misfired: 0 | Lost: 3 | Empty : 1 | Recoverd 26 | Geologist C.Dons

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	G
1	3136,5	2	Sltst/Sst: lt gry-lt brngry, Qtz, vf-slt, fri, sbang, mod srt, frm, non calc, mnr mic, r glauc, mod arg, r pyr, r carb, sl lam, modvis por Shows: nor dir flu, slo strmg, yel-bl wh fluor cut, no vis cut, wk bri yel fluor res, fnt straw vis res					X	
2	3127	2,5	Sltst/Sst: dk gry-brngry, Qtz, vf-slt, fri, sbang, mod srt, frm, non calc, mnr mic, r glauc, mod arg, r pyr, r carb, sl lam, modvis por Shows: nor dir flu, slo strmg, yel-bl wh fluor cut, no vis cut, wk bri yel fluor res, fnt straw vis res					X	
3	3115,5	2	Sst: lt brn gry-brn gry,Qtz, vf, fri, sbang, mod srt, frm, non calc, mnr mic, r glauc, mod arg, r pyr, r carb, sl lam, modvis por Shows: no dir flu, slo strmg, yel-bl wh fluor cut, no vis cut, wk bri yel fluor res, fnt straw vis res				X		
4	3112,5	2	Clst: brn blk-brn gry, frm-plas, non calc, abd mic, sli slty, lam						
5	3107,5	2	Clst: brn blk-brn gry, frm, sl calc, abd mic, tr slty, lam						
6	3099	2	Sst: brn gry, Qtz, vf-slty, fri, sbang, mod srt, frm, sl calc, mod arg, mnr mic, r glauc, mod arg, r pyr, tr carb, sl lam, pr vis por Shows: no dir flu, slo strmg, bl wh fluor cut, no vis cut, wk bri yel fluor res, fnt straw vis res				X		
7	3097	0	Empty						
8	3092	2	Clyst: med dk gry, mod hd, v calc, xln calc, plt rem, calc microfos, r glau, r Sd. carb, sl lam (Draupne) Shows on Clyst: wk slo blmg yel wh flu cut, bri yel flu res				X		
9	3090	2	Clyst: med dk gry- dk gry, mod hd, v calc, xln calc, plt rem, calc microfos, abd micropyr, carb (Draupne) Shows on Clyst: wk slo blmg yel wh flu cut, bri yel flu res				X		
10	3088	2,5	Clyst: gry blk-brn blk, mod hd, sl calc, r plt rem, r micropyr, tr micromic, carb , tr slick, hom (Draupne) Shows on Clyst: v wk slo blmg yel wh flu cut, bri yel flu res				X		

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO	SIDE WALL CORE DESCRIPTION	WELL: 30/9-19 RIG : West Delta

Run:	Date	Logging Co Schlumberger			Page : 2 of 3
Shot:	Misfired:	Lost:	Empty :	Recoverd	Geologist

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	G
11	3086	3	Clst: med dk gry-brn gry, mod hd, non calc, r micromic, hom						
12	3082,5	3	Clst: med dk gry-dk gry, mod hd, non calc, r micromic, hom						
13	3079,5	2,5	Clst: lt brn gry-med gry, frm-fri, non calc, abd vf sdy, mic, carb frag, r glau						
14	3077	4	Clyst/Coal: blk-brn blk, mod hd, non calc, abd frag Coal, r micropyr, plt rem, coaly lam,. Coal: hd, blky, brit, conch, shiny						
15	3073,5	2,5	Sst: lt gry-lt brn gry, Qtz, vf-r m, fri-lse, sbang, w srt, sl calc, r carb frag, tr micropyr, hom, fair vis por Shows: no dir flu, v wk bl wh flu crush cut				X		
16	3072,5	0	LOST						
17	3068	3,5	Coal: blk, hd, blky, brit, conch, tr pyr, shiny, layered + fragments						
18	3065	4	Coal: blk, hd, blky, brit, arg in pt, conch, tr pyr, shiny,						
19	3063	1,5	Ls: v lt gry, micro-cryptoxln, mod hd-hd, blky, v calc, arg, r glauc, hom						
20	3057,5	2	Clst: mod brn-gry rd, frm, non calc, r micromic, hom						

Tr:Trace M:Medium G:Good

Comments:

2
3
1
1,5
1

NORSK **HYDRO**	**SIDE WALL CORE DESCRIPTION**	**WELL:** 30/9-19 **RIG :** West Delta

Run:	Date	Logging Co Schlumberger			Page : 3 of 3
Shot:	Misfired:	Lost:	Empty :	Recoverd	Geologist

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	G
21	3055	3	Clst: gry blk, mod hd, non calc, r micromic, hom						
22	3052,5	1,5	Clst: mod brn, fri, sl calc, r micromic, hom						
23	3048	0	LOST						
24	3040	0	LOST						
25	3030	2	Clst: med lt gry altg dk gry + blk (1mm lam), fri, v calc, vf slty lam w/ abd glauc altg w/ 1mm coaly-carb lam						
26	3029	3	Clst:med lt gry altg dk gry + blk (1mm lam), fri, v calc, vf slty lam w/ abd glauc altg w/ 1mm coaly-carb lam						
27	3007,5	1	Clst: med dk gry, mod hd, mod calc, r micromic, hom-sl lam						
28	2999	1,5	Clst: med dk gry, mod hd, sl calc, r micromic, hom						
29	2988	1	Clst: med dk gry, mod hd, sl calc, r micromic, hom						
30	2975	1,5	Clst: med dk gry, mod hd, sl calc, r micromic, hom						

Tr:Trace M:Medium G:Good

Comments:

APPENDIX III

WELL SUMMARY

GEOLOGICAL WELL SUMMARY

MDT RESULTS

WELL SUMMARY:

Coord: 60° 27' 35.38"N
02° 41' 38.94"E
UTM: 6 702 819.9 N
483 176.9 E
Zone: ED50, UTM Zone 31, CM 3° E
Line: NH9201, Inline 439
xline 1341
Rig: West Delta
Waterdepth: 105 m MD
Stopped in: Dunlin Gp.

On location: 06.09.98
Spudded: 09.09.98
At T.D.: 17.10.98
Completed: 25.10.98
T.D. Driller: 3560 m
T.D. Logger: 3556.5 m
Wireline Logging: Schlumberger
Mudlogging: Geoservice

WELL:
30/9-19

COUNTRY
Norway

OPERATOR Norsk Hydro **LICENCE** PL169

OWNED BY:

TARGETS

Primary: Tarbert Fm.
Secondary: ORE Fm.

RESULTS

Gas discovery i Sandstone ~ 3073 m (Cretaceous)
Gas discovery in Tarbert 3 - Tarbert 2
Oil discovery in Tarbert 1
Gas zone in Ness sand ~ 3450 m
Oil zone in ORE 3485 - 3503 m
Well sidetracked as 30/9-19A

CASING

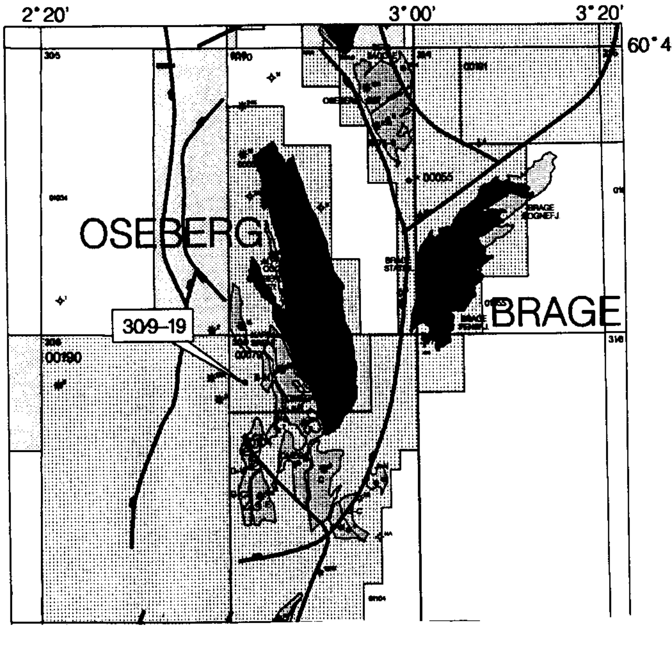
30" 231 m MD
20" 1198 m MD
13 3/8" 2318.5 m MD
9 5/8" 2907 m MD

CORES

#1 C: 3184 - 3240.3 m
R: 100% Cut 56.3 m

#2 C: 3240.3 - 3254.5 m
Cut: 14.2 m Rec: 6.4 m
Rec: 45.1%

#3 C: 3494 - 3522 m
Cut: 28.0 mRec: 27.3 m
Rec = 97.6%



GAS RECORD

134 - 1205 m: Returns to seabed

1205-1610 m	0 - 0.01%	C1
1610-1800m	0.03 - 0.25%	C1 - C2 tr C3
1800-2329m	0.2 - 0.95%	C1 - nC4
2329-2922m	0.21 - 0.71%	C1 - nC4
2922-2958m	0.1 - 0.24%	C1 - nC4
2958-3064m	0.15 - 0.49%	C1 - nC4
3064-3114m	0.88 - 3.82%	C1 - nC4
3114-3184m	5.03 -12.98%	C1 - nC4
3184-3218m	12 - 15%	C1 - nC5*
3218-3230m	15 - 15.7%	C1 - nC5
3230-3240m	9.4 - 15.8%	C1 - nC5
3240-3251m	1.7 - 15.8%	C1 - nC5
3251-3402m	1 - 2%	C1 - nC5
3402-3450m	4.2 - 11.4%	C1 - nC5
3450-3494m	0.3 - 7.6%	C1 - nC5
3494-3560m	0.3 - 0.5%	peak 19.9 @ 3490.8

* GAS Logger had detective seal - gas extrapolated in Gas/oil zone

LOGS

MWD/CDR/GR/ RES/DIR	134 - 3184
MWD/DR/GR/ RES/DIR	3245 - 3552
PEX/HALS/MCFL/ CNL/TLD/GR(1A)	134 - 3255
MDT/AMS/GR(1A)	3247 - 3247
PEX(HALS/MSFL/ CNL/TLD/GR (2B)	3556,5 - 3200
FMI/NGT/DSI (2A)	3556,5 - 2907
VSP/GR (2A)	3198 - 2530
VSP/GR (2B)	3520 - 3190
MDT/GR (2B)	3029 - 3497
CMR/GR (2A)	3515 - 3065
CST/GR (2A)	3136,5 - 2975

OIL SHOWS

3232 - 3240	- mod pet od, brn oil stn, fair uni yel dir fluor, inst blmg even bl-wh fluor cut, no vis cut, mod even bl-wh-gn fluor res, yel ring vis res.
3485,5 - 3494	- dull yel-bri yel dir fluor, slow-mod fast wh-pl yelsh gn blmg fluor cut, slo wh-pl yel strmg pinpt fluor cut, gen no vis cut, v pl straw vis cut, pl wh-pl yelsh crm fluor res, no vis res.
3494 - 3503/4	- mod strg pet od, 90-100% gen hom slily pch bri yel-dull yel gn dir fluor, mod fast pl wh-mky wh blmg Fluor cut, mod fast strg wh-pl yel strmg Fluor cut, no vis cut, wk-mod strg pl yel crm res fluor, no vis res.

GEOLOGICAL WELL SUMMARY

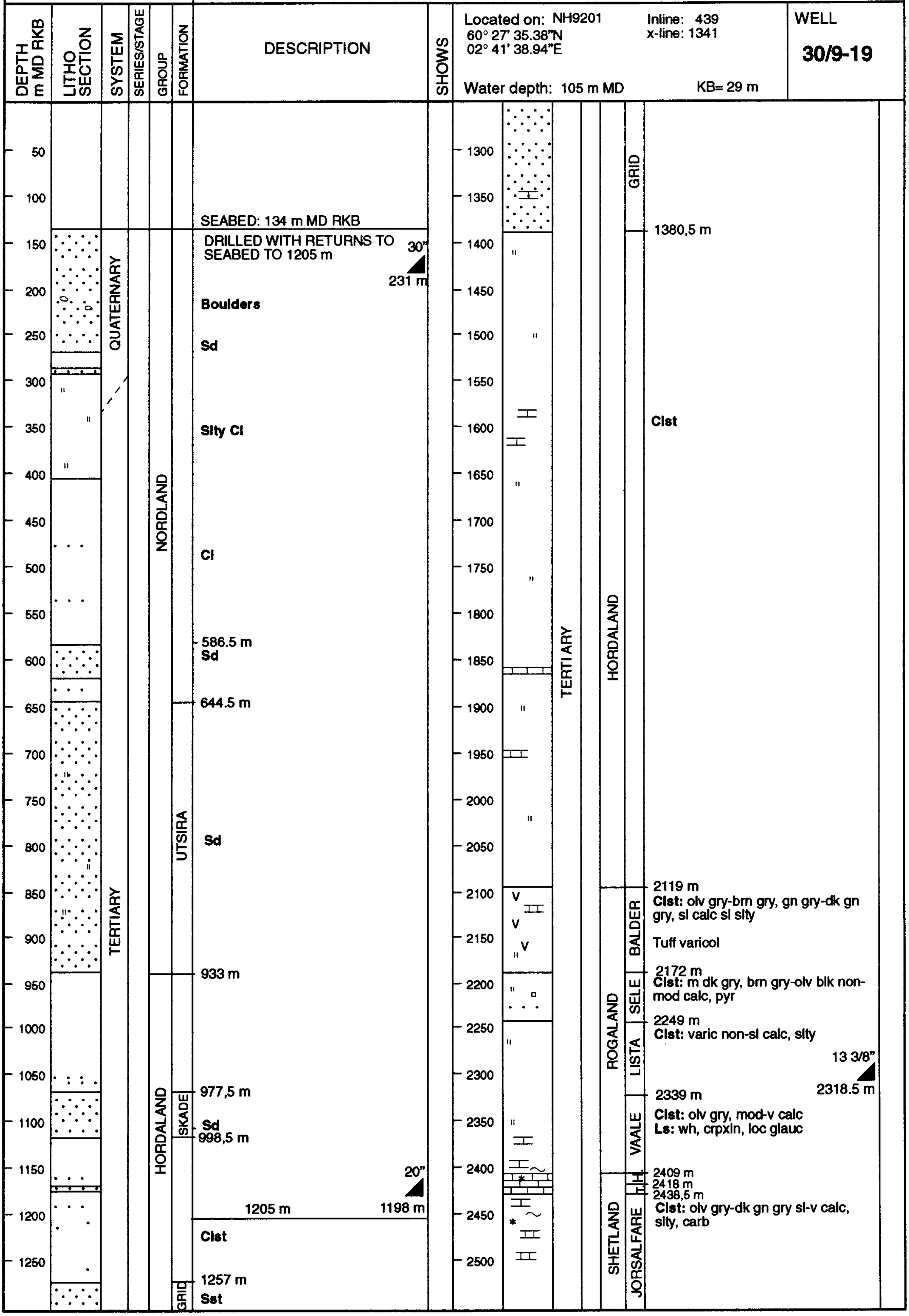
Located on: NH9201
60° 27' 35.38"N
02° 41' 38.94"E

Inline: 439
x-line: 1341

Water depth: 105 m MD

KB= 29 m

WELL
30/9-19



SEABED: 134 m MD RKB

DRILLED WITH RETURNS TO SEABED TO 1205 m

Boulders

Sd

Slty Cl

Cl

586.5 m
Sd

644.5 m

Sd

933 m

977,5 m

Sd
998,5 m

1205 m

Clst

1257 m
Sst

1380,5 m

Clst

2119 m
Clst: olv gry-brn gry, gn gry-dk gn gry, sl calc sl slty

Tuff varicol

2172 m
Clst: m dk gry, brn gry-olv blk non-mod calc, pyr

2249 m
Clst: varic non-sl calc, slty

2339 m
Clst: olv gry, mod-v calc
Ls: wh, crpxln, loc glauc

2409 m
2418 m
2438,5 m
Clst: olv gry-dk gn gry sl-v calc, slty, carb

T. = Tor
H.= Hardråde

GEOLOGICAL WELL SUMMARY

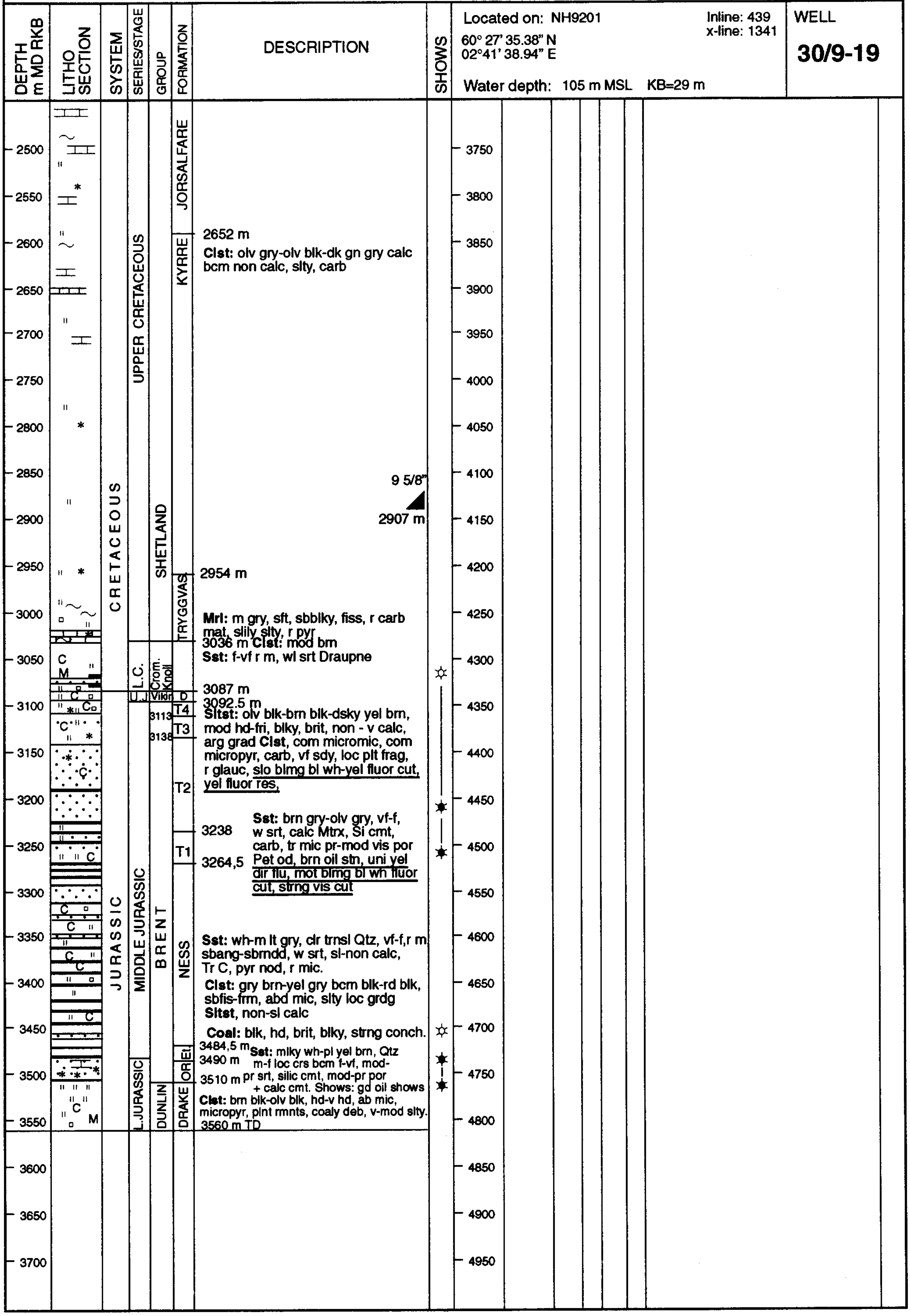
Located on: NH9201

60° 27' 35.38" N
02°41' 38.94" E

Inline: 439
x-line: 1341

Water depth: 105 m MSL KB=29 m

WELL
30/9-19



2652 m
Clst: olv gry-olv blk-dk gn gry calc bcm non calc, slty, carb

2954 m

Mrl: m gry, sft, sbblky, fiss, r carb mat, slily slty, r pyr

3036 m **Clst:** mod brn

Sst: f-vf r m, wl srt Draupne

3087 m

3092.5 m

Sltst: olv blk-brn blk-dsky yel brn, mod hd-fri, blky, brit, non - v calc, arg grad **Clst**, com micromic, com micropyr, carb, vf sdy, loc plt frag, r glauc, slo blmg bl wh-yel fluor cut, yel fluor res,

3238

3264,5

Sst: brn gry-olv gry, vf-f, w srt, calc Mtrx, Si cmt, carb, tr mic pr-mod vis por Pet od, brn oil stn, uni yel dir flu, mot blmg bl wh fluor cut, strng vis cut

Sst: wh-m lt gry, clr trnsl Qtz, vf-f,r m sbang-sbrndd, w srt, sl-non calc, Tr C, pyr nod, r mic.

Clst: gry brn-yel gry bcm blk-rd blk, sbfis-frm, abd mic, slty loc grdg **Sltst**, non-sl calc

Coal: blk, hd, brit, blky, strng conch.

3484,5 m

3490 m

3510 m

Sst: mlky wh-pl yel brn, Qtz m-f loc crs bcm f-vf, mod-pr srt, silic cmt, mod-pr por + calc cmt. Shows: gd oil shows

Clst: brn blk-olv blk, hd-v hd, ab mic, micropyr, plnt rmnts, coaly deb, v-mod slty.

3560 m TD

FORMATION PRESSURE WORKSHEET

Well Name : 30/9-19 **Rig :** West Delta **Date :** 8.-12.10.98

Pressure Units : Bars **RKB-MSL :** m. **MSL-SBed:** m. **Witnessed by :** J. Vik / J. Storegjerde

Run No./ Test No.	Depth	Depth	Initial Hydrostatic Pressure		Formation Pressure		Final Hydrostatic Pressure		Time hh:mm		Formation Pressure	Test Temp	Good Data?	Sample Information			Remarks
	mMD RKB	mTVD RKB	Strain	HP	Strain	HP	Strain	HP	Set		sg EMD	degC	Y/N	Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	
1A/1	3244,0	3244,0	402,71	404,20	341,69	341,822	403,17	403,23	10.10.98	11:05	1,074	120,2	Y	Oil			Mobility 340 mD/cp
1A/2	3243,0	3243,0	404,50	404,59	341,61	341,788	405,21	405,40	10.10.98	17:00	1,074	122,2	Y	Oil			Mobility 215 mD/cp
1A/3	3242,0	3242,0	404,32	404,52	341,57	341,733	404,50	404,60	10.10.98	17:14	1,074	122,1	Y	Oil			Mobility 110 mD/cp
1A/4	3241,0	3241,0	404,16	404,25	341,51	341,680	403,23	404,52	10.10.98	17:25	1,075	122,0	Y	Oil			Mobility 215 mD/cp
1A/5	3240,0	3240,0	404,28	404,65	341,45	341,620	405,15	405,44	10.10.98	17:35	1,075	121,8	Y	Oil			Mobility 160 mD/cp
1A/6	3234,0	3234,0	402,61	402,29	341,14	341,277	403,44	404,61	10:10.98	17:56	1,076	121,2	Y	Oil			Mobility 30 mD/cp
1A/7	3233,0	3233,0	403,61	404,10	341,07	341,248	403,98	403,03	11.10.98	00:33	1,076	121,3	Y	Oil			Mobility 60 mD/cp
1A/8	3215,0	3215,0	398,94	400,38	339,42	339,577	401,45	401,80	11.10.98	03:35	1,077	121,2	Y	Gas			Mobility 690 mD/cp
1A/9	3213,0	3213,0	400,10	400,09	339,38	339,534			11.10.98	03:45	1,077	120,6	Y	Gas			Mobility 665 mD/cp
1A/10	3210,0	3210,0	400,07	400,89	339,45	339,619	400,42	399,91	11.10.98	04:33	1,078	119,9	Y	Gas			Mobility 135 mD/cp
1A/11	3211,0	3211,0	400,87	400,29	339,34	339,509	400,24	400,41	11.10.98	04:45	1,078	119,9	Y	Gas			Mobility 290 mD/cp
1A/12	3207,0	3207,0	398,75	398,71	340,25	340,396	399,15	398,16	11.10.98	04:54	1,082	119,7	Y	Gas			Mobility 35 md/cp
1A/13	3204,0	3204,0	398,88	398,64	339,16	339,323	399,16	398,44	11.10.98	05:05	1,080	119,6	Y	Gas			Mobility 200 mD/cp
1A/14	3200,0	3200,0	398,14	398,61	339,05	339,206	399,57	398,03	11.10.98	05:16	1,081	119,4	Y	Gas			Mobility 480 mD/cp
1A/15	3196,0	3196,0	398,44	398,02	398,97	339,112	398,81	396,47	11.10.98	05:26	1,082	119,2	Y	Gas			Mobility 180 mD/cp
1A/16	3153,0	3152,2	393,53	393,25	337,93	338,051	393,90	393,84	12.10.98	05:00	1,093	116,9	Y	Gas			Mobility 140 mD/cp
1A/17	3168,5	3167,7	395,40	395,60	338,33	338,480	395,95	394,80	12.10.98	06:00	1,089	117,3	Y	Gas			Mobility 4200 mD/cp

NB: Fmtn Press sg calculated from RKB

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FORMATION PRESSURE WORKSHEET

Well Name : 30/9-19 **Rig: West Delta** **Date :** 21/10-1998'

Pressure Units : Bars **RKB-MSL :** 29 m. **MSL-SBed:** m. **Witnessed by :** C.Dons, A.Relbo,J.S.,S.Vik,G.Risberg

Run No./	Depth	Depth	Initial Hydrostatic		Formation Pressure		Final Hydrostatic		Time		Formation	Test Temp	Good	Sample Information			
Test No.			Pressure				Pressure		hh:mm		Pressure		Data?	Main	HC Gravity	Sample	Remarks
	mMD RKB	mTVD RKB	Strain	HP	Strain	HP	Strain	HP	Set	Retract	sg EMD	degC	Y/N	Fluid Type	g/cc	Vol, cc	Mobility [mD/cP]
2B/1	3029.0	3028.5	392.3	392.70		199.38	392.4	392.65	02:13	02:17		102.5	No			2.3'	Tight, 2.3
2B/2	3073.0	3072.5	398.1	398.30	344.0	344.44	398.1	398.29	02:26	02:32	1.14	103.4	Yes			20	271.3
			400.3	398.21	347.3	344.34	401.2	398.15	02:41	05:03		103.5	Yes		Sample	450	
2B/3	3488.5	3487.5	454.5	451.09	433.7	430.67	454.6	451.13	05:44	08:38	1.26	116.5	Yes		Sample	450	22.6 (Large Diam. Probe)
			***		***		***						Yes		Sample	2x250	22.6 (Large Diam. Probe)
													Yes		Sample	2x1 gal	22.6 (Large Diam. Probe)
2B/4	3115.0	3114.5	403.0	403.11		339.22	402.9	403.14	10:24	10:26		110.3	?			1.5'	0.5
2B/5	3116.0	3115.5	403.1	403.29	337.0	337.33	403.0	403.33	10:43	10:49	1.10'	100.5	Yes			4.9'	5.2
2B/6	3117.0	3116.5	403.2	403.43	337.6	337.87	403.2	403.43	10:54	11:02	1.11'	108.2	?			2.7'	0.5
2B/7	3256.0	3255.0	420.9	421.24		388.45	420.9	421.26	11:17	11:29		110.9	?			4.3'	Supercharged ? , 1.2
2B/8	3258.7	3257.7	421.4	421.56					11:35	11:39		111.5	No			3.4'	Tight
2B/9	3301.0	3300.0	426.7	426.98	355.7	356.11	426.7	426.98	11:46	11:53	1.10'	112.8	Yes			20'	17.7'
2B/10	3303.0	3302	427.0	427.26	356.0	356.28	427.1	427.31	12:27	12:35	1.10'	114.5	Yes			20'	69.0'
2B/11	3290.0	3289.0	425.4	425.59	355.8	356.07	425.5	425.61	12.40	12.53		114.7	?			2'	1.4
2B/12	3289.0	3288.0	425.1	425.44	356.4	356.66	425.1	425.47	12.55	13:05		114.5	?			2.8'	1.9
2B/13	3344.0	3343.0	432.2	432.46	363.6	363.93	432.3	432.49	13:11	13:20	1.11'	114.6	Yes			20'	10.8'
2B/14	3455.0	3454.0	446.5	446.85	410.1	410.51	446.5	446.92	13:33	13:39	1.21'	118.2	Yes			20'	400.2
2B/15	3497.0	3496.0	451.9	452.28	432.6	432.95	451.9	452.26	13:49	13:59		119.3	?			7'	0.8
2B/16	3489.0	3488.0	450.9	451.24	n/a	327.85	n/a	n/a	14:01	14:09			No			4.5'	Tight
2B/17	3488.5	3487.5	450.8	451.14	430.3	430.64	450.8	451.13	14:11	14:16	1.26'	121.3	Yes			20	50.5'
2B/18	3485.0	3484.0	450.4	450.67	430.2	430.50	450.4	450.69	14:20	14:27	1.26'	121.5	Yes			20	6.9'
2B/19	3257.0	3256.0	421.0	421.05	n/a	292.29	n/a	n/a	17:23	17:28		117.0	No			3.5'	Tight
2B/20	3256.5	3255.5	420.9	421.00	n/a	291.77	n/a	n/a	17:30	17:35		115.9	No			3.1'	Tight
2B/21	3255.8	3254.8	420.8	420.93	387.9	388.18	420.9	420.38	17:38	17:49	1.22'	116.4	Yes			6.1'	2.4, Standard Probe
2B/22	3255.8	3254.8	***	420.92	***	388.13	***	420.96	17:55	18:10	1.22'	116.5	Yes			20	4.7 Big Diam. Probe

NB: Formation Pressure sg calculated from RKB

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SECTION B

OPERATIONS

Prepared by: Ivar Vee Aune Verified by: Thor Andre Løvoll Approved by: Tor Johan Skakstad

Ivar Vee Aune Thor A. Løvoll Tor Skakstad

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TABLES

FIGURES

1 DRILLING SUMMARY AND EXPERIENCES

1.1 Mobilising

Total time used:	185.0 hrs
Operational time:	79.5 hrs (43.0 %)
Downtime:	105.5 hrs (57.0 %)

For a detailed breakdown, see report 1-3.

Wellhead co-ordinates:

6702819.9 mN	483176.9 mE

The rig heading was 298°.

1.2 36" Hole Section / 30" Conductor

Total depth of section: 231 mMD.

Total time used:	36.5 hrs .
Operational time:	30.5 hrs (83.6 %)
Downtime:	6.0 hrs (16.4 %)

For a detailed breakdown, see report 3-6.

1.2.1 Drilling

The well was spudded at 11 am September 8, 1998.

The 36" hole was drilled with sea water from 134 mMD to 231 mMD. A six armed heavy duty hole opener with a 17 1/2" insert bit was used.

Boulders were registered between 217 and 231 mMD. A wiper trip was performed to TD and the hole was partially displaced to 1.50 sg mud.

1.2.2 Casing

The 30" casing was run with a PGB and cemented back to the sea floor. The casing was grouted after running the 20" casing.

1.3 9 7/8" x 26" Hole Section / 20" Casing

Total depth of section: 1198 mMD.

Total time used:	213.5 hrs
Operational time:	187.5 hrs (87.8 %)
Downtime:	26.0 hrs (12.2 %)

For a detailed breakdown, see report 6-14.

1.3.1 Drilling

Due to a shallow gas warning, a 9 5/8" pilot hole was drilled and then opened to 26". In both cases an insert bit was chosen. No gas was encountered.

The section was drilled with sea water and viscous pills.

A wiper trip to TD was performed and the hole was displaced to 1.20 sg mud prior to running the 20" casing.

1.3.2 Casing

The casing had to be worked through tight spots from 265 to 279 mMD. A maximum weight of 45 tons was applied to the casing.

The casing was cemented according to the programme, but the plug did not bump even after over displacing with 1/2 shoe track.

1.4 17 1/2" Hole Section / 13 3/8" Casing

Total depth of section:	2318.5 mMD.
Total time used:	164.0 hrs
Operational time:	159.5 hrs (97.3 %)
Downtime:	4.5 hrs (2.7 %)

For a detailed breakdown, see report 14-21.

1.4.1 Drilling

Ran BOP prior to drilling this section. One guide wire was loosened, so the BOP was landed with three wires.

An LOT was performed to 1.62 sg EMW after having drilled out the cement and three meters of new formation.

An insert bit was used throughout the section. The mud weight at the start of the section was 1.3 sg, but pore pressure calculations showed that it was necessary to increase this to 1.45 sg at 1550 mMD.

The ROP decreased drastically in the Lista formation, and it was decided not to drill to the planned casing depth at 2450 mMD.

No wiper trip was performed.

1.4.2 Casing

The casing was run and cemented according to the program.

When pressure testing the casing, the pressure dropped off after reaching 245 bars. A wash out was later discovered in the landing string. The casing was pressure tested again when running in hole with the 12 1/4" drilling assembly.

1.5 12 1/4" Hole Section / 9 5/8" Casing

Total depth of section: 2907.4 mMD.

Total time used:	195.0 hrs
Operational time:	143.5 hrs (73.6 %)
Downtime:	51.5 hrs (26.4 %)

For a detailed breakdown, see report 21-26.

1.5.1 Drilling

The BOP was pressure tested to 455 bar prior to start of drilling.

The section was drilled with 1.35 sg KCl mud.

An LOT to 1.70 sg EMW was performed after drilling out the shoe and three meters new formation.

The drilling was stopped at 2922.5 mMD due to steering problems caused by the angle of the formation layers and an agressive bit. It was impossible to orient the tool face and further drilling in the same direction would have resulted in missing the first target. Planned TD of section was 3090 mMD.

1.5.2 Logging

Due to a shorter section, the planned logging was not performed.

1.5.3 Casing

The casing was run according to program.

The cement was not displaced properly due to a wash out in the 5" U-170 drill pipe used as landing string. The wash out was discovered when pulling the landing string. This wash out was probably what had caused problems during the pressure test of the previous casing. Wet cement was cleaned out of the BOP area using a jet sub. A milled tooth bit was run to drill out the cement inside the casing. Cement was tagged at 2567 mMD. No cement was found below the float collar. A cement stinger consisting of 3 1/2" drill pipe was run and a balanced cement plug was sat and squeezed into the annular space. The cement was held back with 97 bar pressure for 9 hrs.

1.6 8 1/2" Hole Section

Total depth of section: 3560 mMD.

Total time used:	437.5 hrs
Operational time:	301.0 hrs (68.8 %)
Downtime:	136.5 hrs (31.2 %)

For a detailed breakdown, see report 26-47

1.6.1 Drilling

An LOT to 1.81 sg EMW was performed after having drilled the shoe track and three meters of new formation.

An insert bit was used to drill down to the first coring point. The direction of the well was changed to make sure target would be hit, thus most of this section was drilled in steering mode. The first coring point was recognised at 3184 mMD.

After having cored from 3184 to 3255 m, a PDC bit was used to drill to the second coring point at Top Ness. The bit was pulled at 3450 mMD, when a gross error in an LWD correction factor made the geologists believe that Top Ness had been found. The error was discovered when the coring assembly was being made up, and the bit was run in hole again for further drilling. Drilling was stopped at 3494 mMD.

After the second coring, from 3494 to 3522.5 m, the same PDC bit was rerun to drill a rat hole for the logging suites. The drilling was stopped at 3637 mMD which is the TD of 30/9-19.

1.6.2 Coring

A total of three cores where cut in 30/9-19

Run #	Cored interval [mMD]	ROP [m/h]	Recovery [%]	Reason pulled
1	3184.0 - 3238.5	45.8	100	Full barrel
2	3238.5 - 3255.0	3.4	45.1	Core jammed
3	3494.0 - 3522.5	28	97.5	Core jammed

The first two coring runs where performed in the Tarbert 2 sand. The third was performed in the ORE formation.

CST side wall coring was performed on wireline in the two reservoir sections. Thirty shots were fired, and the recovery was 86.7 %.

1.6.3 Logging

The following logs were run:

Log suite	Logged interval [mMD]	Comments
PEX	2907.0 - 3254.0	Run after coring T2
MDT	Tarbert 2 Form.	Stuck. Freed w/ overshot
PEX	2907.0 - 3560.0	
FMI, NGT, DSI, AMS	2907.0 - 3560.0	Computer failure
FMI, NGT, DSI, AMS	2907.0 - 3560.0	Rerun due to comp. failure
CMR, GR	2907.0 - 3560.0	
VSP, GR	3560.0 - 2907.0	One geophone
MDT	Reservoir sections	Samples and press. points
CST	Reservoir sections	30 shots, 86.7 % recovery

The PEX logging suite consisted of HALS, TDL, HGNS, GPIT and AMS.

The first MDT logging suite got stuck when sampling. An over shot was stripped in hole, and the tool was worked free. A torpedo connection was installed before logging was continued. Samples were taken at 3244, 3234 and 3233 m, pressure points were taken between 3196 and 3215 mMD.

When running in with the VSP suite, the tool hung up due to uncontrolled opening of spring loaded centralising arms. Three of the four geophones where laid out, and the suite was rerun with one geophone.

1.7 Plug and Abandonment

Total time used:	51.0 hrs
Operational time:	50.5 hrs (98.1 %)
Downtime:	0.5 hrs (1.9 %)

For a detailed breakdown, see report 47-55

The open hole was plugged back in three stages from 3560 and into the 9 5/8" casing at 2834 mMD. The plug was tagged with 10 mT and pressure tested to 212 bars.

The 9 5/8" casing of 30/9-19 was cut at 2372 mMD and pulled, resulting in a 50 m window below the 13 3/8" casing shoe.

A kick off plug was set from 2468 to 2240 mMD.

GENERAL INFORMATION ON WELL 30/9-19

Field : OSEBERG

Country : NORWAY

Licence : 79

UTM zone : 31

Central Median : 3' E

Horiz. Datum: ED50

Location coordinates:		Surface	Target
UTM	North [m]:	6702819.9	6702819.9
UTM	East [m]:	483176.9	483176.9
Geographical	North :	60 27'35.39"	
Geographical	East :	02 41'38.94"	

Water Depth: 105.0 m

Reference Point Height: 29.0 m

Formation at TD: TARBERT at 3093 m MD

Operators: NORSK HYDRO PRODUKSJON A/S **Share:** 16.00 %

Partners: DEN NORSKE STATS OLJESELSKAP A/S **Share:** 73.50 %

SAGA PETROLEUM A/S 10.50 %

Total depth (RKB) : 3560.0 **m MD** 3558.6 **m TVD**

TIME SUMMARY

Start Time : 1998-09-06 08:00:00

Spudding date : 1998-09-08

Abandonment date : 1998-12-16

Main operation	Hours	Days	%
MOBILIZATION	79.5	3.3	6.2
DRILLING	654.0	27.3	51.0
FORMATION EVALUATION MWD	1.5	0.1	0.1
FORMATION EVALUATION LOGGING	125.0	5.2	9.7
FORMATION EVALUATION CORING	41.5	1.7	3.2
PLUG AND ABANDONMENT	50.5	2.1	3.9
DOWNTIME MOBILIZATION	105.5	4.4	8.2
DOWNTIME DRILLING	123.0	5.1	9.6
DOWNTIME FORM. EVAL. LOGGING	99.5	4.1	7.8
DOWNTIME FORM. EVAL. CORING	2.0	0.1	0.2
DOWNTIME PLUG AND ABANDONMENT	0.5	0.0	0.0
Sum:	**1282.5**	**53.4**	

Hole and casing record

Hole	Track	Depth [m MD]	Casing/Tubing	Track	Depth [m MD]
36"		231.1	30"		231.0
26"		1202.0	20"		1198.0
17 1/2"		2400.0	13 3/8"		2318.5
12 1/4"		2922.0	9 5/8"		2907.4
8 1/2"		3560.0			

Well status: PERMANENTLY ABANDONED

Rig name: WEST DELTA

NORSK HYDRO
DRIFT/BORESEKTOR

DRILLING

WELL	**: 30/9-19**			
[illegible]ICENS	: 079			
[illegible]IG	**: West Delta**			
RIG RATE	:	$140 000	$140 000	$140 000
DEPTH IN METER	:	4 612	4 612	4 433
EXCHANGE RATE USD 1=	:	NOK 7,6	NOK 7,6	NOK 7,6
DAYS	:	41,7	49,8	53,4
DATE OF REPORT	:	26.11.98	03.11.98	22.04.99

ESTIMATED COSTS (IN 1.000 NOK)	**APPR.AFE NO. 1**	**APPR.AFE NO. 2**	**ESTIMATED FIN.COSTS**
0 EMPLOYEE RELATED COSTS	**4 923**	**4 982**	**6 899**
1 RIG COSTS	**44 369**	**52 987**	**53 477**
2 RIG SUPPORT COSTS	**5 105**	**7 197**	**9 021**
3A Fuel/lub.	1 376	1 643	1 081
3C Bits	3 450	1 889	1 696
3D Casing/casing equipment	7 752	8 153	8 924
3F Wellhead	1 261	1 261	1 281
[illegible]ement/cement additives	1 488	1 584	2 919
3[illegible] Mud/mud chemicals	3 425	3 778	4 011
3 CONSUMABLES COSTS, SUB TOTAL	**18 752**	**18 308**	**19 912**
4E Fix. wing transportation	0	0	0
4C Other transportation	83	50	23
4D Standby vessel	2 202	2 630	2 656
4F Helicopter transportation	1 251	1 494	1 523
4C Supply vessels	5 328	5 933	2 514
4 TRANSPORTATION COSTS, SUB TOTAL	**8 864**	**10 107**	**6 716**
5A Coring	1 210	1 053	952
5E Drilling	359	399	1 255
5C Cutting of casing/Fishing equipm.	400	400	222
5D Completion services	0	0	172
5F MWD-services	2 031	2 252	2 748
5C Casing Services	750	750	920
5[illegible] Mud logging/MUD SERVICES	1 162	1 359	909
[illegible]ement/press.test	792	946	788
5J Electrical logging	2 820	3 752	5 374
5K VSP	0	0	0
5L Prod. testing	210	251	332
5M Diving/ROV	832	917	921
5N Misc. rental & op.costs	1 751	2 092	1 634
5 SERVICE COSTS, SUB TOTAL	**12 317**	**14 171**	**16 227**
6A Site survey	0	0	0
6E Rig positioning	250	250	297
6C Drilling site clean up	0	0	0
6 SURVEY COSTS, SUB TOTAL	**250**	**250**	**297**
7 WAREHOUSE COSTS	**917**	**1 096**	**1 121**
TOTAL OPERATION COSTS	**95 497**	**109 098**	**113 670**

Downtime report, 3[illegible]-19

Well	Rep	#	Hrs	Date	Downtime Type	Short Description	Responsible Contractor	Nsfi Type	Equipment Type	Service Type
30/9-19	1.		14.0	1998-09-08	Equipment failure	Smedvig work on emergency-controlsystem for th ballastpumps according to DNV regulations	SMEDVIG OFFSHORE A/S	Other Service Equipment/System	SERVICE EQUIPMENT/SYSTEMS	RIG UTILITIES
	2.		6.0	1998-09-10	Waiting for cement to cur	Waited on cement.	TO BE NAMED			
	3.		23.0	1998-09-10	Equipment failure	Rig operations stopped due to bearing failure in th drawwork's brake.	SMEDVIG OFFSHORE A/S	Drawworks and Machinery	DRILL FLOOR EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	4.		1.0	1998-09-12	Equipment failure	Geoservices unit shut down due to door left open.	GEOSERVICES	Miscellaneous equipment, systems and servic	MISCELLANEOUS EQUIPMENT/SYSTEM/SERVICE	MUD LOGGING
	5.		0.5	1998-09-14	Equipment failure	Replaced leaking hydraulic hose in HPU-unit	SMEDVIG OFFSHORE A/S	Other Drill Floor Eq./Syst.	DRILL FLOOR EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	6.		1.5	1998-09-15	Equipment failure	Changed dies in TDS torque wrendh and 4 1/2" IF savor sub.	SMEDVIG OFFSHORE A/S	Other Pipe Handling Equipment	PIPE HANDLING EQUIPMENT/SYSTEM	DRILLING CONTRACTOR
	7.		0.5	1998-09-20	Equipment failure	Trouble shoot seawater supply to mud pumps.	SMEDVIG OFFSHORE A/S	Mud Supply(incl. HP mudpumps)	MUD AND BULK SYSTEMS	RIG UTILITIES
	8.		4.0	1998-09-22	Equipment failure	Rig power failure in the main panel.	SMEDVIG OFFSHORE A/S	Rig Power Supply	MISCELLANEOUS EQUIPMENT/SYSTEM/SERVICE	RIG UTILITIES
	9.		0.5	1998-09-30	Equipment failure	Repaired draw-work brake.	SMEDVIG DRILLING A/S	Drawworks and Machinery	DRILL FLOOR EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	11.		2.5	1998-10-01	Equipment failure	Unable to set 9 5/8" wear bushing.	DRIL-QUIP	Wellhead	SERVICE EQUIPMENT/SYSTEMS	WELLHEAD
	12.		3.5	1998-10-01	Equipment failure	Attempted to function test upper pipe ram on accoustic system. Ram wouldnt open.	SMEDVIG OFFSHORE A/S	BOP Stack	WELLCONTROL EQUIPMENT/SYSTEM	DRILLING CONTRACTOR
	13.		52.0	1998-10-02	Other	Drilled cement from 2567 m to 2859 m.	NORSK HYDRO A/S			
	14.		0.5	1998-10-04	Equipment failure	Repaired cooling water leak in draw-work.	SMEDVIG DRILLING A/S	Drawworks and Machinery	DRILL FLOOR EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	15.		2.0	1998-10-07	Equipment failure	Repaired drilling line anchor on draw-work.	SMEDVIG DRILLING A/S	Drawworks and Machinery	DRILL FLOOR EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	16.		2.0	1998-10-08	Equipment failure	Replaced broken compensator wire, snatch block and T-bar.	SMEDVIG DRILLING A/S	Electric Logging Eq. in General	SERVICE EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	17.		85.0	1998-10-08	Other	Fishing of Schlumberger MDT logging tools.	NORSK HYDRO A/S			
	18.		0.5	1998-10-12	Equipment failure	Replaced the faulty lucifer valve on drawwork brak	SMEDVIG OFFSHORE A/S	Drawworks and Machinery	DRILL FLOOR EQUIPMENT/SYSTEMS	DRILLING CONTRACTOR
	19.		26.0	1998-10-13	Other	Flowchecked and pulled out to 2896 m.	ANADRILL			
	20.		1.0	1998-10-17	Equipment failure	Replaced broken shear-pin on upper racking arm	SMEDVIG DRILLING A/S	Vertical Pipe Handling	PIPE HANDLING EQUIPMENT/SYSTEM	RIG UTILITIES
	21.		3.5	1998-10-17	Equipment failure	Computer problems let to loss of FMI calibrations.	SCHLUMBERGER NORGE	Surface data aquisition	SERVICE EQUIPMENT/SYSTEMS	ELECTRIC LOGGING
	22.		2.5	1998-10-19	Equipment failure	Repaired broken 1" hydraulic supply hose connect to Topdrive	SMEDVIG DRILLING A/S	Top Drive	HOISTING EQUIPMENT	RIG UTILITIES
	23.		3.5	1998-10-20	Equipment failure	Pulled out of hole with suite # 4 due to a poor connection in connectorhead	SCHLUMBERGER NORGE	Other Drilling/Downhole Equipment	DRILLSTRING/DOWNHOLE EQUIPMENT	ELECTRIC LOGGING
	24.		3.0	1998-10-20	Other	Laid down 3 satelite geofons from the VSP tool.	READ WELL SERVICE A/S			
	25.		9.0	1998-12-17	Waiting on weather	Waiting on weather to pull anchors.				
	32.		82.5	1998-12-18	Waiting on weather	Waited on boat to start anchor handling.				

Daily report no : 1 **Date:** 1998-09-06
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 0.00 sg

Stop time	Description
08:00	Start report on 30/9-19 from 08:00 HRS
23:59	Rig move to new location. Block 30/9-19

Daily report no : 2 **Date:** 1998-09-07
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 0.00 sg

Stop time	Description
10:00	Rig move to new location.
23:59	Running anchor operation at location.

Daily report no : 3 **Date:** 1998-09-08
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 0.00 sg

Stop time	Description
05:00	Running anchor operation at location. Ballasting and anchortesting.
11:00	Replace anchor #2 and reposition rig.
13:00	RIH with 36" BHA.
23:59	Smedvig work on emergency controlsystem for the ballast pumps according to DNV requirements.

Daily report no : 4 **Date:** 1998-09-09
Midnight depth : 231 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.05 sg

Stop time	Description
03:00	Smedvig work on emergency controlsystem for the ballastpumps according to DNV requirements.
04:30	RIH to 127m.
10:30	Tag bottom at 133m. (Depth ref: 17 1/2" bit.) Wask down first 5m, take surveys-OK. Drill 36" hole to TD. (Depth ref: 36" holeopener.)
11:30	Pump 20m3 Hi-visc & circulate bottoms up.
12:00	Displace hole to 1,20 sg mud.
13:00	Performed wiper trip to seabed.
14:00	Tag bottom at 231m. Work boulders from 217m to 231m. (Depths ref: 36" holeopener.)
14:30	Displace hole to 30m3 1,20 sg mud and 30m3 1,50 sg mud.
17:00	POOH. Checked beacon-readings at seabed.
18:00	Clean rigfloor and prepare to run 30" conductor.
20:00	Pick up and run 30" conductor.
22:30	Run 89m stinger inside 30" conductor. Make up 30" runningtool and connect runningtool to PGB.
23:59	Run 30" conductor on landingstring to TD.

Daily report no : 5 **Date:** 1998-09-10
Midnight depth : 233 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.05 sg

Stop time	Description
00:30	Verified landing with the ROV. Checked the bullseye.
01:00	Pumped 40 m3 seawater with the rig pumps.
03:00	Flushed and pressure tested the surface lines to 250 bar. Mixed and pumped cement.
09:00	Waited on cement.
11:00	Released the running tool and pulled out of the hole.
13:30	Laid down the casing running tool, the cement equipment and cleared the rig floor.
15:00	Made up the 26" clean out assembly.
17:30	Ran in with the clean out assembly to 199 m.
18:00	Broke the circulation and tagged the cement at 227 m.
19:00	Drilled out the cement in the shoe track and 30" shoe at 231 m. Drilled the new hole to 233 m. Pumped 15 m3 high viscous mud and circulated the hole volume with seawater.
21:00	Pulled out with the clean out assembly.
23:00	Picked up the 5" drill pipe from the deck and racked back stands in the derrick.
23:59	Rig operations stopped due to bearing failure in the drawwork's brake.

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Daily report no : 6 **Date:** 1998-09-11
Midnight depth : 233 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.05 sg

Stop time	Description
13:30	Waited on new bearing for the drawworks elmagco brake.
22:00	Install and mount new bearing for the drawworks elmagco brake.
23:59	Make up 9 7/8" pilothole assembly.

Daily report no : 7 **Date:** 1998-09-12
Midnight depth : 794 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.05 sg

Stop time	Description
01:00	Enter 30" housing with 9 7/8" bit and continue running in the hole to 230 m.
09:00	Drilled pilot hole from 233m to 417m
09:30	Circulate bottoms up
14:00	Drilled pilothole from 417m to 502m
14:30	Circulate bottoms up and flowcheck, while restart GeoService and Anadrill equipment
18:30	Drilled 9 7/8" pilothole from 502m to 589m,
23:59	Drilled 9 7/8" pilothole from 794m to 980m

Daily report no : 8 **Date:** 1998-09-13
Midnight depth : 1202 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.05 sg

Stop time	Description
04:30	Drilled 9 7/8" pilothole from 794m to 980m Circulate bottoms up and flowcheck, while restart GeoService and Anadrill equipment Drilled 9 7/8" pilothole from 980m to 1017m
05:00	Circulated while re-starting Geoservice and Anadrill equipment
12:00	Drilled 9 7/8" pilothole from 980m to 1202m
13:30	Circulated bottoms up. Pump and displace 58m3 1.20sg mud on bottom
14:00	Checked TDS and Dollies for loose bolts
15:30	Pulled out with the hole assembly to 230m
16:00	Pumped and displaced 30" casing with 40m3 1.20sg mud
17:30	Pull out with the BHA and laid down bit, bit sub, float , CDR, MWD and 2 x NMDC
21:30	Picked up 18 3/8 housing and installed the bore protector. Made up running tool with Halliburton wiper plug installed. Racked housing in derrick on HWDP
22:30	Made up Halliburton cement head on 5" HWDP and racked in derrick.
23:59	Made up the 26" BHA

Daily report no : 9 **Date:** 1998-09-14
Midnight depth : 1202 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.05 sg

Stop time	Description
02:30	Made up the 26" BHA while running in to the wellhead. Enter the 30" housing with the 26" bit and ran in to 208m.
03:00	Function tested MWD tool
17:30	Opened 9 7/8" pilot hole to 26" from 233m to 645m
18:30	Circulated bottoms up
19:00	Replaced leaking hydraulic hose in HPU-unit
23:59	Opened 9 7/8" pilot hole to 26" from 645m to 810m

Daily report no : 10 **Date:** 1998-09-15
Midnight depth : 1205 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.20 sg

Stop time	Description
04:00	Opened 9 7/8" pilothole to 26" from 810m to 942 m.
05:00	Pumped and circulated a 10m3 Hi-Vis pill around to seabed
14:00	Opened 9 7/8" pilot hole to 26" from 942m to 1205m.
16:30	Displaced the hole to 1,20 sg mud to 443 m.
17:00	Worked and reamed tight hole from 1196 m to 1205 m.
19:00	Pulled out with the 26" assembly from 1205 m to 1047 m.

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Daily report no : 10 **Date:** 1998-09-15
Midnight depth : 1205 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.20 sg

Stop time	Description
20:30	Changed dies in DDM tool joint breaker.
22:30	Pulled out with the 26" assembly to 500 m
23:59	Ran in with the 26" assembly to 1114 m.

Daily report no : 11 **Date:** 1998-09-16
Midnight depth : 1205 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.20 sg

Stop time	Description
00:30	Ran in the hole from 1114 m to 1170 m
01:30	Washed and reamed from 1170m to 1205m
04:00	Displaced hole to 1.20 sg mud to 600 m.
05:30	Pulled out of hole with the 26" assembly from 1205 m to 600 m.
06:00	Lubricated the rig.
07:00	Pump 170 m3 1.20 sg mud.
09:30	Pulled out of the hole to 140 m
11:30	Washed the 30" housing from 140 m to 133 m. Pulled above 30" housing and washed PGB.
13:00	Pulled out with the BHA
14:00	Slipped and cut 35 m of drilling line
16:00	Rigged up the 20" casing running equipment.
20:30	Ran the 20" casing. Entered the 30" housing with 20" shoe joint and continued running in with the casing.
22:30	20" casing took weight at 264 m. Worked casing down from 264 m to 279 m.
23:59	Continued running 20" casing to 360 m.

Daily report no : 12 **Date:** 1998-09-17
Midnight depth : 1205 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.20 sg

Stop time	Description
08:00	Ran 20" casing from 360 m to 1060 m.
08:30	Installed torque wrench on DDM
11:00	Made up 18 3/4" housing joint and continued running 20" casing on 5" HWDP to 1995 m
12:00	Landed the 18 3/4" housing in the 30" wellhead.
19:30	Pressure tested surface line to 200 bar. Mixed and pumped the cement. Released the dart and displaced the cement.
20:00	Bled back to the cement unit.
21:30	Released the running tool and washed the RGB.
22:30	Pulled out and laid down the 20" housing running tool.
23:00	Changed to 350 t bails.
23:59	Laid down cement head, X-overs and 3 joints of HWDP

Daily report no : 13 **Date:** 1998-09-18
Midnight depth : 1205 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.30 sg

Stop time	Description
00:30	Made up the Drill-Quip hang off tool and racked in derrick.
04:00	Laid down the 26" BHA. Changed out the 8" drilling jar and racked same in derrick.
06:30	Ran in with the 3 1/2"/5" grout string. Stab into grout funnel on RGB and continued running in to 163 m.
08:30	Flushed and pressure tested surface lines to 100 bar. Mixed and pumped cement slurry, and displaced cement with seawater.
10:00	Pulled out to 132 m and washed the RGB
11:00	Pulled out with grouting string.
12:30	Rigged up the BOP handling equipment. Moved the rig 30 m off location. Made up 2 riser handling joints.
21:00	Skid BOP to well center. Installed guide wires. Connected riser handling joint. Pressure tested the choke/kill lines to 410 bar before installing the slip joint.
23:59	Engaged the support ring and installed choke/kill goosenecks.

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Daily report no : 14 **Date:** 1998-09-19

Midnight depth : 1205 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.30 sg

Stop time	Description
03:00	Mowed the rig over the well. ROV re-installed the guide line no. 2 anchor in post
04:30	Landed the BOP on the wellhead. Latched the connector and overpull tested to 30 tons. OK Rigged down the BOP handling equipment.
07:00	Rigged down the BOP equipment and installed diverter. Changed to 350 ton bails.
09:00	Pressure tested DDM kelly coks to 345 bar
10:30	Picked up 3 stands 5" U-170 drill pipe and racked back in the derrick.
11:00	Lubricated the rig and serviced the DDM
12:00	Picked up 2 stands 5" U-170 drill pipe and racked back in the derrick.
18:30	Made up the 17 1/2" BHA while running in to 224 m.
19:00	Function tested the MWD tool and displaced the riser to 1.20 sg mud.
19:30	Ran in the hole to 370 m.
21:30	Function tested the BOP stack.
23:00	Ran in with the 17 1/2" assembly, tagged top of cement at 1150 m.
23:59	Drilled cement from 1150 m to 1159 m.

Daily report no : 15 **Date:** 1998-09-20

Midnight depth : 1552 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.30 sg

Stop time	Description
00:30	Attempted to circulate cement contaminated mud.
01:30	Displaced the hole with seawater.
02:00	Trouble shoot seawater supply to mud pumps.
02:30	Drilled cement from 1159 m to 1186 m. Drilled float collar at 1186 m. Drilled shoe at 1198 m and cleaned out rathole to 1205 m.
04:30	Drilled 17 1/2" hole from 1175 m to 1205 m.
06:00	Pumped 20 m3 Hi-Vis mud and displaced the hole to 1.30 sg new Glydrill mud.
08:30	Pulled out to 1191 m. Rigged up and pressure tested surface lines to 100 bar. Performed leak-off test to 1.62 sg.
23:59	Drilled 17 1/2" hole from 1208 m to 1552 m.

Daily report no : 16 **Date:** 1998-09-21

Midnight depth : 1974 m MD **Estimated PP:** 1.37 sg **Mud weight:** 1.45 sg

Stop time	Description
23:59	Drilled and oriented 17 1/2" hole from 1552 m to 1974 m.

Daily report no : 17 **Date:** 1998-09-22

Midnight depth : 2244 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.45 sg

Stop time	Description
01:00	Drilled 17 1/2" hole from 1974 m to 1988 m.
02:00	Rig power failure in the main panel.
02:30	Re-started the copmputer equipmentl and the gas detection equipment.
03:00	Drilled 17 1/2" hole from 1988 m to 1998 m.
04:00	Circulated and re-startet the computer equipment and ythe gas detection equipment.
04:30	Reamed and re-logged with the MWD from 1988 m to 1998 m.
08:30	Drilled the 17 1/2" hole from 1998 m to 2061 m.
09:30	Rig power failure.
23:59	Drilled the 17 1/2" hole from 2061 m to 2244 m.

Daily report no : 18 **Date:** 1998-09-23

Midnight depth : 2329 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.45 sg

Stop time	Description
06:00	Drilled the 17 1/2" hole from 2244 m to 2277 m.
14:00	Continued drilling 17 1/2" hole from 2244 m to 2329 m.
18:30	Swept hole with 10 m3 weighted high viscosity pill and circulated until hole was clean.
23:30	Flow checked well and pulled out of hole to 20" casing shoe at 1198 m.

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Daily report no : 18 **Date:** 1998-09-23
Midnight depth : 2329 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.45 sg

Stop time	Description
23:59	Flow checked well and continued pulling out of hole to 1171 m.

Daily report no : 19 **Date:** 1998-09-24
Midnight depth : 2329 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.46 sg

Stop time	Description
04:00	Continued pulling out of hole to 11 m.
05:00	Downloaded MWD memory bank. Racked tool back in derrick.
07:30	Retreived the 20" bore protector and washed the wellhead/BOP..
09:30	Made up the 13 3/8" casing hanger to stand of drillpipe. Racked in the derrick.
10:30	Made up and loaded the cement head. Racked back in the derrick.
11:00	Serviced the hoisting equipment.
13:00	Rigged up to run the 13 3/8" casing.
23:00	Ran the 13 3/8" casing according to programme to 1197 m.
23:59	Rigged up 500 t bails and the fill-up tool.

Daily report no : 20 **Date:** 1998-09-25
Midnight depth : 2329 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.46 sg

Stop time	Description
01:00	Rigged up the bails and the fill-up tool.
08:00	Ran the 13 3/8" casing to 2182 m.
08:30	Rigged down fill-up tool and changed to short bails.
10:00	Made up casing hanger. Rigged down casing handling equipment.
12:00	Picked-up landing string and landed casing hanger in wellhead.
14:30	Circulated and conditioned mud prior to cementing.
16:00	Pressure tested surface lines and cemented as per program.
18:00	Displaced cement and attempted to pressure test casing.
19:00	Sat and tested seal assembly.
20:00	Released running tool and pulled out of hole.
21:30	Sat 13 3/8" wear bushing.
23:59	Breaked and laid down 17 1/2" bottom hole assembly.

Daily report no : 21 **Date:** 1998-09-26
Midnight depth : 2329 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.40 sg

Stop time	Description
01:00	Continued breaking and laying down 17 1/2" bottom hole assembly.
05:30	Built 12 1/4" bottom hole assembly.
06:00	Service hoisting equipment
09:00	Picked up singles of 5" drillpipe while running in hole.
10:30	Pressure tested 13 3/8" casing.
12:30	Continued picking up singles of 5" drillpipe while running in hole.
15:00	Continued running in hole to 2254 m.
16:00	Circulated and conditioned mud.
19:00	Tagged cement. Drilled float, shoe track and shoe. Cleaned out rathole and drilled 3 m of new formation.
21:00	Swept hole with 10 m3 high-viscosity pill and condition mud prior to leak off test.
21:30	Performed leak off test.
23:59	Drilled 12 1/4" hole from 2332 m to 2390 m.

Daily report no : 22 **Date:** 1998-09-27
Midnight depth : 2787 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.35 sg

Stop time	Description
23:59	Continued drilling 12 1/4" hole from 2390 m to 2787 m. Cut mud weight from 1,40 to 1,35 sg while drilling.

Daily report no : 23 **Date:** 1998-09-28
Midnight depth : 2922 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.35 sg

Stop time	Description
09:30	Continued drilling 12 1/4" hole from 2787 m to 2922 m.
12:30	Circulated and conditioned mud. Flow checked well.
13:00	Pulled out of hole to 2855 m.
13:30	Serviced hoisting equipment
18:00	Pulled back into 13 3/8" casing shoe at 2318 m.
19:00	Ran back to 2922 m.
22:00	Swept hole with 2 x high viscosity pills and circulated until hole was clean. Flow checked well.
23:30	Pulled out of hole to 13 3/8" casing shoe.
23:59	Flow checked well and continued pulling out of hole.

Daily report no : 24 **Date:** 1998-09-29
Midnight depth : 2922 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.35 sg

Stop time	Description
05:00	Continued pulling out of hole.
06:00	Loaded cement head and racked it back in derrick.
07:30	Slipped and cut 34 m off drilling line.
08:00	Serviced hoisting equipment.
10:00	Made up casing hanger with cement plugs and racked in derrick.
12:00	Ran in hole and washed wellhead and retrieved 13 3/8" wear bushing.
12:30	Held pre - job safety meeting prior to start running 9 5/8" casing.
14:30	Rigged up 9 5/8" casing handling equipment.
23:59	Ran 9 5/8" casing to 1070 m.

Daily report no : 25 **Date:** 1998-09-30
Midnight depth : 2922 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.36 sg

Stop time	Description
08:00	Continued running 9 5/8" casing to 2312 m.
08:30	Serviced hoisting equipment.
09:00	Repaired draw-work brake.
12:30	Continued running 9 5/8" casing to 2774 m
14:30	Made up 9 5/8" casing hanger and rigged down casing handling equipment
15:30	Ran in with landing string to 2904 m. Made up cement hose and landed casing in wellhead.
17:30	Broke circulation and circulated bottoms up.
19:00	Tested surface lines. Cemented 9 5/8" casing according to program.
20:00	Displaced cement with rig pumps. Observed wiper plug bump, would not hold any pressure.
21:00	Sat and tested seal assembly.
23:59	Tested BOP on yellow pod. Function tested on blue pod from mini panel.

Daily report no : 26 **Date:** 1998-10-01
Midnight depth : 2922 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.35 sg

Stop time	Description
02:00	Released casing hanger running tool and pulled out of hole.
03:00	Attempted to set 9 5/8" wear bushing.
04:30	Ran in hole with jet sub and washed BOP and wellhead. Pulled out of hole.
05:30	Sat 9 5/8" wear bushing.
06:00	Changed back to drilling bails.
08:30	Rigged up and tested surface equipment.
10:00	Broke and laid down cement head and 3 x 5" drillpipe.
14:30	Made up 8 1/2" bottom hole assembly.
15:30	Ran in hole with 5" drillpipe to 643 m.
19:00	Attempted to function test upper pipe ram on accoustic system. Ram would not open. Worked pipe in rams until free. Circulated one riser volume.
20:00	Recharged BOP accumulaters and tested upper pipe ram on accoustic system.
23:59	Continued running in hole and tagged top of cement at 2567 m.

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DAILY REPORT ON WELL 30/9-19

Daily report no : 27 **Date:** 1998-10-02
Midnight depth : 2922 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.35 sg

Stop time	Description
00:30	Broke circulation and took free torque.
02:30	Drilled cement from 2567 m to 2608 m.
03:30	Rigged up surface lines and tested casing.
16:00	Continued drilling cement and float collar at 2859 m.
16:30	Cleaned out shoe track and tagged casing shoe with 2 tons.
18:30	Swept hole with 10 m3 high viscosity pill and conditioned mud.
19:30	Took injection rates.
23:59	Pulled out of hole.

Daily report no : 28 **Date:** 1998-10-03
Midnight depth : 2922 m MD **Estimated PP:** 1.10 sg **Mud weight:** 1.35 sg

Stop time	Description
02:30	Made up mule shoe and picked up 3 1/2" drillpipe.
05:30	Continued running in hole and tagged casing shoe at 2907 m.
06:00	Spaced out drillstring and prepared for squeezing cement.
07:00	Circulated bottoms up and took injection rates.
08:00	Sat balanced cement plug as per program.
09:30	Pulled out of hole to 2550 m.
10:00	Reverse circulated 1,5 times string volume,
10:30	Squeezed 5,8 m3 of cement.
19:00	Attempted to bleed back static pressure, casing shoe leaked. Held a 97 bar back pressure while waiting on cement to set.
19:30	Bled off static pressure and rigged down surface equipment.
22:30	Pulled out of hole.
23:59	Laid down 12 1/4" bottom hole assembly.

Daily report no : 29 **Date:** 1998-10-04
Midnight depth : 2958 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.21 sg

Stop time	Description
04:00	Continued laying down 12 1/4" bottom hole assembly and 9 x 5" drillpipe.
07:30	Built new 8 1/2" bottom hole assembly.
11:30	Picked up 5" drillpipe while running in hole.
12:00	Continued running in hole to 1416 m.
12:30	Serviced hoisting equipment.
14:00	Continued in hole to 2575 m.
14:30	Repaired cooling water leak in draw-work.
15:00	Continued in hole to 2844 m.
15:30	Reamed down from 2844 m to 2906 m.
16:00	Drilled cement and casing shoe at 2907 m. Washed down rathole to 2922 m.
16:30	Drilled 8 1/2" hole from 2922 m to 2925 m.
18:00	Circulated and conditioned mud prior to leak off test.
19:00	Pulled back into 9 5/8" casing shoe and performed leak off test.
20:30	Displaced well to 1,21 sg Glydril mud.
23:59	Drilled and oriented from 2925 m to 2958 m.

Daily report no : 30 **Date:** 1998-10-05
Midnight depth : 3184 m MD **Estimated PP:** 1.22 sg **Mud weight:** 1.25 sg

Stop time	Description
11:00	Continued drilling and orienting 8 1/2" hole from 2958 m to 3087 m.
13:00	Circulated bottoms up due to relatively high gas concentration in returns.
14:00	Flow checked well and circulated bottoms up. Increased mud weight to 1,23 sg while circulating.
18:00	Drilled and oriented 8 1/2" hole from 3087 m to 3148 m.
20:00	Flow checked drilling break and circulated bottoms up. Increased mud weight to 1,25 sg.
22:00	Continued drilling to 3184 m.
23:00	Circulated bottoms up for samples.
23:59	Flow checked well and pulled out to 9 5/8" casing shoe.

DAILY REPORT ON WELL 30/9-19

Daily report no : 31 **Date:** 1998-10-06
Midnight depth : 3239 m MD **Estimated PP:** 1.22 sg **Mud weight:** 1.26 sg

Stop time	Description
00:30	Ran back to 3184 m.
02:00	Swept hole with 10 m3 high viscosity mud.
02:30	Pulled out of hole to run core barrel.
07:30	Continued out of hole.
10:30	Made up core barrel.
14:00	Ran in hole with core barrel to 9 5/8" casing shoe.
14:30	Continued in hole to 3127 m.
16:00	Washed down to 3184 m.Circulated bottoms up.
17:00	Spaced out string and dropped ball.
18:30	Cut core # 1 from 3184 m to 3240,3 m.
19:00	Pulled out of hole to 9 5/8" casing shoe.
23:59	Continued pulling out of hole to 62 m.

Daily report no : 32 **Date:** 1998-10-07
Midnight depth : 3255 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.26 sg

Stop time	Description
02:00	Broke and laid down inner core barrel.
05:30	Made up new core head and installed new inner barrel.
07:00	Ran in hole to 275 m.
07:30	Serviced hoisting equipment
08:00	Continued in hole to 1075 m.
09:00	Cut and slipped 34 m off drilling line.
11:00	Repaired drilling line anchor on draw-work.
13:00	Continued running in hole to 9 5/8" casing shoe.
13:30	Continued running in hole to 3182 m.
15:00	Washed down to 3238 m. Spaced out string and pumped down ball.
19:30	Cut core # 2 from 3240,3 m to 3254,5 m
20:00	Flow checked and pulled out to casing shoe.
23:59	Continued pulling out of hole to 200 m.

Daily report no : 33 **Date:** 1998-10-08
Midnight depth : 3255 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.26 sg

Stop time	Description
01:00	Continued pulling out of hole with bottom hole assembly.
02:00	Laid out inner barrel with core.
03:00	Racked 28 m of outer core barrel in derrick. Broke and laid down remaining 27 m.
04:30	Rigged up to run wireline logs.
05:30	Picked up logging tools for suite # 1: PEX
10:00	Ran in hole with logging suite # 1. PEX. Logged open hole section and pulled out of hole.
13:30	Laid down tools for suite # 1 PEX. Made up tools for suite # 2.
17:00	Ran in hole with suite # 2. Stuck while taking first sample at 3247 m. Worked wireline.
19:00	Replaced broken compensator wire, snatch block and T-bar.
20:30	Continued working wire-line in an attempt to free logging tools.
23:59	Prepared and rigged up equipment for fishing of Schlumberger logging tools.

Daily report no : 34 **Date:** 1998-10-09
Midnight depth : 3255 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.26 sg

Stop time	Description
04:00	Made up Schlumberger overshot and stripped in the hole over wire-line.
04:30	Wire-line parted. Rigged down sheave from derrick.
06:00	Pulled out of hole with drillpipe.
09:00	Secured wire-line. Retreived stuck sinker bars from drillpipestand and reterminated wire-line connection.
10:00	Rigged up for stripping in the hole over wire-line.
11:30	Drifted drillpipe in derrick with a 2,75 inch drift.
23:59	Stripped over wire-line with Schlumberger overshot to 2286 m.

DAILY REPORT ON WELL 30/9-19

Daily report no : 35 **Date:** 1998-10-10
Midnight depth : 3255 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.26 sg

Stop time	Description
05:30	Continued stripping in hole over wire-line to 3206 m.
06:00	Worked logging tools free. Pulled out of hole with drillpipe to 3147 m.
10:30	Re-rigged wire-line equipment, installed "Torpedo" connection.
23:59	Continued logging with Modular Formation Dynamic Tester.

Daily report no : 36 **Date:** 1998-10-11
Midnight depth : 3255 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.26 sg

Stop time	Description
05:30	Continued logging with Modular Formation Dynamic Tester.
07:00	Rigged down surface equipment.
10:00	Pulled out with drillpipe to 3004 m.
13:30	Cut cable. Made 2 new rope socket connections.
20:00	Logging tools stuck. Ran back with drillpipe to 3158 m. Worked tools free.
23:30	Pulled out with drillpipe to 3090 m.
23:59	Started making 2 new rope-socket connections.

Daily report no : 37 **Date:** 1998-10-12
Midnight depth : 3255 m MD **Estimated PP:** 1.13 sg **Mud weight:** 1.26 sg

Stop time	Description
04:30	Continued making new rope-socket connection on the wireline cable.
06:30	Logged with mutual formation dynamic tester.
09:00	Rigged up and circulated. Engaged the fish in the overshot.
10:30	Rigged T-bar and pulled off the weak point in the logging cable.
12:30	Pulled out with the logging cable and rigged down the surface equipment.
13:30	Pulled out to 9 5/8" casing shoe.
17:30	Pulled out of the hole.
19:30	Laid down the logging tools.
22:30	Built the 8 1/2" bottom hole assembly.
23:00	Replaced the faulty lucifer valve on drawwork brake.
23:59	Ran in the hole to 1214 m.

Daily report no : 38 **Date:** 1998-10-13
Midnight depth : 3450 m MD **Estimated PP:** 1.20 sg **Mud weight:** 1.26 sg

Stop time	Description
00:30	Function tested the MWD.
02:00	Ran in the hole to 2905 m.
02:30	Ran in the hole to 3105 m.
05:00	Reamed the tight spots to 3254 m.
17:00	Drilled the 8 1/2" hole from 3254 m to 3450 m.
20:30	Circulated to clean the hole and take samples.
23:59	Flowchecked and pulled out to 2896 m.

Daily report no : 39 **Date:** 1998-10-14
Midnight depth : 3494 m MD **Estimated PP:** 1.22 sg **Mud weight:** 1.31 sg

Stop time	Description
00:30	Circulated bottoms up at 2896 m.
05:00	Flowchecked well and pulled out of hole.
05:30	Dumped CDR memory. Broke bit and racked stand in derrick.
06:00	Circulated the bottoms up at 2896 m. Observed the well, sluggeds the pipe and pulled out of the hole. Racked the bottom hole assembly. Made up the 120' coring assembly.
07:00	Made up corehead and coreassembly # 3.
08:00	Ran in hole with coreassembly an BHA to 94 m.
09:30	Pulled out off hole and laid down corebarrel assembly 3.

DAILY REPORT ON WELL 30/9-19

Daily report no : 39 **Date:** 1998-10-14

Midnight depth : 3494 m MD **Estimated PP:** 1.22 sg **Mud weight:** 1.31 sg

Stop time	Description
12:00	Made up 8,5" bit assembly. Loaded MWD.
15:00	Ran in hole with 8,5" bit.
15:30	Continued run in hole to 3415 m.
16:30	Washed and reamed from 3415 to 3450 m.
18:00	Increased mudweight from 1.26 to 1,31 SG.
18:30	Drilled 8,5" hole from 3450 to 3467,5 m.
20:00	Circulated bottoms up.
22:30	Continued drill 8,5" hole to 3494 m.
23:30	Circulated bottoms up at 3494.
23:59	Flowchecked well. Gained 150 liters in triptank within 20 minutes.

Daily report no : 40 **Date:** 1998-10-15

Midnight depth : 3494 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
01:30	Circulated bottoms up. No gas in return mud.
03:00	Observed well static. Pulled bit into casing shoe.
09:00	Observed well static. Pulled out of hole.
10:30	Made up BOP test tool. Ran in with same and set in wellhead
16:30	Function tested and pressure tested BOP according to Norsk Hydro specifications.
17:30	Pulled out with BOP test tool and laid down same.
20:00	Made up coreassembly # 3 with 180' corebarrel.
23:59	Ran in hole with core-assembly.

Daily report no : 41 **Date:** 1998-10-16

Midnight depth : 3522 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
00:30	Continued run in hole to 3494 m.
04:30	Circulated bottoms up to evaluate trip gas / pore pressure.
05:00	Pumped down ball to activate corebarrel.
07:00	Cut core from 3494 to 3522 m. Core jammed off.
08:00	Flowchecked well and pulled out to casing shoe.
11:00	Flowchecked well and pulled out to 562 m.
11:30	Flowchecked well with BHA below BOP prior to pull out of hole with corebarrel.
12:30	Pulled out of hole with corebarrel.
14:00	Broke and laid down innertubes.
15:30	Broke and laid down complete core assembly.
18:30	Made up BHA # 14 to drill 8,5" hole to TD.
22:00	Ran in hole.
23:00	Continued run in hole to 3478 m.
23:59	Logged cored interval from 3480 m with MWD/CDR tools.

Daily report no : 42 **Date:** 1998-10-17

Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
00:30	Continued logging cored interval from 3508 m to 3522 m with MWD/CDR tools.
02:00	Drilled 8,5" hole 50 m into Dunlin formation. TD at 3560 m.
04:00	Sweaped hole with 10 m3 weighted hi-vis pill and circulate clean hole
04:30	Took slow circulation rates and flow checked well.
05:30	Replaced broken shear-pin on upper racking arm
07:00	Pulled out to casing shoe.
10:30	Flow checked well and pulled out of hole.
11:30	Broke and laid down stabilizers and bit. Dumped CDR-memory.
13:00	Rigged up to run wireline logs
14:30	Picked up logging tools for suite # 1: PEX.
20:00	Ran in hole with suite # 1. PEX. Logged open hole section an pulled out of hole.

DAILY REPORT ON WELL 30/9-19

Daily report no : 42 **Date:** 1998-10-17
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
22:00	Laid down tools for suite # 1 PEX. Made up tools for suite # 2.
23:59	Computer problems let to loss of FMI calibrations.

Daily report no : 43 **Date:** 1998-10-18
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
01:30	Calibrated FMI tool due to backup computer fault.
10:00	Ran in hole with suite # 2, FMI. Logged open hole section and pulled out of hole.
13:00	Laid down tools for suite # 2 FMI. Made up tools for suite # 3, CMR.
23:59	Ran in hole with suite # 3, CMR. Logged open hole section.

Daily report no : 44 **Date:** 1998-10-19
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
06:30	Continued logging open hole section with suite # 3. Pulled out of hole and laid down tools.
08:30	Rigged down all wireline equipment and prepared for wipertrip.
11:00	Repaired broken 1" hydraulic supply hose connected to Topdrive
11:30	Installed diverter element and prepared to make up BHA.
14:00	Made 8 1/2" bit and BHA # 15. Ran in hole to 199 m.
17:30	Ran in hole to 3532 m.
18:30	Washed an reamed from 3532 m to 3560 m.
22:30	Circulated and conditioned mud.
23:59	Flowchecked well and pulled out of hole.

Daily report no : 45 **Date:** 1998-10-20
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
04:30	Continued pulling out of hole.
05:30	Rigged up to run wireline logs.
07:00	Picked up logging tools for suite # 4, VSP.
08:30	Ran in hole with suite # 4, VSP.
09:30	Pulled out of hole with suite # 4 due to a poor connection in connectorhead between tools and logging wire.
11:00	Rigged down VSP tool and changed connector head.
12:00	Ran in hole with suite # 4, VSP.
16:00	Continued run in hole with suite # 4 to 3258 m. Logged open hole section and pulled out of hole.
16:30	Laid down 3 satelite geofons from the VSP tool.
18:00	Ran in hole with suite # 4, VSP.
19:30	Logged open hole intervals with VSP from 3560 to 2907 m.
20:30	Pulled out of hole with suite # 4.
21:00	Laid down tools for suite # 4, VSP.
23:59	Picked up logging tool # 5, MDT.

Daily report no : 46 **Date:** 1998-10-21
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
19:30	Ran in hole with suite # 5, MDT. Took fluid samples and pressure points. Pulled out of hole.
21:00	Laid down MDT logging tools.
23:00	Picked up logging tools for suite # 6, CST with 30 sidewall core samplers.
23:59	Ran in hole with suite # 6, CST.

DAILY REPORT ON WELL 30/9-19

Daily report no : 47 **Date:** 1998-10-22
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
03:30	Continued run in hole with CST logging tools. Took 30 coresamples in reservoar sections. Pulled out of hole with suite # 6, CST.
04:00	Laid down CST tool with sidewall cores.
06:00	Made up cement stinger with divertor sub.
09:30	Ran in hole to 2912 m.
10:30	Made up cement stand with side-entry sub and valves. Racked stand in derrick.
11:30	Slipped and cutted 35 m drill line.
12:00	Lubricated topdrive and dollies.
13:00	Ran in hole to 3543 m.
13:30	Installed cement stand and washed down to 3560 m.
15:30	Circulated and conditioned mud prior to plug back well.
16:00	Flushed and tested surface lines. Held pre-job meeting with crew.
16:30	Mixed and pumped 9,8 m3 slurry for cement plug # 1.
17:00	Displaced slurry with 27,5 m3 mud.
18:00	Pulled out of slurry to 3309 m.
19:30	Circulated out spacer and excess cement at 3309 m.
20:00	Flushed and tested surface lines. Held pre-job meeting with crew.
20:30	Mixed and pumped 9,8 m3 slurry for cement plug # 2.
21:00	Displaced slurry with 25,3 m3 mud.
22:00	Pulled out of slurry to 3058 m.
23:00	Circulated out spacer and excess cement at 3058 m.
23:30	Flushed and tested surface lines. Held pre-job meeting with crew.
23:59	Mixed and pumped 10,4 m3 slurry for cement plug # 3.

Daily report no : 48 **Date:** 1998-10-23
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
00:30	Displaced slurry with 22,8 m3 mud.
01:30	Pulled out of slurry to 2750 m.
02:00	Circulated out spacer and excess cement at 2750 m m.
05:30	Flowchecked well and pulled out to wellhead at 134 m.
06:00	Stopped due to fault in trafo station 2 - 440 volt system.
07:00	Washed wellhead and BOP area.
07:30	Pulled out of hole with cement stinger.
09:00	Made up 8 1/2" flat bottom mill and ran in hole with BHA.
11:00	Ran in hole to 1531 m.
11:30	Lubricated rig equipment.
12:30	Continued run in hole to 2550 m.
15:00	Attempted twice to pressure test cement plug to 212 bar. No sucsess.
16:00	Ran in hole to 2749 m.
19:30	Circulated and conditioned mud while waiting on cement to set.
20:30	Pressure tested cement plug and 9 5/8" casing to 212 bar.
21:30	Ran in hole and tagged top cement plug with 10 tons downweight.
23:59	Flowchecked and pulled out of hole.

Daily report no : 49 **Date:** 1998-10-24
Midnight depth : 3560 m MD **Estimated PP:** 1.26 sg **Mud weight:** 1.31 sg

Stop time	Description
00:30	Pulled out with 8 1/2" mill to 500 m.
03:00	Installed multi purpose running tool. Retrieved wear bushing with 30 ton overpull.
04:00	Pulled seal assembly with 18 ton overpull.
04:30	Hung up with seal assembly in wellhead. Worked pipe and pulled free with 23 ton overpull.
05:30	Pulled out of hole with seal assembly
07:00	Pulled out of the hole with 8 1/2" mill. Racked BHA.
23:59	No activity on 30/9-19, PO:1. Start 30/9-19 A

DAILY REPORT ON WELL 30/9-19

Daily report no : 50 **Date:** 1998-12-17
Midnight depth : 3560 m MD **Estimated PP:** 1.03 sg **Mud weight:** 1.31 sg

Stop time	Description
15:00	No activity on well 30/9-19. On budget time for well 30/9-19 A
23:59	Waiting on weather to pull anchors.

Daily report no : 51 **Date:** 1998-12-18
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 1.31 sg

Stop time	Description
23:59	Continued waiting on weather to commence anchor handling. Following anchor handling vessels on location: Viking Titan, Skandi Bergen and Far Grip.

Daily report no : 52 **Date:** 1998-12-19
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 1.31 sg

Stop time	Description
23:59	Waited on weather to commence anchor handling. Anchor handling vessels on location: Far Grip, Viking Titan, Skandi Bergen and Havila Champion.

Daily report no : 53 **Date:** 1998-12-20
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 1.31 sg

Stop time	Description
23:59	Waited on weather to commence anchor handling. Anchor handling vessels on location: Far Grip, Viking Titan, Skandi Bergen and Havila Champion.

Daily report no : 54 **Date:** 1998-12-21
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 1.31 sg

Stop time	Description
08:30	Waited on weather to commence anchor handling. Started deballasting rig @ 0200 hrs. Anchor handling vessels on location: Far Grip, Viking Titan, Skandi Bergen and Havila Champion.
23:59	Anchor handling. V.Titan: Start anch # 6 0830 hr - on bolst 1155 hr, Start # 5 1208 hr - on bolst 2051 hr, start # 10 2308 hr. Far Grip: start # 12 0900 hr - on rig 1250 hr, start # 11 1430 hr - on bolst 1905 hr, start # 4 2340 hr

Daily report no : 55 **Date:** 1998-12-22
Midnight depth : 0 m MD **Estimated PP:** sg **Mud weight:** 1.31 sg

Stop time	Description
05:00	Continued anchor handling. Skandi Bergen had anchor # 3 on bolster @ 0055 hrs, Havila Champ. started # 9 @ 0220 hrs. Rig started pulling on anchor # 1 @ 0355 hrs.
07:00	Waited on weather to continue anchor handling.
15:00	Continued anchor handling. Continued pulling anchor # 1 - on bolster @ 1350 hrs. Skandi Bergen secured anchor # 3 on deck @ 1430 hrs. Departed location 30/9-19 /19 A @ 1500 hrs.
23:59	No activity on well 30/9-19

1999-04-22

Norsk Hydro

TIME DISTRIBUTION

Well: 30/9-19 **PO:** 1 **Start date:** 1980-01-01 **Rig:** WEST DELTA **Depth:** 2787.0 m MD
All sections **Stop date:** 1999-04-22

Operations	Hours	%	Hours	%	Acc. total
MOBILIZATION					
MOVING	26.0	2.03			
MOORING; RUNNING ANCHORS	25.0	1.95			
MOORING; PULLING ANCHORS	28.5	2.22			
Sum.			79.5	6.20	79.5
DRILLING					
BHA HANDLING/TESTING	52.0	4.05			
EQUIPMENT TEST	5.0	0.39			
TRIPPING IN CASED HOLE	64.5	5.03			
TRIPPING IN OPEN HOLE	32.0	2.50			
DRILLING	231.5	18.05			
OTHER	22.5	1.75			
WELLHEAD EQUIPMENT INSTALLATION	5.0	0.39			
REAMING	4.0	0.31			
CIRC. AND COND. MUD/HOLE	52.5	4.09			
WIPER TRIP	5.0	0.39			
CASING HANDLING/TESTING	53.5	4.17			
RUNNING CASING IN CASED HOLE	28.5	2.22			
RUNNING CASING IN OPEN HOLE	20.0	1.56			
DRILLING OUT OF CASING	0.5	0.04			
PRIMARY CEMENTING	29.0	2.26			
DRILLING OUT CEMENT PLUG	3.0	0.23			
FORMATION STRENGTH TESTING	7.5	0.58			
BOP HANDLING	11.0	0.86			
BOP RUNNING/RETRIEVING	10.0	0.78			
BOP TESTING	14.5	1.13			
SLIP AND CUT DRILLING LINE	2.5	0.19			
Sum.			654.0	50.99	733.5
FORMATION EVALUATION MWD					
MWD HANDLING/TESTING/SURVEYING	0.5	0.04			
LOGGING WITH MWD	1.0	0.08			
Sum.			1.5	0.12	735.0
FORMATION EVALUATION LOGGING					
LOGGING	79.5	6.20			
LOGGING EQUIPMENT HANDLING/TESTING	22.0	1.72			
OTHER	6.0	0.47			
WIPER TRIP	17.5	1.36			
Sum.			125.0	9.75	860.0
FORMATION EVALUATION CORING					
TRIPPING IN CASED HOLE	17.5	1.36			
CORING EQUIPMENT/CORE HANDLING	10.5	0.82			
TRIPPING IN OPEN HOLE	2.0	0.16			
OTHER	0.5	0.04			
CORING	6.0	0.47			
CIRC. AND COND. MUD/HOLE	4.0	0.31			
SLIP AND CUT DRILLING LINE	1.0	0.08			
Sum.			41.5	3.24	901.5
PLUG AND ABANDONMENT					
BHA HANDLING/TESTING	3.5	0.27			
TRIPPING IN CASED HOLE	8.0	0.62			
TRIPPING IN OPEN HOLE	1.5	0.12			
OTHER	2.0	0.16			
CIRC. AND COND. MUD/HOLE	5.5	0.43			
CONNECTION TOOL OPERATIONS	5.0	0.39			
TRIPPING FOR CEMENT JOB	12.0	0.94			
SET CEMENT PLUG	12.0	0.94			

TIME DISTRIBUTION

Well: 30/9-19 **PO:** 1 **Start date:** 1980-01-01 **Rig:** WEST DELTA **Depth:** 2787.0 **m MD**

All sections **Stop date:** 1999-04-22

Operations	**Hours**	**%**	**Hours**	**%**	**Acc. total**
PLUG AND ABANDONMENT					
SLIP AND CUT DRILLING LINE	1.0	0.08			
Sum.			50.5	3.94	952.0
DOWNTIME MOBILIZATION					
EQUIPMENT FAILURE AND REPAIR	14.0	1.09			
WAITING	91.5	7.13			
Sum.			105.5	8.23	1057.5
DOWNTIME DRILLING					
EQUIPMENT FAILURE AND REPAIR	39.0	3.04			
WAITING	6.0	0.47			
CEMENTING	52.0	4.05			
OTHER	26.0	2.03			
Sum.			123.0	9.59	1180.5
DOWNTIME FORM. EVAL. LOGGING					
EQUIPMENT FAILURE AND REPAIR	11.5	0.90			
FISHING	85.0	6.63			
OTHER	3.0	0.23			
Sum.			99.5	7.76	1280.0
DOWNTIME FORM. EVAL. CORING					
EQUIPMENT FAILURE AND REPAIR	2.0	0.16			
Sum.			2.0	0.16	1282.0
DOWNTIME PLUG AND ABANDONMENT					
EQUIPMENT FAILURE AND REPAIR	0.5	0.04			
Sum.			0.5	0.04	1282.5

Reported time (100.0 % of well total 1282.5 hours) : 1282.5

HOLE DEVIATION

Well: 30/9-19 **Reference point:** RKB ; 29.0 m ABOVE MSL
Waterdepth: 105.0 m **Vertical to:** 133.9 m **Total Depth:** 3560.0 m MD
Utm zone: 31 **Central Median:** 3' E **Horizontal datum:** ED50
Template Centre Coordinates, UTM: **North :** m, **East:** m
Wellhead Coordinates, UTM: **North :** 6702819.90 m, **East:** 483176.90 m
Official Surveys: Y **Track :**
Coordinates are measured from the wellhead centre.

Depth MD [m]	Incli-nation [Deg]	Direc-tion [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	Coordinates East [m]	Vert. Sect [m]	Dogleg [D/30m]	Build [D/30m]	Turn [D/30m]
134.0	0.00	0.00	MWD		134.0	0.00	0.00	0.0	0.00	0.00	0.00
141.0	0.14	69.90	MWD		141.0	0.00	0.01	0.0	0.60	0.60	299.57
152.4	0.62	139.20	MWD		152.4	-0.04	0.06	0.1	1.54	1.26	182.37
157.0	0.40	140.50	MWD		157.0	-0.07	0.09	0.1	1.44	-1.43	8.48
165.9	0.32	155.70	MWD		165.9	-0.12	0.12	0.2	0.42	-0.27	51.24
179.4	0.15	206.80	MWD		179.4	-0.17	0.13	0.2	0.56	-0.38	113.56
188.0	0.25	164.20	MWD		188.0	-0.20	0.13	0.2	0.60	0.35	-148.60
196.4	0.15	214.20	MWD		196.4	-0.22	0.12	0.3	0.68	-0.36	178.57
205.6	0.54	160.80	MWD		205.6	-0.27	0.13	0.3	1.52	1.27	-174.13
219.3	0.67	226.30	MWD		219.3	-0.39	0.10	0.4	1.45	0.28	143.43
267.8	0.12	110.30	MWD		267.8	-0.60	-0.06	0.6	0.45	-0.34	-71.75
323.5	0.69	358.64	MWD		323.5	-0.29	-0.02	0.3	0.40	0.31	-60.11
381.1	0.16	7.73	MWD		381.1	0.14	-0.01	0.1	0.28	-0.28	4.73
438.1	0.32	66.10	MWD		438.1	0.28	0.14	0.3	0.14	0.08	30.74
495.3	0.42	71.81	MWD		495.3	0.41	0.49	0.6	0.06	0.05	3.00
554.0	0.41	107.23	MWD		554.0	0.42	0.89	1.0	0.13	-0.01	18.11
610.8	0.46	81.20	MWD		610.7	0.39	1.31	1.4	0.11	0.03	-13.75
667.4	0.20	28.40	MWD		667.4	0.51	1.58	1.7	0.20	-0.14	-27.94
724.5	0.67	47.70	MWD		724.5	0.83	1.88	2.1	0.26	0.25	10.15
749.8	0.19	58.90	MWD		749.8	0.95	2.02	2.2	0.58	-0.57	13.28
812.6	0.56	125.90	MWD		812.6	0.82	2.36	2.5	0.25	0.18	32.02
869.5	0.43	59.70	MWD		869.5	0.77	2.77	2.9	0.29	-0.07	-34.88
927.1	0.73	218.70	MWD		927.1	0.59	2.73	2.8	0.59	0.16	82.81
955.5	0.85	220.50	MWD		955.5	0.29	2.48	2.5	0.13	0.13	1.90
984.5	0.92	227.50	MWD		984.5	-0.03	2.17	2.2	0.13	0.07	7.24
1013.6	1.41	231.39	MWD		1013.5	-0.41	1.72	1.8	0.51	0.51	4.02
1042.3	0.74	259.60	MWD		1042.3	-0.67	1.26	1.4	0.87	-0.70	29.44
1070.5	0.81	223.10	MWD		1070.5	-0.85	0.94	1.3	0.52	0.07	-38.83
1099.9	0.43	228.90	MWD		1099.9	-1.07	0.72	1.3	0.39	-0.39	5.92
1127.8	1.17	255.80	MWD		1127.8	-1.21	0.36	1.3	0.87	0.80	28.92
1156.2	1.75	265.20	MWD		1156.1	-1.32	-0.35	1.4	0.66	0.61	9.93
1184.6	1.44	272.80	MWD		1184.5	-1.34	-1.14	1.8	0.40	-0.33	8.03
1203.0	1.29	271.30	MWD		1202.9	-1.32	-1.58	2.1	0.25	-0.24	-2.45
1231.3	1.28	274.20	MWD		1231.2	-1.29	-2.21	2.6	0.07	-0.01	3.07
1260.0	1.22	273.60	MWD		1259.9	-1.25	-2.84	3.1	0.06	-0.06	-0.63
1288.0	1.21	275.30	MWD		1287.9	-1.20	-3.43	3.6	0.04	-0.01	1.82

Norsk Hydro

1999-04-22

HOLE DEVIATION

Well: 30/9-19
Reference point: RKB ; 29.0 m ABOVE MSL
Waterdepth: 105.0 m
Vertical to: 133.9 m
Total Depth: 3560.0 m MD
Utm zone: 31
Central Median: 3' E
Horizontal datum: ED50
Template Centre Coordinates, UTM: **North :** m, **East:** m
Wellhead Coordinates, UTM: **North :** 6702819.90 m, **East:** 483176.90 m
Official Surveys: Y
Track :
Coordinates are measured from the wellhead centre.

Depth MD [m]	Inclination [Deg]	Direction [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	Coordinates East [m]	Vert. Sect [m]	Dogleg [D/30m]	Build [D/30m]	Turn [D/30m]
1316.9	1.22	278.60	MWD		1316.8	-1.13	-4.04	4.2	0.07	0.01	3.43
1346.1	1.17	279.60	MWD		1346.0	-1.03	-4.64	4.8	0.06	-0.05	1.03
1375.0	1.13	282.30	MWD		1374.9	-0.92	-5.21	5.3	0.07	-0.04	2.80
1404.2	1.20	282.60	MWD		1404.1	-0.79	-5.79	5.8	0.07	0.07	0.31
1433.1	1.14	283.60	MWD		1433.0	-0.66	-6.36	6.4	0.07	-0.06	1.04
1462.5	1.02	285.90	MWD		1462.4	-0.52	-6.90	6.9	0.13	-0.12	2.35
1491.0	1.04	295.70	MWD		1490.9	-0.34	-7.37	7.4	0.19	0.02	10.32
1519.5	1.14	303.30	MWD		1519.4	-0.07	-7.84	7.8	0.18	0.11	8.00
1548.5	1.18	303.50	MWD		1548.4	0.25	-8.33	8.3	0.04	0.04	0.21
1576.8	1.14	338.30	MWD		1576.7	0.68	-8.68	8.7	0.74	-0.04	36.89
1606.7	1.12	342.80	MWD		1606.5	1.23	-8.88	9.0	0.09	-0.02	4.52
1634.9	1.09	345.50	MWD		1634.7	1.75	-9.03	9.2	0.06	-0.03	2.88
1662.2	1.11	345.90	MWD		1662.0	2.26	-9.16	9.4	0.02	0.02	0.44
1692.1	1.15	356.30	MWD		1692.0	2.84	-9.25	9.7	0.21	0.04	10.42
1720.4	1.19	4.90	MWD		1720.2	3.42	-9.24	9.9	0.19	0.04	9.14
1748.9	1.12	16.30	MWD		1748.7	3.98	-9.14	10.0	0.25	-0.07	11.98
1778.1	1.15	48.20	MWD		1777.9	4.45	-8.84	9.9	0.64	0.03	32.77
1808.0	1.28	54.40	MWD		1807.8	4.85	-8.34	9.6	0.19	0.13	6.22
1835.7	1.32	57.90	MWD		1835.5	5.19	-7.82	9.4	0.10	0.04	3.79
1863.6	1.26	63.20	MWD		1863.4	5.50	-7.27	9.1	0.14	-0.06	5.70
1892.9	1.05	73.40	MWD		1892.7	5.73	-6.73	8.8	0.30	-0.22	10.44
1920.2	1.01	104.80	MWD		1920.0	5.74	-6.26	8.5	0.61	-0.04	34.51
1948.7	0.98	108.40	MWD		1948.5	5.59	-5.78	8.0	0.07	-0.03	3.79
1978.2	1.05	111.20	MWD		1978.0	5.42	-5.29	7.6	0.09	0.07	2.85
2007.9	1.10	107.40	MWD		2007.7	5.23	-4.77	7.1	0.09	0.05	-3.84
2036.0	1.05	105.70	MWD		2035.8	5.08	-4.26	6.6	0.06	-0.05	-1.81
2064.4	1.11	103.60	MWD		2064.2	4.95	-3.74	6.2	0.08	0.06	-2.22
2092.9	1.15	103.40	MWD		2092.7	4.82	-3.20	5.8	0.04	0.04	-0.21
2121.4	1.17	98.10	MWD		2121.1	4.71	-2.63	5.4	0.11	0.02	-5.58
2149.9	1.14	97.80	MWD		2149.6	4.63	-2.06	5.1	0.03	-0.03	-0.32
2178.8	1.02	96.70	MWD		2178.5	4.56	-1.52	4.8	0.13	-0.12	-1.14
2207.2	0.95	93.90	MWD		2206.9	4.52	-1.03	4.6	0.09	-0.07	-2.96
2236.0	0.80	94.80	MWD		2235.7	4.48	-0.60	4.5	0.16	-0.16	0.94
2263.6	0.83	89.70	MWD		2263.3	4.47	-0.20	4.5	0.08	0.03	-5.54
2291.9	0.77	89.60	MWD		2291.6	4.47	0.19	4.5	0.06	-0.06	-0.11
2301.5	0.80	92.80	MWD		2301.2	4.47	0.32	4.5	0.16	0.09	10.04

1999-04-22

Norsk Hydro

HOLE DEVIATION

Well: 30/9-19
Waterdepth: 105.0 m
Utm zone: 31
Reference point: RKB ; 29.0 m ABOVE MSL
Vertical to: 133.9 m
Central Median: 3' E
Total Depth: 3560.0 m MD
Horizontal datum: ED50
Template Centre Coordinates, UTM: **North :** m, **East:** m
Wellhead Coordinates, UTM: **North :** 6702819.90 m, **East:** 483176.90 m
Official Surveys: Y **Track :**
Coordinates are measured from the wellhead centre.

Depth MD [m]	Inclination [Deg]	Direction [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	Coordinates East [m]	Vert. Sect [m]	Dogleg [D/30m]	Build [D/30m]	Turn [D/30m]
2345.5	0.71	78.90	MWD		2345.2	4.50	0.90	4.6	0.14	-0.06	-9.47
2373.1	0.78	85.60	MWD		2372.8	4.55	1.25	4.7	0.12	0.08	7.28
2402.9	0.83	80.70	MWD		2402.6	4.60	1.67	4.9	0.09	0.05	-4.93
2458.2	0.93	61.80	MWD		2457.9	4.88	2.46	5.5	0.17	0.05	-10.25
2517.2	1.02	66.10	MWD		2516.9	5.32	3.36	6.3	0.06	0.05	2.19
2574.9	1.07	63.30	MWD		2574.6	5.77	4.31	7.2	0.04	0.03	-1.46
2632.3	1.11	59.60	MWD		2631.9	6.29	5.27	8.2	0.04	0.02	-1.94
2689.1	1.03	65.70	MWD		2688.8	6.78	6.21	9.2	0.07	-0.04	3.22
2717.7	1.25	71.10	MWD		2717.4	6.99	6.74	9.7	0.26	0.23	5.66
2746.4	1.63	75.60	MWD		2746.1	7.19	7.43	10.3	0.41	0.40	4.70
2774.8	1.74	73.40	MWD		2774.4	7.41	8.23	11.1	0.13	0.12	-2.32
2802.8	2.00	77.90	MWD		2802.4	7.64	9.12	11.9	0.32	0.28	4.82
2830.7	2.17	71.50	MWD		2830.3	7.91	10.10	12.8	0.31	0.18	-6.88
2859.4	2.61	72.20	MWD		2859.0	8.28	11.23	14.0	0.46	0.46	0.73
2888.5	2.84	76.50	MWD		2888.1	8.65	12.57	15.3	0.32	0.24	4.43
2898.0	2.88	75.00	MWD		2897.5	8.77	13.02	15.7	0.27	0.13	-4.76
2942.5	1.29	43.50	MWD		2942.1	9.42	14.45	17.2	1.28	-1.07	-21.22
2971.3	1.58	327.50	MWD		2970.8	9.99	14.46	17.6	1.86	0.30	-79.28
3000.3	2.00	324.00	MWD		2999.8	10.73	13.95	17.6	0.45	0.43	-3.62
3027.5	3.07	315.60	MWD		3027.0	11.64	13.16	17.6	1.24	1.18	-9.24
3056.5	1.91	302.80	MWD		3055.9	12.46	12.21	17.4	1.32	-1.20	-13.26
3086.3	1.88	273.50	MWD		3085.7	12.76	11.31	17.0	0.97	-0.03	-29.53
3112.7	2.88	261.80	MWD		3112.1	12.69	10.22	16.3	1.26	1.14	-13.30
3123.0	3.40	260.00	MWD		3122.4	12.60	9.66	15.9	1.54	1.51	-5.23
3142.8	4.03	263.40	MWD		3142.1	12.42	8.39	15.0	1.01	0.96	5.16
3160.6	4.19	260.60	MWD		3159.9	12.24	7.13	14.2	0.43	0.27	-4.71
3236.7	3.88	253.50	MWD		3235.8	11.05	1.91	11.2	0.23	-0.12	-2.80
3259.0	3.15	257.80	MWD		3258.0	10.71	0.59	10.7	1.05	-0.99	5.81
3286.8	3.01	253.30	MWD		3285.8	10.34	-0.85	10.4	0.30	-0.15	-4.86
3318.7	3.10	251.40	MWD		3317.7	9.82	-2.47	10.1	0.13	0.08	-1.79
3345.7	3.04	248.00	MWD		3344.7	9.32	-3.83	10.1	0.21	-0.07	-3.77
3375.1	2.87	244.20	MWD		3374.0	8.71	-5.21	10.1	0.27	-0.17	-3.89
3403.0	2.84	232.40	MWD		3401.8	7.98	-6.39	10.2	0.63	-0.03	-12.68
3431.4	2.80	219.20	MWD		3430.2	7.02	-7.39	10.2	0.69	-0.04	-13.95
3460.5	2.75	202.10	MWD		3459.3	5.82	-8.10	10.0	0.85	-0.05	-17.61
3478.7	2.90	180.70	MWD		3477.5	4.95	-8.27	9.6	1.75	0.25	-35.27

HOLE DEVIATION

Well: 30/9-19
Reference point: RKB ; 29.0 m ABOVE MSL
Waterdepth: 105.0 m
Vertical to: 133.9 m
Total Depth: 3560.0 m MD
Utm zone: 31
Central Median: 3' E
Horizontal datum: ED50
Template Centre Coordinates, UTM: **North :** m, **East:** m
Wellhead Coordinates, UTM: **North :** 6702819.90 m, **East:** 483176.90 m
Official Surveys: Y
Track :
Coordinates are measured from the wellhead centre.

Depth MD [m]	Incli-nation [Deg]	Direc-tion [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	Coordinates East [m]	Vert. Sect [m]	Dogleg [D/30m]	Build [D/30m]	Turn [D/30m]
3515.2	3.40	149.80	MWD		3513.9	3.09	-7.73	8.3	1.43	0.41	-25.40
3539.7	3.90	143.30	MWD		3538.4	1.80	-6.87	7.1	0.79	0.61	-7.96

MAIN CONSUMPTION OF CASING/TUBING ON WELL 30/9-19 PO: 1

Size	Casing string	Grade	Weight [kg/m]	Weight [lb/ft]	Threads type	Length [m]	No. of joints
30"	CONDUCTOR	X-52	234.38	157.50	SL-60	99.1	6
20"	SURFACE	X-56	197.92	133.00	E60MT	1067.5	88
13 3/8"	INTERMEDIATE	P-110	107.14	72.00	NS-CC	2186.2	191
9 5/8"	PRODUCTION	P-110	79.61	53.50	NS-CC	2775.9	235

BITRECORD FOR WELL 30/9-19 PO: 1

Bit				Size (in)	Manu- fact- urer	Trade name	Serial no.	IADC code	Nozzles diameter (../32in)	Flow area (in2)	BHA no.	Depth out (m MD)	Bit meter (m)	Rot. hours (hrs)	ROP (m/hr)	Rotation min/max) (rpm)	Total bit revol.	Weight min/max (kN)	Flow min/max (l/min)	Pump min/max (bar)	Cutting Structure I - O -DC- L - B	Gauge 1/16 (in)	Other Remarks	Pull Cause
No		RR	Type																					
1			ISRT	17.50	SDBS	SS81LJ4	686439	425M	18,18,18,18	0.994	1	231	98	5.20	18.9	60/90		0/100	2000/3500	52/106	2 - 2 - WT - N - E	I	NO	TD
1			HO	36.00	REDB	HEAVYDUTY	RB16463			0.000	1	231	98	5.20	18.9	60/90		0/100	2000/3500	52/106	1 - 1 - WT - A - E	I	NO	
2			ISRT	26.00	SDBS	SS80LTJ4	707096	415M	20,20,22,22	1.356	2	233	6	1.00	6.0	60/70	2000	50/100	4300/4300	20/100	0 - 0 - NO - A - 0	I	NO	TD
3			ISRT	9.88	HTC	ATMGTC09	W23YP	437	22,22,22	1.114	3	1202	969	22.80	42.5	60/175	195000	0/100	2500/3300	50/135	2 - 2 - WT - A - E	I	NO	TD
2		1	ISRT	26.00	SDBS	SS80LTJ4	707096	415M	20,20,22,22	1.356	4	1205	972	34.40	28.3	45/150	183000	0/150	3100/4800	85/230	2 - 2 - NO - A - E	I	NO	TD
4			ISRT	17.50	HTC	MAXGTPT09DD	B16DF	435	14,16,20,22	1.025	5	2329	1124	57.40	19.6	20/109	749000	0/270	2647/4556	155/266	1 - 1 - BT - A - 5	I	NO	TD
5			PDC	12.25	HTC	BD536H	1402951	M323	14,14,15,15,15,15	0.991	6	2922	593	25.90	22.9	0/137	293000	40/200	3130/3600	230/255	1 - 1 - CT - T - X	I	WT	TD
6			MITO	8.50	HTC	ATJG8	A79DS	347	16,16,16	0.589	7	2859	292	11.80	24.7	80/80	57000	10/180	2480/2600	223/240	2 - 5 - BT - A - E	I	CD	TD
7			ISRT	8.50	HTC	MX09DX	C31DD	437	16,16,16	0.589	8	3184	262	16.11	16.3	59/306	247000	40/250	2020/2315	173/229	2 - 3 - BT - G - E	I	NO	CP
8			CORE	8.50	SDBS	FC264RILI	7980828	243		0.000	9	3240	56	1.20	46.9	110/190	10000	60/130	970/990	81/85	4 - 1 - ER - N - X	I	NO	NC
9			CORE	8.50	SDBS	FC284RILI	7980962	M231		0.000	10	3255	14	4.12	3.4	87/109	24000	60/170	999/1017	63/73	1 - 1 - NO - A - X	I	NO	CJ
10			PDC	8.50	SMIT	M50P	JR3654	M333	11,11,11,12,12,12	0.610	11	3450	196	8.70	22.5	115/135	67000	40/80	1850/1850	140/140	1 - 2 - CT - T - X	I	NO	CP
10		1	PDC	8.50	SMIT	M50P	JR3654	M333	11,11,11,12,12,12	0.610	12	3494	44	1.73	25.4	125/125	14000	40/70	1850/1850	150/150	2 - 2 - CT - T - X	I	NO	CP
11			CORE	8.50	SDBS	FC264LI	7980555	243		0.000	13	3522	28	1.21	23.1	120/135	8000	70/130	1100/1100	75/75	6 - 6 - CT - A - X	I	WT	CJ
10		2	PDC	8.50	SMIT	M50P	JR3654	M333	11,11,11,12,12,12	0.610	14	3560	38	1.05	36.2	140/140	12000	100/150	2200/2200	190/190	2 - 2 - CT - T - X	I	NO	TD
10		3	PDC	8.50	SMIT	M50P	JR3654	M333	11,11,11,12,12,12	0.610	15	3560	0		0.0	120/120		0/0	2256/2256	192/192	2 - 2 - CT - T - X	I	NO	LOG

BOTTOM HOLE ASSEMBLIES USED ON WELL 30/9-19 PO: 1

BHA no. 1: No. / Element / OD(in) / Length(m) Depth In: 133 m MD Out: 231 m MD

1	SS81LJ4	17.5	0.43	2	HEAVYDUTY	36.0	5.28
3	FLOAT SUB	9.5	0.85	4	X-OVER	9.5	0.47
5	MWD	9.0	8.48	6	NON MAG. COLLAR	9.5	9.14
7	DRILL COLLAR STEEL	9.5	9.40	8	DRILL COLLAR STEEL	9.5	9.30
9	DRILL COLLAR STEEL	9.5	9.19	10	DRILL COLLAR STEEL	9.5	9.21
11	X-OVER	9.25	1.16	12	DRILL COLLAR STEEL	8.0	9.23
13	DRILL COLLAR STEEL	7.75	8.51	14	DRILL COLLAR STEEL	8.0	9.30
15	DRILL COLLAR STEEL	8.0	9.35	16	DRILL COLLAR STEEL	8.0	9.28
17	DRILL COLLAR STEEL	8.0	9.35	18	DRILL COLLAR STEEL	7.875	9.20
19	X-OVER	8.0	1.09				

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 128.22

BHA no. 2: No. / Element / OD(in) / Length(m) Depth In: 227 m MD Out: 233 m MD

1	SS80LTJ4			2	BIT SUB	9.5	0.96
3	STEEL STAB	25.75	2.36	4	X-OVER	9.25	1.16
5	DRILL COLLAR STEEL	8.0	55.02	6	JAR	7.875	9.70
7	DRILL COLLAR STEEL	8.0	18.46	8	X-OVER	8.0	1.09
9	HWDP		81.65				

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 88.75

BHA no. 3: No. / Element / OD(in) / Length(m) Depth In: 233 m MD Out: 1202 m MD

1	ATMGTC09			2	BIT SUB	8.0	1.22
3	FLOAT SUB	7.5	0.98	4	CDR	8.25	6.82
5	MWD	8.25	8.12	6	NON MAG. COLLAR	8.0	16.87
7	DRILL COLLAR STEEL	8.0	64.39	8	JAR	7.875	9.70
9	DRILL COLLAR STEEL	8.0	27.91	10	X-OVER	8.0	1.09
11	HWDP		81.65				

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 137.10

BHA no. 4: No. / Element / OD(in) / Length(m) Depth In: 233 m MD Out: 1205 m MD

1	SS80LTJ4	26.0	0.56	2	BIT SUB	9.5	0.96
3	FLOAT SUB	9.5	0.85	4	CDR	9.625	7.34
5	MWD	9.0	8.48	6	NON MAG. X-OVER	9.5	2.36
7	NON MAG. COLLAR	9.5	17.84	8	NON MAG. X-OVER	9.5	1.97
9	DRILL COLLAR STEEL	9.5	27.70	10	X-OVER	9.25	1.16
11	DRILL COLLAR STEEL	8.0	64.39	12	JAR	7.875	9.70
13	DRILL COLLAR STEEL	8.0	27.91	14	X-OVER	8.0	1.09
15	HWDP	5.0	81.65				

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 253.96

BHA no. 5: No. / Element / OD(in) / Length(m) Depth In: 1205 m MD Out: 2329 m MD

1	MAXGTPT09DDT	17.5	0.42	2	DOWNHOLE MOTOR	11.25	8.99
3	FLOAT SUB	9.5	0.85	4	STEEL STAB	9.5	2.52
5	CDR	9.875	7.34	6	MWD	8.49	8.49
7	STEEL STAB	16.75	2.26	8	NON MAG. COLLAR	9.5	9.14
9	NON MAG. COLLAR	9.5	8.70	10	X-OVER	9.25	1.16
11	DRILL COLLAR STEEL	8.0	9.23	12	DRILL COLLAR STEEL	8.0	9.30
13	DRILL COLLAR STEEL	8.0	9.35	14	DRILL COLLAR STEEL	8.0	9.28
15	DRILL COLLAR STEEL	8.0	9.35	16	DRILL COLLAR STEEL	8.0	9.37
17	JAR	7.875	9.70	18	DRILL COLLAR STEEL	8.0	9.20
19	DRILL COLLAR STEEL	8.0	9.26	20	DRILL COLLAR STEEL	8.0	9.45
21	X-OVER	8.0	1.09	22	HWDP	5.5	81.65

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 226.10

BOTTOM HOLE ASSEMBLIES USED ON WELL 30/9-19 PO: 1

BHA no. 6: No. / Element / OD(in) / Length(m) Depth In: 2329 m MD Out: 2922 m MD

1	BD536H	12.25	0.47	2	DOWNHOLE MOTOR	9.625	9.29
3	FLOAT SUB	8.438	0.63	4	NON MAG. STAB	12.125	1.89
5	CDR	8.25	6.62	6	MWD	8.25	8.30
7	NON MAG. STAB	11.5	1.78	8	NON MAG. COLLAR	7.937	8.75
9	NON MAG. COLLAR	8.0	7.96	10	DRILL COLLAR STEEL	8.0	9.23
11	DRILL COLLAR STEEL	8.0	9.35	12	DRILL COLLAR STEEL	8.0	9.37
13	JAR	8.0	9.70	14	DRILL COLLAR STEEL	7.875	9.20
15	DRILL COLLAR STEEL	8.0	9.26	16	DRILL COLLAR STEEL	8.0	9.45
17	X-OVER	8.0	0.74	18	HWDP	5.0	81.65

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 193.64

BHA no. 7: No. / Element / OD(in) / Length(m) Depth In: 2567 m MD Out: 2859 m MD

1	ATJG8	8.5	0.23	2	NEAR BIT STAB	8.5	1.68
3	DRILL COLLAR STEEL	6.25	8.94	4	NON MAG. STAB	8.5	1.62
5	DRILL COLLAR STEEL	6.5	9.29	6	DRILL COLLAR STEEL	6.25	8.95
7	NON MAG. STAB	8.0	1.66	8	DRILL COLLAR STEEL	6.25	8.83
9	DRILL COLLAR STEEL	6.437	9.00	10	DRILL COLLAR STEEL	6.312	9.07
11	DRILL COLLAR STEEL	6.25	9.26	12	DRILL COLLAR STEEL	6.312	9.27
13	DRILL COLLAR STEEL	6.5	9.08	14	JAR	6.375	9.33
15	DRILL COLLAR STEEL	6.437	9.25	16	DRILL COLLAR STEEL	6.5	9.40
17	DRILL COLLAR STEEL	6.375	8.94	18	HWDP	5.0	81.65

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 205.45

BHA no. 8: No. / Element / OD(in) / Length(m) Depth In: 2922 m MD Out: 3184 m MD

1	MX09DX	8.5	0.24	2	DOWNHOLE MOTOR	6.75	7.67
3	FLOAT SUB	6.5	0.84	4	NON MAG. STAB	8.0	1.66
5	CDR	6.75	6.84	6	MWD	6.75	8.39
7	NON MAG. STAB	7.875	1.85	8	NON MAG. COLLAR	6.5	8.85
9	NON MAG. COLLAR	6.812	9.22	10	DRILL COLLAR STEEL	6.25	8.83
11	DRILL COLLAR STEEL	6.437	9.00	12	DRILL COLLAR STEEL	6.312	9.07
13	DRILL COLLAR STEEL	6.25	9.26	14	DRILL COLLAR STEEL	6.312	9.27
15	DRILL COLLAR STEEL	6.5	9.08	16	JAR	6.375	9.33
17	DRILL COLLAR STEEL	6.437	9.25	18	DRILL COLLAR STEEL	6.5	9.40
19	DRILL COLLAR STEEL	6.375	8.94	20	HWDP	5.0	81.65

Reason pulled: CORE POINT Sum: 218.64

BHA no. 9: No. / Element / OD(in) / Length(m) Depth In: 3184 m MD Out: 3240 m MD

1	FC264RILI	8.5	0.36	2	CORE BARREL	8.5	57.56
3	FLOAT SUB	6.5	0.84	4	NON MAG. COLLAR	8.5	8.85
5	NON MAG. COLLAR	6.812	9.22	6	DRILL COLLAR STEEL	6.25	8.83
7	DRILL COLLAR STEEL	8.0	9.00	8	DRILL COLLAR STEEL	6.312	9.07
9	DRILL COLLAR STEEL	6.25	9.26	10	DRILL COLLAR STEEL	6.25	8.94
11	DRILL COLLAR STEEL	6.5	9.29	12	DRILL COLLAR STEEL	6.25	8.95
13	DRILL COLLAR STEEL	6.312	9.27	14	DRILL COLLAR STEEL	6.5	9.08
15	JAR	6.375	9.33	16	DRILL COLLAR STEEL	6.437	9.25
17	DRILL COLLAR STEEL	6.5	9.40	18	DRILL COLLAR STEEL	6.375	8.94
19	HWDP	5.0	81.65				

Reason pulled: NEW CORE/FULL BARREL Sum: 277.09

BOTTOM HOLE ASSEMBLIES USED ON WELL 30/9-19 PO: 1

BHA no. 10: No. / Element / OD(in) / Length(m) Depth In: 3240 m MD Out: 3255 m MD

1	FC284RILI	8.5	0.36	2	CORE BARREL	8.5	57.56
3	FLOAT SUB	6.5	0.84	4	NON MAG. COLLAR	6.5	8.85
5	NON MAG. COLLAR	6.812	9.22	6	DRILL COLLAR STEEL	6.25	8.83
7	DRILL COLLAR STEEL	8.0	9.00	8	DRILL COLLAR STEEL	6.312	9.07
9	DRILL COLLAR STEEL	6.25	9.26	10	DRILL COLLAR STEEL	6.25	8.94
11	DRILL COLLAR STEEL	6.5	9.29	12	DRILL COLLAR STEEL	6.25	8.95
13	DRILL COLLAR STEEL	6.312	9.27	14	DRILL COLLAR STEEL	6.5	9.08
15	JAR	6.375	9.33	16	DRILL COLLAR STEEL	6.437	9.25
17	DRILL COLLAR STEEL	6.5	9.40	18	DRILL COLLAR STEEL	6.375	8.94
19	HWDP	5.0	81.65				

Reason pulled: CORE JAMMED Sum: 277.09

BHA no. 11: No. / Element / OD(in) / Length(m) Depth In: 3254 m MD Out: 3450 m MD

1	M50P	8.5	0.31	2	NEAR BIT STAB	6.562	1.68
3	SHORT NON MAG. DC	6.75	2.85	4	NON MAG. STAB	6.688	1.62
5	CDR	6.75	6.84	6	MWD	6.75	8.39
7	NON MAG. STAB	6.5	1.96	8	NON MAG. COLLAR	6.5	8.85
9	NON MAG. COLLAR	6.813	9.22	10	NON MAG. STAB	8.0	1.66
11	DRILL COLLAR STEEL	6.5	8.83	12	DRILL COLLAR STEEL	6.438	9.00
13	DRILL COLLAR STEEL	6.313	9.07	14	DRILL COLLAR STEEL	6.25	9.26
15	DRILL COLLAR STEEL	6.313	9.27	16	DRILL COLLAR STEEL	6.5	9.08
17	JAR	6.375	9.33	18	DRILL COLLAR STEEL	6.438	9.25
19	DRILL COLLAR STEEL	6.5	9.40	20	DRILL COLLAR STEEL	6.375	8.94
21	HWDP	6.5	81.65				

Reason pulled: CORE POINT Sum: 216.46

BHA no. 12: No. / Element / OD(in) / Length(m) Depth In: 3450 m MD Out: 3494 m MD

1	M50P	8.5	0.31	2	BIT SUB	6.438	0.97
3	CDR	6.75	6.84	6	MWD	8.5	8.39
7	NON MAG. STAB	8.5	1.62	8	NON MAG. COLLAR	6.5	8.85
9	NON MAG. COLLAR	6.813	9.22	10	NON MAG. STAB	8.25	1.96
11	DRILL COLLAR STEEL	6.5	8.83	12	DRILL COLLAR STEEL	6.438	9.00
13	DRILL COLLAR STEEL	6.313	9.07	14	DRILL COLLAR STEEL	6.25	9.26
15	DRILL COLLAR STEEL	6.313	9.27	16	DRILL COLLAR STEEL	6.5	9.08
17	JAR	6.375	9.33	18	DRILL COLLAR STEEL	6.438	9.25
19	DRILL COLLAR STEEL	6.5	9.40	20	DRILL COLLAR STEEL	6.375	8.94
21	HWDP	6.5	81.65				

Reason pulled: CORE POINT Sum: 211.24

BHA no. 13: No. / Element / OD(in) / Length(m) Depth In: 3494 m MD Out: 3522 m MD

1	FC264LI	8.5	0.36	2	CORE BARREL	8.5	57.56
3	FLOAT SUB	6.5	0.84	4	NON MAG. COLLAR	8.5	8.85
5	NON MAG. COLLAR	6.812	9.22	6	DRILL COLLAR STEEL	6.25	8.83
7	DRILL COLLAR STEEL	8.0	9.00	8	DRILL COLLAR STEEL	6.312	9.07
9	DRILL COLLAR STEEL	6.25	9.26	10	DRILL COLLAR STEEL	6.25	8.94
11	DRILL COLLAR STEEL	6.5	9.29	12	DRILL COLLAR STEEL	6.25	8.95
13	DRILL COLLAR STEEL	6.312	9.27	14	DRILL COLLAR STEEL	6.5	9.08
15	JAR	6.375	9.33	16	DRILL COLLAR STEEL	6.437	9.25
17	DRILL COLLAR STEEL	6.5	9.40	18	DRILL COLLAR STEEL	6.375	8.94
19	HWDP	5.0	81.65				

Reason pulled: CORE JAMMED Sum: 277.09

BOTTOM HOLE ASSEMBLIES USED ON WELL 30/9-19 PO: 1

BHA no. 14: No. / Element / OD(in) / Length(m) Depth In: 3522 m MD Out: 3560 m MD

1	M50P	8.5	0.31	2	NEAR BIT STAB	6.562	1.68
3	SHORT NON MAG. DC	6.75	2.85	4	NON MAG. STAB	6.688	1.62
5	CDR	6.75	6.84	6	MWD	6.75	8.39
7	NON MAG. STAB	6.5	1.96	8	NON MAG. COLLAR	6.5	8.85
9	NON MAG. COLLAR	6.813	9.22	10	NON MAG. STAB	8.0	1.66
11	DRILL COLLAR STEEL	6.5	8.83	12	DRILL COLLAR STEEL	6.438	9.00
13	DRILL COLLAR STEEL	6.313	9.07	14	DRILL COLLAR STEEL	6.25	9.26
15	DRILL COLLAR STEEL	6.313	9.27	16	DRILL COLLAR STEEL	6.5	9.08
17	JAR	6.375	9.33	18	DRILL COLLAR STEEL	6.438	9.25
19	DRILL COLLAR STEEL	6.5	9.40	20	DRILL COLLAR STEEL	6.375	8.94
21	HWDP	6.5	81.65				

Reason pulled: TOTAL DEPTH/CASING DEPT Sum: 216.46

BHA no. 15: No. / Element / OD(in) / Length(m) Depth In: 3560 m MD Out: 3560 m MD

1	M50P	8.5	0.31	2	NEAR BIT STAB	6.562	1.68
3	SHORT NON MAG. DC	6.75	2.85	4	NON MAG. STAB	6.688	1.62
8	NON MAG. COLLAR	6.5	8.85	9	NON MAG. COLLAR	6.813	9.22
10	NON MAG. STAB	8.0	1.96	11	DRILL COLLAR STEEL	6.5	8.83
12	DRILL COLLAR STEEL	6.438	9.00	13	DRILL COLLAR STEEL	6.313	9.07
14	DRILL COLLAR STEEL	6.25	9.26	15	DRILL COLLAR STEEL	6.313	9.27
16	DRILL COLLAR STEEL	6.5	9.08	17	JAR	6.375	9.44
18	DRILL COLLAR STEEL	6.438	9.25	19	DRILL COLLAR STEEL	6.5	9.40
20	DRILL COLLAR STEEL	6.375	8.94	21	HWDP	6.5	81.65

Reason pulled: RUN LOGS Sum: 199.68

BHA no. 16: No. / Element / OD(in) / Length(m) Depth In: 3560 m MD Out: 3560 m MD

1	CEMENT STINGER	3.5	337.76	2	X-OVER	6.5	1.10

Reason pulled: Sum: 338.86

BHA no. 28: No. / Element / OD(in) / Length(m) Depth In: 2834 m MD Out: 2834 m MD

1	OTHER	8.5	0.62	2	BIT SUB	6.562	0.87
3	SHORT NON MAG. DC	6.75	2.85	4	NON MAG. STAB	6.688	1.62
8	NON MAG. COLLAR	6.5	8.85	9	NON MAG. COLLAR	6.813	9.22
10	NON MAG. STAB	8.0	1.96	12	DRILL COLLAR STEEL	6.438	9.00
13	DRILL COLLAR STEEL	6.313	9.07	14	DRILL COLLAR STEEL	6.25	9.26
15	DRILL COLLAR STEEL	6.313	9.27	16	DRILL COLLAR STEEL	6.5	9.08
17	JAR	6.375	9.44	18	DRILL COLLAR STEEL	6.438	9.25
19	DRILL COLLAR STEEL	6.5	9.40	20	DRILL COLLAR STEEL	6.375	8.94
21	HWDP	6.5	81.65				

Reason pulled: Sum: 190.35

CEMENT SLURRY REPORT ON WELL 30/9-19

Date	CsgSize	Jobtype	Slurry Type	Pumped Volume [m3]	Density [sg]	BHCT [DegC]	Yield [l/100 kg]	Additive	Unit	Additives [../100 kg Cement]	Additives [../m3 Slurry]
1998-09-10	30"	CASING CEMENTING	DISPLACEMENT	4.21	1.03						
			LEAD	31.50	1.56		129.61	ECONO	l	3.50	
			TAIL SLURRY	29.50	1.95		75.06	CaCl2C	l	4.35	
			SPACER	40.00	1.03						
1998-09-17	20"	CASING CEMENTING	LEAD	285.30	1.44		169.82	ECONO	l	5.00	
								NF-6	l	0.10	
								HR-4L	l	4.00	
			TAIL SLURRY	54.50	1.90		76.74	NF-6	l	0.10	
								HR-4L	l	0.70	
			SPACER		1.20		20.00				
			DISPLACEMENT				3.18				
1998-09-18	30"	GROUT	SPACER	0.71	1.03		73.69				
			LEAD	18.00	1.95		73.69				
			DISPLACEMENT	1.27	1.03						
1998-09-25	13 3/8"	CASING CEMENTING	SPACER	11.60	1.67	60.00					
			LEAD	29.90	1.90	60.00	77.37	HR-4L	l	1.00	
								GASCON	l	2.50	
								NF-6	l	0.10	
								CFR-3L	l	1.50	
			DISPLACEMENT	166.30		60.00					
1998-09-30	9 5/8"	CASING CEMENTING	SPACER	10.00	1.63	79.00					
			LEAD	13.60	1.90	79.00	102.56	CFR-3L	l	1.50	
								GASCON	l	6.00	
								HAL600	l	6.00	
								NF-6	l	0.10	
								SCR100	kg	2.90	
			DISPLACEMENT	101.98		79.00					
1998-10-03	9 5/8"	SQUEEZE	LEAD	6.90	1.90	79.00	102.56	CFR-3L	l	1.50	
								GASCON	l	6.00	
								HAL600	l	6.00	
								SCR100	kg	2.90	
			DISPLACEMENT	22.30		79.00					

CEMENT SLURRY REPORT ON WELL 30/9-19

Date	CsgSize	Jobtype	Slurry Type	Pumped Volume [m3]	Density [sg]	BHCT [DegC]	Yield [l/100 kg]	Additive	Unit	Additives [../100 kg Cement]	Additives [../m3 Slurry]
1998-10-03	9 5/8"	SQUEEZE	PREFLUSH	2.30	1.10	79.00					
1998-10-22		PLUG IN OPEN HOLE	LEAD	9.81	1.90		102.42	CFR-3L	l	1.00	
								GASCON	l	5.50	
								HAL600	l	6.00	
								NF-6	l	0.10	
								SCR-L	l	3.00	
			DISPLACEMENT	28.45							
			SPACER	3.50	1.61						
1998-10-22		PLUG IN OPEN HOLE	LEAD	9.81	1.90		102.42	CFR-3L	l	1.00	
								GASCON	l	5.50	
								HAL600	l	6.00	
								NF-6	l	0.10	
								SCR-L	l	3.00	
			SPACER	3.50	1.61						
			DISPLACEMENT	25.40							
1998-10-22	9 5/8"	PLUG IN CASED TO OPEN HOLE	DISPLACEMENT	23.90							
			LEAD	10.41	1.90		102.42	CFR-3L	l	1.00	
								GASCON	l	5.50	
								HAL600	l	6.00	
								NF-6	l	0.10	
								SCR-L	l	3.00	
			SPACER	3.50	1.61						

CEMENT CONSUMPTION PER JOB ON WELL 30/9-19

Date	CsgSize	Job Type	Cement/ Additive	Description	Unit	Actual Amount Used
1998-09-10	30"	CASING CEMENTING	CaCl2C	CaCl2 / ACCELERATOR: CALCIUM CHLORIDE	l	1900
			ECONO	EXTENDER: ECONOLITE	l	900
			NF-6	NF-6	l	62
1998-09-17	20"	CASING CEMENTING	ECONO	EXTENDER: ECONOLITE	l	8100
			HR-4L	RETARDER: HR-4L, LIQUID	l	6740
			NF-6	NF-6	l	220
1998-09-18	30"	GROUT	NF-6	NF-6	l	25
1998-09-25	13 3/8"	CASING CEMENTING	CFR-3L	DISPERSANT: CFR-3 LIQUID	l	810
			GASCON	EDP-C469-91	l	1200
			HR-4L	RETARDER: HR-4L, LIQUID	l	450
			NF-6	NF-6	l	70
1998-09-30	9 5/8"	CASING CEMENTING	CFR-3L	DISPERSANT: CFR-3 LIQUID	l	158
			GASCON	EDP-C469-91	l	900
			HAL600	FLUID LOSS ADDITIVE: HALAD-600	l	800
			NF-6	NF-6	l	20
			SCR100	RETARDER: SCR-100	kg	780
1998-10-03	9 5/8"	SQUEEZE	CFR-3L	DISPERSANT: CFR-3 LIQUID	l	150
			NF-6	NF-6	l	80
			SCR100	RETARDER: SCR-100	kg	220
			SP500	SPACER 500	l	454
			HAL600	FLUID LOSS ADDITIVE: HALAD-600	l	600
			GASCON	EDP-C469-91	l	450
1998-10-22		PLUG IN OPEN HOLE	CFR-3L	DISPERSANT: CFR-3 LIQUID	l	114
			SCR-L	RETARDER: SCR-100L	l	310
			NF-6	NF-6	l	27
			GASCON	EDP-C469-91	l	570
			HAL600	FLUID LOSS ADDITIVE: HALAD-600	l	620
1998-10-22		PLUG IN OPEN HOLE	CFR-3L	DISPERSANT: CFR-3 LIQUID	l	114
			GASCON	EDP-C469-91	l	570
			NF-6	NF-6	l	27
			SCR-L	RETARDER: SCR-100L	l	310
			HAL600	FLUID LOSS ADDITIVE: HALAD-600	l	620
1998-10-22	9 5/8"	PLUG IN CASED TO OPEN HOLE	CFR-3L	DISPERSANT: CFR-3 LIQUID	l	122
			GASCON	EDP-C469-91	l	610
			HAL600	FLUID LOSS ADDITIVE: HALAD-600	l	660
			NF-6	NF-6	l	36
			SCR-L	RETARDER: SCR-100L	l	330

TOTAL CONSUMPTION OF CEMENT ADDITIVES ON WELL 30/9-19

Section	Cement/Additive	Unit	Total Amount Used
36"	EXTENDER: ECONOLITE	l	900.00
	CaCl2 / ACCELERATOR: CALCIUM CHLORIDE	l	1900.00
	NF-6	l	87.00
26"	RETARDER: HR-4L, LIQUID	l	6740.00
	EXTENDER: ECONOLITE	l	8100.00
	NF-6	l	220.00
17 1/2"	DISPERSANT: CFR-3 LIQUID	l	810.00
	RETARDER: HR-4L, LIQUID	l	450.00
	EDP-C469-91	l	1200.00
	NF-6	l	70.00
12 1/4"	DISPERSANT: CFR-3 LIQUID	l	308.00
	EDP-C469-91	l	1350.00
	FLUID LOSS ADDITIVE: HALAD-600	l	1400.00
	NF-6	l	100.00
	SPACER 500	l	454.00
	RETARDER: SCR-100	kg	1000.00
8 1/2"	DISPERSANT: CFR-3 LIQUID	l	350.00
	EDP-C469-91	l	1750.00
	FLUID LOSS ADDITIVE: HALAD-600	l	1900.00
	NF-6	l	90.00
	RETARDER: SCR-100L	l	950.00

DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS FOR WELL 30/9-19 PO: 1

Hole section : 36"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-09-09 23:59	231	231	SPUD MUD		1.05						0	0							
1998-09-10	233	233	SPUD MUD		1.05						0	0							

Hole section : 26"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-09-11 23:59	233	233	SPUD MUD	100.0	1.05						0	0							
1998-09-12	750	750	SPUD MUD	100.0	1.05						0	0							
1998-09-12 10:00	420	420	SPUD MUD	100.0	1.05						0	0							
1998-09-12 14:00	502	502	SPUD MUD	100.0	1.05						0	0							
1998-09-12 22:00	750	750	SPUD MUD	100.0	1.05						0	0							
1998-09-13 10:00	1050	1050	SPUD MUD	100.0	1.05						0	0							
1998-09-13 14:00	1202	1202	SPUD MUD	100.0	1.05						0	0							
1998-09-13 22:00	1202	1202	SPUD MUD	100.0	1.05						0	0							
1998-09-14 10:00	425	425	SPUD MUD	100.0	1.05						0	0							
1998-09-14 14:00	550	550	SPUD MUD	100.0	1.05						0	0							
1998-09-15	1205	1205	SPUD MUD	75.0	1.20						0	0							
1998-09-15 10:00	1175	1175	SPUD MUD	70.0	1.20						0	0							
1998-09-15 22:00	1205	1205	SPUD MUD	81.0	1.20						0	0							
1998-09-16 10:00	1205	1205	SPUD MUD	79.0	1.20						0	0							
1998-09-16 17:00	1205	1205	SPUD MUD	82.0	1.20						0	0							
1998-09-16 23:00	1205	1205	SPUD MUD	88.0	1.20						0	0							
1998-09-17 23:00	1198	1198	SPUD MUD	84.0	1.20						0	0							
1998-09-18 22:00	1205	1205	BENTONITE MUD	75.0	1.30		70	52	44	33	0	0			50.0	18.0	17.0	6.5	8.0

Hole section : 17 1/2"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-09-19 21:00	1205	1205	ANCO 2000	75.0	1.30		70	52	44	100	0	0	14	12	50.0	18.0	17.0	6.5	8.0
1998-09-20 11:30	1325	1325	ANCO 2000	65.0	1.30		50	35	30	21	0	0	7	5	50.0	15.0	10.0	7.0	9.5
1998-09-20 17:00	1435	1435	ANCO 2000	64.0	1.30		53	38	32	23	0	0	7	6	50.0	15.0	13.5	7.0	8.0
1998-09-20 22:00	1500	1500	ANCO 2000	55.0	1.30		61	44	36	27	0	0	9	8	50.0	17.0	13.5	4.0	6.5

DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS FOR WELL 30/9-19 PO: 1

Hole section : 17 1/2"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-09-21 03:30	1580	1580	ANCO 2000	72.0	1.45		74	55	45	34	0	0	12	10	50.0	19.0	18.0	6.0	8.0
1998-09-22 21:00	2215	2215	ANCO 2000	63.0	1.45		93	70	60	46	0	0	19	16	50.0	23.0	23.5	8.0	13.4
1998-09-23 21:00	2329	2329	ANCO 2000	68.0	1.45		93	70	61	46	0	0	20	17	50.0	23.0	23.5	10.0	15.0
1998-09-24 22:00	2329	2329	ANCO 2000	70.0	1.46		91	69	60	44	0	0	19	16	50.0	22.0	23.5	10.0	15.0
1998-09-25 22:00	2329	2329	ANCO 2000	70.0	1.46		81	60	50	38	0	0	15	13	50.0	21.0	19.5	8.0	13.0

Hole section : 12 1/4"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-09-26 23:00	2390	2390	ANCO 2000	62.0	1.40		82	61	52	40	0	0	16	14	50.0	21.0	20.0		7.5
1998-09-27 22:00	2750	2750	ANCO 2000	53.0	1.35		85	64	55	43	0	0	17	14	50.0	21.0	21.5	8.0	12.4
1998-09-28 22:00	2922	2922	ANCO 2000	59.0	1.35		82	62	53	42	0	0	16	14	50.0	20.0	21.0	8.5	13.0
1998-09-29 10:00	2922	2922	ANCO 2000	64.0	1.35		89	66	56	42	0	0	16	13	50.0	23.0	21.5	8.0	12.0
1998-09-30 13:00	2922	2922	ANCO 2000	66.0	1.36		89	65	56	43	0	0	16	14	50.0	24.0	20.5	8.0	12.0
1998-10-01 22:00	2922	2922	ANCO 2000		1.35		82	59	49	37	0	0	14	11	50.0	23.0	18.0	6.0	12.0
1998-10-02 18:00	2907	2907	ANCO 2000	180.0	1.35		84	59	47	35	0	0	13	11	50.0	25.0	17.0	7.0	21.0
1998-10-03 10:30	2922	2922	ANCO 2000		1.35		83	61	45	34	0	0	13	11	50.0	22.0	19.5	7.0	16.0

Hole section : 8 1/2"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-10-04 23:00	2958	2958	ANCO 2000	54.0	1.21		52	37	32	24	0	0	9	8	50.0	15.0	11.0	4.0	4.5
1998-10-05 21:00	3184	3183	ANCO 2000	52.0	1.25		54	39	33	24	0	0	9	8	50.0	12.0	15.0	4.0	5.5
1998-10-06 17:00	3238	3237	ANCO 2000	62.0	1.26		62	45	38	29	0	0	11	10	50.0	17.0	14.0	5.0	6.5
1998-10-07 19:45	3254	3253	ANCO 2000	70.0	1.26		59	43	35	27	0	0	11	9	50.0	16.0	13.5	5.0	6.5
1998-10-08 19:30	3254	3253	ANCO 2000	81.0	1.26		60	43	36	28	0	0	11	9	50.0	17.0	13.0	5.0	6.5
1998-10-09 13:00	3254	3253	ANCO 2000	82.0	1.26		59	43	35	28	0	0	11	9	50.0	16.0	13.5	5.0	6.5
1998-10-10 03:20	3254	3253	ANCO 2000	84.0	1.26		60	44	36	29	0	0	10	9	50.0	16.0	14.0	5.5	7.0
1998-10-11 21:05	3254	3253	ANCO 2000	85.0	1.26		59	43	35	28	0	0	11	9	50.0	16.0	13.5	5.5	7.0
1998-10-12 14:35	3255	3254	ANCO 2000	86.0	1.26		59	43	36	28	0	0	12	10	50.0	16.0	13.5	5.0	6.5
1998-10-13 22:00	3450	3449	ANCO 2000	56.0	1.26		57	42	33	25	0	0	10	8	50.0	15.0	13.5	4.0	6.0
1998-10-14 18:30	3494	3493	ANCO 2000	54.0	1.31		66	46	33	27	0	0	10	9	50.0	20.0	13.0		6.0

DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS FOR WELL 30/9-19 PO: 1

Hole section : 8 1/2" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-10-17 23:59	3560	3559	ANCO 2000	57.0	1.31		67	50	43	33	0	0	12	10	50.0	17.0	16.5	11.0	17.0
1998-10-18 22:00	3560	3559	ANCO 2000	55.0	1.31		68	50	43	33	0	0	12	10	50.0	18.0	16.0	11.0	17.0
1998-10-19 22:00	3560	3559	ANCO 2000	55.0	1.31		67	50	43	33	0	0	12	10	50.0	17.0	16.5	13.0	16.0
1998-10-20 00:30	3560	3559	ANCO 2000	58.0	1.31		68	50	44	34	0	0	12	10	50.0	18.0	16.0	13.0	16.0
1998-10-21 19:45	3560	3559	ANCO 2000	59.0	1.31		69	51	45	35	0	0	12	10	50.0	18.0	16.5	12.5	16.0

Hole section : 12 1/4" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-10-22 18:00	2807	2807	ANCO 2000	59.0	1.31		67	50	43	33	0	0	11	9	50.0	17.0	16.5	9.0	14.0
1998-10-23 20:30	2834	2834	ANCO 2000	57.0	1.31		56	41	34	25	0	0	10	8	50.0	15.0	13.0	4.0	4.5

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 30/9-19 PO: 1

Hole section : 36" **WATER BASED SYSTEM**

Date	Depth [m] MD	TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Pf [ml]	Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Oil [%]	Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-09-09 23:59	231	231	SPUD MUD	1.05					/																
1998-09-10	233	233	SPUD MUD	1.05					/																

Hole section : 26" **WATER BASED SYSTEM**

Date	Depth [m] MD	TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Pf [ml]	Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Oil [%]	Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-09-11 23:59	233	233	SPUD MUD	1.05					500 / 110																
1998-09-12	750	750	SPUD MUD	1.05					/																
1998-09-12 10:00	420	420	SPUD MUD	1.05					/																
1998-09-12 14:00	502	502	SPUD MUD	1.05					/																
1998-09-12 22:00	750	750	SPUD MUD	1.05					/																
1998-09-13 10:00	1050	1050	SPUD MUD	1.05					/																
1998-09-13 14:00	1202	1202	SPUD MUD	1.05					/																
1998-09-13 22:00	1202	1202	SPUD MUD	1.05					/																
1998-09-14 10:00	425	425	SPUD MUD	1.05					/																
1998-09-14 14:00	550	550	SPUD MUD	1.05					/																
1998-09-15	1205	1205	SPUD MUD	1.20					/																
1998-09-15 10:00	1175	1175	SPUD MUD	1.20					/																
1998-09-15 22:00	1205	1205	SPUD MUD	1.20					/																
1998-09-16 10:00	1205	1205	SPUD MUD	1.20					/																
1998-09-16 17:00	1205	1205	SPUD MUD	1.20					/																
1998-09-16 23:00	1205	1205	SPUD MUD	1.20					/																
1998-09-17 23:00	1198	1198	SPUD MUD	1.20					/																
1998-09-18 22:00	1205	1205	BENTONITE MUD	1.30	2.1		1		34 / 110	9.5		0.0	0.6						360	3.0					

Hole section : 17 1/2" **WATER BASED SYSTEM**

Date	Depth [m] MD	TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Pf [ml]	Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Oil [%]	Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-09-19 21:00	1205	1205	ANCO 2000	1.30	2.1		1		35 / 110	9.5		0.0	0.6			66000	280		360	9.5					-8
1998-09-20 11:30	1325	1325	ANCO 2000	1.30	3.0		1		/			0.0	0.8			61000			340	10.5		0.3			45
1998-09-20 17:00	1435	1435	ANCO 2000	1.30	3.0		1		34 / 110	10.0		0.0	0.7			61000	250		360	10.8		0.4			61
1998-09-20 22:00	1500	1500	ANCO 2000	1.30	2.5		1		34 / 110	9.8		0.0	0.7			62000	320		430			0.5			72
1998-09-21 03:30	1580	1580	ANCO 2000	1.45	2.6		1		34 / 110	9.8		0.0	0.6			63500	300		390	16.2		0.6			111

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 30/9-19 PO: 1

Hole section : 17 1/2" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-09-22 21:00	2215	2215	ANCO 2000	1.45	3.4		1		/	7.5		0.0	0.6	132		76000	960		1200	16.5		1.0	43	488.0	127
1998-09-23 21:00	2329	2329	ANCO 2000	1.45	3.6		1		/	7.5						76100	985			16.6		1.0			132
1998-09-24 22:00	2329	2329	ANCO 2000	1.46	3.4		1		500 / 110	7.5		0.0	0.1			7700			1200	16.6		1.0			
1998-09-25 22:00	2329	2329	ANCO 2000	1.46	3.2		1		/	7.8		0.0	0.4	130			980			16.6		1.0			116

Hole section : 12 1/4" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-09-26 23:00	2390	2390	ANCO 2000	1.40	3.8		1		/			0.2	0.8			71000	615		885	16.0		0.8			182
1998-09-27 22:00	2750	2750	ANCO 2000	1.35	3.6		1		/	8.0		0.0	0.8	120		72000	705	105	810	15.0		0.5			211
1998-09-28 22:00	2922	2922	ANCO 2000	1.35	2.4		1		/	7.5		0.0	0.6			74000	680	115	795	15.2		0.3			222
1998-09-29 10:00	2922	2922	ANCO 2000	1.35	2.7		1		/	7.9		0.0	0.5			76000	670	110	780	15.0		0.3			211
1998-09-30 13:00	2922	2922	ANCO 2000	1.36	2.8		1		/	8.0		0.0	0.5			75500	650	110	760	15.0		0.4			195
1998-10-01 22:00	2922	2922	ANCO 2000	1.35	3.2		1		/	11.9		0.1	0.8			81000	420		800	15.0		0.3			198
1998-10-02 18:00	2907	2907	ANCO 2000	1.35	4.0		1		/	12.1		0.3	2.0			75000	360		700	14.7		0.2			203
1998-10-03 10:30	2922	2922	ANCO 2000	1.35	4.0		1		/	11.5		0.3	2.0			75000	360		700	15.0		0.2			203

Hole section : 8 1/2" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-10-04 23:00	2958	2958	ANCO 2000	1.21	4.0		1		/	9.4		0.1	0.4			72000				8.5		0.0			8
1998-10-05 21:00	3184	3183	ANCO 2000	1.25	3.6		1		/	8.2		0.0	0.4			70000	320		640	10.0		0.1			25
1998-10-06 17:00	3238	3237	ANCO 2000	1.26	3.0		1		/	8.2		0.0	0.4			71000	440		640	10.5		0.1			34
1998-10-07 19:45	3254	3253	ANCO 2000	1.26	3.4		1		/	8.2		0.0	0.5			72500	360		880	11.0		0.1			58
1998-10-08 19:30	3254	3253	ANCO 2000	1.26	3.2		1		/	8.3		0.0	0.5			72000	360		800	11.0		0.1			59
1998-10-09 13:00	3254	3253	ANCO 2000	1.26	3.4		1		/	8.2		0.0	0.4			71000	360		880	11.0		0.1			60
1998-10-10 03:20	3254	3253	ANCO 2000	1.26	3.3		1		/	8.3		0.0	0.4			71000	360		880	11.0		0.1			60
1998-10-11 21:05	3254	3253	ANCO 2000	1.26	3.4		1		/	8.2		0.0	0.4			71000	320		760	11.0		0.1			60
1998-10-12 14:35	3255	3254	ANCO 2000	1.26	3.4	1.0			500 / 110	8.2		0.0	0.5	140		72000	360		880	11.0		0.1			59
1998-10-13 22:00	3450	3449	ANCO 2000	1.26	2.4		1		500 / 110	8.2		0.0	0.3	140		72000	320		820	11.5					85
1998-10-14 18:30	3494	3493	ANCO 2000	1.31	1.9				/	8.3		0.0	0.4			72000	280		800	13.0					
1998-10-17 23:59	3560	3559	ANCO 2000	1.31	1.9		1		/	8.3		0.0	0.3	140					780	13.0		0.1			82
1998-10-18 22:00	3560	3559	ANCO 2000	1.31	1.9		1		/	8.3		0.0	0.3			73000	320		780	13.0					

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 30/9-19 PO: 1

Hole section : 8 1/2" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-10-19 22:00	3560	3559	ANCO 2000	1.31	1.9		1		/	8.3		0.0	0.3			73000	320		800	13.0					
1998-10-20 00:30	3560	3559	ANCO 2000	1.31	1.9		1		/	8.3		0.0	0.3			74000	315		800	13.0					
1998-10-21 19:45	3560	3559	ANCO 2000	1.31	1.9		1		/	8.2		0.0	0.2			74000	316		780	13.0					

Hole section : 12 1/4" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
1998-10-22 18:00	2807	2807	ANCO 2000	1.31	2.0		1		/	8.2		0.0	0.2			74000	325		780	13.0					
1998-10-23 20:30	2834	2834	ANCO 2000	1.31	2.5		1		/	8.1		0.0	0.9			72000	340		800	3.5		0.3			

TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 30/9-19

Section	Product/ Additive	Unit	Total Amount Used
36"	BARITE	kg	100000.00
	BENTONITE	kg	25000.00
	CMC EHV	kg	1125.00
	LIME	kg	80.00
	SODA ASH	kg	125.00
26"	BARITE	kg	307000.00
	BENTONITE	kg	127000.00
	CMC EHV	kg	100.00
	LIME	kg	860.00
	SODA ASH	kg	1275.00
17 1/2"	BARITE	kg	418000.00
	CELPOL ESL	kg	11975.00
	FLOWZAN	kg	4400.00
	GLYDRIL MC	l	28500.00
	KCL BRINE	l	428000.00
	KCL POWDER	kg	10000.00
	POTASSIUM CARBONATE	kg	1250.00
	SODA ASH	kg	250.00
	SODIUM BICARBONATE	kg	250.00
12 1/4"	BARITE	kg	75000.00
	CELPOL ESL	kg	6975.00
	CITRIC ACID	kg	3225.00
	FLOWZAN	kg	2150.00
	GLYDRIL MC	l	16000.00
	KCL BRINE	l	281000.00
	KCL POWDER	kg	2000.00
	POTASSIUM CARBONATE	kg	150.00
	SODA ASH	kg	350.00
	SODIUM BICARBONATE	kg	4600.00
8 1/2"	BACL2	l	275.00
	BARITE	kg	122000.00
	CELPOL ESL	kg	7925.00
	CITRIC ACID	kg	150.00
	FLOWZAN	kg	2325.00
	GLYDRIL MC	l	10700.00
	KCL BRINE	l	246000.00
	POTASSIUM CARBONATE	kg	575.00
	SODIUM BICARBONATE	kg	175.00

Estimated Pore Pressure, Fracture, Overburden and Temperature Gradients

Pore Pressure

The pore pressure in well 30/9-19 are based on MWD resistivity log, MDT pressure readings, and DXC.

It is very difficult to calculate pore pressure in Hordaland Group when drilling with high overbalance and PDC bit. Lithological variations make it difficult to estimate pore pressure decrease in Rogaland Gp and pressure development over the boundary to Shetland Gp.

No shallow gas occurs in the upper sediments. Down to 1700m the pore pressure is normal and increases rapidly to max pore pressure 1.32 +/- 0.05 sg. The pore pressure stays constant down to top Rogaland and is evaluated to decrease to 1.10 sg at the top of Shetland Gp. The pore pressure follows a 1.10 sg trend down to a sandstone interval between 3070 - 3074 mTVD. The pore pressure is measured with MDT to 1.14 sg

Results from MDT measurement, in the Brent Gp, shows that the pressure in Tarbert 3 is 1.11 sg and decreasing to 1.07 in Tarbert 1. The gas gradient in Tarbert 2 is 0.025 bar/m, 0.016 bar/m in Tarbert 1, and the oil gradient in Tarbert 1 is 0.052 bar/m. An isolated sandbody in Tarbert 1, at 3255 mTVD, has a pore pressure of 1.22 sg. The pore pressure in Ness formation increases from 1.10 sg to 1.22 sg. The pore pressure in ORE formation is measured to 1.26 sg.

There are no indications of pressure alteration in Dunlin GP down to TD.

Formation Strength

Leak off tests were performed to 1.62 sg @ 1208m, 1.70 sg @ 2332m and 1.81 @ 2924.5m.

Breckels & van Eekelen formula for fracture gradient indicates lower value than LOT in Hordaland and Shetland.

There were no hole problems in the well during drilling.

Overburden Gradient

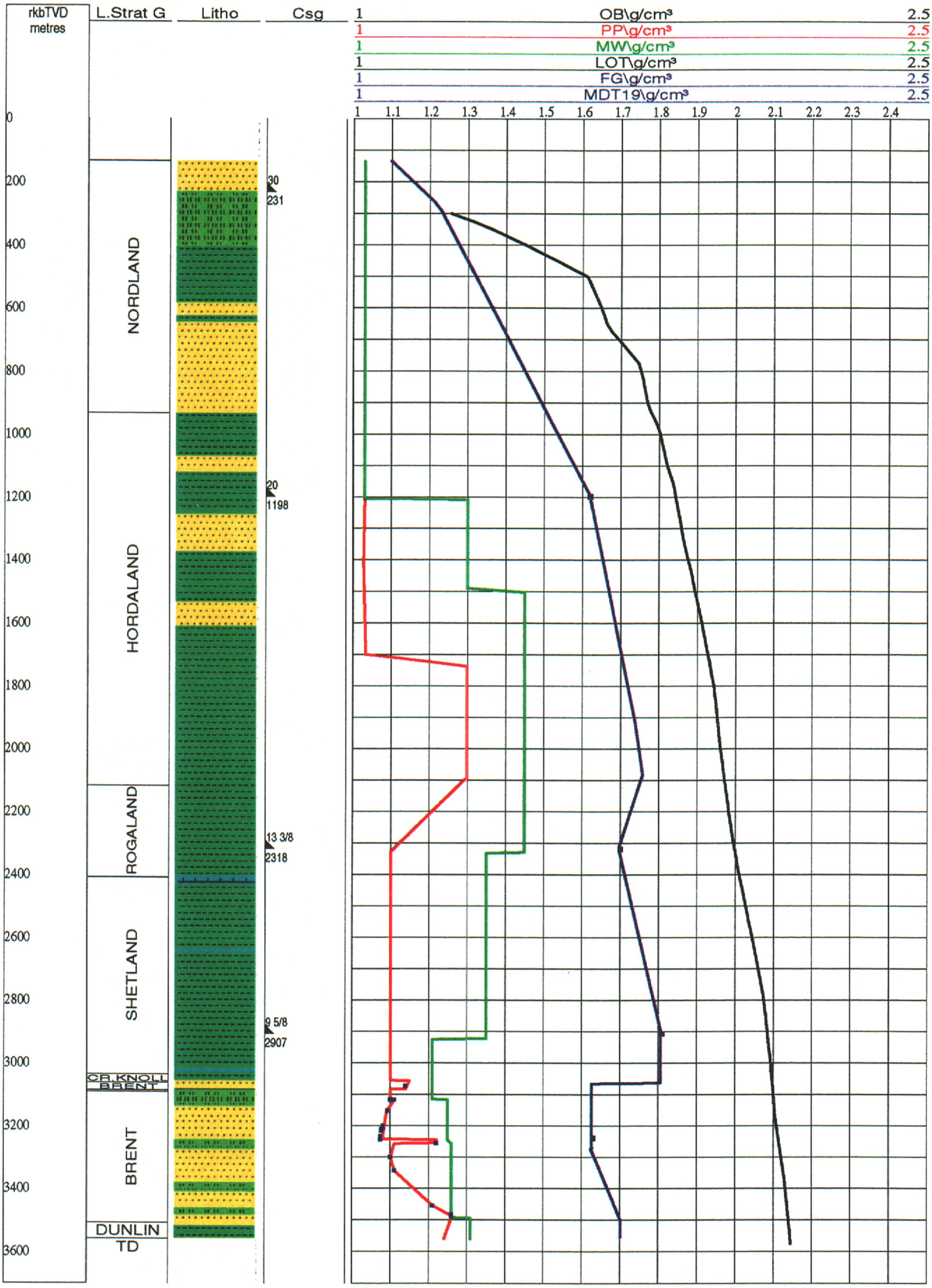
Overburden gradient is taken from prognosis in Drilling program due to absents of density log above reservoar.

Temperature Gradient

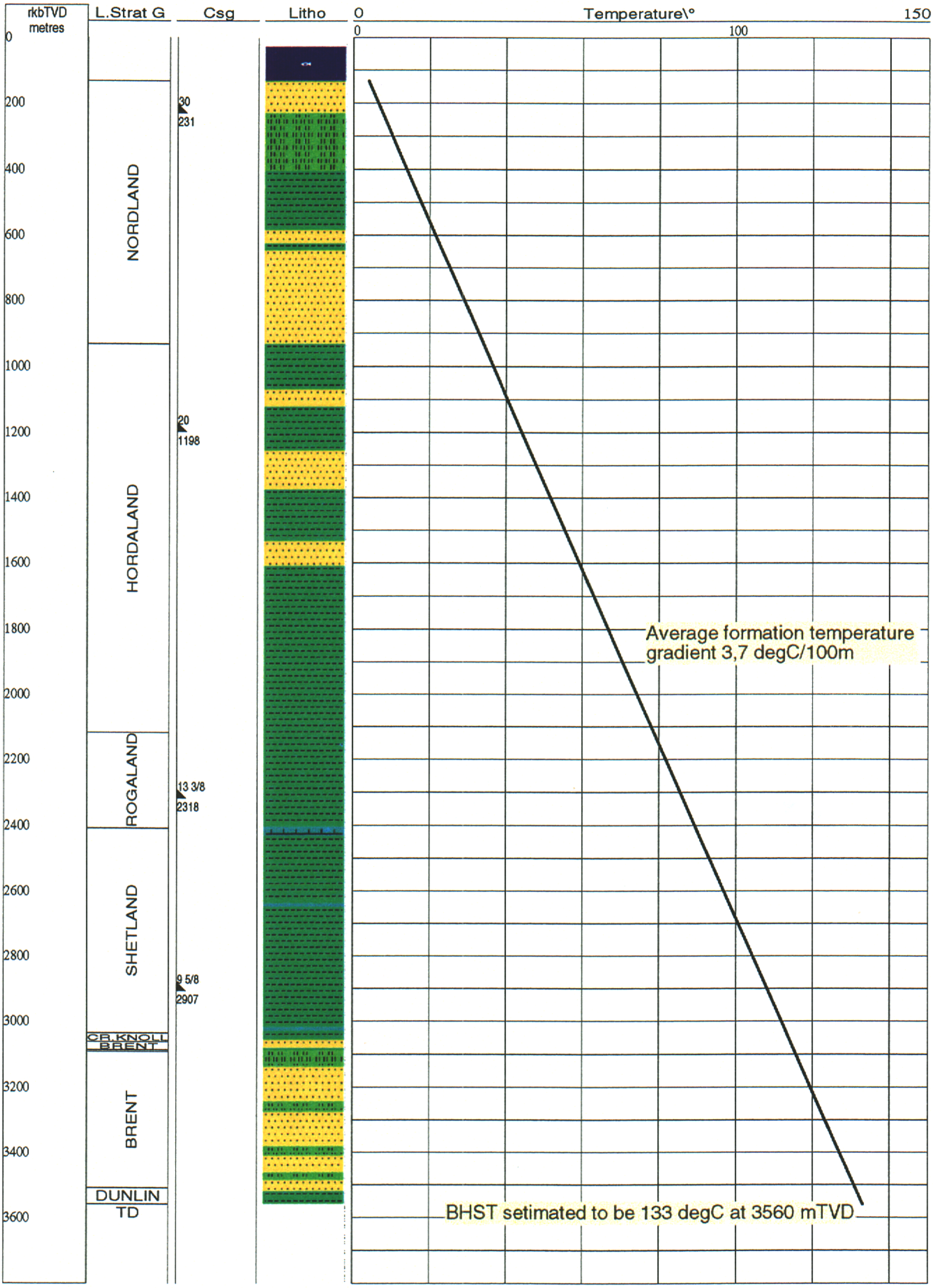
Bottom hole static temperature is taken from DST in well 30/9-19A and measured to 121 deg C from the perforated interval 3242 - 3258 mTVD. The temperaure at TD, 3560 mTVD RKB, was estimated to 133 deg C with a gradient of 3.73 deg/100m.

Well: 30/9-19

Fig.B-1



Estimated Pore pressure, Fracture and Overburden Gradient



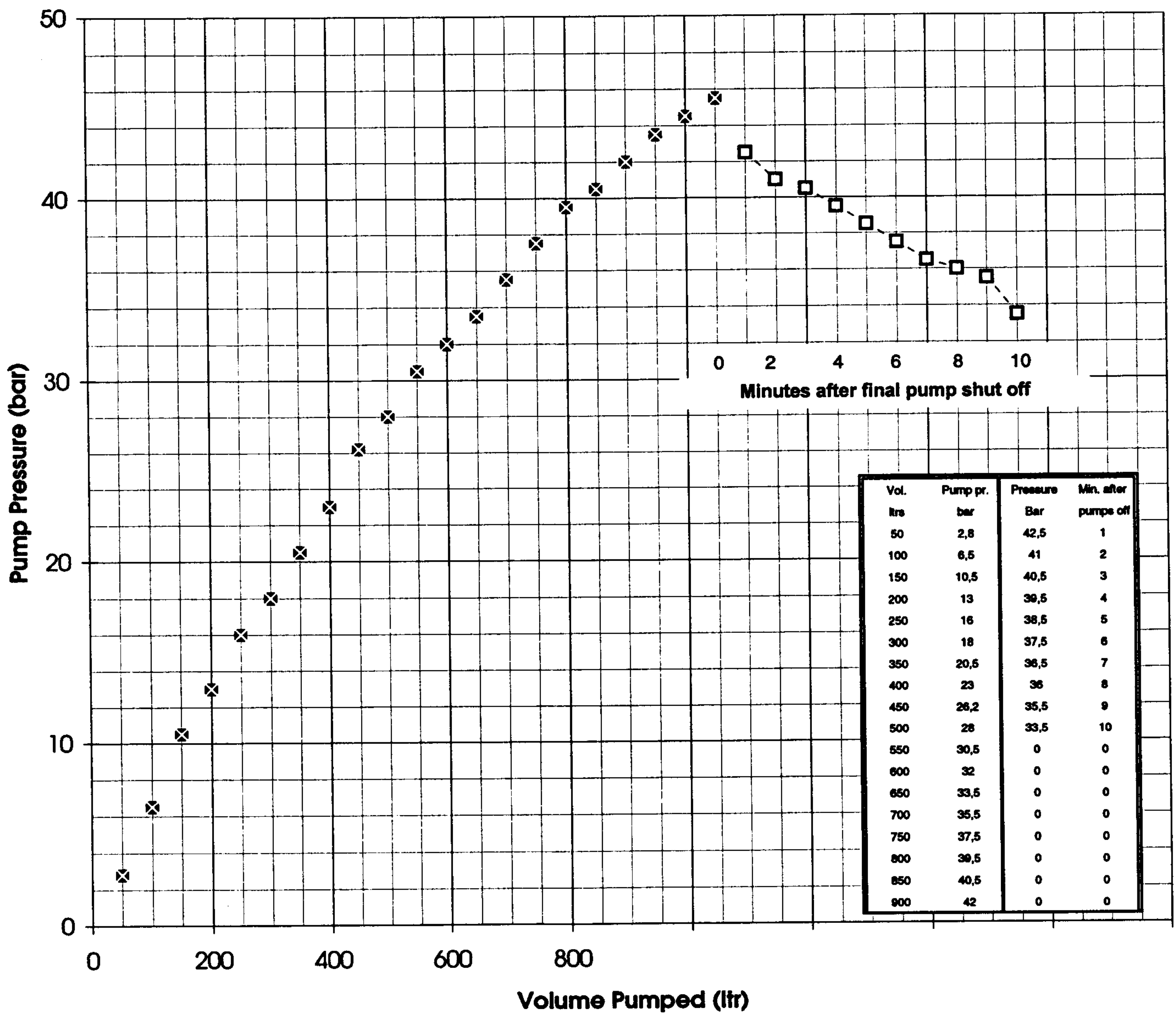
Average formation temperature gradient 3,7 degC/100m

BHST setimated to be 133 degC at 3560 mTVD

Formation Temperature Gradient

B-50 A

Well 30/9-19		Test type - ELOT/LOT/FIT LOT		Test date 20/9-98	
Rig West Delta	Airgap(m) 29	Water depth (m) 105,0	Csg OD (in) 20"	Hole angle (deg) 1,46	
Csg Shoe (mMD/mTVD) 1198	1198	OH depth, (mMD/mTVD) 1208	1208	Lithology Clst	
Mud Properties	Dens (sg) 1,3	API WL(ml/30min)	PV (cp)	YP (Pa)	Gels (Pa)
Pump Rate (l/min) 80		Vol pumped (l.) 1050		Vol bled back (l.) 557	
Leakoff Pressure (bar) 38		Max pressure (bar) 45,5		Propagation press. (bar)	
Test result (sg EMD) 1,62		Comments			



Vol. ltrs	Pump pr. bar	Pressure Bar	Min. after pumps off
50	2,8	42,5	1
100	6,5	41	2
150	10,5	40,5	3
200	13	39,5	4
250	16	38,5	5
300	18	37,5	6
350	20,5	36,5	7
400	23	36	8
450	26,2	35,5	9
500	28	33,5	10
550	30,5	0	0
600	32	0	0
650	33,5	0	0
700	35,5	0	0
750	37,5	0	0
800	39,5	0	0
850	40,5	0	0
900	42	0	0

Final Well Report 30/9-19

Fig. B-3 A

Formation Strength Test Report

HYDRO

B-50 B

Vell 30/9-19 | Test type - ELOT/LOT/FIT **LOT** | Test date 26/9-98

Rig West Delta | Airgap(m) 29 | Water depth (m) 105,0 | Csg OD (in) 13 3/8" | Hole angle (deg) 1,46

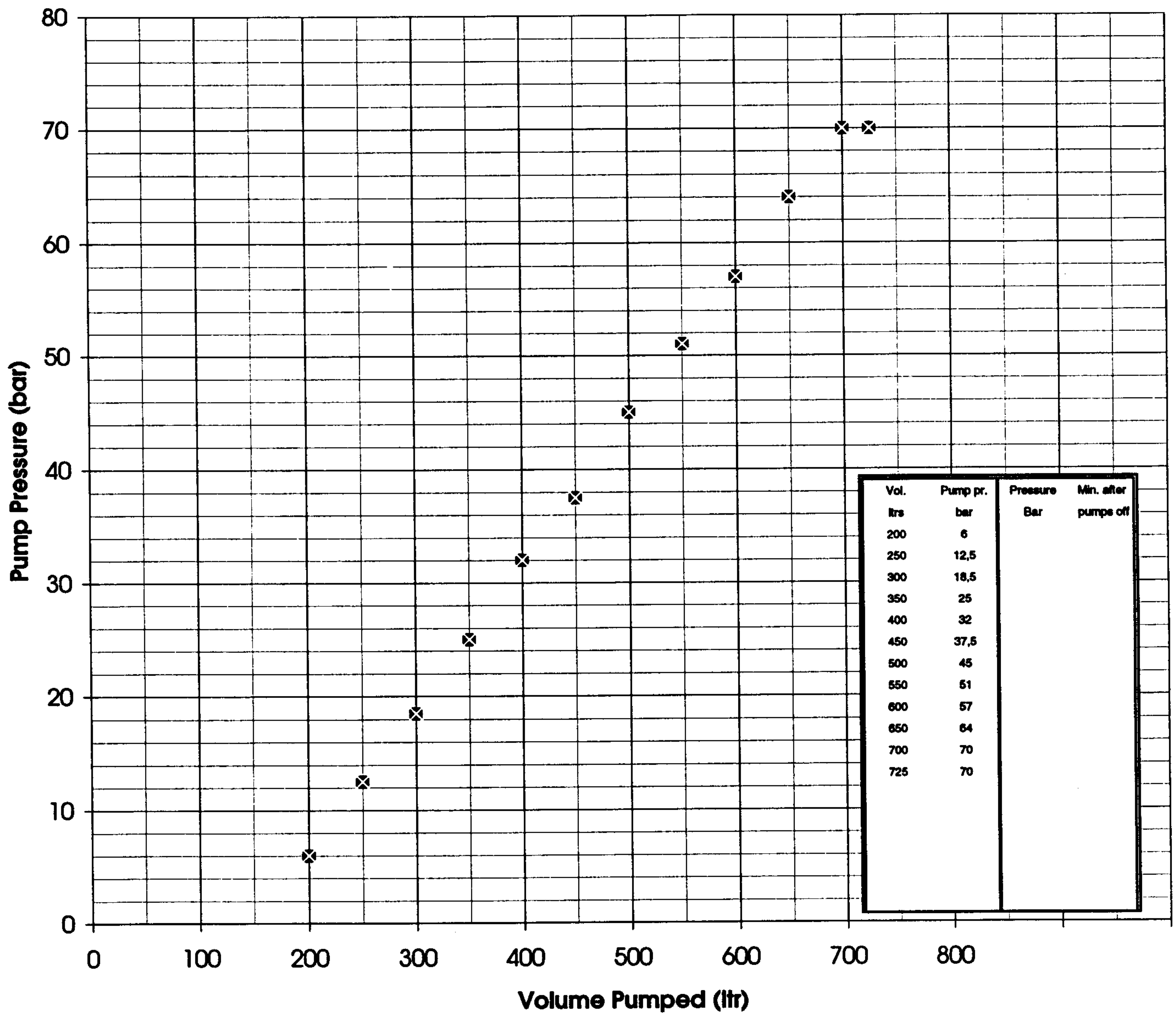
Csg Shoe (mMD/mTVD) 2318 | 2318 | OH depth, (mMD/mTVD) 2332 | 2332 | Lithology Clst

Mud Properties | Dens (sg) 1,4 | API WL(ml/30min) | PV (cp) | YP (Pa) | Gels (Pa)

Pump Rate (l/min) 100 | Vol pumped (l.) 700 | Vol bled back (l.) 550

Leakoff Pressure (bar) 70 | Max pressure (bar) 70 | Propagation press. (bar)

Test result (sg EMD) 1,71 | Comments



Vol. ltrs	Pump pr. bar	Pressure Bar	Min. after pumps off
200	6		
250	12,5		
300	18,5		
350	25		
400	32		
450	37,5		
500	45		
550	51		
600	57		
650	64		
700	70		
725	70		

Final Well
Report
30/9-19

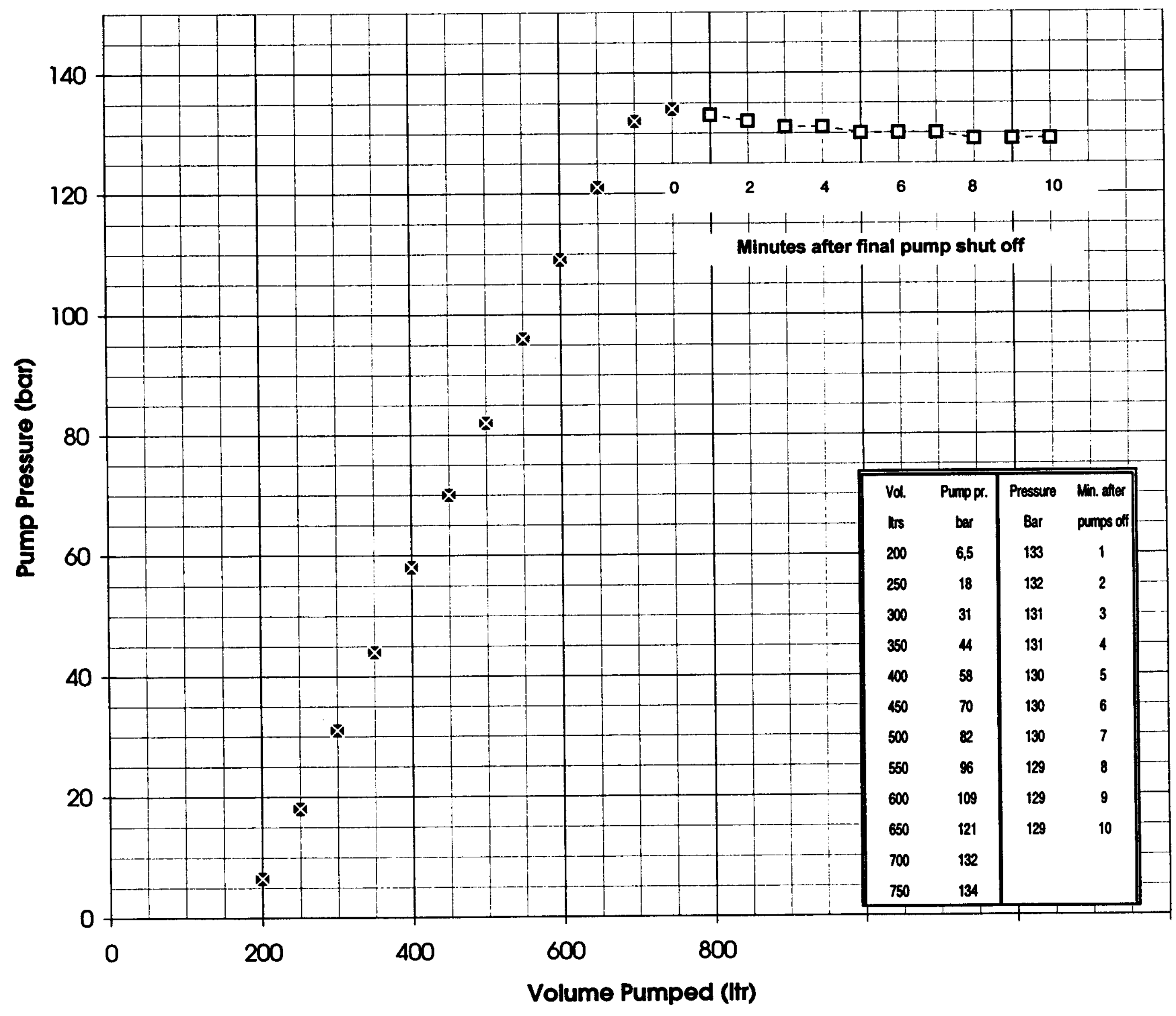
Fig.
B-3 B

Formation Strength Test Report

HYDRO

B-50 C

Vell 30/9-19
Test type - ELOT/LOT/FIT LOT
Test date 04/10-98
Rig West Delta
Airgap(m) 29
Water depth (m) 105,0
Csg OD (in) 9 5/8"
Hole angle (deg) 2,9
Csg Shoe (mMD/mTVD) 2907 2907
OH depth, (mMD/mTVD) 2925 2925
Lithology Clst
Mud Properties **Dens (sg)** 1,36
API WL(ml/30min)
PV (cp)
YP (Pa)
Gels (Pa)
Pump Rate (l/min) 50
Vol pumped (l.) 750
Vol bled back (l.) 750
Leakoff Pressure (bar) 130
Max pressure (bar) 134
Propagation press. (bar)
Test result (sg EMD) 1,82
Comments



Vol. ltrs	Pump pr. bar	Pressure Bar	Min. after pumps off
200	6,5	133	1
250	18	132	2
300	31	131	3
350	44	131	4
400	58	130	5
450	70	130	6
500	82	130	7
550	96	129	8
600	109	129	9
650	121	129	10
700	132		
750	134		

Final Well
Report
30/9-19

Fig.
B-3 C

Formation Strength Test Report

HYDRO

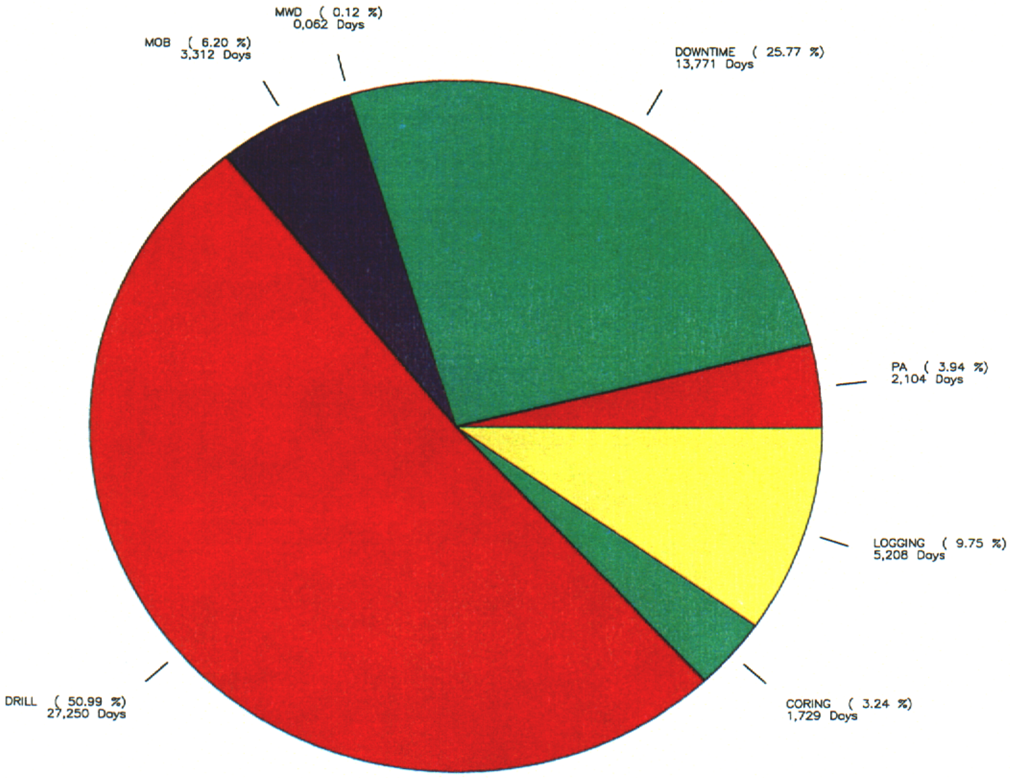


Figure 4

Time Distribution

30/9-19

HYDRO

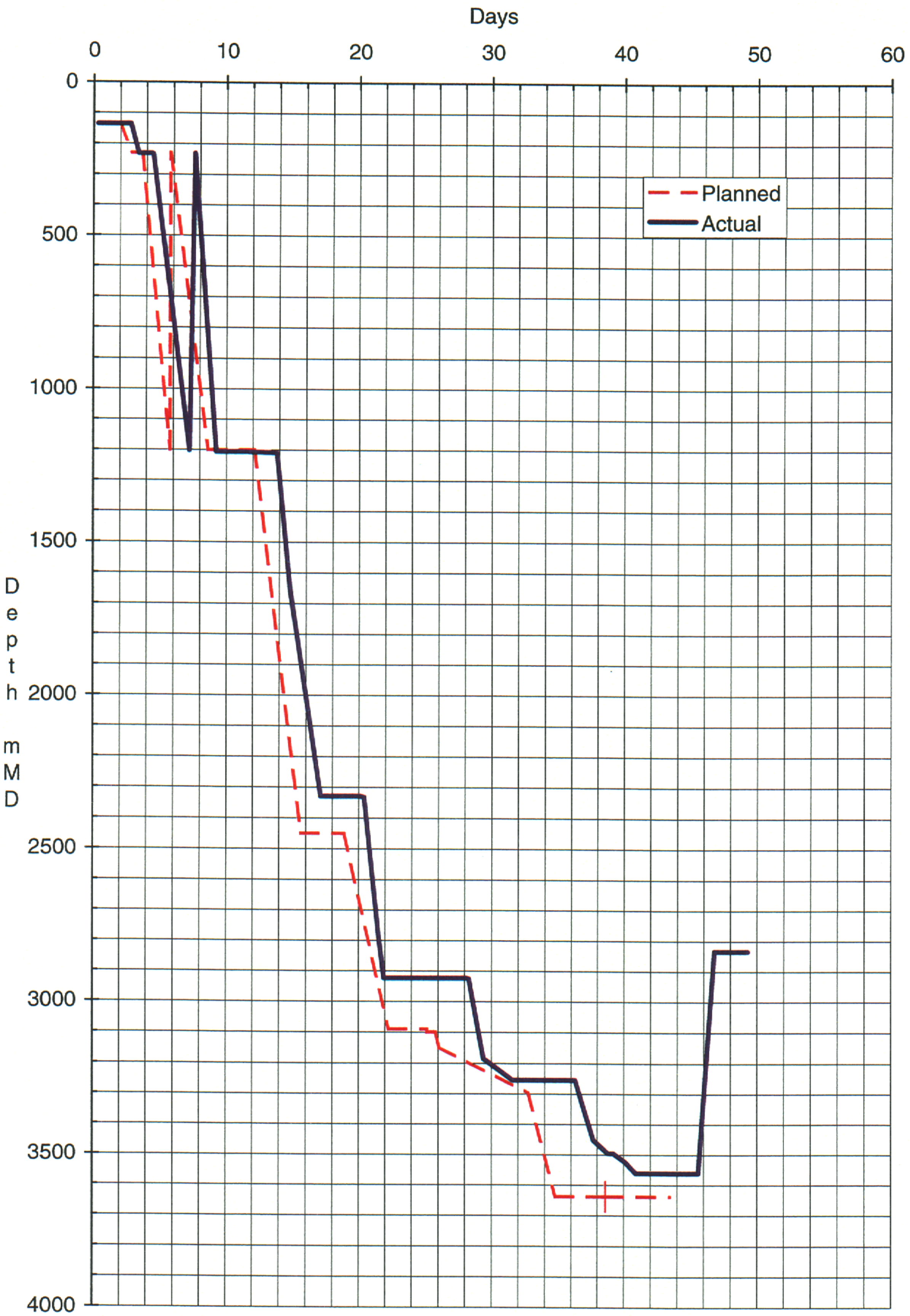


FIGURE 5

Actual Drilling Curve
Well 30/9-19

HYDRO

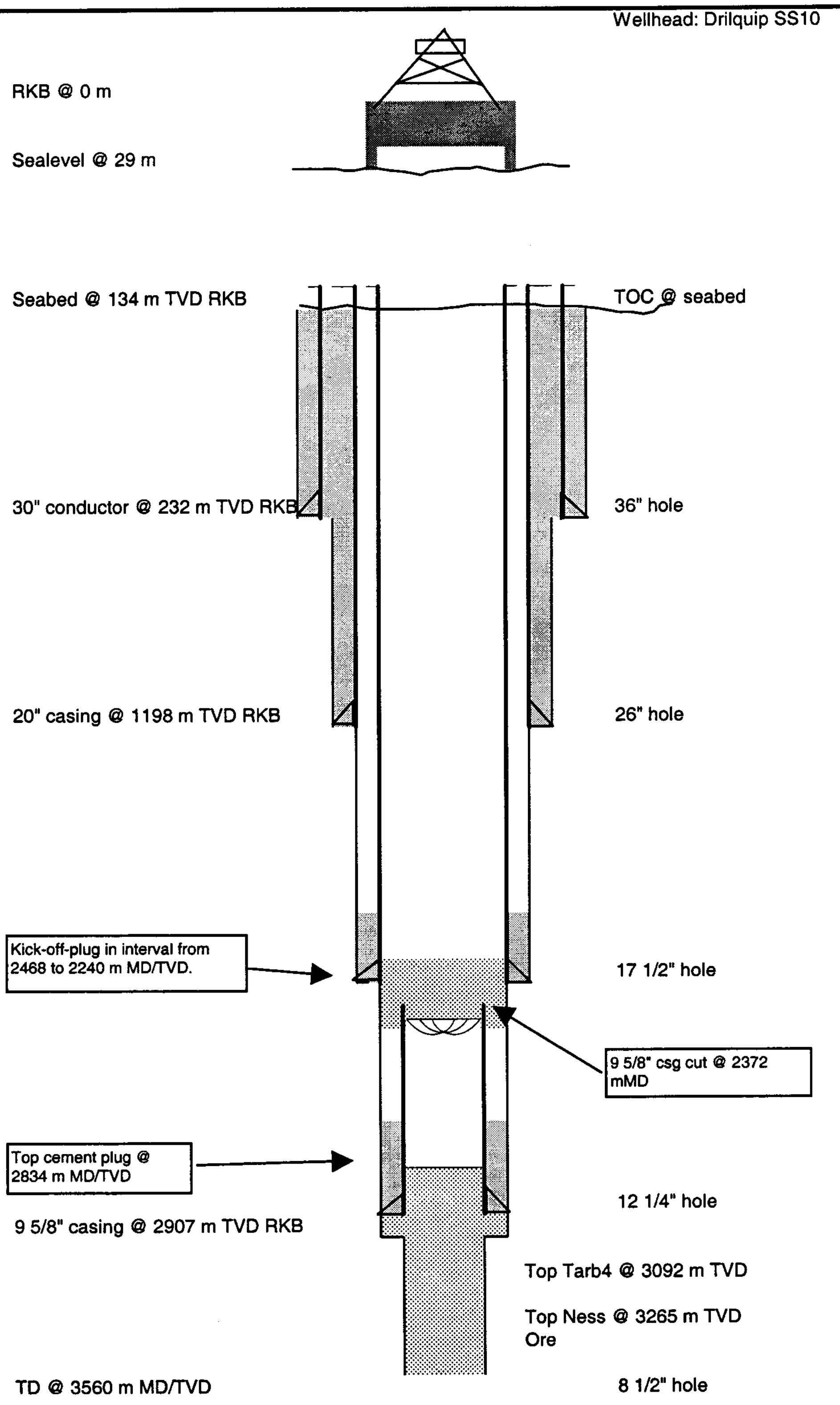
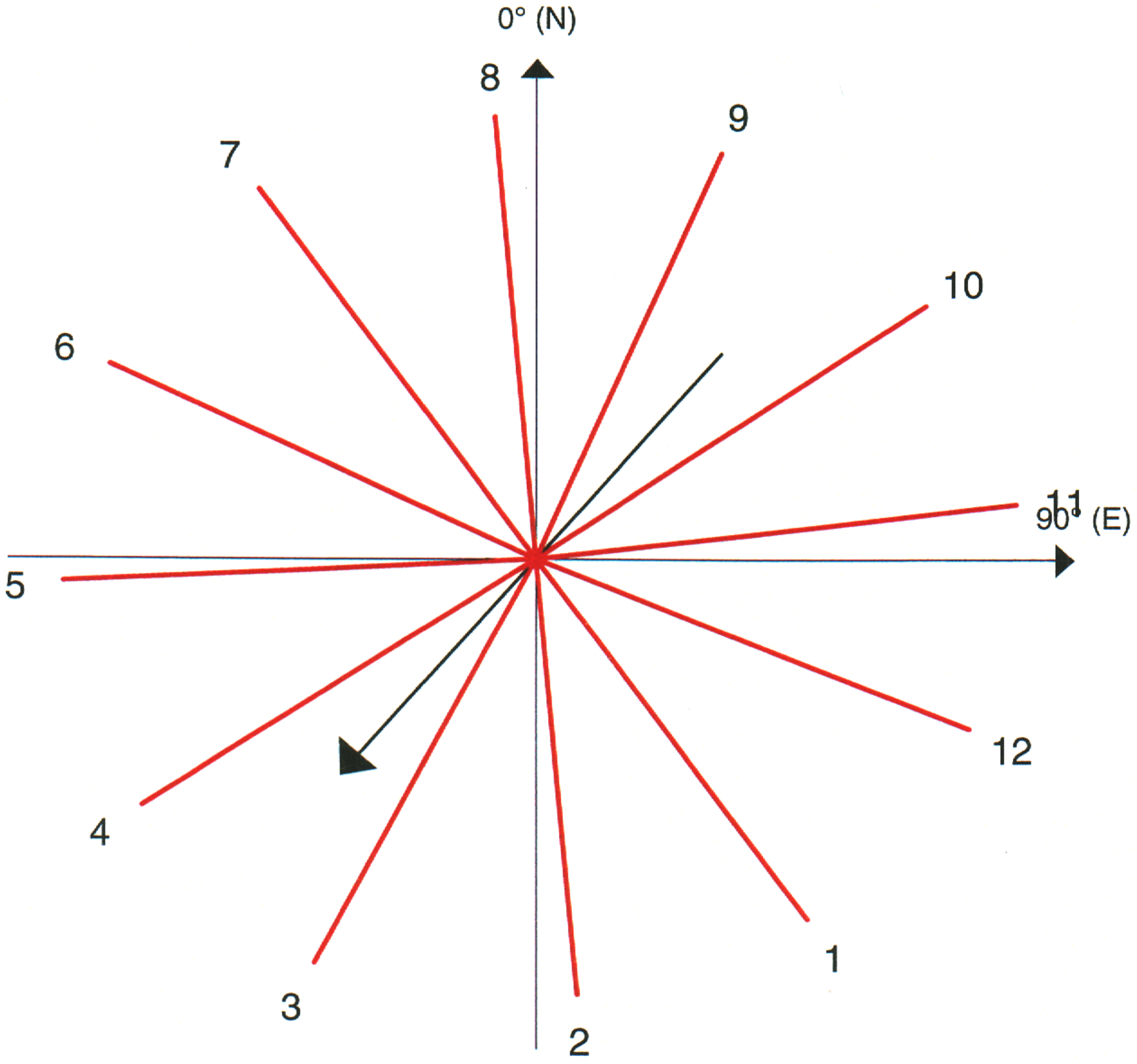


Figure 6

Well Status

After Abandonment

HYDRO



RIGHEADING 220 DEG.

ANCHOR NO	DIRECTION (DEG.)	LENGTH (m)
1	145	1790
2	175	1785
3	207	1850
4	236	1800
5	267	1790
6	296	1795
7	325	1835
8	355	1805
9	23	1795
10	55	1800
11	83	1830
12	113	1780

Figure 7

RIG ANCHORS
WEST DELTA
30/9-19

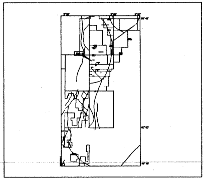
HYDRO

Completion log

Scale: 1:500

Well: 30/9-19

Location map



Coordinates:	N 60° 27′ 35.38″ E 02° 41′ 38.94″	UTM:	6 702 819.9 mN 483 176.9 mE
Elevation K B:	29 m	ED 50. UTM Zone 31. CM 03° E	
Water Depth:	105 m MSL		
Total Depth (Driller):	3560 m		
Total Depth (Logger):	3556.5 m		
Formation at Total Depth:	DUNLIN GP		

Country:	NORWAY
Licence:	PL 079
Owners:	NORSK HYDRO. STATOIL. SAGA
Field:	OSEBERG
Date Spudded:	09.09.98
Reached Total Depth:	17.10.98
Completed:	25.10.98 off cost
Well Status:	P & A. Oil & Gas Discovery well sidetracked as 30/9-19 A
Rig:	West Delta
Contractor:	Smedvig
Mudlogging Company:	Geoservice
Geologists:	R. Nyby, A.M. Hay, B. Kjellin, M. Henderson, B. Schønningsen, C. Dons
Prepared by:	B. Kjellin
Controlled by:	O. Rong
Date:	June, 1999

Casing Records:

30"	at	231 m MD
20"	at	1198 m MD
13 3/8"	at	2318.5 m MD
9 5/8"	at	2907 m MD

Comments:

Drilled 9 7/8" pilot hole from 233 to 1202 m.

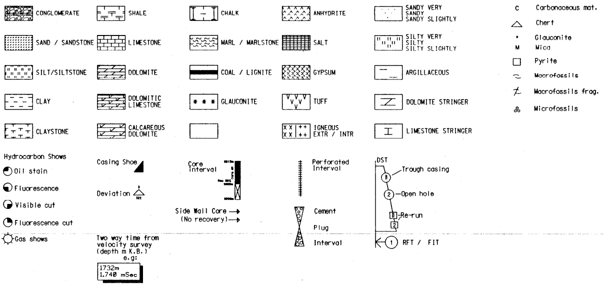
Opened 9 7/8" hole to 26" hole down to 1205 m

17 1/2"	hole	drilled	1205 - 2329 m
12 1/4"	"	"	2329 - 2922 m
8 1/2"	"	"	2922 - 3560 m

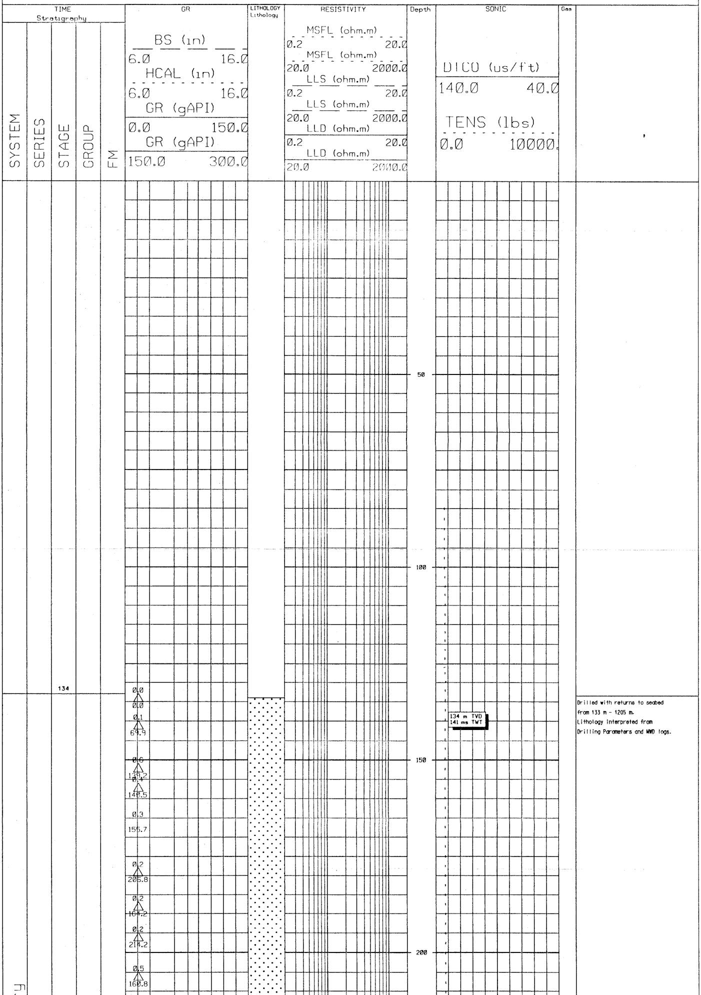
Logs Run

VSP/GR		CST/GR		FMI/NGT/DSI/ACTS		PEX(HALS/TLD/HGNS/AMS)		MDT/GR		CMR/GR	
2A	3198 - 2530	2A	3136.5 - 2975	2A	3556.5 - 2907	1A	(134) - 3255	1A	3247 - 3247	2A	3515 - 3065
2B	3520 - 3190					2B	3556.5 - 3200	2B	3029 - 3497		

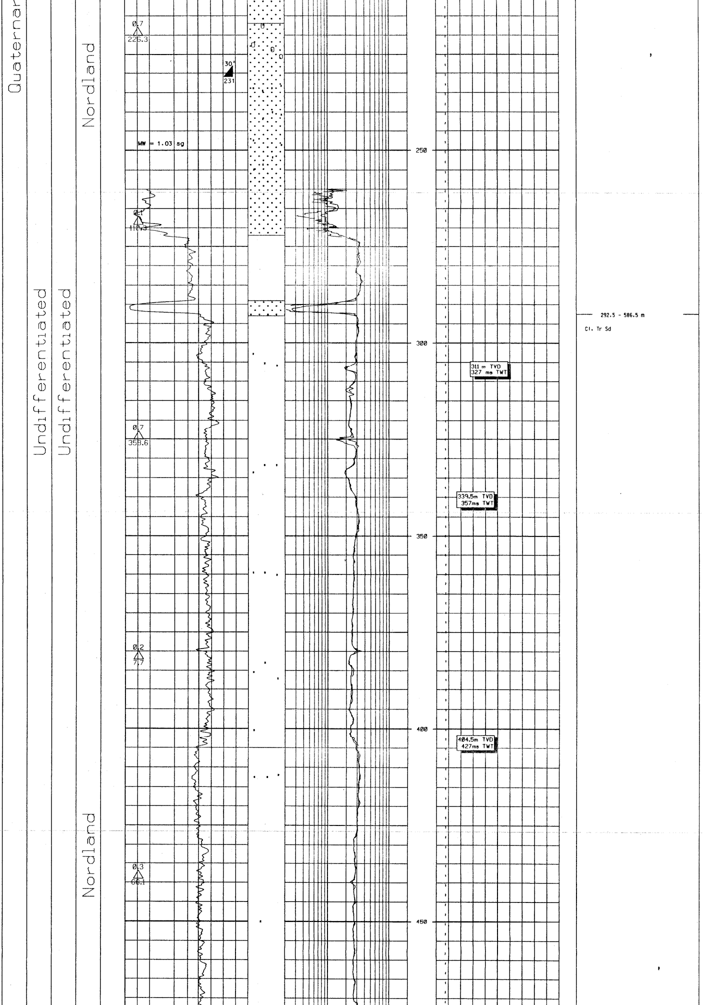
Legend

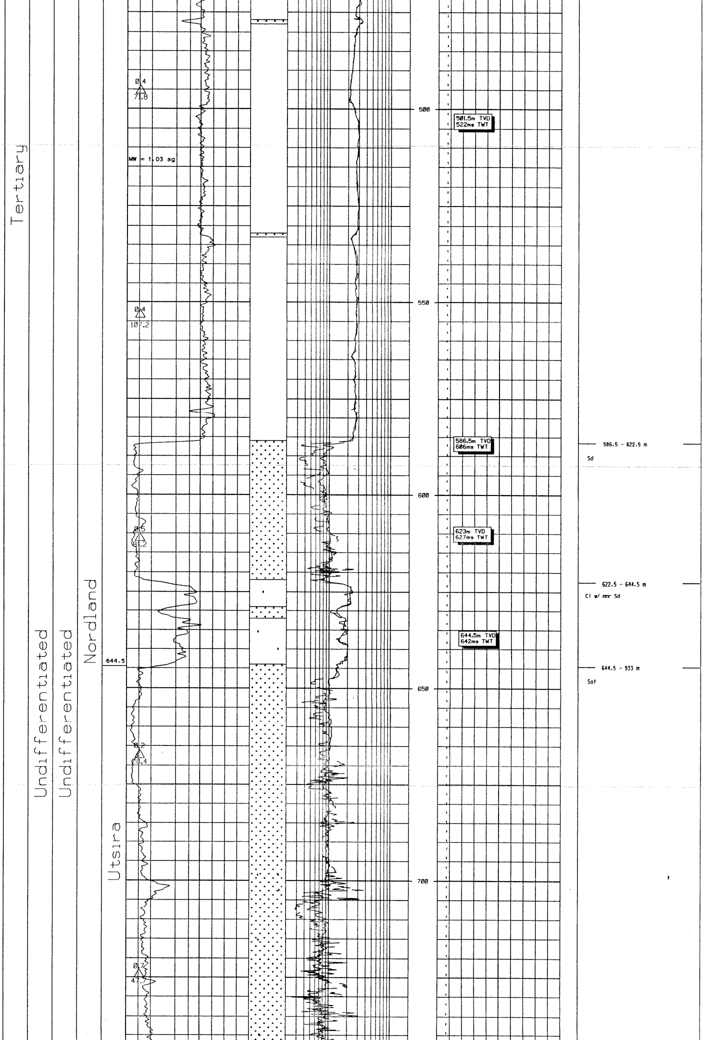


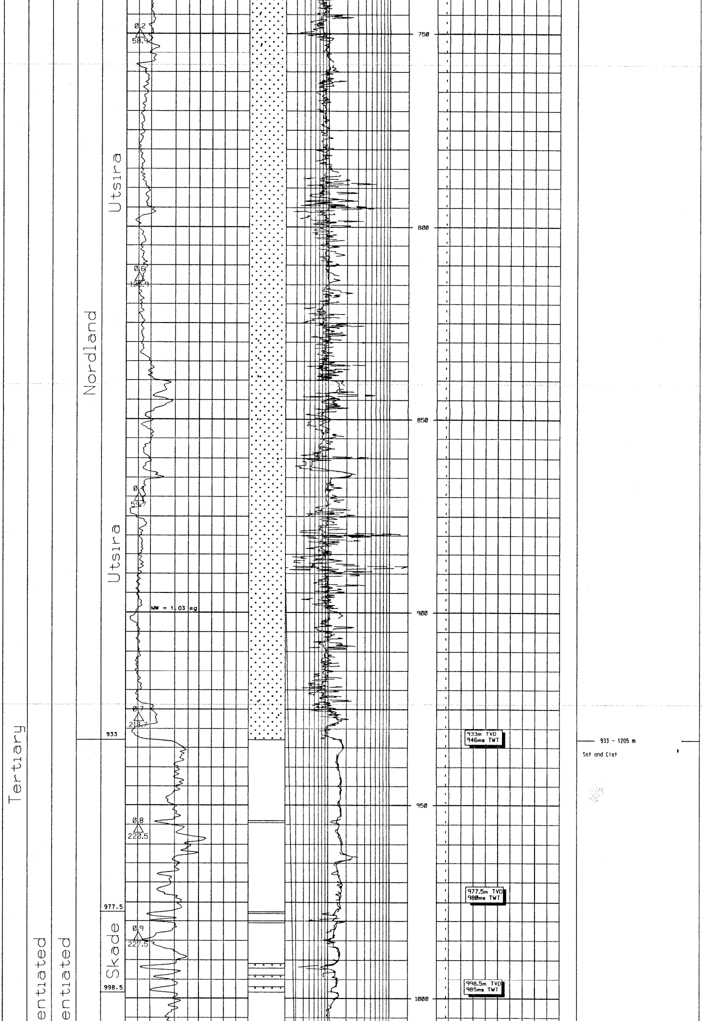
C	Carbonaceous mat.
△	Chert
•	Glauconite
M	Mica
□	Pyrite
~	Macrofossils
⌿	Macrofossils frag.
♣	Microfossils

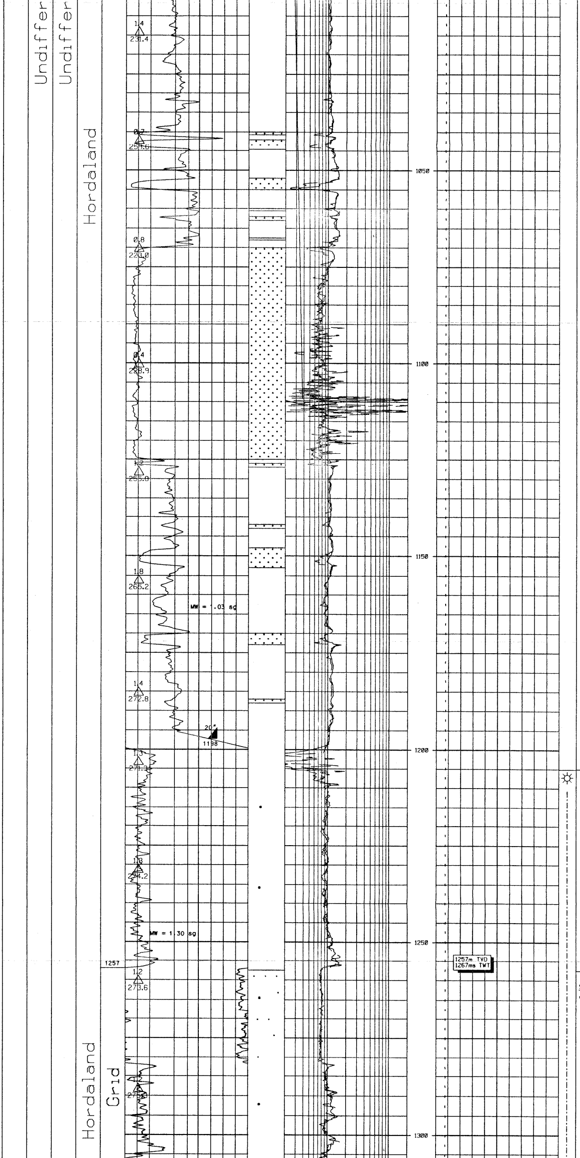


Drilled with returns to seabed
from 133 m - 1205 m.
Lithology interpreted from
Drilling Parameters and MWD logs.







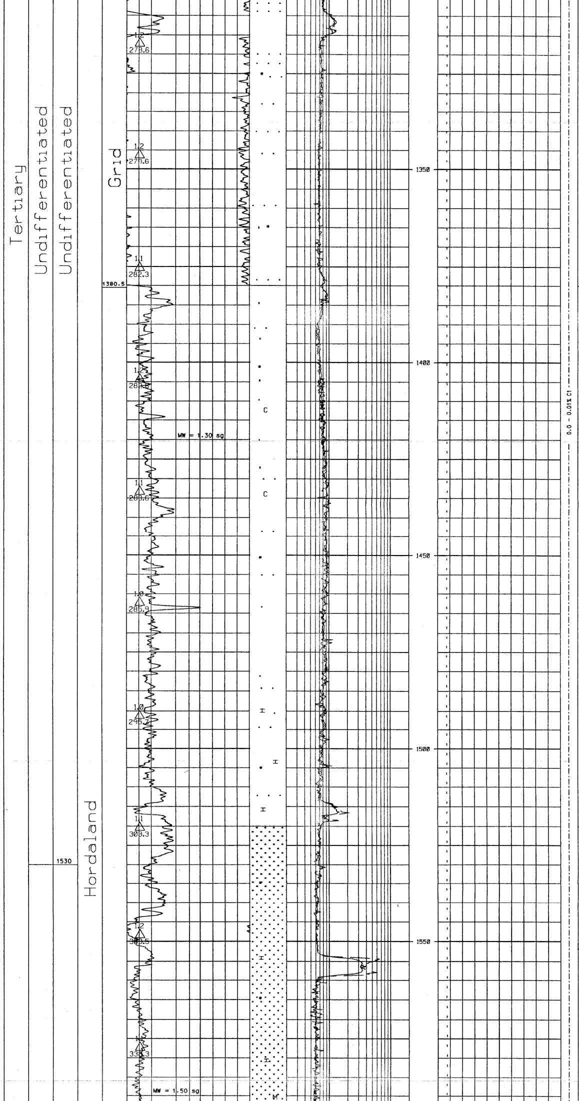


1205 - 1257.5 m

☼ Clst: m-dk yel brn, sft-firm, sbblky -sbtab, non-sli calc, non-sli slty, r-Tr glau, r carb Mat, r micropyr.

1257.5 - 1380 m

Sst: clt-trnsl Qtz, f-m, rnd-sbang, Tr ang, pred lse gr, non calc, glau I.P..



1380 - 1520 m

Clst: m-dk yel brn gy, lt olv gy, sft-firm, non calc, sli stty, r glau, r carb Mat.

Sst: clr-trnsl Qtz, v f-m, loc crs, sbrnd-rnd, mod-gd spher, bimod, mod-wl srt, locv pr srt, com lse gr, loc intercal w/ Clst & arg Sltst.

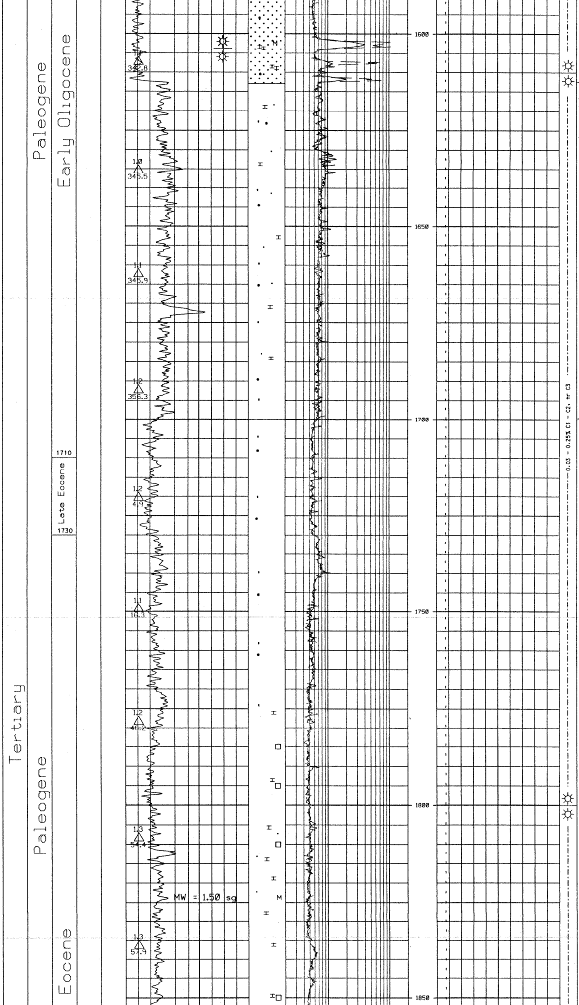
1520 - 1552 m

Sst: clr-trnsl Qtz, occ op Qtz, dom f-m, loc v f, occ crs, sbrndd-sbang, occ wl rndd, mod spher, dom mod- wl srt, r amor sft Kao Mtrx, occ rd Hem cotd gn, loc

1552 - 1613 m

Sst: lt gy-off wh, occ pl yelsh gy-pl-dusky yelish brn, clr-trnsl Qtz, dom m-loc f, r crs, w/ dom arg/calc Mtrx.

Clst: olv gy-dusky yelsh brn, firm, mod hd I.P., sbblky-sbtab, hygroclastic, bcm mod-sli calc, abd lse Sd & Glau. com Micromic.



1613 - 1700 m

Clst. olv gy, dusky yelsh brn, firm, occ mod hd, sbblky-sbplty, non-sli calc, sli slty, glau, w/ loc Sd gr.

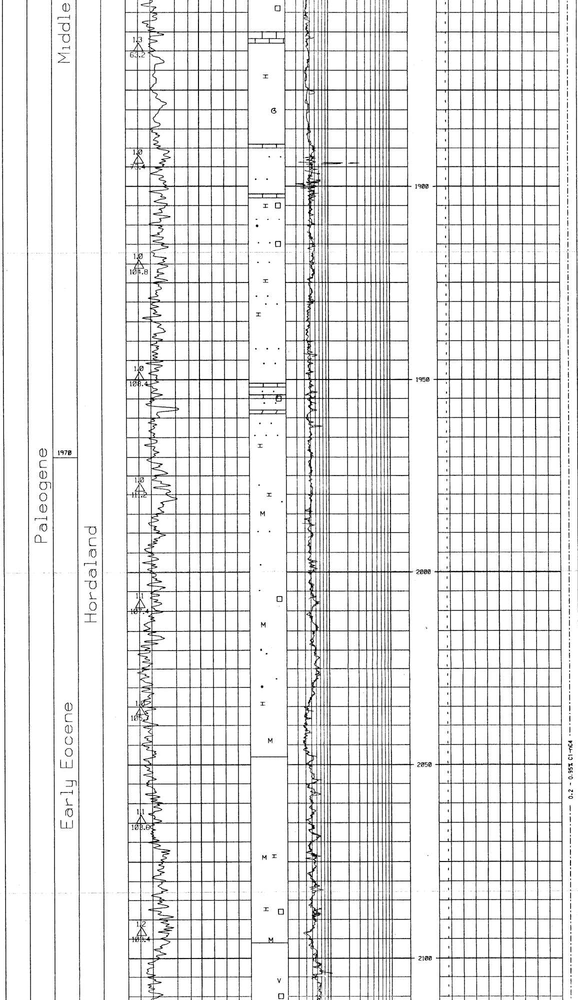
dol Ls: mod-dk yelsh brn,gyish or, firm-occ v hd, blky, microxln, occ crpxln, dol.

1700 - 1950m

Clst:dk grnsh gry, olv gry, occ dusky yelsh brn, r med blish gry, firm - hd, sbblky - subtab, nono calc, slily slty, glauc

dol Ls: mod brn, hd - v hd, blky, shp brks, crpxln

Ls: mod yelsh brn, firm, blky, ea tex, microxln, slily dol I.P. grad dol Ls



1950 - 2048m

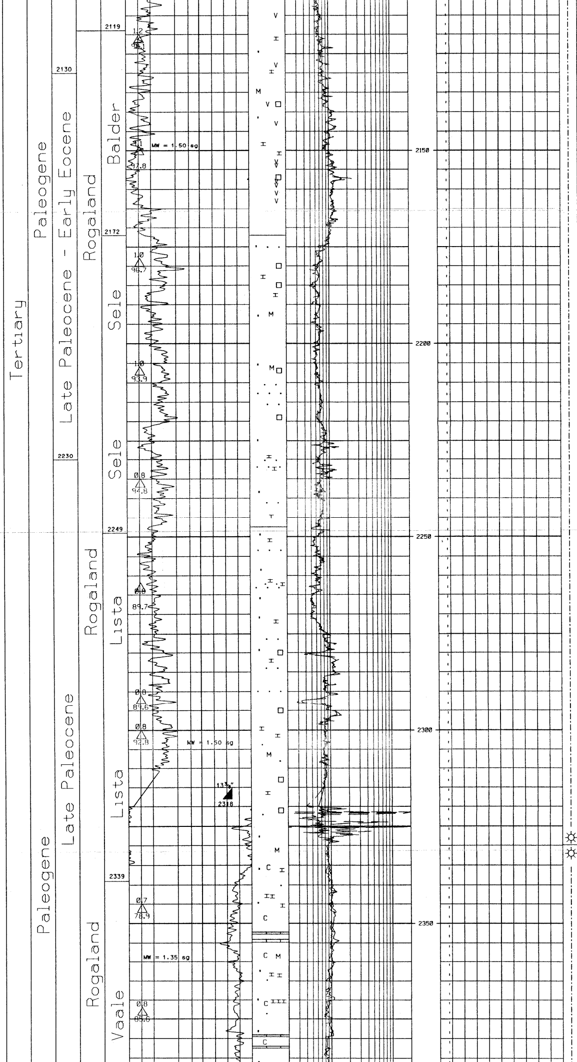
Clst: dk grnsh gry - olv gry, occ dsky yelsh brn, bcm lt brnsh gry - pl rdsh brn, from 1974m bcm dom dsky yelsh brn - pl rdsh brn, w/ com dk grnsh gry, firm, sbblky - subtab, hom, mod calc, tr micromic, loc vf sdy gns incl, intbd w/ th Ls/dol Ls strgr

dol Ls: lt brn - dk yelsh or, occ mod brn, hd - v hd, blky, shp brk, crpxln, gr dol I.P

Ls: dk or yel - lt brn, firm - sft, blky, ea tex, microxln, intbd w/ clst

2096 - 2172m

Clst: olv gry - brnsh gry, gnsh gryn - dk gnsh gry, sbblky - subpty, sft - firm, slily calc, slily slty, r micromic, micropyr



Tf: vari col, grysh or, blsh gry, occ pl rdsh purp - pl purp, v pl gnsh bl - v pl blgry, loc com crm, r med dk grysh gn, sft, rndd ctgs, ashy app com slty, blk spkls, loc abd lith deb, corr Fspr, v r tr lapilli, v r cl flsr

Ls: pnksh gry, grysh or, sft - mod hd, microxln

2172 - 2247.5m

Clst: m dk gry, brnsh gry - olv blk, sft - firm, slily hygroclastic - hygroturgid, sbblky, loc com v f sd & slt gn incl, loc abd v f diss micropyr, non - slily calc, occ mod calc, com micromic, pyr

Sst: lt olv gry, clr - trnsl Qtz, f - m, com lse

Ls: wh - lt brn, sft - firm, occ hd, brit, shp brks, occ ea tex, microxln - crpxln, slty, dol I.P

2247.5 - 2329m

Clst: vari col, gnsh gry - dk gnsh gry, olv blk, dsky brn, mod brn, lt gry, rdsh gry, m - dk gry, blsh gry bcm pred olv blk olv gry, grysh brn, sft - firm, sbblky - blky, non - slily calc, loc slty - v f sdy r pyr nod

Ls: wh, sft, blky, ea tex, microxln

Sst: clr - trnsl Qtz, f - m, sbang - sbrndd, occ ang, lse

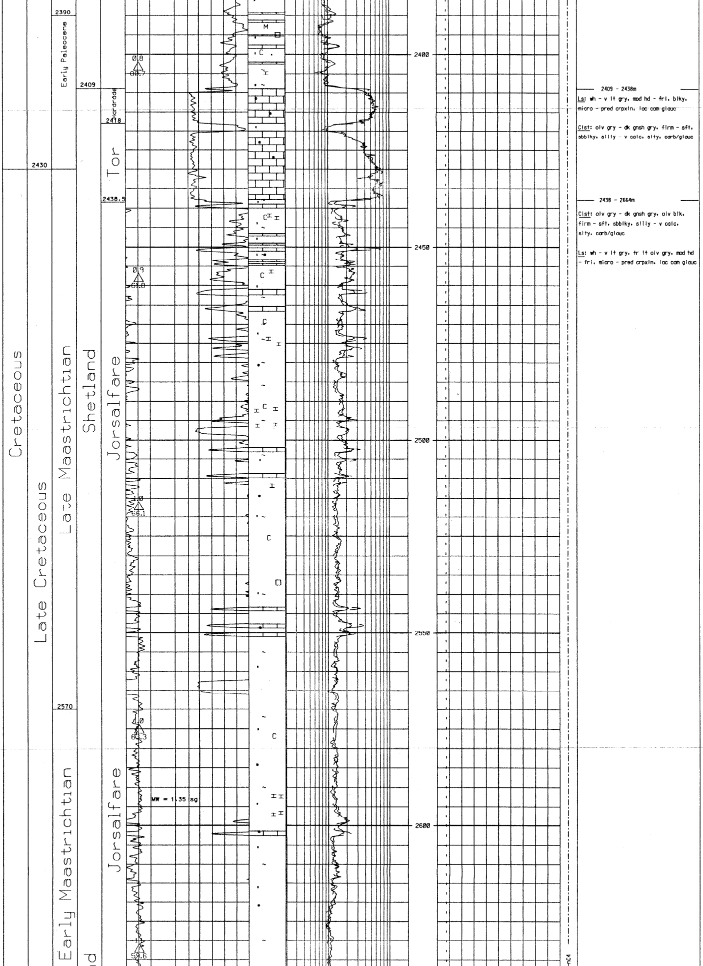
2329 - 2409m

Clst: olv blk - olv gry, fri - mod hd, blky, non calc, slily slty, tr c/glauc, tr v f sdy, r micromic, loc r pyr nod

Clst: olv gry, firm - mod hd, blky, mod - v calc, slily slty, tr c/glauc, r micromic

Ls: v lt - lt gry, mnr pl yel brn, lt brnsh gry, mod hd - fri, blky, crp - microxln, loc sucrosic, loc arg, loc dol

Dol: dk - pl yelsh brn, hd, brit, blky, crpxln, slily arg, slily calc



2409 - 2438m

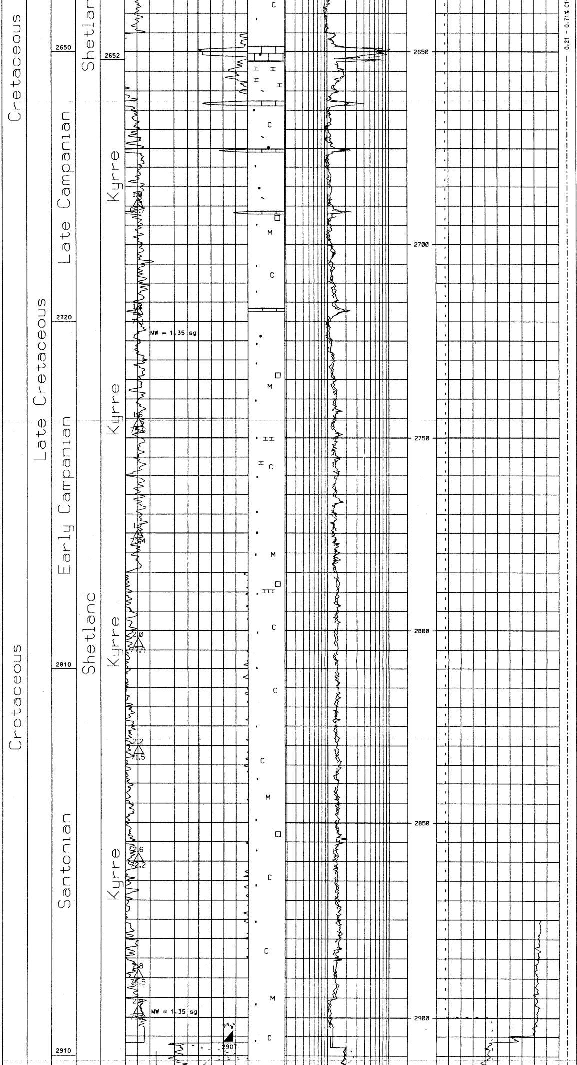
Ls: wh - v lt gry, mod hd - fri, blky, micro - pred crpxln, loc com glauc

Clst: olv gry - dk gnsh gry, firm - sft, sbblky, slly - v calc, slty, carb/glauc

2438 - 2664m

Clst: olv gry - dk gnsh gry, olv blk, firm - sft, sbblky, slly - v calc, slty, carb/glauc

Ls: wh - v lt gry, tr lt olv gry, mod hd - fri, micro - pred crpxln, loc com glauc



2664 - 2830m

Clst: olv gry - dk gnsh gry, loc tr dk gnsh gry, firm - mod hd, loc stky, loc sol, sbblky - amor, non - v calc, predom slily - mod calc, tr v f sdy, carb/glauc, r pyr, r micromic

(2660m)

tr Clst: dsky - mod brn, firm - mod hd, sbblky, v - mod calc, carb/glauc

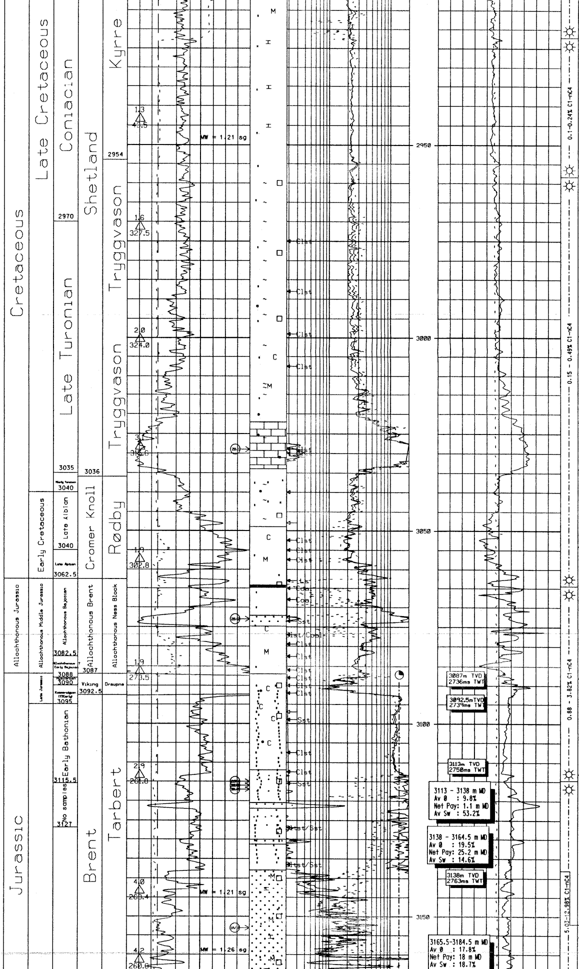
Ls: wh-v lt gry, mod hd, brit, blky-plty, micro-pred crpxln, locTr Glau.

2830-2958m

Clst: olv gry-olv blk, dk gnsh gry, firm -mod hd, loc sft, loc sol, blky-amor, sli-pred non calc, sli slty-slty, Tr v f sdy, carb/glau, loc r pyr nod/micropyr, r micromic.

Ls: wh-v lt gry, mod hd-firm, brit, blky -plty, mocro-pred crpxln, cln, loc Tr glau.

Dol: dk yelsh brn, hd, brit, blky, xln-crpxln.



3113 - 3138 m MD
Av Ø : 9.8%
Net Pay: 1.1 m MD
Av Sw : 53.2%

3138 - 3164.5 m MD
Av Ø : 19.5%
Net Pay: 25.2 m MD
Av Sw : 14.6%

3165.5-3184.5 m MD
Av Ø : 17.8%
Net Pay: 18 m MD
Av Sw : 18.7%

2958-3000m

Clst: olv blk, firm-mod hd, blky-sbblky, sli calc, sli slty,micromic.

Mrl: m gry-m lt gry, sft, sbblky, fis, r carb, sli slty, r pyr, r glau.

3000-3022 m

Clst: dk-m dk gry, m gry-olv gry, Tr lt olv gry-m lt gry, sft-firm, occ mod hd, sbblky, pt plas, pt brit, sli-v calc, Tr grad Mrl, pt carb, pt glau, pt micropyr, r micromic.

3022-3034 m

Ls: lt - v lt gry, med lt gry - med dk gry, sft - mod hd, fri, blky, microxln, pt suc, pt glauc, pt arg gr Clst, pt cln

3034 - 3054m

Clst: pred olv gry, mnr med dk gry, sft - mod hd, pred firm, sbblky, mod - v calc, prt gr Mrl, slily - v slty, loc glauc, loc micropyr

3054 - 3087m

Clst: olv blk - olv gry, sft - mod hd, pred firm, sbblky, non - slily calc, pt gr Mrl, slily - v slty, loc glauc, loc micropyr

Clst: mod brn, sft - firm - stky, sbblky - amor, sol, mod - pred non calc, slily slty, r micromic

Coal: blk, hd - brit, blky, slty tex, tr micropyr, slily arg

3065m: no dir Fluor, r slo strmg bl wh - yel Fluor cut, yel Fluor Res.

3087 - 3113.5m

Sltst: olv blk - brn blk, dsky yel brn, mod hd - fri, blky, non calc - v calc, arg gr Clst, com micromic, com micropyr, carb, v f sdy, loc pl frag, r glauc

Sst: Qtz, v f - f, subang, Spher, mod srt, lse

3087-3113.5m: no dir Fluor, slo strmg bl wh - yel Fluor cut, no vis cut, yel Fluor Res, clr yel vis Res.

3113.5 - 3138m

Sltst: olv blk - brn blk, dsky yel brn, mod hd - fri, blky, brit - fri, non calc - v calc, arg gr Clst, com micromic, com micropyr, carb, v f sdy, loc pl frag, r glauc

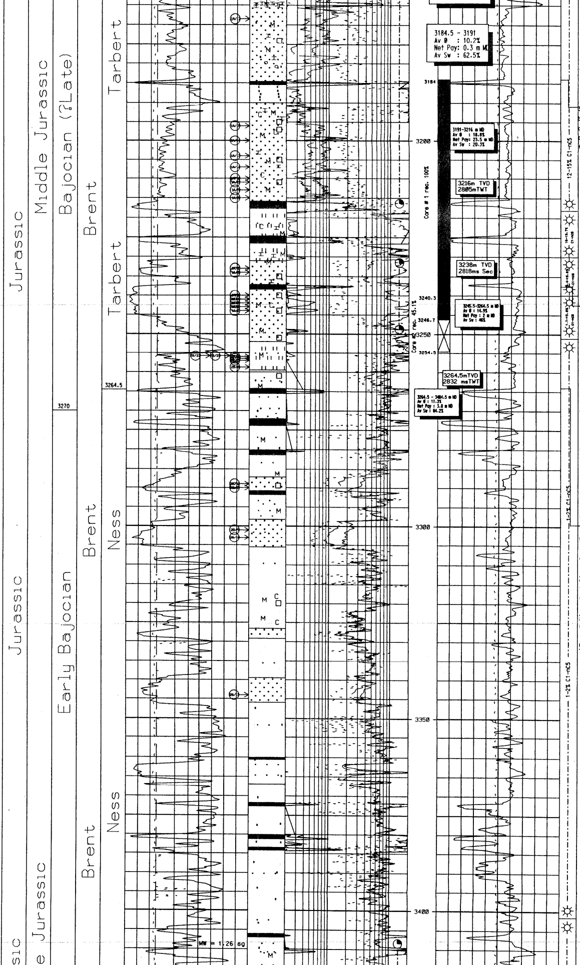
Sst: dsky yel brn - olv blk, clr Qtz, v f - f, subang, spher, mod srt, fri- lse, non calc, v arg/slty mtrx, gr Sltst, mic, carb, r glauc, n.v.p

Ls: m lt gry, firm - sft, crpxln, pt gr Clst

3113.5-3130m: no dir Fluor, tr slo blmg bl wh - yel Fluor cut, no vis cut, tr yel Fluor Res, no vis Res.

3138 - 3237.5m

Sst: dsky yel brn - olv blk, clr trnsl Qtz, f - m, tr crs, subang - subrndd, mod srt, mic, pyr, prt cmt, firm - hd, pr.v.p



<u>Sltst</u>: olv blk - brn blk - dsky yel brn, mod hd - fri, blky, brit - fri, non - v calc, arg gr Clst, com micromic, com micropyr, carb, v f sdy, loc pty frag, r glauc

<u>Ls</u>: wh - med blsh, sft - firm, arg, crpxln

<u>Coal</u>: blk, hd, shiny, concn, pyr, lam

3138-3184m: no dir Fluor, pr slo blmg bl wh Fluor cut, no vis cut, no Fluor Res, no vis Res.

3184 - 3217m: mod - strg pet od, yelsh brn - dusky yelsh brn O stn, no dir fluor, abd pinpt slow strmg fluor cut, no - v wk pl straw vis fluor cut, wk pl yel ring fluor res, no - wk yel spotty ring vis res.

3216 - 3238 m MD
Av Ø : 15.6%
Net Pay: 5.2 m MD
Av Sw: 53.1%

3238-3245.5 m MD
Av Ø : 15.9%
Net Pay: 7 m MD
Av Sw: 37.3%

3232 - 3237.5m: mod pet od, brn oil stn, fr uni yel dir fluor , inst blmg even bl - wh fluor cut, no vis cut, mod even bl - wh - gn fluor res, yel ring vis res.

3237.5 - 3264m

<u>Sst</u>: brn blk - dsky yel brn bcm pl yel brn - pl yel, gry brn, clr - op trnsl Qtz gr, pred m - f, r crs - v crs, subang - subrndd, mod spher, mod - wl srt, fri bcm mod - wl sil cmt, I.P silty calc cmt, abd oil stn, r mass Pyr, Tr Mic, loc arg - carb, mod - pr intgran por, com carb cotd gn.

<u>Clst</u>: olv gry - olv blk, bcm grysh brn - lt grysh brn, firm - mod hd, blky, non calc.

3237.5 - 3246.7m

mod strg - strg HC od, dom r pinpt - v r uniform pl yel-straw dir fluor, instant bri wh-slow wk pl wh cut fluor, com pl yelsh gn mod fast blmg cut fluor, mod strg yelsh gn vis fluor, mod-strg wh strmg cut fluor, wh-v pl yelsh gn res fluor, r v pl straw - crm vis res, com no vis res, mod - pr show.

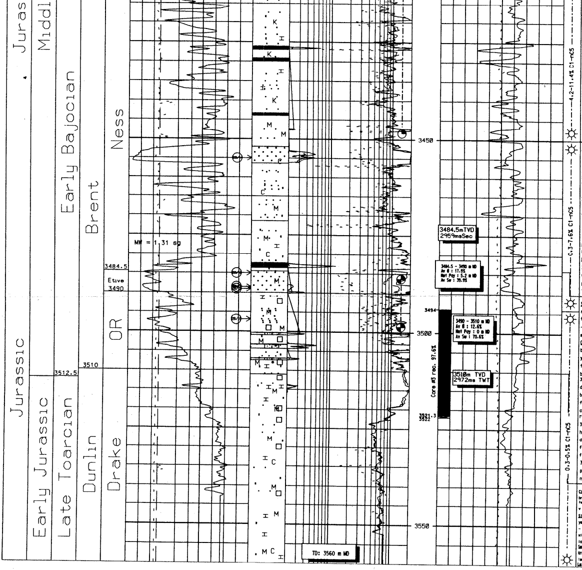
3264 - 3417.5 m

<u>Clst</u>: olv gry - olv blk bcm grysh brn - lt grysh brn, firm - mod hd, blky, non calc.

<u>Sst</u>: lt - m gry, clr - trnsl Qtz, f - v f, loc m, firm, sbang - sbrndd, mod - wl srt, non calc, Tr C, Pyr, r Mic.

<u>Sltst</u>: olv blk - olv gry, m gry - dk gry, sft - firm, blky.

<u>C</u>: blk, hd - v hd, brit, pyr.



3417.5 - 3450 m

Sst: dom wh - sli pl yelsh gry, com trnsl - op, dom v f - f, loc bcm m, sbang, sbrndd, wl srt, sli dol cmt, com arg Mtx, Kao, abdt Mic, loc abdt C Frag.

Clst: pl yelsh gry, brnsh gry, bcm m blk - rdsh blk, Mic, bcm slty, I.P. grad arg Sltst.

Sltst: pl yelsh brn, firm, blky, loc abd carb & micromic, occ v f Sd gr.

C: blk - rdsh blk, firm - sft I.P., sbblky - sbfis, occ micropyr.

3437m-3440m:# 5% Sst aggr, bri yel dir fluor, slow blmg - pinpt strmg pl yel - yel wh fluor cut, no vis cut, wh -pl yelsh wh fluor res, pr show.

3450 - 3484.5 m

Sst: mlky wh - clr Qtz, occ op, dom f - v f, loc bcm m - r crs, v r v crs, bimod, sbang - ang, com sbang - sbrndd, pr - mod srt, sil & r pyr cmt, hd - loc fri, com Kao Mtrx, loc abd C Frag.

Clst. pl yelsh brn - brnsh gry, brnsh blk - grysh blk, com pl yelsh brn - dusky yelsh brn, firm - mod hd, brit I.P., occ ea Tex, loc sharp breaks, micromic & C Deb, bcm slty I.P., grad arg sltst.

Sltst. dusky nyelsh brn, bcm lt gry I.P., firm - sft, blky, loc abd C Frag & Mic, com v f Sd gr, v arg, ea Tex.

C: blk - blksh brn, hd - firm, brit, conch Frac, vit Lstr, v arg grad carb Clst.

Lst: wh, sft - firm, blky, chky Tex, microxln.

3450m-3485.5m:no dir fluor, v wk pl mky wh slow blmg fluor cut, Tr pl yelsh gn pinpt slow strmg cut, no vis cut, v r Tr wk pl wh res fluor, no vis res, pr show.

3484.5 - 3510 m

Sst: mky wh - com pl yelsh brn (oil stain), dom mky - trnsl Qtz, com op, m - f, loc crs, bimod, loc v f - f, mod - wl - pr srt, ang - subang, lse I.P., sil cmt, mod - pr intgran por, else a.a

Clst: pl yelsh gry - brnsh gry, brnsh blk - grysh blk, com pl yelsh brn - dsky yelsh brn, firm . mod hd, brit I.P, ea tex occ, loc shp brk, micromic and c Deb, bcm slty I.P, grad arg Slts

3485.5m-3494m:10-60% dull yel-bri yel dir fluor, slow-mod fast wh-pl yelsh gn blmg fluor cut, slow wh-pl yel strmg pinpt fluor cut, gen no vis cut, r pl straw vis cut, pl wh-pl yelsh crm res fluor, no vis res, mod-pr show.

3494m-3504m:mod strg pet Od, 90-100% gen homog slily pch bri yel - dull yel gn dir fluor,mod fast pl wh-mky wh blmg cut fluor, no vis cut, wk-mod strg pl yel-crm fluor res, no vis res

3504m-3510m: no pet Od, no dir fluor, slow pl wh diffuse blmg fluor cut, no vis cut, no fluor cut, no vis res

3510 - 3560m

Clst: grysh blk - brnsh blk, bcm dsky yelsh brn - pl yelsh brn, firm - sft, loc silty sol, gen subblky - subfis, ea tex I.P., grad v slty Clst, v mic, loc abd pyr, c and carb Deb, v micropyr I.P., bcm intercal / w v th sdy bds

Sltst: brnsh blk - grysh blk, bcm dsky yelsh brn, hd - v hd, bcm firm - hd, blky - subfis, v mic, w/ abd sd gr, occ mass xln pyr, tr c plt remnants, c Dbr com, loc calc, v arg gr Clst I.P

Sst: mky wh - clr sst, mky - clr - trnsl Qtz, f - v f, firm - hd, calc cmt, com lse, bcm slty gr Slts

Lst wh, firm - sft, blky, chky tex, microxln

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INTERPRETATION RESULTS

LEGEND:

→ Correlation of seismic event with log event (Seismic pick in site survey report)

←- - - Revised seismic pick (Based on log results)

DRILLING RESULTS

30/ 9-19

COORDINATES:
Geographic:
60° 27' 35.38" N – 2 °41' 38.94" E

UTM:
6 702 819.9 mN – 483 176.9 mE
ED50, Zone 31 (CM 3° E).

RIG: West Delta
RKB: 29 m

SPUD DATE: 09-09-1998
COMPLETION DATE: 22.12.1998

LEGEND:

☐	– Clay/claystone
▨	– Silt/Siltstone
▒	– Sand/sandstone
▦	– Limestone
▨	– Cement plug

Seismic

Seismic source: 3D Exploration Seismic
Line: NH9201 Inline 439

Well location

Prognosis

Reflectors	TWT (ms)	Int. Velocity (m/s)	Depth (m RKB)	Anomaly
		1489		
Seabed	141		134	
R2	151	1820	143	
		1830		Weak gas warning
R3c	239		223	
R3	256		240	
		1940		
R4	300		282	
BPLEI	327		309	No anomaly close to location*
IPAN1	357		338	
		1950		
IPAN2	427		406	* Appr. 10 m SE of location
IPAN3	522		508	* 200 m SW of location
		2150		
IP3	606		598	
	627		621	
TUTSI	642		637	
		2000		
BUTSI	946		941	
		2120		
TSKADE	983		980	
BSKADE	997		995	
		2090		
	1273		1284	
I. HORD. SAND		2150		
	1324		1338	
		2000		
TGRID	1397		1412	

Correlation

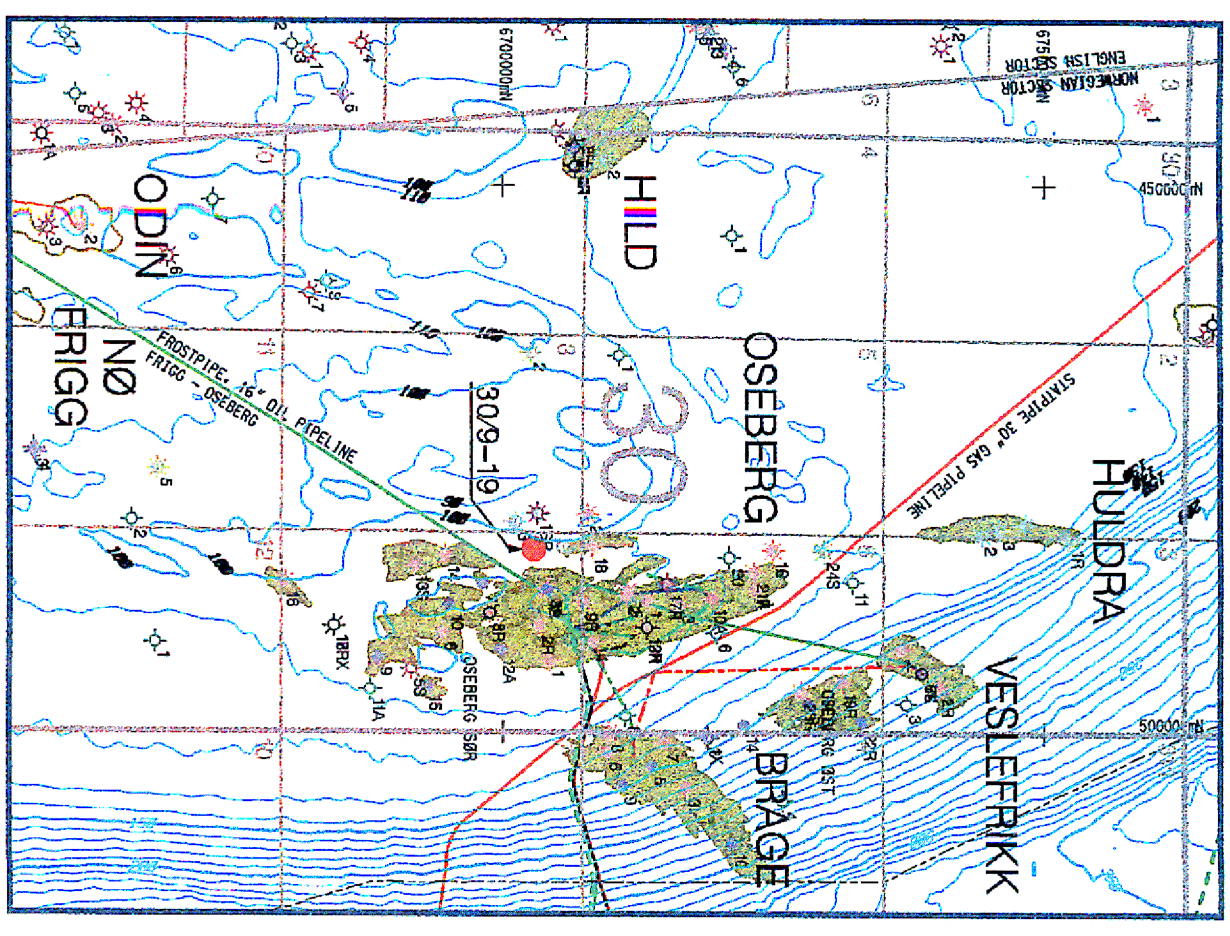
Shallow Gas

Tophole section drilled with returns to seabed to 1205 m RKB. Background levels not recorded.

Background gas level: 0.01% (C1–C3)

Results

Results	Int. Velocity (m/s)
	1489
134 m (141 ms)	
143 m (151 ms)	1800
	1682
217 m (239 ms)	
240 m (256 ms)	
	2136
282 m (300 ms)	
289.5–292 m	
311 m (327 ms)	
339 m (357 ms)	
340 m	
379.5–380.5 m	
404.5 m (427 ms)	
	1954
477–478 m	
501.5 m (522 ms)	
501.5–533 m	
	2383
586.5 m (606 ms)	
623 m (627 ms)	
644.5 m (642 ms)	
	1898
933 m (946 ms)	
954–955 m	
967.5–968.5 m	
971–973.5 m	2673
977.5 m (980 ms)	
998.5 m (995 ms)	
	2200
1040–1041 m	
1042.5–1044.5 m	
1052.5–1055.5 m	
1070 m (c. 1060 ms)	
	1692
1125 m (c. 1125 ms)	
1148.5–1152.5 m	
1170.5–1173.5 m	
	1859
1257 m (c. 1267 ms)	
1282 m	
1304.5–1310 m	
1315 m	
	2266
1380.5 m (c. 1376 ms)	



NOTES:

The given stratigraphy is based on seismic correlation to other wells as no datings or cuttings are available above 1205 m RKB in well 30/9-19.

Scale Index Map:
0 10 20 30 40 km

HYDRO
Marine Surveys Section

Marine Surveys Section

Exploration and Production Division

Drawing title :

Post Site Survey for Well 30/9-19

Comparison for predicted lithology, stratigraphy, shallow gas and obtained drilling results

Interpreted by	Drawn by	Checked by	Date	File no.	Rev.
ESA	ESA	SRØ	12.05.1999	m2280.dgn	0

Scale 1:2000

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