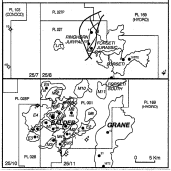
Esso Norge AS

COMPOSITE LOG 1:500

25/8-12A

REGIONAL MAP


PL 103 (CONOCO)
PL 027P
PL 169 (HYDRO)
PL 027
RINGHORN JUR/PAL
LIT
FORSETI JURASSIC
FORSETI
25/7
25/8
E5
M9
M10
M11
FORSETI SOUTH
PL 028P
PL 001
PL 169 (HYDRO)
E4
BALDER
M8
GRANE
E2
E3
M1
M2
M3
M4
M7
PL 028
25/10
25/11
0
5 Km

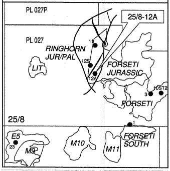
COUNTRY	: Norway
FIELD	: RINGHORN
BLOCK	: 25/8
LICENSE / ROUND	: PL027
OPERATOR	: Esso Norge AS
DRILLING PERMIT	: P955
RIG NAME / TYPE	: Maersk Jutlander
COMPLETION STATUS	: P & A OIL DISCOVERY

OBJECTIVES

PRIMARY : LOWER JURASSIC STATFJORD FORMATION SANDSTONES

SECONDARY : TRIASSIC SANDSTONES

LOCATION MAP


PL 027P
25/8-12A
PL 027
RINGHORN JUR/PAL
LIT
11
12S
12A
FORSETI JURASSIC
3
10ST2
FORSETI
25/8
1
E5
23
M9
M10
M11
FORSETI SOUTH

RIG DATA

RIG PICK UP	: 28 May 1999	RKB - MSL	: 23 m
SIDE TRACK STARTED	: 09 June 1999	RKB - SB	: 151.0 m
DRILLING STOPPED	: 12 June 1999	WATER DEPTH	: 128.0 m
DRILLING COMPLETED	: 18 June 1999	TD (DRILLER)	: 2156.0 m MDRKB 2059m TVDSS)
RIG RELEASED	: 19 June 1999	TD (LOGGER)	: 2160.0 m MDRKB 2063m TVDSS)
TOTAL DAYS	: 11		

LOCATION DATA

SURFACE LATITUDE	: 59° 17' 22.57" N (6 572 584.3 m N)
SURFACE LONGITUDE	: 02° 26' 39.45" E (468 340.5 m E)
SEISMIC LOCATION	:INLINE 1976 CDP 2315 ES 9403_RE98
BOTTOM LATITUDE	: 59° 17' 13,398" N (6 572 298,39 m N)
BOTTOM LONGITUDE	: 02° 26' 56,246" E (468 603,89 m E)

OPERATOR

Esso Norge AS	100%

CONTRACTORS

DRILLING CONTRACTOR	: MAERSK
MUD LOGGING	: SPERRY SUN
WIRELINE LOGGING	: SCHLUMBERGER
MWD	: SPERRY SUN
VSP	: CGG
CORE ANALYSIS	: RESLAB
BIOSTRATIGRAPHY	: STRATLAB
GEOCHEMISTRY	: N / A

GEOLOGISTS

OPERATIONS	: T. Valheim
WELLSITE	: B.Millen , N.Briedis, R. Musum

LOG COMPILER

Geologists	: D. Marmion, C. Bacchiana
Date	: August 1999
Revised by	: N. Briedis Nov 1999

LITHOSTRATIGRAPHIC TOPS

GROUP	FORMATION	MEMBER	SEQUENCE / CYCLE	DEPTH m MDRKB	DEPTH m TVDSS
NORDLAND		Water Bottom		150,0	127,0
	UTSIRA			560,0	537,0
	UTSIRA	MASSIVE SAND		728,0	705,0
HORDALAND				954,0	931,0
ROGALAND	BALDER			1748,0	1679,8
	SELE	ZONE II UPPER SHALE		1815,2	1741,5
	SELE	ZONE II LOWER SHALE		1843,3	1767,6
	LISTA	ZONE B1 SHALE		1875,0	1797,0
	LISTA	ZONE IA2 SHALE		1904,4	1824,5
	VÅLE	ZONE IA2 SHALE		1915,3	1834,7
SHETLAND	(Undifferentiated)	CHALK		1920,9	1839,9
	STATFJORD	MIDDLE STATFJORD		1945,7	1863,1
	STATFJORD	LOWER STATFJORD		1951,7	1868,6
HEGRE	SMITH BANK			2028,4	1940,3
Well T.D.				2156,0	2059,0

WIRELINE LOGGING

DATE	RUN	TOOL SUITE	INTERVAL (m MDRKB)
29.05.99	1	DIR	153 - 213
30/31.05.99	2	DIR - FE	213 - 990
9/11.06.99	7	DIR - FE	972 - 1951
12/13.06.99	9	DIR - FE	951 - 2156
13.06.99	1A	AITH-IPLT-DSI	986 - 2160
13/14.06.99	1B	MDT	2057 - 1948
14.06.99	1C	VSP	300 - 2150

CASING DATA

BIT SIZE	INTERVAL (m MDRKB)	CASING	SHOE DEPTH (m MDRKB)	MUD SYSTEM
36"	156 - 213	30"	211	SEAWATER
12 1/4"	213 - 990	9 5/8"	984	SEAWATER
8 1/2"	990 - 2156			OBM

KICKED OFF FROM 25/8-12S OPEN HOLE, AFTER SETTING CEMENT PLUG, AT 1014 m MDRKB

CONVENTIONAL CORES

CORE	INTERVAL (m MDRKB)	RECOVERY
core #1	1951 - 1988,5	37,5 m (100%)

BIOSTRATIGRAPHIC TOPS

SERIES	STAGE	ZONE	DEPTH (m MDRKB)	DEPTH (m TVDSS)

DRILLSTEM TESTS

DST N°	INTERVAL (m MDRKB)	FLOW	CHOKE	WHP	TEST N°	DEPTH (m MDRKB)	FORMATION PRESSURE	SAMPLE TYPE	TOP (m MDRKB)	BOTTOM (m MDRKB)	PLUG TYPE		
	No DST's performed												

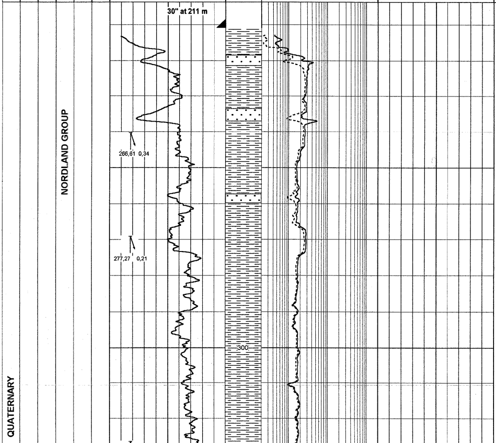
SIDEWALL CORES

RUN	SHOT	DEPTH (m MDRKB)	RECOVERY (cm)	RUN	SHOT	DEPTH (m MDRKB)	RECOVERY (cm)
		No Cst's performed					

MDT DATA

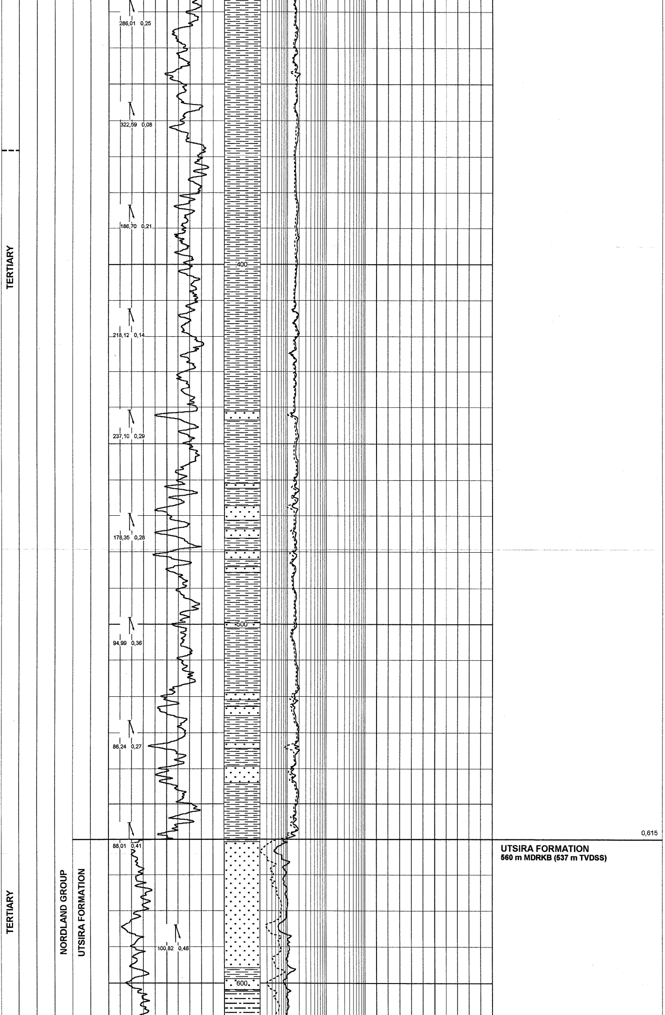
RUN	DEPTH (m MDRKB)	HYDROSTATIC PRESSURE (bar)	FORMATION PRESSURE (bar)	COMMENTS Calculated Mobility	FORMATION
1B	1947,7	249,58	187,45	24	
1B	1951,5	250.26	187,71	792	
1B	1954,9	250,76	187,95	272	ZONE T1
1B	1959,3	251,48	188,22	3363	ZONE T1
1B	1963,0	251,79	188,51	2656	ZONE T1
1B	1967,6	252,01	188,79	2154	ZONE T2
1B	1971,3	252,35	189,04	1118	ZONE T2
1B	1975,0	253,06	189,30	4218	ZONE T2
1B	1980,6	253,94	189,68	3456	ZONE T2
1B	1984,5	254,39	189,93	5003	ZONE T2
1B	1992,2	255,40	190,45	5306	ZONE T2
1B	1993,8	255,47	190,55	6987	ZONE T2
1B	2006,0	256,45	191,47	388	ZONE T3
1B	2008,0	256,90	191,60	382	ZONE T3
1B	2016,0	257,85	192,37	14	ZONE T3
1B	2019,2	258,38	tight	tight	ZONE T3
1B	2017,0	257,89	192,46	165	ZONE T3
1B	2024,0	259,08	193,09	819	ZONE T3
1B	2025,8	258,82	193,26	633	ZONE T3
1B	2056,9	262,50	198,62	super charged	TRIASSIC
1B	2060,2	263,20	198,66	34	TRIASSIC
1B	2063,3	263,70	198,90	289	TRIASSIC
1B	2064,2	263,40	199,00	67	TRIASSIC
1B	2009,5	256,80	191,69	757	ZONE T3
1B	1975,0	252,67	189,27		ZONE T2
1B	2015,0	257,58	192,23	17	ZONE T3
1B	2024,0	259,16	193,08	86	ZONE T3
1B	2025,8	259,22	193,28	59	ZONE T3
1B	1991,0	254,73	190,34	5479	ZONE T2
1B	2008,2	257,58	191,62	253	ZONE T3

CHRONO / LITHO STRATIGRAPHY	GAMMA RAY DEVIATION SURVEYS SWCs	DEPTH AND LITH	RESISTIVITY MDTs	POROSITY LOGS	LITHOLOGY DESCRIPTIONS TWT (secs)
SYSTEM SERIES STAGE GROUP FORMATION MEMBER	Gamma Ray (SGR) 0 API 150 Caliper 8 INCH 18 Gamma Ray (CGR) 0 API 150	1 M : 500 M MD in M	Resistivity Shallow 0.2 OHMM 200 Resistivity Deep 0.2 OHMM 200	Neutron Porosity (frac) 0.45 M3/M -0.15 1.05 0.45 Density 1.95 G/CC 2.95 0.95 1.95	

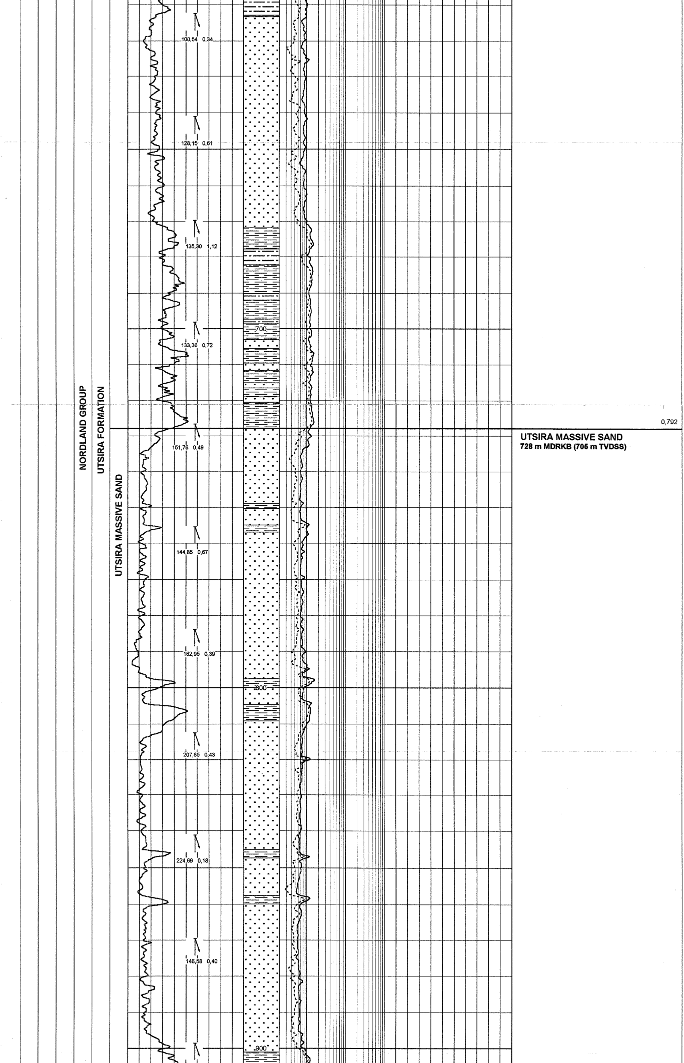


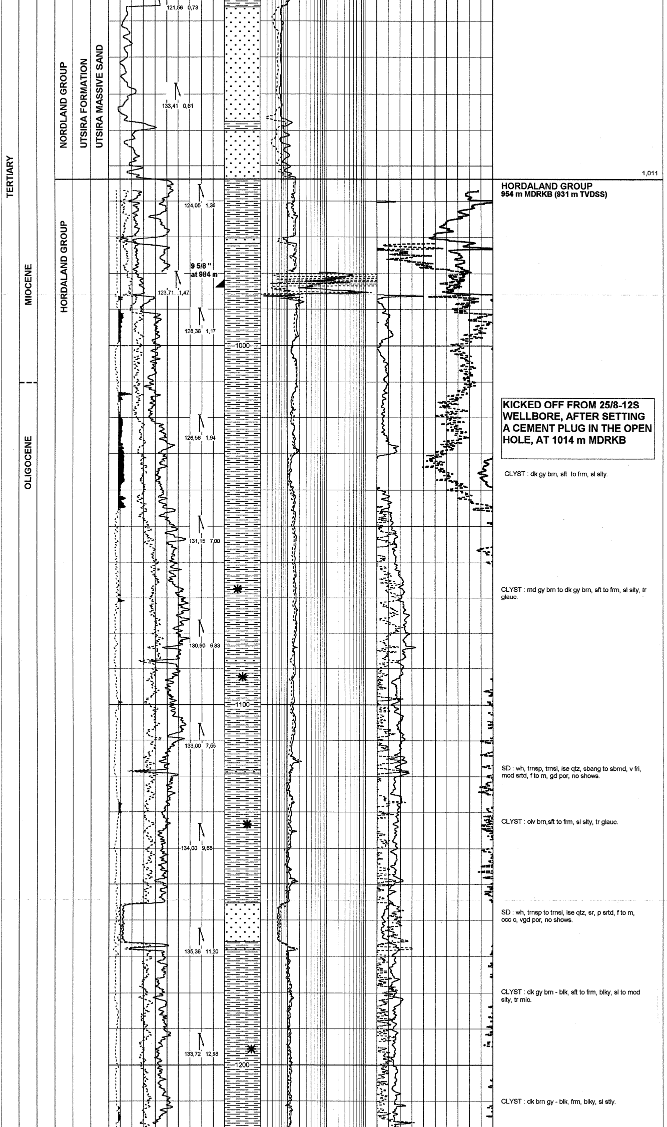
12 1/4" HOLE TO 993 M.

Returns to seabed
lithology interpreted from MWD logs



UTSIRA FORMATION
560 m MDRKB (537 m TVDSS)





HORDALAND GROUP
954 m MDRKB (931 m TVDSS)

KICKED OFF FROM 25/8-12S WELLBORE, AFTER SETTING A CEMENT PLUG IN THE OPEN HOLE, AT 1014 m MDRKB

CLYST : dk gy brn, sft to frm, sl slty.

CLYST : md gy brn to dk gy brn, sft to frm, sl slty, tr glauc.

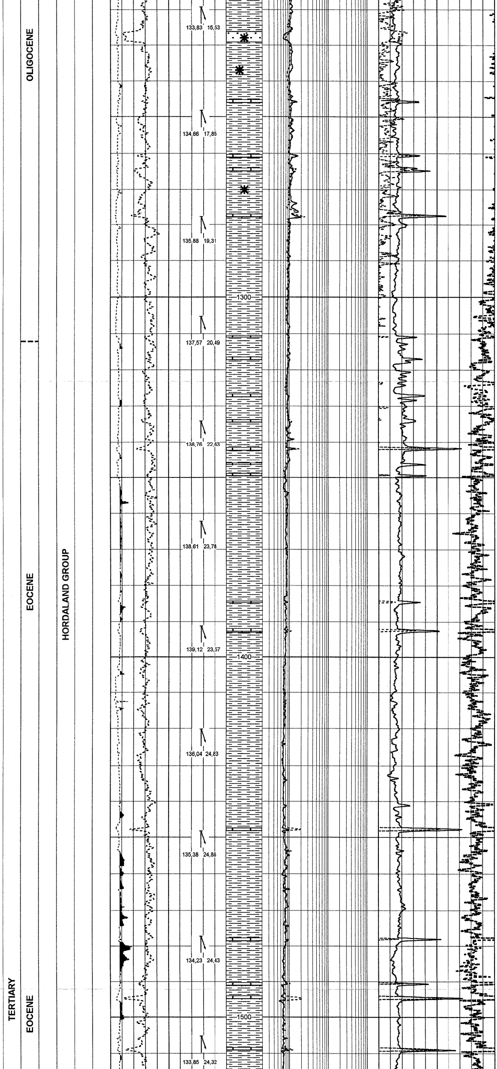
SD : wh, trnsp, trnsl, lse qtz, sbang to sbrnd, v fri, mod srtd, f to m, gd por, no shows.

CLYST : olv brn,sft to frm, sl slty, tr glauc.

SD : wh, trnsp to trnsl, lse qtz, sr, p srtd, f to m, occ c, vgd por, no shows.

CLYST : dk gy brn - blk, sft to frm, blky, sl to mod slty, tr mic.

CLYST : dk brn gy - blk, frm, blky, sl stly.



SS : ltgy-wh, sft-fri, vf to f,qtz w/clay mtx and glauc.

CLYST : dk brngy-blk, frm, blky, sl to mod slty, tr glauc.

LS : tn-ltbrn, frm to hd, dolic, slty ot sdy.

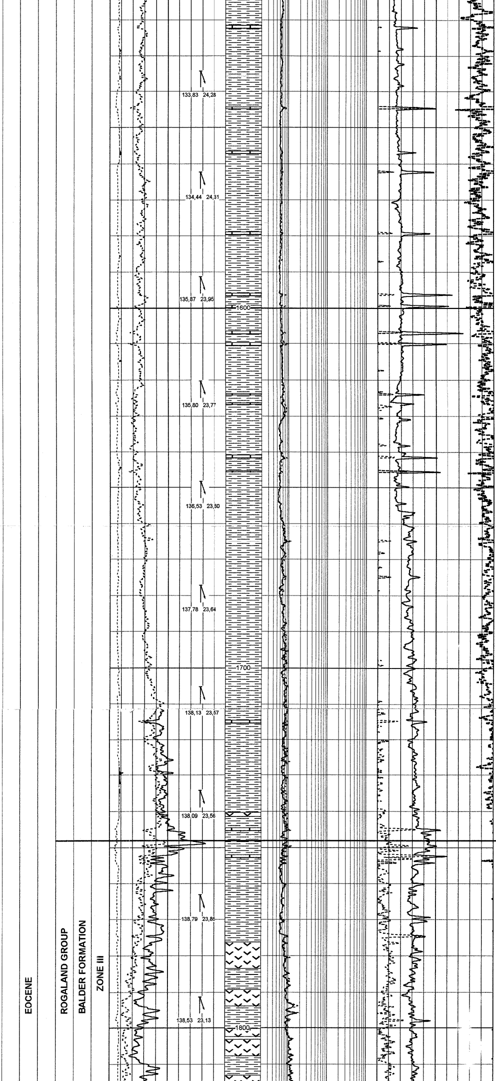
CLYST : dk brugy - dk brngy, frm, blky, sl slty, occ v glauc, tr pyr.

LS : wh - tn, frm to modhd, blky - lam,tr glauc.

CLYST : mblugy - dk brngy, frm, blky, sl slty occ vglauc, tr pyr.

LS : ltgy, wh and tn, frm to modhd, blky - lam.

CLYST : dkgy, frm, blky, sl slty tr pyr.



CLYST : m blugy - dk brngy, frm, blky, sl slty tr glauc and pyr.

LS : tn - brn, frm - modhd, blky, sl slty, w/vf sd.

CLYST : m blugy, gy and dk brngy, frm, blky, sl slty, occ v glauc.

LS : lt brn, frm - mod hd, blky, v slty.

TUFF : lt bl gy, sft to frm,dk gy blk incl, sl calc.

1,710

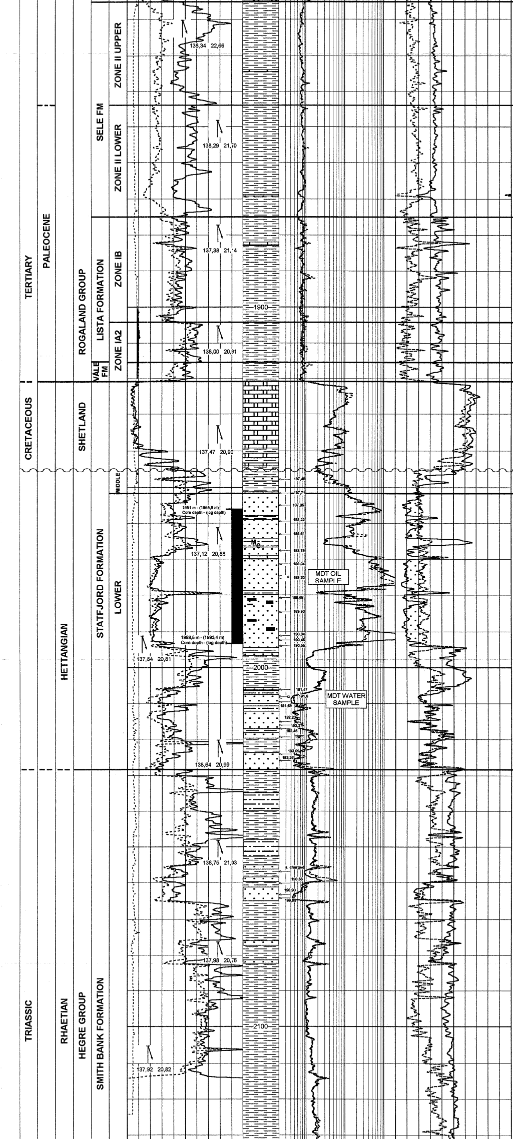
TOP BALDER

1748,0 m MDRKB (1679,8 m TVDSS)

CLYST : m gy brn, frm, blky to subfis.

TUFF : lt blu gy, sft to frm, dk gy blk incl, sl calc.

1,762



TOP SELE FORMATION
1815,2 m MDRKB (1741,5 m TVDSS)

LS : lt - m brn, frm to modhd, mdstn, sl dolic.

1,785

CLYST : dk gy brn, frm, blky - sub fis, tr pyr.

SS : w - ltbrn, uncons, trnsp, trnsl, vf to f, sbang to sbrnd, v arg, noshows.

1,811

TOP LISTA FORMATION
1875.0 m MDRKB (1797.0 m TVDSS)

CLYST : dk gy, gn gy, rd brn, frm, blky, sl slty, tr glauc.

1,834

1,842

VALE FORMATION
1915,3 m MDRKB (1834,7 m TVDSS)

1,845

TOP CHALK (UNDIFFERENTIATED)
1920,9 m MDRKB (1839,9 m TVDSS)

CHK : off wh - lt brn, pnk, micro xln, frm, no shows.

BASE CRETACEOUS UNCONFORMITY 1,856

STATFJORD FORMATION
1945,7 m MDRKB (1863,1 m TVDSS)
CLYST : lt gy, dk gy to blk, frm, blky, slty, carb in part, sdy in part.
SS : qtz, trnsp, trsnsl, f to c, p srt, mass w/ faint lam by hv min.

1,860

LOWER STATFJORD FORMATION
1951,7 m MDRKB (1868,6 m TVDSS)

SS : qtz, trnsp, trnsl, parallel lam, C, hv min, sh clasts
SS : qtz, trnsp, trnsl, f to c, p srt, sbang, ripples and x-bedding.

SLTST : lt gy, lam, muscovite rich.

SS : qtz, trnsl, trnsp, md - dk brn, vc to m, sbang to sbrnd, mod srt, channel lag, mass, x-beds, lam from bot to top.

SLTST : gy, v f lam, pyr.

SS : qtz, trnsl, trnsp, m - dk brn, vc to m, sang to sbrnd, mod drt, channel lag, mass, x-beds, lam from bot to top, loc sh clasts.

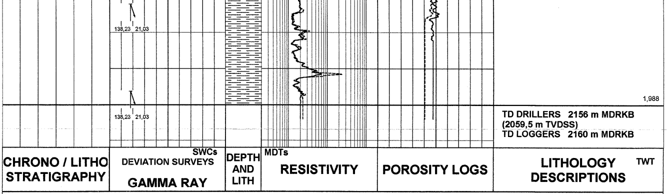
CLYST : predy lt gy, occ grn, solf, blky, occ v slty.

SS : qtz, trnsp, trnsl, uncon. vf to m, sbang to sbrnd, mod srt.

1,909

SMITH BANK FORMATION
2028,4 m MDRKB (1940,3 m TVD SS)

CLYST : predy lt gy, olv grn, soft, blky, slty.



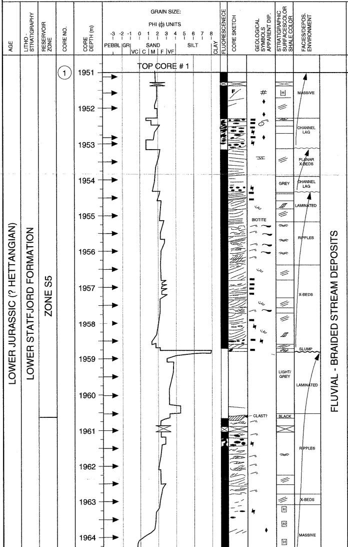
TD DRILLERS 2156 m MDRKB
(2059,5 m TVDSS)
TD LOGGERS 2160 m MDRKB

▤	**Limestone**	▨	**Dolomite**	⁘	**Sandstone**	▤	**Siltstone**	▤	**Claystone**
▦	**Argillaceous Limestone**	▦	**Dolomitic Limestone**	●	**Conglomerate**	▤	**Claystone**	▤	**Claystone**
▦	**Chalk**	⌄	**Tuff**						
⊥	**Calcareous**	⊥	**Dolomitic**	✱	**Glauconitic**	--	**Shaley**	▰	**Pyritic**
■	**Core (recovered)**	☒	**Core (unrecovered)**	◢	**Casing shoe.**	↘	**Deviation**	∿	**Unconformity**
⊂	**Pressure**	⊂	**Pressure measurement with fluid samples**						

LEGEND

CORE DESCRIPTION DATA SHEET

FIELD/AREA: RINGHORN WELL NO.: 25/08-12A SCALE: 1 : 50 Inclination 21° DATE: JUNE 28, 1999 GEOLOGIST: F. MEDIAVILLA PAGE 1 OF 3


AGE
LITHO - STRATIGRAPHY
RESERVOIR ZONE
CORE NO.
CORE DEPTH (m)
GRAIN SIZE:
PHI (ϕ) UNITS
-3 -2 -1 0 1 2 3 4 5 6 7 8
PEBBL GR VC C M F VF SAND SILT CLAY
FLUORESCENECE
CORE SKETCH
GEOLOGICAL SYMBOLS APPARENT DIP.
STRATIGRAPHIC SURFACESCOLOR SHALE COLOR
FACIES/DEPOS. ENVIRONMENT
TOP CORE # 1
1
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
LOWER JURASSIC (? HETTANGIAN)
LOWER STATFJORD FORMATION
ZONE S5
F
#
BIOTITE
CLAST?
GREY
LIGHT/ GREY
BLACK
H
MASSIVE
CHANNEL LAG
PLANAR X-BEDS
CHANNEL LAG
LAMINATED
RIPPLES
X-BEDS
SLUMP
LAMINATED
RIPPLES
X-BEDS
MASSIVE
FLUVIAL - BRAIDED STREAM DEPOSITS

COMMENTS

Massive sand, angular poorly sorted
faint lamination by heavy minerals,
(pyroxene, pyrite)

Rip-up coal clasts dolomitic nodules
shale clasts

Parallel lamination, cm scale, heavy minerals

Aligned shale clasts

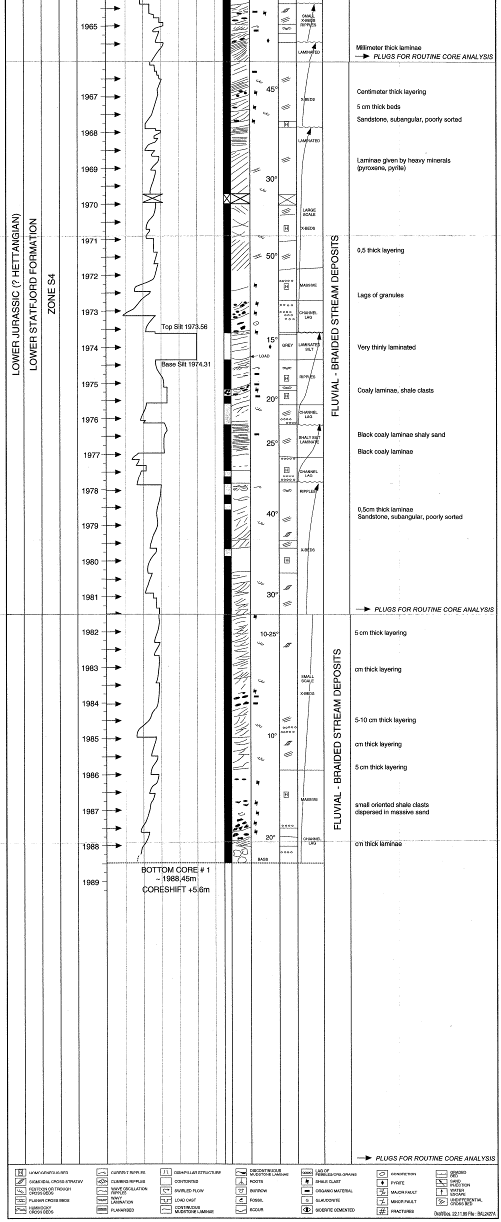
Thin shale laminae, 0,5cm thick layering
Biotite rich laminae

Sdt, subangular, poorly sorted

Silt muscovite rich.

Sdt, subangular, poorly sorted

Millimeter thick shale laminae

Sdt, angular, poorly sorted
faint laminations by pyrite, silica cemented