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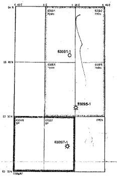
P&A GAS DISCOVERY **BP NORGE U.A**

COMPOSITE LOG 6305/7-1 SCALE 1:500 MEASURED DEPTH

BLOCK MAP



WELL LOCATION

CO-ORDINATES AT SURFACE

Latitude:	63° 21' 47.613" N
Longitude:	05° 15' 43.730" E
Grid Reference:	7 028 228.7mN 613 145.7mE

CO-ORDINATES AT T.D

Latitude:	63° 21' 47.613" N
Longitude:	05° 15' 43.730" E
Grid Reference:	7 028 228.7mN 613 145.7mE
Projection Mnemonics:	NUTM31

Depth	Casing Size	LOT
955.00	30"	-
1696.00	13 3/8"	1.44 S.G.EMW
2810.00	9 5/8"	1.59 S.G.EMW
3369.00	7"	
2641.00	7" Liner hanger	

Operations Geologist	Elisabeth Brodahl
Wellsite Geologists	Andrew Johnston Graham Wheatley Mike Henderson Atle Scholtze

Composite Log compiled by Andrew Johnston

GENERAL WELL DATA

PRE-SPUD WELL STATUS:	Exploration
COMPLETION WELL STATUS:	P&A Gas Well
OPERATOR:	BP Norge U.A.
RIG USED:	Ocean Alliance
RIG TYPE:	DP Semi-Submersible
DEPTH DATUM:	Rotary Table
DATUM HEIGHT:	25.85mAMSL
WATER DEPTH:	857.0m
DATE SPUDDED:	6th July 1998
REACHED T.D:	7th August 1998
RIG RELEASED:	30th August 1999
TOTAL DEPTH:	3377.0 mBRTDD 3376.8m TVDSS 3380.0 mBRT (logger)

LICENCE: PL208

INTERESTS

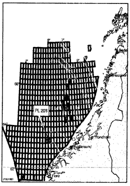
BP Norge U.A 45%

DEN NORSKE STATS OLJSELSKAP A/S 30%

Norske Shell A/S 25%

DRILLING CONTRACTORS:	Diamond Drilling
MUDLOGGING CONTRACTOR:	Sperry Sun
WIRELINE LOGGING CONTRACTOR:	Schlumberger
CORING CONTRACTOR:	Baker Hughes Inteq
CORE ANALYSIS:	Reslab
BIOSTRATIGRAPHY:	Geostrat

REGIONAL MAP



STRATIGRAPHY

STRATIGRAPHY	LITHO & SEQUENCE	TOP MD mBRT	TOP TVD mBRT	TOP TVD mSS	VERTICAL THICKNESS	COMMENTS
TERTIARY						
Miocene	Kai					
Oligocene	Brygge	1643	1643	1617	1033	
Eocene						
Late Eocene	T96-98	1968	1968	1942	236	
	T94	2204	2204	2178	24	
	T92	2228	2228	2202	98	
	T84	2326	2326	2300	56	
Early Eocene	T82	2356	2356	2330	82	
	T60-70	2438	2438	2412	82	
	T50	2562	2562	2536	100	
	Tare	2562	2562	2536	95	
	Tang	2657	2657	2631	254	
	T45	2662	2662	2636	47	
	T40	2709	2709	2683	8	
Paleocene						
Late Paleocene		2717	2717	2691	23	
	T30	2740	2740	2714	108	
	T20	2848	2848	2822	66	
Early Paleocene		2888	2888	2862	23	
	(T10) Egga Sandstone Member	2911	2911	2885	80	
LATE CRETACEOUS						
Late Maastrichian	Shetland Group Springar Formation K90	2991	2991	2965	39.5	
Early Maastrichtian		3030.5	3030.5	3004.5	22.5	
Early Campanian	K80	3053	3053	3027	198	
Late Santonian		3251	3251	3225	39	

CORING SUMMARY

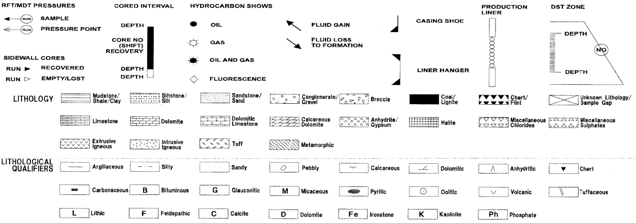
No.	INTERVAL CORED		RECOVERY			COMMENTS
	Hole Size	mBRT DD	m BRT DD	m	%	
1	8 1/2"	2917.00 2944.00	2917.00 2943.80	26.8	99.3	
2	8 1/2"	2944.00 2971.00	2944.00 2971.00	27.0	100.0	
3	8 1/2"	2971.00 2985.50	2971.00 2984.90	13.9	95.5	
4	8 1/2"	2985.50 3012.50	2985.50 3011.70	26.3	97.3	

WIRELINE LOGGING SUMMARY

Run No.	Date	Log	Interval m MD BRT	Hole Size	Max Temp	Op Time (hr:min)	Lost Time (hr:min)
1A	18/07/1998	HALS-PEX-DSI	883 - 2819	12 1/4"	83°C	8:10	0:40
2A	28/07/1998	VSP-GR	1920 - 2780	12 1/4"	81°C	12:45	6:15
3B	07/08/1998	PEX-GPIT-GR	2760.6 - 3380	8 1/2"	88.3°C	5:30	0:00
3A	07/08/1998	MDT-GR	2914 - 3047	8 1/2"	87.8°C	18:10	0:00
3B	08/08/1998	FMI-DSI-GR	2000 - 3373	8 1/2"	95.6°C	7:10	0:00
3B	09/08/1998	VSP-GR	2720 - 3360	8 1/2"	-	5:50	0:00
3A	09/08/1998	CST-GR	2832 - 3360	8 1/2"	-	7:55	0:00

DRILL STEM TESTS

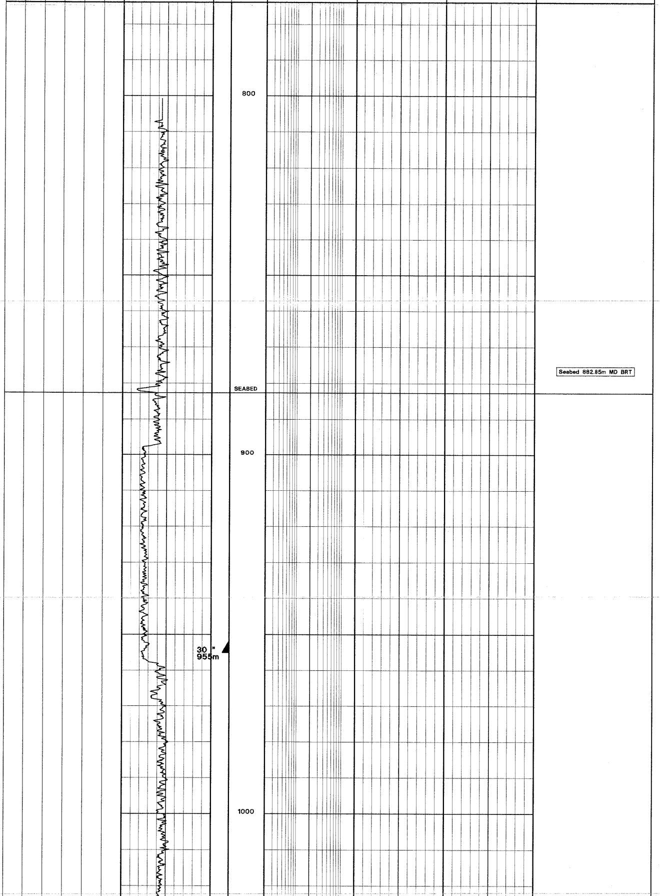
TEST TYPE	TEST NO.	TOP DEPTH (m)	BOTTOM DEPTH (m)	GAUGE DEPTH (m)	STRATIGRAPHIC INTERVAL	CHOKE SIZE (ins)	FORMATION PRESSURE (PSIG)	B.H.F.P (psig)	W.H.F.P (psig)	FLOW DURATION (hours)	FLOWRATE		REVERSED VOLUME (bbl)	HYDROCARBON GRAVITY		GOR	CGR
											FLUIDS B.P.D	GAS		OIL	GAS		
-	1	2915	2931	2904/2906	Paleocene Sandstone	32/64"	4200	4147	3068	9	244	17.2	-	0.77SG	0.61SG	71993	13
						40/64"	@gauge	4163	2761	6	362	23.0	-			63088	15
						60/64"		4148	1872	4	502	33.0	-			65693	15



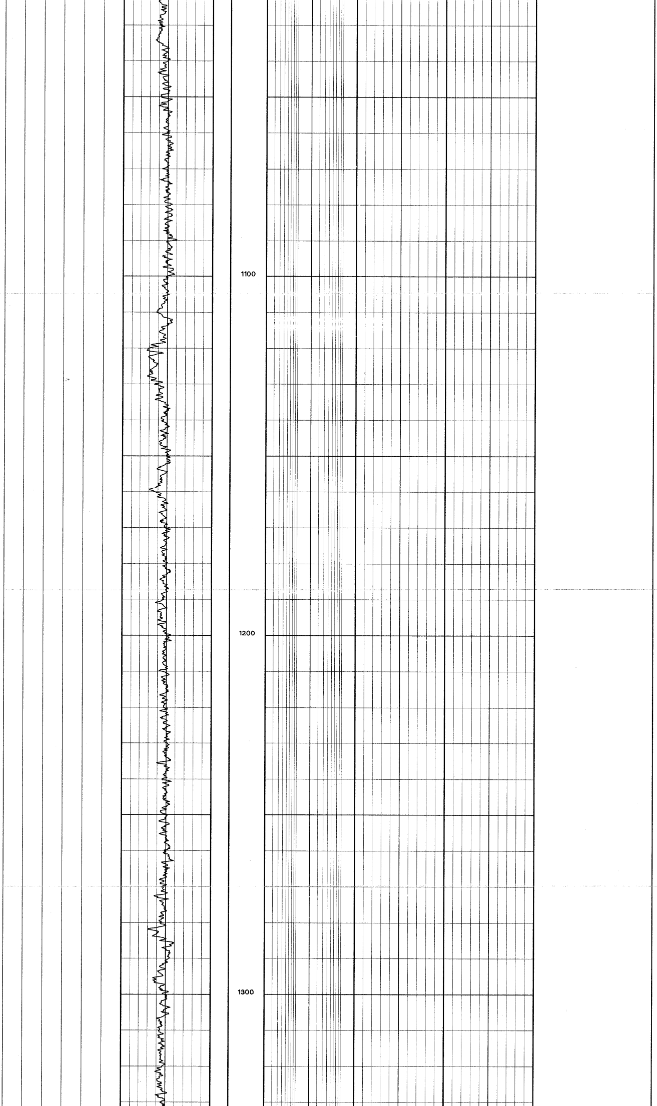
Q Quartz S Siderite Si Silica Cl Chlorite Nodule Fe Iron Nodule + Halite

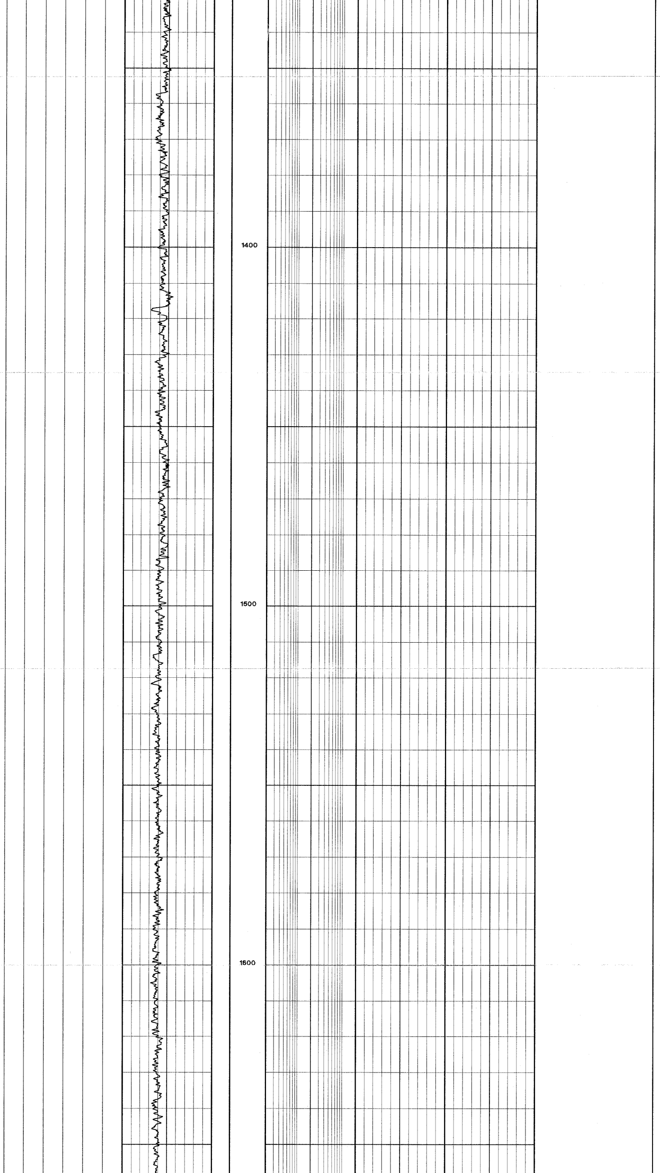
FOSSILIFEROUS MATERIAL Macrofossils Bioclastic Debris Microfossils Plant Remains

CHRONOSTRAT			LITHOSTRAT			GAMMA RAY	DEPTH (m)	RESISTIVITY	POROSITY LOGS	SONIC	LITHOLOGICAL DESCRIPTION
PERIOD	EPOCH	AGE	GROUP	FORMATION	MEMBER	-300 SP(mV) 100 8.00 HCAL(in) 18 0 GR(API) 150		0.20 RXOZ(ohmm) 200 0.20 HLLS(ohmm) 200 0.20 HLLD(ohmm) 200	140 DTCO(us/ft) 40	0.45 TNPH(PU) -0.15 1.95 RHOZ(g/cc) 2.95	

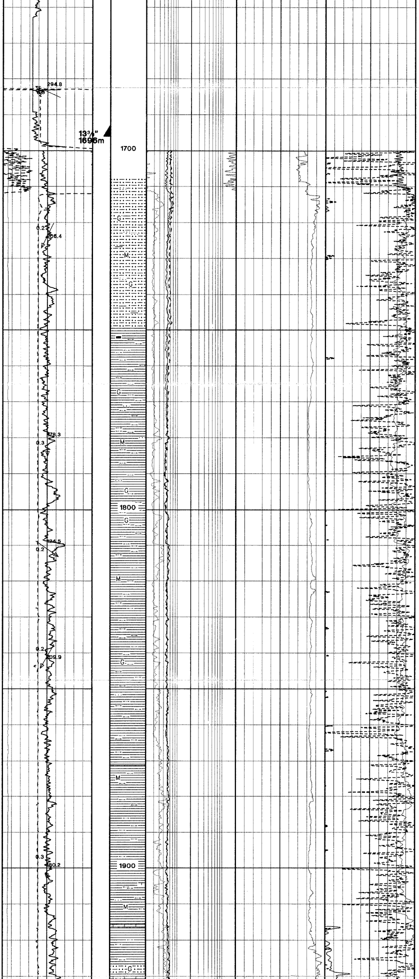


Seabed 882.85m MD BRT





Oligocene - undifferentiated



LOT @ 1696m - 1.44 SG EMW

1708m - 3377m
KCL/NaCl/PAC
Water Based Mud
MWT = 1.3 SG

Returns from 1708m

Siltstone: brownish black to dusky yellowish brown, soft to firm, friable, blocky to amorphous, non calcareous, argillaceous, commonly very fine sand, grading to sandstone, trace micromicaceous, trace glauconitic.

Mudstone: brownish grey to dark yellowish brown, soft to firm, friable, blocky to amorphous, non calcareous, moderately to very silty grading to Siltstone, trace glauconitic, trace micromicaceous, trace very fine sand.

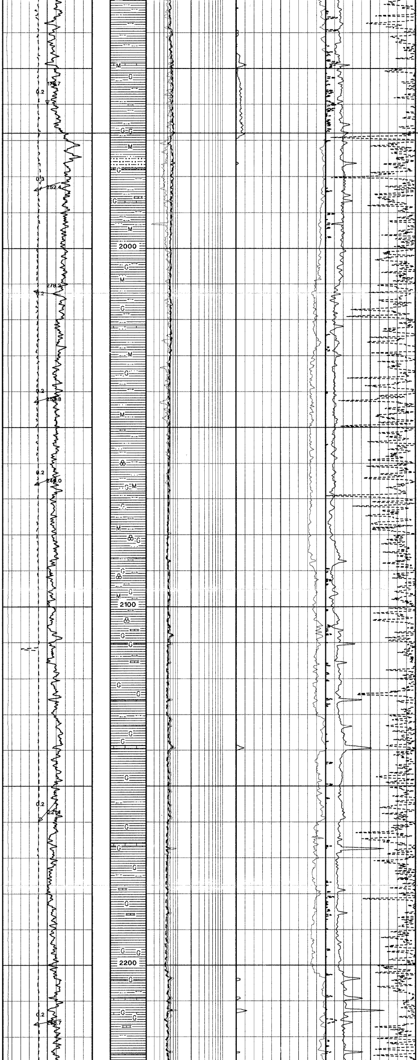
Mudstone: olive black to olive grey, soft to firm, friable, blocky to amorphous, non calcareous, silty to very silty grading to siltstone, trace micromicaceous, trace glauconitic, rare carbonaceous specks.

Limestone: dark yellowish brown, moderately hard, brittle, slightly argillaceous, dolomitic, cryptocrystalline.

Tertiary

Eocene

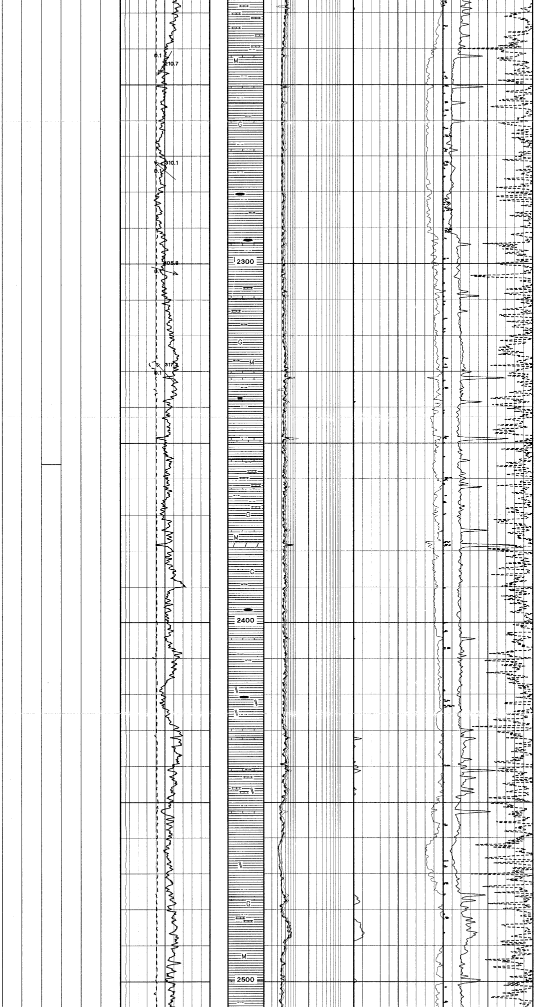
Middle to Late Eocene



Late to Middle Eocene
Hordaland Group
1968 mbrt

Mudstone: olive black to olive grey, becoming brownish black, soft to firm, friable, blocky to amorphous, non calcareous, silty to very silty grading to siltstone, trace micromicaceous, trace glauconitic, rare carbonaceous.

Mudstone: pale olive grey, very soft, sticky, amorphous, non calcareous, locally trace to common glauconite, part brownish black, olive grey, dark greenish grey, soft to firm, blocky, non calcareous, slightly to very silty, trace micromicaceous, trace glauconite.



Mudstone: olive grey, trace pale yellowish brown, very soft, sticky, amorphous, non calcareous, common glauconite, part olive grey to olive black, dark greenish grey, local trace brownish black, soft to firm, friable, blocky, non calcareous, silty grading to Siltstone in places, glauconitic, micromicaceous in places.

Mudstone: predominantly dark olive grey to dark green grey, soft, sticky, occasionally firm, amorphous to sub blocky, non to slightly calcareous, slightly silty, micropyritic, trace glauconite, micromicaceous , trace carbonaceous material.

Limestone: white to off white, very pale green, soft to occasionally moderately hard, amorphous to blocky, crypto to microcrystalline.

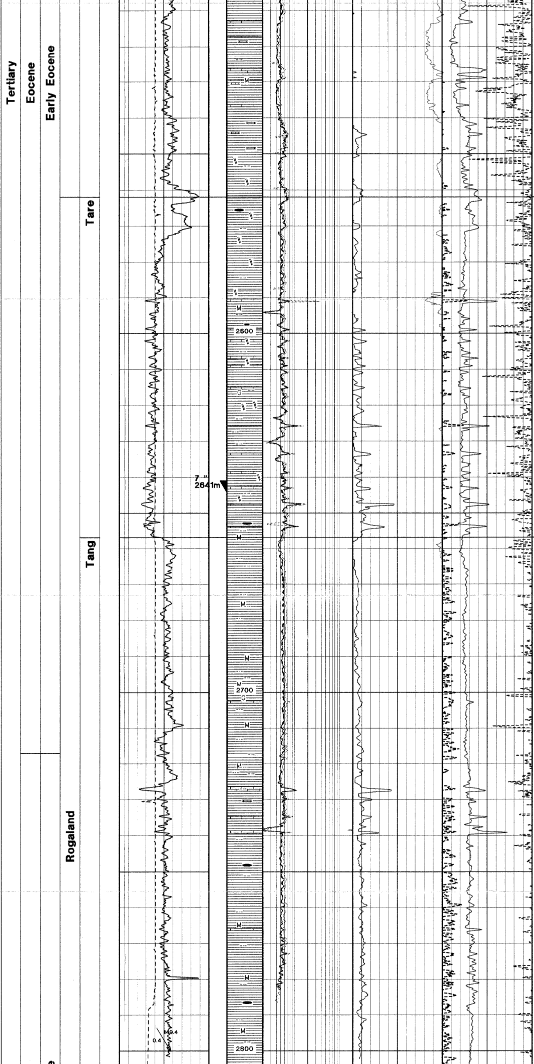
Top Early Eocene
2356 mbrt

Trace Tuff: moderate blue grey, soft, amorphous, occasionally sub blocky, slighty silty in places.

Limestone: very light grey to pale yellowish brown, grey orange, firm to occasionally moderately hard, amorphous to blocky, occasionally splintery, microcrystalline, dolomitic in places.

Mudstone: predominantly dark olive grey to dark green grey, dark brownish black to brown grey, amorphous to sub blocky, non to slighly calcareous, commonly slightly silty, locally micromicaceous, rarely microcarbonaceous, trace glauconite.

Rare trace Tuff: light to moderately blue grey, speckled with white and dark grey, very soft, non calcareous, slightly silty.



Mudstone: varicoloured, light olive grey to light green grey, medium olive grey to medium green grey, purple grey, pale blue grey, very light grey, trace dark blue green, brownish black, dusky yellowish brown, firm to occasionally moderately hard, blocky to platey, friable, non to very slightly calcareous, slightly silty in places.

Mudstone: varicoloured as above with green blue, blue grey tuffaceous mudstone, "cigarette ash" texture, rarely pyritic.

Top Tare formation 2562 mbrt

Mudstone: predominantly dark olive grey to dark brownish grey, minor medium dark green grey, minor brownish grey, soft to firm, sub blocky, commonly silty, carbonaceous, micaceous.

Trace Tuff: medium grey speckled dark grey and pale yellowish brown to white, non calcareous, argillaceous, silty.

Limestone: very light grey, locally pale yellowish brown, soft to moderately hard to hard, blocky to platy, argillaceous in places, crypto to microcrystalline.

Mudstone: varicoloured, predominantly olive grey to olive black, commonly medium blue grey, dark greenish grey, trace pale yellowish brown, olive black, rarely medium grey, soft moderately hard, firm, friable in places, blocky, non to occasionally slightly calcareous, silty, locally sandy, micromicaceous in places, trace carbonaceous material, becoming predominantly olive grey, minor varicoloured, tuffaceous in places.

Top Tang formation 2657 mbrt

Mudstone: olive grey, medium grey, light brown grey, olive grey to dark greenish grey, firm to blocky, non to slightly calcareous, silty.

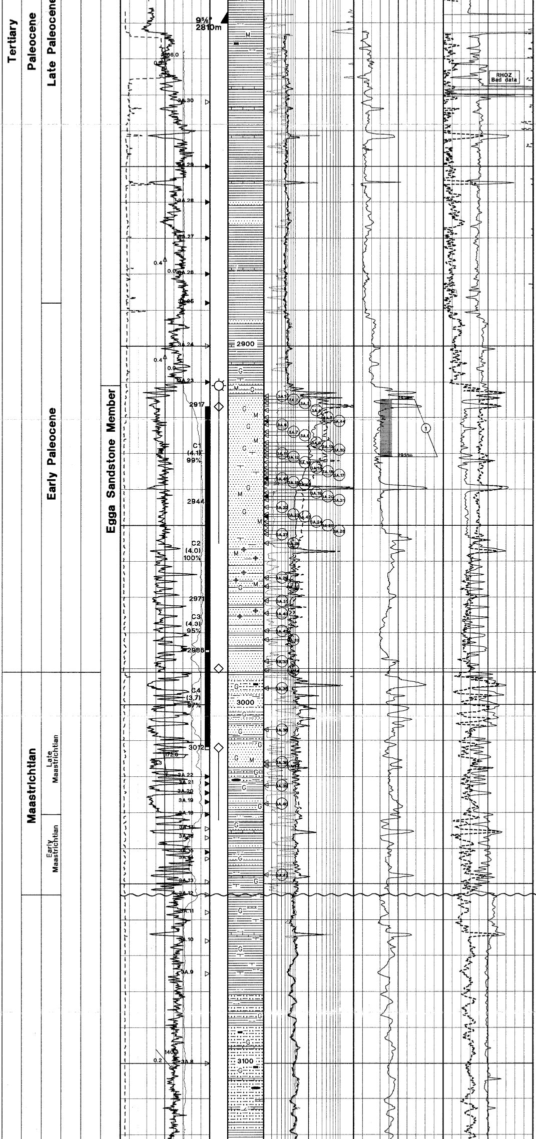
Mudstone: olive grey to olive black, locally minor medium light grey, trace varicoloured, soft to firm, amorphous to blocky, non calcareous, silty, trace micromicaceous, trace carbonaceous material.

Top Late Paleocene
2717 mbrt

Mudstone: predominantly medium dark grey to dark greenish grey, trace light brown grey, soft to firm, sub blocky, non calcareous, part slightly silty, carbonaceous, trace micromicaceous, rarely micropyritic.

Limestone: very light grey, crypto to micro crystalline, moderately hard to firm.

12 1/4" Section Intermediate Logging
Run 1a HALS-PEX-DSI



Cased hole logging
Run 2a VSP-GR

Rig operations suspended
due to regional fisheries restrictions
from 22-07-98 to 31-07-98

LOT @ 2810m - 1.59 SG EMW

Mudstone: varicoloured, light to medium grey, light brownish grey, moderately blue green, greyish brown to moderate brown, soft to firm, moderately hard in places, amorphous to sub blocky, blocky in places, angular to crumbly, plastic in places, non to slightly calcareous, disseminated micropyrite, nodular micropyrite, grading to siltstone in places.

Limestone: light to medium grey, translucent in places, very hard to firm, blocky to splintery, cryptocrystalline - pulverised into white, soft, amorphous calcareous rock flour in places.

Top Early Paleocene (T10)
2888 mbrt

Egga Sandstone Member 2911mbrt

Sandstone: light olive grey to medium light grey, transparent to translucent, colourless to occasionally milky quartz, predominantly fine to very fine grained, medium coarse grained in places, pebbles at 2941m, friable to loose, sub angular to sub rounded, rounded when medium to coarse, sub spherical to sub elongate, predominantly well sorted, bimodally sorted where coarse fraction occurs, predominantly poor calcareous cement with silty matrix, occasionally good calcareous cement, kaolinitic matrix in places, abundant glauconite, common muscovite and biotite, rare aggregates of micropyrite, fair to good visible porosity.
Shows: Weak petroleum odour, no visible stain, no direct fluorescence, trace slow blooming weak blue white cut, no further crush cut, trace blue white to yellow fluorescent residue, no visible residue.

Shows (acetone used as cut solvent): 2949m - Weak Petroleum odour, no visible staining, moderate blue white direct fluorescence, fast streaming / blooming blue white fluorescent cut, no visible cut, blue white to yellow fluorescent residue, no visible residue.

Mudstone: dark greenish grey, hard, sub fissile, angular, blocky, common muscovite and biotite mica, trace disseminated micropyrite, floating sand grains (medium to coarse, sub rounded to rounded, sub spherical to spherical), non calcareous, interbedded Sandstone lenses and streaks (bioturbated), slickensides in places.

Top Late Cretaceous 2991.5 mbrt
Springar formation

Sandstone: medium light grey, transparent to translucent, colourless to milky white, fine to medium grained, predominantly fine grained, occasionally coarse grained, quartz grains, angular to sub angular, sub spherical to sub elongate (coarse grains - sub round to round, sub spherical), well to moderately sorted, friable, glauconitic, biotite and muscovite, well to very well cemented with calcite cement, moderate to poor visible porosity.

Mudstone: greyish black to medium dark grey, occasionally medium grey, firm, blocky, slightly calcareous

Trace shows in Rock flour (3012-3032m): dull yellow direct fluorescence, very weak and very slow cloudy yellow blue white cut fluorescence, no visible residue or fluorescence residue.

Top Early Maastrichtian 3030 mbrt

Sandstone: transparent to translucent, colourless to light grey, quartz grains, fine to medium, occasionally coarse to very coarse, subrounded to subangular, well to moderately sorted.

Mudstone: medium dark grey to dark grey, soft, amorphous to sub blocky, slight calcareous, very silty to locally grading to a siltstone.

Top Early Campanian 3053 mbrt

Mudstone: moderate brown, soft to firm, amorphous to sub blocky, occasionally sticky and calcareous to very calcareous.

Limestone: very light grey to off white, firm, sub blocky to blocky.

Mudstone: varicoloured, medium grey to dark greenish grey, greenish grey , light to very light grey, soft, amorphous to occasionally sub blocky, sticky, calcareous to very calcareous.

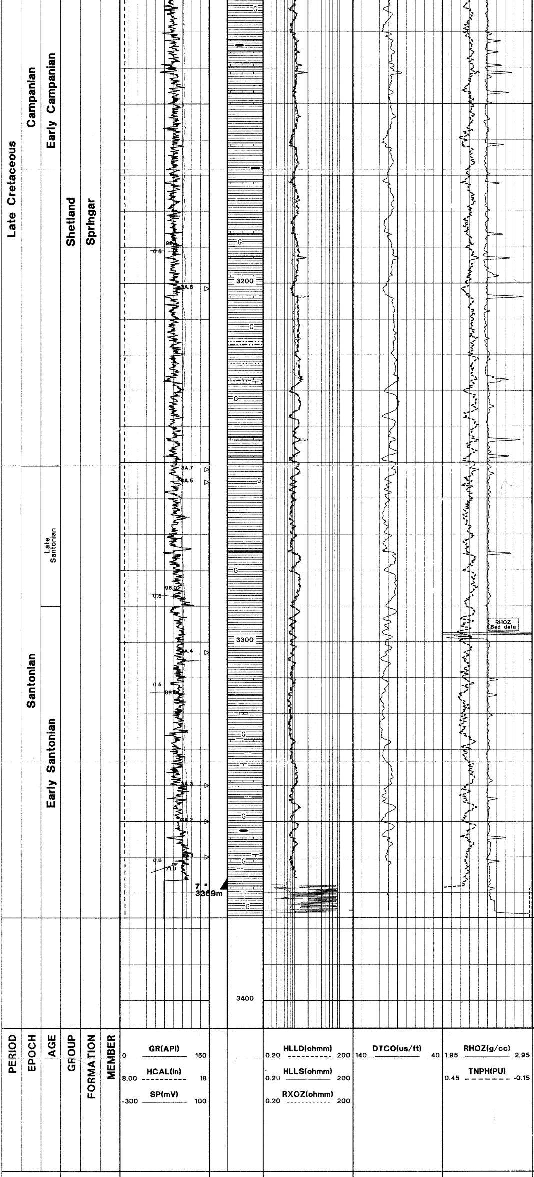
Trace Mudstone: moderate brown, soft to firm, amorphous to sub blocky, occasionally sticky and calcareous to very calcareous.

Mudstone: predominantly medium dark grey, occasionally light grey, soft and amorphous, occasionally firm and sub blocky, non to slightly calcareous, grading Siltstone in places.

Siltstone: medium dark grey to olive grey, soft, amorphous to sub blocky, occasionally slightly sticky, non calcareous, trace microcarbonaceous specks, trace disseminated micropyrite, trace glauconite.

Limestone: white to off white, firm, blocky, micro crystalline.

Trace Dolomitic limestone: yellowish brown, moderately hard, crystalline and crypto crystalline



Mudstone: olive grey, soft (hydrated), amorphous to sub blocky, plastic, sticky, disseminated micropyrite in places, pyrite nodules in places, non calcareous.

Limestone: off white to light brown, hard, soft in places, angular, brittle to crumbly, blocky, microcrystalline, argillaceous in places.

Siltstone: medium grey to light brownish grey, soft to firm, sub blocky, crumbly, occasional disseminated micropyrite, slightly calcareous in places.

Top Santonian 3250 mbrt

Mudstone: medium grey to olive grey, soft, amorphous to sub blocky, plastic, trace micropyrite, non calcareous.

Top Early Santonian 3290 mbrt

Mudstone: olive grey, soft, amorphous to sub blocky, plastic, sticky, occasional pyrite nodules, non calcareous.

Limestone: light grey brown to light brown, soft to firm, sub blocky to blocky, crumbly to angular, microcrystalline, argillaceous in places.

Mudstone: olive grey, soft, amorphous to sub blocky, plastic to crumbly, micromicaceous, disseminated micropyrite, microcarbonaceous, silty in places, slightly to non calcareous.

TD Logging
Run 3b PEX-GPIT
Run 3a MDT-GR
Run 3b FMI-DSI
Run 3b VSP-GR
Run 3a CST-GR

TD 3377m MD BRT (DRILLER)
TD 3376.8m TVD BRT (DRILLER)
TD 3380m MD BRT (LOGGER)

CHRONOSTRAT	LITHOSTRAT	GAMMA RAY	DEPTH (m)	RESISTIVITY	POROSITY LOGS	SONIC	LITHOLOGICAL DESCRIPTION

SIDEWALL CORE DESCRIPTIONS

Logging Run No.	Core No.	Depth (m BRT)	Recovery cm	Lithology Descriptions
3A	30	2832	Lost	-
3A	29	2850	20	Mudstone
3A	28	2860	32	Sandstone
3A	27	2870	23	Mudstone
3A	26	2880	25	Mudstone
3A	25	2888	40	Mudstone
3A	24	2900	Lost	-
3A	23	2910	30	Mudstone
3A	22	3020	23	Sandstone
3A	21	3022	20	Mudstone
3A	20	3024.5	20	Mudstone
3A	19	3027	26	Sandstone
3A	18	3030.5	20	Mudstone
3A	17	3034.5	Lost	-
3A	16	3037	Lost	-
3A	15	3041	33	Mudstone
3A	14	3043	Lost	-
3A	13	3049.5	Lost	-
3A	12	3053	Lost	-
3A	11	3058	Lost	-
3A	10	3066	Lost	-
3A	9	3075	Lost	-
3A	8	3100	Lost	-
3A	6	3201.5	Lost	-
3A	7	3252	Lost	-
3A	5	3255.5	Lost	-
3A	4	3303	Lost	-
3A	3	3340	Lost	-
3A	2	3350	Lost	-
3A	1	3360	Lost	-

WIRELINE FORMATION TESTS

TYPE	TEST No.	TOP DEPTH (m)	FORMATION PRESSURE (psi)	PERM	RES	SAMPLE	COMMENTS ON TEST
MDT	1	2914	0	-	3.928	-	Dry test
MDT	2	2915.5	4197	280.0	22.053	-	Good test
MDT	3	2916	4203	0.9	15.179	-	Good test
MDT	4	2918	4197	219.6	19.724	-	Good test
MDT	5	2920	4198	176.7	20.585	-	Good test
MDT	6	2922	4199	194.6	19.71	-	Good test
MDT	7	2924	4199	128.1	24.163	-	Good test
MDT	8	2925	4199	156.2	16.345	-	Good test
MDT	9	2927	4201	58.8	15.048	-	Good test
MDT	10	2929	4200	125.8	17.245	-	Good test
MDT	11	2930	4203	2.1	19.058	-	Good test
MDT	12	2931	4211	5.0	18.007	-	Good test
MDT	13	2928	4200	130.0	3.368	-	Good test
MDT	14	2932.5	4201	97.5	12.992	-	Good test
MDT	15	2934	4201	57.6	11.468	-	Good test
MDT	16	2935	4202	59.0	10.074	-	Good test
MDT	17	2936	4201	74.2	9.264	-	Good test
MDT	18	2938	4202	111.2	6.137	-	Good test
MDT	19	2941	4205	196.1	3.648	-	Good test
MDT	20	2942	4207	214.4	3.895	-	Good test
MDT	21	2943	4208	257.2	4.136	-	Good test
MDT	22	2945	4211	220.0	3.83	-	Good test
MDT	23	2947	4214	181.6	3.802	-	Good test
MDT	24	2949	4217	149.8	3.947	-	Good test
MDT	25	2950	4218	156.8	3.881	-	Good test
MDT	26	2951.5	4220	187.9	3.655	-	Good test
MDT	27	2952.5	4222	333.7	3.938	-	Good test
MDT	28	2955	4226	15.3	2.699	-	Good test
MDT	29	2964.5	4237	554.2	2.007	-	Good test
MDT	30	2967	0	0.92	1.807	-	Dry test
MDT	31	2971	4246	402.5	2.013	-	Good test
MDT	32	2982	0	1.9	1.707	-	Dry test
MDT	33	2988	4276	239.8	2.218	-	Good test
MDT	34	2990.5	4280	63.3	1.978	-	Good test
MDT	35	2995.5	0	2.9	1.812	-	Dry test
MDT	36	3007	4306	220	2.639	-	Good test
MDT	37	3017	0	4.2	1.89	-	Dry test
MDT	38	3016	4318	271.7	2.373	-	Good test
MDT	39	3022.5	4328	493.1	3.289	-	Good test
MDT	40	3027	4334	127.6	2.943	-	Good test
MDT	41	3047.5	0	1.9	2.887	-	Dry test
MDT	42	2979.5	0	16.4	1.657	-	Dry test
MDT	43	2974.5	4253	10.4	2.218	-	Good test
MDT	44	2938.5	0	4.2	6.137	-	Dry test
MDT	45	2921	4198	x	20.406	Gas	2xPVT, 1x1gall
MDT	46	2937	4211	x	8.561	Gas	2xPVT
MDT	47	2942	4268.5	x	3.895	Water	1xPVT
MDT	48	2947	4053	x	3.802	Water	1xPVT,1x1gall