SAMPLE STATION DATA

INSTITUTE OF GEOLOGICAL SCIENCES - MARINE GEOLOGY UNIT

F — SAMPLE NO.: +59 | +00 | 262 (± lat | ± long | no.)

CRUISE NO.: 84 FE 09 (year : ship : no)

DATE: 06 14 (mnth : day)

TIME (local): (hrs : mins)

WATER DEPTH: 137 metres

POSITION FIXING METHOD: H

COMMENT:

NAVIGATIONAL READINGS (tick lanes with best intersection)

CHAIN | RED | GREEN | PURPLE

POSITION

LATITUDE: +59 35·08 (± degs : mins (decimal))

LONGITUDE: +00 09·19 (± degs : mins (decimal))

ADDITIONAL INFORMATION :

BGS BH 84/10

EQUIPMENT TYPE:
1 = sample recovered
2 = no sample (geological reasons)
3 = no sample (equipment failure)
4 = no sample (undifferentiated)

G dup cols 2-11

GS | VE | CS | CR | DM | DR | BH | SD | RD | SU | PS | DI | BS | OC | OG

T.D. metres: 94·50

SUMMARY SAMPLE DESCRIPTION : (Free text - max. 69 characters)

H dup cols 2-11: 37M QUATERNARY MUD AND FINE SAND ON GREEN MICACEOUS SAND ?TERTIARY

GEOTECHNICAL DATA :

RAW DATA

PENETROMETER: Head | Readings

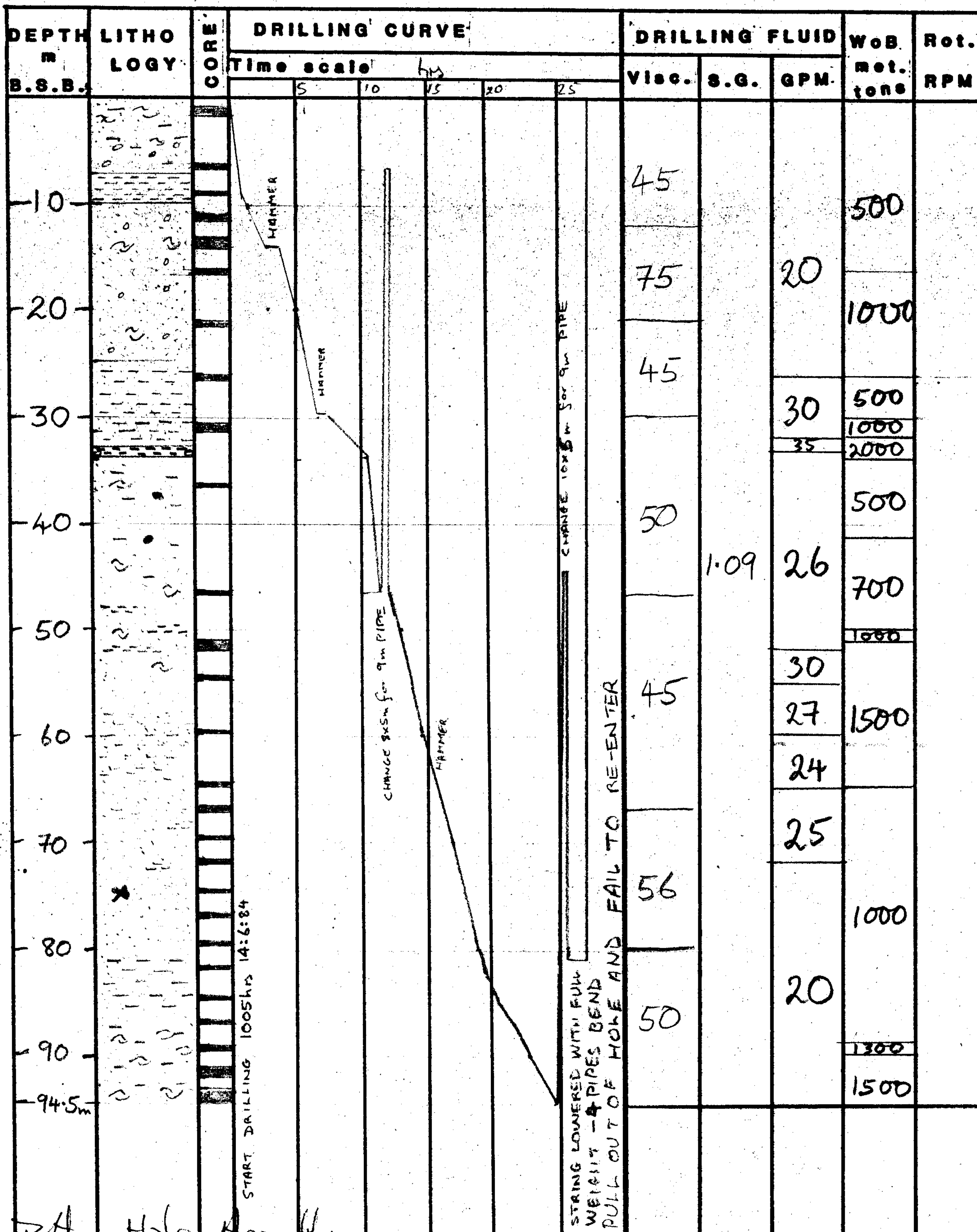
HAND VANE: Head | Readings

AVERAGED DATA

I dup cols 2-11: DEPTH | PENETROMETER (KPa) | HAND VANE (KPa)

I dup cols 2-11

D.S. FERDER	BGS MGLU	B.H.	LATITUDE	LONGITUDE	WATER DEPTH
1984 PROGRAMME		84/10	59°35.077'N	0°9.194'E	136 m



Bottom Hole Assembly
T.C. Stepped Bit + Pilot
Core Barrel
6 x 4.5m Drill Collars
1 x 9.5m Drill Pipe
Safety Sub.

I

M/S FERDER

BH84/10.

DRILLER'S LOG

Date 14.06.84	Client BGS	Location 267	Borehole No
Depth deck to mudline 149.5		Waterdepth 142.5	

Time	Pipe No.	Length single pipe	Length total pipe	Plus/minus pipe	Pipe below mudline	Bit load	Total weight.	Mud press	REMARKS
Bit + Sub.			5.9						
6 d.c.			32.9						
11 x 9m + (7)			146.-						
	1	5	151.-	-1.5	0	500			
1000/1010				0	1.5	"		22	
1020/1100	2	5	156		6.5	"		20	
1120/1105	3	5	161	-2.5	9.-	"		20	
				0	11.5	"		20	
1355/1416	4	5	166	-2.5	14.-	"		20	kl. 1210 Hullet raset
1433/1515	5	5	171	0	16.5	"		20	Mixet tykkere mud
				0	21.5	1000		20	renset opp og fortsatt
1535/1602	6	5	176	0	26.5	"		20	boring
1613/1650	7	5	181	-2	29.5	500		30	kl 1325 Hull stabi
1710/1755				0	31.5	1000		30	" 1715 På DASS
1812/1912	8	5	186	-3.5	33.-	2000		35-26	" 1720 SUNOT Hullet
1930/2025				0	36.5	2000/500		26	kaffe
2048/2052	9	5	191	0	41.5	500		26	
2118/2135	10	5	196	0	46.5	700		26	2150-2230 Byttet pi
									~~[illegible] på~~
	4x9m		194						~~[illegible]~~
2235/2242 No	3	5	199	0	49.5	700		26	
2303/2324 No	4	5	204	-2.5	52.-	1000/1500		26	
2334/2340				0	54.5	1500		30	
0004/0014	5	5	209	0	59.5	"		27	2345 - Mix Mud.
0021/0035	6	5	214	÷2,5	62,-	1500		24	
0047/0051				0	64,5	"		"	Hammer prøve. / Hammer...
0140/0158	7	5	219	÷2,5	67,0	1000		22	Mixer tykkere mud
0212/0225				0	69,5	1000		24	
0250/0308	8	5	224	÷2,5	72,0	"		26	
0315/0322				0	74,5	"		22	
0340/0355	9	5	229	÷2,5	77	"		22	
0405/0420				0	79,5	"		20	
0440/0503	10	5	234	-2,5	82,0	"		20	
0516/[illegible]				0	84,5	1000		20	
~~[illegible]~~	~~11~~	~~5~~	~~239~~	~~÷2,5~~	~~87~~	~~1000~~		~~20~~	

M/S FERDER

DRILLER'S LOG

194
45,95
239,95

240
5
245

9,40
9,20
9,30
9,55
9,50
45,95

Date	Client	Location	Borehole No
15.06.84	BGS	267	50
Depth deck to mudline 149,5		**Waterdepth** 142,5	

Time	Pipe No.	Length single pipe	Length total pipe	Plus/ minus pipe	Pipe below mudline	Bit load	Total weight	Mud press	REMARKS
0625/0735	11	5	239	÷2,5	87	1000		20	
0750/0815				0	89,5	1500		20	
~~0830~~ 0910	12	5	244	÷2,5	92	1500		22	
0922/1016				0	94,5	1500		20	
	Skiftet	10×5	mot		5·9+5.				
	5·9	45,95	240						
	3	5	245		94,5				Kl. 12[illegible] Pipen beg
									beg å hugge opp
									kl 1510 alt på dekk
									4 stk 9m bøyd

CICERO GRAFISK a.s. Tønsberg

TIME	DATE & LOCATION	ACTIVITY
	14/6/84 Site 267	
0000	BH84/10	
0100		
0200	plugging around	
0300		
0400		
0500		
0600		
0700	Anchored	
0800	Putting ~~drag~~ drillstring down	
0900		
1000	On bottom, drilling. 10.10am 1.5m	
1100	11.00am 6.5m 11.25 9.00m 11.50 11.50m	
1200	12.23. 14.00m 1255 [illegible] hammer	
1300	1330 recommence drilling	
1400	1420 16.5m	
1500	1515 21.5m	
1600	1605 26.5m 1649 29.5m no recovery	Hammer.
1700	1755 31.5m	
1800		
1900	1915 33.0m	
2000	2020 36.5m 2050 41.5	
2100	2135 46.5m 2145 Pull back 8 x 5m pipe	
2200	replace with 9m pipe 2225 – back to base of hole 2235 – drilling 2245	49.5m hammer
2300	2325 52m 2340 54.5m	
2400		

TIME	DATE & LOCATION	ACTIVITY
0000	00.20 59.5 00.45 62.0	
0100	01.15 64.5m +3 HAMMERS	
0200	2.15 67.0m 2.45 69.5m	
0300	72.0m 74.5	
0400	77.0m 4.40 79.5m	
0500	82.0m.	
0600	615 84.5m	
0700	740 87.0m	
0800	825. 89.5M	
0900	920 92.0m	
1000	10.45 94.5 TRIPPING THE STRING	
1100	PULLING ON ANCHORS TO STRAIGHTEN PIPE ONLY TO FIND TEMPLATE BENT NOW!!	
1200	pull drillstring	
1300	4 feet pipes	
1400	c1500 bit up and cleaned. o.k.	
1500	1530 Going back down	
1600	1620 On seabed - pull bit guide 1635 Fail to re-enter hole 1655 Pull inner barrel pull string	
1700		
1800	1815 Bit on deck	
1900		
2000		
2100		
2200		
2300		
2400		

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1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/10

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 0.0 m to 1.5 m Recovery 0.7 m (46.6%)

Depth	Sub Samples	Lithology	Description
0			
		0.8	Coarse sandy/gravel top with shell fragments. Gravel polymictic.
1	MPAL 1.0m		0.8-1.15. Olive grey (5Y 4/2), very fine to fine, mod.-well-sorted quartz sand with subordinate lithics + detritals, forams and shell fragments. Weak to moderately calcareous. Clean. Loose
	MPAL 1.5m	1.5	1.15-1.3 Dk-grey (10YR 4/1), v. fine to ~~medium~~, fine (occasionally coarse-v. coarse), moderate to poorly sorted, argillaceous sand. Quartz dominant but with abundant lithics + detritals, and minor forams + shell frags. Moderately calcareous. Loose
2			1-3-1.5 Dk grey (10YR 4/1) - grey (10YR 5/1), fine, moderately sorted, clean quartz sand with subordinate lithics, detritals and shell fragments. Calcareous. V.soft/loose
			Nature of sediment (gloopy) obscured the contact relationships.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 2 of 32

Run 1·5 m to 6·5 m Recovery 0·1 m (2 %)

Depth	Sub Samples	Lith-ology	Description
1			
		1·5	
2			
3			
4			
5			
6			Dk.grey (10YR 4/1), v.fine-fine, v.poorly sorted, shelly, gravelly, muddy sand. Gravel fraction dominated by lithic clasts and shell fragments. Lithics include grey quartzite, grey sandstone, and pegmatitic clast. ~~and~~ Clast shapes vary from angular to rounded, low sphericity, faceted.
		6·4	
	MPAL 6·5	6·5	
7			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 3 of 32

Run 6.5 m to 9.0 m Recovery 0.65 m (26 %)

Depth	Sub Samples	Lithology	Description
6			
7			
8			
8.35	M'PAL 8.5 P'MAG 8.8		Dk grey (5Y 4/1), soft to ~~firm~~ Hard, highly plastic mud with thin laminae + irregular blebs of sand towards base of core
9 / 9.0	MPAL 9.0		

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 9.0 m to 11.5 m Recovery 0.9 m (36%)

Depth	Sub Samples	Lithology	Description
9			
10			
11		10.6 – 11.2 – 11.5	10.6 Sand, grey, fine to vcrs, poorly sorted, immature, ca 70% quartz, 25% rock fragments, 5% worn shell frags. No structures seen as sediment is spilled out over ~~ca~~ ca 60cm. Rock fragments - many metamorphic affinity 11.2 – 11.3 Firm grey clay "lump" with stones, shells and sand as armour. Clay with moderate reaction to HCl, highly plastic 11.3 – 11.5 Gravel, worn shell fragments up to granule/small pebble grade over rock fragments and shell frag up to max di 80mm of sandstones, metamorphic rocks - quartzite, gneiss, epidiorite. Mostly well rounded of varying sphericity - high to low.
12			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 11.5 m to 14.0 m Recovery 1.0 m (40 %)

Depth	Sub Samples	Lithology	Description
11.0			
11.5			
12.0			
13.0			13.0 Sand, fine to coarse grained, poorly sorted, grey, ca 70% quartz, 25% rock fragments, 5% shell fragments. Quartz is rounded to subangular, apparently frosted in places – some rose quartz. Rock fragments of vfine
	13.5 MPAL		
14.0			14.0 sandstone/siltstone, metamorphics and pyrite nodules. Shell fragments are all well ~~rounded~~ worn cream/white and ? black. Isolated ?forams replaced with glauconite/iron mineral – hard – poss. fish faeces. No structures seen due to spreading of sediment in barrel. Basal sands coarser but probably recovery artifact.
15.0			HAMMER
16.0			Gravel similar to above but obviously coarser! Rock fragments of varying provenance and well-worn shell fragments ca 60% lithic / 40% carbonate.
17.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 14.0 m to 16.5 m Recovery 0.4 m (16%)

Depth	Sub Samples	Lithology	Description
14.0			
15.0			
16.0			
16.1 – 16.4		gravel	Gravel, well-washed, max di 70mm mainly of metamorphic rock fragments. Occas. sand and shell fragments.
16.4 – 16.5	16.5 MPAL	sand	Sand, fine–medium – moderately sorted, mainly quartz, pale greenish grey in colour ?clay mineral – granule grade and gravel worn shell fragments and pebbles of similar affinity to above. Sand generally well-rounded. Surrounding core is firm grey clay but apparently not in bedded sequence.
17.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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B.H. NO: 84/10

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 16.5 m to 21.5 m Recovery 0.4 m (8 %)

Depth	Sub Samples	Lithology	Description
16.0			
17.0			
18.0			
19.0			
20.0			
21.0			21.1 Pebbles as core run above but more well-worn shell material
21.5			21.5 At base sand - greyish green as in core above with well-worn shell fragments lying horizontally (parallel to the bedding plane)
22.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 21.5 m to 26.5 m Recovery 0.4 m (8 %)

Depth	Sub Samples	Lith-ology	Description
21.0			
22.0			
23.0			
24.0			
25.0			
26.0			
26.1 – 26.5			Interlaminated muddy sand and stiff grey (silty) clay. Muddy sand is very fine, angular, mod-well sorted, predominantly quartz with few coarser shell fragments. Clay is highly plastic, ~~intermediate~~ moderate reaction to HCl. Interlamination is apparently regular with little disturbance.
27.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/10

GEOLOGICAL LOG COVERING ONE CORE RUN

Run 26.5 m to 29.5 m Recovery 0.0 m (0 %)

Depth	Sub Samples	Lithology	Description
26.0			
26.5			26.5 – 29.5 m No Recovery
27.0			
28.0			
29.0			
29.5			29.5 m HAMMER SAMPLE Very fine argillaceous sand – stiff and highly compacted – some shell frags incl. Cardium. Sediment similar to that above
30.0			
31.0			
32.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT

1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/10

GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 29.5 m to 31.5 m Recovery 0.8 m (40%)

Depth	Sub Samples	Lithology	Description
29.0			
29.5			
30.0			
			30.7 Interlaminated silty clay and very fine sand. Silty clay is dark grey, hard, intermediate plasticity, Sand very fine, angular, quartzose. Laminae are regular in places esp. near the base of the run but elsewhere are disturbed. Some bioturbation at 31.0m with sand o/a in pods and lenses. micaceous Strong reaction with HCl. V. rare shell frags
31.0			
31.5	31.5 MPAL		31.5
32.0			Pebble at base ?caved

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT

1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/10

GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 31.5 m to 33.0 m Recovery 0.05 m (3 %)

Depth	Sub Samples	Lith-ology	Description
31.0			
32.0			
33.0		32.95 33.00	Silty mud as above with less sand material, rare shell material.
34.0			
35.0			
36.0			
37.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT — 1984 PROGRAMME

SHIP: FERDER — B.H. NO: 84/10

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 12 of 32

Run 33.0 m to 36.5 m Recovery 0.25 m (7 %)

Depth	Sub Samples	Lithology	Description
33.0			
34.0			
35.0			
36.0			36.25 - 36.35 Slightly greenish grey muddy sand / sandy mud, interlaminated similar to above
36.5		36.25 36.35 36.5	36.35 - 36.5 Hard dark grey clay with pods sand, v fine, small pebbles (10mm) and shell fragments — more common than in sediment above.
37.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT

SHIP: FERDER

GEOLOGICAL LOG COVERING ONE CORE RUN

1984 PROGRAMME

B.H. NO: 84/10

Run 36.5 m to 41.5 m Recovery 0.0 m (0 %)

Depth	Sub Samples	Lithology	Description
36.0			
36.5			36.5 – 41.5 NO RECOVERY
37.0			
38.0			
39.0			
40.0			
41.0			
41.5			HAMMER — Greenish grey very fine sand, argillaceous, sub-angular quartz, muscovite and biotite, granule-grade shell fragments some green mineral ?glauconite and other rock fragments. (JAC)
42.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT — 1984 PROGRAMME

SHIP: FERDER — B.H. NO: 84/10

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 14 of 32

Run 41·5 m to 46·5 m Recovery 0·25 m (5 %)

Depth	Sub Samples	Lith-ology	Description
41·0			
41·5			
42·0			
43·0			
44·0			
45·0			Above 46·25 – Shell fragments – gravel grade also grey clay pellets up to 10 mm across (coarse fraction of ....)
46·0			
46·25			46·25 – 46·5 – Sand, very fine, dark greenish grey, subangular, quartz with mica and glauconite – pale green clay matrix includes some shell fragments and 'patches' of dk grey clay.
46·5			
47·0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT

1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/10

GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 46.5 m to 49.5 m Recovery 0.0 m (0 %)

Depth	Sub Samples	Lith- ology	Description
46.0			
		46.5	46.5-49.5m NO RECOVERY
47.0			
48.0			
49.0			
		49.5	Hammer sample Green sand as above with rotted shell fragments in bedding planes
50.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 16 of 32

Run 49.5 m to 52.0 m Recovery 0.9 m (36 %)

Depth	Sub Samples	Lithology	Description
49.0			
49.5			
50.0			
51.0		51.1	51.1 – 51.85m Sand – very fine subangular quartz sand – greenish grey, abundant shell fragments throughout especially at 51.85m – mica, glauconite: strong reaction with HCl.
	51.6m MPAL		
52.0	51.95 PMAG	51.85 52.0	51.85 – 52.0m Silt – v. fine sandy, green as above – strong reaction with HCl considerable decrease in amount of shell material.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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Run 52·0 m to 54·5 m Recovery 0·20 m (8 %)

Depth	Sub Samples	Lith-ology	Description
52·0			
53·0			
54·0			
54·5	MPAL 54·5		54·3 – 54·5 Silty to v. fine sandy a/a. Argillaceous. Hard.
55·0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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Run 54.5 m to 59.5 m Recovery 0.18 m (3.6 %)

Depth	Sub Samples	Lithology	Description
54			
55			
56			
57			
58			
59			
59.32 – 59.5	MPAL 59.45		Interlaminated v.fine-fine, moderately sorted sand and v.fine sandy silty mud. Hard. Micaceous. Shell fragments locally granule to pebble gravel grade. Weakly calcareous. DK. olive grey (5Y 3/2.)
60			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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Run 59.5 m to 62.0 m Recovery 0.0 m (0 %)

Depth	Sub Samples	Lith-ology	Description
59			
60			No recovery
61			
62			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 62·0 m to 64·5 m Recovery 0·13 m (52 %)

Depth	Sub Samples	Lith-ology	Description
62			
63			
64	MPAL 64·4	64·37 – 64·50	Interlaminated vfine, dk greenish grey (5G 4/1), moderately sorted, argillaceous sand and silty mud. Weakly calcareous. Hard.
65			*Hammer samples (A) Olive grey (5Y 4/2)/to grey, fine, moderate to well-sorted, (micaceous) quartz sand with minor detritals + lithics. Rare shell fragments (B) Clean micaceous sand a/a. (Hammers show much cleaner, lighter coloured sand). (C) Clean grey micaceous sand a/a

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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Run 64.5 m to 67.0 m Recovery 0.4 m (16 %)

Depth	Sub Samples	Lithology	Description
64			
65			
66			
		66.6	DK grey (N4/) to olive grey (5Y 5/2) very fine - fine, moderately sorted, (micaceous) (argillaceous) sand. Grain size decreases and sediment changes from clean sand to argillaceous sand towards base of core. Firm. Non calcareous. Slight colour banding and variation in mica content suggests laminations at top of core. Weak laminations also noted at base of core.
67	MPAL 67.00	67.0	

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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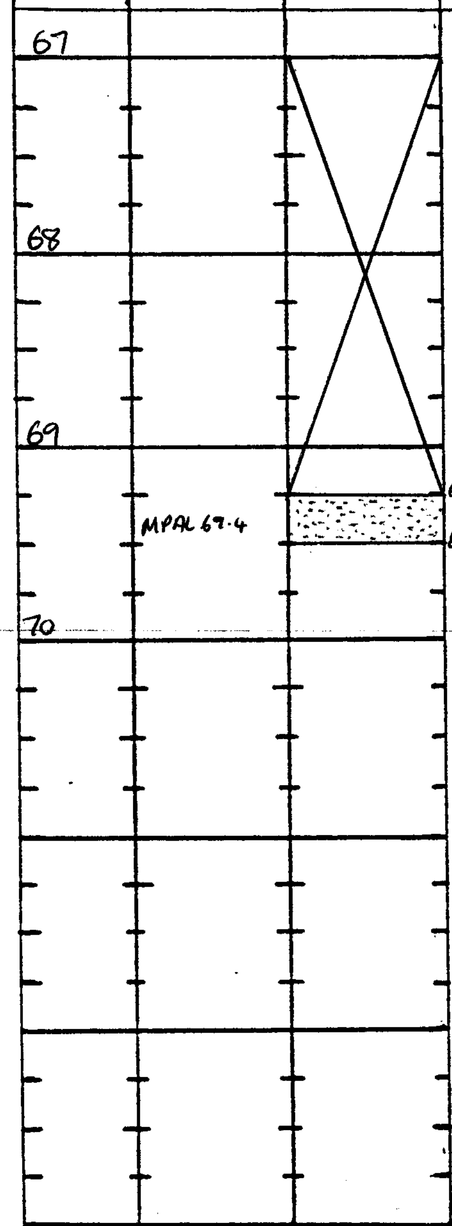
Run 67.0 m to 69.5 m Recovery 0.25 m (10%)

Depth	Sub Samples	Lithology	Description



laminated, fine-v.fine olive-grey (5Y 4/2) to light grey, soft, moderately sorted, clean to argillaceous quartz sands with minor detritals + rare shell fragments. Muscovite locally abundant, and along with variable fine muddy content + variation in grain size, ~~are~~ are responsible for the laminations. Alternations of clean, fine, micaceous sand and very fine muddy sand. Also results in a colour banding; the muddy very fine horizon being light grey.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 69.5 m to 72.0 m Recovery 0.3 m (12 %)

Depth	Sub Samples	Lith-ology	Description
69			
70			
71			
71.7			Very fine-fine, micaceous sand. Olive-grey a/a. V. soft. Weakly calcareous. Detritals include abundant glauconite. Rare shell fragments.
72 (72.0)	MPAL 72.0	sand/sandstone	

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mág - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 72·0 m to 74·5 m Recovery 0·2 m (8 %)

Depth	Sub Samples	Lith- ology	Description
72			
73			
74			
74·3 – 74·5	MAAL 74·5		Very fine-fine, dk. olive grey (5Y 3/2), well sorted, clean, quartz sand. Detritals very subordinate but glauconite prominent. Slightly micaceous but not as much as previous samples. Very soft. Weakly calcareous. Possible small wood fragment noted. V. rare shell fragments.
75			

All core recovered measured from base of run.

Sub Sample Code

- EGU - Engineering
- P.S.A. - grain size
- M'Pal - Micropalaeontology
- Macro - Macropalaeontology
- P'Mag - Palaeomagnetic
- M - Moisture Content

Lithology Code

- Clay/shale/mudstone
- silt/siltstone
- sand/sandstone
- gravel/conglomerate
- Carbonate
- Extrusive
- Intrusive
- Metamorphic
- pebbles
- shells
- c organic
- P Plant Fragments
- Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 25 of 32

Run 74.5 m to 77.0 m Recovery 0.25 m (10 %)

Depth	Sub Samples	Lithology	Description
74			
75			
76			
76.75 – 77.00 (77)	MPAL 77.0	sand	DK. olive grey (5Y 3/2), moderate - well sorted, clean, v fine - fine, quartz sand. Quartz ca. 99%. Very few detritals noted. V. rare shell fragments. Non calcareous. Very soft. * Top 20cm of sample mixed with drilling mud hence marked colour change.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 77·0 m to 79·5 m Recovery 0·15 m (6 %)

Depth	Sub Samples	Lith-ology	Description
77			
78			
79			
79·35 – 79·50		sand	Dk. olive grey sand a/a. * Mixed with drilling mud.
80			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 79.5 m to 82.0 m Recovery 0.3 m (12 %)

Depth	Sub Samples	Lithology	Description
79			
80			
81			
82	MPAL 82.0		81.7 – 82.0 Dk. olive grey (5Y 3/2) to black (5Y 2.5/2) very fine-fine, moderate to poorly sorted, argillaceous micaceous sand. Some very rich mica bands (1-2mm thick); very coarse flakes & books of mica [redacted]. Non-calcareous. V. rare shell fragments. Soft to firm (More argillaceous than sand recovered above this interval).

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN | Page No: 28 of 32

Run 82.0 m to 84.5 m Recovery 0.3 m (12 %)

Depth	Sub Samples	Lith-ology	Description
82			
83			
84		84.2	Very dark grey (5Y 3/1) to black (5Y 2.5/1), argillaceous, weakly calcareous, silty to very fine sand. ~~Stiff~~ Firm, becoming very firm at base. Quartz dominant with subordinate detritals inc. muscovite, and ? glauconite.
	MPAL. 84.4	84.5	
85			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic
pebbles
shells
c organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 29 of 32

Run 84.5 m to 87.0 m Recovery 0.3 m (12 %)

Depth	Sub Samples	Lithology	Description
84			
85			
86			
86.7			
87	MPAL 86.9		Very dark grey (5Y 3/1) to dark olive grey (5Y 3/2), very fine - fine, argillaceous, shelly, moderate to poorly sorted sand. Quartz dominant with subordinate detritals. Abundant shell debris, often in discrete bands, with fragments ranging from very fine sand to gravel grade. Firm. Weakly calcareous. One pebble ca. 25mm length noted
87.0			

All core recovered measured from base of run.

Sub Sample Code

EGU -	Engineering
P.S.A. -	grain size
M'Pal -	Micropalaeontology
Macro -	Macropalaeontology
P'Mag -	Palaeomagnetic
M -	Moisture Content

Lithology Code

Clay/shale/mudstone	pebbles
silt/siltstone	shells
sand/sandstone	c organic
gravel/conglomerate	P Plant Fragments
Carbonate	Si, Fe, minerals
vvv Extrusive	
xxx Intrusive	
Metamorphic	

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 87·0 m to 89·5 m Recovery 0·4 m (16 %)

Depth	Sub Samples	Lithology	Description
87			
88			
89		89·1	
	MPAL 89·5	89·5	DK. Olive grey (5Y 3/2) to v. dk. grey (5Y 3/1), colour banded (laminated), fine - v. fine, weakly calcareous, moderate to poorly sorted, argillaceous, shelly sand. Some of shell fragments are of gravel grade.
90			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 31 of 32

Run 89.5 m to 92.0 m Recovery 0.9 m (36 %)

Depth	Sub Samples	Lithology	Description
89			
90			
91			
91.1	MPAL 91.5		Very dark grey (5Y 3/1) to dark olive grey (5Y 3/2), shelly, argillaceous, weakly calcareous, very fine to silty sand. Quartz ca. 85%, *detritals and shell fragments ca 15%. Shell debris ranges from very fine sand to gravel grade and is abundant throughout core. Sediment has a "rotting" smell about it. Firm, moderate to poorly sorted.
92 / 92.0	MPAL 92.0		* ? inc. glauconite (abundant)

All core recovered measured from base of run.

Sub Sample Code

- EGU - Engineering
- P.S.A. - grain size
- M'Pal - Micropalaeontology
- Macro - Macropalaeontology
- P'Mag - Palaeomagnetic
- M - Moisture Content

Lithology Code

- Clay/shale/mudstone
- silt/siltstone
- sand/sandstone
- gravel/conglomerate
- Carbonate
- Extrusive
- Intrusive
- Metamorphic
- pebbles
- shells
- organic
- Plant Fragments
- Si, Fe, minerals

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Run 92.0 m to 94.5 m Recovery 1.45 m (58 %)

Depth	Sub Samples	Lithology	Description
92			
93		93.05	V. dk grey to dk olive grey, shelly, sand a/a. Very glauconite rich. Distinct lithified sandstone (glauconitic) interval at 94.3 to 94.4 m depth. Identical to glauconitic sandstones noted in borehole sites 261 + 262. (1984 cruises).
94		94.5	
95			

All core recovered measured from base of run.

Sub Sample Code

- EGU - Engineering
- P.S.A. - grain size
- M'Pal - Micropalaeontology
- Macro - Macropalaeontology
- P'Mag - Palaeomagnetic
- M - Moisture Content

Lithology Code

- Clay/shale/mudstone
- silt/siltstone
- sand/sandstone
- gravel/conglomerate
- Carbonate
- Extrusive
- Intrusive
- Metamorphic
- pebbles
- shells
- organic
- Plant Fragments
- Si, Fe, minerals

BRITISH GEOLOGICAL SURVEY
MARINE GEOLOGY UNIT

COMPOSITE LOG

Borehole No 84/10 (59/+00/262)

Borehole No 84/10

Location: 53 nautical miles E of Fair Isle

Actual position: **Latitude:** 59° 35·077'N
Longitude: 0° 9·194'E

Dates of drilling: 14th – 15th June 1984
Total depth: 94·5m (RECOVERY 13·25%)
Water depth: 136·5m (MSD)

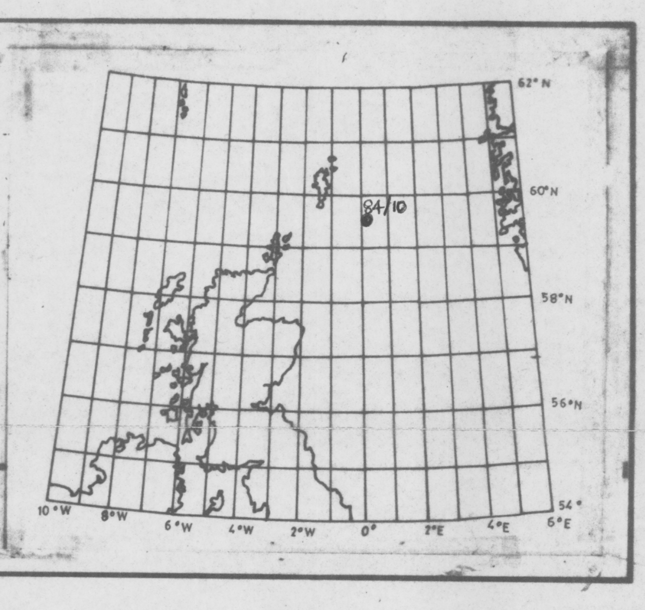
Navigation: SATNAV / DECCA
Positioning: SATNAV
Contractor: ANTON VON DER LIPPE
Vessel: D/S FERDER

Sea Area: BRESSAY BANK
Planned BGS No: 267
Licence Block: 8/11
Operator: UNALLOCATED

1:100000 Sheet No: 59·5°N 0°E
Geophysical Data on which site is planned year/cruise/line/fix: 82/04 LINE 25 FIX 43
Geologists: A.FYFE, M.STOKER, D.LONG, A SKINNER
COMPOSITE LOG COMPILED BY A.FYFE ON LOG SHEETS COMPLETED BY A.FYFE AND M.STOKER

Purpose
The site was planned to penetrate a condensed sequence of Quaternary strata and prove the underlying Tertiary sediments including a unit of seismic 'cross-bedding' believed to be Miocene or older.

Comments
The borehole penetrated glauconitic sands and silts taken as Tertiary in age at a shallower depth than predicted. The target formation of 'cross-bedding' was not reached due to technical difficulties at 94·5m. These difficulties also precluded gamma-logging of the hole. The resulting composite log is therefore based on nothing but very poor core recovery.



LITHOLOGICAL KEY

CLAY/SHALE, MUDSTONE	EVAPORITES	
SILT/SILTSTONE	EXTRUSIVE IGNEOUS	
SAND/SANDSTONE	INTRUSIVE IGNEOUS	
GRAVEL/CONGLOMERATE	BASEMENT	
LIMESTONE	WHOLE SHELLS/SHELL FRAGMENTS	
CHALK	CARBONACEOUS/PLANT FRAGMENTS	
DOLOMITE	IRON PYRITES / FERRUGINOUS	
COAL/LIGNITE	CALCAREOUS	

AGE	NATURAL GAMMA RAY LOG (Counts/s) 0 50 100	Depth (m below sealevel)	LITHOLOGY (INTERPRETATION / CORE RECOVERED)	DESCRIPTION	SUB-SAMPLES	COMMENTS
	NOT LOGGED DUE TO TECHNICAL DIFFICULTIES ENCOUNTERED AT 94·5M DEPTH			Seabed		
QUATERNARY – U PLEISTOCENE – HOLOCENE	Scale: 1:100	0		Olive grey very fine to find sand with shells	1·0m MPAL	
				Sand, dark grey, very fine – fine, moderately – poorly sorted; mainly argillaceous but some beds of clean fine sand. Quartz, lithic fragments and detritals, shell fragments and pebbles of varying provenance seen esp near base of unit	1·5m MPAL	
		5			6·5m MPAL	
				Mud, dark grey, soft to hard, highly plastic, thin laminae and pods of sand towards the base	8·5m MPAL 8·8m PMAG 9·0m MPAL	
		10		Sand, grey, fine to coarse grained, poorly sorted, immature sediment comprising ca 70% quartz, 25% lithic fragments and 5% carbonate. Quartz is rounded to subangular, apparently frosted in places; rock fragments are of very fine sandstone/siltstone, metamorphics and pyrite nodules. Shell fragments are all well-worn, cream/white and black. Some ?forams replaced by Fe minerals / glauconite	13·5m MPAL	
		15			16·5m MPAL	
		20				
		25		Interlaminated silty clay and v.fine sand. – Silty clay is dark grey, hard with intermediate plasticity – Sand is very fine angular quartz with some mica and rare shell fragments. Laminae are regular but sometimes disturbed with sand in pods and lenses exhibiting bioturbation		
		30			31·5m MPAL	RUN 33 – 36·5m: Very slow drilling to start then very fast to end of run. Hard clay may be 33m – 34m, below which is sand as below.....
BASAL TILL		35		Clay, dark grey, hard with pods v.fine sand, shell frags and pebbles up to 10mm max di.		
TERTIARY – SHELLY ARGILLACEOUS SAND UNIT				Sand, dark greenish grey, very fine grained, subangular quartz with mica and glauconite, poor – moderate sorting, argillaceous, strong reaction with HCl. Abundant shell fragments, well-worn, sometimes in carbonate-rich bands or decomposing shells in bedding planes. Also intraformational mud clasts		
		40				
		45				
		50		Silt bands, dark green, very fine sandy with less shell material	51·6m MPAL 51·95m PMAG	
		55			54·5m MPAL	
INTERLAMINATED SAND/MUD UNIT				Interlaminated sand and silty mud. – Sand is very fine to fine, moderately sorted, dark olive grey – Silty clay is v. fine sandy Hard, micaceous, Shell fragments up to gravel grade found locally	59·45m MPAL	
TRANSITIONAL UNIT		65		Interlaminated sand and silty muds with interbeds of v. fine to fine sand as below	64·4m MPAL 67·0m MPAL	
CLEAN SAND UNIT		70		Sand, olive grey, to light grey moderately sorted very fine – fine quartz with minor detritals and rare shell fragments. Clean to argillaceous, muddy bands being paler and causing colour-banding. Micaceous, some glauconite	69·4m MPAL 72·0m MPAL	
				Becoming cleaner downhole		
		75		?possible wood fragments	74·5m MPAL 77·0m MPAL	
ARGILLACEOUS SAND UNIT		80		Sand, dark olive grey, to black, moderately to poorly sorted, very fine to fine quartz, argillaceous, very micaceous – in places very rich bands 1–2mm thick of coarse flakes and "books" of mica. Non-calcareous, rare shell fragments becoming less micaceous and more glauconitic with depth	82·0m MPAL 84·4m MPAL	
SHELLY GLAUCONITIC SAND UNIT		85		Sand, very dark grey to dark olive grey, very fine to fine, moderate – poor sorting, argillaceous, shelly, often [illegible]	86·9m MPAL [illegible]	
		90		glauconite becoming abundant with depth	[illegible]	
				"Cemented" sand at 94·0m		