Geological results of boreholes drilled on the southern United Kingdom Continental Shelf by the Institute of Geological Sciences 1969-1982

Compiled by M. Parkin and A. Crosby

Report No. 82/2

Additions and corrections 1988/89

Since the borehole report was compiled in 1982 samples and cores have been re-examined and additional biostratigraphical analysis carried out. Conclusions about chronostratigraphic and lithostratigraphic determinations have been changed. General errors and omissions have been found in the text. The changes which have now been made in the text and are listed below.

VOLUME 1

PAGE	BOREHOLE NO.	CHANGES
7	70/11	Lower Palaezoic?
	73/48	Triassic?
	73/49	Lower Carboniferous?
9	71/37	Carboniferous?
	71/53	Triassic
	72/72	Carboniferous?
	71/54	Triassic? Carboniferous?
10	71/39	Triassic? Carboniferous?
11	70/8	Tertiary?
	71/48	Undivided
	71/50	Undivided
	74/21	Tertiary?
	74/22	Jurassic?
12	81/8A	Cretaceous
13	72/43	Lower Jurassic
	72/54	Middle Jurassic
	72/55	Middle Jurassic
	73/35	Tertiary
	73/40	Tertiary?
	73/60	Early Cretaceous
14	72/41	Addition of borehole 72/41
	74/42	Tertiary?
	75/4	Lower Jurassic
	75/8	Late Triassic
	75/20	Tertiary?
16	SLS32	Lower Cretaceous
	SLS72	deleted Permian
18	81/9	Lower Cretaceous
19	SLS/9	Lower Cretaceous
	SLS/8	Tertiary?
	SLS31A	Lower Jurassic
22	79/4	deleted L. Jurassic change to Tertiary
23	75/31	Lower Cretaceous?
	75/35	deleted Quaternary
27	79/08	Tertiary?
32	70/02	Remark: Age indeterminate.

PAGE	BOREHOLE NO.	CHANGES
38	71/43	Age: Upper Carboniferous Namurian B (IGS 79/9) **Note:** IGS 79/9 = Wilkinson, I.P. and Halliwell, G.P. (Compilers) 1980. Offshore micropalaeontological biostratigraphy of southern and western Britain. Rep. Inst. Geol. Sci., No. 79/9.
40	71/52	Age: Indeterminate. (IGS 79/9)
48	73/48	Age: Indeterminate. (IGS 79/9)
50	73/50	Age: Recent Age Indeterminate (IGS 79/9)
52	73/52	Age: Indeterminate (IGS 79/9)
57	73/67	BGS reg. no. 54/-06/116
58	73/69	Biostratigraphy. Age: Triassic, Anisian (IGS 79/9)
65	71/61	Biostratigraphy: Age Indeterminate (IGS 79/9)
67	71/62	?Permian/Triassic Biostratigraphy: Age Middle Triassic Anisian (IGS 79/9)
70	69/2	Biostratigraphy: Age Triassic, late Scythian to Anisian (IGS 79/9)
71	69/5	Location changed to: Latitude 53° 57.40'N Longitude 4° 8.13'W
72	70/01	Upper Carboniferous; Westphalian A (IGS 79/9)
73	70/05	Biostratigraphy: Age Indeterminate (IGS 79/9)
75	71/37	Biostratigraphy: Age Indeterminate (IGS 79/9)
76	71/38	Biostratigraphy: Age Carboniferous (IGS 79/9)
77	71/53	Age: Early to middle Triassic (Late Scythian or Anisian)
78	71/54	Remarks: Interpreted as Carboniferous on Anglesey 1:250,000 Solid Geology map. Biostratigraphy indeterminate. Petrology suggests Carboniferous.

PAGE	BOREHOLE NO.	CHANGES
79	72/69	? Permian/Triassic, Biostratigraphy: Age Early or Mid Triassic (IGS 79/9)
82	72/71A	? Permian/Triassic, Biostratigraphy: Age Indeterminate (IGS 79/9)
85	73/68	Biostratigraphy: Age Upper Carboniferous (4.5 m) Age Indeterminate (6.25 m) (IGS 79/9)
86	75/6	Biostratigraphy: Age Carboniferous; post Tournaisian (46.15-65.9 m) Age Indeterminate (66.2-67.2 m) (IGS 79/9)
88	75/7	Biostratigraphy: Age Indeterminate (IGS 79/9) ?Permian/Triassic (IGS 79/9)
91	70/07	Biostratigraphy: Age Indeterminate (49 m) Age uncertain: Palynomorphs assemblage (possibly recycled) of late Permian (Kazanian - Tatarian) age recovered (51 m) (IGS 79/9)
93	71/39	Remarks: Biostratigraphy - Upper Carboniferous palynomorphs at 26.1-26.2 m Age ? Upper Carboniferous.
98	72/73	Biostratigraphy: Age Indeterminate (IGS 79/9)
98A	72/74	Biostratigraphy: Age Permain (IGS 79/9)
101	73/54	Biostratigraphy: Age Late Permian; Kazanian or Tatarian (IGS 79/9)

VOLUME 2

PAGE	BOREHOLE NO.	CHANGES
107	71/46	Biostratigraphy: Age Lower Jurassic; Toarcian (IGS 79/9)
114	71/55	Biostratigraphy: Age Indeterminate (IGS 79/9)
119	72/38A & B	Biostratigraphy: Age Middle Jurassic; Bathonian (IGS 79/9)
133	74.24	Biostratigraphy: Age Lower Jurassic; Pliensbachian (IGS 79/9)
142	72/40	Biostratigraphy: Age Indeterminate (IGS 79/9)
142A	72/41	Addition of borehole 72/41 ?Jurassic
143	72/42	?Permian/Triassic
144	72/43	Biostratigraphy: Age Lower Jurassic ? Hettangian to Sinemurian (IGS 79/9)
151	72/51	Biostratigraphy: Age Indeterminate (IGS 79/9)
153	72/54	Biostratigraphy: Age Middle Jurassic Bathonian (IGS 79/9)
154	72/55	Biostratigraphy: Age Middle Jurassic Bathonian (IGS 79/9)
167	73/39	?Permian/Triassic
174	73/59	?Permian/Triassic
175	73/60	?Permian Triassic Biostratigraphy: Age late Triassic to early Cretaceous (IGS 79/9)
179	74/26	?Permian/Triassic
181	74/24	Biostratigraphy: Age Lower Jurassic; Hettangian (IGS 79/9)
186	75/4	Biostratigraphy: Age lower Jurassic; Hettangian to Sinemurian (IGS 79/9)
188	75/8	Biostratigraphy: Age late Triassic; (IGS 79/9) Rhaetian or ?Norian late Triassic
197	75/23	?Permian/Triassic

PAGE	BOREHOLE NO.	CHANGES
198	75/24	?Permian/Triassic
208	SLS25	Biostratigraphy: Age Indeterminate (IGS 79/9) ?Permian/Triassic
210	SLS28	Biostratigraphy: Age Indeterminate (IGS 79/9)
212	SLS32	Biostratigraphy: Age Indeterminate (IGS 79/9)
214	SLS33	Biostratigraphy: Age Indeterminate (IGS 79/9)
218	SLS34	?Permian/Triassic
219	SLS67	Biostratigraphy: Age Indeterminate (IGS 79/9)
220	SLS67	?Permian/Triassic
221	SLS68	Biostratigraphy: Age Upper Cretaceous (26 - 38.5 m, 51.09 m) Age: Indeterminate (IGS 79/9) (104 m)
222	SLS68	?Permian/Triassic
223	SLS72	Biostratigraphy: Age Lower Cretaceous Aptian to early Albian (75.7 - 78.5 m) Age: Indeterminate (94.4 - 97.5 m) Age: Triassic; (?) Norian to Rhaetian (97.6 - 110 m) (IGS 79/9)
226	SLS73	?Permian/Triassic

VOLUME 3

PAGE	BOREHOLE NO.	CHANGES
232	SLS Trial	Biostratigraphy: Neogene - early Miocene, Burdigalian (IGS 79/9)
236	SLS74	Biostratigraphy: Age Indeterminate (55.5 m) Age: Lower Cretaceous, Late Albian (67.85 m) (IGS 79/9)
238	SLS76	Biostratigraphy: Age Upper Cretaceous; Coniacian (84.2-73.3 m) Age Upper Cretaceous; Turonian (79m) Age Upper Cretaceous; early Campanian (87 m, 96 m) Age Indeterminate; (100.5-106 m) (IGS 79/9)
240	SLS77	Biostratigraphy: Age Upper Cretaceous; early Campanian (11.50 m) (IGS 79/9)
244	81/4	Age: Quaternary/?Quaternary or Palaeogene (surface - 4.2 m) Age: Holocene; ?Pleistocene or Palaeogene.
246	SLS9	Biostratigraphy: Age Palaeogene; early to middle Eocene (IGS 79/9)
247	SLS16	Biostratigraphy: Age lower Cretaceous; late Neocomian to early Albian (IGS 79/9)
250	SLS18	?Permian/Triassic Biostratigraphy: Age Indeterminate.
251	SLS31A	Biostratigraphy: Age Upper Cretaceous; Turonian to Coniacian (45-67.8 m) Age Upper Cretaceous; Turonian (69 m) Age Upper Cretaceous; Cenomanian (68-73.55m) Age Indeterminate (78.25 m) Age Lower Jurassic; early Toarcian (90.55 m) Age Lower Jurassic; Pliensbachian (?late) (106.5 - 119.3 m) Age Lower Jurassic; Late Sinemurian to early Pliensbachian (106.4 - 209.65 m) Age Lower Jurassic; early Sinemurian (210.65 m) (IGS 79/9)
255	SLS360	Biostratigraphy Age Upper Cretaceous;

PAGE	BOREHOLE NO.	CHANGES
265	SLS64	Biostratigraphy: Age Lower Cretaceous; late Albian (38-38.25 m) Age Lower Cretaceous; Aptian to early Albian (101 m) (IGS 79/9)
275	SLS8	Biostratigraphy: Age Upper Cretaceous; early to late Campanian. (IGS 79/9)
278	74/41	?Permian/Triassic
298	75/27	Biostratigraphy: Age Indeterminate; (Surface - 4.8 m). Age Palaeogene; early Eocene, Ypresian (6.7m) Age Indeterminate (7.05 m) Age Palaeogene; early Eocene, Ypresian (10.05 m) Age Indeterminate (11.85-24.6 m) (IGS 79/9)
300	75/29,29A	Biostratigraphy: Age Upper Cretaceous; Turonian (10-21.9 m) Age Upper Cretaceous; Cenomanian (24.4-41.15m) Age Lower Cretaceous; late Albian (46.5-60.75m) Age Lower Cretaceous (?) middle Albian (56.4-69.9m) Age Lower Cretaceous; Early Albian (72-76.5m) Age Lower Cretaceous; Aptian (76.75m) (IGS 79/9)
305	75/34	Biostratigraphy: Indeterminate. (IGS 79/9)
314	79/7. 7A	Age: Lower Eocene/Upper Palaeocene (30.47 - 30.78 m) Age: Upper Palaeocene (36.46 - 53.6 m) Age: ? Upper Palaeocene (61 - 61.2 m) Age: Indeterminate (65.59 - 65.83 m)
316	79/06	Age: Pleistocene (69.5 m) Age: Middle Oligocene - Rupelian (72.3 - 124.2 m) Age: Late Eocene - Bartonian (127.1 - 139.3 m) Age: Middle Eocene (142.3 - 199.9 m)
316A	79/1A, 1B, 1C	Age: Holocene (surface - 7 m) Age: ?Middle Pleistocene (12.5 - 13.71 m) Age: Lower Pleistocene (71.93 - 72.13 m)
320	81/1A	Age: Holocene (surface - 15 m) Age: ?Holocene (15 - 22 m) Age: ?Neogene (22 m - end)

PAGE	BOREHOLE NO.	CHANGES
323	81/50A	Age: Lower Pleistocene (- 110.1 m) Age: ? Neogene (110.1 - 113.7 m) Age: Lower - Middle Eocene (113.7 m - end)
326	81/51	Age: Holocene (- 2 m) Age: Lower Pleistocene (- 2 - 49 m) Age: Upper Pleistocene (49 - 89.7 m) Age: Lower Pliocene (89.7 m - end)
328	81/53,53A	Age: Holocene (-17 m) Age: Lower Pleistocene (17 - 37 m) Age: Middle to Upper Eocene (37 - 70 m) Age: Middle Eocene (70 m - end)
334	81/49	Age: Quaternary (surface - 11.3 m) Age: ?Upper Jurassic (11.3 - end)
335	82/52, 52A	IGS regd No. +53/00/1232 Age: Holocene (-0.5 m) Age: late Devensian (.5 - 13m) Age: Upper Cretaceous (44 m - end)
335A	82/22	Age: Eemian to Holocene (surface - 21 m) Age: Elsterian to Saalian (21 - 42.5 m) Age: Lower Bajocian (42.5 - end)
341	81/41	Age Lower Kimeridgian (surface - 46 m) Age Upper Oxfordian (46-62.8 m) Age Middle Oxfordian (62.8 - end) IGS Vol 46 pt. 2
343	81/42	Age: Middle Jurassic (surface - 15.2 m) Age: Jurassic; lower Lias? (15.2 m - end)
348	81/46A	Age: Quaternary (surface - 25 m) Eocene (25-107 m) Palaeocene (107-139 m) late Campanian to early Maastrichtian (139 m - end) (IGS 79/9)
351	82/19	Age: Holocene (surface 4 m) Age: Pleistocene (4 - 14 M) Age: Upper Campanian (14 m - end)
	82/20	Age: Recent + Pleistocene (surface - 3.7 m) Age: Lower Pleistocene/Pliocene (3.7-23.2 m) Age: Upper Cretaceous (23.5 m - end) Age: Palaeogene (23.2 - 23.5 m)
	82/21	Age: Lower Pleistocene - Holocene (surface - 41.6 m) Age: Lower Pleistocene (41.6 - 85 m) Age: ?M/U Eocene (85 - end)

Borehole Number	Lake District		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
69/3	54° 5·25 N	3° 56·45 W	/							/								60
69/4	8·39 N	47·38 W	/							/								61
71/41	22·55 N	44·75 W	/							/	/							62
71/42	3·15 N	43·19 W	/															63
71/61	29·98 N	58·30 W	/							/	/							65
71/62	25·33 N	54·09 W	/							/	/							66
71/64	29·12 N	56·37 W	/							/	/							68

Borehole Number	Anglesey		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
69/2	53° 40·30 N	4° 3·10 W	/							/								70
69/5	57·20 N	8·80 W	/									/						71
70/01	46·10 N	20·70 W	/									/						72
70/05	21·99 N	1·13 W	/							/	/							73
70/10	45·00 N	7·50 W	/															74
71/37	44·90 N	7·79 W	/									? /						75
71/38	48·51 N	13·01 W	/									/						76
71/53	1·10 N	35·05 W	/							/		/						77
71/54	4·80 N	26·39 W	/							? /		? /						78
72/69	31·65 N	6·27 W	/							/	/							79
72/70	29·80 N	16·40 W	/									/						80
72/71	54·78 N	18·64 W	/															81
72/71A	54·66 N	16·59 W	/							/	/							82
72/72	28·11 N	14·59 W	/									? /						83
72/75	55·75 N	26·65 W	/															84
73/68	47·57 N	16·41 W	/									/						85
75/6	41·81 N	53·56 W	/									/						86
75/7	51·23 N	22·98 W	/							/	/							88

Borehole Number	Isle Of Man		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
70/2	54° 44·75 N	4° 45·80 W	/							/	/							32
70/3	46·70 N	12·75 W	/															33
70/11	9·20 N	5° 49·60 W	/											/				35
70/12	46·31 N	4° 12·46 W	/															36
71/43	8·28 N	52·97 W	/									/						38
71/44	24·34 N	34·23 W	/															39
71/52	21·34 N	17·27 W	/									/						40
71/63	46·46 N	16·45 W	/							/	/							42
72/76	36·40 N	40·50 W	/															44
73/46,46A	18·86 N	53·93 W	/							/	/							45
73/47	36·49 N	40·72 W	/															47
73/48	34·09 N	3·41 W	/							/								48
73/49	30·75 N	34·06 W	/									/						49
73/50	42·97 N	5·65 W	/							/	/							50
73/51	31·21 N	19·90 W	/							/	/							51
73/52	34·30 N	38·14 W	/									/						52
73/53	33·77 N	33·53 W	/									/						53
73/65	8·60 N	5° 31·90 W	/									/						54
73/66	28·30 N	4° 31·30 W	/															55
73/67	14·15 N	5° 22·28 W	/									/						57
73/69	40·85 N	4° 10·14 W	/							/	/							58
74/46	32·60 N	00·60 W	/															59

Borehole Number	Liverpool Bay		Stratigraphy																Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic					
69/1	53° 36·12′ N	3° 48·38′ W	/							/									89
70/6	33·90′ N	30·17′ W	/							/	/								90
70/7	21·45′ N	46·83′ W	/							/	/								91
71/39	47·51′ N	56·96′ W	/							? /		? /							93
71/40A, B	49·54′ N	41·20′ W	/																94
71/60	51·87′ N	36·74′ W	/																96
72/73	54·41′ N	41·38′ W	/							/	/								98
72/74	59·01·N	56·40·W	/								/								98A
73/32	58·30′N	56·23′W	/							/	/								99
73/54	58·90′N	56·40′W	/								/								101

Borehole Number	Cardigan Bay		Stratigraphy																Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic		Confidential			
70/8	52° 49·25 N	4° 19·66 W		?															102
70/9	49·17 N	18·82 W																	104
71/45	30·92 N	36·46 W					Undivided												106
71/46	30·02 N	31·98 W					Undivided												107
71/47	32·35 N	44·17 W																	108
71/48	13·23 N	52·70 W					Undivided												109
71/49	38·88 N	12·77 W																	110
71/50	27·61 N	36·49 W					Und												112
71/51 A	9·14 N	45·43 W																	113
71/55	28·04 N	47·38 W																	114
71/56	14·62 N	5° 00·54 W																	115
71/57	37·40 N	4° 13·84 W																	117
71/59	21·92 N	45·90 W																	118
72/38	31·15 N	16·18 W																	119
72/39	23·66 N	45·91 W																	120
72/66	6·68 N	57·32 W																	121
73/41	21·72 N	53·14 W																	122
73/42	11·62 N	32·44 W																	124
73/43	33·75 N	51·05 W																	125
73/45	6·04 N	59·89 W																	127
74/21	6·34 N	59·45 W		?															128
74/22	25·34 N	44·94 W					Undivided?												129
74/23	27·24 N	22·41 W																	131
74/24	14·83 N	44·88 W					Undivided												132
74/25	38·78 N	18·96 W																	134
75/15	25·10 N	31·25 W																	137
75/17	26·34 N	41·22 W					Undivided												139
70/4	49·13' N	19·76' W																	101AB

Borehole Number	Nymphe Bank		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
81/8A	51° 6.36 N	6° 24.95 W	/		/	/												140

Borehole Number	Lundy (1) Latitude	Longitude	Stratigraphy: Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	U. Palaeozoic	L. Palaeozoic			Page Number
72/40	51° 33.63 N	4° 34.84 W	/							/								142
72/42	17.47 N	45.45 W	/							/	/							143
72/43	16.39 N	24.52 W	/						/									144
72/44	14.78 N	24.78 W	/	/														145
72/45	8.94 N	28.21 W	/	/														146
72/47	5.93 N	53.12 W	/							/	/							147
72/48	2.80 N	48.88 W	/									/						148
72/49 75/5	0.95 N	54.80 W	/									/						149
72/50	13.89 N	54.56 W	/									/						150
72/51	18.36 N	54.76 W	/				UNDIVIDED											151
72/52	23.03 N	54.45 W	/															152
72/54	20.87 N	47.32 W	/					/										153
72/55	21.34 N	43.25 W	/					/										154
72/56	25.89 N	45.00 W	/							/	/							155
72/57	29.75 N	45.21 W	/							/								156
72/60	34.80 N	34.71 W	/											/	/			157
72/62	30.17 N	5° 13.44 W	/							/	/							158
72/64	21.01 N	4° 4.91 W	/				/											159
72/65	3.13 N	35.02 W										/						160
72/67	30.74 N	10.36 W	/						/									161
72/68	27.12 N	25.90 W	/						/									162
73/34	33.96 N	25.55 W	/							/	/							163
73/35	11.98 N	27.46 W	/	? /														164
73/36	17.30 N	39.03 W	/	/														165
73/37	32.96 N	26.00 W	/						/									166
73/39	31.88 N	34.60 W	/							/	/							167
73/40	20.86 N	54.74 W		? /														168
73/44	48.46 N	5° 12.16 W	/											/				169
73/55	31.25 N	4° 2.14 W	/						/									170
73/56	26.75 N	6.95 W	/						/									171
73/57	28.11 N	15.27 W	/						/									172
73/58	12.09 N	34.68 W	/	/														173
73/59	23.25 N	44.86 W	/							/	/							174
73/60	24.93 N	44.80 W	/			/				/	/							175
73/61	17.75 N	6.26 W					UNDIVIDED											176
73/63	19.73 N	6.09 W	/				UNDIVIDED											177
73/64	31.68 N	26.30 W	/						/									178
74/26	14.79 N	21.52 W	/							/	/							179

Borehole Number	Lundy (2)		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
74/27	51° 28·70 N	4° 35·30 W	/															180
74/28	28·64 N	35·10 W	/						/									181
74/29	8·25 N	5° 1·60 W	/						/									182
74/42	2·68 N	4° 19·13 W	/	? /								/						183
74/43	14·76 N	29·70 W	/	/														184
74/44	23·72 N	34·87 W	/			/	/											185
75/4	27·79 N	35·16 W	/				/		/									186
75/8	29·90 N	35.03 W	/						/	/								187
75/12	26.33 N	35·26 W	/							/	/							188
75/13	21·00 N	35·00 W	/				Undivided											189
75/14	18·19 N	34·89 W	/															190
75/16	20·26 N	24·68 W	/				Undivided											191
75/18	22·81 N	24·73 W	/				Undivided											192
75/19	17.52 N	30.03 W	/				Undivided											193
75/20	11·68 N	5° 4·35 W	/	? /														194
75/21	18.22 N	4° 24·58 W	/				Undivided											195
75/22	20·67 N	8·64 W	/				Undivided											196
75/23	24·42 N	24·64 W	/							/	/							197
75/24	28·41 N	44·92 W	/							/	/							198
75/25 73/33	27·65 N	54·93 W	/				Undivided											199
75/26	23·27 N	5° 4·21 W	/				Undivided											200
72/41	51° 23·35'N	4° 45·06'W	/				Undivided											142A

Borehole Number	Bristol Channel		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
72/46	51° 33·36 N	3° 53·86 W	/									/						201
72/53	32·66 N	55·68 W	/									/						202
72/58	32·49 N	57·26 W	/									/						203
72/59	33·79 N	56·92 W	/									/						204
72/61	29·63 N	56·21 W	/				Undivided											205
72/63	16·59 N	44·29 W	/						/									206
73/62	17·15 N	33·15 W	/					/	/									207

Borehole Number	Haig Fras		Stratigraphy														Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic			
SLS 25	50° 3·13 N	7° 33.00 W			/					/	/						208
SLS 28	11·33 N	9·79 W			/	/				/	/						210
SLS 32	2·99 N	1·06 W			/	/				/	/						212
SLS 33	2·86 N	16·15 W			/	/											214
SLS 34	3·00 N	40.61 W			/					/	/						217
SLS 67	17:66 N	6° 47·15 W			/					/	/						219
SLS 68	14·37 N	59·95 W			/					/	/						221
SLS 72	2·97 N	7° 23.58 W			/	/				/	/						223
SLS 73	0.00 N	36·95 W			/	/				/	/						225
79/3	33·79 N	6° 58·13 W		/													227
81/7	48·13 N	42·75 W	/	/	/												229

Borehole Number	Cockburn Bank		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
83/24-1	49° 10.35 N	8° 20.34 W		/	/	/				/	/	/	/					231

Borehole Number	Scilly		Stratigraphy																Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic					
SLS Trial	49° 10.73 N	7° 27.86 W	/	/															232
SLS 45	22.75 N	51.51 W		/	/														233
SLS 74	56.16 N	7.38 W			/	/													236
SLS 76	35.78 N	6° 45.84 W			/	/													238
SLS 77	36.96 N	7.43 W	/	/	/														240
79/2	20.08 N	15.04 W	/	/															241
79/5	8.80 N	00.50 W	/	/															243
81/4	23.13 N	15.44 W	/	/															244
81/9	8.46 N	1.03 W	/	/	/	/													245

PARSON'S BANK

BOREHOLE NUMBER	LATITUDE	LONGITUDE	STRATIGRAPHY															PAGE NUMBER
			QUATERNARY	TERTIARY	U. CRETACEOUS	L. CRETACEOUS	U. JURASSIC	M. JURASSIC	L. JURASSIC	TRIASSIC	PERMIAN	CARBONIFEROUS	DEVONIAN	L. PALAEOZOIC				
81/2	48° 45·06'N	7° 28·47'W	/	/														245A
81/3A	59·51N	47·83'W	/	/														245C

Borehole Number	Lizard		Stratigraphy																Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic					
SLS 9	49° 24·27 N	5° 44·62 W	/	/		/													246
SLS 16	51·15 N	4° 19·98 W	/	/															247
SLS 17	42·90 N	16·47 W	/						/	/									248
SLS 18	53·70 N	26·09 W		/?						/	/								250
SLS 31 A	40·65 N	12·46 W			/				/										251
SLS 36 D	33·40 N	39·62 W			/														255
SLS 37	45·44 N	5° 18·96 W			/														259
SLS 38	43·09 N	23·40 W			/														260
SLS 63	46·54 N	32·50 W				/													263
SLS 64	43·81 N	36·51 W			/	/													265
SLS 65	43·74 N	10·48 W			/														267
SLS 66 A	45·50 N	52·03 W										/	/						270
87/14-1	32·02 N	4° 12·25 W		/	/					/	/								272
87/16-1	26·21 N	53·17 W		/	/	/				/									273
81/5	33·73 N	7·26 W		/															274

Borehole Number	Guernsey		Stratigraphy														Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic			
SLS 8	49° 51.46 N	3° 39.17 W			/												275
88/2-1	51.13 N	47.21 W			/				/	/							277

Borehole Number	Lands End		Stratigraphy														Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic			
74/41	50° 12·02′ N	4° 30·15′ W	/							/	/						278
81/6	50° 50·16 N	5° 49·83 W		/													279

Borehole Number	Portland		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
73/70	50° 18·45 N	3° 35·24 W	/								/							281
74/30 & 31	36·88 N	7·25 W	/							/								282
74/32	27·01 N	4·58 W	/						/									283
74/33 & 34	15·08 N	37·95 W	/									/	/					284
74/35	37·09 N	2° 43·05 W	/					/										285
74/36	27·20 N	54·50 W	/						/									286
74/37	18·36 N	3° 9·85 W	/						/									287
74/38	18·26 N	2° 56·14 W	/					/										288
74/39	27·04 N	39·18 W					/											289
74/40	36·98 N	54·15 W	/						/									290
74/47	27·07 N	3° 14·04 W	/						/									291
74/48	37·64 N	2° 55·01 W	/					/										292
75/9	28·26 N	47·99 W	/					/										293
75/10	36·59 N	45·67 W	/					/										294
75/11	36·43 N	48·76 W	/					/										295
75/30	9·35 N	35·14 W	/															296
79/04	13·50 N	40·41 W	//	/					/									297

Borehole Number	WIGHT		STRATIGRAPHY																	Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic						
75/27	50° 11.94 N	1° 33.67 W	/	/																298
75/28	14.26 N	8.90 W	/			/														299
75/29, 29A	25.13 N	45.02 W			/	/														300
75/31	20.30 N	49.80 W	/			? /														302
75/32	14.46 N	33.90 W					/													303
75/33	14.20 N	22.95 W					/													304
75/34	40.03 N	49.95 W	/	/																305
75/35	37.81 N	5.54 W				/														306
75/36	14.26 N	8.90 W	/			/														308
75/37	14.38 N	0° 51.02 W	/			/														309
75/38	31.42 N	19.87 W	/	/																310

BOREHOLE NUMBER	EAST ANGLIA		STRATIGRAPHY															PAGE NUMBER
	LATITUDE	LONGITUDE	QUATERNARY	TERTIARY	U. CRETACEOUS	L. CRETACEOUS	U. JURASSIC	M. JURASSIC	L. JURASSIC	TRIASSIC	PERMIAN	CARBONIFEROUS	DEVONIAN	L. PALAEOZOIC				
71/65	52° 59 · 74 N	00° 21 · 70 E	/				/											312
71/66	58 · 53 N	24 · 04 E	/				/											313
79/7, 7A	48 · 15 N	01° 39 · 23 E	/		/													314

Borehole Number	FLEMISH BIGHT. Latitude	Longitude	STRATIGRAPHY: Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				Page Number
79/1A, 1B, 1C	52° 54·70'N	2° 19·96'E																316
79/06	08·43'N	44·29'E																317
81/1A	04·70'N	21·63'E		?														320
81/50	31·43'N	27·30'E																321
81/50 A	30·87'N	27·44'E		?														323
81/51	14·28'N	26·84'E																326
81/53, 53A	05·05'N	32·93'E																328

Borehole Number	Spurn		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
72/77 A,B	53° 0.51 N	00° 25.88 E					Undivided											330
72/78	1.21 N	27.54 E																332
81/48	48.10 N	01° 01.36 E																333
81/49	48.14 N	00° 58.59 E																334
81/52 A,B	31.85 N	44.29 E																335
82/22	16.97 N	42.32 E																335A

Borehole Number	Indefatigable		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
79/08	53° 20·33 N	2° 25·73 N	/	? /														335

Borehole Number	Tyne Tees		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
81/44	54° 20.32 N	00° 00.95 E								/								339

Borehole Number	California		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
81/41	54° 22·19 N	00° 27·28 E	/				/											340
81/42	39·10 N	6·82 E						/	/									342
81/43	38·91 N	14·50 E	/			/	/											343
81/45	59·88 N	36·52 E	/	/														345
81/46A	59·99 N	32·27 E	/	/	/													347
81/47	16·58 N	23·16 E					/											350
82/18, 18A	42·55 N	04·98 E	/				/											351A
82/19	47·49 N	34·13 E	/		/													351B
82/20	06·05 N	29·88 E	/	/	/													351D
82/21	03·69 N	58·96 E	/	/														351E

Borehole Number	Farne		Stratigraphy															Page Number
	Latitude	Longitude	Quaternary	Tertiary	U. Cretaceous	L. Cretaceous	U. Jurassic	M. Jurassic	L. Jurassic	Triassic	Permian	Carboniferous	Devonian	L. Palaeozoic				
81/30	55° 58.91 N	1° 51.91 W	/									/						351
81/35	58.79 N	0° 10.02 W	/	/	/													352

BRITISH GEOLOGICAL SURVEY
MARINE GEOLOGY RESEARCH PROGRAMME

MARINE REPORT 82/2

COMMERCIAL IN CONFIDENCE

GEOLOGICAL RESULTS OF BOREHOLES DRILLED ON THE SOUTHERN UNITED KINGDOM CONTINENTAL SHELF BY THE INSTITUTE OF GEOLOGICAL SCIENCES

1969 - 1982

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Vol 1 of 3

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June 1986

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21.	Spurn	"	"	"	"
22.	Indefatigable	"	"	"	"
23.	Tyne Tees	"	"	"	"
24.	California	"	"	"	"
25.	Farne	"	"	"	"

Enclosure: 1:1,000,000 Solid Geology and borehole location map of the southern United Kingdom Continental Shelf.

INTRODUCTION

This report summarises the geological results from two hundred and forty-seven boreholes drilled by the Institute of Geological Sciences (now the British Geological Survey) on the southern United Kingdom Continental Shelf from 1969 to 1982 (Enclosure 1).

The boreholes were sited with three objectives. The first to obtain sub-Quaternary stratigraphical information in areas covered by Quaternary sediments too thick for penetration by vibrocoring or gravity coring methods. The second to recover a sequence of cores from which a composite stratigraphical column could be erected; in the southern North Sea this included cores obtained to investigate Quaternary stratigraphy. The third to aid the interpretation of shallow and deep seismic records used in the compilation of the 1:250,000 Series of geology maps.

The report opens with a brief summary of the drilling programme from 1969 to 1982. This is followed by a stratigraphic index in which a summary of the stratigraphy encountered in each borehole is shown; the boreholes are arranged in chronological order within each 1:250,000 geology map area. The report is then divided into three geographical regions; the western Continental Shelf, the southern Continental Shelf and the southern North Sea. Within these divisions the boreholes have been grouped within each 1:250,000 geological map (Fig. 1). A summary solid geology map showing the borehole sites is included for each 1:250,000 map area, this is followed by geological summaries of the boreholes in chronological order.

By dividing the report in this way, borehole information available for specific geographical areas and parts of the stratigraphic column can be identified.

The borehole information is shown as graphic sections at 1:250 scale, and a standard lithological ornament has been used. The sections of the deeper boreholes 83/24-1, 87/14-1, 87/16-1 and 88/2-1 have been drawn at a

smaller scale. More detailed information from the boreholes including palaeontological reports, petrological reports and core samples are available for inspection at the Institute of Geological Sciences.

Geological age determinations of the core samples were carried out by the Palaeontological Unit of the Institute. The Geochemistry and Petrology Division ran gamma ray logs in some of the boreholes and carried out petrological analysis of cores. The gamma ray logging equipment has been run by the Marine Geology Unit since 1976. The Engineering Geology Unit carried out geotechnical tests on core samples.

The Institute's drilling programme extended into the Scottish Continental Shelf, the results of which are summarised in reports listed in the references.

SUMMARY OF DRILLING OPERATIONS

1969 Heathergate

Five boreholes were drilled in 1969 in the Irish Sea using an over-the-side drilling platform on an adapted cargo vessel, the m.v. Heathergate on charter to Wimpey Laboratories Ltd. The boreholes were drilled to test the feasibility of penetrating Quaternary deposits and obtaining a short core of underlying rocks. Four boreholes recovered cores of Triassic red marl and the fifth recovered grey mudstones of Namurian age.

The drilling vessel was moored on site with two bow anchors and three stern anchors, a second vessel was used as an anchor tender to lay the anchors. The Decca Navigator Main Chain System was used for navigation, with a Mark 12 receiver set on the 3B chain. Marker buoys were placed at the anchor sites to assist anchor laying. The final position of the borehole was determined from several readings of the Decca Navigator receiver.

The boreholes were drilled by conventional site investigation techniques, using $9^5/_8$" casing embedded into the formations within which

shell and auger, rotary tricone and diamond core drilling tools were run. Core barrels of SF ($5^1/_2$") and PF ($4^3/_4$") sizes were used. The drilling rate and sample recovery in Quaternary deposits using shell and auger and rotary methods was compared.

Experience gained by the Institute on this project enabled plans to be made for further drilling on the Continental Shelf.

1970-75 Whitethorn

Starting in 1970 a five year contract was awarded to Wimpey Laboratories Ltd. to provide a drilling vessel to drill cored boreholes on the United Kingdom Continental Shelf.

A bulk cargo vessel, the m.v. Whitethorn owned by S. William Coe of Liverpool, was equipped with an over-the-side drilling platform. The vessel was first located on site with a Decca Navigator Main Chain Mark 12 receiver using a track plotter to assist in the laying of six anchors. A self deploying and retrieving anchoring system was used by the vessel. A final accurate position was provided by a Decca 729 radar coupled with an Alpine radar ranging unit. This operated in conjunction with shore based transponders and had $\pm$ 12 metre accuracy.

The boreholes were drilled using $9^5/_8$" casing embedded in the formations, within which shell and auger, rotary tricone and diamond core drilling techniques were carried out. Where consolidated strata was encountered, wireline coring barrels and rods were inserted to improve core recovery from greater depths.

Drilling took place in water depths of up to 60 m with borehole penetration to 220 metres below the sea bed. A total of one hundred and seventy-six boreholes were drilled by the Whitethorn on the southern United Kingdom Continental Shelf, in the Irish Sea, Cardigan Bay, Bristol Channel and English Channel, and four boreholes were drilled in the southern North Sea as part of a geological survey of the Wash.

1975 Wimpey Sealab

The m.v. Wimpey Sealab was employed on an experimental basis for a month to drill in water depths greater than the depth in which the Whitethorn could operate and also in more exposed locations. Four boreholes were drilled in the western English Channel, the fifth was drilled 110 km south-west of the Isles of Scilly as a trial for the equipment before a contract was awarded by the Institute to Wimpey Laboratories Ltd. for further boreholes.

1976 Wimpey Sealab

The dynamically positioned drillship Wimpey Sealab, operated by Wimpey Laboratories Ltd., drilled twenty-two boreholes in the western English Channel, south Celtic Sea and Western Approaches. The dynamic position keeping system enabled the ship to operate in more exposed and deeper waters where conventional mooring systems were difficult to operate. This system also enabled the vessel to rapidly set up on site and to move off with relative ease. Position fixing of the sites was by means of a Satellite Navigation System.

The drill string was rotated by an hydraulic power swivel hung from a derrick mounted over a centrewell (moonpool). The drilling system was heave compensated to enable the ship to operate in 4 metre seas, depending on wave period frequency and attitude of ship. The bottom hole string assembly consisted of an 8" tricone bit for open hole drilling in the upper formations reducing to 2" lower in the boreholes. The objective was to recover cores of the bedrock, and consequently a core barrel with a 2" (NQ) diamond bit was run on a wireline inside the drill pipe. Drilling mud was pumped to lubricate the bit and support the borehole, but was not recirculated to the drilling platform so cuttings were not recovered.

The variable nature of the formations encountered, with soft chalk, chalk with flint bands, hard bioclastic limestone, soft friable sandstones,

and compact marls, led to considerable problems in maintaining good core recovery and necessitated constant changes of bit types.

A gamma ray log was run on most boreholes.

1977 Zephyr

In 1977 the Department of Energy commissioned the Institute of Geological Sciences to site a series of boreholes in the western English Channel and South Western Approaches with the object of investigating the sub-Chalk stratigraphy of the area (Evans et al. 1981). Four deep boreholes were completed.

The sites were chosen on deep seismic survey lines run in the area. Rock cuttings were collected for all the non-cored sections of the boreholes. Selected intervals were cored in boreholes 83/24-1, 87/14-1, 88/2-1. A comprehensive suite of downhole geophysical logs was run on each borehole.

The boreholes were drilled by the semi-submersible drilling rig Zephyr 1, operated by Odeco Drilling. The rig was anchored on site and the position fixed using a Satellite Navigation System, by Decca Survey Ltd.

Standard oil well drilling techniques were used with a motion compensated drilling system, a B.O.P. stack installed and a marine riser for recirculation of drilling mud. The holes started at 36" diameter reducing through $17^1/_2$" to $8^1/_2$" at depth, and were cased in the upper part of the holes. A variety of tricone bits were used for the non-cored sections, a Christensen core barrel with diamond bit, was used for coring operations.

1979 Surveyor

The drilling vessel Surveyor, owned by Heerema Marine Contractors, was operated during 1979 in the southern North Sea, the English Channel and Western Approaches. Seven boreholes were completed.

This vessel was equipped with a self deploying and retrieving six

anchor system. The Decca Pulse 8 navigation system was used for position fixing.

The drill system was heave compensated with a derrick mounted over a moonpool. The drill string was rotated with large power tongs normally used in oil well drilling for connection of drill pipe. An I.G.S. Christensen core barrel (at the bottom end of the contractors' drill pipe) was used for coring, this had an inner barrel which was recovered by an overshot assembly attached to a wireline. The bit was lubricated with drilling mud. A push coring system using a hammer sampler was used in soft formations where rotary coring had produced no recovery. A sea bed template was employed to allow re-entry of the borehole when necessary. Gamma ray logs were run in most boreholes.

1981 Mariner

The m.v. Mariner, owned by Heerema Marine Contractors, was chartered for the 1981 drilling programme. Twenty-three boreholes were completed at sites in the southern North Sea, the Western Approaches of the English Channel and the Celtic Sea.

A Magnavox Satellite Navigation System was used for position fixing with the Decca Navigator Main Chain System being used for anchor laying. The ship was moored with six anchors which were self deployed and retrieved.

The drilling system was similar to that of the Surveyor. The drill string was rotated with a power swivel. The I.G.S. Christensen core barrel with wireline inner barrel was used for coring. Some samples were collected with a hammer sampler. An improved gamma ray logging system was run, producing better results than in previous years.

1982 Ferder

The borehole programme was carried out from the drilling ship m.v. Ferder. Drilling equipment utilised a Christensen marine wireline system

modified by I.G.S. and the downhole gamma logging was carried out using a Mount Sopris 2500 portable logger. The ship was positioned on location using Main Chain Decca and the precise position subsequently verified using a Magnavox Satellite Navigation System. Five boreholes were completed in the southern North Sea.

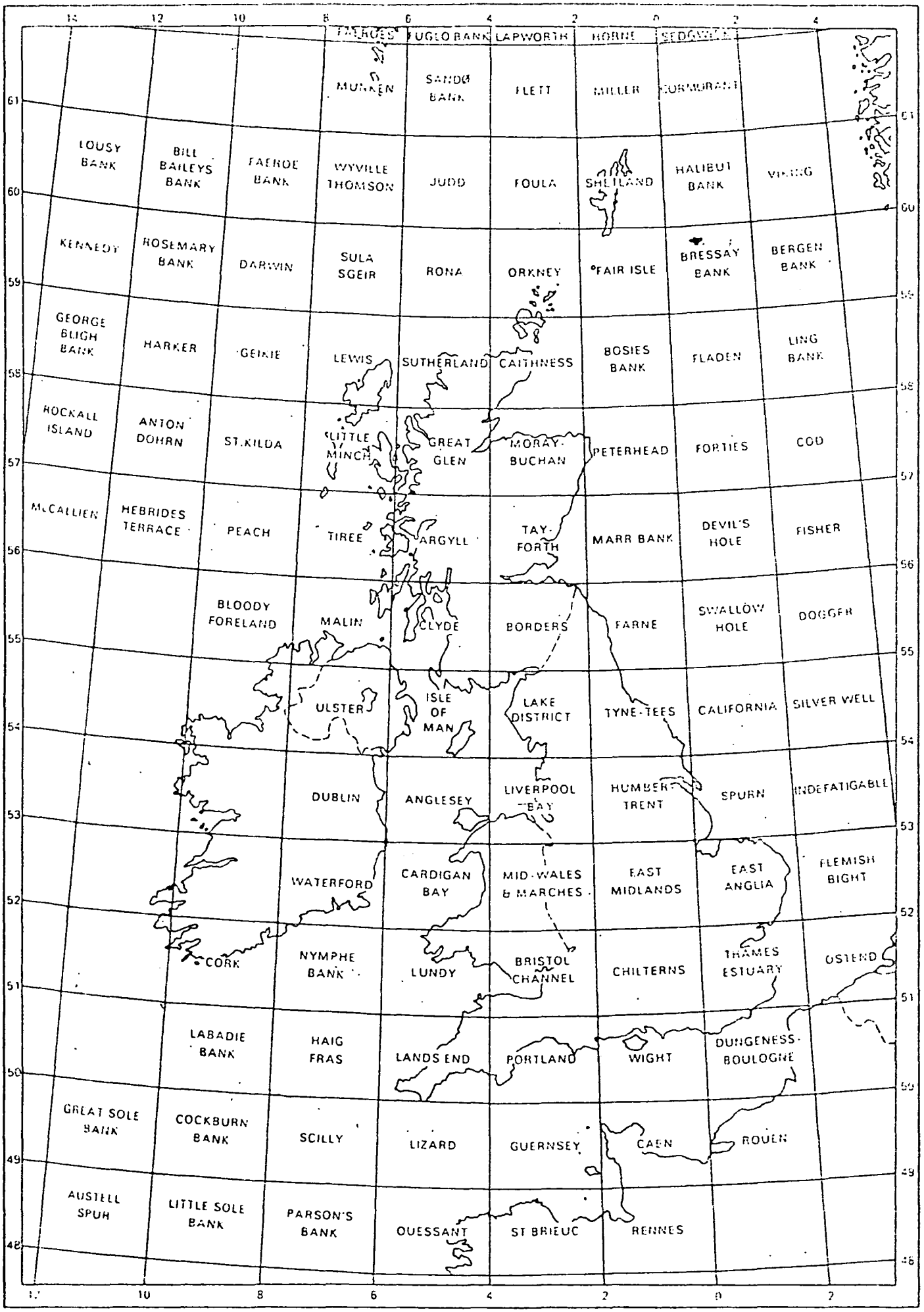


fig 1

INDEX OF 1 : 250 000 SERIES

GEOLOGY MAPS

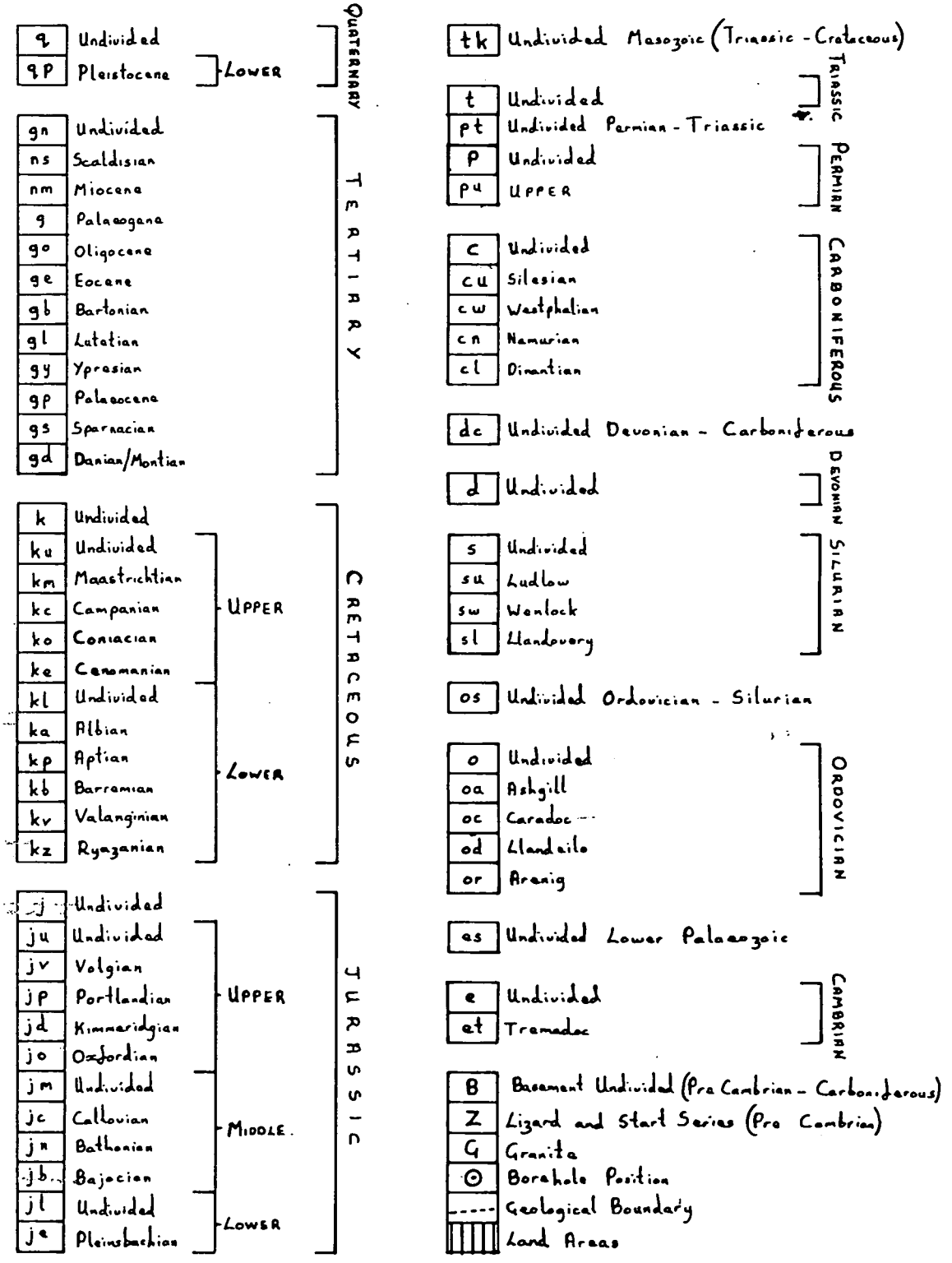


Fig. 2 Explanation Of Chronostratigraphic Codes And Symbols Shown On Borehole Location Maps

BOREHOLES ON THE WESTERN CONTINENTAL SHELF

IRISH SEA

1 : 250,000 GEOLOGY MAPS

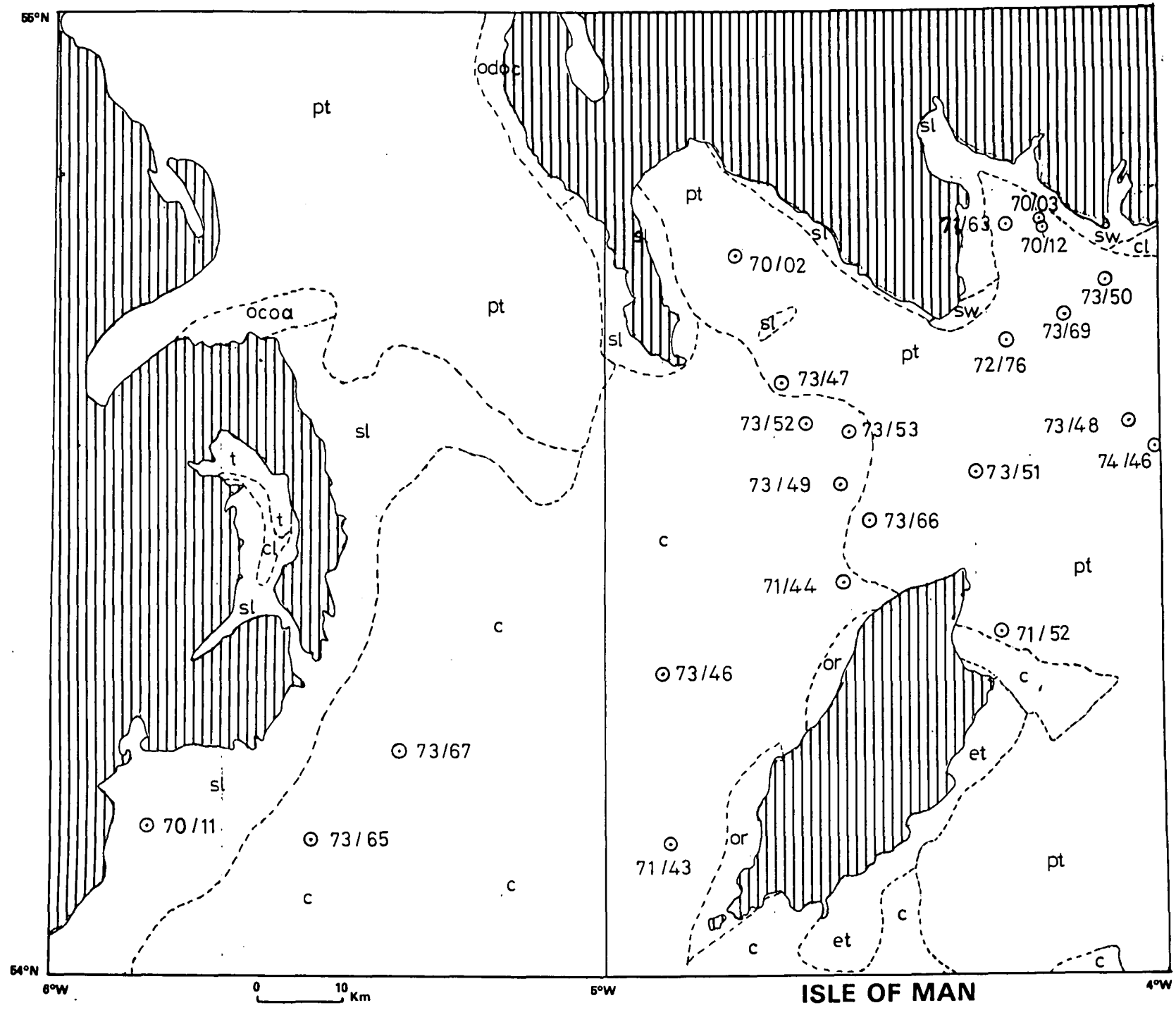
ISLE OF MAN

LAKE DISTRICT

ANGLESEY

LIVERPOOL BAY

fig 3


55°N
54°N
6°W
5°W
4°W
0
10 Km
ISLE OF MAN
pt
odoc
ocoa
sl
t
cl
c
et
or
sw
70/02
70/03
70/12
71/63
73/50
73/69
72/76
73/47
73/52
73/53
73/48
74/46
73/51
73/49
73/66
71/44
71/52
73/46
73/67
70/11
73/65
71/43

Borehole No 70/02	Area Isle Of Man	Block No 112 - 7	
Latitude 54° 44·75 N		I.G.S reqd. No 54/05/03	
Longitude 4° 45·80		Water Depth 17 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red C 1·36 green A 35·81		Spud Date 4·9·70	Completion Date 6·9·70
Sextant		Status Completed	Final Depth b.s.b. 42·5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10				SAND, grey and brown, fine grained shelly: Cardium sp, Glycimeris sp, Nucleа sp			Biostratigraphy - Age - indeterminate
						CLAY, red brown			
						SILT, brown, clayey			
						SAND, brown, fine, silty, shelly.			
		20				CLAY, brown and grey, gravelly plastic soft Boulder Clay?			
						BOULDER CLAY, brown, stiff, sandy, erratics minute 0.10m			
						Clayey silt and reddish brown sand.			
						SAND reddish brown, med/crs grained			
		30				SAND, pale reddish brown with ? grey shale fragments.			
PERMO - TRIASSIC	BUNTER FACIES ?	40				SANDSTONE, reddish-brown, fine grained, thin regular bedding, jointed, friable.			
		50				END OF BOREHOLE			

IGS 1264 1000 1/75

Borehole No 70/3	Area Isle Of Man	Block No 112 – 7	
Latitude 54° 46 · 70 N		I·G·S regd No 54/05/13	
Longitude 4° 12 · 75 W		Water Depth 19 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 12 · 9 · 70	Completion Date 14 · 9 · 70
		Status Completed	Final Depth bs.b. 71 · 0 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
HOLOCENE		10 20 30				CLAY, light grey – dark grey at base, sticky, silty, slightly calcareous in parts with rare shells.			
PLEISTOCENE		40 50				BOULDER CLAY. grey brown, sandy, soft and sticky. assorted rounded and sub angular pebbles up to 6cm			

IGS 1284 1000 1/75

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palæo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE		50				BOULDER CLAY, grey brown, sandy, slightly muddy			
		60							
		70				END OF BOREHOLE			
		80							
		90							
		100							

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54/05/13	M. Parkin

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Borehole No 70 / 11	Area Isle Of Man	Block No 111 - 27	
Latitude 54° 9' 20" N		I.G.S regd No 54/06/54	
Longitude 5° 49 · 6 W		Water Depth 18 - 22m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red I 17·38 green D 47·65 purple B 52·40		Spud Date 14·11·70	Completion Date 15·11·70
		Status Completed	Final Depth bs.b. 28·52 m

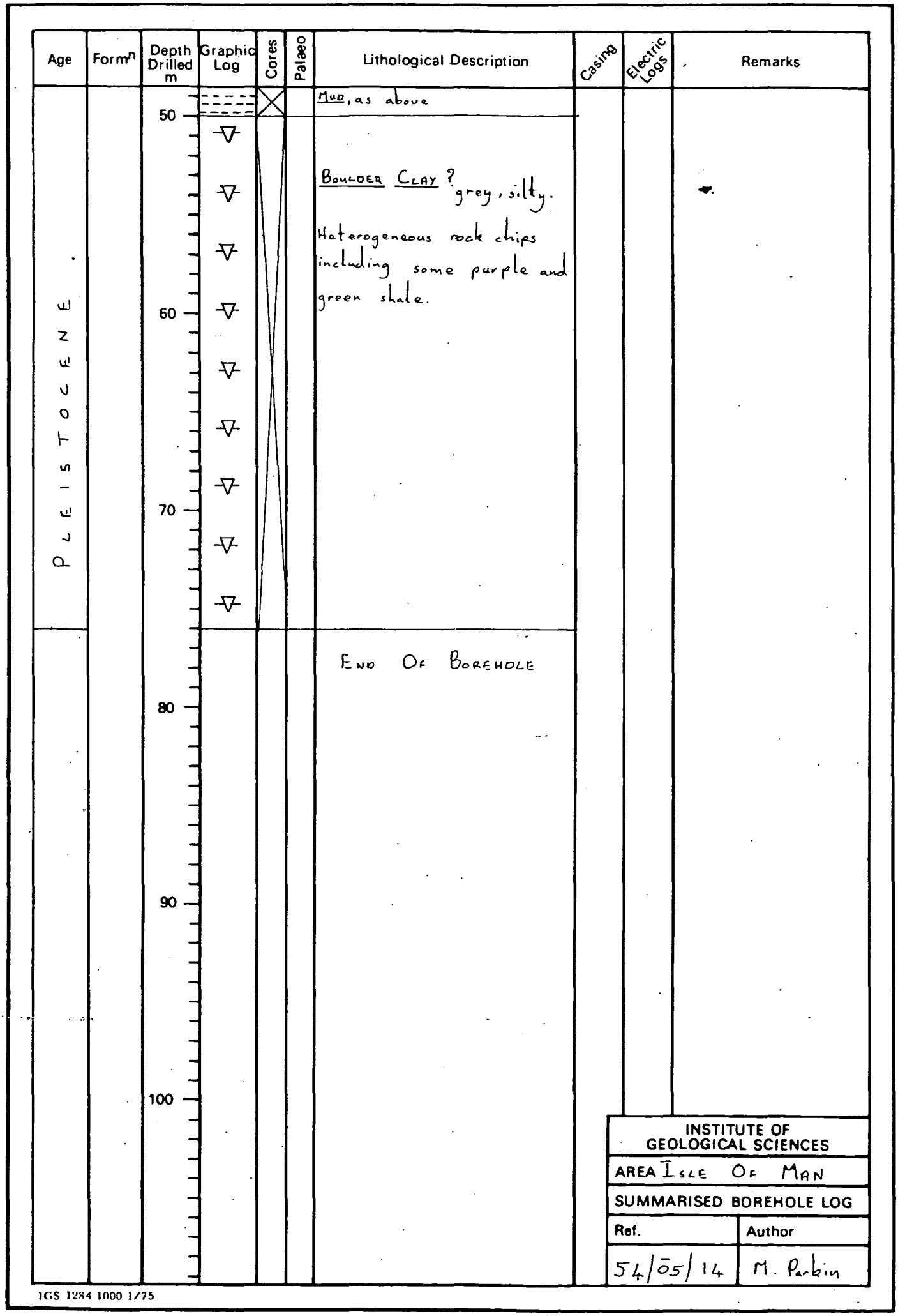
Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Holocene						Sand, grey, very fine, silty, muddy with shells and shell fragments, with pebbles oblate up to 4cm across.			
Pleistocene ?		10				Clay, grey, silty, sandy with occasional small angular rock fragments.			
						Clay, as above mixed with boulder clay?			
		20				Boulder Clay, brown and grey, stiff with angular rock fragments and rare shell fragments. Mixed fragment of underlying weathered rock present.			Many boulders mixed with fragments of rock. 20cm rounded - 12cm angular. All are cleaved psammite and pelite
						Sand, coarse with a little clay.			
Lower Palaeozoic ?						Low grade metamorphic, sandstones and shales, psammite, green, quartzitic fine, hard, layers of pelite with quartz veins.			
		30				End Of Borehole			
		40							
		50							

IGS 1264 1000 1/75

Borehole No 70/12	Area Isle Of Man	Block No 112 – 7	
Latitude 54° 46 · 31 N		IGS regd No. 54/05/14	
Longitude 4° 12 · 46 W		Water Depth 15 – 19 m	Rig whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 17 · 11 · 70	Completion Date 18 · 11 · 70
Decca red A 0 · 70 green A 42 · 61 purple B 55 · 02		Status Completed	Final Depth bs.b. 76 · 0 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
HOLOCENE						CLAY, light brown, silty, very finely sandy with small shell fragments.			
GLACIAL ? POST ? PLEISTOCENE ?		10				SILT, grey, clayey, rich in sulphides, calcareous.			
		20							
		30				CLAY, grey, slightly calcareous sulphide rich.			
		40				MUD, fragments of silt – clay as above.			
		50							

IGS 1284 1000 1/75


Age
Formⁿ
Depth Drilled m
Graphic Log
Cores
Palæo
Lithological Description
Casing
Electric Logs
Remarks
PLEISTOCENE
50
60
70
80
90
100
Mud, as above
Boulder Clay ? grey, silty.
Heterogeneous rock chips including some purple and green shale.
End Of Borehole
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AREA Isle Of Man
SUMMARISED BOREHOLE LOG
Ref.
Author
54/05/14
M. Parkin
IGS 1284 1000 1/75

Borehole No 71/43	Area Isle Of Man	Block No 112 - 26	
Latitude 54° 8·28 N		I·G·S regd No 54/05/141	
Longitude 4° 52·97 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red E09·13 green E40·76 purple A53·45		Spud Date 22·7·71	Completion Date 23·7·71
Sextant.		Status Completed	Final Depth bs.b. 33·0 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT						Gravel, sand and broken shell.			
PLEISTOCENE		10				Boulder Clay, very stiff, brown sandy.			
		20							
UPPER CARBONIFEROUS Namurian B		30				Grey Shale and Sandstone.			
		40				End Of Borhole			
		50							

IGS 1284 1000 1/75

Borehole No 71/44	Area ISLE OF MAN	Block No 112 – 18	
Latitude 54° 24 · 34 N		I·G·S regd No 54/05/166	
Longitude 4° 34 · 23 W		Water Depth 33 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red C 3 · 44 green C41 · 28 purple A50 · 06		Spud Date 23 · 7 · 71	Completion Date 24 · 7 · 71
		Status Uncompleted	Final Depth b.s.b. 2m

Age	Form^{n}	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
HOLOCENE PLEISTOC – ENE						SAND & GRAVEL			
						BOULDER CLAY			
						END OF BOREHOLE			

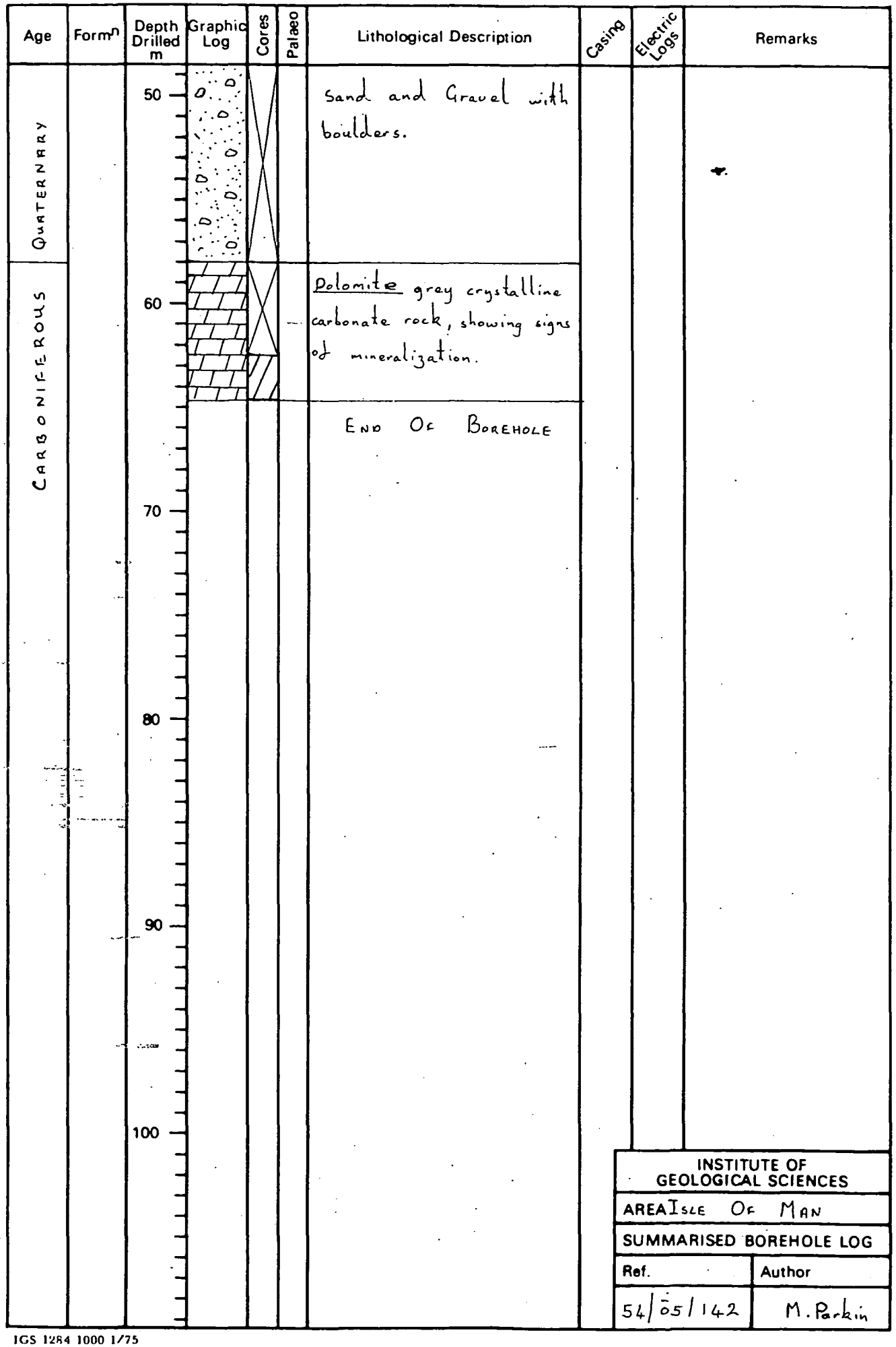
10 20 30 40 50

IGS 1284 1000 1/75

Borehole No 71/52	Area Isle Of Man		Block No 112 - 19
Latitude 54° 21 · 34 N		I.G.S regd No 54/05/142	
Longitude 4° 17 · 27 W		Water Depth 16.5 - 20m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 28 · 8 · 71	Completion Date 31 · 8 · 71
Decca red B11 · 62 green D40 · 86 purple 52 · 90		Status Completed	Final Depth bs.b. 64 · 60m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Quaternary		10 20 30 40 50				Sand And Gravel Boulder Clay, brown, reddish brown at top, stiff, sandy. Clay, laminated, with silts and bands of clay with pebbles near middle and traces of peat in lower part. Sand and gravel with boulders.			Age = Indeterminate

IGS 1284 1000 1/75


Age
Formⁿ
Depth Drilled m
Graphic Log
Cores
Palaeo
Lithological Description
Casing
Electric Logs
Remarks
QUATERNARY
CARBONIFEROUS
50
60
70
80
90
100
Sand and Gravel with boulders.
Dolomite grey crystalline carbonate rock, showing signs of mineralization.
END OF BOREHOLE
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AREA Isle Of Man
SUMMARISED BOREHOLE LOG
Ref.
Author
54/05/142
M. Parkin
IGS 1284 1000 1/75

Borehole No 71/63	Area ISLE OF MAN Block No 112 – 7
Latitude 54° 46.46 N	I.G.S regd No 54/05/168
Longitude 4° 16.45 W	Water Depth 12.8 – 15.8m Rig Whitethorn
Other Position Fixing Methods	Objectives Stratigraphic
Radar Ranging	Spud Date 10.11.71 Completion Date 12.11.71
Decca green A 38.01 purple B 50.06	Status Completed Final Depth bs.b. 69.60m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT		10 20 30 40 50				CLAY grey, darkening with depth, sticky, sulphide rich in part. In part silty and sandy.			
						SAND AND GRAVEL silty in part.			

IGS 1284 1000 1/75

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT		50				SAND AND GRAVEL silty in part.			
		60				BOULDER CLAY sandy with large boulders.			
?PERMIAN/TRIASSIC		70				SANDSTONE, red-brown, fine, cross stratified with mud flake conglomerate beds. Near horizontal dip.			"New Red Sandstone"
						END OF BOREHOLE			
		80							
		90							
		100							

IGS 1284 1000 1/75

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AREA I SLE. OF MAN

SUMMARISED BOREHOLE LOG

Ref.	Author
54/05/168	M Parkin

Borehole No 72/76	Area ISLE OF MAN		Block No 112 - 14
Latitude 54° 36.4 N		IGS regd No 54/05/153	
Longitude 4° 40.5 W		Water Depth 38 - 41 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red B18.80 green A46.50		Spud Date 14.11.72	Completion Date 15.11.72
purple A59.1		Status Completed.	Final Depth bs.b. 13.6 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE		10				CLAY, brown, sandy in parts, with small rock fragments and pebbles; bands of gravel and sand; some boulders (encountered by rock roller)			
		20				END OF BOREHOLE			
		30							
		40							
		50							

IGS 1284 1000 1/75

Borehole No 73/46/46A Area Isle Of Man	Block No 112 – 21
Latitude 54° 18·86N	I.G.S regd No 54/05/174
Longitude 4° 53·93W	Water Depth 69 – 73m Rig Whitethorn
Other Position Fixing Methods	Objectives Stratigraphic
Radar Ranging	Spud Date 18.9.73 Completion Date 21.9.73
Decca Red D22.52 Green D33.47	Status Terminated Bad weather Final Depth b.s.b. 64·5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY AND RECENT		10				SAND, fine, silty in parts			73/46 Borehole drilled by shell to 12·5m by rock roller to 44m by core barrel to 44·4m Terminated due to loss of core bit and bad weather 73/46A Borehole redrilled without samples to 44m. by rock roller to 62m by core run to 61-62·5m by rock roller to 64·5m Terminated, bad weather.
						GRAVEL, small rounded to sub rounded			
		20				SAND, soft and silty.			
		30							
		40							
PLEISTOCENE		50				BOULDER CLAY, reddish brown, sandy clay.			

IGS 1284 1000 1/75

Borehole No 73/46 / 46A	Area ISLE OF MAN		Block No 112 - 21
Latitude 54° 18·86 N		IGS regd No 54/05/174	
Longitude 4° 53·93 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives	
		Spud Date 18·9·73	Completion Date 21·9·73
		Status Terminated bad weather	Final Depth bs.b. 64·5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE						BOULDER CLAY, reddish brown, sandy.			
		60				COBBLES, variegated, sub rounded.			
						GRAVEL, very fine.			
?PERMIAN/TRIASSIC									Smooth drilling, red wash, dim, not hard to bit and scrapings from rock roller all suggest MARL
						END OF BOREHOLE			
		70							This succession agrees well with the spanner record of traverse. S1 - 73 - 10 - 12.
		80							
		90							
		100							

Borehole No 73/47	Area Isle Of Man	Block No 112 - 12	
Latitude 54° 36·49 N		I.G.S regd No 54/05/175	
Longitude 4° 40·72 W		Water Depth 35 - 38m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 21.9.73	Completion Date 23.9.73
Decca red B18·86 green A46·42 purple A59·46		Status Terminated Cave in.	Final Depth bs.b. 39·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE		10				BOULDER CLAY, brown, with shell debris.			
						GRAVEL, sandy with cobbles.			
		20				BOULDER CLAY, reddish brown, sandy.			
		30				COBBLES AND BOULDERS			
						LAMINATED SANDY CLAYS ??			
		40				?? Permo - Trias marls. No samples were taken below 36.4m. The only evidence of ? red beds below 37m was the smooth drilling rate and a small smear of red mud on the rock roller bit.			
		50				End Of Borehole.			

IGS 1284 1000 1/75

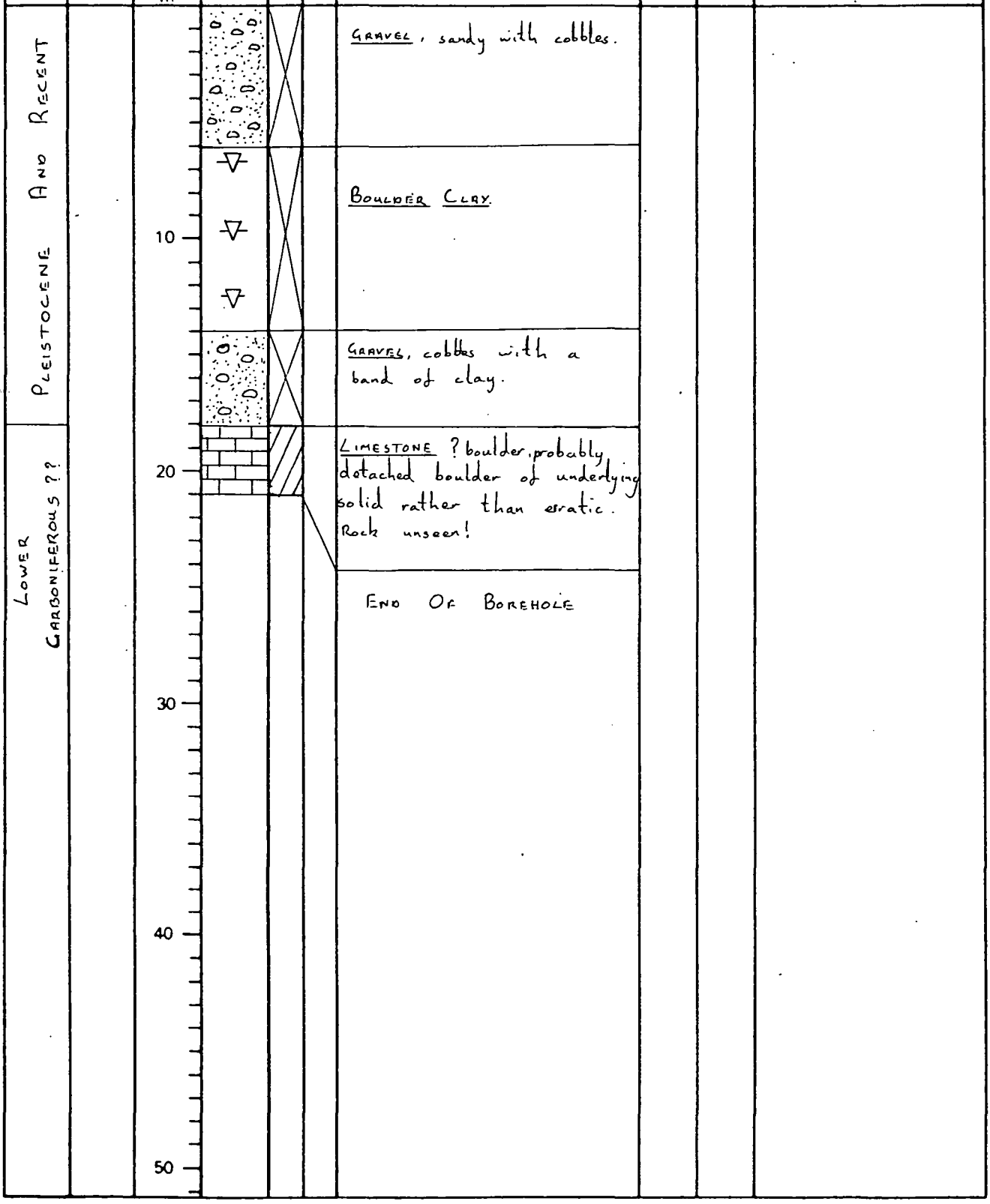
Borehole No 73/48	Area Isle Of Man		Block No 112 – 15
Latitude 54° 34.09 N		I.G.S regd No 54/05/176	
Longitude 4° 3.41 W		Water Depth 42.2 – 49.2m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 24.9.73	Completion Date 25.9.73
Decca red A06.18 green C37.58 purple A71.24		Status Completed.	Final Depth bs.b. 12.0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE						Boulder Clay, soft and shelly.			Biostratigraphy: Age = Indeterminate
TRIASSIC?		10				Siltstone, red-brown and greenish grey, massive, slightly calcareous in part.			
						End Of Borehole			

20
30
40
50

IGS 1284 1000 1/75

Borehole No 73/49	Area Isle Of Man	Block No 112 - 13	
Latitude 54° 30.75 N		I G S regd No 54/05 1/177	
Longitude 4° 34.06 W		Water Depth 40.5 - 46.5m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging.		Spud Date 24.9.73	Completion Date 25.9.73
Decca red B15.18 green B42.13 purple A51.38		Status Completed	Final Depth bs.b. 21.0m



IGS 1284 1000 1/75

Borehole No 73/50	Area ISLE OF MAN		Block No 112 - 10
Latitude 54° 42·97 N		J.T.M. CGS regd No	54/05/178
Longitude 4° 5·65 W		Water Depth 24·5 - 29m	Rig Whitethorn
Other Position Fixing Methods		Objectives	Stratigraphic
Radar Ranging		Spud Date 30·9·73	Completion Date 1·10·73
Decca red 23·84 green B36·46 purple B54·55		Status Completed	Final Depth bs.b. 47·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY? FLANDRIAN		10				CLAY, grey, soft, silty.			Biostratigraphy: Age = Recent for Palynomorphs (2-4m) Age = Indeterminate - Polymorphs (6-20m)
PLEISTOCENE		20 30				BOULDERY TILL, gravelly and sandy lenses.			
PERMIAN/TRIASSIC		40				SANDSTONE, reddish brown, medium with thin bands of whitish grey sst.			
		50				END OF BOREHOLE			

IGS 1284 1000 1/75

Borehole No 73/51	Area Isle Of Man		Block No 112 – 14
Latitude 54° 31·21 N		IGS regd No 54/05/179	
Longitude 4° 19·90W		Water Depth 46 – 52m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
radar ranging		Spud Date 2·10·73	Completion Date 3·10·73
Decca red A20·16 green C30·05 purple A52·34		Status Completed	Final Depth bs.b. 45·50m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
									GRAVEL. Sandy, RECENT 0·2m
FLANDRIAN						CLAY. reddish brown, increasingly sandy downwards.			
		10				GRAVEL, sandy in parts, very dense, appears typical beach deposit.			
PLEISTOCENE		20				TILL, brick red, stiff clay with sand and gravel, occ boulders. Top massive becoming uniform in lithology at base.			
		30							
		40							
PERMIAN/ TRIASSIC						SILTSTONE, reddish brown with thin veins of fibrous gypsum and thicker veins of mottled gypsum.			
		50				END OF BOREHOLE			

IGS 1254 1000 1/75

Borehole No 73/52	Area Isle Of Man		Block No 112 – 12
Latitude 54° 34 · 30 N		I·G·S regd No 54/05/180	
Longitude 4° 38 · 14 W		Water Depth 46 – 51 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 4·10·73	Completion Date 5·10·73
Decca red B16·36 green B32·83 purple A55·18		Status Completed	Final Depth bs.b. 13·60m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Recent			P.S.A.						
PLEISTOCENE						Till, stiff clay, reddish brown, with pebbles and some sand.			Gravel, sandy, RECENT
CARBONIFEROUS		10				SANDSTONE, stained reddish brown coarse/medium, with minor siltstone			Probably Scottish Carboniferous sandstone series.
						END OF BOREHOLE			Biostratigraphy: Age – indeterminate
		20							
		30							
		40							
		50							

IGS 1284 1000 1/75

Borehole No 73/53	Area Isle Of Man		Block No 112 - 13
Latitude 54° 33.77 N		IGS regd No 54/05/181	
Longitude 4° 33.53 W		Water Depth 47 - 51	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 5.10.73	Completion Date 6.10.73
Decca red B15.68 green B36.10 purple A53.30		Status Completed	Final Depth bs.b. 31.0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
FLANDRIAN						SAND, grey, fine			
						Dense brown sand and gravel.			
PLEISTOCENE		10				TILL, reddish colour, sandy with boulders.			"IRISH SEA TILL"
		20				TILL, greyish colour, clayey.			"SCOTTISH TILL"
?HIGH VISEAN OR LOWER NAMURIAN CARBONIFEROUS		30				SANDSTONE, original colour pale grey but stained reddish brown. Silty intercalations and wispy lamina dip of bedding about 20°			Possibly calciferous Sandstone series.
						MUDSTONE, reddish stain on dk grey colour, bioclastic, calcareous and occassionally sandy.			
		40				END OF BOREHOLE			
		50							

IGS 1284 1000 1/75

Borehole No 73/65	Area Isle Of Man	Block No 111 - 28	
Latitude 54° 8·60		I.G.S. regd No 54/06/114	
Longitude 5° 31·9 W		Water Depth 44 - 49 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Interscan		Spud Date 15·11·73	Completion Date 16·11·73
Decca red H 8·35 green E 32·54 purple A 72·04		Status Completed	Final Depth bs.b. 28·50 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY ?		10, 20				CLAY, reddish brown, silty with small pebbles.			
						CLAY, reddish brown, soft with pebbles.			
CARBONIFEROUS		30				End Of Borehole			LIMESTONE, grey, massive bioclastic. Broken angular fragments of limestone in a grey clay matrix at the limestone/reddish brown clay interface.
		40, 50							

IGS 1264 1000 1/75

Borehole No 73/66	Area Isle Of Man	Block No 112 - 13	
Latitude 54° 28·3 N		IGS regd No 54/05/182	
Longitude 4° 31·3 W		Water Depth 36 - 40m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 20·11·73	Completion Date 21·11·73
Decca red B15·62 green C31·50 purple A50·28		Status Suspended	Final Depth bs.b. 62·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT						SAND, fine, muddy, occassionally gravelly.			
						GRAVEL, coarse.			
PLEISTOCENE		10				BOULDER CLAY, brownish red, with pebbles up to 10cm; between 20-27m, more gravelly or sandy.			"IRISH SEA TILL"
		20							
		30							
		40							
		50							

IGS 1254 1000 1/75

Borehole No 73/66	Area Isle Of Man	Block No 112 - 13	
Latitude 54° 28·3 N		IGS regd No. 54/05/182	
Longitude 4° 31·3 W		Water Depth	Rig
Other Position Fixing Methods		Objectives	
		Spud Date 20.11.73	Completion Date 21.11.73
		Status Suspended	Final Depth bs.b. 62·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE						Boulder Clay brownish red, pebbles up to 10cm.			"Irish Sea Till"
		60				Sand			
						End Of Borehole			
		70							
		80							
		90							
		100							

IGS 1284 1000 1/75

Borehole No 73/67	Area Isle Of Man Block No 111 - 24
Latitude 54° 14 · 15 N	I G S regd No 54/06/176
Longitude 5° 22 · 28 W	Water Depth Rig Whitethorn
Other Position Fixing Methods	Objectives Stratigraphic
Decca red G 11 · 81 green D 41 · 04 purple A 70 · 42	Spud Date 27 · 11 · 73 Completion Date 28 · 11 · 73
	Status Completed Final Depth bs.b. 11 · 60 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY						SILT, shelly with gravel.			
LOWER CARBONIFEROUS		10				LIMESTONE, pale grey, fine grained, bioclastic with som crinoidal debris. stylolitic features.			
						END OF BOREHOLE			
		20							
		30							
		40							
		50							

IGS 1254 1000 1/75

Borehole No 73/69	Area ISLE OF MAN		Block No 112 - 15
Latitude 54° 40·85 N		I.G.S regd No 54/05/187	
Longitude 4° 10·14 W		Water Depth 38–43 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 1·12·73	Completion Date 2·12·73
Decca red A0·54 green B33·64 purple A71·70		Status Completed	Final Depth bs.b. 46·70m

Age	Form^{n}	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT		10				SAND, grey-brown, muddy, silty, with shell fragments and numerous Turritella.			Biostratigraphy; Age – Triassic; Anisian
						MUD, grey, silty, shelly.			
PLEISTOCENE		20				SILT, red brown, coarse, clayey, small rounded pebbles and black carbonaceous (?) streaks.			
? PERMIAN.../ TRIASSIC		30				MUDSTONE, red, silty			
		40				MUDSTONE, pale green/green, silty, micaceous in parts, with small gypsum veinlets and nodules with intercolated thin beds of red mudstones			
		50				END OF BOREHOLE			

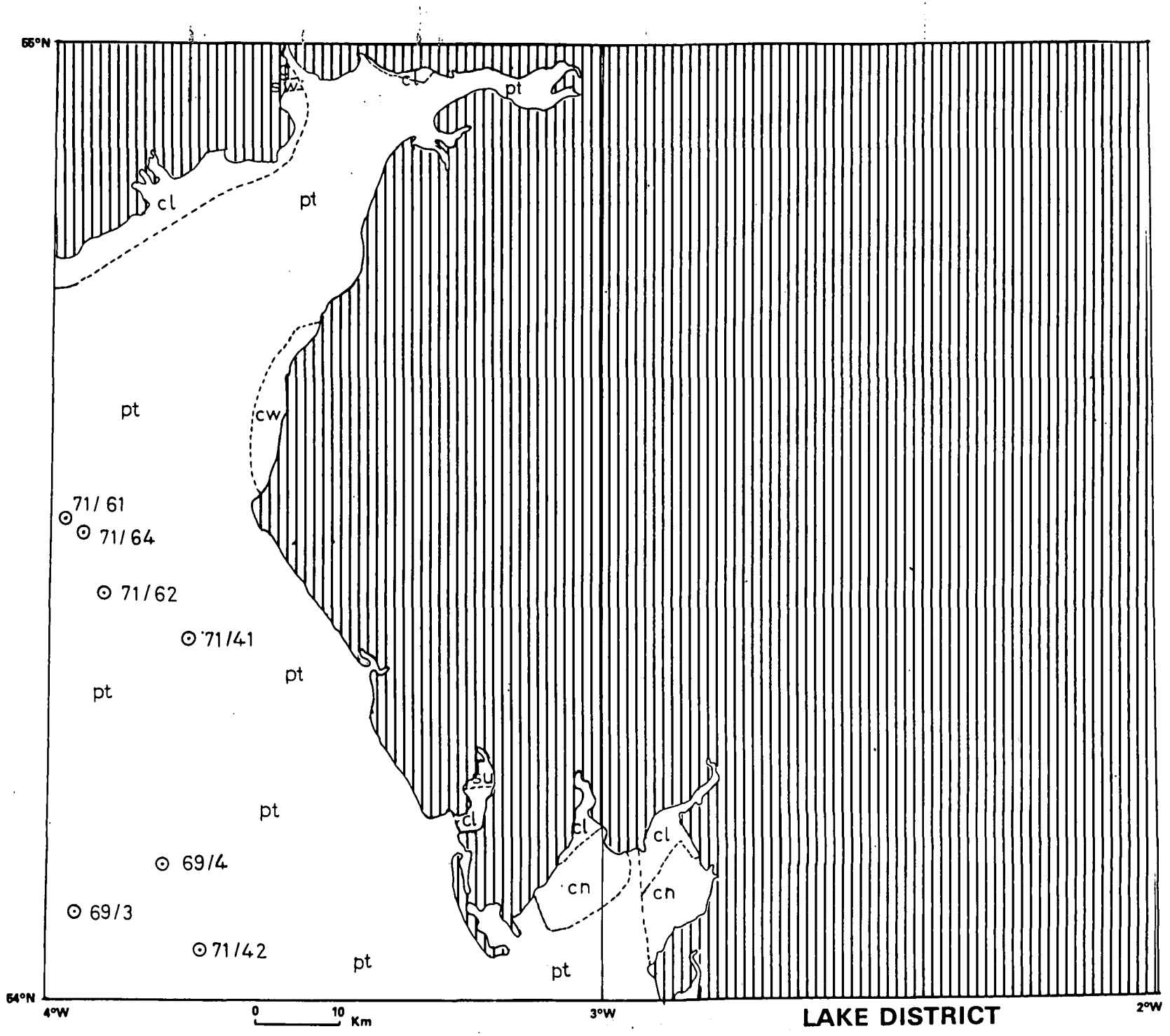
IGS 1264 1000 1/75

Borehole No 74/146	Area Isle Of Man	Block No 112 - 15	
Latitude 54° 32·6 N		I.G.S regd No 54/05/191	
Longitude 4° 0·6 W		Water Depth 42 - 48m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red A 7·88 green C 44·26		Spud Date 16.11.74	Completion Date 19.11.74
purple A 72·14		Status Not Completed Technical problems	Final Depth bs.b. 34·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
ELANDRIAN		10				SANDY GRAVEL, with clayey sand layers.			Hole abandoned due to 6" casing breaking and unsuccessful recovery attempts.
PLEISTOCENE		20 30				CLAY, red / brown, stiff with more sandy layers.			
		40 50				END OF BOREHOLE			

IGS 1284 1000 1/75

fig 4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71/61
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69/4
69/3
71/42

Borehole No 69 / 3	Area Lake District	Block No 113 - 26	
Latitude 54° 5' 25" N		I.G.S regd No 54/04/64	
Longitude 3° 56' 45" W		Water Depth 40.5m	Rig MV HEATHERGATE
Other Position Fixing Methods		Objectives Stratigraphic	
Decca Red B20.03 Green 47.88		Spud Date 8.9.69	Completion Date 10.9.69
		Status Completed	Final Depth bs.b. 44.95m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE To RECENT		0				SAND brown - grey, fine - coarse with some fine gravel.			rock roller washings
		10				SILTY CLAY brown, very sandy			rock roller washings
		20							
						BOULDER CLAY dark grey, stiff			rock roller washings
		30				SAND dark grey, medium - coarse grain size.			rock roller washings
						BOULDER CLAY, brown - dark grey at base. slightly silty, stiff			Diamond core barrel
		40							rock roller washings
TRIASSIC						MARL red and green with layers of gypsum			Diamond core barrel
		50				END OF BOREHOLE			

IGS 1254 1000 1/75

Borehole No 69/4	Area Lake District	Block No 113 - 27	
Latitude 54° 08'. 39" N		I G S regd No 54/04/60	
Longitude 3° 47'. 38" W		Water Depth 30m approx	Rig M V HEATHERGATE
Other Position Fixing Methods		Objectives Stratigraphic	
Decca Red B10.60 Green H 30.14		Spud Date 10.6.69	Completion Date 11.6.69
		Status Completed	Final Depth bs.b. 25.9m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT						SAND, pale brown, fine to medium, quartz, with shells scattered throughout.			
		10				MUD, grey, soft, a few shell fragments.			
						SILT OR FINE MUDDY SAND, grey			SAND, brownish grey, medium grained, with a few shells.
		20				MARL AND BOULDER CLAY, red/brown slightly sandy/silty mixture of above solids.			BOULDER CLAY brown, clayey sandy, with pebbles up to 3cms.
TRIASSIC						MARL, chocolate coloured with irregular green bands. Many irregular gypsum bands.			CLAY, red+coarse, ill graded sand with fragments of rock, red+green marl+ gypsum.
		30				END OF BOREHOLE			Core badly broken
		40							
		50							

IGS 1284 1000 1/75

Borehole No 71/41	Area Lake District	Block No 113 - 17	
Latitude 54° 22'·55" N		I.G.S regd No 54/04/80	
Longitude 3° 44'·75" W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 17.7.71	Completion Date 18.7.71
Decca Green F31.55 Purple A79.64		Status	Final Depth bs.b. 44 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
HOLOCENE — QUATERNARY						MUD, grey, brown.			
						CLAY grey, brown.			
						CLAY grey, brown with shell fragments.			
						CLAY grey, fine sand and shell fragments.			
		10				CLAY Dark grey.			
						CLAY dark grey, smell of H_2S.			
						CLAY very dark grey, smell of H_2S.			
		20				CLAY grey, slightly brownish clay, smell of H_2S.			
						CLAY, brown, 1 small angular pebble.			
PLEISTOCENE						BOULDER CLAY red, brown, sandy.			
						BOULDER CLAY, broken fragments of Red Sst			
PERMIAN AND TRIASSIC		30				SAND, red, very clean			
						SANDSTONE red, medium grained with coarse subrounded grains of quartz. Bedding throughout at 25°-30° to horizontal.			
		40				SANDSTONE red, fine to medium grain size, 20° dip.			
						SANDSTONE, red, fine to medium grainsize, numerous joints, poorly consolidated. dip 45°.			
		50				END OF BOREHOLE			

IGS 1284 1000 1/75

Borehole No 71/42	Area Lake District	Block No 113 - 27	
Latitude 54° 3'.15" N		I.G.S Regd No 54/04/81	
Longitude 3° 43'.19" W		Water Depth 37-42 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging.		Spud Date 19.7.71	Completion Date 21.7.71
Decca R:B14.23 G:I30.76 P:A69.53		Status Completed.	Final Depth bs.b. 55m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT						SAND Very fine sandy Mud with shell fragments.			
						SAND Fine sand with small angular pebbles and shell fragments			
						FINE SAND			
		10				GRAVEL Fine gravel, pebbles, large % of shell fragments broken and whole			
						CLAY stoneless with fine sand and some very small shell fragments.			
PLEISTOCENE.		20				BOULDER CLAY, red, brown sandy with numerous pebbles, very stiff.			
						Fine Sand 26.0m			Rock roller water washings
		30				Sand and rock chippings. 32.0m			" " " "
						red-brown silt. 34.0m			" " " "
		40				Red-brown silt 42.8m			" " " "
						stiff red brown boulder clay. 42.8m - 45.4m			ONE CORE
						red brown silt. 48.0m			Rock roller washings.
		50				Brown clay with pieces of green shale.			CORE

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Borehole No 71/42	Area Lake District	Block No 113 - 27	
Latitude 54° 3'. 15"N		I.G.S Regd No. 54/04/81	
Longitude 3° 43'. 19"W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives	
		Spud Date 19.7.71	Completion Date 21.7.71
		Status Completed	Final Depth bs.b. 55m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE						Boulder Clay with pieces of green shale. Some fragments of gypsum and anhydrite?			Core
						Red brown silt			Rock Roller Washings.
						End Of Borehole			
		60							
		70							
		80							
		90							
		100							

IGS 1284 1000 1/75

Borehole No 71/61	Area Lake District		Block No 113-16
Latitude 54° 29' 98" N		I.G.S regd No 54/04/82	
Longitude 3° 58' 30" W		Water Depth 40-42 m.	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 12.9.71	Completion Date 14.9.71
Decca Green D35.04 Purple A72.18		Status. Completed	Final Depth bs.b. 31.50 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT						GRAVEL. shelly, sandy with some mud.			Drilled by Shell and auger to 12.0m. by rock roller to 18.5m by Core barrel to 31.5m Biostratigraphy: Age - Indeberminate
						SAND. medium - coarse, shelly.			
						GRAVEL. coarse, sandy, pebble up to 4cm.			
						GRAVEL, coarse, muddy, sub-rounded pebbles, ? Stoney Boulder Clay			
		10				CLAY. greenish grey, silty, micaceous. Occasional shell fragments. ? lacustrine			
PERMIAN AND TRIASSIC		20				SANDSTONE. mainly red-brown but with pale green and white patches; sand grains sub angular to well rounded; broken to 24.00m			
						SANDSTONE, red-brown, broken from 24.0m - 25.9m			
		30				SANDSTONE, reddish brown, with irregular white and pale green patches, well rounded sand grains			
						END OF BOREHOLE			
		40							
		50							

IGS 1284 1000 1/75

Borehole No 71/62	Area Lake District		Block No 113 - 16
Latitude 54° 25' 33" N		I.G.S regd No 54/04/83	
Longitude 3° 54' 09" W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 25.9.71	Completion Date 28.9.71
Decca Green E 32.88 Purple A 72.58		Status Completed	Final Depth bs.b. 90.0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT		10				SAND, grey, with rare shells.			Drilled by Shell and auger to 49.0m by rock roller to 65.5m by core barrel to 68m by rock roller to 73.5m by core barrel to 74.6m by rock roller to 77m by core barrel to 78m by rock roller to 86.6m by core barrel to 90m
		20				SILT and MUD, grey, with rare shells.			
		30							
		40							
						CLAY, brown with a reddish tinge.			
PLEISTOCENE		50				BOULDER CLAY, brown and red/brown clayey sand and sandy sand with pebbles up to 8cms.			

IGS 1284 1000 1/75

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE		50				BOULDER CLAY, brown and red/brown clayey sand, sandy clay, with pebbles up to 8cms			
		60							
		70							
? PERMIAN / TRIASSIC						MUDSTONE red/brown and green/grey, much disturbed, grey bands showing contortions, traces of gypsum. 7cm band of grey/green mudstone at base of core			
						MUDSTONE AS Above			
		80							Drilled by rock roller
									Biostratigraphy: Age – Middle Triassic, Anisian for Palynomorphs (74·6 – 78·2m)
		90				MUDSTONE, red/Brown with green patches (·56) metres, mainly green/grey, contorted and soft; veins of gypsum throughout. Green band common towards base			
						END OF BOREHOLE			
		100							

INSTITUTE OF GEOLOGICAL SCIENCES

AREA

SUMMARISED BOREHOLE LOG

Ref.	Author

IGS 1284 1000 1/75

Borehole No 71/64	Area Lake District		Block No 113 - 16
Latitude 54° 29' 12" N		I.G.S Regd No 54/04/88	
Longitude 3° 56' 37" W		Water Depth 39 - 45m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 3·12·71	Completion Date 7·12·71
Decca Green D39·18 Purple A73·53		Status Completed	Final Depth bs.b. 92·5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT AND PLEISTOCENE		10				Sand, fine to medium grained, brown, shelly.			Drilled by shell and auger to 20m by rock roller to 77m by core barrel to 79m by rock roller to 90m by core barrel to 92·5m
						Sand, fine silty brown with rare pebbles.			
		20				Clay, grey, sand and silt with some finely comminuted shell debris at base.			Sample down to 90m taken from washings. 90m - 92·5m core.
		30				Clay, sandy and silty, grey or brownish grey			Wash samples mainly sand and silt. It is inferred that the clay has been washed away, otherwise the hole would have collapsed while drilling
		40							
		50							

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Borehole No 71/64	Area Lake District	Block No 113 - 16	
Latitude 54° 29' 12" N		I.G.S regd No 54/04/88	
Longitude 3° 56' 37" W		Water Depth 39-45 m	Rig Whitethorn
Other Position Fixing Methods		Objectives	
Radar Ranging + Decca		Spud Date 3-12-71	Completion Date 7-12-71
		Status	Final Depth bs.b. 92.5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT		60 70				Clay, grey, sand and silt brownish grey.			
PERMIAN AND TRIASSIC		80 90				Sandstone, brick red, medium to fine grained with well rounded to sub rounded grains, friable.			
						Sandstone a/a. Core shows well bedded nature of sst; dips 7° - 8°			
		100				End of Borehole			

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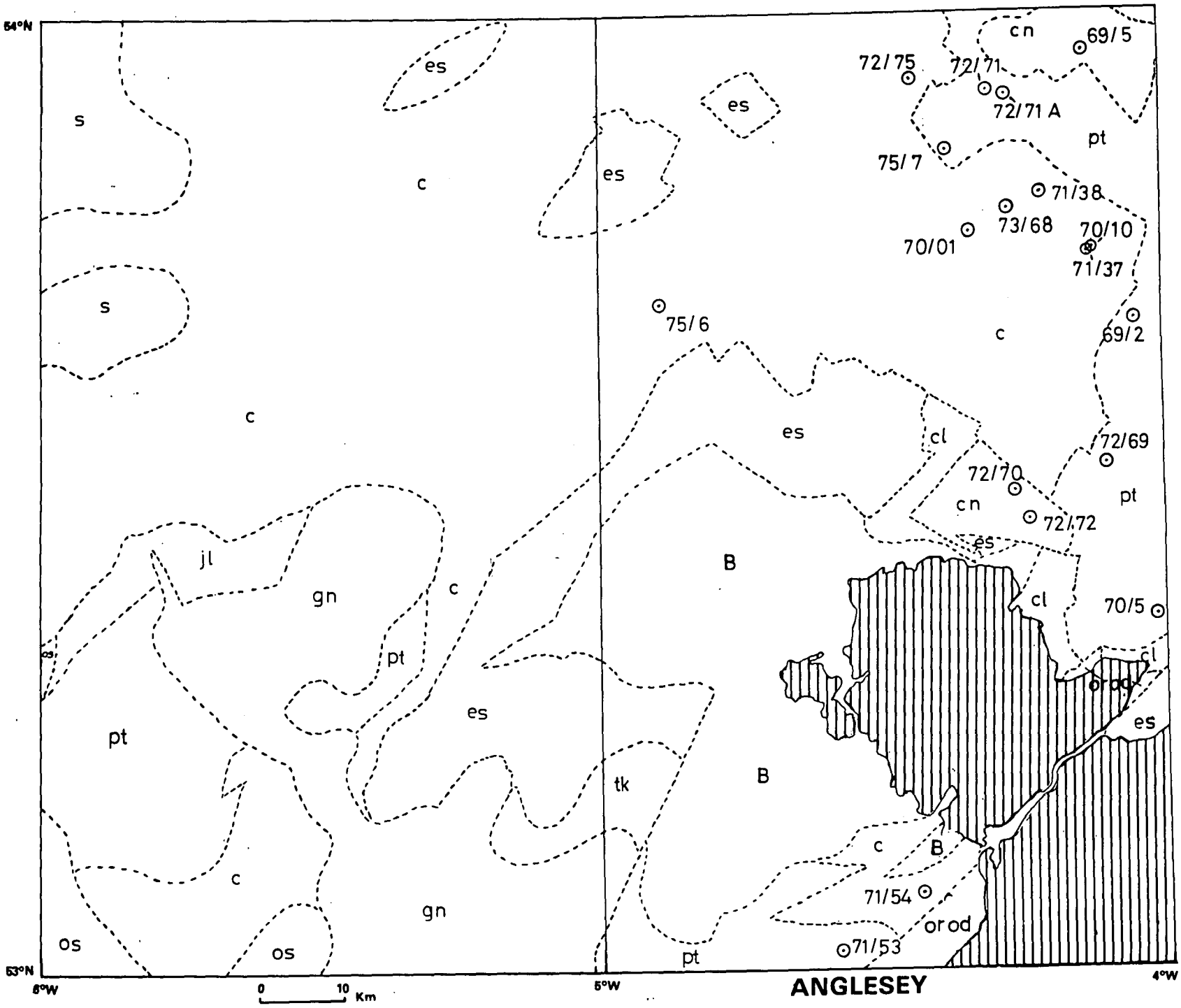
fig 5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72/72
70/5
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71/53

Borehole No 69/2	Area ANGLESEY	Block No 109 - 15	
Latitude 53° 40·3 N		I·G·S reqd No 53/05/29	
Longitude 4° 3·10 W		Water Depth 84 m	Rig Heathergate
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red 04·37 green A35·45		Spud Date 6·6·69	Completion Date 8·6·69
		Status Completed	Final Depth bs.b. 14·02 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY						BOULDER CLAY, brown, very hard with pebbles up to 17cm.			
						SAND, grey. green, fine.			
		10				BOULDER CLAY, brown, very stiff, numerous small round pebbles.			
TRIASSIC						MARL: red and green, soft with fragments of gypsum. Keuper?			Biostratigraphy: Age - Triassic; late Scythian to Anisian
						END OF BOREHOLE			
		20							
		30							
		40							
		50							

IGS 1284 1000 1/75

Borehole No 69/5	Area ANGLESEY	Block No 109/5	
Latitude 53° 57·24'W		I·G·S regd No 53/05/95	
Longitude 4° 8·08'W		Water Depth 49 m	Rig Heathergate
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red C14·96 green H41·84		Spud Date 12·6·69	Completion Date 13·6·69
		Status Completed	Final Depth bs.b. 27·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10				BOULDER CLAY grey brown, soft, silty.			
CARBONIFEROUS		20				MUDSTONE, dk grey, shaley, clayey. Fossils determined as Namurian R2a.			
		30 40 50				END OF BOREHOLE			

IGS 1284 1000 1/75

Borehole No 70/01	Area Anglesey		Block No 109 - 9
Latitude 53° 46.10 N		I.G.S regd No 53/05/59	
Longitude 4° 20.7 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red D14.70 green I42.42 purple H51.79		Spud Date 29.8.70	Completion Date 30.8.70
Radar Ranging		Status Uncompleted	Final Depth bs.b. 6.40 M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Quaternary						Boulder Clay, dk grey and brown pieces of mudst at base.			Gravel, brown, sandy.
Upper Carboniferous Westphalian A						Mudstone dk grey, fossiliferous, silty.			
						End Of Borehole			Hole Abandoned when Core Barrel was Lost.
						Fossil List depth 5m - 6m Curvirimula subovata (Oewar) C. candela (Oewar) Geisina arcuata (Bean) depth 6m - 6¼m carbonicola aff. cristagalli Wright Curvirimula subovata (Oewar)			

10
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Borehole No 70/5	Area ANGLESEY		Block No 109 - 20
Latitude 53° 21 · 99 N		I·G·S regd No. 53/05/16	
Longitude 4° 01 · 13 W		Water Depth 24 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging and Sextant		Spud Date 19 · 9 · 70	Completion Date 20 · 9 · 70
Decca red D17.70 green C41.54 purple 55.73		Status Completed	Final Depth bs.b. 23 · 5 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
HOLOCENE		10				SAND, grey brown, fine grained, with pebbles upto 4 cm at base.			
						GRAVEL and SAND, pebbles varying in size up to 8 cm.			
PLEISTOCENE						CLAY, red brown, very stiff and sandy with pebbles up to 12 cm at base.			Base of clay according to driller.
?PERMIAN/TRIASSIC		20				SANDSTONE, pale grey, fine, friable poorly bedded, no obvious mica or plant debris. glaconite present?			Biostratigraphy; Age – Indeterminate
						END OF BOREHOLE.			
		30							
		40							
		50							

IGS 1284 1000 1/75

Borehole No 70 / 10	Area ANGLESEY	Block No 109 / 10	
Latitude 53° 45·0 N		I·G·S regd No 53/05/190	
Longitude 4° 07·50 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca co-ordinates		Spud Date 7·11·70	Completion Date 8·11·70
		Status Completed	Final Depth bs.b. 11·5 M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10	▽ ▽ ▽ ▽			Boulder Clay, light grey sand and shell fragments on clay - hard red-brown with very large boulders.			
		20				End Of Borehole			
		30							
		40							
		50							

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Borehole No 71/37	Area ANGLESEY	Block No 109 - 10	
Latitude 53° 44·90 N		I·G·S regd No 53/05/100	
Longitude 4° 7·79 W		Water Depth 46 - 49 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 3·7·71	Completion Date 4·7·71
Decca red 03·70 green J38·66 purple A54·86		Status Completed	Final Depth bs.b. 24 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT		0				SAND, brown, muddy with gravel.			Biostratigraphy; Age – Indeterminate
		10				BOULDER CLAY red brown, pebbles up to 3cm.			
CARBONIFEROUS?		20				MUDSTONE, red brown and grey, silty.			
		30				END OF BOREHOLE			
		40							
		50							

IGS 1284 1000 1/75

Borehole No 71/38	Area ANGLESEY		Block No 109 - 9
Latitude 53° 48 · 51 N		I·G·S· regd No 53/05/101	
Longitude 4° 13 · 01 W		Water Depth 56 - 56.5 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar - Ranging		Spud Date 4·7·71	Completion Date 5·7·71
Deccared D4·8 green I43·00 purple A53·32		Status Completed	Final Depth bs.b. 20·4 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10				BOULDER CLAY red brown, sandy, rock fragments include red-brown sst and brown-green shale.			Biostratigraphy: Age - Carboniferous
UPPER CARBONIFEROUS		20				MUDSTONE grey - dk grey			
		30				END OF BOREHOLE			
		40							
		50							

IGS 1264 1000 1/75

Borehole No 71/53	Area ANGLESEY	Block No 109 - 27	
Latitude 53° 1.1 N		I.G.S rogd No 53/05/102	
Longitude 4° 35.05 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 4.9.71	Completion Date 6.9.71
Decca red F7.30 green C37.6 purple A50.73		Status Completed	Final Depth bs.b. 31.5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10, 20				SAND AND GRAVEL			
						BOULDER CLAY, grey, abundant pebbles up to .06m.			
Early to middle Triassic (Late Scythian or Anisian)		30				SANDSTONE grey, coarse, poorly cemented, with quartz towards the base.			
						END OF BOREHOLE.			SILTSTONE sandy, micaceous greenish grey at top becoming grey downwards with traces of plant debris.
		40, 50							

IGS 1284 1000 1/75

Borehole No 71/54	Area ANGLESEY		Block No 109 – 28
Latitude 53° 4·80N		I·G·S regd. No 53/05/103	
Longitude 4° 26·39W		Water Depth 15 – 20M	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 6·9·71	Completion Date 8·9·71
Decca red E23·00 green C41·00 purple A51·26		Status Completed	Final Depth bs.b. 44·50M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10				SAND, Medium – Coarse grained, with shell debris.			Biostratigraphy; Age – Indeterminate
						BOULDER CLAY,			
						SANDY GRAVEL			
		20				BOULDER CLAY, sandy, reddish brown, with pebbles and much fine gravel grade material.			
TRIASSIC? (LITHOLOGY)		30				SANDSTONE, red-brown, with partings of darker mudstones and some clay flake breccias (red brown and green) towards base.			Interpreted as Carboniferous on Anglesey 1:250,000 Solid Geology map. Biostratigraphy indeterminate. Petrology suggests Carboniferous.
		40							
		50				END OF BOREHOLE			

IGS 1284 1000 1/75

Borehole No 72/69	Area ANGLESEY	Block No 109 - 15	
Latitude 53° 31·65 N		I.G.S regd No 53/05/104	
Longitude 4° 6·27 W		Water Depth 48 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 16.10.72	Completion Date 17.10.72
Decca red D14.40 green B35.88 purple A54.8		Status Completed	Final Depth bs.b. 30·10 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT		10				SAND AND GRAVEL BOULDER CLAY			Biostratigraphy Age – Early or Mid Triassic
?PERMIAN. TRIASSIC		30				MUDSTONE red with grey mottling. Occasional indurated micaceous silty mudstones with grey and reddish brown bands (KEUPER facies)			
		40				END OF BOREHOLE			
		50							

IGS 1284 1000 1/75

Borehole No 72/70	Area ANGLESEY		Block No 109 - 19
Latitude 53° 29·80 N		I·G·S rogd No. 53/05/105	
Longitude 4° 16·40 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red E00·10 green A46·57 purple A52·8		Spud Date 17·10·72	Completion Date 18·10·72
INTERSCAN SEXTANT.		Status Completed	Final Depth bs.b. 24·5 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT		10				Sand and medium gravel.			
						BOULDER CLAY			
CARBONIFEROUS (NAMURIAN)		20				MUDSTONE dk grey, black, pyritic with shales. Occasional thin grey lst units and arenaceous layers. Very thin ? calcite veins along micro-fractures.			
		30				END OF BOREHOLE			
		40							
		50							

IGS 1284 1000 1/75

Borehole No 72/71	Area ANGLESEY		Block No 109 - 4
Latitude 53° 54·78 N		I.G.S. regd No 53/05/106	
Longitude 4° 18·64 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 19.10.72	Completion Date 20.10.72
Decca red D01.74 green H42.46 purple A52.85		Status Uncompleted	Final Depth bs.b. 7.50 M

Age	Form^{n}	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY						GRAVEL, with Boulder Clay			NOTE! green decca lane maybe -1 :- green H42.46 (?H41.46)
						BOULDER CLAY, brown, hard.			
		10				END OF BOREHOLE			Hole terminated when anchors dragged
		20							
		30							
		40							
		50							

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Borehole No 72/71 A	Area ANGLESEY		Block No 109 - 4
Latitude 53° 54.66		I.G.S reqd No 53/05/107	
Longitude 4° 16.59		Water Depth 49 - 55.5m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging.		Spud Date 20.10.72	Completion Date 21.10.72
Decca red D1.67 green H42.56 purple A52.64		Status Completed	Final Depth bs.b. 24 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT						GRAVEL, medium with shelly sand.			Biostratigraphy: Age:-Indeterminate
		10				BOULDER CLAY, brown/grey			
		20							
PERMIAN/TRIASSIC						MUDSTONE and silt, brick red with green patches and streaks gypsum is abundant throughout			
						END OF BOREHOLE			
		30							
		40							
		50							

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Borehole No 72/72	Area ANGLESEY	Block No 109 - 19	
Latitude 53° 28·11 N		I·G·S rogd No 53/05/108	
Longitude 4° 14·59 W		Water Depth 42 M	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 30·10·81	Completion Date 31·10·81
Decca red E00.00 green B33·90 purple A53·80		Status Completed	Final Depth bs.b. 20·66 M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT						GRAVEL. shelly and sandy.			
		10				BOULDER CLAY. grey and brown locally laminated; relatively sparse angular stones but with bouldery layers at about 7·0m and 8·5 - 9 m			
CARBONIFEROUS ?		20				MUDSTONE. grey, soft, silty			
						END OF BOREHOLE			SILTSTONE. grey, laminated with thin sandy laminae small plant fragments
		30							
		40							
		50							

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Borehole No 72/75	Area ANGLESEY		Block No 109 - 3
Latitude 53° 55 · 75 N		I·G·S	regd No 53/05/109
Longitude 4° 26 · 65 W		Water Depth 48m	Rig Whitethorn
Other Position Fixing Methods		Objectives	Stratigraphic
Decca red D11·32 green H32·27 purple A50·82		Spud Date 5·11·72	Completion Date 6·11·72
Sextant Fix		Status Uncompleted	Final Depth bs.b. 12·0M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT									GRAVEL, sandy, shelly. pebble up to 2cm.
						BOULDER CLAY, brown, stiff sandy. shell fragments, small pebbles.			
		10				SAND, fine with ? boulders at some horizons.			Hole abandoned at 12·0m because of weather conditions.
						END OF BOREHOLE			
		20							
		30							
		40							
		50							

IGS 1284 1000 1/75

Borehole No 73/68	Area ANGLESEY	Block No 109 - 9	
Latitude 53° 47.57 N		I.G.S regd No 53/05/173	
Longitude 4° 16.41 W		Water Depth	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 29.11.73	Completion Date 30.11.73
Decca red D8.94 green I42.58 purple A52.63		Status TERMINATED	Final Depth bs.b. 6.25m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY						SAND AND GRAVEL, with shell.			Biostratigraphy Age – Upper Carboniferous (4.5m) Age - Indeterminate (6.25m)
CARBONIFEROUS NAMURIAN – WESTPHALIAN						CLAY grey. SANDSTONE, dk grey, fine with carbonaceous material dips 45° END OF BOREHOLE			Terminated due to drilling difficulties

10
20
30
40
50

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Borehole No 75/6	Area ANGLESEY	Block No 109 – 7	
Latitude 53° 41.81 N		I.G.S regd No 53/05/188	
Longitude 4° 53.56 W		Water Depth 53 M	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 16.4.75	Completion Date 20.4.75
Decca red F07.15 green H 46.36 (3B		Status Completed	Final Depth bs.b. 67.85M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT		10				SAND, fine - medium.			Biostratigraphy: Age - Carboniferous; Post Tournaisian (46.15 – 65.9m) Age - Indeterminate; (66.2 – 67.2m)
						GRAVEL with COBBLES			
QUATERNARY		20 30 40				TILL very sandy boulder clay			
UPPER CARBONIFEROUS		50				MUDSTONE, grey with subordinate Sandstone and thin coals.			

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Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
UPPER CARBONIFEROUS		50 60 70 80 90 100				MUDSTONE grey with subordinate sandstone and thin coals.			
						END OF BOREHOLE			

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53/05/18	M. Parkin

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Borehole No 75/7	Area ANGLESEY	Block No 109 - 4	
Latitude 53° 51·23 N		I·G·S regd. No 53/05/189	
Longitude 4° 22·98 W		Water Depth 52 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 24·4·75	Completion Date 26·4·75
Decca red D11·90 green H46·25 purple A51·33		Status Terminated	Final Depth bs.b. 27·10m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE - RECENT		10				SAND. GRAVEL. shell fragments passing into boulder clay.			Biostratigraphy: Age - Indeterminate
PERMIAN / TRIASSIC		20				SANDSTONE, red, fine - medium grained with marl partings. Very micaceous. current bedding and reduction spots present.			
		30				END OF BOREHOLE			Rods snapped at 27.1m Hole terminated due to inability to dish successfully.
		40							
		50							

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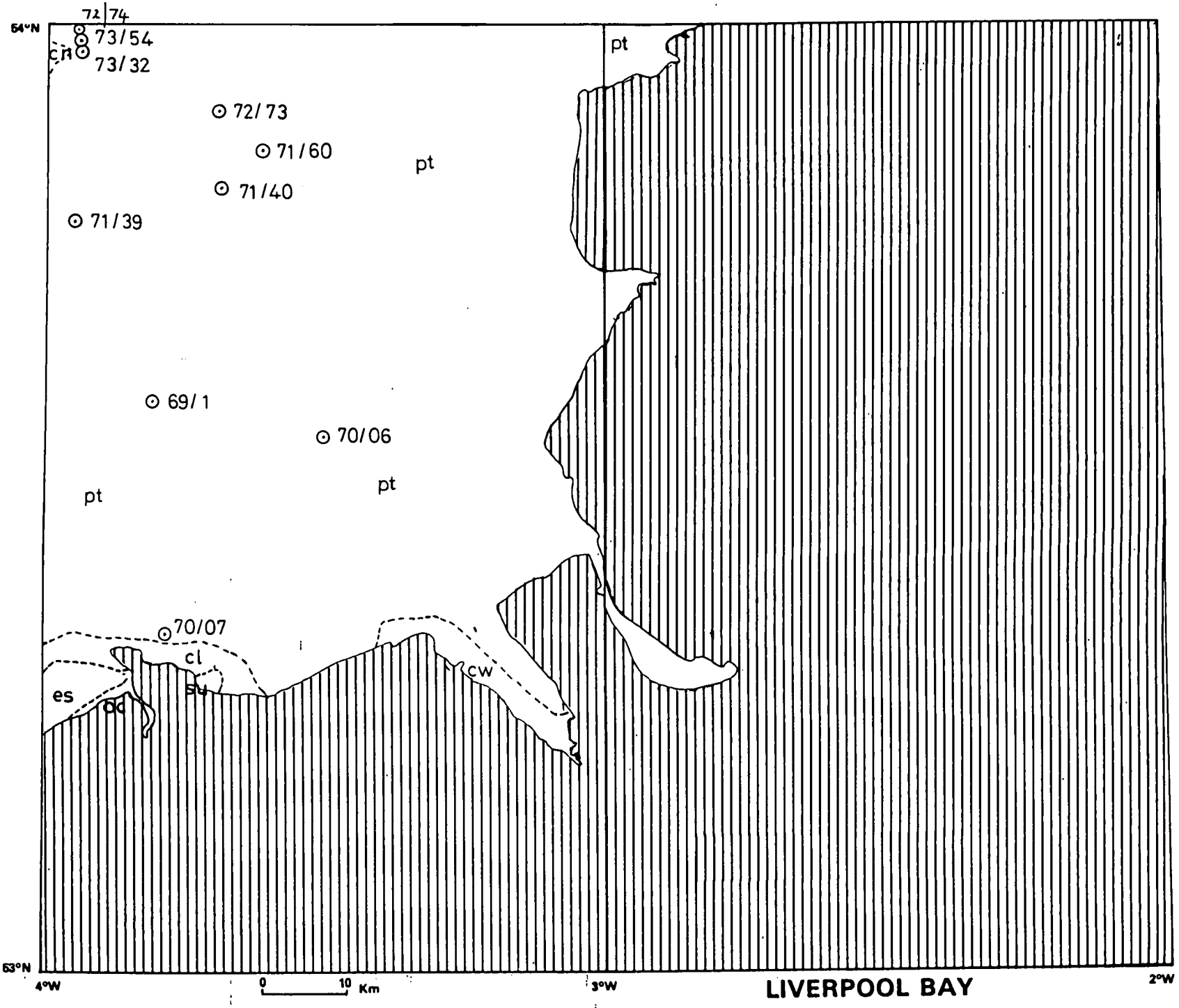
fig 6


72 | 74
54°N
73/54
73/32
72/73
71/60
71/40
71/39
69/1
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10 Km
3°W
2°W
LIVERPOOL BAY

Borehole No 69/1	Area Liverpool Bay	Block No 110 - 11	
Latitude 53° 36 · 12 N		I·G·S regd No 53/04/85	
Longitude 3° 48 · 38 W		Water Depth 42 · 0m	Rig Heathergate
Other Position Fixing Methods		Objectives Stratigraphic	
Decca red C21 · 61 green B43 · 07.		Spud Date 4·6·69	Completion Date 5·6·69
		Status Completed	Final Depth bs.b. 17 · 67 M

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE						Boulder Clay, brown, silty soft – stiff at base.			
TRIASSIC		10				Marl, red brown, soft – hard with thin gypsum veinlets. Keuper Marl ?			
		20				End Of Borehole			
		30							
		40							
		50							

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Borehole No 70/6	Area Liverpool Bay	Block No 110 – 13	
Latitude 53° 33·90 N		I·G·S regd No 53/04/114	
Longitude 3° 30·17 W		Water Depth 33 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 21·9·70	Completion Date 22·9·70
Decca red C12.25 green D31·28 purple A68·14		Status Completed	Final Depth bs.b. 21·0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND HOLOCENE						SAND, brown, fine - coarse, pebbles up to 8cm.			First attempt on hole stopped at 10m when anchors dragged. Second attempt completed hole.
						Boulder, angular, green, volcanic			28 cm long
						SAND, brown, med, gravelly with shell fragments.			
		10				Boulder, volcanic.			
						SAND, brown, coarse.			
?PERMIAN/TRIASSIC						MUDSTONE, red brown with green reduction patches; veins and localized pockets of gypsum.			
		20				END OF BOREHOLE...			
		30							
		40							
		50							

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Borehole No 70/07	Area Liverpool Bay	Block No 110 - 17	
Latitude 53° 21 · 45 N	I·G·S regd No 53/04/148		
Longitude 3° 46 · 83 W	Water Depth 19m	Rig Whitethorn	
Other Position Fixing Methods	Objectives Stratigraphic.		
Radar Ranging	Spud Date 26.9.70	Completion Date 28.9.70	
	Status Completed	Final Depth bs.b. 84.0m.	

Age	Form^{n}	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Holocene						SAND Fine-medium with shell fragments.			Biostratigraphy Age – indeterminate (49m) Age – uncertain; palynomorph assemblage (possibly recycled) of Late Permian (Kazanian – Tatarian) age recovered. (51m)
QUATERNARY						CLAY, gray, shell fragments with fragment of boulder clay.			
		10				BOULDER CLAY, red brown, sandy, stiff with fine grained volcanic rock towards base.			
		20							
TRIASSIC		30				SAND, red, fine grain size. Rare small black shards down to 38m.			
		40							
		50							

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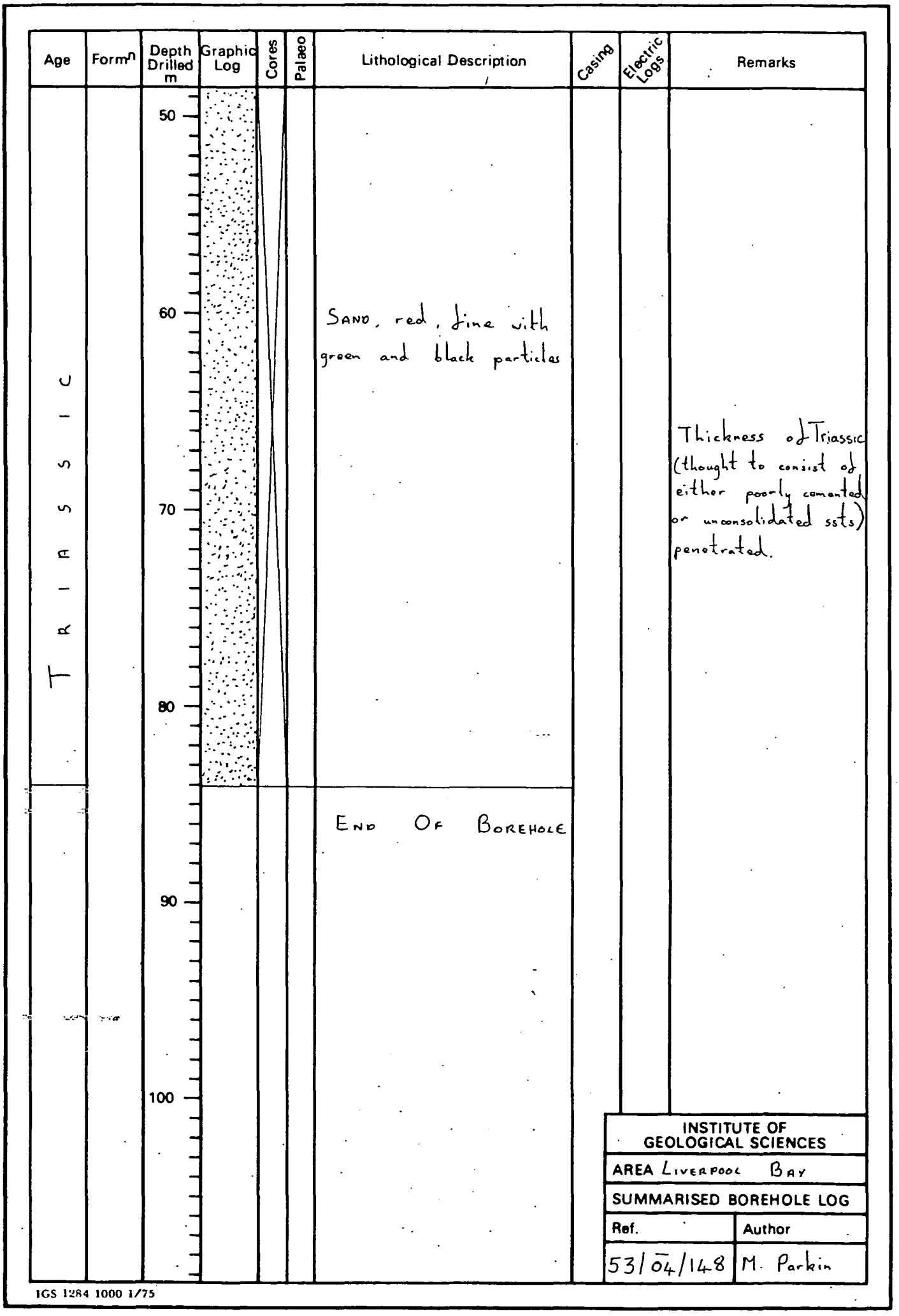
Age
Formⁿ
Depth Drilled m
Graphic Log
Cores
Palaeo
Lithological Description
Casing
Electric Logs
Remarks
TRIASSIC
50
60
70
80
90
100
SAND, red, fine with green and black particles
END OF BOREHOLE
Thickness of Triassic (thought to consist of either poorly cemented or unconsolidated ssts) penetrated.
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SUMMARISED BOREHOLE LOG
Ref.
Author
53/04/148
M. Parkin
IGS 1284 1000 1/75

Borehole No 71/39	Area Liverpool Bay		Block No 110 - 6
Latitude 53° 47.51 N		I.G.S regd No 54/04/153	
Longitude 3° 56.96 W		Water Depth 41 - 46 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 6.7.71	Completion Date 8.7.71
Decca red C16.47 green J42.00 purple A58.68		Status Completed	Final Depth bs.b. 32.0m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
						No Recovery			
						Four pebbles: ?Lr Palaeozoics and one Bunter Sst.			Drilled by rock roller 5.25 - 7.50
?	DRIFT	10				SILT and CLAY, dark brown and laminated. Clay dominant towards base.			Biostratigraphy Age - Upper Carboniferous (26.1 - 26.2m) Age - Indeterminate (30.1 - 30.2m)
?	GLACIAL					CLAY, red. brown, with varying amounts of rock fragments.			
		20				No Recovery			
						CLAY, red brown, with small rock fragments and fragments of red marl, grey green shaley and gypsum.			
UPPER CARBONIFEROUS? TRIASSIC? (LITHOLOGY)		30				MUDSTONE, grey. red-brown at base, with veins and bands of gypsum.			Biostratigraphy: Age - Upper Carboniferous. Palynomorphs at 26.1 - 26.2m
						END OF BOREHOLE			
		40							
		50							

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Borehole No 71/40 A/B	Area LIVERPOOL BAY		Block No 110 – 7
Latitude 53° 49 . 54 N		I G S: regd No 53/04/157	
Longitude 3° 41 . 20 W		Water Depth 33 – 40m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 8.7.71	Completion Date 10.7.71
Decca red C 3·89 green A 33·25 purple A 66.55		Status CAVE IN UNCOMPLETED	Final Depth bs.b. 63m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		0				SAND, shelly with a few pebbles at base.			71/40 A drilled to 36. Hole abandoned as rods jammed in hole.
		10				BOULDER CLAY, red-brown silty and grey sandy clay; rock fragments and pebbles; traces of shells.			
		20							
		30							
						NO RECOVERY			
						Assorted pebbles and cobbles.			No samples taken down to 33 metres; succession as for 71/40 A.
		40				SAND, brown, muddy.			
		50							

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Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		50				SAND, brown, muddy.			
						Gravel and cobbles and trace of sand with some very stiff brown clay.			
						SAND, brown, muddy			
		60				Mud, brown, silty.			
						END OF BOREHOLE			
		70							
		80							
		90							
		100							

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AREA Liverpool Bay

SUMMARISED BOREHOLE LOG

Ref.	Author
53/04/157	M. Parkin

IGS 1284 1000 1/75

Borehole No 71/60	Area Liverpool Bay		Block No 110 – 3
Latitude 53° 51.87 N		I.G.S regd No 53/04/154	
Longitude 3° 36.74 W		Water Depth 32 – 38 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 1.10.71	Completion Date 3.10.71
Decca red B23.0 green A31.22 purple A69.70		Status Uncompleted	Final Depth bs.b. 107 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Pleistocene and Holocene		10				Sand, fine, shelly, muddy with Turritella communis.			
		20				Boulder Clay, chocolate brown no stone content.			
		30				Mud, brown.			
		40				Clay, brown.			
						Mud, brown silty.			
		50				Boulder Clay, brown, with small pebbles			

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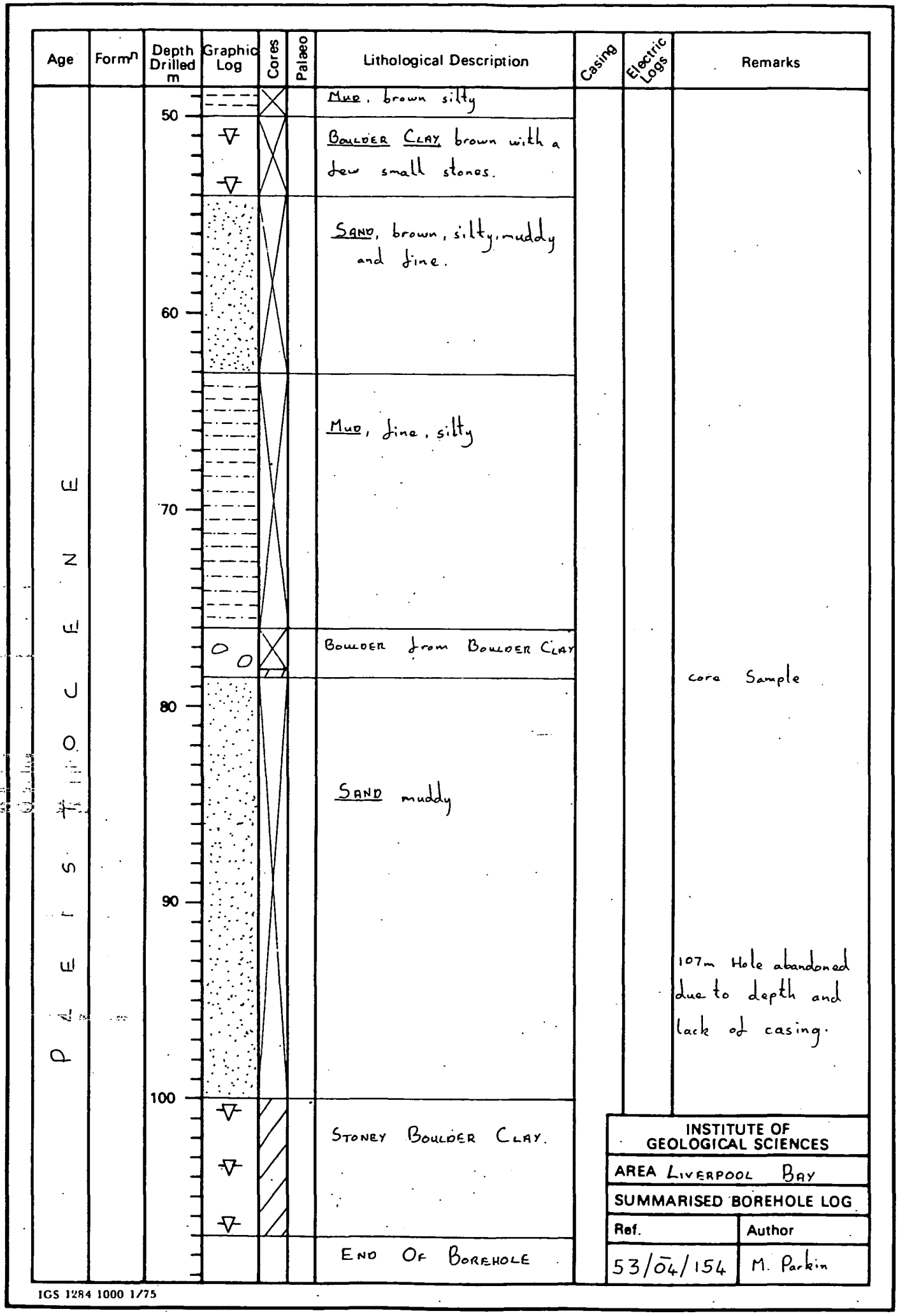
Age
Formⁿ
Depth Drilled m
Graphic Log
Cores
Palaeo
Lithological Description
Casing
Electric Logs
Remarks
PLEISTOCENE
50
60
70
80
90
100
Mud. brown silty
Boulder Clay brown with a few small stones.
Sand, brown, silty, muddy and fine.
Mud, fine, silty
Boulder from Boulder Clay
core Sample
Sand muddy
107m Hole abandoned due to depth and lack of casing.
Stoney Boulder Clay.
End Of Borehole
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AREA Liverpool Bay
SUMMARISED BOREHOLE LOG
Ref.
Author
53/04/154
M. Parkin
IGS 1284 1000 1/75

Borehole No 72 / 73	Area LIVERPOOL BAY	Block No 110 - 2	
Latitude 53° 54 · 41 N		I · G · S regd No 53/04/155	
Longitude 3° 41 · 38 W		Water Depth 35 m	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 2 · 11 · 72	Completion Date 3 · 11 · 72
Decca red B23.20 green J37.91 purple A67.58		Status Completed	Final Depth bs.b. 34 · 5m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PLEISTOCENE AND RECENT						SAND, medium, shelly, slightly muddy.			Biostratigraphy Age — Indeterminate
						GRAVEL, sandy, pebbles up to 5cm.			
		10				CLAY, brown, rather sandy to 10m less sandy and more plastic below, sparse pebbles; possibly lacustrine rather than boulder clay.			
		20				BOULDER CLAY			
?PERMIAN/TRIASSIC						MUDSTONE, brown, silty massive (marl), with irregular gypsum vainlets; greenish bands and patches from 32 · 8m – 33 · 7m			
		30				END OF BOREHOLE			
		40							
		50							

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Borehole No 72/74	Area LIVERPOOL BAY	Block No 110 — 1
Latitude 53° 59·01 'N	IGS REG. No. 53/04/156	
Longitude 03°56·40'W	Water Depth 38 - 44 m	Rig WHITETHORN
Other Position Fixing Methods	Objectives STRATIGRAPHIC	
RADAR RANGING	Spud Date 3-11-72	Completion Date 5-11-72
DECCA: Red C3·20; Green H4T·92; Purple A60·53	Status Completed	Final Depth bs.b. 34 metres

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
RECENT AND ?PLEISTOCENE						Gravel, sandy, shelly, cobbles at seabed.			Biostratigraphy Age - Permian
		10				Sand, mainly fine, silty or muddy locally.			
		20				Sand, coarse, gravelly, shelly			
PERMIAN	ST. BEES EVAPORITES / SANDWITH ANHYDRITE / SALTOM DOLOMITE AND SILTSTONE / "GREY BEDS" OF FURNESS	30				Gypsum, siltstone, mudstone. Gypsum. Dolomite. Siltstone and Silty mudstone; some dolomite. Dolomite. Total Depth 34·00 m			PDL. 73/298 Palynology Report Permian or younger. PDL. 72/163 Invertebrate Report. Zechstein 1 or 2
		40							
		50							

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AREA LIVERPOOL BAY

SUMMARISED BOREHOLE LOG

Ref.	Author
53/04/156	A.C.

IGS 1284 1000 1/75

Borehole No 73/32	Area Liverpool Bay	Block No 110 - 1	
Latitude 53° 58.30' N		I.G.S regd. No 53/04/~~84~~18	
Longitude 3° 56.23' W		Water Depth 40 - 44	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 27.7.73	Completion Date 31.7.73
Decca red C3.74 green I32.0 purple A60.4		Status Uncompleted	Final Depth bs.b. 58.50m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
Pleistocene And Recent		10				Boulder Clay, brown with inferred sand horizons.			
Permian - Triassic		20 30 40 50				Sandstone, red, micaceous, friable, fine - medium grained with subangular grains, and red blocky mudstones. Bands of intercalated white fine grained sst and siltst, well cemented, occur. Occasional dendritic manganese staining occurs near the base of the hole. Thin grey/green mudstone bands occur associated with the white sst. dips 15° - 30°			

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Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
PERMIAN / TRIASSIC		50				SANDSTONE As above			
		60				END OF BOREHOLE			
		70							
		80							
		90							
		100							

IGS 1284 1000 1/75

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AREA Liverpool Bay	
SUMMARISED BOREHOLE LOG	
Ref.	Author
53/04/~~184~~ 185	M. Parkin

Borehole No 73/54	Area Liverpool Bay	Block No 110 - 1	
Latitude 53° 58 · 90 N		I · G · S regd No 53/04/188	
Longitude 3° 56 · 40		Water Depth 39 - 43	Rig Whitethorn
Other Position Fixing Methods		Objectives Stratigraphic	
Radar Ranging		Spud Date 7.10.73	Completion Date 8 · 10.73
Decca red C 3.17 green H 47.92 purple		Status Abandoned Bad Weather	Final Depth bs.b. 36.5 m

Age	Formⁿ	Depth Drilled m	Graphic Log	Cores	Palaeo	Lithological Description	Casing	Electric Logs	Remarks
QUATERNARY		10, 20				SAND AND GRAVEL			Biostratigraphy: Age - Late Permian; Kazanian or Tatarian
						SANDY TILL			
PERMIAN	SALTOM SILTSTONE	30				SILTSTONE, grey, calcareous, crossbedding and thin gypsum veins. Dips 5° - 10°			
		40, 50				END OF BOREHOLE			

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