

**The sand and gravel
resources of the country
around Chichester and north
of Bognor Regis, Sussex**

Description of 1:25 000
sheet SU 80 and 90

J. H. Lovell and P. H. A. Nancarrow

The first twelve assessments of British sand and gravel resources were published as a subseries of the Report Series of the Institute of Geological Sciences; subsequent assessment accounts appear as Mineral Assessment Reports of the Institute.

Details of the published accounts appear at the end of this Report.

Any enquiries concerning this report may be addressed to
Head, Industrial Minerals Assessment Unit
Institute of Geological Sciences, Nicker Hill
Keyworth, Nottingham NG12 5GG

PREFACE

National resources of many industrial minerals may seem so large that stocktaking appears unnecessary, but the demand for minerals and for land for all purposes is intensifying and it has become increasingly clear in recent years that regional assessments of the resources of these minerals should be undertaken. The publication of information about the quantity and quality of deposits over large areas is intended to provide a comprehensive factual background against which planning decisions can be made.

Sand and gravel, considered together as naturally occurring aggregate, was selected as the bulk mineral demanding the most urgent attention, initially in the south-east of England, where about half the national output is won and very few sources of alternative aggregates are available. Following a short feasibility project, initiated in 1966 by the Ministry of Land and Natural Resources, the Industrial Minerals Assessment Unit (formerly the Mineral Assessment Unit) began systematic surveys in 1968. The work is now being financed by the Department of the Environment and is being undertaken with the co-operation of the Sand and Gravel Association of Great Britain and independent members of the extractive industry.

This report describes the sand and gravel resources of an area around Chichester and north of Bognor Regis, Sussex, shown on the accompanying 1:25 000 resource map. The field work for the survey was conducted by Messrs P. M. Hopson, P. H. A. Nancarrow and D. Thomas. This report has been compiled by Messrs J. H. Lovell and P. H. A. Nancarrow and additional material has been contributed by Mr P. M. Hopson; the geology section has been adapted from a report prepared by staff of the Institute's East Anglia and South-East England Unit.

Messrs J. D. Burnell, ISO (Chief Land Agent) and G. I. Coleman (Land Agent) were responsible for negotiating access to land for drilling. The ready co-operation of landowners, tenants and sand and gravel operators is gratefully acknowledged.

G. M. Brown
Director

Institute of Geological Sciences
Nicker Hill, Keyworth
Nottingham NG12 5GG

11 May 1983

CONTENTS

SUMMARY	1	TABLES	
INTRODUCTION	1	1 Geological succession of drift deposits and outcropping strata in the survey area	4
DESCRIPTION OF THE DISTRICT	2	2 Mean composition of the gravel fraction of specified samples from the mineral-bearing deposits	6
General	2	3 Summary of statistical results	9
Geology	4	4 Block A: data from IMAU boreholes	10
Composition of the sand and gravel deposits	7	5 Block B: data from IMAU boreholes	11
The Map	8	6 Block C: data from IMAU boreholes	12
Results	9	7 Block D: data from IMAU boreholes	13
Notes on the resource blocks	9	8 Block E: data from IMAU boreholes	14
REFERENCES	17	9 Block F: data from IMAU boreholes	14
Appendix A: Field and laboratory procedures	18	10 Block G: data from IMAU boreholes	15
Appendix B: Statistical procedure	19	11 Block H: data from IMAU boreholes	16
Appendix C: Classification and description of sand and gravel	20		
Appendix D: Explanation of the borehole records	22		
Appendix E: Industrial Minerals Assessment Unit borehole records	24		
 FIGURES			
1 Map showing the location of the resource sheet	2		
2 Schematic block diagram illustrating the drift sequence of the coastal plain of West Sussex	3		
3 Topography and drainage	3		
4 Solid formations cropping out beneath the drift	4		
5 Map showing simplified distribution of drift deposits in relation to the raised beach cliff lines	5		
6 Mean particle size distribution for the assessed thickness of sand and gravel in the resource blocks	9		
7 Grading characteristics of the mineral in block A	10		
8 Grading characteristics of the mineral in block B	11		
9 Grading characteristics of the mineral in block C	11		
10 Grading characteristics of the mineral in block D	12		
11 Grading characteristics of the mineral in block E	13		
12 Grading characteristics of the mineral in block F	15		
13 Grading characteristics of the mineral in block G	16		
14 Grading characteristics of the mineral in block H	17		

MAP

The sand and gravel resources of sheet SU 80 and 90 (Chichester and north of Bognor Regis, Sussex) **in pocket**

The sand and gravel resources of the country around Chichester and north of Bognor Regis, Sussex

Description of 1:25 000 sheet SU 80 and 90

J. H. Lovell and P. H. A. Nancarrow

SUMMARY

The geological maps of the Institute of Geological Sciences, pre-existing borehole information and 138 boreholes drilled for the Industrial Minerals Assessment Unit (IMAU) form the basis for the assessment of the sand and gravel resources of the country around Chichester and north of Bognor Regis, Sussex.

All the deposits in the district that might be potentially workable for sand and gravel have been investigated and a simple statistical method has been used to estimate the volume. The reliability of the volume estimates is given at the symmetrical 95 per cent probability level.

The mineral bearing ground is divided into eight resource blocks, containing between 7.5 and 16.1 km² of potentially workable sand and gravel. For each block the geology of the deposits is described, and the mineral-bearing area, the mean thicknesses of overburden and mineral and the mean gradings of the mineral are stated; detailed borehole data are also given. The geology, the positions of the boreholes and the outlines of the resource blocks are shown on the accompanying resource map.

Notes

Each borehole registered with the Institute is identified by a four-element code (e.g. SU 90 NE 39). The first two elements define the 10-km square (of the National Grid) in which the borehole is situated; the third element defines a quadrant of that square, and the fourth is the accession number of the borehole. In the text of this report the letters SU are normally omitted.

All National Grid references in this publication refer to sites within the 100-km square SU unless otherwise stated. Grid references may be given to eight figures, accurate to within 10 m, or to six figures for more extensive locations, for example farms.

Bibliographical reference

LOVELL, J. H. and NANCARROW, P. H. A. 1983. The sand and gravel resources of the country around Chichester and north of Bognor Regis, Sussex. Description of 1:25 000 resource sheet SU 80 and 90. *Miner. Assess. Rep. Inst. Geol. Sci.*, No. 138.

Authors

J. H. Lovell, BSc
Institute of Geological Sciences
Murchison House
West Mains Road
Edinburgh EH9 3LA

P. H. A. Nancarrow, BSc
Institute of Geological Sciences
Exhibition Road
London SW7 2DE

INTRODUCTION

The survey is concerned with the estimation of resources, which include deposits that are not currently exploitable but have a foreseeable use, rather than reserves, which can only be assessed in the light of current, locally prevailing, economic considerations. Clearly, neither the economic nor the social factors used to decide whether a deposit may be workable in the future can be predicted; they are likely to change with time. Deposits not currently economically workable may be exploited as demand increases, as higher-grade or alternative materials become scarce, or as improved processing techniques are applied to them. The improved knowledge of the main physical properties of the resource and their variability, which this survey seeks to provide, will add significantly to the factual background against which planning policies can be decided (Archer, 1969; Thurrell, 1971, 1981; Harris and others, 1974).

The survey provides information at the 'indicated' level "for which tonnage and grade are computed partly from specific measurements, samples or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout" (Bureau of Mines and Geological Survey, 1948, p. 15).

It follows that the whereabouts of reserves must still be established and their size and quality proved by the customary detailed exploration and evaluation undertaken by the industry. However, the information provided by this survey should assist in the selection of the best targets for such further work. The following arbitrary physical criteria have been adopted:

- a The deposit should average at least 1 m in thickness.
- b The ratio of overburden to sand and gravel should be no more than 3:1.
- c The proportion of fines (particles passing a 0.063 mm B.S. sieve, about $\frac{1}{16}$ mm) should not exceed 40 per cent.
- d The deposit should lie within 25 m of the surface, this being taken as the likely maximum working depth under most circumstances. It follows from the second criterion that boreholes are drilled no deeper than 18 m if no sand and gravel has been proved.

A deposit of sand and gravel that broadly meets these criteria is regarded as 'potentially workable' and is described and assessed as 'mineral' in this report. As the assessment is at the indicated level, parts of such a deposit may not satisfy all the criteria.

Pre-Pleistocene rocks, which are usually consolidated and devoid of potentially workable sand and gravel, are referred to as 'bedrock'; 'waste' is any material other than bedrock or mineral; 'overburden' is waste that occurs between the surface and an underlying body of mineral.

For the particular needs of assessing sand and gravel resources, a grain-size classification based on the geometric scale $\frac{1}{16}$ mm, $\frac{1}{4}$ mm, 1 mm, 4 mm, 16 mm, 64 mm has been adopted. The boundaries between fines (that is, the clay and silt fractions) and sand, and between sand and gravel grade material, are placed at $\frac{1}{16}$ mm and 4 mm respectively (see Appendix C).

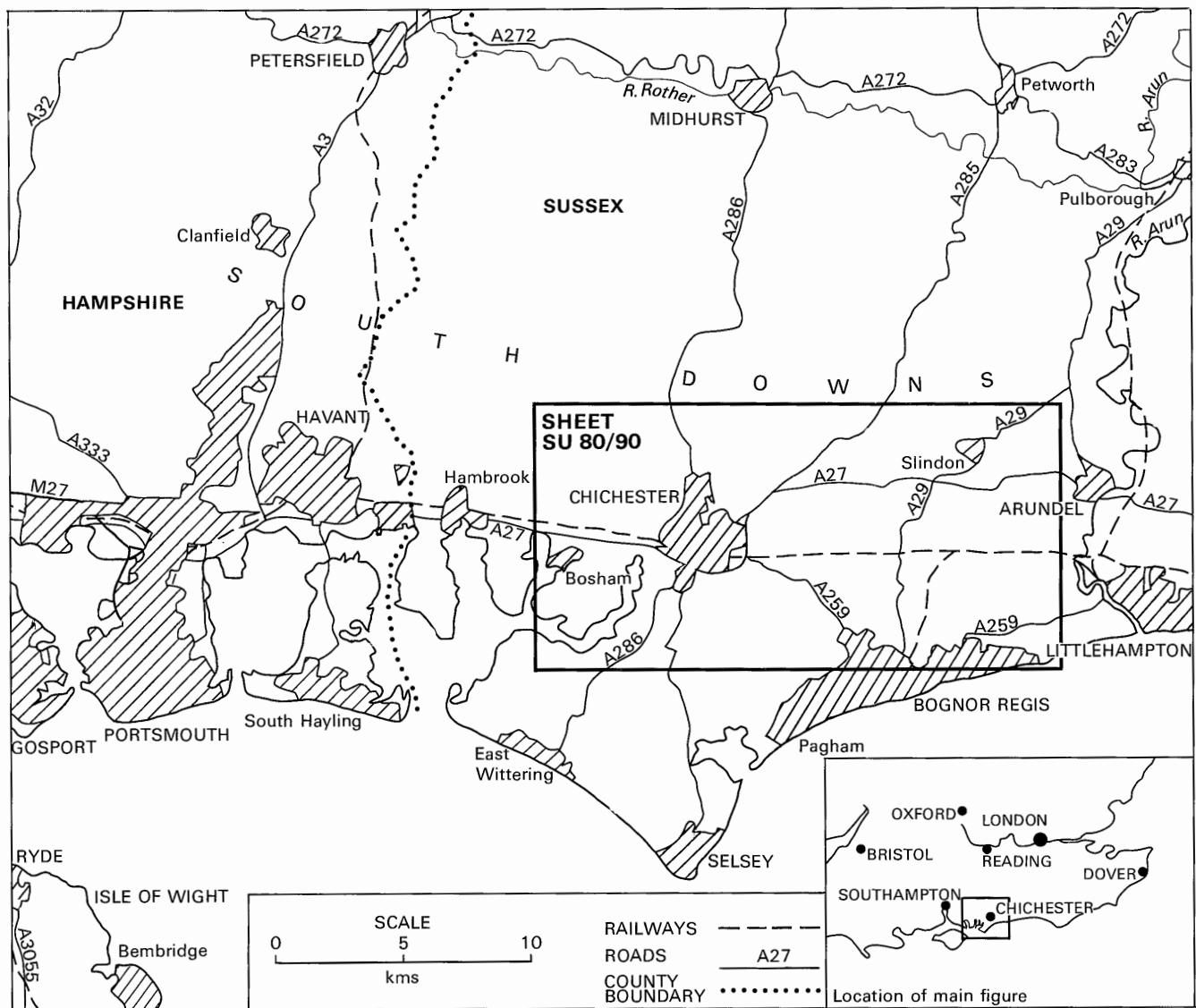


Figure 1 Map showing the location of the resource sheet.

The volume and other characteristics are assessed within resource blocks, each of which, ideally, contains approximately 10 km² of sand and gravel. No account is taken of any factors, for example roads, villages or land of high agricultural or landscape value, which might stand in the way of sand and gravel being exploited, although towns are excluded. The estimated total volume therefore bears no simple relationship to the amount that could be extracted in practice.

It must be emphasised that the assessment applies to the resource block as a whole; valid conclusions cannot be drawn about mineral in parts of a block, except in the immediate vicinity of the actual sample points.

DESCRIPTION OF THE DISTRICT

General

The survey area (Figure 1) is a portion of the West Sussex coastal plain which lies between the South Downs and the sea. This plain consists of two raised beach levels of Quaternary age (Figure 2); the upper (older), lying between about 20 and 45 m above Ordnance Datum (OD), is cut into the dip-slope of the Chalk of the South Downs, and the lower (younger), sloping southwards from about 15 m OD to sea-level at the present-day coast, lies on the planed surface of the folded Chalk and Lower Tertiary deposits at the eastern extremity of the

Hampshire Basin. To the north, the dip-slope of the Chalk rises to about 120 m OD within the limits of the area, and ultimately to over 250 m OD near the scarp edge about 5 km farther north. The Sussex coastal plain is drained by a series of small streams known as rifes which cut through the deposit of brickearth covering most of the lower raised beach and part of the upper raised beach (Figure 3). The weathered top of the brick-earth forms a fertile, relatively stone-free silty soil which, under the influence of mild climatic conditions, supports the thriving agricultural and horticultural activity which dominates the rural part of the area.

The cathedral city of Chichester has been the most important settlement in the area since Roman times and today is a busy cultural, administrative, market and light industrial centre. Tourism is very important to local prosperity with numerous attractions including extensive beaches near the resorts of Bognor Regis and Littlehampton and the scenic hinterland of the South Downs and the Weald. Most of the smaller villages are primarily agricultural communities, although some depend partly on holiday trade and are also popular as retirement centres.

Extensive sand and gravel workings to the east and south-east of Chichester have nearly exhausted the accessible part of the high-quality fan gravel deposits and are now mostly discontinued. North and north-east of Chichester head gravel and the underlying fine sand of

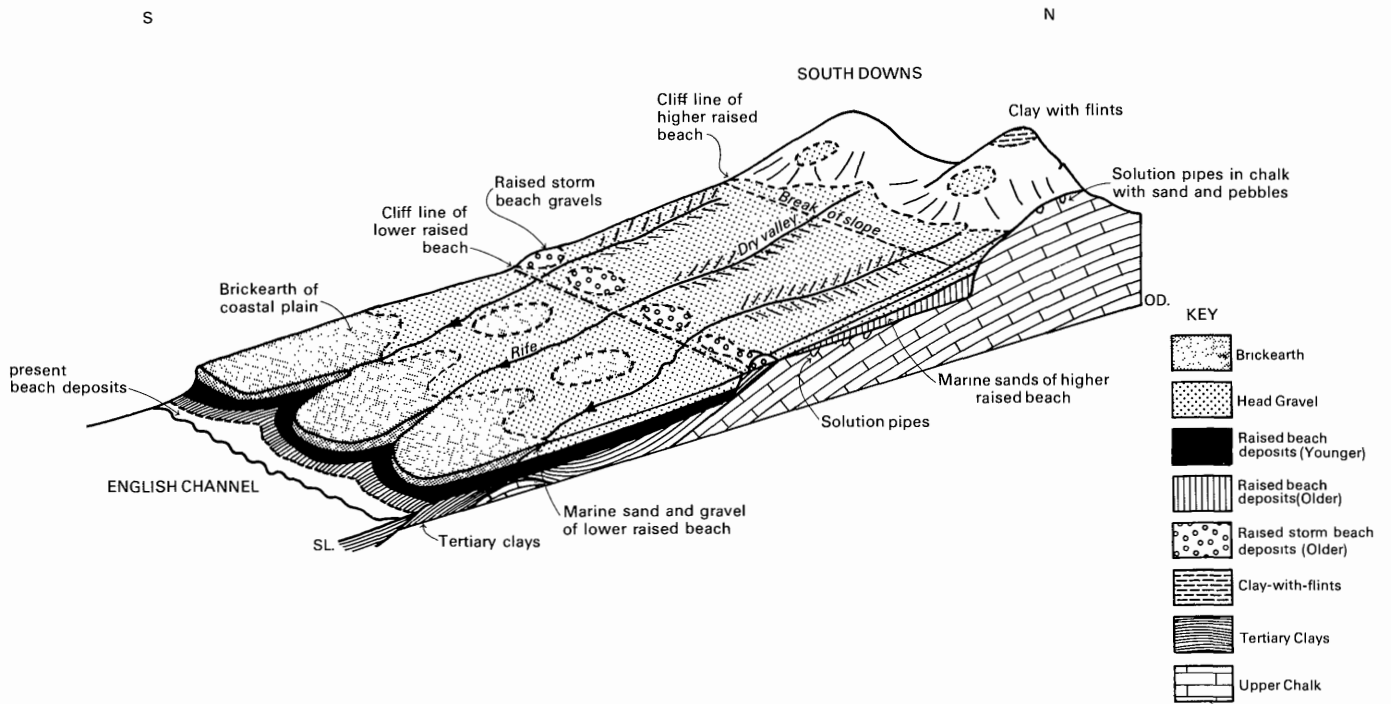


Figure 2 Schematic block diagram illustrating the drift sequence of the coastal plain of West Sussex.

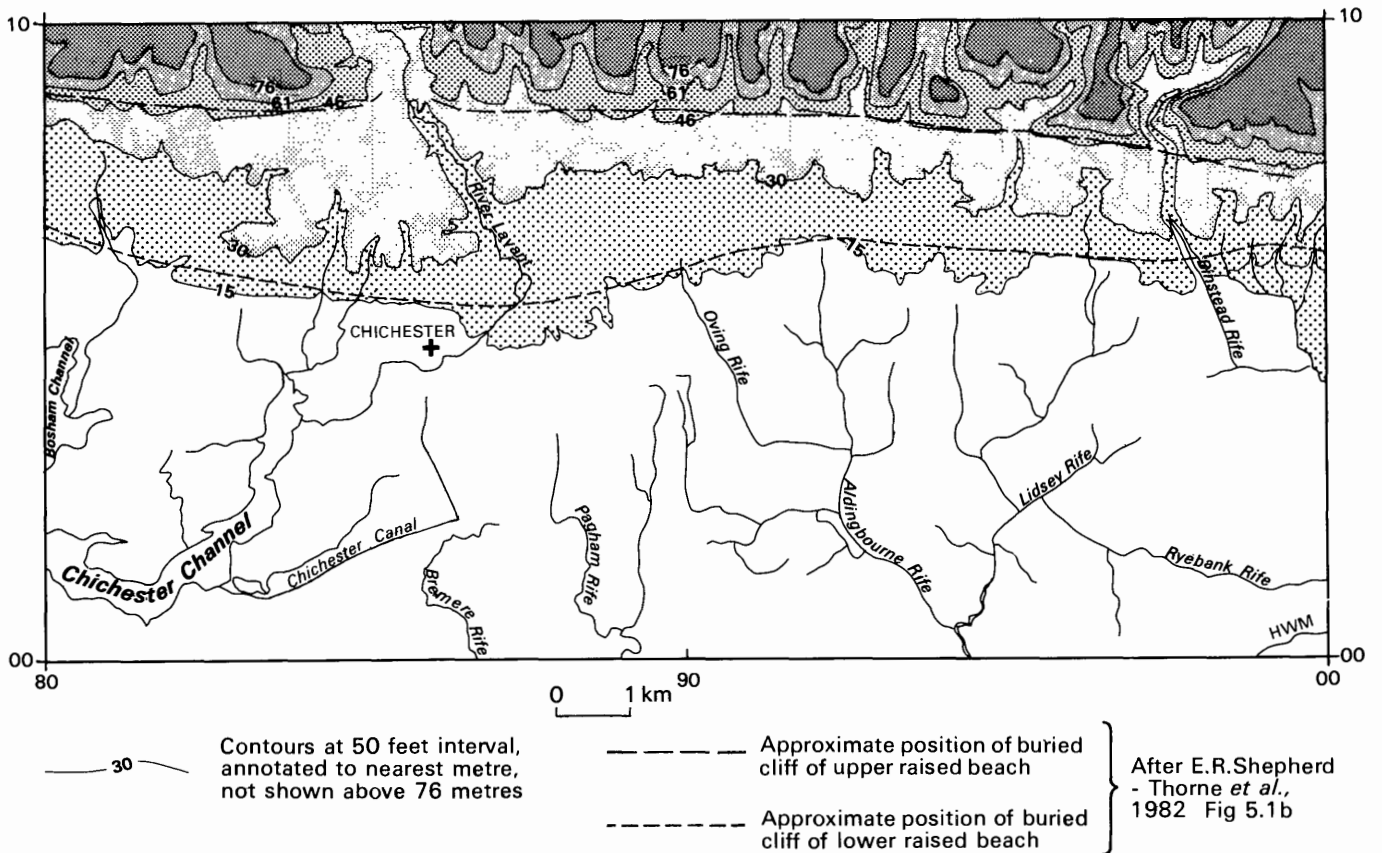


Figure 3 Topography and drainage.

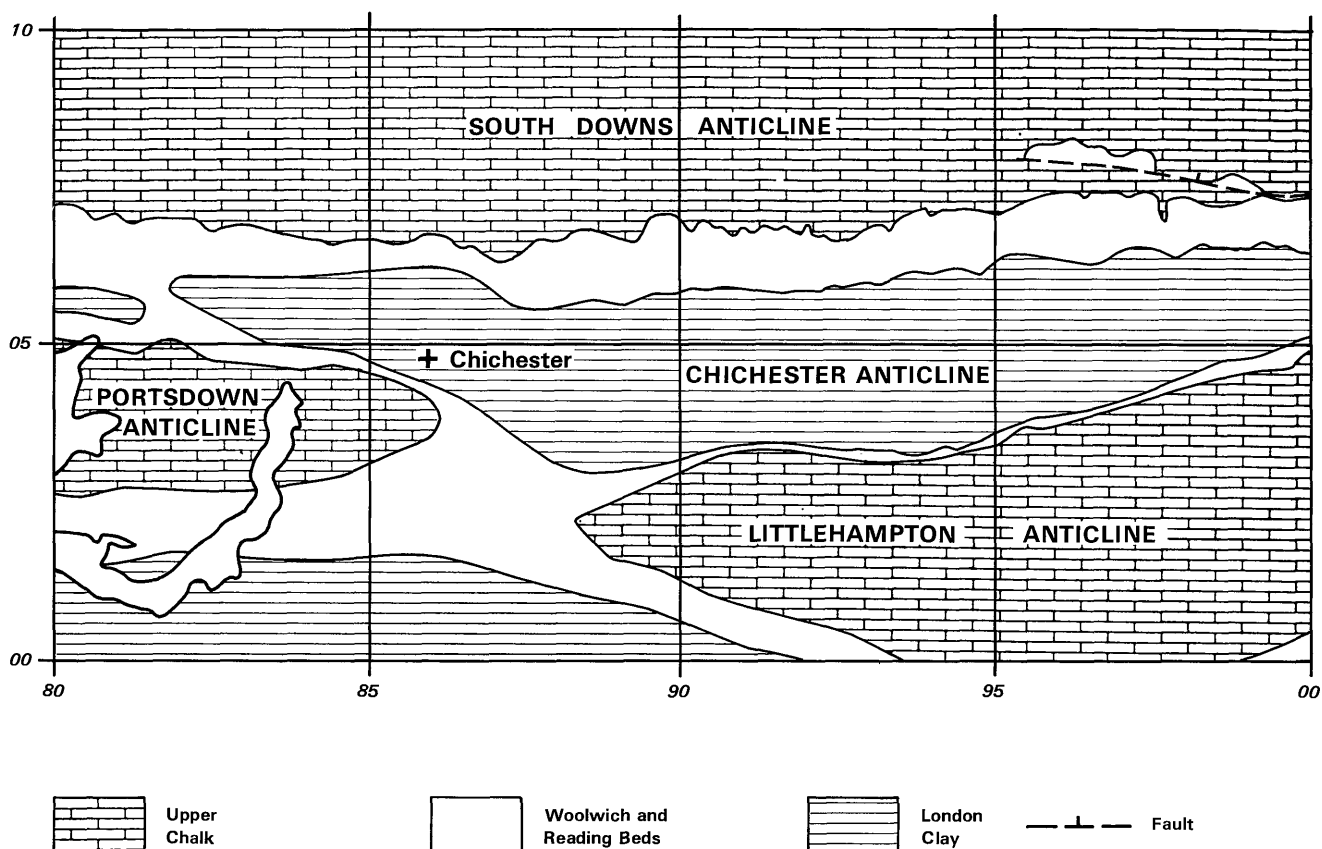


Figure 4 Solid formations cropping out beneath the drift.

the older raised beach deposits have been exploited in several pits, but major workings are at present confined to the area of Boxgrove Common [920 083]. No large-scale extraction of material from the younger raised beach deposits seems to have been attempted, possibly because of the wet nature of those deposits and the availability of adequate supplies of fine sand from the dry workings in the older raised beach deposits. The sandy gravel of the raised storm beach, which lies along the southern edge of the upper raised beach platform, has been worked only in a few small pits, presumably for local use. Chalk, for agricultural use, was extracted in numerous small pits in the northern part of the area and the brickearth and Reading Beds clay have been used for brick making on a minor scale in a few places.

Table 1 Geological succession of drift deposits and out-cropping strata in the survey area.

DRIFT	
Recent and Pleistocene (Quaternary)	<ul style="list-style-type: none"> Alluvium Dry valley deposits River terrace deposits Fan gravel Marine beach and tidal flat deposits Marine or estuarine alluvium Brickearth Head (undifferentiated) Head gravel Raised storm beach deposits Raised beach deposits (younger) Raised beach deposits (older) Clay-with-Flints
SOLID	
Eocene	London Clay
Palaeocene	Woolwich and Reading Beds
Cretaceous	Upper Chalk

Geology

Staff of the Institute's East Anglia and South-East England Unit surveyed the district at the 1:10 000 scale as a preliminary to the sand and gravel assessment programme. This section has been adapted from their report on the area (Shephard-Thorn and others, 1982) to which the reader is referred for further details. The solid and drift deposits are listed in Table 1 and described briefly below.

SOLID (Figure 4)

Upper Chalk Exposures of this formation are confined to a strip along the northern boundary of the area, where it forms the dip-slope of the South Downs, and to sporadic exposures along valley sides and in disused pits. Farther south, drift-covered Upper Chalk occupies the cores of the east-west-trending 'en echelon' Portsdown and Littlehampton anticlines. Typically, it is a pure white limestone with closely spaced bands of nodular and tabular flints. Near the surface it is weathered and affected by cryoturbation. In some working pits older raised beach and head gravel deposits are seen to have collapsed into solution 'pipes' in the Chalk.

Woolwich and Reading Beds The eroded Upper Chalk surface is unconformably overlain by upto 40 m of dark grey 'waxy' clays which are mottled red, green and grey. A basal bed comprising dark grey sands and loams with clasts of flint, chalk and some lignite is generally present. The beds are drift-covered except near West Ashling [811 073] and Tortington [992 060], on the northern limb of the Chichester syncline and south of Eastergate [948 047] on the steeper southern limb. The beds weather to wet and heavy orange-brown clayey soils, and support woodlands.

London Clay East-west-oriented outliers of London Clay occupy the cores of synclines in the central and southern parts of the area. The deposit consists of bluish grey clays with sandy seams, septarian nodules and beds

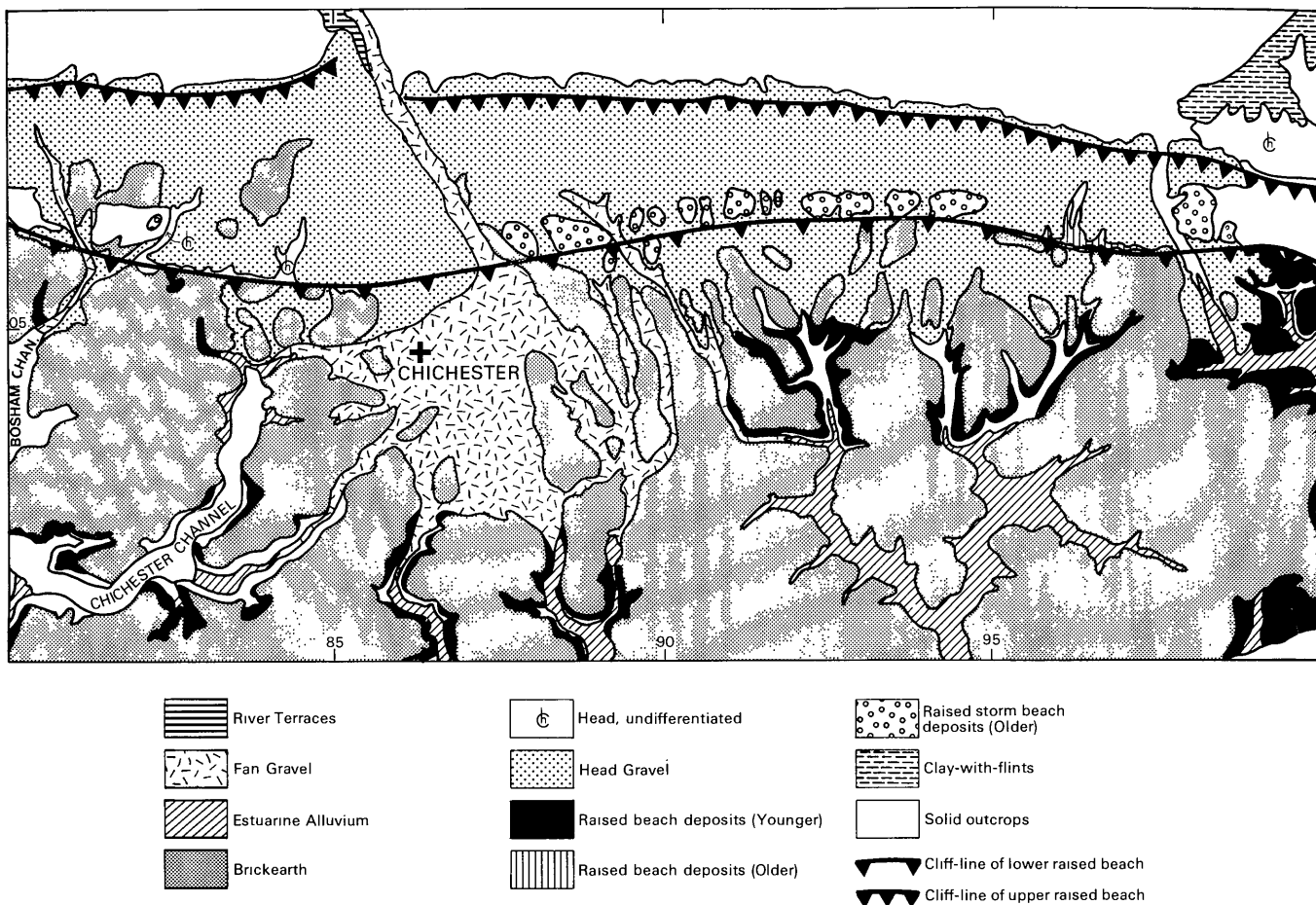


Figure 5 Map showing simplified distribution of the drift deposits in relation to the raised beach cliff lines (from Shephard-Thorn and other, 1982).

of calcareous, shelly sandstone. It weathers greyish brown and forms heavy clay soils. With the exception of that north of Tortington, outcrops are confined to narrow strips along valley sides.

DRIFT (Figure 5)

Clay-with-Flints Thin patches of stiff, reddish brown clay containing broken flints occur as hill cappings on the Chalk outcrop at Halnaker Hill [921 096] and Rewell Wood [985 085] in the north of the district.

Raised beach deposits (older) These deposits, ranging from sandy silt to pebbly fine sand*, crop out sporadically on the upper raised beach platform but are almost completely obscured by overlying head gravel. The thickest development, up to 5 metres, is found at Boxgrove Common and on some parts of the head gravel resting directly on Chalk bedrock; the mean thickness of the deposit is 1.8 m. Locally, a thin bed of subrounded to well rounded flint pebbles is present at the base of the sand, and a hard calcareated breccia of chalk and flint pebbles in a sandy matrix occurs sporadically on the eroded surface of the Chalk. In the eastern part of the area a few small natural exposures are found on the slopes of valleys cut through the upper raised beach platform (e.g. at Slindon Bottom [952 079]). West of the River Lavant no natural exposures are known but the deposits have been encountered in boreholes 80 NW 117, 128 and 80 NE 36.

Raised beach deposits (younger) These deposits occur over most of the lower raised beach platform but are largely concealed by the extensive cover of brickearth and, near the lower raised beach cliff line, by head gravel. Small exposures occur adjacent to the Chichester Channel and along the valley slopes of the rifes to the east; larger areas are seen north of Ford [996 038] and inland from Poole Place [994 003]. The two latter areas are unusual in that they form the only significant outcrops of younger raised beach deposits on the area of Chalk subcrop. The deposits are thickest over the Tertiary subcrop, where they consist of silty quartz sand with sporadic bivalve fossils and, mostly near the base, sandy gravels. Over the Chalk, however, the deposits are thinner, patchy and interspersed with chalky silt and sandy chalk rubble. On some parts of the Chalk subcrop, solifluxion of the overlying brickearth combined with cryoturbation at the top of the Chalk has obliterated the original form of the raised beach deposits, and there remains an apparently structureless mixture of material from each of the three deposits which forms a transition from brickearth down to the Chalk. The sandy deposits are best preserved east of Chichester on the northern 2 to 3 km of the lower raised beach platform from around Oving [903 050] to the eastern limit of the district. The maximum thickness in this part of the district is 4.4 m proved in borehole 90 NE 40, south-east of Walberton. South of Chichester, the deposits are generally thinner, with a maximum of 3.1 m recorded in borehole 80 SE 48. Borehole 80 SW 86 proved 7.0 m of silty fine sand at 2.1 m below OD, but this is considered anomalous for, farther east, bedrock was proved at 3.0 and 4.7 m above OD in boreholes 80 SW 90 and 80 SW 92

* The system of classification of sand and gravel is described in Appendix C.

Table 2 Mean composition of the gravel fraction of specified samples from the mineral-bearing deposits

Borehole number	Sample depth (m)	Lithology (percentage by weight)										
		Flint			Chalk	Quartz and quartzite	Shell fragments, calcite/ aragonite	Sandstone	Limestone	Pyrite & iron oxides	Igneous & metamorphic	Others
		angular to sub-angular	well-rounded	white porous and silicified chalk								
Fan Gravel												
SU 80 NW 118	1.4-3.2	91	trace	8	trace							
SU 80 SE 42	1.5-3.3	79	3	17	trace	trace		trace		trace	trace	
SU 80 SE 46	0.3-2.3	80	4	15	trace	trace						
SU 80 SE 49	0.4-2.8	70	15	4	2	trace		trace	7	trace	trace	
SU 80 SE 57	2.8-5.7	71	trace	27	1		trace	trace	trace			
SU 90 SW 35	1.3-3.1	82	trace	14	2	trace		trace	trace			
Raised Beach Deposits (younger)												
SU 80 NW 121	1.1-3.1	84	8	7	trace	trace		trace				
SU 80 NW 125	3.1-3.8	87	1	11	1				trace			
SU 80 SW 85	1.7-2.9	74	14	9	trace	trace	trace	trace	2	trace	trace	
SU 80 SE 46	2.3-4.1	73	12	6	7	trace		1	trace		trace	
SU 80 SE 57	5.7-6.2	62	5	13	6	trace		trace	3	trace	9	
SU 80 SE 60	2.3-3.3	83	trace	2	15		trace	trace	trace			
SU 90 NW 59	4.1-5.3	86	trace	5	trace	trace	trace	trace	trace	8*	trace	
SU 90 NW 64	2.4-4.3	94	1	2	trace	trace	trace	trace	trace	2*		
SU 90 NW 68	1.5-2.9	78		20	trace	1		trace	trace	trace	trace	
SU 90 NW 71	4.4-5.7	73	18	2	3	trace	trace	trace	trace	2*		
SU 90 NW 72	5.0-6.0	82	7	4	6	trace		trace	trace	trace	trace	
SU 90 SW 35	4.1-5.4	77	1	6	3	1	trace	6†	3	trace	trace	
SU 90 SW 52	1.3-3.4	81	2	4	10	trace		trace	2	trace	trace	
SU 90 SE 21	2.6-4.6	79	1	4	14	trace	trace	trace	1	trace		
SU 90 SE 24	3.3-4.5	71	1	7	14	1	trace	trace	3	1*	1	
SU 90 SE 28	4.9-5.4	86	2	9	1	trace	trace	trace	trace	trace	trace	
SU 90 SE 34	2.0-3.3	90	trace	1	7		trace	1	trace		trace	
SU 90 SE 34	3.9-5.9	79		trace	15		trace	1	4		trace	
SU 90 SE 38	1.7-4.0	98	trace	trace	1	trace	trace	trace	trace	trace	trace	
SU 90 SE 39	1.1-2.6	92	trace	1	5	trace		1	trace	trace	trace	
Raised Beach Deposits (older)												
SU 90 NW 73	5.7-8.0	51	6	42	trace							
SU 90 NW 74	3.3-4.9	33	62	4	trace	trace						
Raised Storm Beach Deposits												
SU 80 NE 44	1.0-3.0	87	6	7		trace		trace				
SU 90 NW 66	2.6-8.0	93	1	5		trace		trace			trace	
Head Gravel												
SU 80 NE 35	3.5-4.2	77		18	4					trace	trace	
SU 80 NE 37	0.2-4.0	91		8		trace		trace		trace		
SU 90 NW 59	2.6-3.1	48		32		trace		20			trace	
SU 90 NW 66	0.2-2.6	82	2	7	8	trace		trace		trace	trace	
SU 90 NW 71	3.4-4.4	58		41	trace			1				
SU 90 NW 72	2.2-3.0	62		38	trace							
SU 90 NW 74	0.2-3.3	90		10								
SU 90 NE 39	4.1-7.2	85	trace	14					trace	trace		

* mostly pyrite

† mostly glauconitic

respectively. The thick sand in borehole 80 SW 86 may, therefore, be a channel- or scour-fill.

Raised storm beach deposits These deposits, consisting mainly of sandy gravel up to about 7 m thick, are found along the southern margin of the upper raised beach platform. They are most prominent to the east of Chichester, where a series of outcrops upto about 1 km wide forms a low hummocky ridge from north-west of Westhampnett [883 062] eastwards to Fontwell [950 073], along the line of the A27. Road cuttings in this area show the deposits resting on bedrock but, farther east, an exposure around Barn's Copse [980 070] overlies fine sand of the older raised beach deposits. Smaller patches are found on the bedrock outcrops south of the A27 near the eastern margin of the district. The only exposure west of Chichester is a small elliptical outlier resting on Reading Beds west of Oakwood House [827 067], though sediments assigned to the older raised beach deposits in boreholes 80 NW 128 and 80 NE 36 show affinities with the raised storm beach deposits and may include thin buried representatives of the latter. The morphology and position of these deposits suggest that they may

represent the remnants of an offshore shingle bar penecontemporaneous with older raised beach deposits.

Head gravel This deposit consists of a sheet of angular flint gravel with a dominantly clayey matrix, overlying deposits of both the upper and lower raised beaches (Figure 2). It is generally regarded as a complex periglacial solifluxion deposit (Shephard-Thorn and others, 1982) containing material from the dip-slope of the South Downs, the local Tertiary deposits and the raised beach deposits. Four separate depositional phases represented by a basal laminated silt ('Lower Brickearth') and two successive layers of clayey gravel separated by a second silt bed ('Middle Brickearth') are recognised in the pits at Boxgrove Common [920 083]. The thin brickearths within the head gravel are distinct from a later, more widespread, brickearth deposit described below.

Head gravel covers most of the platform of the upper raised beach in a zone 2 to 4 km wide, extending from the western edge of the area near Funtingdon [803 083] eastwards to the vicinity of Tortington. The northern edge of this deposit is at approximately 60 m above OD on the dip-slope of the South Downs just north of the

buried cliff-line of the upper raised beach. To the south, head gravel extends down the slope of the lower cliff on the northern part of the lower raised beach (Figure 2). There it is less continuous than on the upper raised beach and thins southwards to about the latitude of Chichester; its southerly limit is largely obscured beneath brickearth deposits which overlap from the south. The general form of the deposit, in section from north to south, is a thin wedge with the thickest development of upto 7 m occurring within 1 km of the northern edge; the maximum thickness south of the lower cliff-line is 4 km.

Head (undifferentiated) A thin deposit of gravelly clay covering a large area south of Rewell Wood has been derived by solifluxion from the Clay-with-Flints on adjacent slopes. Elsewhere, small patches of undifferentiated head deposits occur on the Chalk outcrop in the north of the area and in valleys adjoining the Bosham and Chichester channels; they are thin and of variable composition, having been derived by solifluxion from adjacent deposits.

Brickearth This, the most widespread drift deposit, forms an almost continuous cover to much of the lower raised beach platform and occurs in smaller outlying patches on part of the upper raised beach platform. It is one of the most recent deposits in the area and overlies head and fan gravel deposits in addition to those of the raised beaches. Typically, the brickearth comprises structureless yellowish brown clayey silts, commonly with particulate organic matter but with very little sand or coarser material. In some places however, particularly where it directly overlies raised beach deposits, it is sandy and pebbly in character, containing small angular white flints, chalk pellets and some chalk pebbles. It is generally non-calcareous, but on or close to the underlying Chalk it is locally grey and calcareous at its base. It is remarkably uniform in thickness, being commonly 1 to 2 m and rarely more than 3 m thick over an area of approximately 80 km². This, together with its normally structureless silty nature, suggests a loessic origin but the presence of atypical pebbly, sandy, and chalky lithologies indicates that it has probably undergone local reworking by solifluxion and/or cryoturbation.

Marine or estuarine alluvium These deposits consist mainly of laminated silty clays and fine sands deposited in the lower reaches of rife valleys and by the small streams draining into Chichester Harbour. They are most extensive north of Bognor Regis, along the Aldingbourne and Lidsey rifes.

Marine beach and tidal-flat deposits These include fine mud, silt, sand, shingle and shelly deposits which are accumulating at the present day in the intertidal zone and in salt-marshes around the channels of Chichester Harbour.

Fan gravel The deposits of fluvial gravel have characters reflecting their origin from various source materials, including reworked earlier drift deposits. The gravel includes white, black and brown, angular to well rounded flint; the matrix ranges from chalky clayey silt with some sand to clean sands of quartz or white flint. The deposits form an outcrop only some 200 to 300 m wide along the course of the River Lavant from the northern edge of the area [853 100], north of Lavant village, south-south-eastwards for about 5 km to the southern edge of the upper raised beach platform. To the south and south-west of this point the outcrop broadens abruptly and the deposits form a broad fan with a radius of approximately 3 km on the lower raised beach platform around Chichester and southwards to Runcton [884 022]. Farther south and west, narrow sinuous exposures follow the courses of streams draining westwards to the Chichester Channel and southwards to Pagham

Harbour; the fan gravel deposits pass beneath alluvium in the lower reaches of these streams. To the east of the main fan, a more irregular group of narrow exposures is associated with the rifes near Oving. Boreholes in this area (e.g. 90 SW 35, 80 SE 57) show fan gravel extending beneath the brickearth and resting in some places on younger raised beach deposits and elsewhere on bedrock. The eastern limit of the continuous fan gravel is in the vicinity of Oving village; a narrow extension is incised through the lower raised beach deposits and follows Oving Rife downstream to about 2 km south-east of Oving. Near the western edge of the district a bed of flint gravel in a chalky clay matrix lies along the course of the stream flowing south from Funtingdon to Colner Creek [805 050].

The maximum known thickness of fan gravel deposits is approximately 10 m, recorded near Westhampnett Mill [876 060] (Shephard-Thorn and others, 1982) and adjacent to the cliff-line of the lower raised beach; it thins southwards to about 2 m along the southern edge of the outcrop. The maximum thickness encountered in boreholes for the present survey is 3.0 m (80 SE 52).

River terrace deposits These are restricted to a terrace feature west of the River Lavant, running north from Lavant village [855 090] to the northern edge of the district, and are composed of silt and thin silty chalky flint gravels.

Dry valley deposits These comprise dark brown flinty loams which occur in narrow strips along the floors of dry valleys on the Chalk dip-slope of the South Downs and extend onto the head gravel on the upper raised beach platform; a few reach the lower raised beach platform in the vicinity of Aldingbourne [923 056]. They are believed to be periglacial solifluxion deposits formed when temporary thaws allowed surface water to flow over permafrost in the bedrock. They are mostly only one or two metres thick, but attain a recorded maximum of five metres, and are of the order of 100 m wide; because of their restricted occurrence they do not constitute a significant mineral resource in the terms of this assessment.

Alluvium A few of the rifes to the east of Chichester have minor deposits of freshwater alluvium in their upper reaches; these deposits consist of grey and brown silty clays with some organic sediment and a little gravel and pass downstream into estuarine sediments.

COMPOSITION OF THE SAND AND GRAVEL DEPOSITS

The deposits of the district which contain potentially workable sand and gravel comprise the raised beach deposits (older and younger), raised storm beach deposits, head gravel and fan gravel. The results of pebble-counts showing the lithology of the gravel fractions of selected samples are listed in Table 2.

Raised beach deposits (older) The mineral deposits of the upper raised beach are homogeneous in character; they consist largely of pale olive brown to medium brown fine silty sand, with a mean grading of fines 25 per cent, fine sand 58 per cent, medium and coarse sand 6 per cent, and gravel 11 per cent. The fines are mostly silt grade quartz with some clay, often in thin seams or lenses. The sand consists of very angular to rounded clear quartz grains, rarely with some faint iron staining, with some flint in the coarse sand fraction. The gravel is mostly confined to the basal part of the deposit and usually consists of subrounded to well rounded flint, with some angular to subrounded calcareous chalk.

Raised beach deposits (younger) These deposits comprise two distinctive lithologies: quartz sands and sandy

gravels occurring over most of the Tertiary subcrop, and chalky silt and sandy chalk rubble, with thin sand seams, found over the Chalk bedrock. The largest barren areas in the drift deposits of the resource sheet area, in the northern part of block D and over most of block H, correspond closely with the Chalk subcrops of the lower raised beach platform and contrast with blocks E, F and G, and the south-western part of block D, over the Tertiary subcrop, where most of the boreholes proved mineral in the younger raised beach deposits. The barren area in the east of block D is part of the sandy facies where the silt content is too high or the deposit too thin to be regarded as mineral. The mean grading of the mineral deposits is fines 19 per cent, sand 65 per cent and gravel 16 per cent.

In the sandy facies, the fines are mostly quartz silt, with some clay, and carry most of the colour of the deposit, ranging from medium brown to pale olive brown, with some strong brown ferruginous staining in places. The sand is predominantly fine and medium with some coarse grade material, and consists of angular to well rounded quartz with some flint, rare chalk pellets and a few shell fragments; some thin seams are rich in darker (?heavy) minerals. The gravel fraction is mostly angular to rounded flint with chalk upto a maximum of about 15 per cent and various other rock types present upto a few per cent; the latter include sandstone (some glauconitic), limestone, igneous rocks, and pyrite. The last-named is most common over the London Clay and usually occurs as irregular fine gravel size fragments with a thick oxide coating. Shell debris is widespread in trace quantities.

The mineral in the chalky facies generally has a higher fines content, composed mostly of chalky silt. Quartz, chalk and flint are found in the sand fraction, and pebbles of chalk and flint with some fresh nodular flint form the gravel. Other rock types are rare, only sandstone being found in greater than trace amounts.

Raised storm beach deposits These consist typically of clean sandy gravels, but range to 'very clayey' gravel or sandy silt in places where they incorporate material from the underlying Tertiary or older raised beach deposits, or have been affected by solifluxion. They have a mean grading of fines 14 per cent, sand 44 per cent and gravel 42 per cent. The fines are mostly silt grade quartz, some with strong iron staining. The fine and medium sand is angular to subrounded quartz with some flint, and the coarse sand is mostly angular white flint with some darker freshly broken flint. The gravel consists of angular to subrounded flint, some with a thin white patina, with only traces of other rock types.

Head gravel These deposits, consisting predominantly of coarse, angular flint gravel in a clay matrix, have a mean grading of fines 26 per cent, sand 19 per cent, fine gravel 25 per cent and coarse gravel 30 per cent. Wide lateral and vertical variations occur in the fines/gravel ratio and in the nature of the fines content. In borehole 80 NE 43, for example, 5.0 m of head gravel, grading fines 28 per cent, gravel 56 per cent, was recorded, whereas in borehole 90 NW 57, 860 m to the south-east, 1.8 m of head gravel, grading non-mineral with fines 46 per cent and gravel 41 per cent, was proved. The fines range from stiff brown clay to silty or chalky clay, and locally, where material from the raised beaches has been incorporated into the head gravel, are predominantly of silt, and the fine/medium sand content is higher than in the 'very clayey' gravels. The fine and medium sands consist of subangular to rounded quartz with flint, and the coarse sand is mostly of angular and subangular white flint with some dark flint and, rarely, rounded chalk pellets. The gravel generally comprises over 95 per cent angular to subrounded flint, much of which is fresh nodular flint of cobble size, sometimes broken, from the nearby chalk. A deep patina of white porous silica is

common on much of the flint in the head gravel and consequently much of the fine gravel consists of white porous flint which is less dense and softer than the dark flint. The softest white flint has the colour and texture of chalk and is referred to as 'silicified chalk' in Table 2. In this assemblage, the presence of true chalk is obscure in the fine gravel fraction, but detailed examination of selected samples has shown that the chalk content ranges from nil to a few per cent, with sporadic chalk cobbles, in the coarse gravel. Other rock types are most abundant where the head gravel rests on raised storm beach or older raised beach deposits; the commonest is sandstone, and other lithologies are present only in trace amounts.

Fan gravel These deposits have a mean grading of fines 13 per cent, sand 28 per cent and gravel 59 per cent; they range from sandy gravel with 7 per cent fines to 'very clayey' gravel with 23 per cent fines in IMAU boreholes 80 SE 57 and 80 NW 118 respectively. In the more arenaceous units the fines consist of silt, composed mostly of quartz with some angular white flint and only a little chalk, whereas those with the highest fines content have much clay and chalky silt. The sand fraction shows a gradation from predominantly rounded clear quartz with some angular white flint in the fine sand range, to angular white flint with some quartz and a little chalk in the medium and coarse ranges. The gravel fractions consist mostly of flint, much of which is angular to subangular, white and patinated, with some more rounded grey flint. Chalk and limestone pebbles seldom comprise more than 5 per cent of the gravel fraction; other lithologies are present only in trace amounts.

The Map

The sand and gravel resource map is folded into the pocket at the end of this report. The base map is the Ordnance Survey 1:25 000 Outline Edition, on which the topography is shown by contours in grey, the geological data in black and the mineral resource information in shades of red.

Geological data The geological boundary lines shown are based on the 1:10 000 geological survey undertaken in 1981 as a preliminary to the sand and gravel assessment of this district. The resource map incorporates amendments resulting from borehole evidence derived from the sand and gravel survey. The geological boundary lines represent the best interpretation of the information available at the time of the resource survey. However, it is inevitable, considering the nature of the drift deposits represented, that local irregularities and discrepancies will be revealed as new evidence from boreholes and excavations becomes available.

Borehole data, which include the stratigraphic relationships, thicknesses and mean particle-size distributions of the sand and gravel samples collected during the assessment survey, are also shown on the map.

Mineral resource information For assessment purposes, the mineral-bearing ground is divided into resource blocks (see Appendix A); these are subdivided into areas where mineral is 'exposed', areas where mineral is present beneath overburden, and areas where sand and gravel is absent or not potentially workable. The mineral is classified as 'exposed' where the overburden, commonly consisting only of soil and subsoil, averages less than 1.0 m in thickness.

Areas where bedrock crops out, where boreholes indicate the absence of sand and gravel beneath cover, and where sand and gravel beneath cover is interpreted as not potentially workable are uncoloured on the map. In such areas it has been assumed that mineral is absent except in infrequent and relatively minor patches that

Table 3 Summary of statistical results

Block	Area		Mean thickness		Volume of mineral			Mean grading percentages			
	Block	Mineral	Over- burden	Mineral	Limits at the 95% confidence level	Fines	Sand	Gravel	Cobbles		
	km ²	km ²	m	m						m ³ x 10 ⁶	± %
A	17.3	10.0	1.2	2.9	29.0	65	19	18	23	56	3
B	11.3	9.6	1.7	3.1	29.8	44	13	24	29	47	0
C	16.4	11.4	0.4	4.2	47.9	36	17	24	31	44	1
D	24.4	7.5	1.4	2.3	17.3	112*	-	18	65	17	0
E	15.9	15.6	1.5	2.1	32.8	22	7	15	52	33	0
F	13.3	12.6	1.6	3.5	44.1	19	8	18	43	39	0
G	17.7	16.1	2.0	3.1	49.9	25	12	18	62	20	0
H	32.6	8.6	1.9	1.9	16.3	61	10	30	52	16	2
Total	148.9	91.4	1.5	3.0	274.2	12	33	20	46	33	1

* The exceptionally wide confidence limits can be attributed to the relatively high value of the mineral thickness recorded in borehole 80 SW 86 (Table 7). The amount by which the figures are biased by this record is illustrated by a calculation based on the five remaining values for Block D, which gives limits of ±41 per cent at the 95 per cent probability level.

can neither be outlined nor assessed quantitatively in the context of this survey. Areas of unassessed sand and gravel, for example in built-up areas, are indicated by a red stipple.

Where possible, the limits of the different categories of deposits are based on the mapped geological boundaries. Where there is a transition from one category to another which is independent of the geological lines and which could not be accurately delineated during this survey, inferred boundaries have been inserted. Such boundaries are shown by a distinctive zig-zag symbol. The symbol is intended to convey an approximate location within a likely zone of occurrence, rather than to represent the breadth of the zone, its size being limited only by cartographic considerations. For the purpose of measuring areas the centre-line of the symbol is used.

Results

The results of the assessment are summarised in Figure 6 and Table 3. Fuller grading particulars are shown in Figures 7 to 14 and Tables 4 to 11; the cumulative grading curves are based on up to 11 data points.

Accuracy of results

For the eight resource blocks, A to H, the accuracy of the results at the symmetrical 95 per cent probability level (that is, on average nineteen out of every twenty sets of limits constructed in this way contain the true value for the volume of mineral) varies between 19 and 112 per cent (Appendix B). However, the true values are more likely to be nearer the figure estimated than either of the limits. Moreover, it is probable that approximately the same percentage limits would apply for the statistical estimate of mineral volume within a very much smaller parcel of ground (say, 100 hectares) containing similar sand and gravel deposits if the results from the same number of sample points were used in the calculation. Thus, if closer limits are needed for quotation of reserves, data from more sample points would be required, even if the area were quite small. This point can be illustrated by considering the whole of the potentially workable sand and gravel on this sheet. The total volume (274.2 million m³) can be estimated to limits of ±12 per cent at the 95 per cent probability level by a calculation based on the data from 78 sample points spread across the eight resource blocks.

However, it must be emphasised that the quoted volume of sand and gravel bears no simple relationship to the amount that could be extracted in practice because no allowance has been made in the calculations for any

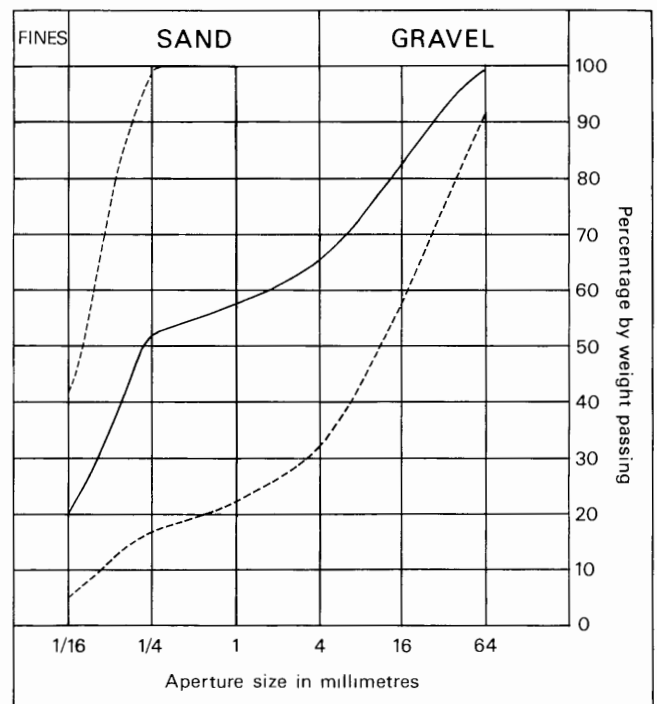


Figure 6 Mean particle size distribution for the assessed thickness of sand and gravel in the resource blocks. The continuous line represents the weighted mean grading of the mineral, and the broken lines represent the envelope within which individual gradings for each borehole fall.

restraints (such as existing buildings and roads) on the use of land for mineral working.

Notes on the Resource Blocks

In this area of 200 km², 51.1 km² have been excluded from the assessment because they consist of outcrops of bedrock, river channels around Bosham, and the urban conurbations around Bosham, Chichester and Bognor Regis. The remaining 148.9 km² have been divided into eight resource blocks. Where possible, the block boundaries follow geological lines; for example, the northern boundaries of blocks A, B and C coincide with the

Table 4 Block A: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Mineral	Waste	Fines	Sand			Gravel		
	m	m	m	- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
80 NW 117	-	-	7.0							
80 NW 118	1.4	1.8	3.0	23	3	6	11	26	31	0
80 NW 119	-	-	1.5							
80 NW 122	-	-	6.5							
80 NW 123	-	-	2.9							
80 NW 124	-	-	0.5							
80 NW 126	-	-	2.6							
80 NW 127	-	-	5.7							
80 NW 128	0.5	3.4	-	18	11	5	11	31	22	2
80 NW 130	2.1	1.4	-	24	4	3	8	28	33	0
80 NW 131	3.0	1.0	-	24	2	3	8	31	32	0
80 NW 132	-	-	2.5							
80 NW 133	0.7	6.3	3.7	15	3	5	12	28	32	5
80 NW 134	0.3	1.9	-	21	3	5	8	21	41	1
80 NE 36	0.2	4.5	0.8	18	15	10	9	23	22	3
Weighted mean grading for the assessed mineral deposits				18	7	6	10	27	29	3

northern limit of the head gravel. The southern boundaries of blocks F and G approximately follow the Chalk subcrop and those of blocks B, C and, to a certain extent, block A follow approximately the cliff-line of the lower raised beach. Elsewhere, resource block boundaries have been arbitrarily drawn to give conveniently managed units. Inferred boundaries have been used where necessary to indicate the passage from mineral-bearing to barren ground.

Block A (Figure 7 and Table 4)

This block has a total area of 17.3 km² and 15 IMAU boreholes have been used to assess its resources. An area of 7.3 km² has been assessed as non-mineral on the basis

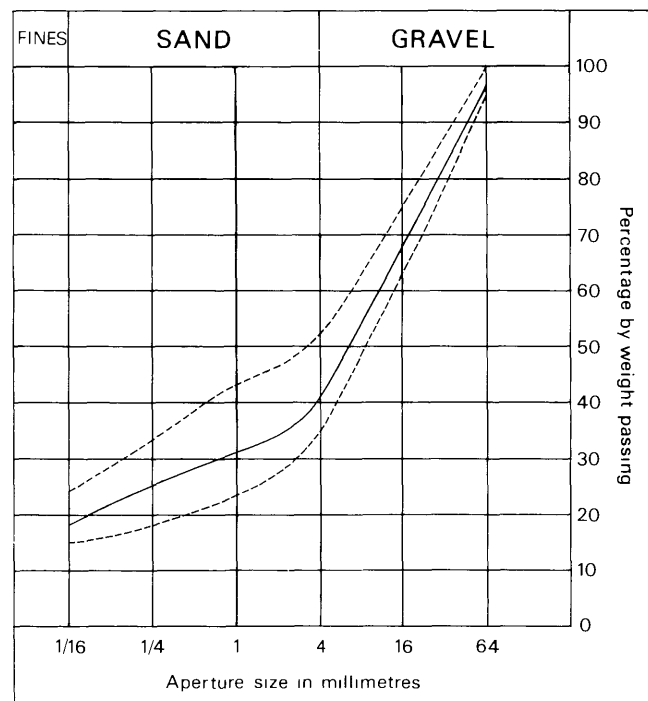


Figure 7 Grading characteristics of the mineral in block A (for explanation see Figure 6).

of information from boreholes SU 80 NW 117, 119, 122, 123, 124, 126, 127 and 132, which proved sand and gravel either too thin or too 'clayey' to be potentially workable.

Mineral occurs in the older raised beach deposits, the head gravels and, in the west of the block, in fan gravels; some may also occur in the raised storm beach deposits. It consists of 'clayey' to 'very clayey' sandy gravels and gravels which range in thickness from 1.0 m in borehole 80 NW 131 to 6.3 m in 80 NW 133, and thicken eastwards towards the block boundary, where they pass beneath the urban area of Chichester. The gravel percentage is generally in excess of 50 per cent, with a maximum of 65 per cent in borehole 80 NW 133. The fines content ranges around 20 per cent, with a maximum of 24 per cent in boreholes 80 NW 130 and 131, and consists of brown and grey chalky clay and silt. For the whole block, the mineral-bearing area is 10.0 km², the mean mineral thickness is 2.9 m and the mean grading is fines 18 per cent, sand 23 per cent and gravel 59 per cent (including 3 per cent cobbles). The estimated volume of mineral present is 29.0 million m³ ±65 per cent.

Overburden, consisting of pebbly clay and silt and small patches of brickearth, varies in thickness from 0.2 m in borehole 80 NE 36 to 3.0 m in 80 NW 131, with a mean thickness of 1.2 m. It is thinnest in the east of the block and an area where overburden is less than 1.0 m thick on average (i.e. the mineral is regarded as exposed), has been delimited, partly with an inferred boundary.

Waste partings within mineral deposits have been recorded from only one borehole, 80 NE 36, where 0.8 m of sandy silt separated beds of mineral in the head gravel and older raised beach deposits.

Block B (Figure 8 and Table 5)

Ten IMAU boreholes have been used to assess the resources of block B, which has a total area of 11.3 km². Borehole 80 NE 41 proved only clay, and sand and gravel in boreholes 90 NW 57 and 80 NE 35 was too 'clayey' and too thin, respectively, to be potentially workable; an area of 1.7 km² (which includes small outcrops of bedrock) has, therefore, been assessed as non-mineral.

Mineral-bearing deposits in the block occur in the older raised beach deposits, the head gravel and, along the southern boundary, in the raised storm beach deposits. The fan gravels of the Lavant Gap are incised

Table 5 Block B: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage								
	Overburden	Mineral	Waste	Fines			Sand			Gravel		
				- $\frac{1}{16}$ mm	$+\frac{1}{16}$ - $\frac{1}{4}$ mm	$+\frac{1}{4}$ -1 mm	+1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm		
m	m	m										
80 NE 35	-	-	4.2									
80 NE 37	0.2	3.8	-	14	3	5	11	29	38	0		
80 NE 38	1.0	4.9	2.0	28	43	3	3	10	13	0		
80 NE 39	4.4	2.2	-	18	4	7	14	33	24	0		
80 NE 40	2.8	1.9	-	22	3	5	9	29	32	0		
80 NE 41	-	-	3.0									
80 NE 42	2.1	2.0	-	39	2	3	7	27	22	0		
80 NE 43	0.3	5.0	1.0	28	3	4	9	24	32	0		
80 NE 44	1.0	2.0	-	19	50	9	8	8	6	0		
90 NW 57	-	-	2.1									
Weighted mean grading for the assessed mineral deposits				24	16	5	8	22	25	0		

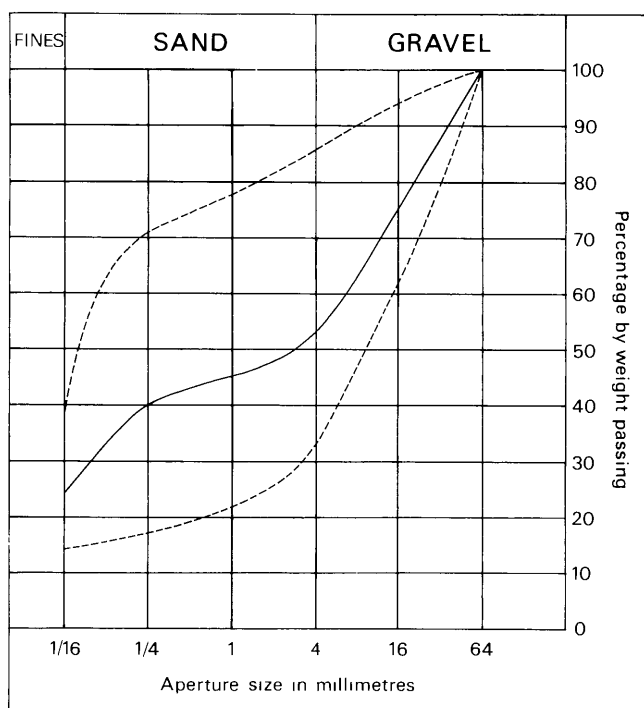


Figure 8 Grading characteristics of the mineral in block B (for explanation see Figure 6).

into the pre-existing deposits, and although they are extensively worked farther south, they were not proved in IMAU boreholes in this block.

The mineral consists chiefly of 'clayey' to 'very clayey' gravels, with 'very clayey' sands and pebbly sands in the basal parts of boreholes 80 NE 38 and 80 NE 44 respectively. The gravel percentage varies up to a maximum of 67 per cent in 80 NE 37, and sand reaches a maximum of 67 per cent in 80 NE 44. The fines content varies from 14 per cent in 80 NE 37 to a maximum of 39 per cent in 80 NE 42, and consists of brown silt and clay. The mineral varies in thickness from 1.9 m in 80 NE 40 to 5.0 m in 80 NE 43, with a mean of 3.1 m, and, in general, is thinnest along the southern boundary of the block and thickens northwards. Its mean grading is fines 24 per cent, sand 29 per cent and gravel 47 per cent, and the estimated volume present is 29.8 million m³ ±44 per cent.

Overburden, consisting chiefly of brown flinty clay, is thinnest in the north of the block, where 0.2 and 0.3 m were recorded in boreholes 80 NE 37 and NE 43 respectively, but it thickens southwards; a maximum of 4.4 m was encountered in borehole 80 NE 39. The mean thickness of overburden is 1.7 m.

Waste partings occur only in borehole 80 NE 38, where 2.0 m of yellowish brown clay separates mineral deposits in head gravel and the older raised beach deposits.

Block C (Figure 9 and Table 6)

Data from 14 IMAU boreholes have been used to assess the resources of this block, which has a total area of 16.4 km² and is an eastward continuation of block B. It contains patchy outcrops of older raised beach deposits, head gravel, and, above the cliff-line marking the southern boundary of the block, raised storm beach deposits. Borehole 90 NW 61 proved only clay, boreholes

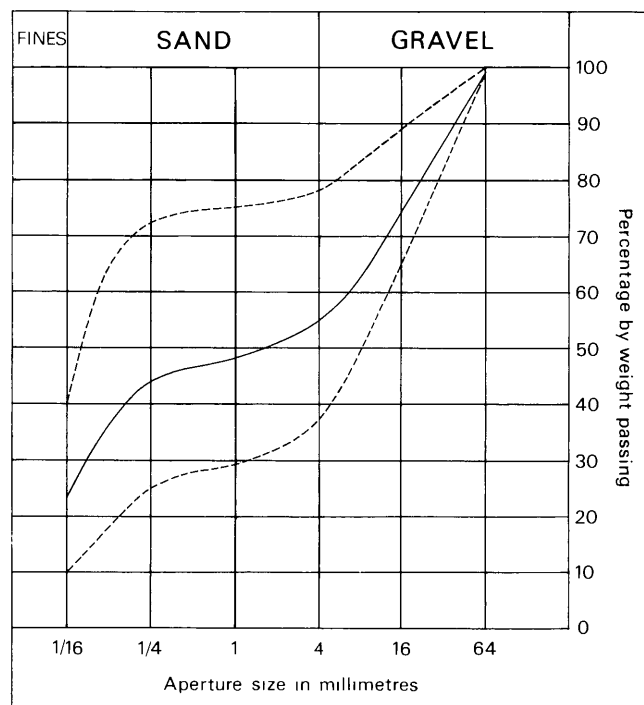


Figure 9 Grading characteristics of the mineral in block C (for explanation see Figure 6).

Table 6 Block C: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Mineral	Waste	Fines			Gravel			
				-1/16 mm	+1/16-1/4 mm	+1/4-1 mm	+1-4 mm	+4-16 mm	+16-64 mm	+64 mm
m	m	m								
90 NW 56	0.2	2.2	-	40	4	5	13	9	27	2
90 NW 60	0.6	3.8	4.5	24	42	2	2	9	18	3
90 NW 61	-	-	2.4							
90 NW 66	0.2	7.8	-	10	18	6	11	28	27	0
90 NW 69	0.2	3.6	-	22	4	4	7	28	35	0
90 NW 70	-	-	6.9							
90 NW 73	0.8	6.9	0.3	27	23	2	5	16	24	3
90 NW 74	0.2	4.7	1.5	21	27	4	10	14	21	3
90 NE 33	0.2	1.3	2.8	29	2	2	8	34	22	3
90 NE 34	0.5	2.3	1.8	29	27	3	6	10	25	0
90 NE 36	0.2	4.7	-	22	3	4	9	27	34	1
90 NE 37	0.3	4.7	3.1	28	44	3	3	11	11	0
90 NE 41	-	-	7.0							
90 NE 45	-	-	1.5							
Weighted mean grading for the assessed mineral deposits				24	20	4	7	19	25	1

90 NW 70 and 90 NE 41 respectively proved thin and 'very clayey' sand and gravel, and borehole 90 NE 45 proved thin 'clayey' pebbly sand in areas which have been assessed as non-mineral. Bedrock outcrops and large worked-out sand and gravel pits further reduce the mineral-bearing area of block C to 11.4 km².

The mineral consists chiefly of 'clayey' to 'very clayey' gravels, though where raised beach deposits are present in the deeper parts of boreholes, for example, in 90 NW 60, 73 and 74, and 90 NE 34 and 37, 'very clayey' pebbly sands were proved. Gravel percentages range from 22 per cent in borehole 90 NE 37 to a maximum of 63 per cent in 90 NW 69. The fines content is generally between 20 and 30 per cent although, exceptionally, only 10 per cent was recorded in borehole 90 NW 66. Sand percentages are generally low, but 50 per cent was found in 90 NE 37. Mineral thicknesses range from 1.3 m in 90 NE 33 to a maximum of 7.8 m proved in 90 NW 66, with a mean thickness of 4.2 m. The mean grading is fines 24 per cent, sand 31 per cent and gravel 45 per cent (including only 1 per cent cobbles) and the estimated volume of mineral is 47.9 million m³ ±36 per cent.

Overburden consists mainly of soil and thin pebbly clay and varies in thickness from 0.2 m in several boreholes to 0.8 m in borehole 90 NW 73, with a mean for the block of 0.4 m.

Waste partings consisting of clay and silt were found separating mineral deposits in four boreholes, and were generally less than 1.0 m thick except in borehole 90 NW 60, where 4.5 m of pebbly silt separated the mineral occurrences in the head gravel and older raised beach deposits.

Block D (Figure 10 and Table 7)

This block has a total area of 24.4 km², of which only 7.5 km² have been proved to be mineral-bearing. The results from 20 IMAU boreholes were used in the assessment of the resources in this block. Mineral is present in the younger raised beach deposits and head gravel, and locally in the fan gravel.

Large areas east and west of the Chichester Channel have been found to be barren. East of Bosham, borehole 80 NW 125 proved sand and gravel too thin to be potentially workable, and boreholes 80 NW 129, 80 SW 81 to 84, 87 and 88 proved thin clays and silts, occasionally sandy, overlying bedrock. East of the Chichester Channel boreholes 80 SW 92 and 94 proved sand and gravel too thin to

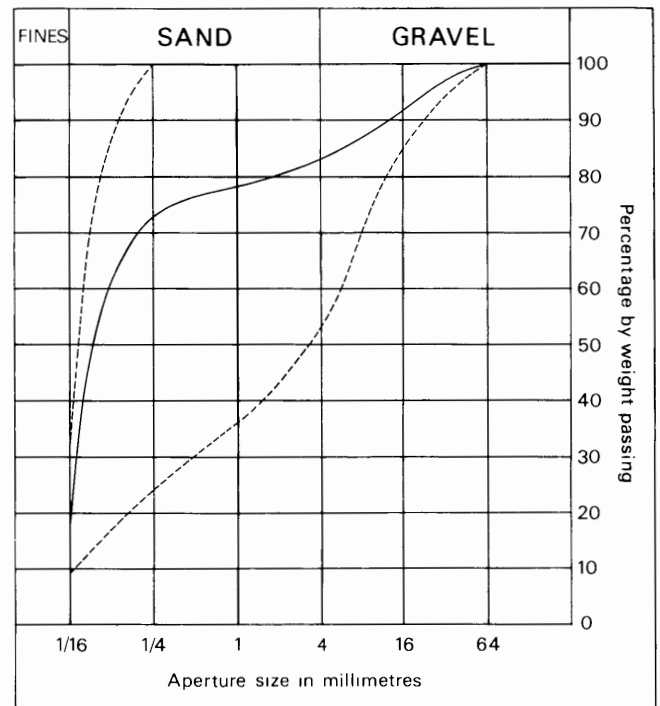


Figure 10 Grading characteristics of the mineral in block D (for explanation see Figure 6).

be potentially workable; silt and clay were found in boreholes 80 SW 91, 93, 95 and 80 SE 45.

Mineral is patchily distributed within this block. In the north-west, borehole 80 NW 121 proved 2.0 m of 'very clayey' gravel beneath overburden, and in the north-east, 1.0 m of 'clayey' gravel was found in 80 NW 135. In the south-west of the block, 'clayey' to 'very clayey' pebbly sands and sandy gravels between 1.0 and 1.7 m thick were proved in boreholes 80 SW 85, 89 and 90; exceptionally, borehole 80 SW 86 proved 7.0 m of 'clayey' to 'very clayey' sand. The mean thickness of mineral in this block is 2.3 m, and the mean grading is fines 18 per cent, sand 65 per cent and gravel 17 per cent. The estimated total mineral volume is 17.3 million m³ ±112 per cent.

Table 7 Block D: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Mineral	Waste	Fines	Sand			Gravel		
	m	m	m	- $\frac{1}{16}$ mm	Fine + $\frac{1}{16}$ - $\frac{1}{4}$ mm	Medium + $\frac{1}{4}$ -1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
80 NW 121	1.1	2.0	-	33	12	6	10	17	22	0
80 NW 125	-	-	3.8							
80 NW 129	-	-	2.2							
80 NW 135	0.5	1.0	0.8	19	5	12	17	34	13	0
80 SW 81	-	-	2.8							
80 SW 82	-	-	5.2							
80 SW 83	-	-	2.0							
80 SW 84	-	-	3.5							
80 SW 85	1.7	1.2	-	14	27	11	13	15	20	0
80 SW 86	2.1	7.0	-	15	85	0	0	0	0	0
80 SW 87	-	-	2.0							
80 SW 88	-	-	3.8							
80 SW 89	1.5	1.7	-	9	31	14	13	18	15	0
80 SW 90	1.2	1.0	1.1	24	60	2	1	3	10	0
80 SW 91	-	-	2.5							
80 SW 92	-	-	1.8							
80 SW 93	-	-	3.0							
80 SW 94	-	-	3.5							
80 SW 95	-	-	2.8							
80 SE 45	-	-	3.5							
Weighted mean grading for the assessed mineral deposits				18	55	5	5	9	8	0

Overburden in this block consists chiefly of brickearth, and is thickest in borehole 80 SW 86, where 2.1 m of brown, silty clay were found; in other boreholes it varies in thickness up to 1.7 m. The mean overburden thickness is 1.4 m.

No waste partings were found in the IMAU boreholes.

Block E (Figure 11 and Table 8)

This block has a total area of 15.9 km², and data from 14 IMAU boreholes have been used to assess its resources. The mineral-bearing area is 15.6 km².

Mineral in block E occurs in the younger raised beach deposits and the fan gravels. Fan gravels crop out in the north of the block where they are the southward continuation of a thick wedge of gravel that has been worked south and east of Chichester. They consist predominantly of 'clayey' gravels and sandy gravels, with gravel percentages ranging up to a maximum of 65 per cent (in borehole 80 SE 42), and thicknesses varying from 1.8 m in 80 SE 42 to 2.4 m in 80 SE 49. In parts they overlie the younger raised beach deposits, which have a lower gravel content. Farther south, the younger raised beach deposits form a continuous sheet, overlain only by brickearth, and consist chiefly of 'clayey' to 'very clayey' sands, pebbly sands, sandy gravels and gravels. Gravel percentages vary from 10 per cent to a maximum of 44 per cent in borehole 80 SE 56. These deposits are generally thin, with thicknesses ranging from 0.9 m in 80 SE 56 to 2.4 m in 80 SE 55.

For the whole block, the mineral ranges in thickness from 1.0 to 3.8 m, and thins towards the western, eastern and southern block boundaries; borehole 80 SE 56 proved only 0.9 m of sand and gravel and this information has not been used in the assessment. Mean gravel contents range from 10 per cent in borehole 80 SE 48 to 65 per cent in 80 SE 42. The fines content is very variable; less than 10 per cent was recorded in five boreholes and a maximum of 36 per cent occurs in 80 SE 60. The mean mineral thickness is 2.1 m, the mean grading is fines 15 per cent, sand 52 per cent and gravel 33 per

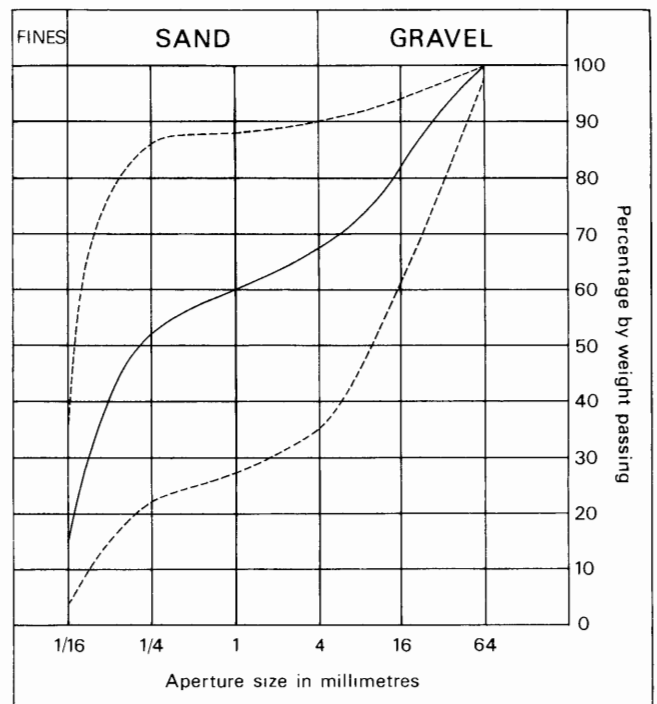


Figure 11 Grading characteristics of the mineral in block E (for explanation see Figure 6).

cent and the estimated total mineral volume is 32.8 million m³ ±22 per cent.

Overburden consists of brickearth and alluvium, and varies in thickness from 0.3 m in 80 SE 46 to 3.0 m in 80 SE 43, with a mean thickness of 1.5 m. No waste partings were recorded in the IMAU boreholes.

Table 8 Block E: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Over-burden	Mineral	Waste	Fines	Sand			Gravel		
				$-\frac{1}{16}$ mm	Fine $+\frac{1}{16}-\frac{1}{4}$ mm	Medium $+\frac{1}{4}-1$ mm	Coarse $+1-4$ mm	Fine $+4-16$ mm	Coarse $+16-64$ mm	Cobble $+64$ mm
m	m	m								
80 SE 42	1.5	1.8	-	16	6	5	8	26	39	0
80 SE 43	3.0	1.6	-	6	39	7	7	19	22	0
80 SE 44	2.1	1.6	-	26	49	5	4	7	9	0
80 SE 46	0.3	3.8	-	13	29	6	7	21	24	0
80 SE 47	1.0	2.2	-	22	38	9	10	11	10	0
80 SE 48	0.9	3.1	-	20	66	2	2	4	4	2
80 SE 49	0.4	2.4	-	9	38	8	6	19	20	0
80 SE 50	2.4	2.2	-	4	54	17	6	8	11	0
80 SE 51	0.6	1.9	-	25	24	6	9	14	22	0
80 SE 54	1.0	2.0	-	15	17	6	8	26	28	0
80 SE 55	1.5	2.4	-	8	36	13	9	16	18	0
80 SE 56	-	-	3.0							
80 SE 60	2.3	1.0	-	36	24	6	8	12	14	0
80 SE 61	2.8	1.4	-	7	30	12	8	19	24	0
Weighted mean grading for the assessed mineral deposits				15	37	8	7	15	18	0

Table 9 Block F: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Over-burden	Mineral	Waste	Fines	Sand			Gravel		
				$-\frac{1}{16}$ mm	Fine $+\frac{1}{16}-\frac{1}{4}$ mm	Medium $+\frac{1}{4}-1$ mm	Coarse $+1-4$ mm	Fine $+4-16$ mm	Coarse $+16-64$ mm	Cobble $+64$ mm
m	m	m								
80 NE 45	0.7	4.3	-	38	6	8	14	22	12	0
80 SE 52	1.2	4.6	-	13	6	8	12	31	29	1
80 SE 53	1.4	3.1	-	10	6	7	12	33	32	0
80 SE 57	2.8	3.4	-	7	15	14	20	27	17	0
80 SE 58	1.3	2.7	-	11	10	7	11	29	32	0
90 NW 58	0.8	2.7	4.6	37	4	5	8	20	24	2
90 NW 59	2.6	2.7	-	19	66	2	3	6	4	0
90 NW 62	-	-	1.9							
90 NW 63	2.0	5.5	-	No data available						
90 NW 64	2.4	1.9	-	23	64	2	2	5	4	0
90 NW 65	0.8	3.9	-	No data available						
90 SW 35	1.3	4.1	-	10	38	8	11	19	14	0
90 SW 40	2.0	2.8	-	16	80	1	1	1	1	0
Weighted mean grading for the assessed mineral deposits				18	26	7	10	21	18	0

Block F (Figure 12 and Table 9)

Data from 13 IMAU boreholes have been used to calculate the resources of this block, which has a total area of 13.3 km². Borehole 90 NW 62 proved only 1.9 m of silt and clay; because of this result and the presence of small outcrops of bedrock, the mineral-bearing area is reduced to 12.6 km² by means of a largely inferred boundary in the north-eastern corner of the block. Boreholes 90 NW 63 and 65 proved head gravel and younger raised beach deposits; grading data are not available from these boreholes but the mineral thicknesses have been used in the calculations.

Mineral in this block occurs in the younger raised beach deposits and in the head gravel and fan gravel. The southern boundary of the block follows approximately the Chalk sub-crop, and coincides partly with a change in the classification of the younger raised beach deposits

from mineral-bearing in this block to barren in block H to the south.

The younger raised beach deposits occur patchily beneath fan gravel in the west of the block, and as a more continuous spread beneath head gravel and brick-earth over most of the remaining area. The deposits include sands, pebbly sands and sandy gravels, partly 'clayey', up to 3.8 m in thickness (90 NW 63).

Head gravel crops out in the north of the block and overlies bedrock except in boreholes 90 NW 59, 63, 64 and 65, where it rests upon raised beach deposits. Proved thicknesses range from 2.7 m in borehole 90 NW 58 to 4.3 m in 80 NE 45; the deposits consist of 'very clayey' gravels with the very high fines content of 37 and 38 per cent respectively in those boreholes.

The fan gravel crops out in the south-west of the block and has been proved in five IMAU boreholes. It

Table 10 Block G: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Mineral	Waste	Fines	Sand			Gravel		
	m	m	m	- $\frac{1}{16}$ mm	Fine + $\frac{1}{16}$ - $\frac{1}{4}$ mm	Medium + $\frac{1}{4}$ -1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
90 NW 67	2.0	4.3	2.2	32	37	3	5	9	14	0
90 NW 68	1.5	1.4	-	24	64	2	2	5	3	0
90 NW 71	3.4	2.3	-	16	32	6	14	20	12	0
90 NW 72	2.2	3.8	-	16	53	3	4	13	11	0
90 NW 75	-	-	5.4	-	-	-	-	-	-	-
90 NW 76	3.2	4.6	-	14	57	4	5	10	9	1
90 NE 35	1.3	1.4	1.0	23	7	14	27	20	9	0
90 NE 38	3.2	3.0	-	19	11	10	20	22	18	0
90 NE 39	4.1	5.3	1.7	26	29	3	7	15	20	0
90 NE 40	0.5	6.5	1.3	18	51	3	4	11	13	0
90 NE 42	-	-	1.6	-	-	-	-	-	-	-
90 NE 43	1.7	4.3	-	15	70	6	2	2	5	0
90 NE 46	-	-	0.3	-	-	-	-	-	-	-
90 SW 45	1.1	1.4	-	30	68	1	1	0	0	0
90 SW 46	1.4	3.5	-	16	59	9	7	6	3	0
90 SW 49	2.0	2.3	0.1	18	48	10	6	10	8	0
90 SW 51	1.5	1.4	-	11	68	4	3	7	7	0
90 SW 52	1.5	1.9	-	10	46	10	10	17	7	0
90 SE 21	2.6	2.0	-	5	58	4	6	13	14	0
90 SE 24	1.3	3.2	-	10	72	5	3	6	4	0
90 SE 28	1.9	3.5	-	14	72	3	3	3	5	0
Weighted mean grading for the assessed mineral deposits				18	51	5	6	10	10	0

consists chiefly of 'clayey' gravels and sandy gravels. Thicknesses range from 1.8 m in 90 SW 35 to 3.0 m in 80 SE 52. Gravel contents are exceptionally high; 72 per cent was recorded in 80 SE 52 and although 85 per cent was recorded in upper part of 80 SE 53, the distinction there between the fan gravel and the underlying raised beach deposits is not clear.

Record mineral thicknesses in the block range from 1.9 to 5.5 m, with a mean of 3.5 m. The mean mineral grading is fines 18 per cent, sand 43 per cent and gravel 39 per cent. The estimated volume of mineral present is 44.1 million m³ ±19 per cent.

Overburden consists chiefly of the clays and silts of the brickearth; it ranges in thickness from 0.7 m in borehole 80 NE 45 to 2.8 m in 80 SE 57, with a mean of 1.6 m, and is generally thickest in the south of the block.

No waste partings were recorded in the IMAU boreholes.

Block G (Figure 13 and Table 10)

This block is the eastward continuation of block F in that its northern boundary approximates to the cliff-line which separates the upper and lower raised beaches and its southern boundary approximates partly with the transition between mineral-bearing and barren younger raised beach deposits. The block area is 17.7 km², but bedrock outcrops, worked-out areas and landslips, and an area around borehole 90 NW 75 which proved sand and gravel too thin to be potentially workable, reduce this to 16.1 km² of mineral-bearing ground. Borehole 90 NE 46 proved deeply weathered bedrock, but the adjacent deposits are considered to be mineral-bearing and have been included in the assessment. Data from 21 IMAU boreholes have been used in the assessment of resources.

The mineral occurs in the younger raised beach deposits and head gravel, and the block can be conveniently described in two parts. In the northern part, head gravel consisting of 'clayey' to 'very clayey' gravels and sandy gravels, ranging in thickness from 0.8 m in borehole 90 NE 35 to 3.1 m in 90 NE 39, overlies bedrock, and, in some boreholes, younger raised beach deposits. In the southern part, younger raised beach deposits underlie the head gravel, and, along the southern margin of the block, form a continuous sheet overlain only by brickearth overburden. These raised beach deposits range in thickness from 0.6 m in borehole 90 NE 35 to 4.4 m in 90 NE 40, and tend to thicken eastwards. They consist chiefly of 'clayey' to 'very

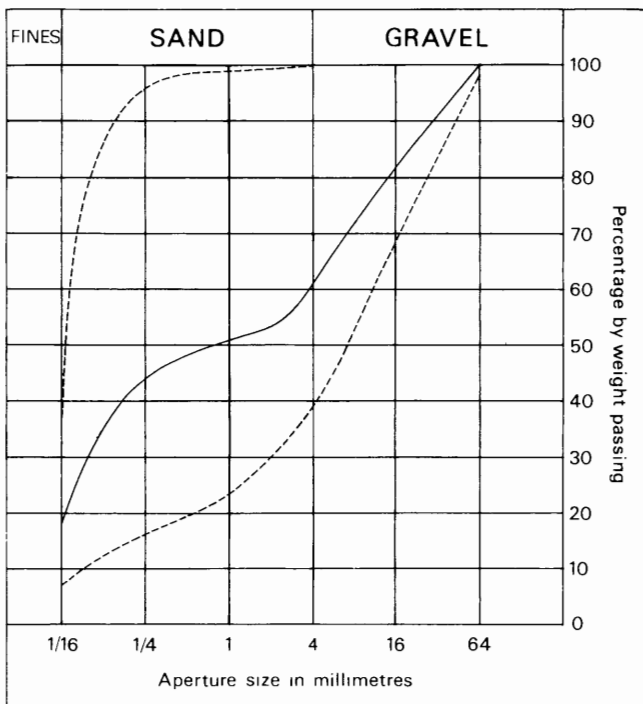


Figure 12 Grading characteristics of the mineral in block F (for explanation see Figure 6).

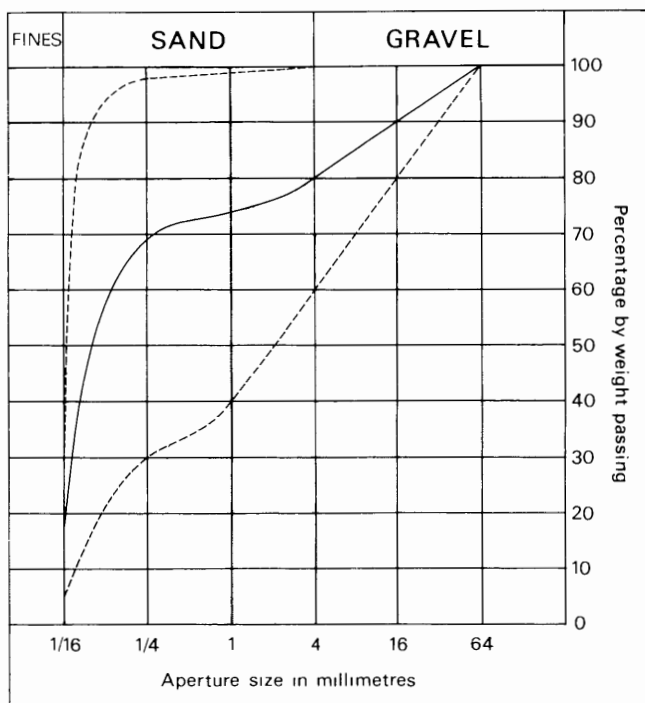


Figure 13 Grading characteristics of the mineral in block G (for explanation see figure 6).

clayey' sands and pebbly sands with some sandy gravels; the sandy gravels are found mainly in the lower parts of boreholes in the southern and western parts of the block.

In this block, mineral thicknesses range from 1.4 m in, for example, borehole 90 NW 68 to 6.5 m in 90 NE 40, with a mean of 3.1 m. Mean gravel percentages range from zero in borehole 90 SW 45 to a maximum of 40 per cent in 90 NE 38, and sand reaches a maximum of 80 per cent in 90 SE 24. The fines content varies greatly; in the south-central part of the block values range from 5 per cent in 90 SE 21 and around 10 per cent in boreholes 90 SE 51, 52 and 90 SE 24 to the maximum of 32 per cent recorded in 90 NW 67. The mean grading is fines 18 per cent, sand 62 per cent and gravel 20 per cent, and the estimated total mineral volume is 49.9 million m³ ±25 per cent.

Overburden consists chiefly of brickearth clay and silt, and tends to be thinner along the southern boundary of the block, where thicknesses of 0.5 m and 1.1 m were recorded in boreholes 90 NE 40 and 90 SW 45 respectively, but ranges up to 4.1 m in 90 NE 39; the mean thickness is 2.0 m.

Waste partings within mineral occur in several IMAU boreholes, and range in thickness from 0.1 m in 90 SW 49 to 2.2 m in 90 NW 67, with a mean of 0.3 m.

Block H (Figure 14 and Table 11)

Data from 31 IMAU boreholes have been used to assess the resources of this block, which has a total area of 32.6 km². However, only six boreholes proved mineral, and a mineral-bearing area of 8.6 km² has been indicated on the map, largely with inferred boundaries.

Table 11 Block H: data from IMAU boreholes

Borehole	Recorded thickness			Mean grading percentage						
	Overburden	Mineral	Waste	Fines	Sand			Gravel		
				- $\frac{1}{16}$ mm	Fine + $\frac{1}{16}$ - $\frac{1}{4}$ mm	Medium + $\frac{1}{4}$ -1 mm	Coarse +1-4 mm	Fine +4-16 mm	Coarse +16-64 mm	Cobble +64 mm
m	m	m								
80 SE 59	-	-	4.0							
90 SW 36	-	-	2.8							
90 SW 37	-	-	5.1							
90 SW 38	-	-	4.5							
90 SW 39	-	-	4.5							
90 SW 41	-	-	5.3							
90 SW 42	-	-	4.3							
90 SW 43	-	-	4.7							
90 SW 44	-	-	3.4							
90 SW 47	-	-	2.4							
90 SW 48	-	-	4.8							
90 SW 50	-	-	4.5							
90 SW 53	2.0	1.5	0.6	36	33	4	5	7	11	4
90 SW 54	-	-	2.8							
90 SW 55	1.6	1.0	2.6	32	54	4	2	2	6	0
90 SE 22	-	-	3.9							
90 SE 23	-	-	1.6							
90 SE 25	-	-	3.1							
90 SE 26	-	-	4.0							
90 SE 27	-	-	4.7							
90 SE 29	2.9	1.0	-	35	28	4	6	10	14	3
90 SE 30	-	-	4.0							
90 SE 31	-	-	3.5							
90 SE 32	-	-	3.3							
90 SE 33	-	-	1.4							
90 SE 34	2.0	3.3	1.2	31	36	14	7	7	4	1
90 SE 85	-	-	3.9							
90 SE 86	-	-	1.5							
90 SE 37	-	-	1.1							
90 SE 38	1.7	3.2	1.2	25	29	18	7	7	11	3
90 SE 39	1.1	1.5	-	35	30	12	3	8	9	3
Weighted mean grading for the assessed mineral deposits				30	34	12	6	7	9	2

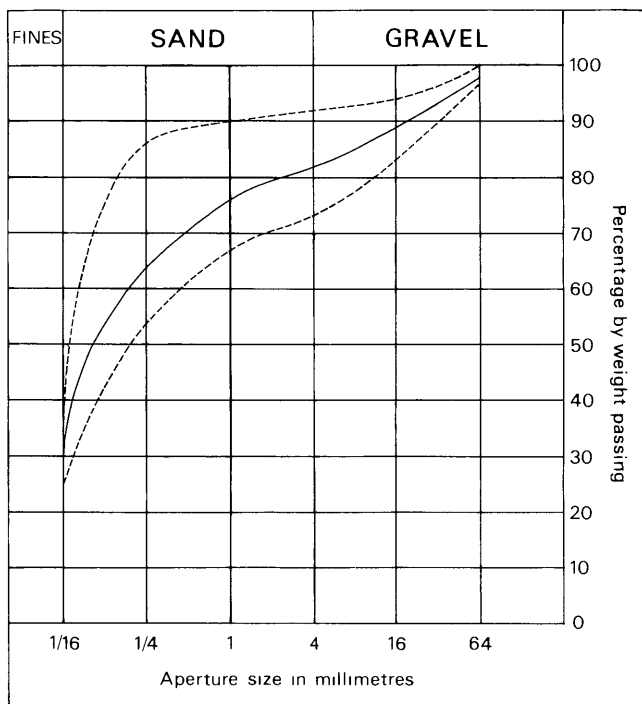


Figure 14 Grading characteristics of the mineral in block H (for explanation see Figure 6).

The block encloses silts and clays of the brickearth overlying sand and gravel deposits of the lower raised beach. These latter rest discontinuously upon the Upper Chalk which, as in block D, appear to have rendered them generally too chalky or 'clayey' to be potentially workable. Some boreholes (for example, 90 SW 54, 90 SE 31 and 35) proved sand and gravel too thin to be potentially workable, and the remainder proved only silt and clay, in some cases pebbly and sandy.

Mineral occurs in two areas in this block. In the central area, boreholes 90 SW 53 and 55 proved 'very clayey' pebbly sands and sandy gravels 1.5 and 1.0 m thick respectively. Farther east, the deposits are thicker and more gravelly; 'very clayey' sandy gravels and gravels from 1.0 to 3.3 m thick were found in boreholes 90 SE 29, 34, 38 and 39. The mean mineral thickness is 1.9 m and the mean grading is fines 30 per cent, sand 52 per cent and gravel 18 per cent (including 2 per cent cobbles). The estimated total mineral volume for the block is 16.3 million m³ \pm 61 per cent.

Overburden consists of the silts and clays of the brickearth, and varies in thickness from 1.1 m in 90 SE 39 to 2.9 m in 90 SE 29, with a mean thickness of 1.9 m. A waste parting comprising 0.6 m of silt was intercalated within the younger raised beach deposits proved in boreholes 90 SE 34.

REFERENCES

- ALLEN, V. T. 1936. Terminology of medium-grained sediments. **Rep. Natl Res. Council., Washington, 1935-1936**, App. 1, Rep. Comm. Sediment., 18-47.
- ARCHER, A. A. 1969. Background and problems of an assessment of sand and gravel resources in the United Kingdom. **Proc. 9th Commonw. Min. & Metall. Congr., 1969**, Vol. 2: Mining and petroleum geology, 495-508.
- 1970a. Standardisation of the size classification of naturally occurring particles. **Geotechnique**, Vol. 20, 103-107.
- 1970b. Making the most of metrication. **Quarry Managers' J.**, Vol. 54, No. 6, 223-227.
- ATTERBERG, A. 1905. Die rationelle Klassifikation der Sande und Kiese. **Chem. Z.**, Vol. 29, 195-198.
- BRITISH STANDARDS INSTITUTION. 1967. **B.S.1377: Methods of testing soils for civil engineering purposes**. (London: British Standards Institution.)
- BUREAU OF MINES AND GEOLOGICAL SURVEY. 1948. **Pp. 14-17 in Mineral resources of the United States**. (Washington, DC: Public Affairs Press.)
- HARRIS, P. M., THURRELL, R. G., HEALING, R. A., and ARCHER, A. A. 1974. Aggregates in Britain. **Proc. R. Soc., Ser. A**, Vol. 339, 329-353.
- HULL, J. H. 1981. Methods of calculating the volume of resources of sand and gravel. **Appendix** (pp. 192-193) to THURRELL, R. G. 1981. Quarry resources and reserves: the identification of bulk mineral resources: the contribution of the Institute of Geological Sciences. **Quarry Management**, for March 1981, 181-193.
- LANE, E. W., and others. 1947. Report of the sub-committee on sediment terminology. **Trans. Am. Geophys. Union**, Vol. 28, 936-938.
- PETTIJOHN, F. J. 1975. **Sedimentary rocks**. 3rd edition. (London: Harper and Row.)
- SHEPHARD-THORN, E. R., BERRY, F. G. and WYATT, R. J. 1982. Geological notes and local details for 1:10 000 sheets SU 80 NW, NE, SW, SE; SU 90 NW, NE, SW, SE; TQ 00 NW, SW. (West Sussex Coastal Plain between Chichester and Littlehampton). (Keyworth: Institute of Geological Sciences).
- THURRELL, R. G. 1971. The assessment of mineral resources with particular reference to sand and gravel. **Quarry Managers' J.**, Vol. 55, 19-25.
- 1981. Quarry resources and reserves: the identification of bulk mineral resources: the contribution of the Institute of Geological Sciences. **Quarry Management**, for March 1981, 181-193.
- TWENHOFEL, W. H. 1937. Terminology of the fine-grained mechanical sediments. **Rep. Natl Res. Council., Washington, 1936-37**, App. 1, Rep. Comm. Sediment., 81-104.
- UDDEN, J. A. 1914. Mechanical composition of elastic sediments. **Bull. Geol. Soc. Am.**, Vol. 25, 655-744.
- WENTWORTH, C. K. 1922. A scale of grade and class terms for clastic sediments. **J. Geol.**, Vol. 30, 377-392.
- 1935. The terminology of coarse sediments. **Bull. Natl Res. Council. Washington**, No. 98, 225-246.
- WILLMAN, H. B. 1942. Geology and mineral resources of the Marseilles, Ottawa and Streator quadrangles. **Bull. Illinois State Geol. Surv.**, No. 66, 343-344.

APPENDIX A

FIELD AND LABORATORY PROCEDURES

Trial and error during initial studies of the complex and variable glacial deposits of East Anglia and Essex showed that an absolute minimum of five sample points evenly distributed across the sand and gravel are needed to provide a worthwhile statistical assessment, but that, where possible, there should be not less than ten. Sample points are any points for which adequate information exists about the nature and thickness of the deposit and may include boreholes other than those drilled during the survey and exposures. In particular, the cooperation of sand and gravel operators ensures that boreholes are not drilled where reliable information is already available; although this may be used in the calculations, it is held confidentially by the Institute and cannot be disclosed.

The mineral shown on each 1:25 000 sheet is divided into resource blocks. The arbitrary size selected is a compromise to meet the aims of the survey by providing sufficient sample points in each block. As far as possible the block boundaries are determined by geological boundaries so that, for example, glacial and river terrace gravels are separated. Otherwise division is by arbitrary lines, which may bear no relationship to the geology. The blocks are drawn provisionally before drilling begins.

A reconnaissance of the ground is carried out to record any exposures and inquiries are made to ascertain what borehole information is available. Borehole sites are then selected to provide an even pattern of sample points at a density of approximately one per square kilometre. However, because broad trends are independently overlain by smaller-scale characteristically random variations, it is unnecessary to adhere to a square grid pattern. Thus such factors as ease of access and the need to minimise disturbance to land and the public are taken into account in siting the holes; at the same time it is necessary to guard against the possibility that ease of access (that is, the positions of roads and farms) may reflect particular geological conditions, which may bias the drilling results.

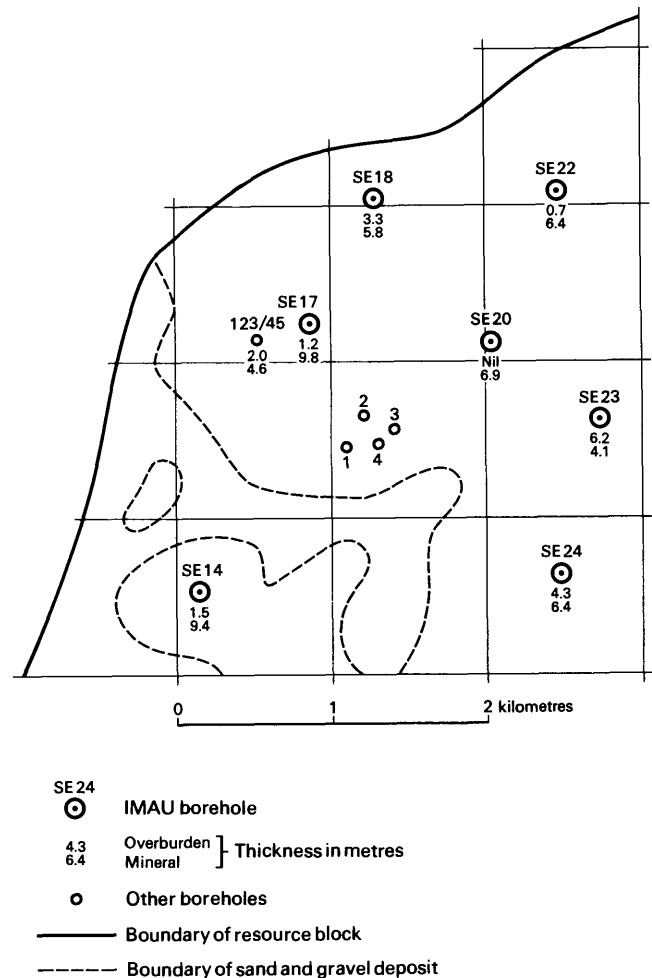
The drilling machine employed should be capable of providing a continuous sample representative of all unconsolidated deposits, so that the in-situ grading can be determined, if necessary, to a depth of 30 m (100 ft) at a diameter of about 200 mm (8 in), beneath different types of overburden. It should be reliable, quiet, mobile and relatively small (so that it can be moved to sites of difficult access). Shell and auger rigs have proved to be almost ideal.

The rigs are modified to enable deposits above the water table to be drilled 'dry', instead of with water added to facilitate the drilling, to minimise the amount of material drawn in from outside the limits of the hole. The samples thus obtained are representative of the in-situ grading, and satisfy one of the most important aims of the survey. Below the water table the rigs are used conventionally, although this may result in the loss of some of the fines fraction and the pumping action of the bailer tends to draw unwanted material into the hole from the sides or the bottom.

A continuous series of bulk samples is taken throughout the sand and gravel. Ideally samples are composed exclusively of the whole of the material encountered in the borehole between stated depths. However, care is taken to discard, as far as possible, material which has caved or has been pumped from the bottom of the hole. A new sample is commenced whenever there is an appreciable lithological change within the sand and gravel, or at every 1 m (3.3 ft) depth. The samples, each weighing between 25 and 45 kg (55 and 100 lb), are despatched in heavy-duty polythene bags to a laboratory for grading. The grading procedure is based on B.S. 1337 (British Standards Institution, 1967). Random checks of the accuracy of the grading are made in the Institute's laboratories.

All data, including mean grading analysis figures calculated for the total thickness of the mineral, are entered on standard record sheets, abbreviated copies of which are reproduced in Appendix E.

Detailed records may be consulted at the appropriate offices of the Institute, upon application to the Head, Industrial Minerals Assessment Unit.



Example of resource block assessment: map of a fictitious block

APPENDIX B

STATISTICAL PROCEDURE

Statistical assessment

1 A statistical assessment is made of an area of mineral greater than 2 km², if there are at least five evenly spaced boreholes in the resource block (for smaller areas, see Paragraph 12 below).

2 The simple methods used in the calculations are consistent with the amount of data provided by the survey (Hull, 1981). Conventional symmetrical confidence limits are calculated for the 95 per cent probability level, that is, on average nineteen out of every twenty sets of limits constructed in this way contain the true value for the volume of mineral.

3 The volume estimate (V) for the mineral in a given block is the product of two variables, the sampled areas (A) and the mean thickness (\bar{l}_m) calculated from the individual thicknesses at the sample points. The standard deviations for these variables are related such that

$$S_V = \sqrt{S_A^2 + S_{\bar{l}_m}^2} \quad [1]$$

4 The above relationship may be transposed such that

$$S_V = S_{\bar{l}_m} \sqrt{1 + S_A^2 / S_{\bar{l}_m}^2} \quad [2]$$

From this it can be seen that as $S_A^2 / S_{\bar{l}_m}^2$ tends to 0, S_V tends to $S_{\bar{l}_m}$.

If, therefore, the standard deviation for area is small with respect to that for thickness, the standard deviation for volume approximates to that for mean thickness.

5 Given that the number of approximately evenly spaced sample points in the sampled area is n with mineral thickness measurements $l_{m1}, l_{m2}, \dots, l_{mn}$, then the best estimate of mean thickness, \bar{l}_m , is given by

$$\Sigma (l_{m1} + l_{m2} \dots l_{mn}) / n.$$

For groups of closely spaced boreholes a discretionary weighting factor may be applied to avoid bias (see note on weighting below). The standard deviation for mean thickness $S_{\bar{l}_m}$, expressed as a proportion of the mean thickness, is given by

$$S_{\bar{l}_m} = (1/\bar{l}_m) \sqrt{[\Sigma (l_m - \bar{l}_m)^2 / (n - 1)]}$$

where l_m is any value in the series l_{m1} to l_{mn} .

6 The sampled area in each resource block is coloured pink on the map. Wherever possible, calculations relate to the mineral within mapped geological boundaries (which may not necessarily correspond to the limits of a deposit). Where the area is not defined by a mapped boundary, that is, where the boundary is inferred, a distinctive symbol is used. Experience suggests that the errors in determining area are small relative to those in thickness. The relationship $S_A / S_{\bar{l}_m} \leq 0.3$ is assumed in all cases. It follows from Equation [2] that

$$S_{\bar{l}_m} \leq S_V \leq 1.05 S_{\bar{l}_m} \quad [3]$$

7 The limits on the estimate of mean thickness of mineral, $L_{\bar{l}_m}$, may be expressed in absolute units $\pm (t/\sqrt{n}) \times S_{\bar{l}_m}$ or as a percentage $\pm (t/\sqrt{n}) \times S_{\bar{l}_m} \times (100/\bar{l}_m)$ per cent, where t is Student's t at the 95 per cent probability level for $(n - 1)$ degrees of freedom, evaluated by reference to statistical tables. (In applying Student's t it is assumed that the measurements are distributed normally).

8 Values of t at the 95 per cent probability level for values of n up to 20 are as follows:

n	t	n	t
1	infinity	11	2.228
2	12.706	12	2.201
3	4.303	13	2.179
4	3.182	14	2.160
5	2.776	15	2.145
6	2.571	16	2.131
7	2.447	17	2.120
8	2.365	18	2.110
9	2.306	19	2.101
10	2.262	20	2.093

(from Table 12 in *Biometrika Tables for Statisticians*, Volume 1, Second Edition, Cambridge University Press, 1962). When n is greater than 20, 1.96 is used (the value of t when n is infinity).

9 In calculating confidence limits for volume, L_V , the following inequality, corresponding to Equation [3], is applied:

$$L_{\bar{l}_m} \leq L_V \leq 1.05 L_{\bar{l}_m}.$$

10 In summary, for values of n between 5 and 20, L_V is calculated as

$$[(1.05 \times t) / \bar{l}_m] \times [\sqrt{\Sigma (l_m - \bar{l}_m)^2 / n (n - 1)}] \times 100$$

per cent,

and when n is greater than 20, as

$$[(1.05 \times 1.96) / \bar{l}_m] \times [\sqrt{\Sigma (l_m - \bar{l}_m)^2 / n (n - 1)}] \times 100$$

per cent.

11 The application of this procedure to a fictitious area is illustrated in the accompanying Figure and example of a block calculation.

Inferred assessment

12 If the sampled area of mineral in a resource block is between 0.25 km² and 2 km², an assessment is inferred on the basis of geological and topographical information, usually supported by the data from one or two boreholes. The volume of mineral is calculated as the product of the area, measured from field data, and the estimated thickness. Confidence limits are not calculated.

13 In some cases a resource block may include an area left uncoloured on the map, within which mineral (as defined) is interpreted to be generally absent. If there is reason to believe that some mineral may be present, an inferred assessment may be made.

14 No assessment is attempted for an isolated area of mineral less than 0.25 km².

15 Note on weighting The thickness of a deposit at any point may be governed solely by the position of the point in relation to a broad trend. However, most sand and gravel deposits also exhibit a random pattern of local, and sometimes considerable, variation in thickness. Thus the distribution of sample points needs to be only approximately regular and in estimating the mean thickness only simple weighting is necessary. In practice, equal weighting can often be applied to thicknesses at all sample points. If, however, there is a distinctly unequal distribution of points, bias is avoided by dividing the sampled area into broad zones, to each of which a value roughly proportional to its area is assigned. This value is then shared between the data points with the zone as the weighting factor.

Block calculation

Scale: 1:25 000
Block: Fictitious

Area
Block: 11.08 km²
Mineral: 8.32 km²

Mean thickness
Overburden: 2.5 m
Mineral: 6.5 m

Volume
Overburden: 21 million m³
Mineral: 54 million m³

Confidence limits of the estimate of mineral volume at the 95 per cent probability level: ± 20 per cent
That is, the volume of mineral (with 95 per cent probability): 54 ± 11 million m³

Thickness estimate (measurements in metres)
 l_o = overburden thickness l_m = mineral thickness

Sample point	Weighting w	Overburden		Mineral		Remarks
		l_o	wl_o	l_m	wl_m	
SE 14	1	1.5	1.5	9.4	9.4	IMAU boreholes
SE 18	1	3.3	3.3	5.8	5.8	
SE 20	1	nil	-	6.9	6.9	
SE 22	1	0.7	0.7	6.4	6.4	
SE 23	1	6.2	6.2	4.1	4.1	
SE 24	1	4.3	4.3	6.4	6.4	
SE 17	$\frac{1}{2}$	1.2	1.6	9.8	7.2	Hydrogeology Unit record
123/45	$\frac{1}{2}$	2.0		4.6		
1	$\frac{1}{4}$	2.7	2.6	7.3	5.8	Close group of four boreholes (commercial)
2	$\frac{1}{4}$	4.5		3.2		
3	$\frac{1}{4}$	0.4		6.8		
4	$\frac{1}{4}$	2.8		5.9		
Totals	$\Sigma w = 8$	$\Sigma wl_o = 20.2$		$\Sigma wl_m = 52.0$		
Means		$\overline{wl_o} = 2.5$		$\overline{wl_m} = 6.5$		

Calculation of confidence limits

wl_m	$ (wl_m - \overline{wl_m}) $	$(wl_m - \overline{wl_m})^2$
9.4	2.9	8.41
5.8	0.7	0.49
6.9	0.4	0.16
6.4	0.1	0.01
4.1	2.4	5.76
6.4	0.1	0.01
7.2	0.7	0.49
5.8	0.7	0.49

$$\Sigma (wl_m - \overline{wl_m})^2 = 15.82$$

$$n = 8$$

$$t = 2.365$$

L_V is calculated as

$$1.05 (t / \overline{wl_m}) \sqrt{[\Sigma (wl_m - \overline{wl_m})^2 / n(n-1)] \times 100}$$

$$= 1.05 \times (2.365 / 6.5) \sqrt{[15.82 / (8 \times 7)] \times 100}$$

$$= 20.3$$

$$\approx 20 \text{ per cent.}$$

APPENDIX C

CLASSIFICATION AND DESCRIPTION OF SAND AND GRAVEL

For the purposes of assessing resources of sand and gravel a classification should take account of economically important characteristics of the deposit, in particular the absolute content of fines and the ratio of sand to gravel.

The terminology commonly used by geologists when describing sedimentary rocks (Wentworth, 1922) is not entirely satisfactory for this purpose. For example, Wentworth proposed that a deposit should be described as a 'gravelly sand' when it contains more sand than gravel and there is at least 10 per cent of gravel, provided that there is less than 10 per cent of material finer than sand ($< \frac{1}{16}$ mm) and coarser than pebbles (> 64 mm in diameter). Because deposits containing more than 10 per cent fines are not embraced by this system, a modified binary classification based on Willman (1942) has been adopted.

When the fines content exceeds 40 per cent the material is considered to be not potentially workable and falls outside the definition of mineral. Deposits which contain 40 per cent fines or less are classified primarily on the ratio of sand to gravel but qualified in the light of the fines content, as follows: less than 10 per cent fines - no qualification; 10 per cent or more but less than 20 per cent fines - 'clayey'; 20 to 40 per cent fines - 'very clayey'.

The term 'clay' (as written, with single quote marks) is used to describe all material passing $\frac{1}{16}$ mm. Thus it has no mineralogical significance and includes particles falling within the size range of silt. The normal meaning applies to the term clay where it does not appear in single quotation marks.

The ratio of sand to gravel defines the boundaries between sand, pebbly sand, sandy gravel and gravel (at 19:1, 3:1 and 1:1).

Thus it is possible to classify the mineral into one of twelve descriptive categories (see the accompanying Figure). The procedure is as follows:

- 1 Classify according to the ratio of sand to gravel.
- 2 Describe the fines.

For example, a deposit grading 11 per cent gravel, 70 per cent sand and 19 per cent fines is classified as 'clayey' pebbly sand. This short description is included in the borehole log (see Appendix D)

Many differing proposals have been made for the classification of the grain size of sediments (Atterberg, 1905; Udden, 1914; Wentworth, 1922; Wentworth, 1935; Allen, 1936; Twenhofel, 1937; Lane and others, 1947). As Archer (1970a, b) has emphasised, there is a pressing need for a simple metric scale acceptable to both scientific and engineering interests, for which the class limit sizes correspond closely with certain marked changes in the natural properties of mineral particles. For example, there is an important change in the degree of cohesion between particles at about the $\frac{1}{16}$ -mm size, which approximates to the generally accepted boundary between silt and sand. These and other requirements are met by a system based on Udden's geometric scale and a simplified form of Wentworth's terminology (see the accompanying table), which is used in the Report.

The fairly wide intervals in the scale are consistent with the general level of accuracy of the qualitative assessments of the resource blocks. Three sizes of sand are recognised, fine ($+\frac{1}{16}$ - $\frac{1}{4}$ mm), medium ($+\frac{1}{4}$ - 1 mm) and coarse (+1 - 4 mm). The boundary at 16 mm distinguishes a range of finer gravel (+4 - 16 mm), often characterised by abundance of worn tough pebbles of vein quartz, from larger pebbles, often of notably different materials. The boundary at 64 mm distinguishes pebbles from cobbles. The term 'gravel' is used loosely to denote both pebble-sized and cobble-sized material.

The size distribution of borehole samples is determined by sieve analysis, which is presented by the laboratory as logarithmic cumulative curves (see, for example, British Standards Institution, 1967). In this report the grading is tabulated on the borehole record sheets (Appendix E), the intercepts corresponding with the simple geometric scale $\frac{1}{16}$ mm, $\frac{1}{4}$ mm, 1 mm, 4 mm, 16 mm and so on as required. Original sample grading curves are available for reference at the appropriate office of the Institute.

Each bulk sample is described, subjectively, by a geologist at the borehole site. Being based on visual examination, the description of the grading is inexact, the accuracy depending on the experience of the observer. The descriptions recorded are modified, as necessary, when the laboratory results become available.

The relative proportions of the rock types present in the gravel fraction are indicated by the use of the words 'and' or 'with'. For example, 'flint and quartz' indicates roughly equal proportions with neither constituent accounting for less than about 25 per cent of the whole; 'flint with quartz' indicates that flint is dominant and quartz, the principal accessory rock type, comprises 5 to 25 per cent of the whole. Where the accessory material accounts for less than 5 per cent of the whole, but is still readily apparent, the phrase 'with some' has been used. Rare constituents are referred to as 'trace'.

The terms used in the field to describe the degree of rounding of particles, which is concerned with the sharpness of the edges and corners of a clastic fragment and not the shape (after Pettijohn, 1975), are as follows.

Angular: showing little or no evidence of wear; sharp edges and corners.

Subangular: showing definite effects of wear. Fragments still have their original form but edges and corners begin to be rounded off.

Subrounded: showing considerable wear. The edges and corners are rounded off to smooth curves. Original grain shape is still distinct.

Rounded: original faces almost completely destroyed, but some comparatively flat surfaces may still remain. All original edges and corners have been smoothed off to rather broad curves. Original shape is still apparent.

Well rounded: no original faces, edges or corners left. The entire surface consists of broad curves; flat areas are absent. The original shape is suggested by the present form of the grain.

Classification of gravel, sand and fines

Size limits	Grain-size description	Qualification	Primary classification
64 mm	Cobble		
16 mm	Pebble	Coarse	Gravel
4 mm		Fine	
1 mm		Coarse	
$\frac{1}{4}$ mm	Sand	Medium	Sand
$\frac{1}{16}$ mm		Fine	
	Fines (silt and clay)		Fines

- I Gravel
- II 'Clayey' gravel
- III 'Very clayey' gravel
- IV Sandy gravel
- V 'Clayey' sandy gravel
- VI 'Very clayey' sandy gravel
- VII Pebbly sand
- VIII 'Clayey' pebbly sand
- IX 'Very clayey' pebbly sand
- X Sand
- XI 'Clayey' sand
- XII 'Very clayey' sand

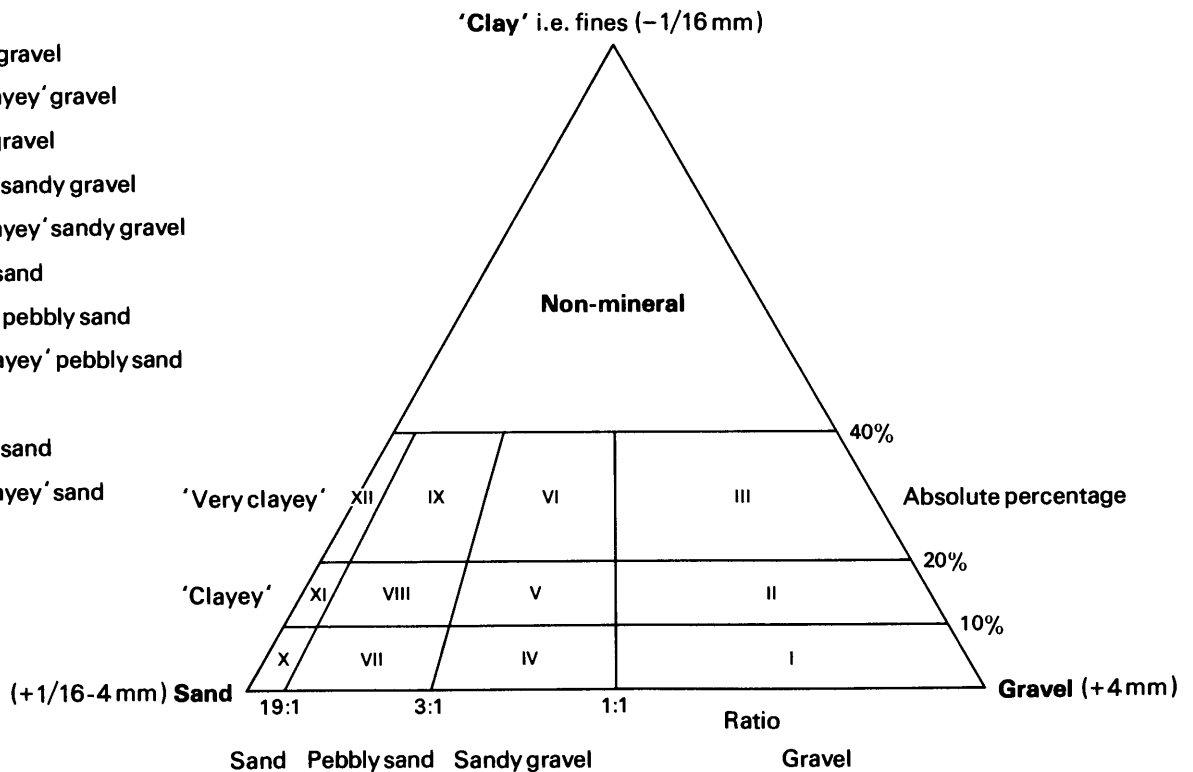


Diagram showing the descriptive categories used in the classification of sand and gravel

APPENDIX D

EXPLANATION OF THE BOREHOLE RECORDS

Annotated fictitious example

CK 66 NW 5¹	6191 6962²	Northfields³	Block B
Surface level c.+49.7 m ⁴			Overburden ⁷ 2.8 m
Water struck at +45.9 m ⁵			Mineral 5.4 m
October 1972 ⁶			Waste 1.1 m
			Mineral 1.4 m
			Bedrock 0.7 m+ ⁸

LOG

Geological classification	Lithology ⁹	Thickness m	Depth m
	Soil	0.2	0.2
Alluvium	Clay, silty, dark brown	2.6	2.8
River Terrace Deposits	a Gravel Gravel: fine to coarse, with cobbles towards base, angular to rounded flint and limestone with ironstone and some quartz and chalk Sand: medium with coarse and some fine, quartz and limestone	5.4	8.2
Boulder Clay	Clay, sandy and pebbly, red-brown	1.1	9.3
Glacial Sand and Gravel	b Sand, 'clayey' in part: fine, subangular to rounded, quartz with some coal	1.4	10.7
Lias	Mudstone, blue-grey, fossiliferous	0.7+	11.4

GRADING¹⁰

	Mean for deposit percentages			Depth below surface (m)	percentages								
	Fines	Sand	Gravel		Fines			Sand			Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm		
a	5	46	49	2.8-3.9	20	14	62	2	2	0	0		
				3.8-4.8	2	2	12	18	42	24	0		
				4.8-5.8	1	3	24	13	35	24	0		
				5.8-6.8	0	4	21	20	26	29	0		
				6.8-8.2	4	3	23	10	23	30	7		
			Mean	5	5	28	13	25	22	2			
b	5	95	0	9.3-10.3	3	73	23	1	0	0	0		
				10.3-10.7	9	85	5	1	0	0	0		
				Mean	5	77	17	1	0	0	0		
a+b	5	56	39	Mean	5	20	26	10	20	17	2		

The numbered paragraphs below correspond with the annotations given on the specimen record opposite.

1 Borehole Registration Number

Each Industrial Minerals Assessment Unit (IMAU) borehole is identified by a Registration Number. This consists of two statements.

- a The number of the 1:25 000 sheet on which the borehole lies, here CK 66.
- b The quarter of the 1:25 000 sheet on which the borehole lies and the number of the borehole in a series for that quarter, here NW 5.

Thus the full Registration Number is CK 66 NW 5.

2 National Grid Reference

All National Grid References fall in the 100 km square identified by the first two letters of the Registration Number. Grid references are given to eight figures, accurate to within 10 m.

3 Location

The position of the borehole is generally referred to the nearest named locality on the 1:25 000 base map and the resource block in which the borehole lies is stated.

4 Surface level

The surface level at the borehole site is given in metres above Ordnance Datum.

5 Groundwater conditions

If groundwater was present the level at which it was encountered is normally given (in metres relative to Ordnance Datum).

6 Type of drill and date of drilling

Unless otherwise stated, boreholes were drilled by a shell and auger rig using 152 or 203 mm casing. The month and year of completion of drilling are stated.

7 Overburden, mineral, waste and bedrock

Mineral is sand and gravel which, as part of a deposit, falls within the arbitrary definition of potentially workable material (see p. 1). Bedrock is the 'formation', 'country rock' or 'rock head' below which potentially workable sand and gravel will not be found. Waste is any material other than bedrock or mineral. Where waste occurs between the surface and mineral it is classified as overburden.

8 The plus sign (+) indicated that the base of the deposit was not reached during drilling.

9 Lithological description

When sand and gravel is recorded a general description based on the grading characteristics (for details see Appendix C) is followed by more detailed particulars of the gravel and/or sand fraction. Where more than one bed of mineral is recognised each is designated by a letter, e.g. **a**, **b**, etc. The description of other deposits is based on visual examination in the field.

10 Grading data

A continuous series of bulk samples is taken throughout the thickness of sand and gravel. A new sample is commenced whenever there is an appreciable lithological change or at every 1 m of depth.

For each bulk sample the percentages of fines ($< \frac{1}{16}$ mm), fine sand ($\frac{1}{16}$ – $\frac{1}{4}$ mm), medium sand ($\frac{1}{4}$ –1 mm), coarse sand (1–4 mm), fine gravel (4–16 mm), coarse gravel (16–64 mm) and cobble gravel (>64 mm) are stated.

The mean grading of groups of samples making up an identified bed of mineral are also given in detail and in summary. Where more than one bed is recognised the

mean grading for the whole of the mineral in the borehole may be given. Where necessary, in calculating mean gradings, data for individual samples are weighted by the thickness represented. If, exceptionally, grading results are not available for a sample, an attempt may be made to estimate the grading by comparing the grading and field descriptions of adjacent samples with the sample in question. Such estimates are shown in square brackets. Alternatively, in calculating means, the sample may be allotted the mean grading of other samples in the deposit.

Fully representative sampling of sand and gravel is difficult to achieve, particularly where groundwater levels are high. Comparison between boreholes and adjacent exposures commonly suggests that in borehole samples the proportion of sand may be higher and the proportion of fines and coarse gravel may be lower.

APPENDIX E
INDUSTRIAL MINERALS ASSESSMENTS UNIT

SU 80 NW 117 8072 0860 Funtington

Block A

Surface level +41.1 m
 Water not struck
 September 1981

Waste 7.0 m
 Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, pebbly	0.5	0.5
Head Gravel	Clay, reddish brown, with flint pebbles	3.5	4.0
Raised Beach Deposits (older)	'Very clayey' sand, fine, olive brown; trace of gravel	1.0	5.0
	Clay and silt, very sandy, grey and indurated at base, with chalk breccia	2.0	7.0
Upper chalk	Chalk	0.3+	7.3

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
31	68	1	4.0-5.0	31	68	0	0	1	0	0

SU 80 NW 118 8059 0782 Northbrook Cottages

Block A

Surface level +21.1 m
 Water struck at +19.9 m
 October 1981

Overburden 1.4 m
 Mineral 1.8 m
 Waste 3.0 m
 Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty, pebbly towards base	1.2	1.2
Fan Gravel	Clay, pebbly, chalky	0.2	1.4
	'Very clayey' gravel Gravel: coarse and fine, angular, to subrounded; flint (some white and porous) Sand: coarse with medium and some fine Fines: chalky clay	1.8	3.2
	Silt, chalky, with some flint pebbles, more pebbly at base	3.0	6.2
Upper Chalk	Chalk, rubbly and weathered	1.8+	8.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
23	20	57	1.4-2.2	11	2	7	13	28	39	0
			2.2-3.2	34	4	5	9	25	23	0
			Mean	23	3	6	11	26	31	0

SU 80 NW 119 8057 0680 Southbrook Road Block A

Surface level +22.2 m Waste 1.5 m
 Water not struck Bedrock 6.0 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Head Gravel	Clay, increasingly pebbly with depth	1.1	1.5
?Woolwich and Reading Beds	Clay, mottled grey and yellow-brown; some sand	0.3	1.8
	Silt, pebbly	3.6	5.4
Woolwich and Reading Beds	Clay, sandy, mottled red and grey	2.1+	7.5

SU 80 NW 121 8045 0592 Mudberry Farm Block D

Surface level +9.5 m Overburden 1.1 m
 Water struck at +8.4 m Mineral 2.0 m
 October 1981 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.6	0.6
Brickearth	Clay, silty, brown, pebbly at base	0.5	1.1
Raised Beach Deposits (younger)	'Very clayey' gravel Gravel: coarse and fine, angular to well rounded; flint Sand: fine and coarse with medium	2.0	3.1
London Clay	Clay and silt, sandy in parts, dark grey and brown, some mottling	1.2+	4.3

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
33	28	39	1.1-2.1	34	5	8	13	20	20	0
			2.1-3.1	31	19	5	6	15	24	0
			Mean	33	12	6	10	17	22	0

SU 80 NW 122 8156 0834 Ashling Wood

Block A

Surface level +38.0 m
Water not struck
September 1981

Waste 6.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, thin, on clay with flint pebbles	0.3	0.3
Head Gravel	Silt, brown, chalky, especially towards base, with much gravel	6.2	6.5
Upper Chalk	Chalk	0.5+	7.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
44	20	36	0.3-1.3	43	5	7	9	19	17	0
			1.3-2.3	42	5	6	9	16	22	0
			Mean	44	5	6	9	17	19	0

SU 80 NW 123 8113 0705 Southbrook

Block A

Surface level +17.3 m
Water not struck
October 1981

Waste 2.9 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, chalky, pebbly, very soft below 1.9 m	2.6	2.9
Upper Chalk	Chalk, very soft	1.0+	3.9

SU 80 NW 124 8157 0633 Clay Lane

Block A

Surface level +17.5 m
Water not struck
September 1981

Waste 0.5 m
Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Woolwich and Reading Beds	Clay, silty and pebbly to 1.4 m, grey with yellow mottling and waxy to 1.7 m, mottled red and grey below	1.9+	2.4

SU 80 NW 125 8159 0548 Brooks Lane

Block D

Surface level +11.6 m
Water not struck
September 1981

Waste 3.8 m
Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, silty, brown, with chalk and flint pebbles below 1.7 m	2.2	2.5
Raised Beach Deposits (younger)	Silt, clayey and sandy, with chalk pellets; 0.7 m sandy gravel seam at base	1.3	3.8
London Clay	Clay, weathered, mottled grey and olive yellow and with some sandy layers near top, grey below	1.7+	5.5

SU 80 NW 126 8270 0807 Lye Wood

Block A

Surface level +37.1 m
Water not struck
September 1981

Waste 2.6 m
Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, reddish brown, clayey	0.5	0.5
Head Gravel	Clayey silt, brown, with many angular and rounded flint pebbles	2.1	2.6
Upper Chalk	Chalk, weathered brown, rubbly	1.4+	4.0

SU 80 NW 127 8225 0744 East Ashling

Block A

Surface level +28.8 m
Water not struck
September 1981

Waste 5.7 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Clay, silty, orange-brown	1.0	1.1
Head Gravel	Clay, silty, pale brown, with flint pebbles; pebbles more rounded below 1.8 m	4.6	5.7
Upper Chalk	Chalk, rubbly and soft at top, with flint pebbles	0.5+	6.2

SU 80 NW 128 8296 0650 Oakwood Park

Block A

Surface level +32.4 m
Water struck at +29.8 m
September 1981

Overburden 0.5 m
Mineral 3.4 m
Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil on brown clay with flints	0.5	0.5
Head Gravel on Raised Beach Deposits (older)	'Clayey' gravel Gravel: fine and coarse with a few cobbles, angular to rounded; flint Sand: fine and coarse with medium; flint Fines: brown and grey clay and silt	3.4	3.9
Woolwich and Reading Beds	Mudstone and clay, mottled red and grey	1.4+	5.3

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
18	27	55	0.5-1.5	18	3	6	15	33	25	0
			1.5-2.0	15	4	8	15	29	23	6
			2.0-2.6	19	14	7	12	27	21	0
			2.6-3.9	18	19	3	6	31	20	3
			Mean	18	11	5	11	31	22	2

SU 80 NW 129 8261 0537 Bethwines Farm

Block D

Surface level +8.9 m
Water not struck
October 1981

Waste 2.2 m
Bedrock 4.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, brown, pebbly below 1.6 m	1.8	2.2
London Clay	Clay, mottled grey and yellow brown to 3.0 m, grey and silty below	4.4+	6.6

SU 80 NW 130 8339 0831 West Stoke

Block A

Surface level +37.9 m
Water not struck
October 1981

Overburden 2.1 m
Mineral 1.4 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.9	0.9
Head Gravel	Clay, brown, with flint pebbles; more pebbly below 2.0 m	1.2	2.1
	'Very clayey' gravel Gravel: coarse and fine, angular to subrounded; flint with white patina Sand: coarse with fine and medium	1.4	3.5
Upper Chalk	Chalk, weathered and rubbly to 4.0 m	2.0+	5.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-16	+16 -4	+4 -1	+1 -4	+4 -16	+16 -64	+64 mm
24	15	61	2.1-3.1	25	3	3	8	28	33	0
			3.1-3.5	23	5	4	8	27	33	0
			Mean	24	4	3	8	28	33	0

Surface level +30.8 m
 Water not struck
 September 1981

Overburden 3.0 m
 Mineral 1.0 m
 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, pale brown	0.4	0.4
Head Gravel	Clay, brown, with flint pebbles	2.6	3.0
	'Very clayey' gravel Gravel: fine and coarse, angular to well rounded; flint Sand: coarse with medium and fine	1.0	4.0
Upper Chalk	Chalk, silty and with flint pebbles to 4.5 m, rubbly and with fresh flints below	0.9+	4.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
24	13	63	3.0-4.0	24	2	3	8	31	32	0

Surface level +22.3 m
 Water struck at +11.3 m
 September 1981

Waste 2.5 m
 Bedrock 10.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Head	Fill and made ground; 0.2 m 'clayey' gravel seam at base	2.5	2.5
London Clay	Clay, mottled pale grey and yellowish brown to 3.0 m; becomes grey, harder and pyritic, with laminations and listric surfaces, below 3.0 m	10.3+	12.8

Surface level +40.6 m
Water not struck
October 1981

Overburden 0.7 m
Mineral 6.3 m
Waste 3.7 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Head Gravel	'Clayey gravel, 'very clayey' above 2.7 m Gravel: coarse and fine with some cobbles; flint, mostly with white patina Sand: coarse with medium and fine	6.3	7.0
	Clay, pebbly, sandy (poor recovery)	3.7	10.7
Upper Chalk	Chalk, rubbly	1.0+	11.7

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	20	65	0.7-1.7	26	2	4	9	26	25	8
			1.7-2.7	22	3	4	8	26	37	0
			2.7-3.7	16	2	5	15	33	26	3
			3.7-4.7	11	3	7	14	29	32	4
			4.7-5.7	7	2	5	13	26	35	12
			5.7-7.0	9	3	6	11	29	39	3
			Mean	15	3	5	12	28	32	5

Surface level +26.3 m
Water not struck
September 1981

Overburden 0.3 m
Mineral 1.9 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Head Gravel	'Very clayey' gravel Gravel: coarse and fine with a few cobbles, angular to rounded; flint Sand: coarse, medium and fine Fines: brown chalky clay	1.9	2.2
Upper Chalk	Chalk, pale brown, weathered, rubbly, becoming fresher downwards	1.8+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
21	16	63	0.3-1.3	21	3	5	9	23	39	0
			1.3-2.2	20	4	5	8	19	41	3
			Mean	21	3	5	8	21	41	1

SU 80 NW 135 8451 0529 Salthill Lodge Block D

Surface level +10.0 m Overburden 0.5 m
 Water struck at +9.4 m Mineral 1.0 m
 October 1981 Waste 0.8 m
 Bedrock 2.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Head Gravel	'Clayey' gravel Gravel: fine with some coarse, angular to subrounded; brown and white flint Sand: coarse and medium with fine	1.0	1.5
	Clay, pebbly, sandy, very soft	0.8	2.3
London Clay	Clay, mottled brown and weathered to 3.5 m, grey below	2.7+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
19	34	47	0.5-1.5	19	5	12	17	34	13	0

SU 80 NE 35 8548 0909 Lavant Block B

Surface level +32.6 m Waste 4.2 m
 Water struck at +29.1 m Bedrock 0.7 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground, topsoil and rubble	1.7	1.7
River Terrace Deposits	Silt, with rounded flint pebbles and chalk pellets	1.8	3.5
Head Gravel	'Very clayey' gravel Gravel: coarse and fine, angular to subrounded; flint (some white and porous) with some chalk Sand: coarse with medium and fine; chalk Fines: chalky	0.7	4.2
Upper Chalk	Chalk, rubbly	0.7+	4.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
22	19	59	3.5-4.2	22	3	5	11	22	37	0

SU 80 NE 36 8515 0607 Whitehouse Farm Block A

Surface level +29.3 m Overburden 0.2 m
 Water struck +26.3 m Mineral 3.0 m
 September 1981 Waste 0.8 m
 Mineral 1.5 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, flinty	0.2	0.2
Head Gravel	a 'Very clayey' gravel Gravel: fine and coarse, angular to rounded; flint Sand: coarse with medium and fine; angular flint	3.0	3.2
	Clay, sandy	0.8	4.0
Raised Beach Deposits (older)	b 'Clayey' pebbly sand Gravel: fine and coarse with cobbles, rounded; flint Sand: fine with medium and some coarse, subangular to subrounded; quartz with some dark rock fragments	1.5	5.5
London Clay	Clay, brown mottled to 5.6 m, grey below	1.2+	6.7

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages								
	Fines	Sand	Gravel		Fines			Sand			Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm		
a	20	18	62	0.2-1.2	24	2	4	9	28	27	6		
				1.2-2.2	16	3	5	11	32	33	0		
				2.2-3.2	20	4	5	12	31	28	0		
				Mean	20	3	5	10	30	30	2		
b	15	67	18	4.0-4.7	5	21	29	13	10	12	10		
				4.7-5.5	23	57	12	2	4	2	0		
				Mean	15	40	20	7	7	7	4		
a+b	18	34	48	Mean	18	15	10	9	23	22	3		

SU 80 NE 37 8694 0801 East Lavant

Block B

Surface level +32.2 m
 Water not struck
 September 1981

Overburden 0.2 m
 Mineral 3.8 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	'Clayey' gravel Gravel: coarse and fine, angular to rounded; flint (some white and porous) Sand: coarse with medium and fine; flint	3.8	4.0
Upper Chalk	Chalk, soft, weathered	1.2+	5.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages								
	Fines	Sand	Gravel		Fines			Sand			Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm		
	14	19	67	0.2-1.2	18	4	4	7	27	38	2		
				1.2-2.2	14	3	5	10	27	41	0		
				2.2-3.2	12	3	5	13	31	36	0		
				3.2-4.0	12	3	6	13	32	34	0		
				Mean	14	3	5	11	29	38	0		

Surface level +40.3 m
 Water not struck
 September 1981

Overburden 1.0 m
 Mineral 2.0 m
 Waste 2.0 m
 Mineral 2.9 m
 Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground on brown clay with flints	1.0	1.0
Head Gravel	a 'Very clayey' gravel Gravel: coarse and fine, angular; flint with some sandstone Sand: coarse with medium and fine Fines: brown clay	2.0	3.0
	Clay, yellow-brown, with flint pebbles	2.0	5.0
Raised Beach Deposits (older)	b 'Very clayey' sand: fine with trace of medium, angular; quartz with traces of mica and dark mineral grains	2.9	7.9
Upper Chalk	Chalk, white, hard	0.7+	8.6

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	30	13	57	1.0-2.0	29	2	3	8	24	34	0
				2.0-3.0	32	1	3	7	25	32	0
				Mean	30	2	3	8	24	33	0
b	26	74	0	5.0-6.0	19	79	1	1	0	0	0
				6.0-7.9	30	66	4	0	0	0	0
				Mean	26	71	3	0	0	0	0
a+b	28	49	23	Mean	28	43	3	3	10	13	0

Surface level +30.4 m
 Water not struck
 September 1981

Overburden 4.4 m
 Mineral 2.2 m
 Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil on buff to brown clay with flint fragments	4.4	4.4
Head Gravel	'Clayey' gravel Gravel: fine and coarse, angular to rounded; flint Sand: coarse and medium with fine, angular; flint	2.2	6.6
Upper Chalk	Chalk, soft and weathered to 7.5 m, harder below	1.3+	7.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
18	25	57	4.4-5.4	16	3	7	15	34	25	0
			5.4-6.6	20	4	8	13	32	23	0
			Mean	18	4	7	14	33	24	0

SU 80 NE 40 8742 0661 Oldplace Farm Block B

Surface level +22.6 m Overburden 2.8 m
 Water struck at +17.6 m Mineral 1.9 m
 September 1981 Bedrock 6.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Fill, thin, on brown silt and clay with small flint pebbles	2.8	2.8
Head Gravel	'Very clayey' gravel Gravel: coarse and fine, angular to rounded; flint, mostly white Sand: coarse and medium with fine, angular; flint Fines: brown clay	1.9	4.7
Woolwich and Reading Beds	Clay and mudstone, soft, lignitic, grey at top, darker grey and mottled red below; yellow, sandy and pebbly at base	6.1	10.8
Upper Chalk	Chalk, soft, grey-white	0.1+	10.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
22	17	61	2.8-3.8	27	3	5	9	31	25	0
			3.8-4.7	16	3	5	9	29	38	0
			Mean	22	3	5	9	29	32	0

SU 80 NE 41 8852 0770 Westerton

Block B

Surface level +30.4 m
Water not struck
September 1981

Waste 4.0 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Head Gravel	Clay, flinty, reddish brown to 1.8 m, yellowish brown to buff and with chalk pellets below	3.6	4.0
Upper Chalk	Chalk, weathered, pale brown and with flints at top, becoming paler and fresher towards base	2.0+	6.0

SU 80 NE 42 8865 0678 Maudlin

Block B

Surface level +24.7 m
Water struck +16.7 m
September 1981

Overburden 2.1 m
Mineral 2.0 m
Bedrock 5.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Head Gravel	Soil, pale brown, on brown clay with small flint pebbles	2.1	2.1
Raised Storm Beach Deposits	'Very clayey' gravel Gravel: fine and coarse, angular to subrounded; flint, brown and white Sand: coarse with medium and fine Fines: greyish clay	2.0	4.1
Woolwich and Reading Beds	Clay, brown to 5.0 m, grey and red mottled below, with flint pebbles and, below 9.0 m, chalk fragments	5.4+	9.5
Upper Chalk	Chalk, weathered, rubbly, just penetrated	-	-

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Sand		Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
39	12	49	2.1-3.1	39	2	2	8	24	25	0
			3.1-4.1	38	2	3	7	30	20	0
			Mean	39	2	3	7	27	22	0

SU 80 NE 43 8990 0820 Waterbeach

Block B

Surface level +39.8 m
Water not struck
September 1981

Overburden 0.3 m
Mineral 5.0 m
Waste 1.0 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.3	0.3
Head Gravel	'Very clayey' gravel Gravel: coarse and fine, angular to rounded; black flint with white patina Sand: coarse with medium and fine Fines: brown clay	5.0	5.3
?Raised Beach Deposits (older)	Clay, brown, flinty, with 0.2 m sand seam at base	1.0	6.3
Upper Chalk	Chalk: soft pebbles in brown chalky matrix	0.9+	7.2

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
28	16	56	0.3-1.3	24	2	4	8	25	37	0
			1.3-2.3	22	3	5	10	24	36	0
			2.3-3.3	25	3	6	13	28	23	2
			3.3-4.3	28	3	5	11	26	27	0
			4.3-5.3	39	2	3	6	21	29	0
			Mean	28	3	4	9	24	32	0

SU 80 NE 44 8955 0685 Temple Bar

Block B

Surface level +23.3 m
Water struck at +22.3 m
September 1981

Overburden 1.0 m
Mineral 2.0 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil with flint pebbles	1.0	1.0
Raised Storm Beach Deposits	'Clayey' pebbly sand Gravel: fine and coarse, angular to well rounded; flint (some white and porous) Sand: fine with some medium and coarse Fines: brown, silty	2.0	3.0
Woolwich and Reading Beds	Clay, mottled, waxy	0.7+	3.7

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
19	67	14	1.0-1.9	5	43	16	15	14	7	0
			1.9-3.0	31	54	4	3	3	5	0
			Mean	19	50	9	8	8	6	0

SU 80 NE 45 8969 0567

Copse Farm

Block F

Surface level +14.0 m
 Water not struck
 September 1981

Overburden 0.7 m
 Mineral 4.3 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil, thin, brown, on brown clay with small flint pebbles and a few silty laminations	0.7	0.7
Head Gravel	'Very clayey' gravel Gravel: fine with some coarse, rounded to angular; white flint with some chalk Sand: coarse, with medium and fine Fines; brownish grey clay and chalk debris	4.3	5.0
London Clay	Clay and mudstone, yellow brown, silty and darker brown towards base	1.0+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
38	28	34	0.7-1.7	39	6	8	12	20	15	0
			1.7-2.7	40	5	10	18	15	12	0
			2.7-3.7	38	10	4	13	26	9	0
			3.7-5.0	36	5	8	14	25	12	0
			Mean	38	6	8	14	22	12	0

SU 80 SW 81

8069 0467

Broadbridge Farm

Block D

Surface level +6.0 m
 Water not struck
 October 1981

Waste 2.8 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, brown	1.0	1.4
Raised Beach Deposits (younger)	Silt, very chalky, with chalk and flint pebbles	1.4	2.8
Upper Chalk	Chalk, rubbly, with large nodular flints	1.2+	4.0

SU 80 SW 82 8008 0269 Lowerhone Farm

Block D

Surface level +6.4 m
Water not struck
October 1981

Waste 5.2 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Clay, silty and brown at top, yellowish brown and sandy near base	2.8	2.9
Raised Beach Deposits (younger)	Silt, chalky, with chalk pebbles	0.2	3.1
	Clay with flint pebbles, sandy near top	2.1	5.2
Upper Chalk	Chalk, rubbly near top	0.6+	5.8

SU 80 SW 83 8151 0411 Rectory House

Block D

Surface level +4.4 m
Water not struck
October 1981

Waste 2.0 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Brickearth	Clay, silty, brown	0.4	1.1
Raised Beach Deposits (younger)	Silt, chalky, with chalk pebbles and flint at base	0.9	2.0
Upper Chalk	Chalk, rubbly	1.0+	3.0

SU 80 SW 84 8118 0332 Southwood Farm

Block D

Surface level +4.2 m
Water not struck
October 1981

Waste 3.5 m
Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, mottled brown	2.3	2.7
Raised Beach Deposits (younger)	Silt, sandy, with chalk pellets and pebbles	0.8	3.5
Upper Chalk	Chalk, soft, with nodular flints, weathered at top	1.5+	5.0

Surface level +6.3 m
Water struck at +4.6 m
October 1981

Overburden 1.7 m
Mineral 1.2 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.1	0.1
Brickearth	Clay, silty, brown	1.6	1.7
Raised Beach Deposits (younger)	'Clayey' sandy gravel Gravel: coarse and fine, angular to well rounded; flint (some white and porous), limestone and traces of other rock fragments Sand: fine with coarse and medium Fines: silt, brown with clay clasts from Woolwich and Reading Beds	1.2	2.9
Woolwich and Reading Beds	Clay, mottled red and grey	1.1+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Sand		Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
14	51	35	1.7-2.1	13	16	11	20	18	22	0
			2.1-2.9	14	33	11	9	14	19	0
			Mean	14	27	11	13	15	20	0

Surface level +7.0 m
Water struck at +5.8 m
September 1981

Overburden 2.1 m
Mineral 7.0 m
Bedrock 3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, brown, silty, with fine sand near base	1.9	2.1
Raised Beach Deposits (younger)	a 'Very clayey' sand with a few pebbles Sand: fine with trace of medium, angular to subrounded; quartz with some dark minerals Fines: silt, yellow-brown	2.0	4.1
	b 'Clayey' sand Sand: fine, angular to subrounded; quartz with some dark minerals Fines: silt, yellow-brown	5.0	9.1
London Clay	Sand, grey-yellow, with dark minerals to 10.1 m, hard and with some shell fragments below	3.5+	12.6

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages									
	Fines	Sand	Gravel		Fines			Sand				Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm			
a	20	79	1	2.1-3.1	30	63	2	1	1	3	0			
				3.1-4.1	10	90	0	0	0	0	0			
				Mean	20	78	1	0	0	1	0			
b	13	87	0	4.1-5.1	7	93	0	0	0	0	0			
				5.1-6.1	6	93	1	0	0	0	0			
				6.1-7.1	13	87	0	0	0	0	0			
				7.1-8.1	21	79	0	0	0	0	0			
				8.1-9.1	18	82	0	0	0	0	0			
				Mean	13	87	0	0	0	0	0			
a+b	15	85	0	2.1-9.1	15	85	0	0	0	0	0			

SU 80 SW 87 8272 0407 Gothic Cottage Block D

Surface level +3.3 m Waste 2.0 m
 Water not struck Bedrock 1.0 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, brown, silty, chalky, with pebbles of chalk and flint	0.8	1.2
Raised Beach Deposits (younger)	Silt, chalky, with chalk pebbles	0.8	2.0
Upper Chalk	Chalk, rubbly, weathered	1.0+	3.0

SU 80 SW 88 8249 0336 Oldpark Farm, Bosham Block D

Surface level +6.1 m Waste 3.8 m
 Water struck at +1.6 m Bedrock 1.7 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Clay, silty, brown, with pebbles near base	1.9	2.0
Raised Beach Deposits (younger)	Silt, sandy, chalky, with chalk pebbles	0.5	2.5
	Silt, sandy, mottled grey and yellow-brown, with chalk pellets and flint pebbles	1.3	3.8
Upper Chalk	Chalk, weathered, rubbly, with silt matrix and nodular flint	1.7+	5.5

Surface level +8.3 m
Water struck at +6.8 m
October 1981

Overburden 1.5 m
Mineral 1.7 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, silty, mottled pale grey and yellowish brown, sandy near base	1.3	1.5
Raised Beach Deposits (younger)	Sandy gravel Gravel: fine and coarse, angular to well rounded; flint (some white and porous), chalk and limestone with some sandstone Sand: fine with medium and coarse; quartz dominant Fines: silt, brown	1.7	3.2
Woolwich and Reading Beds	Clay, waxy, mottled red and grey, brown near top	0.6+	3.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
9	58	33	1.5-2.5	7	32	15	16	20	10	0
			2.5-3.2	12	31	12	8	16	21	0
			Mean	9	31	14	13	18	15	0

Surface level +6.3 m
Water struck at +5.1 m
September 1981

Overburden 1.2 m
Mineral 1.0 m
Waste 1.1 m
Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, silty, yellow-brown	0.9	1.2
Raised Beach Deposits (younger)	'Very clayey' pebbly sand Gravel: coarse with fine, angular to subrounded; flint with some chalk and sandstone Sand: fine with traces of medium and coarse, angular to subrounded; quartz Fines: silt, yellow-brown	1.0	2.2
	Silt, sandy, brown and grey	1.1	3.3
London Clay	Silt, clayey, grey, with traces of shells	2.1+	5.4

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
24	63	13	1.2-2.2	24	60	2	1	3	10	0

SU 80 SW 91 8364 0175 New Barn, Appledram Block D

Surface level +6.7 m Waste 2.5 m
 Water struck at +5.2 m Bedrock 3.0 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.3	0.3
Brickearth	Clay, yellow-brown and grey variegated, with some flint pebbles	1.2	1.5
Raised Beach Deposits (younger)	Silt, sandy, brown with some olive green mottling; some flint pebbles	1.0	2.5
London Clay	Silt, sandy, dark grey at top, purple near base, glauconitic, with some pyrite nodules	2.1	4.6
Woolwich and Reading Beds	Clay, grey, with brown mottling near top, purple towards base	0.9+	5.5

SU 80 SW 92 8303 0009 Birdham Block D

Surface level +6.5 m Waste 1.8 m
 Water struck at +4.7 m Bedrock 2.2 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, silty, brown	1.1	1.6
Raised Beach Deposits (younger)	'Very clayey' sand with flint pebbles	0.2	1.8
London Clay	Clay, brown with yellow mottling to 3.6 m, hard and grey below	2.2+	4.0

SU 80 SW 93 8456 0360 Appledram Lane

Block D

Surface level +4.3 m
Water struck at +1.3 m
September 1981

Waste 3.0 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.4	0.4
Brickearth	Clay, stiff, brown, with rootlet markings	1.6	2.0
Fan Gravel	Clay, chalky, very pebbly, with angular to rounded flint ranging from sand to coarse gravel size	1.0	3.0
Upper Chalk	Chalk, soft, rubbly, greyish white	0.9+	3.9

SU 80 SW 94 8441 0264 Morgansholme

Block D

Surface level +7.8 m
Water struck at +5.0 m
September 1981

Waste 3.5 m
Bedrock 5.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.3	0.3
Brickearth	Clay, silty, yellow-brown	2.5	2.8
Raised Beach Deposits (younger)	'Clayey' gravel Gravel: coarse and fine, angular to well rounded; flint (some white and porous), limestone, sandstone and chalk Sand: fine with some coarse and medium, angular to subangular; quartz with some flint Fines: silt	0.7	3.5
Woolwich and Reading Beds	Clay, stiff, mottled bright red and grey	5.5+	9.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	41	44	2.8-3.5	15	33	3	5	19	22	3

SU 80 SW 95 8406 0104 Manhood End

Block D

Surface level +6.2 m
Water not struck
September 1981

Waste 2.8 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.2	0.2
Brickearth	Clay, silty, brown	0.8	1.0
Raised Beach Deposits (younger)	Silt, sandy, grey	1.8	2.8
London Clay	Clay, dark grey, weathered brown at top, with fragments of large bivalve shells	1.0+	3.8

SU 80 SE 42 8553 0294 Selsey Road, Donnington

Block E

Surface level +6.1 m
Water struck at +3.9 m
September 1981

Overburden 1.5 m
Mineral 1.8 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, flinty	0.2	0.2
	Clay, silty, brown, with flints	1.3	1.5
Fan Gravel	'Clayey' gravel Gravel: coarse with fine, angular to rounded; flint Sand: fine, medium and coarse, angular; flint with some chalk Fines: chalky clay	1.8	3.3
Woolwich and Reading Beds	Clay, reddish brown with grey mottling	0.7+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
16	19	65	1.5-2.5	18	3	5	8	28	38	0
			2.5-3.3	15	9	6	9	24	37	0
			Mean	16	6	5	8	26	39	0

Surface level +8.1 m
Water struck at +5.1 m
September 1981

Overburden 3.0 m
Mineral 1.6 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, yellow-brown, with many rounded flints in lower part	2.7	3.0
Raised Beach Deposits (younger)	Sandy gravel Gravel: coarse and fine, angular to rounded; flint Sand: fine with some coarse and medium, angular to subrounded; quartz with flint	1.6	4.6
Woolwich and Reading Beds	Mudstone and clay, red and grey mottled	0.8+	5.4

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
6	53	41	3.0-4.0	7	34	5	6	19	29	0
			4.0-4.6	4	51	8	9	19	9	0
			Mean	6	39	7	7	19	22	0

Surface level +6.5 m
Water struck at +4.4 m
September 1981

Overburden 2.1 m
Mineral 1.6 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, pale brown, with flints	0.4	0.4
Brickearth	Clay, yellow-brown, silty, with small white flints	1.7	2.1
Raised Beach Deposits (younger)	'Very clayey' pebbly sand Gravel: fine and coarse, angular to rounded; flint Sand: fine with some medium and coarse, angular to subrounded; quartz with flint Fines: yellow brown	1.6	3.7
London Clay	Clay, brown, grading downwards into grey clay and mudstone	0.8+	4.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
26	58	16	2.1-3.1	29	47	5	4	6	9	0
			3.1-3.7	22	49	6	5	9	9	0
			Mean	26	49	5	4	7	9	0

SU 80 SE 45 8515 0025 Sidlesham Common, Hunston Block D

Surface level +7.1 m Waste 3.5 m
 Water struck at +5.1 m Bedrock 0.5 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, pale brown, loamy	0.3	0.3
Brickearth	Clay, mainly yellow-buff to brown, silty; sandy and with flint pebbles at base	3.2	3.5
London Clay	Mudstone, brown grading downwards to grey	0.5+	4.0

SU 80 SE 46 8627 0323 Watery Lane, Oving Block E

Surface level +7.7 m Overburden 0.3 m
 Water struck +6.7 m Mineral 3.8 m
 September 1981 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, flinty	0.3	0.3
Fan Gravel	a 'Very clayey' gravel Gravel: coarse and fine, angular and rounded; flint Sand: coarse, fine and medium, angular; flint Fines: flint debris with grey clay	2.0	2.3
Raised Beach Deposits (younger)	b Sandy gravel Gravel: fine and coarse, angular and rounded; brown and blue flint Sand: fine with some medium and coarse	1.8	4.1
Woolwich and Reading Beds	Clay, grey, with bright red mottling and some green spots	0.9+	5.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
a	20	21	59	0.3-1.3	22	1	2	8	28	39	0
				1.3-2.3	17	13	8	10	26	26	0
				Mean	20	7	5	9	27	32	0
b	6	65	29	2.3-3.3	6	45	7	6	18	18	0
				3.3-4.1	7	57	10	5	11	10	0
				Mean	6	52	8	5	15	14	0
a+b	13	42	45	0.3-4.1	13	29	6	7	21	24	0

SU 80 SE 47 8650 0147 Manor House Block E

Surface level +6.4 m
 Water level not recorded
 September 1981

Overburden 1.0 m
 Mineral 2.2 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.4	0.4
Brickearth	Clay, silty, pale brown	0.6	1.0
Raised Beach Deposits (younger)	'Very clayey' sandy gravel Gravel: fine and coarse, angular and rounded; brown flint Sand: fine with coarse and medium	2.2	3.2
London Clay	Mudstone, brown and dark grey	1.0+	4.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
	22	57	21	1.0-2.0	27	34	11	13	10	5	0
				2.0-3.2	17	41	8	8	12	14	0
				Mean	22	38	9	10	11	10	0

Surface level +5.6 m
 Water struck +3.4 m
 September 1981

Overburden 0.9 m
 Mineral 3.1 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil on brown silt with flints	0.9	0.9
Raised Beach Deposits (younger)	a 'Clayey' sandy gravel Gravel: fine and coarse, angular and rounded; flint Sand: fine with some coarse and medium, angular and subrounded; quartz with flint	1.0	1.9
	b 'Very clayey' sand: fine with traces of medium and coarse, angular and rounded; quartz with flint	2.1	4.0
London Clay	Sand, dark grey, harder and with fragments of calcareous shelly sandstone towards base	1.2+	5.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	19	50	31	0.9-1.9	19	41	5	4	12	11	8
b	20	79	1	1.9-2.9	15	80	1	1	1	2	0
				2.9-4.0	25	75	0	0	0	0	0
				Mean	20	79	0	0	0	1	0
a+b	20	70	10	0.9-4.0	20	66	2	2	4	4	2

Surface level +6.4 m
 Water struck +5.0 m
 September 1982

Overburden 0.4 m
 Mineral 2.4 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark grey	0.4	0.4
Fan Gravel	Sandy gravel Gravel: fine and coarse, angular to rounded; brown flint Sand: fine with medium and coarse, angular to subrounded	2.4	2.8
Woolwich and Reading Beds	Mudstone, grey with red mottling	1.2+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
9	52	39	0.4-1.4	10	34	9	7	17	23	0
			1.4-2.8	8	41	7	6	21	17	0
			Mean	9	38	8	6	19	20	0

SU 80 SE 50 8754 0156 Mundham House Block E

Surface level +7.5 m Overburden 2.4 m
 Water struck at +5.1 m Mineral 2.2 m
 September 1981 Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil on stiff reddish brown clay	1.5	1.5
Raised Beach Deposits (younger)	Pebbly sandy silt with angular to rounded flints and traces of chalk	0.9	2.4
	a Sandy gravel Gravel: coarse with fine, angular to rounded; brown flint Sand: fine with medium and some coarse, subangular; quartz with flint	1.0	3.4
	b Pebbly sand Gravel: coarse with fine, angular to rounded; flint Sand: fine with medium and some coarse, angular to subangular; quartz and flint	1.2	4.6
Woolwich and Reading Beds	Mudstone, buff with reddish streaks	0.4+	5.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand			Gravel	
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	3	68	29	2.4-3.4	3	41	19	8	12	17	0
b	6	83	11	3.4-4.6	6	61	16	6	4	7	0
a+b	4	77	19	2.4-4.6	4	54	17	6	8	11	0

Surface level +6.5 m
 Water not struck
 September 1981

Overburden 0.6 m
 Mineral 1.9 m
 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Brown soil on yellow brown clay	0.6	0.6
Raised Beach Deposits (younger)	a 'Very clayey' sandy gravel Gravel: fine and coarse, angular to rounded; flint Sand: fine, with some coarse and medium, angular to subangular; quartz and flint Fines: brown clay	1.0	1.6
	b 'Clayey' gravel Gravel: coarse with fine, angular to rounded; flint Sand: fine with coarse and medium Fines: brown clay	0.9	2.5
London Clay	Mudstone, grey clayey	1.5+	4.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages							
	Fines	Sand	Gravel		Fines		Sand		Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	31	49	20	0.6-1.6	31	33	7	9	10	10	0	
b	19	27	54	1.6-2.5	19	13	5	9	19	35	0	
a+b	25	39	36	0.6-2.5	25	24	6	9	14	22	0	

Surface level +11.4 m
 Water struck at +9.4 m
 September 1981

Overburden 1.2 m
 Mineral 4.6 m
 Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Brown soil on yellow-brown flinty clay	1.2	1.2
Fan Gravel	a 'Clayey' gravel Gravel: fine and coarse, angular to rounded; brown and black flint Sand: coarse, with medium and fine	3.0	4.2
Raised Beach Deposits (younger)	b 'Clayey' sandy gravel Gravel: fine and coarse, angular to subrounded; flint Sand: coarse with medium and fine, angular to rounded; flint with some quartz	1.6	5.8
London Clay	Silt, dark brown, becoming dark grey towards base	0.6+	6.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines				Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
a	14	14	72	1.2-2.2	23	3	3	6	28	34	3
				2.2-3.2	13	3	5	9	30	40	0
				3.2-4.2	5	2	4	10	43	36	0
				Mean	14	2	4	8	34	37	1
b	11	47	42	4.2-5.2	9	4	10	25	37	15	0
				5.2-5.8	14	27	23	13	9	14	0
				Mean	11	12	15	20	28	14	0
a+b	13	26	61	1.2-5.8	13	6	8	12	31	29	1

SU 80 SE 53
8870 0356
Kives Farm, Oving
Block F

Surface level +8.8 m
 Water struck at +7.4 m
 September 1981

Overburden 1.4 m
 Mineral 3.1 m
 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Sandy soil with flints on flinty clay	1.4	1.4
Fan Gravel on Raised Beach Deposits (younger)	'Clayey' gravel Gravel: fine and coarse, angular and rounded; flint predominating Sand: coarse with medium and fine, angular; flint Fines: clay and silt with fine chalk debris	3.1	4.5
London Clay	Clay, silty, brown at top, becoming dark grey	0.5+	5.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines				Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
	10	25	65	1.4-2.4	3	1	2	9	41	44	0
				2.4-3.4	21	2	3	7	24	43	0
				3.4-4.5	8	15	14	19	33	11	0
				Mean	10	6	7	12	33	32	0

SU 80 SE 54 8828 0266 Runcton

Block E

Surface level +7.3 m
Water struck at +6.3 m
September 1981

Overburden 1.0 m
Mineral 2.0 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil on brown silty clay with angular flints	1.0	1.0
Fan Gravel	'Clayey' gravel Gravel: fine and coarse, angular and rounded; brown and black flint Sand: fine with coarse and medium, angular; flint Fines: grey silt and clay	2.0	3.0
Woolwich and Reading Beds	Mudstone, grey with bright red mottling	1.0+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	31	54	1.0-3.0	15	17	6	8	26	28	0

SU 80 SE 55 8889 0135 Saltham House

Block E

Surface level +7.4 m
Water struck at +5.4 m
September 1981

Overburden 1.5 m
Mineral 2.4 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil on dark silty clay	1.5	1.5
Raised Beach Deposits (younger)	Sandy gravel Gravel: fine and coarse, angular and rounded; brown flint Sand: fine with medium and coarse, rounded; flint and quartz	2.4	3.9
Woolwich and Reading Beds	Mudstone, soft, dark grey with red mottling	1.1+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	58	34	1.5-2.5	12	34	16	10	15	13	0
			2.5-3.9	6	37	10	8	17	22	0
			Mean	8	36	13	9	16	18	0

Surface level +3.3 m
 Water not struck
 September 1981

Waste 3.0 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Head	Soil on yellow brown silty clay	2.1	2.1
Raised Beach Deposits (younger)	'Very clayey' gravel Gravel: fine with coarse, angular to rounded; flint Sand: coarse with medium and fine, angular; flint Fines: grey to brown clay	0.9	3.0
London Clay	Clay, brown, grading downwards into grey mudstone	1.0+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
29	27	44	2.1-3.0	29	8	8	11	33	11	0

Surface level +11.7 m
 Water struck at +9.1 m
 August 1981

Overburden 2.8 m
 Mineral 3.4 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Clay, silty, mottled brown	2.7	2.8
Fan Gravel on Raised Beach Deposits (younger)	Sandy gravel Gravel: fine with coarse, angular to well-rounded; flint (some white and porous), chalk and, below 5.7 m, igneous fragments Sand: coarse and medium with fine to 5.7; fine with some medium and coarse below; quartz with flint	3.4	6.2
London Clay	Clay, silty, dark olive grey	1.0+	7.2

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sanc			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
7	49	44	2.8-3.8	4	3	12	28	28	25	0
			3.8-4.8	10	10	22	24	25	9	0
			4.8-5.7	8	14	11	16	32	19	0
			5.7-6.2	9	52	6	5	15	13	0
			Mean	7	15	14	20	27	17	0

Surface level +8.7 m
 Water struck at +6.4 m
 September 1981

Overburden 1.3 m
 Mineral 2.7 m
 Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil on yellow brown silty clay with flints	1.3	1.3
Fan Gravel	'Clayey' gravel Gravel: coarse and fine, angular and rounded; flint Sand: coarse and fine with medium, angular; flint with quartz Fines: yellow silt and clay	2.7	4.0
London Clay	Mudstone, stiff, dark-grey	0.6+	4.6

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
11	28	61	1.3-2.3	21	3	5	9	27	35	0
			2.3-3.3	5	12	10	13	31	29	0
			3.3-4.0	4	19	7	11	27	32	0
			Mean	11	10	7	11	29	32	0

SU 80 SE 59 8965 0238 Merston, Oving Block H

Surface level +5.0 m Waste 4.0 m
 Water struck at +2.0 m Bedrock 0.3 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Brown soil on yellow-brown clay with some flints	4.0	4.0
Upper Chalk	Chalk, soft, weathered, with black flints	0.3+	4.3

SU 80 SE 60 8984 0151 Forbridge Farm, Pagham Block E

Surface level +5.0 m Overburden 2.3 m
 Water not struck Mineral 1.0 m
 September 1981 Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Silt on brown chalky clay with sand and flint pebbles	2.3	2.3
Raised Beach Deposits (younger)	'Very clayey' sandy gravel Gravel: fine and coarse, angular to rounded; flint and chalk Sand: fine with some coarse and medium; flint Fines: silt, chalky	1.0	3.3
Upper Chalk	Chalk, sandy and rubbly at top	1.4+	4.7

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
36	38	26	2.3-3.3	36	24	6	8	12	14	0

SU 80 SE 61

8974 0032

Copyhold Farm, Pagham

Block E

Surface level +7.4 m
 Water struck at +4.6 m
 September 1981

Overburden 2.8 m
 Mineral 1.4 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Brickearth	Soil on brown silt with flints, lignite fragments and chalk nodules	2.0	2.0
	Silt, grey, with some flints	0.8	2.8
Raised Beach Deposits (younger)	Sandy gravel Gravel: coarse and fine, angular and rounded; flint Sand: fine with medium and coarse, angular to subrounded; quartz Fines: clay	1.4	4.2
London Clay	Mudstone, grey, clayey, weathered brown at top	0.8+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
7	50	43	2.8-4.2	7	30	12	8	19	24	0

SU 90 NW 56

9062 0881

Halnaker House

Block C

Surface level +50.7 m
 Water not struck
 September 1981

Overburden 0.2 m
 Mineral 2.2 m
 Bedrock 2.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil with flints	0.2	0.2
Head Gravel	'Very clayey' gravel Gravel: coarse with fine and some cobbles; flint with some chalk, rounded to angular pebbles Sand: coarse with medium and fine; mainly quartz and angular flint	2.2	2.4
Upper Chalk	Chalk, weathered, with flints at top, soft, white below	2.6+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
40	22	38	0.2-1.4	40	3	3	10	10	31	3
			1.4-2.4	42	6	7	16	8	21	0
			Mean	40	4	5	13	9	27	2

SU 90 NW 57 9035 0747 Boxgrove Block B

Surface level +28.4 m
 No information on groundwater
 September 1981

Waste 2.1 m
 Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil with flints	0.3	0.3
Head Gravel	Clay with abundant rounded and angular brown and black flints, more chalky towards base	1.8	2.1
Upper Chalk	Chalk, weathered brown at top, harder below	1.9+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
46	13	41	0.3-1.3	43	3	3	5	18	28	0
			1.3-2.1	52	3	5	7	15	18	0
			Mean	46	3	4	6	17	24	0

SU 90 NW 58 9021 0654 Tangmere Block F

Surface level +18.9 m
 Water struck at +12.5 m
 August 1981

Overburden 0.8 m
 Mineral 2.7 m
 Waste 4.6 m
 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Silt, brown, with a few flint pebbles	0.7	0.8
Head Gravel	'Very clayey' gravel Gravel: coarse and fine, angular to subangular; flint with white patina, a few well rounded black flint pebbles Sand: coarse, medium and fine; quartz and flint Fines: brown clay	2.7	3.5

	Clay, brown, silty, with chalk pellets and a few flint pebbles	4.6	8.1
Woolwich and Reading Beds	Clay, silty, olive grey with black mottling; some black flint pebbles and a few shell fragments	0.4	8.5
	Clay, stiff, mottled red, grey and orange-brown	0.5+	9.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
37	17	46		0.8-1.8	37	4	3	5	22	29
			1.8-2.8	40	4	6	10	19	21	0
			2.8-3.5	34	5	5	8	18	22	8
			Mean	37	4	5	8	20	24	2

SU 90 NW 59	9073 0517	Ham Cottages	Block F
Surface level +11.4 m			Overburden 2.6 m
Water struck at +8.6 m			Mineral 2.7 m
September 1981			Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Brickearth	Clay, silty, brown, with a few pebbles near base	0.6	1.3
	Clay, silty, chalky, olive to olive grey, with flint pebbles and chalk pellets	1.0	2.3
Head Gravel	Silt with chalk pebbles	0.3	2.6
Raised Beach Deposits (younger)	'Clayey' pebbly sand Gravel: fine and coarse, subrounded to angular; flint with sandstone and some pyrite Sand: fine with trace of coarse and medium; quartz with some chalk Fines: silt	2.7	5.3
London Clay	Silt, very clayey, sandy, dark olive grey, with some lignite fragments, shell debris and a few rounded flint pebbles	0.5+	5.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
19	71	10		2.6-3.1	37	21	6	9	20	7
			3.1-4.1	21	75	1	1	2	0	0
			4.1-5.3	10	75	2	2	4	7	0
			Mean	19	66	2	3	6	4	0

Surface level +44.1 m
 Water not struck
 October 1981

Overburden 0.6 m
 Mineral 1.3 m
 Waste 4.5 m
 Mineral 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Dry Valley Deposit	Clay, silty, brown	0.2	0.6
Head Gravel	a 'Clayey' gravel Gravel: coarse and fine, angular to subrounded; flint, mostly with deep white patina Sand: coarse, medium and fine Fines: silty clay	1.3	1.9
	Clay, silty, brown, with pebbles	1.2	3.1
	Silt, mottled olive, with lignite fragments	0.9	4.0
Raised Beach Deposits (older)	Silt, olive, sandy, with a few pebbles	2.4	6.4
	b 'Very clayey' pebbly sand Gravel: coarse and fine; angular flint and calcreted chalk with a few well rounded chalk pebbles Sand: fine with traces of medium and coarse; quartz Fines: olive silt	2.5+	8.9

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	18	11	71	0.6-1.9	18	3	3	5	21	45	5
b	26	65	9	6.4-7.4	27	71	2	0	0	0	0
				7.4-8.4	26	60	1	1	3	6	3
				8.4-8.9	25	45	2	4	9	9	6
				Mean	26	62	2	1	3	4	2
a+b	26	46	30	Mean	24	42	2	2	9	18	3

SU 90 NW 61 9169 0739 Ounces Barn, Priory Farm

Block C

Surface level +28.5 m
Water not struck
August 1981

Waste 2.4 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Head Gravel	Silt, pale brown, pebbly	0.9	1.0
	Clay, orange-brown, with flint pebbles and a few peat fragments; more pebbly near base	1.4	2.4
Upper Chalk	Chalk, weathered, rubbly near top, with nodular and some angular flint	1.8+	4.2

SU 90 NW 62 9152 0673 East Hampnett

Block F

Surface level +18.1 m
Water not struck
August 1981

Waste 1.9 m
Bedrock 2.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Head Gravel	Silt, brown, pebbly	0.9	0.9
	Clay, brown, pebbly	1.0	1.9
Woolwich and Reading Beds	Clay, brown with red mottling in part, varying soft to stiff, with a few flint pebbles	1.3	3.2
Upper Chalk	Chalk, weathered, rubbly	1.3+	4.5

SU 90 NW 63 9188 0616 Tangmere airfield (east)

Block F

Surface level +12.7 m
Water struck at +8.7 m
November 1981

Overburden 2.0 m
Mineral 5.5 m
Bedrock 19.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.4	0.4
Brickearth	Clay, silty, dark yellowish brown, with organic specks, rootlets and some fine angular white flint pebbles	1.6	2.0
Head Gravel	'Very clayey' sandy gravel Gravel: chalk with flint below 2.3 m Sand: with abundant chalk pellets Fines: silt, clayey, pale yellowish brown	1.7	3.7

Raised Beach Deposits (younger)	Sand: fine with a trace of medium, angular to subangular quartz; angular fine and coarse flint pebbles below 6.5 m	3.8	7.5
Woolwich and Reading Beds	Clay, grey with red and green mottling, stiff, waxy, silty in part; flint pebbles below 25.0 m	18.5	26.0
	Gravel: angular flints, red and white, with some clay	0.4	26.4
Upper Chalk	Chalk, soft yellowish white	0.2+	26.6

SU 90 NW 64	9141 0548	Ham Cottages	Block F
Surface level +10.3 m			Overburden 2.4 m
Water struck at +7.9 m			Mineral 1.9 m
August 1981			Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, sandy	0.5	0.5
Head Gravel	Clay, silty, dark to light brown; chalk and flint pebbles below 1.2 m	1.0	1.5
	Clay, very chalky, with flint pebbles	0.4	1.9
	Clay, sandy, light brown, with chalk and flint pebbles	0.5	2.4
Raised Beach Deposits (younger)	'Very clayey' pebbly sand Gravel: fine and coarse, angular to rounded; flint Sand: fine with traces of medium and coarse; quartz with some chalk Fine: brown and light olive silt with some clay	1.9	4.3
London Clay	Clay, silty, dark olive grey (5Y 3/2) with some shell fragments	0.9+	5.2

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
23	68	9	2.4-3.4	23	71	1	2	1	2	0
			3.4-4.2	26	53	2	3	9	7	0
			4.2-4.3	12	74	3	3	6	2	0
			Mean	23	64	2	2	5	4	0

SU 90 NW 65 9188 0564 Tangmere airfield (east) Block F

Surface level +9.9 m Overburden 0.8 m
 Water struck at +7.6 m Mineral 3.9 m
 November 1981 Bedrock 17.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, with some angular flint pebbles	0.6	0.6
Head Gravel	Clay, brown, silty, sandy, with chalk pellets and some flint pebbles	0.2	0.8
	'Very clayey' sandy gravel Gravel: fine and coarse, angular; flint and chalk Sand: medium and fine with coarse; subrounded to subangular quartz with angular flint and chalk pellets Fines: clay, silty, yellowish brown	2.0	2.8
Raised Beach Deposits (younger)	'Clayey' sand, pebbly at base Gravel: fine; chalk with some flint Sand: fine with some medium and a trace of coarse; angular to subangular quartz with a trace of angular flint Fines: silt, clayey, brown	1.9	4.7
London Clay	Clay, silty, dark bluish grey, micaceous, with a trace of fine sand and disseminated pyrite	15.8	20.5
?Woolwich and Reading Beds	Clay, silty, dark grey, very stiff, waxy	1.8+	22.3

SU 90 NW 66 9253 0706 Aldingbourne Sanatorium Block C

Surface level +28.8 m Overburden 0.2 m
 Water not struck Mineral 7.8 m
 September 1981 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	a 'Very clayey' gravel Gravel: coarse and fine, angular to subrounded; flint with chalk near top Sand: coarse with medium and fine Fines: clay, brown	2.4	2.6
Raised Storm Beach Deposits	b Gravel Gravel: fine and coarse, angular to subrounded; flint Sand: fine with coarse and some medium Fine: silt, brown	5.4	8.0
Upper Chalk	Chalk	0.5+	8.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
a	25	12	63	0.2-0.9	13	4	4	8	32	35	4
				0.9-1.9	40	3	2	3	20	32	0
				1.9-2.6	17	4	4	8	33	34	0
				Mean	25	3	3	6	28	34	1
b	3	45	52	2.6-3.6	8	20	7	11	32	22	0
				3.6-4.6	3	14	15	13	33	22	0
				4.6-5.6	2	13	6	14	25	40	0
				5.6-6.6	3	37	4	15	25	16	0
				6.6-8.0	2	34	3	13	25	23	0
				Mean	3	25	7	13	27	25	0
a+b	10	35	55	0.2-8.0	10	18	6	11	28	27	trace

SU 90 NW 67	9256 0638	Norton Farm	Block G
Surface level +13.8 m			Overburden 2.0 m
Water struck at +8.6 m			Mineral 2.0 m
September 1981			Waste 2.2 m
			Mineral 2.3 m
			Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Head Gravel	Gravel, very clayey, with flint pebbles - some porous	0.6	0.9
	Clay, silty, brown, with pebbles	1.1	2.0
	a 'Very clayey' gravel Gravel: coarse and fine; flint, some porous Sand: coarse with fine and medium Fines: silt, chalky	2.0	4.0
Raised Beach Deposits (younger)	Silt, very chalky	0.5	4.5
	Silt, brown, with fine sand and some bivalve shells	1.7	6.2
	b 'Very clayey' sand: fine; a few flint pebbles near base	2.3	8.5
Woolwich and Reading Beds	Clay, grey, silty, with a few flint pebbles	0.5	9.0
	Clay, mottled brown and grey	0.8	9.8
	Clay, mottled red and grey, with a few small calcareous nodules	0.2+	10.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
a	34	21	45	2.0-3.0 3.0-4.0 Mean	35 31 34	6 4 5	6 6 6	9 11 10	20 19 19	24 29 26	0 0 0
b	31	67	2	6.2-7.2 7.2-8.5 Mean	36 28 31	64 67 66	0 1 1	0 0 0	0 0 0	0 4 2	0 0 0
a+b	32	45	23	Mean	32	37	3	5	9	14	0

SU 90 NW 68

9254 0543

Aldingbourne Church

Block G

Surface level +8.7 m
Water struck at +6.7 m
August 1981

Overburden 1.5 m
Mineral 1.4 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Head Gravel	Clay, dark brown, with flint pebbles	0.7	0.8
	Clay, silty, sandy, chalky	0.7	1.5
Raised Beach Deposits (younger)	'Very clayey' pebbly sand Gravel: fine and coarse, angular to subrounded; flint (some white and porous) and some rock fragments Sand: fine with traces of medium and coarse Fines: silt	1.4	2.9
London Clay	Clay, brown, with a few flints	0.2	3.1
	Clay, silty, grey, with some shell fragments and mica flakes	1.0+	4.1

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
	24	68	8	1.5-2.0 2.0-2.9 Mean	32 20 24	51 70 64	3 2 2	4 2 2	8 3 5	2 3 3	0 0 0

SU 90 NW 69 9385 0784 Hungerdown

Block C

Surface level +32.0 m
Water not struck
August 1981

Overburden 0.2 m
Mineral 3.6 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	'Very clayey' gravel Gravel: coarse and fine, angular to subangular; flint with white patina Sand: coarse with medium and fine Fines: dark brown, silt near top, clay below	3.6	3.8
Upper Chalk	Chalk, weathered rubbly near top, soft and white below	0.8+	4.6

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{7}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
22	15	63	0.2-1.0	25	2	3	10	29	31	0
			1.0-2.0	29	2	5	3	26	35	0
			2.0-3.0	17	6	4	8	28	37	0
			3.0-3.8	14	8	5	9	30	34	0
			Mean	22	4	4	7	28	35	0

SU 90 NW 70 9361 0695 Hales Barn

Block C

Surface level +25.5 m
Water struck at +19.7 m
September 1981

Waste 6.6 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Raised Storm Beach Deposits	Clay, brown, with flint pebbles	1.5	1.9
	Gravel, very clayey, sandy; pebbles mostly flint with white porous flint dominant in fine gravel	0.4	2.3
	Clay, silty, sandy, mottled olive/olive yellow and brown near top, becoming darker brown and sandier below	1.2	3.5
	Clay, very sandy	1.0	4.5
	Silt, soft, brown	0.5	5.0
	Clay, silty, firm	0.8	5.8
	Gravel, very clayey, sandy; pebbles mostly flint	0.4	6.2
	Clay, silty, firm	0.4	6.6
Woolwich and Reading Beds	Clay	0.9+	7.5

Surface level +11.6 m
 Water struck at +8.2 m
 August 1981

Overburden 3.4 m
 Mineral 2.3 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	Silt, sandy, with rootlets	0.8	1.0
	Clay, silty, with chalk	0.2	1.2
	Clay, greyish brown, with chalk and angular flint pebbles, becoming more silty, with rootlets, near base	1.8	3.0
	Silt, sandy, chalky, light brown	0.4	3.4
	a 'Very clayey' sandy gravel Gravel: fine with coarse, angular to sub-rounded; flint (some white, porous) and some rock fragments Sand: coarse and fine with medium Fines: clay	1.0	4.4
Raised Beach Deposits (younger)	b 'Clayey' pebbly sand on sandy gravel Gravel: fine and coarse, angular to well rounded; flint with some chalk and other rock fragments Sand: fine with coarse and some medium	1.3	5.7
London Clay	Clay, grey, silty near top	1.0+	6.7

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages									
	Fines	Sand	Gravel		Fines			Sand				Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm			
a	25	40	35	3.4-4.4	25	12	7	21	25	10	0			
b	8	63	29	4.4-5.0	12	71	2	2	4	9	0			
				5.0-5.7	5	26	9	16	28	16	0			
				Mean	8	47	6	10	16	13	0			
a+b	16	52	32	3.4-5.7	16	32	6	14	20	12	0			

Surface level +10.8 m
 Water struck at +7.8 m
 September 1981

Overburden 2.2 m
 Mineral 3.8 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Silt, brown	0.4	0.7
	Clay, silty, brown, with a few pebbles near base	1.5	2.2
Head Gravel	a 'Very clayey' gravel Gravel: fine with coarse, angular to subrounded; flint, some white and porous Sand: coarse with fine and medium Fines: clay	0.8	3.0
Raised Beach Deposits (younger)	b 'Clayey' pebbly sand Gravel: coarse and fine, angular to subrounded; flint, some white and porous Sand: fine with traces of medium and coarse; quartz Fines: silt, brown	2.0	5.0
	c Sandy gravel Gravel: fine and coarse, angular to well rounded; flint (some white and porous), chalk and other rock fragments Sand: fine with coarse and medium; quartz	1.0	6.0
London Clay	Clay, stiff, dark olive grey with a few rounded flint pebbles	0.8+	6.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
a	37	17	46	2.2-3.0	37	5	4	8	29	17	0
b	15	79	6	3.0-4.0	15	70	1	1	6	7	0
				4.0-5.0	15	84	1	0	0	0	0
				Mean	15	77	1	1	3	3	0
c	3	56	41	5.0-6.0	3	41	7	8	19	22	0
b+c	11	72	17	3.0-6.0	11	66	3	3	8	9	0
a+b+c	16	60	24	2.2-6.0	16	53	3	4	13	11	0

Surface level +42.1 m
 Water not struck
 August 1981

Overburden 0.8 m
 Mineral 3.1 m
 Waste 0.3 m
 Mineral 3.8 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	Clay, silty, with pebbles	0.6	0.8
	a 'Very clayey' gravel Gravel: coarse and fine, angular to rounded; flint, some white and porous Sand: coarse with medium and fine Fines: clay	3.1	3.9
	Clay, sandy, red-brown with some dark brown mottling; lignite fragments and angular to sub-rounded flint pebbles	0.3	4.2
	b 'Very clayey' gravel Gravel: coarse with fine, angular to rounded; flint, some white and porous Sand: coarse with fine and medium Fines: clay	1.5	5.7
Raised Beach Deposits (older)	c 'Very clayey' pebbly sand Gravel: coarse with fine, angular to well rounded; flint, some white and porous Sand: fine with traces of coarse and medium Fines: silt, olive	2.3	8.0
Upper Chalk	Chalk, soft, white, with traces of fine olive sand	1.0+	9.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages								
	Fines	Sand	Gravel		Fines			Sand			Gravel		
					- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm		
a	30	12	58	0.8-1.8	32	2	2	7	28	27	2		
				1.8-2.8	33	2	3	6	24	29	3		
				2.8-3.9	29	2	3	7	23	32	4		
				Mean	30	2	3	7	25	30	3		
b	23	12	65	4.2-5.2	28	2	3	7	24	30	6		
				5.2-5.7	14	4	3	5	15	53	6		
				Mean	23	3	3	6	21	38	6		
c	24	68	8	5.7-6.7	17	75	2	1	3	2	0		
				6.7-8.0	30	58	1	0	1	10	0		
				Mean	24	66	1	1	2	6	0		
a+b+c	27	30	43	Mean	27	23	2	5	16	24	3		

Surface level +35.7 m
 Water not struck
 September 1981

Overburden 0.2 m
 Mineral 4.7 m
 Waste 1.6 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	a 'Very clayey' gravel Gravel: coarse with fine, angular to subrounded; flint, some white and porous Sand: coarse with fine and medium Fines: clay, stiff	3.1	3.3
Raised Beach Deposits (older)	b 'Very clayey' pebbly sand Gravel: coarse with fine, well rounded to angular; flint (some white, porous) and traces of other rock fragments Sand: fine with traces of medium and coarse; quartz Fines: silt, brown	1.6	4.9
	Silt, brown, sandy	1.5	6.4
	Sand, chalky	0.1	6.5
Upper Chalk	Chalk, hard white	0.8+	7.3

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
a	20	26	54	0.2-1.3	9	9	9	28	10	26	9
				1.3-2.3	29	3	4	7	22	31	4
				2.3-3.3	24	9	3	7	27	30	0
				Mean	20	7	5	14	19	30	5
b	23	69	8	3.3-4.3	21	73	2	1	3	0	0
				4.3-4.9	28	51	3	2	3	13	0
				Mean	23	66	2	1	3	5	0
a+b	21	41	38	0.2-4.9	21	27	4	10	14	21	3

Surface level +22.2 m
 Water struck at +17.9 m
 September 1981

Waste 5.4 m
 Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, brown, silty, with thin pebbly bands	4.1	4.5
Head Gravel	'Very clayey' gravel Gravel: coarse and fine, angular to subrounded; flint, some white and porous Sand: coarse and fine with medium Fines: clay	0.9	5.4

Woolwich and Reading Beds	Clay, sandy, silty, reddish brown, laminated	1.2	6.6
	Silt, grey	0.1	6.7
	Clay, waxy, mottled red and grey	1.0+	7.7

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
39	11	50	4.5-5.4	39	5	2	4	17	33	0

SU 90 NW 76 9480 0546 Eastergate Block G

Surface level +13.5 m
 Water struck at +9.5 m
 September 1981

Overburden 3.2 m
 Mineral 4.6 m
 Bedrock 2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, silty, brown, with flint pebbles near base	0.9	1.2
	Silt, chalky, with flint pebbles; abundant chalk pellets near base	2.0	3.2
Head Gravel	a 'Clayey' gravel Gravel: coarse and fine, angular to subrounded flint Sand: coarse, fine and medium Fines: clay, chalky	1.6	4.8
Raised Beach Deposits (younger)	b 'Clayey' sand: fine, quartz; a few pebbles of flint, chalk and sandstone	3.0	7.8
London Clay	Clay, brown	0.2	8.0
	Clay, silty, dark olive grey	2.0+	10.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines	Sand			Gravel			
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	19	27	54	3.2-4.0	21	4	6	7	24	33	5
				4.0-4.8	18	9	10	16	28	19	0
				Mean	19	7	8	12	26	26	2
b	12	85	3	4.8-5.8	13	85	1	0	1	0	0
				5.8-6.8	10	89	1	0	0	0	0
				6.8-7.8	12	79	2	1	4	2	0
				Mean	12	83	1	1	2	1	0
a+b	14	66	20	3.2-7.8	14	57	4	5	10	9	1

Surface level +37.2 m
Water not struck
August 1981

Overburden 0.2 m
Mineral 1.3 m
Waste 2.8 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	'Very clayey' gravel Gravel: fine and coarse, angular to subangular; flint with white patina Sand: coarse with medium and fine Fines: clay, brown, silty	1.3	1.5
	Silt, yellowish brown with some black mottling (peat particles), a few flint and quartz pebbles; grading to pebbly clay at base	2.8	4.3
Upper Chalk	Chalk, weathered, with silt and sand at top, cleaner and white below	1.3+	5.6

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
29	12	59	0.2-1.0	29	2	3	9	33	19	5
			1.0-1.5	28	2	2	7	33	28	0
			Mean	29	2	2	8	34	22	3

Surface level +23.6 m
Water struck at +21.8 m
September 1981

Overburden 0.5 m
Mineral 1.3 m
Waste 1.0 m
Mineral 1.0 m
Waste 0.8 m
Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.5	0.5
Head Gravel	a 'Very clayey' gravel Gravel: coarse with fine, angular to subrounded; flint with white patina, fine gravel mostly white flint Sand: coarse with fine and medium, angular; flint Fines: clay, mottled brown	1.3	1.8
Raised Beach Deposits (older)	Silt, sandy, brown	1.0	2.8
	b 'Very clayey' sand Sand: fine with trace of medium, angular to subrounded; quartz Fines: silt, brown, with some clay	1.0	3.8
	Silt, sandy, clayey, brown	0.8	4.6
Woolwich and Reading Beds	Sand, grey, with some clay	0.5	5.1
	Mudstone, grey near top, dark red below	0.9+	6.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
a	22	16	62	0.5-1.8	22	3	2	11	18	44	0
b	39	61	0	2.8-3.8	39	58	3	0	0	0	0
a+b	29	36	35	Mean	29	27	3	6	10	25	0

SU 90 NE 35

9581 0562

Choller Farm

Block G

Surface level +10.0 m
 Water struck at +8.7 m
 October 1981

Overburden 1.3 m
 Mineral 0.8 m
 Waste 1.0 m
 Mineral 0.6 m
 Bedrock 2.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.7	0.7
Head Gravel	Clay with flint pebbles	0.6	1.3
	a 'Very clayey' sandy gravel Gravel: fine with coarse, angular to subrounded; flint, mostly white, with some brown and black Sand: coarse and medium with some fine; mostly white flint Fines: clay with some silt	0.8	2.1
	Silt, chalky	1.0	3.1
Raised Beach Deposits (younger)	b 'Very clayey' pebbly sand Gravel: fine, angular; white porous flint with some chalk Sand: coarse with medium and some fine; white flint with chalk and some quartz	0.6	3.7
London Clay	Silt, brown, sandy	0.3	4.0
	Clay, mottled greyish brown near top, dark grey below	2.4+	6.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
						- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64
a	22	40	38	1.3-2.1	22	6	13	21	23	15	0
b	24	61	15	3.1-3.7	24	8	15	38	15	0	0
a+b	23	48	29	Mean	23	7	14	27	20	9	0

Surface level +35.8 m
Water not struck
August 1981

Overburden 0.2 m
Mineral 4.7 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Head Gravel	'Very clayey' gravel Gravel: coarse with fine, angular to subangular; flint, mostly with white patina, fine gravel dominantly white flint. Very large flint cobbles in 4.0-4.9 m sample broken to very angular coarse gravel during drilling Sand: coarse with medium and fine Fines: brown, silt to 1.0 m, clay to 4.9	4.7	4.9
Upper Chalk	Chalk, rubbly; lumps of chalk in very pale brownish-yellow chalk silt matrix	0.9+	5.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Sand		Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
22	16	62	0.2-1.0	21	3	4	11	23	38	0
			1.0-2.0	26	4	4	7	24	28	7
			2.0-3.0	24	2	3	8	28	35	0
			3.0-4.0	25	2	4	10	27	32	0
			4.0-4.9	16	3	6	11	32	32	0
			Mean	22	3	4	9	27	34	1

Surface level +25.5 m
Water struck at +23.3 m
October 1981

Overburden 0.3 m
Mineral 1.7 m
Waste 0.2 m
Mineral 3.0 m
Waste 2.9 m
Bedrock 7.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Head Gravel	a 'Very clayey' gravel Gravel: coarse and fine, angular to subangular; flint with white patina; fine gravel white flint Sand: coarse with medium and fine Fines: clay	1.7	2.0
	Clay, mottled brown, silty	0.2	2.2
Raised Beach Deposits (older)	b 'Very clayey' sand Sand: fine with trace of medium Fines: silt with some clay	3.0	5.2
	Silt, brown, with fine sand and some clay	2.9	8.1
Woolwich and Reading Beds	Clay, sandy, silty, mottled grey and brown, with yellow and orange in more sandy parts. Rare seams of iron-pan and lignite 1 to 3 mm thick	7.1+	15.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{16}$	Sand		+4 -16	+16 -64	+64 mm	
						+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1				+1 -4
a	24	15	61	0.3-1.2	19	2	4	10	35	30	0
				1.2-2.0	30	4	3	7	24	32	0
				Mean	24	3	4	8	30	31	0
b	30	70	0	2.2-3.2	37	59	4	0	0	0	0
				3.2-4.2	20	78	2	0	0	0	0
				4.2-5.2	33	66	1	0	0	0	0
				Mean	30	68	2	0	0	0	0
a+b	28	50	22	Mean	28	44	3	3	11	11	0

SU 90 NE 38

9684 0548

Pigeonhouse Farm

Block G

Surface level +11.5 m
 Water struck at +8.0 m
 October 1981

Overburden 3.2 m
 Mineral 3.0 m
 Bedrock 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, brown	1.1	1.5
	Silt, brown, with chalk pellets	0.2	1.7
	Silt, chalky, sandy, with flint pebbles	1.5	3.2
Raised Beach Deposits (younger)	'Clayey' sandy gravel Gravel: fine and coarse, angular to well rounded; flint with some chalk, sandstone and ironstone Sand: coarse with fine and medium Fines: silt, brown, chalky.	3.0	6.2
London Clay	Clay, mottled brown and dark grey	2.8+	9.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{16}$	Sand		+4 -16	+16 -64	+64 mm	
						+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1				+1 -4
	19	41	40	3.2-3.7	30	5	4	6	23	32	0
				3.7-4.7	12	11	12	24	21	20	0
				4.7-5.6	28	13	12	20	16	11	0
				5.6-6.2	5	13	12	26	30	14	0
				Mean	19	11	10	20	22	18	0

Surface level +17.7 m
Water struck at +10.9 m
August 1981

Overburden 4.1 m
Mineral 3.1 m
Waste 1.7 m
Mineral 2.2 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Silt, clayey, brown, with yellowish and dark brown mottling; discontinuous "pipes" of dark brown clay, up to 1 cm diameter, containing abundant chalk pellets; scattered angular to subrounded white flint pebbles, more common near base	2.7	3.0
Head Gravel	Silt, very chalky, pale brown, with abundant chalk granules, a few chalk pebbles and white subangular to rounded flint pebbles	1.1	4.1
	a 'Very clayey' gravel Gravel: coarse with fine, angular to subrounded; flint, some white and porous Sand: coarse with medium and fine Fines: clay, brown	3.1	7.2
	Clay, silty, with fine sand, pale olive with mottling of orange-brown and dark brown (peat); a few angular flint pebbles	0.7	7.9
Raised Beach Deposits (younger)	Silt, brown, with fine sand, a few angular flint pebbles and some shell fragments	1.0	8.9
	b 'Very clayey' sand Sand: fine quartz Fines: silt, brown to 10.6 m then grey	2.2	11.1
London Clay	Clay, stiff, with pockets of silty and fine sandy clay; very fine mica flakes and rare rounded flint pebbles	0.4+	11.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Sand		Gravel	
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	21	19	60	4.1-5.1	28	4	3	11	17	37	0
				5.1-6.8	20	3	3	8	30	36	0
				6.8-7.2	7	3	11	30	32	17	0
				Mean	21	3	4	12	26	34	0
b	33	67	0	8.9-9.9	34	66	0	0	0	0	0
				9.9-10.6	35	64	1	0	0	0	0
				10.6-11.1	28	70	1	0	1	0	0
				Mean	33	67	trace	0	trace	0	0
a+b	26	39	35	Mean	26	29	3	7	15	20	0

Surface level +13.1 m
 Water struck at +8.1 m
 October 1981

Overburden 0.5 m
 Mineral 2.1 m
 Waste 1.3 m
 Mineral 4.4 m
 Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.5	0.5
Head Gravel	a 'Clayey' gravel Gravel: coarse and fine, angular to subrounded; flint, mostly with white patina Sand: coarse with medium and fine Fines; clay, dark brown to 1.6 m, light brown and more chalky below	2.1	2.6
	Clay, light brown, chalky, with flint pebbles and chalk pellets	1.1	3.7
	Silt, brown, sandy, with chalk pellets	0.2	3.9
Raised Beach Deposits (younger)	b 'Clayey' sand, pebbly near base Gravel: fine with coarse, angular to well rounded; flint with some chalk and sandstone Sand: fine with traces of coarse and medium; mostly quartz Fines: silt, brown	4.4	8.3
London Clay	Clay, grey	0.7+	9.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	18	15	67	0.5-1.6	20	2	3	5	29	41	0
				1.6-2.6	17	6	6	10	28	33	0
				Mean	18	3	4	8	28	39	0
b	18	78	4	3.9-5.0	28	66	1	1	4	0	0
				5.0-6.0	15	84	1	0	0	0	0
				6.0-7.0	24	75	1	0	0	0	0
				7.0-8.3	6	73	7	5	6	3	0
				Mean	18	73	3	2	3	1	0
a+b	18	58	24	Mean	18	51	3	4	11	13	0

SU 90 NE 41 9833 0751 Goblestubb's Copse Block C

Surface level +35.6 m Waste 7.0 m
 Water not struck Bedrock 0.8 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground; soil with bricks	0.9	0.9
Head Gravel	Clay, brown, with flint pebbles	4.6	5.5
Raised Beach Deposits (older)	'Very clayey' pebbly sand Gravel: coarse with fine, angular to well rounded; flint Sand: fine with traces of medium and coarse Fines: silt	1.5	7.0
Upper Chalk	Chalk	0.8+	7.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
24	62	14	5.5-6.5	22	63	4	1	3	7	0
			6.5-7.0	28	42	3	2	5	20	0
			Mean	24	58	3	1	3	11	0

SU 90 NE 42 9806 0638 Church Farm, Binstead Block G

Surface level +20.4 m Waste 1.6 m
 Water struck at +19.9 m Bedrock 7.4 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil with pebbles	0.9	0.9
Head Gravel	'Very clayey' gravel Gravel: coarse and fine; flint Sand: coarse with fine and medium Fines: silt and clay	0.7	1.6
London Clay	Clay, silty, sandy, mottled brown and grey near top, grey below	3.4	5.0
	Clay, very sandy, glauconitic; rare lignite fragments	2.0	7.0
	Clay, hard, olive brown	1.1	8.1
	Clay, crumbly, grey, mottled brown and red, with glauconite and some lignite fragments	0.1	8.2
Woolwich and Reading Beds	Clay, stiff, mottled purple and grey	0.8+	9.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
25	29	46	0.9-1.6	25	9	7	13	22	24	0

SU 90 NE 43 9880 0546
 Surface level +10.8 m
 Water struck at +8.1 m
 October 1981

Oakleys Cottages

Block G
 Overburden 1.7 m
 Mineral 4.3 m
 Bedrock 4.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground; soil with pieces of brick and lumps of chalk	0.7	0.7
Head Gravel	Clay, brown, with flint pebbles	0.8	1.5
	Clay, silty, mottled brown	0.2	1.7
Raised Beach Deposits (younger)	'Clayey' pebbly sand Gravel: coarse with fine, subangular to rounded; flint with chalk, sandstone, limestone and some ironstone Sand: fine with some medium and trace of coarse Fines: silt, brown	4.3	6.0
London Clay	Clay, dark grey	4.0+	10.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	78	7	1.7-2.7	20	69	2	1	1	7	0
			2.7-3.7	16	82	1	0	1	0	0
			3.7-4.7	17	83	0	0	0	0	0
			4.7-5.7	9	57	20	4	4	6	0
			5.7-6.0	9	46	7	5	9	24	0
			Mean	15	70	6	2	2	5	0

SU 90 NE 44 9948 0744
 Surface level +36.0 m
 Water not struck
 August 1981

Park Farm Cottages

Waste 2.2 m
 Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Head	Clay, soft, silty, yellowish brown with dark brown peat and lignite granules near top, reddish-brown with olive brown mottling in lower part; angular to subrounded flint pebbles with white patina	1.9	2.2
Upper Chalk	Chalk, rubbly, soft, white, with nodular flints	0.7+	2.9

SU 90 NE 45 9969 0671 Tortington Common

Block C

Surface level +31.8 m
Water not struck
October 1981

Waste 1.5 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
	Clay, sandy, mottled brown	0.6	0.9
	'Clayey' pebbly sand Gravel: coarse with some fine, angular to well rounded; flint Sand: medium and fine with some coarse Fines: silt, brown	0.6	1.5
Woolwich and Reading Beds	Clay, mottled brown, red and grey	1.0+	2.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
13	70	17	0.9-1.5	13	25	43	2	2	15	0

SU 90 NE 46 9992 0575 Knowles' Barn

Block G

Surface level +5.4 m
Water not struck
October 1981

Waste 0.3 m
Bedrock 9.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
London Clay	Clay, silty, mottled grey and brown to 2.6 m, grey below	9.7+	10.0

Surface level +9.8 m
 Water struck at +8.0 m
 August 1981

Overburden 1.3 m
 Mineral 4.1 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.9	0.9
Brickearth	Clay, silty, dark brown, with flint pebbles	0.4	1.3
Fan Gravel	a 'Clayey' gravel Gravel: fine and coarse, subangular to rounded; flint (some white and porous), some chalk and other rock fragments Sand: coarse and medium with fine Fines: clay, very chalky below 2.3 m	1.8	3.1
Raised Beach Deposits (younger)	b 'Clayey' pebbly sand: grading from fine sand near top to pebbly sand below 4.1 m Gravel: fine and coarse, angular to well rounded; flint (some white and porous), chalk, glauconitic sandstone and traces of other rock fragments Sand: fine with some medium and coarse Fines: silt	2.3	5.4
London Clay	Clay, stiff, dark olive grey; some sand and very fine mica flakes, a few small rounded flint pebbles and some fossil fragments	1.0+	6.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	10	33	57	1.3-1.8	12	2	5	11	36	34	0
				1.8-2.4	6	2	5	17	37	33	0
				2.4-3.1	12	12	17	21	28	10	0
				Mean	10	6	10	17	33	24	0
b	11	75	14	3.1-4.1	16	80	1	1	1	1	0
				4.1-4.6	7	58	8	5	9	10	3
				4.6-5.4	7	46	12	12	14	9	0
				Mean	11	63	6	6	7	6	1
a+b	10	57	33	1.3-5.4	10	38	8	11	19	14	trace

SU 90 SW 36 9064 0338 Colworth Farm

Block H

Surface level +8.3 m
Water struck at +6.0 m
August 1981

Waste 2.8 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Silt, clayey, brown, with peat particles and a few subangular white flint pebbles	0.6	1.1
	Clay, sandy, silty, with flint pebbles and abundant chalk pellets	0.2	1.3
Raised Beach Deposits (younger)	Silt, chalky, sandy, with some fine gravel (mostly white flint and some sandstone)	1.0	2.3
	'Very clayey' sandy gravel Gravel: fine and coarse; flint with some chalk, sandstone and limestone Sand: fine with medium and coarse Fines: clay and silt, brown	0.5	2.8
London Clay	Clay, brown with dark grey mottling to 3.1 m, silty and dark olive grey below, with a few small rounded flint pebbles	1.1+	3.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
20	55	25	2.3-2.8	20	37	9	9	17	8	0

SU 90 SW 37 9084 0257 South-west of Colworth, by A259

Block H

Surface level +5.7 m
Water not struck
September 1981

Waste 5.1 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Silt, brown, sandy, with a few angular flint pebbles	0.5	0.9
Raised Beach Deposits (younger)	Silt, clayey, sandy, pebbly, brown, with chalk pellets and pebbles, and a few large nodular flints	1.6	2.5
	Silt, mottled brown and greyish brown to 2.8 m, pale grey below, with a few chalk pellets	2.6	5.1
Upper Chalk	Chalk, weathered, yellowish-brown and silty at top	0.8+	5.9

SU 90 SW 38 9042 0125 Park Farm, Elbridge

Block H

Surface level +5.2 m
Water not struck
September 1981

Waste 4.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, brown, silty	0.8	1.2
Raised Beach Deposits (younger)	Silt, sandy, clayey, pale brown	0.6	1.8
	Silt, very pale grey, with thin sandy laminae	1.1	2.9
	Silt, very sandy, chalky, with abundant chalk pellets and pebbles	1.6	4.5
Upper Chalk	Chalk, rubbly, with grey sand and flint pebbles	0.5+	5.0

SU 90 SW 39 9091 0035 Morells Farm

Block H

Surface level +8.3 m
Water struck at +4.1 m
September 1981

Waste 4.5 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, brown, silty	3.0	3.2
Raised Beach Deposits (younger)	Silt, brown and yellowish olive green, sandy, with chalk pellets and a few flint and chalk pebbles	1.3	4.5
Woolwich and Reading Beds	Clay, stiff, mottled red and grey, with a few pebbles at top	0.9+	5.4

SU 90 SW 40 9111 0454 Woodhorn Farm

Block F

Surface level +11.7 m
Water struck at +8.7 m
August 1981

Overburden 2.0 m
Mineral 2.8 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, mottled brown, orange brown and olive, sandy, with a few small flint pebbles	1.8	2.0
Raised Beach Deposits (younger)	'Clayey' sand, with a few pebbles of flint and chalk Sand: fine with traces of medium and coarse; quartz Fines: silt	2.8	4.8
London Clay	Clay, silty, dark olive grey, with some fine mica, sand and a few shell fragments	1.0+	5.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
16	82	2	2.0-3.0	23	76	0	0	1	0	0
			3.0-4.0	18	79	1	0	0	2	0
			4.0-4.8	5	89	3	1	2	0	0
			Mean	16	80	1	1	1	1	0

SU 90 SW 41 9144 0314 Woodend Farm Block H

Surface level +6.7 m Waste 5.3 m
 Water not struck Bedrock 0.3 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Brickearth	Clay, silty, brown	1.4	2.0
Raised Beach Deposits (younger)	Silt, mottled brown and grey, with chalk pellets and some chalk and flint pebbles	3.3	5.3
Upper Chalk	Chalk, rubbly, with a few rounded black flints and some pockets of grey silt	0.3+	5.6

SU 90 SW 42 9172 0278 Manor Farm, Colworth Block H

Surface level +3.9 m Waste 4.3 m
 Water not struck Bedrock 2.7 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, brown, silty, with angular flint pebbles and, below 0.7 m, abundant chalk pellets	1.3	1.5
Raised Beach Deposits (younger)	Silt, sandy, olive to yellow-brown, with flint and chalk pebbles	2.8	4.3
Upper Chalk	Chalk, very soft, with thin weathered layer at top	2.7+	7.0

SU 90 SW 43 9128 0202 Elbridge **Block H**

Surface level +3.6 m Waste 4.7 m
 Water not struck Bedrock 1.2 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, silty, brown	1.0	1.2
Raised Beach Deposits (younger)	Silt, pale grey with brown mottling near top, some thin sandy laminae	1.3	2.5
	Silt, very sandy, with chalk pellets and a few flint pebbles	2.2	4.7
Upper Chalk	Chalk, rubbly, with silt and sand near top	1.2+	5.9

SU 90 SW 44 9133 0069 Tinhale Barn **Block H**

Surface level +7.1 m Waste 3.4 m
 Water struck at +4.0 m Bedrock 0.9 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, sandy, silty, mottled grey and brown	2.0	2.5
Raised Beach Deposits (younger)	Silt, sandy, with flint pebbles	0.6	3.1
	Sand, clayey, pebbly	0.3	3.4
Woolwich and Reading Beds	Clay, waxy, mottled red and grey	0.9+	4.3

SU 90 SW 45 9263 0460 Park Farm, Aldingbourne **Block G**

Surface level +8.0 m Overburden 1.1 m
 Water struck at +2.1 m Mineral 1.4 m
 August 1981 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Silt, mottled orange brown and grey-brown, with fine sand, some small flint pebbles and lignite fragments	0.7	1.1
Raised Beach Deposits (younger)	'Very clayey' sand with a few rounded flint pebbles at base	1.4	2.5
	Sand: fine with traces of medium and coarse Fines: silt, brown		
London Clay	Clay, silty, greyish olive brown, with fine mica flakes and a few shell fragments	1.0+	3.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages										
Fines	Sand	Gravel		Fines				Sand				Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$		$+\frac{1}{16}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
30	70	0	1.1-2.1	31	68	0	1		0	0	0			
			2.1-2.5	27	70	1	1		1	0	0			
			Mean	30	68	1	1		trace	0	0			

SU 90 SW 46 9291 0386 Headhone Farm Block G

Surface level +8.8 m Overburden 1.4 m
 Water struck at +7.4 m Mineral 3.5 m
 September 1981 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, brown	1.0	1.4
Raised Beach Deposits (younger)	a 'Very clayey' sand Sand: fine with traces of medium and coarse Fines: silt	2.0	3.4
	b Pebbly sand Gravel: fine with coarse; flint (some white and porous) with a few chalk and sandstone pebbles Sand: fine with some medium and coarse Fines: silt	1.5	4.9
London Clay	Clay, brown and with pebbles near top, grey below	1.0+	5.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages										
Fines	Sand	Gravel		Fines				Sand				Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$		$+\frac{1}{16}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
a	24	76	0	1.4-2.4	37	60	1	2		0	0	0		
				2.4-3.4	11	89	0	0		0	0	0		
				Mean	24	74	1	1		0	0	0		
b	4	76	20	3.4-4.4	3	40	20	15		15	7	0		
				4.4-4.9	5	43	23	13		11	5	0		
				Mean	4	41	21	14		14	6	0		
a+b	15	76	9	1.4-4.9	15	59	9	7		6	3	0		

SU 90 SW 47 9269 0247 Poplars Barn

Block H

Surface level +3.5 m
Water not struck
September 1981

Waste 2.4 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, brown, silty, with a few flint pebbles	1.0	1.3
Raised Beach Deposits (younger)	Silt, chalky, very sandy, with chalk pebbles and a few nodular flints	1.1	2.4
Upper Chalk	Chalk, very soft, weathered at top	1.2+	3.6

SU 90 SW 48 9231 0132 Manor Farm, North Bersted

Block H

Surface level +4.2 m
Water not struck
September 1981

Waste 4.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, clayey, brown	2.6	2.8
Raised Beach Deposits (younger)	Silt, brown, very sandy, with pebbles of chalk and some flint	2.0	4.8
Upper Chalk	Chalk, rubbly and weathered at top	1.2+	6.0

SU 90 SW 49 9372 0369 Headhone Farm

Block G

Surface level +8.0 m
Water struck at +6.0 m
September 1981

Overburden 2.0 m
Mineral 1.5 m
Waste 0.1 m
Mineral 0.8 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, brown, silty, with a few pebbles near base	1.5	2.0
Raised Beach Deposits (younger)	a 'Very clayey' pebbly sand Gravel: fine with coarse; flint (some white and porous), sandstone and ironstone with some chalk Sand: fine with medium and some coarse Fines: silt	1.5	3.5
	Clay, grey, silty	0.1	3.6

b 'Clayey' sandy gravel 0.8 4.4
 Gravel: coarse with fine; flint (some white and porous) with limestone, sandstone and some chalk
 Sand: fine with medium and some coarse
 Fines: silt

London Clay Clay, grey 1.0+ 5.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
	a	20	69		11	2.0-3.0	23	49	13	5	8
				3.0-3.5	12	65	6	5	10	2	0
				Mean	20	53	11	5	9	2	0
b	16	51	33	3.6-4.4	16	35	9	7	12	21	0
a+b	18	64	18	Mean	18	48	10	6	10	8	0

SU 90 SW 50 9352 0234 Shripney Block H
 Surface level +3.5 m Waste 4.5 m
 Water not struck Bedrock 0.5 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, silty, mottled brown and grey	1.9	2.4
Raised Beach Deposits (younger)	Silt, chalky, with chalk and flint pebbles	2.1	4.5
Upper Chalk	Chalk	0.5+	5.0

SU 90 SW 51 9454 0470 Eastergate Block G
 Surface level +9.3 m Overburden 1.5 m
 Water struck at +7.8 m Mineral 1.4 m
 September 1981 Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, silty, mottled brown, with sand and pebbles near base	1.0	1.5
Raised Beach Deposits (younger)	'Clayey' pebbly sand Gravel: coarse and fine; flint (some white and porous) with some chalk, sandstone and ironstone Sand: fine with some medium and coarse Fines: silt	1.4	2.9
London Clay	Clay, brown at top, grey below	2.1+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
11	75	14	1.5-2.5	13	69	2	2	7	7	0
			2.5-2.9	8	65	7	5	7	8	0
			Mean	11	68	4	3	7	7	0

SU 90 SW 52

9457 0349

Lidsey

Block G

Surface level +8.0 m
Water struck at +6.0 m
September 1981

Overburden 1.5 m
Mineral 1.9 m
Bedrock 11.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, clayey, brown, with pebbles near base	1.3	1.5
Raised Beach Deposits (younger)	<p>a 'Clayey' pebbly sand Gravel: fine and coarse; flint with chalk Sand: fine with some coarse and medium Fines: silt, brown</p> <p>b Sandy gravel Gravel: fine with coarse, angular to well rounded; flint (some white and porous), chalk, limestone and other rock fragments Sand: fine, coarse and medium Fines: silt, brown</p>	1.0	2.5
		0.9	3.4
London Clay	Clay, dark olive grey	11.6+	15.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm	
a	14	75	11	1.5-2.5	14	66	5	4	7	4	0
b	6	56	38	2.5-3.4	6	23	16	17	28	10	0
a+b	10	66	24	1.5-3.4	10	46	10	10	17	7	0

SU 90 SW 53 9450 0267 Lidsey Lodge

Block H

Surface level +3.4 m
Water not struck
September 1981

Overburden 2.0 m
Mineral 1.5 m
Waste 0.6 m
Bedrock 2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, brown, silty; abundant chalk pellets below 1.1 m; pebbly and more sandy near base	1.7	2.0
Raised Beach Deposits (younger)	'Very clayey' sandy gravel Gravel: coarse and fine; flint and chalk Sand: fine with some coarse and medium Fines: silt and clay, light brown	1.5	3.5
	Silt, sandy, pebbly, very chalky, with a few flint pebbles	0.6	4.1
Upper Chalk	Chalk, weathered, pale brown, sandy near top, cleaner and with nodular flints below 6.0 m	2.2+	6.3

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
36	42	22	2.0-3.0	35	33	3	5	7	13	4
			3.0-3.5	38	35	4	5	7	7	4
			Mean	36	33	4	5	7	11	4

SU 90 SW 54 9426 0141 Oldlands Farm

Block H

Surface level +3.2 m
Water not struck
September 1981

Waste 2.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, brown, silty near top, sandier near base	1.5	1.9
Raised Beach Deposits (younger)	'Very clayey' pebbly sand Gravel: coarse and fine; flint with chalk Sand: fine with traces of medium and coarse Fines: silt	0.9	2.8
Upper Chalk	Chalk, rubbly, silty near top	1.2+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
39	48	13	1.9-2.8	39	42	3	3	6	7	0

SU 90 SW 55	9488 0071	Bognor	Block H
Surface level +3.6 m			Overburden 1.6 m
Water struck at -1.6 m			Mineral 1.0 m
September 1981			Waste 2.6 m
			Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, brown, with particles of peat and a few flint pebbles	1.4	1.6
Raised Beach Deposits (younger)	'Very clayey' pebbly sand Gravel: coarse with fine, angular; flint Sand: fine with traces of medium and coarse Fines: silt	1.0	2.6
	Clay, silty, grey with brown mottling	0.7	3.3
	Silt, sandy, very chalky, with pebbles of chalk and nodular flint	1.9	5.2
Upper Chalk	Chalk, soft, white	0.9+	6.1

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
32	60	8	1.6-2.6	32	54	4	2	2	6	0

SU 90 SE 21	9530 0473	Barnham	Block G
Surface level +9.0 m			Overburden 2.6 m
Water struck at +6.3 m			Mineral 2.0 m
September 1981			Bedrock 3.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, brown, silty, with pebbles near base	1.4	1.6
Head Gravel	Silt, chalky, with abundant chalk pebbles	1.0	2.6

Raised Beach Deposits (younger)	a Pebbly sand	1.0	3.6
	Gravel: fine and coarse, angular to subrounded; flint with chalk Sand: fine with traces of medium and coarse; quartz Fines: silt		
	b Sandy gravel	1.0	4.6
	Gravel: coarse and fine, angular to subrounded; flint (some white and porous), chalk, limestone and traces of other rock fragments Sand: fine with some coarse and medium; quartz and rock fragments Fines: silt		
London Clay	Clay, dark olive grey	3.4+	8.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand			Gravel	
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
	a	6	86		8	2.6-3.6	6	83	2	1	5
b	4	49	47	3.6-4.6	4	33	6	10	22	25	0
a+b	5	68	27	2.6-4.6	5	58	4	6	13	14	0

SU 90 SE 22	9597 0369	near Vicarage, Barnham	Block H
Surface level +7.2 m			Waste 3.9 m
Water not struck			Bedrock 1.4 m+
October 1981			

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Silt, clayey, with sand and pebbles near base	2.3	2.4
Raised Beach Deposits (younger)	Silt, chalky, sandy, with flint and chalk pebbles	1.5	3.9
Upper Chalk	Chalk, weathered, rubbly at top	1.4+	5.3

SU 90 SE 23	9542 0155	Hoe Farm, Flansham	Block H
Surface level +3.7 m			Waste 1.6 m
Water not struck			Bedrock 3.2 m+
September 1981			

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, brown, very silty, with peat particles and a few small angular flint pebbles	1.4	1.6
Upper Chalk	Chalk, rubbly near top, soft and crumbly below, with nodular flints	3.2+	4.8

Surface level +9.5 m
 Water struck at +7.9 m
 October 1981

Overburden 1.3 m
 Mineral 3.2 m
 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, brown, silty	0.8	1.3
Raised Beach Deposits (younger)	a 'Clayey sand Sand: fine with trace of medium; quartz Fines: silt, brown	2.0	3.3
	b Sandy gravel Gravel: fine and coarse, angular to well rounded; flint (some white and porous), chalk and limestone with some other rock fragments and pyrite Sand: fine with some medium and coarse; quartz Fines: silt, brown	1.2	4.5
London Clay	Clay, grey-brown, silty	1.5+	6.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines		Sand			Gravel	
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	12	88	0	1.3-2.3	16	82	1	0	1	0	0
				2.3-3.3	8	91	1	0	0	0	0
				Mean	12	87	1	0	0	0	0
b	5	69	26	3.3-4.5	5	51	11	7	16	10	0
a+b	10	80	10	1.3-4.5	10	72	5	3	6	4	0

Surface level +6.1 m
 Water struck at +1.1 m
 October 1981

Waste 3.1 m
 Bedrock 2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.4	0.4
Brickearth	Clay, brown, silty	2.7	3.1
Upper Chalk	Silt, very chalky, with chalk pebbles	1.4	4.5
	Chalk, soft, weathered	0.8+	5.3

SU 90 SE 26 9618 0249 Hams, Yapton Block H

Surface level +3.5 m Waste 4.0 m
 Water not struck Bedrock 2.2 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.5	0.5
Brickearth	Clay, silty, brown and mottled brown on grey, with some peat particles and rare angular flint pebbles	1.8	2.3
Raised Beach Deposits (younger)	Silt, olive and olive brown, very sandy and chalky, with abundant chalk and a few angular flint pebbles	1.7	4.0
Upper Chalk	Chalk, soft, with nodular flints, weathered at top	2.2+	6.2

SU 90 SE 27 9638 0133 Flansham Block H

Surface level +3.7 m Waste 4.7 m
 Water struck at -0.8 m Bedrock 1.5 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, brown and mottled grey-brown	2.4	2.8
Raised Beach Deposits (younger)	Silt, very sandy, chalky, with chalk pebbles	1.9	4.7
Upper Chalk	Chalk, soft, weathered at top	1.5+	6.2

SU 90 SE 28 9726 0449 Todhurst Farm Block G

Surface level +11.0 m Overburden 1.9 m
 Water struck at +9.1 m Mineral 3.5 m
 August 1981 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, silty, mottled brown and greyish brown, with peat particles and a few small subangular white flint pebbles	1.7	1.9

Raised Beach Deposits (younger)	a 'Clayey' sand with a few pebbles of flint and sandstone Sand: fine, with traces of medium and coarse; quartz Fines: silt and clay, brown	3.0	4.9
	b Sandy gravel Gravel: coarse with fine, angular to well rounded; flint (some white and porous), chalk and traces of other rock fragments Sand: fine with coarse and medium Fines: silt, brown	0.5	5.4
London Clay	Clay, very silty, olive grey, with some fine sand and mica	1.0+	6.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	16	82	2	1.9-2.9	25	65	2	3	1	4	0
				2.9-3.9	12	87	1	0	0	0	0
				3.9-4.9	11	83	3	2	1	0	0
				Mean	16	78	2	2	1	1	0
b	4	51	45	4.9-5.4	4	32	9	10	18	27	0
a+b	14	78	8	1.9-5.4	14	72	3	3	3	5	0

SU 90 SE 29	9738 0335	North-east end of Drove Lane, Yapton	Block H
Surface level +6.6 m			Overburden 2.9 m
Water struck at +1.9 m			Mineral 1.0 m
October 1981			Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, brown, silty	1.4	1.9
Raised Beach Deposits (younger)	Silt, chalky, with chalk pebbles	1.0	2.9
	'Very clayey' sandy gravel Gravel: coarse with flint dominant, and fine with chalk dominant; some cobbles Sand: fine with some medium and coarse; coarse mostly chalk Fines: silt and clay, chalky	1.0	3.9
Upper Chalk	Chalk, rubbly, soft, silty and sandy to 6.0 m	2.3+	6.2

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
	35	38	27	2.9-3.9	35	28	4	6	10	14	3

SU 90 SE 30 9703 0214 Bilsham Farm Block H

Surface level +5.1 m Waste 4.0 m
 Water not struck Bedrock 1.0 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, brown and mottled grey brown	2.0	2.4
Raised Beach Deposits (younger)	Silt, very sandy, chalky, with chalk and some flint pebbles	1.6	4.0
Upper Chalk	Chalk, soft, with nodular flints	1.0+	5.0

SU 90 SE 31 9737 0118 A259/B2132 junction Block H

Surface level +4.0 m Waste 3.5 m
 Water struck at +1.9 m Bedrock 1.1 m+
 October 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Clay, brown, silty	1.3	1.4
Raised Beach Deposits (younger)	Silt, very sandy, chalky, with chalk granules	0.7	2.1
	'Very clayey' sandy gravel Gravel: coarse with fine, angular to subangular; flint and chalk Sand: fine with medium and coarse; chalk in coarse Fines: silt and clay, chalky	0.9	3.0
	Silt, sandy, chalky	0.5	3.5
Upper Chalk	Chalk, rubbly, sandy, bluish grey	1.1+	4.6

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
34	45	21	2.1-3.0	34	32	7	6	8	13	0

SU 90 SE 32 9822 0430 North End, Yapton

Block H

Surface level +6.0 m
Water not struck
August 1981

Waste 3.3 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, brown, silty, with a few subangular flint pebbles. Very sandy near base	2.7	3.0
Raised Beach Deposits (younger)	Sand, mid to dark brown: fine to coarse; quartz with flint; silty and with angular to well rounded flint pebbles	0.3	3.3
Upper Chalk	Chalk, soft, rubbly	1.2+	4.5

SU 90 SE 33 9827 0349 Yapton Church

Block H

Surface level +6.4 m
Water not struck
September 1981

Waste 1.4 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil and made ground	0.3	0.3
Brickearth	Clay, very sandy, mottled brown and grey-brown; some small flint pebbles	1.1	1.4
Upper Chalk	Chalk, soft, weathered, pale yellowish brown; nodular flints	1.6+	3.0

SU 90 SE 34 9869 0257 Northwood Farm

Block H

Surface level +6.8 m
Water not struck
August 1981

Overburden 2.0 m
Mineral 1.3 m
Waste 0.6 m
Mineral 2.0 m
Waste 0.6 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, silty, mottled grey-brown and reddish brown, with some large angular flints in lower part	1.8	2.0

Raised Beach Deposits (younger)	a 'Very clayey' pebbly sand Gravel: coarse and fine, angular to subrounded; flint (some white and porous) with some chalk and sandstone and traces of other rock fragments Sand: fine with medium and some coarse Fines: silt, brown	1.3	3.3
	Silt, sandy, very chalky, pale olive, with abundant pebbles of chalk and some nodular flint	0.6	3.9
	b 'Very clayey' pebbly sand Gravel: fine and coarse with some cobbles, angular to subrounded; flint with chalk and some limestone, sandstone and traces of other rock fragments Sand: fine with medium and some coarse; some chalk Fines: silt and clay, chalky, brown	1.0	4.9
	c 'Clayey' pebbly sand Gravel: fine and coarse, composition as 'b' Sand: fine and medium with coarse; some chalk Fines: silt, chalky, brown	1.0	5.9
	Silt, sandy, very chalky, with chalk and flint pebbles	0.6	6.5
Upper Chalk	Chalk, hard, white, with nodular flint, brecciated, sandy near top	0.5+	7.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					$-\frac{1}{16}$	$+\frac{1}{16} - \frac{1}{4}$	$+\frac{1}{4} - 1$	$+1 - 4$	$+4 - 16$	$+16 - 64$	$+64$ mm
a	38	54	8	2.0-3.0	38	40	10	4	4	4	0
				3.0-3.3	38	37	10	3	6	4	2
				Mean	38	40	10	4	4	4	trace
b	36	53	11	3.9-4.9	36	37	11	5	6	2	3
c	18	63	19	4.9-5.9	18	27	23	13	12	7	0
a+b+c	31	57	12	Mean	31	36	14	7	7	4	1

SU 90 SE 35 9860 0149 A259, north of Grevatt's Bridge Block H

Surface level +4.6 m Waste 3.9 m
Water not struck Bedrock 1.3 m+
September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, mottled brown, greyish brown and olive grey, with fine sand and chalk granules	2.0	2.2
Raised Beach Deposits (younger)	Silt, very sandy, with pebbles of chalk and some flint	1.0	3.2

	'Very clayey' sandy gravel Gravel: fine with coarse; chalk with some nodular flint Sand: fine and medium with coarse; quartz and chalk Fines: silt and clay, chalky	0.7	3.9
Upper Chalk	Chalk, weathered, rubbly, with sand near top	1.3+	5.2

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
38	44	18	3.2-3.9	38	25	12	7	13	5	0

SU 90 SE 36 9920 0414 Wick's Farm Block H

Surface level +5.0 m Waste 1.5 m
 Water not struck Bedrock 1.5 m+
 August 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, very silty, brown, with angular and subangular flint pebbles, some peat particles and a few pockets of sand	1.2	1.5
Upper Chalk	Chalk, rubbly, with matrix of olive fine sand near top	1.5+	3.0

SU 90 SE 37 9994 0349 Ford Airfield (north-east) Block H

Surface level +3.4 m Waste 1.1 m
 Water struck at +1.4 m Bedrock 4.9 m+
 September 1981

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Raised Beach Deposits (younger)	Clay, silty, reddish brown, with angular to well rounded flint pebbles and some gastropod shell fragments	0.9	1.1
Upper Chalk	Chalk, rubbly, with matrix of olive silt and fine sand and some rounded flint pebbles to 5.5 m, greyish white, with nodular flints, below	4.9+	6.0

Surface level +5.7 m
Water struck at +3.7 m
August 1981

Overburden 1.7 m
Mineral 3.2 m
Waste 1.2 m
Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, clayey, yellowish brown, with peat particles and a few small flint pebbles	1.5	1.7
Raised Beach Deposits (younger)	a 'Very clayey' sand with a few flint pebbles Sand: fine with medium and trace of coarse Fines: silt, brown	0.3	2.0
	b 'Very clayey' sandy gravel Gravel: coarse and fine, angular to subrounded; flint (some white and porous) with some chalk and traces of other rock fragments Sand: fine and medium with some coarse Fines: silt, brown to 4.0 m, chalky below	2.9	4.9
	Silt, pale olive, sandy, very chalky, with pebbles of chalk and some larger nodular flints	0.9	5.8
	c 'Very clayey' gravel Gravel: coarse (angular flint) with fine (chalk with some flint) Sand: fine and medium with coarse Fines: silt, chalky	0.3	6.1
Upper Chalk	Chalk, soft, rubbly, weathered at top	1.7+	7.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines			Sand			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	31	66	3	1.7-2.0	31	54	11	1	1	2	0
b	25	55	20	2.0-3.0	21	41	21	7	3	7	0
				3.0-4.0	17	30	28	9	9	3	4
				4.0-4.9	39	13	10	6	8	20	4
				Mean	25	28	20	7	7	10	3
c	21	29	50	5.8-6.1	21	11	10	8	14	33	3
a+b	26	57	17	1.7-4.9	26	31	19	7	6	9	2
a+b+c	25	54	21	Mean	25	29	18	7	7	11	3

Surface level +3.3 m
 Water struck at +1.6 m
 September 1981

Overburden 1.1 m
 Mineral 1.5 m
 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, clayey, mottled orange-brown and pale yellowish olive, with lignite granules and a few flint pebbles	0.9	1.1
Raised Beach Deposits (younger)	'Very clayey' sandy gravel Gravel: coarse and fine, angular to subrounded; flint with some chalk and traces of other rock fragments Sand: fine and medium with some coarse Fines: silt, chalky	1.5	2.6
Upper Chalk	Chalk, weathered, sandy and silty at top; nodular flints	0.9	3.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
35	45	20	1.1-1.7	40	31	14	1	5	9	0
			1.7-2.6	33	29	11	4	11	8	4
			Mean	35	30	12	3	8	9	3

The following reports of the Institute relate particularly to bulk mineral resources

Reports of the Institute of Geological Sciences

Assessment of British Sand and Gravel Resources

- 1 The sand and gravel resources of the country south-east of Norwich, Norfolk: Resource sheet TG 20.
E. F. P. Nickless.
Report 71/20 ISBN 0 11 880216 X £1.15
- 2 The sand and gravel resources of the country around Witham, Essex: Resource sheet TL 81. H. J. E. Haggard.
Report 72/6 ISBN 0 11 880588 6 £1.20
- 3 The sand and gravel resources of the country south and west of Woodbridge, Suffolk: Resource sheet TM 24.
R. Allender and S. E. Hollyer.
Report 72/9 ISBN 0 11 880596 7 £1.70
- 4 The sand and gravel resources of the country around Maldon, Essex: Resource sheet TL 80. J. D. Ambrose
Report 73/1 ISBN 0 11 880600 9 £1.20
- 5 The sand and gravel resources of the country around Hethersett, Norfolk: Resource sheet TG 10.
E. F. P. Nickless.
Report 73/4 ISBN 0 11 880606 8 £1.60
- 6 The sand and gravel resources of the country around Terling, Essex: Resource sheet TL 71. C. H. Eaton.
Report 73/5 ISBN 0 11 880608 4 £1.20
- 7 The sand and gravel resources of the country around Layer Breton and Tolleshunt D'Arcy, Essex: Resource sheet TL 91 and part 90. J. D. Ambrose.
Report 73/8 ISBN 0 11 880614 9 £1.30
- 8 The sand and gravel resources of the country around Shotley and Felixstowe, Suffolk: Resource sheet TM 23.
R. Allender and S. E. Hollyer.
Report 73/13 ISBN 0 11 880625 4 £1.60
- 9 The sand and gravel resources of the country around Attlebridge, Norfolk: Resource sheet TG 11.
E. F. P. Nickless.
Report 73/15 ISBN 0 11 880658 0 £1.85
- 10 The sand and gravel resources of the country west of Colchester, Essex: Resource sheet TL 92. J. D. Ambrose.
Report 74/6 ISBN 0 11 880671 8 £1.45
- 11 The sand and gravel resources of the country around Tattingstone, Suffolk: Resource sheet TM 13. S. E. Hollyer.
Report 74/9 ISBN 0 11 880675 0 £1.95
- 12 The sand and gravel resources of the country around Gerrards Cross, Buckinghamshire: Resource sheet SU 99, TQ 08, 09. H. C. Squirrel.
Report 74/14 ISBN 0 11 880710 2 £2.20

Mineral Assessment Reports

- 13 The sand and gravel resources of the country east of Chelmsford, Essex: Resource sheet TL 70. M. R. Clarke.
ISBN 0 11 880744 7 £3.50
- 14 The sand and gravel resources of the country east of Colchester, Essex: Resource sheet TM 02. J. D. Ambrose.
ISBN 0 11 880745 5 £3.25
- 15 The sand and gravel resources of the country around Newton on Trent, Lincolnshire: Resource sheet SK 87.
D. Price.
ISBN 0 11 880746 3 £3.00
- 16 The sand and gravel resources of the country around Braintree, Essex: Resource sheet TL 72. M. R. Clarke.
ISBN 0 11 880747 1 £3.50
- 17 The sand and gravel resources of the country around Besthorpe, Nottinghamshire: Resource sheet SK 86 and part 76. J. R. Gozzard.
ISBN 0 11 880748 X £3.00
- 18 The sand and gravel resources of the Thames Valley, the country around Cricklade, Wiltshire: Resource sheet SU 09, 19 and parts SP 00, 10. P. R. Robson.
ISBN 0 11 880749 8 £3.00

- 19 The sand and gravel resources of the country south of Gainsborough, Lincolnshire: Resource sheet SK 88 and part 78. J. H. Lovell.
ISBN 0 11 880750 1 £2.50
- 20 The sand and gravel resources of the country east of Newark upon Trent, Nottinghamshire: Resource sheet SK 85.
J. R. Gozzard.
ISBN 0 11 880751 X £2.75
- 21 The sand and gravel resources of the Thames and Kennet Valleys, the country around Pangbourne, Berkshire: Resource sheet SU 67. H. C. Squirrel.
ISBN 0 11 880752 8 £3.25
- 22 The sand and gravel resources of the country north-west of Scunthorpe, Humberside: Resource sheet SE 81.
J. W. C. James.
ISBN 0 11 880753 6 £3.00
- 23 The sand and gravel resources of the Thames Valley, the country between Lechlade and Standlake: Resource sheet SP 30 and parts SP 20, SU 29, 39. P. Robson.
ISBN 0 11 881252 1 £7.25
- 24 The sand and gravel resources of the country around Aldermaston, Berkshire: Resource sheet SU 56, 66.
H. C. Squirrel.
ISBN 0 11 881253 X £5.00
- 25 The celestite resources of the area north-east of Bristol: Resource sheet ST 68 and parts 59, 69, 79, 58, 68, 78, 77.
E. F. P. Nickless, S. J. Booth and P. N. Mosley.
ISBN 0 11 881262 9 £5.00
- 26 The sand and gravel resources of the country around Monyash, Derbyshire: Resource sheet SK 16. F. C. Cox and D. McC. Bridge.
ISBN 0 11 881263 7 £7.00
- 27 The sand and gravel resources of the country west and south of Lincoln, Lincolnshire: Resource sheets SK 95 and part 96, and SK 97 and part 96. I. Jackson.
ISBN 0 11 884003 7 £6.00
- 28 The sand and gravel resources of the country around Eynsham, Oxfordshire: Resource sheet SP 40 and part 41.
W. J. R. Harries.
ISBN 0 11 884012 6 £3.00
- 29 The sand and gravel resources of the country south-west of Scunthorpe, Humberside: Resource sheet SE 80.
J. H. Lovell.
ISBN 0 11 884013 4 £3.50
- 30 Procedure for the assessment of limestone resources.
F. C. Cox, D. McC. Bridge and J. H. Hull.
ISBN 0 11 884030 4 £1.25
- 31 The sand and gravel resources of the country west of Newark upon Trent, Nottinghamshire: Resource sheet SK 75.
D. Price and P. J. Rogers.
ISBN 0 11 884031 2 £3.50
- 32 The sand and gravel resources of the country around Sonning and Henley, Berkshire, Oxfordshire and Buckinghamshire: Resource sheet SU 77, 78.
H. C. Squirrel.
ISBN 0 11 884032 0 £5.25
- 33 The sand and gravel resources of the country north of Gainsborough, Lincolnshire: Resource sheet SK 89.
J. R. Gozzard and D. Price.
ISBN 0 11 884033 9 £4.50
- 34 The sand and gravel resources of the Dengie Peninsula, Essex: Resource sheet TL 90 and parts 80, TM 00, TQ 89, 99, TR 09. M. B. Simmons.
ISBN 0 11 884081 9 £5.00
- 35 The sand and gravel resources of the country around Darvel, Strathclyde: Resource sheet comprising parts of NS 53, 54, 63, 64. E. F. P. Nickless, A. M. Aitken and A. A. McMillan.
ISBN 0 11 884082 7 £7.00

- 36 The sand and gravel resources of the country around Southend-on-Sea, Essex: Resource sheets comprising parts of TQ 88, 89, 98, 99, TR 08, 09; and TQ 78, 79 and parts of 88, 89. S. E. Hollyer and M. B. Simmons.
ISBN 0 11 884083 5 £7.50
- 37 The sand and gravel resources of the country around Bawtry, South Yorkshire: Resource sheet SK 69. A. R. Clayton.
ISBN 0 11 884053 3 £5.75
- 38 The sand and gravel resources of the country around Abingdon, Oxfordshire: Resource sheet SU 49, 59, SP 40, 50. C. E. Corser.
ISBN 0 11 884084 5 £5.50
- 39 The sand and gravel resources of the Blackwater Valley (Aldershot) area: Resource sheet SU 85, 86 and parts 84, 94, 95, 96. M. R. Clarke, A. J. Dixon and M. Kubala.
ISBN 0 11 884085 1 £7.00
- 40 The sand and gravel resources of the country west of Darlington, County Durham: Resource sheet NZ 11, 21. A. Smith.
ISBN 0 11 884086 X £5.00
- 41 The sand and gravel resources of the country around Garmouth, Grampian Region: Resource sheet NJ 36. A. M. Aitken, J. W. Merritt and A. J. Shaw.
ISBN 0 11 884090 8 £8.75
- 42 The sand and gravel resources of the country around Maidenhead and Marlow: Resource sheet SU 88 and parts 87, 97, 98. P. N. Dunkley.
ISBN 0 11 884091 6 £5.00
- 43 The sand and gravel resources of the country around Misterton, Nottinghamshire: Resource sheet SK 79. D. Thomas and D. Price.
ISBN 0 11 884092 4 £5.25
- 44 The sand and gravel resources of the country around Sedgefield, Durham: Resource sheet NZ 32. M. D. A. Samuel.
ISBN 0 11 884093 2 £5.75
- 45 The sand and gravel resources of the country around Brampton, Cumbria: Resource sheet NY 55, part 56. I. Jackson.
ISBN 0 11 884094 0 £6.75
- 46 The sand and gravel resources of the country north of Harlow, Essex: Resource sheet TL 41. P. M. Hopson.
ISBN 0 11 884107 6 £9.50
- 47 The limestone and dolomite resources of the country around Wirksworth, Derbyshire: Resource sheet SK 25 and part 35. F. C. Cox and D. J. Harrison.
ISBN 0 11 884108 4 £15.00
- 48 The sand and gravel resources of the Loddon Valley area: Resource sheet SU 75, 76, and parts 64, 65, 66, 74. M. R. Clarke, E. J. Raynor and R. A. Sobey.
ISBN 0 11 884109 2 £8.75
- 49 The sand and gravel resources of the country around Lanark, Strathclyde Region: Resource sheet NS 94 and part 84. J. L. Laxton and E. F. P. Nickless.
ISBN 0 11 884110 6 £11.00
- 50 The sand and gravel resources of the country around Fordingbridge, Hampshire: Resource sheet SU 11 and parts 00, 01, 10, 20, 21. M. Kubala.
ISBN 0 11 884111 4 £7.75
- 51 The sand and gravel resources of the country north of Bournemouth, Dorset: Resource sheet SU 00, 10, 20, SZ 09, 19, 29. M. R. Clarke.
ISBN 0 11 884112 2 £9.75
- 52 The sand and gravel resources of the country between Hatfield Heath and Great Waltham, Essex: Resource sheet TL 51, 61. R. J. Marks.
ISBN 0 11 884113 0 £8.00
- 53 The sand and gravel resources of the country around Cottenham, Cambridgeshire: Resource sheet TL 46, 47. A. J. Dixon.
ISBN 0 11 884114 9 £9.25
- 54 The sand and gravel resources of the country around Huntingdon and St Ives, Cambridgeshire: Resource sheets comprising parts of TL 16, 17, 26, 27; and TL 26, 27, 36, 37. R. W. Gatliff.
ISBN 0 11 884115 7 £8.75
- 55 The sand and gravel resources of the country around Ipswich, Suffolk: Resource sheet TM 14. R. Allender and S. E. Hollyer.
ISBN 0 11 884116 5 £10.00
- 56 Procedure for the assessment of the conglomerate resources of the Sherwood Sandstone Group. D. P. Piper and P. J. Rogers.
ISBN 0 11 884143 2 £1.25
- 57 The conglomerate resources of the Sherwood Sandstone Group of the country around Cheadle, Staffordshire: Resource sheet SK 04. P. J. Rogers, D. P. Piper and T. J. Charsley.
ISBN 0 11 884144 0 £7.75
- 58 The sand and gravel resources of the country west of Peterhead, Grampian Region: Resource sheet NK 04 and parts NK 05, 14, 15, NJ 94, 95. A. A. McMillan and A. M. Aitken.
ISBN 0 11 884145 9 £12.00
- 59 The sand and gravel resources of the country around Newbury, Berkshire: Resource sheet SU 46, 47 and parts 36, 37, 47. J. R. Gozzard.
ISBN 0 11 884146 7 £11.50
- 60 The sand and gravel resources of the country south-west of Peterborough, in Cambridgeshire and east Northamptonshire: Resource sheets TL 09, 19 and SP 98, TL 08. A. M. Harrison.
ISBN 0 11 884147 5 £15.50
- 61 The sand and gravel resources of the country north of Wrexham, Clwyd: Resource sheet SJ 35 and part 25. P. N. Dunkley.
ISBN 0 11 884148 3 £11.75
- 62 The sand and gravel resources of the country around Dolphinton, Strathclyde Region, and West Linton, Borders Region: Resource sheet NT 04, 14 and parts 05 15. A. A. McMillan, J. L. Laxton and A. J. Shaw.
ISBN 0 11 884149 1 £8.00
- 63 The sand and gravel resources of the valley of the Douglas Water, Strathclyde Region: Resource sheet NS 83 and parts 82, 92, 93. A. J. Shaw and E. F. P. Nickless.
ISBN 0 11 884150 5 £11.50
- 64 The sand and gravel resources of the country between Wallingford and Goring, Oxfordshire: Resource sheet SU 68 and part 58. C. E. Corser.
ISBN 0 11 884151 3 £11.50
- 65 The sand and gravel resources of the country around Hexham, Northumberland: Resource sheet NY 86, 96. J. H. Lovell.
ISBN 0 11 884152 1 £7.50
- 66 The sand and gravel resources of the country west of Chelmsford, Essex: Resource sheet TL 60. P. M. Hopson.
ISBN 0 11 884153 X £8.50
- 67 The sand and gravel resources of the country around Hatfield and Cheshunt, Hertfordshire: Resource sheet TL 20, 30 and parts TQ 29, 39. J. R. Gozzard.
ISBN 0 11 884167 X £10.00
- 68 The sand and gravel resources of the country north-east of Halstead, Essex: Resource sheet TL 83. R. J. Marks and J. W. Merritt.
ISBN 0 11 884168 8 £13.25
- 69 The sand and gravel resources of the country around Welwyn Garden City, Hertfordshire: Resource sheet TL 11, 21. J. R. Gozzard.
ISBN 0 11 884169 6 £10.50
- 70 The sand and gravel resources of the country east of Harrogate, North Yorkshire: Resource sheet SE 35. D. L. Dundas.
ISBN 0 11 884170 7 £15.50

- 71 The sand and gravel resources of the country around Hemel Hempstead, St Albans and Watford: Resource sheet TL 00, 10, and parts TQ 09, 19. W. J. R. Harries, S. E. Hollyer and P. M. Hopson. ISBN 0 11 884171 8 £12.00
- 72 The sand and gravel resources of the country around Bury St Edmunds, Suffolk: Resource sheet TL 86. M. P. Hawkins. ISBN 0 11 884172 6 £10.50
- 73 The sand and gravel resources of the country between Ely and Cambridge, Cambridgeshire: Resource sheet TL 56, 57. A. R. Clayton. ISBN 0 11 884173 4 £9.50
- 74 The sand and gravel resources of the country around Blydon, Tyne and Wear: Resource sheet NZ 06, 16. J. R. A. Giles. ISBN 0 11 884174 2 £10.50
- 75 The sand and gravel resources of the country around Stokesley, North Yorkshire: Resource sheet NZ 40, 50, and parts 41, 51. R. G. Crofts. ISBN 0 11 884175 0 £11.50
- 76 The sand and gravel resources of the country around Ellon, Grampian Region: Resource sheets NJ 93 with parts 82, 83, 92, and NK 03 with parts 02, 13. J. W. Merritt. ISBN 0 11 884176 9 £15.00
- 77 The limestone and dolomite resources of the country around Buxton, Derbyshire: Resource sheet SK 07 and parts 06, 08. D. J. Harrison. ISBN 0 11 884177 7 £13.50
- 78 The sand and gravel resources of the country west of Boroughbridge, North Yorkshire: Resource sheet SE 36. D. A. Abraham. ISBN 0 11 884178 5 £12.75
- 79 The limestone and dolomite resources of the country around Bakewell, Derbyshire: Resource sheet SK 26 and part 27. D. McC. Bridge and J. R. Gozzard. ISBN 0 11 884179 3 £10.50
- 80 The sand and gravel resources of the country between Stamford, Lincolnshire, and Peterborough, Cambridgeshire: Resource sheet TF 00, 10. S. J. Booth. ISBN 0 11 884180 7 £14.50
- 81 The sand and gravel resources of the country around Dorchester and Watlington, Oxfordshire: Resource sheet SU 69 and part 59. C. E. Corser. ISBN 0 11 884204 8 £14.25
- 82 The sand and gravel resources of the country around Sible Hedingham, Essex: Resource sheet TL 73. R. J. Marks and D. W. Murray. ISBN 0 11 884205 6 £10.75
- 83 The sand and gravel resources of the country around Hollesley, Suffolk: Resource sheet TM 34. S. E. Hollyer and R. Allender. ISBN 0 11 884206 4 £13.25
- 84 The sand and gravel resources of the country around Kirk Hammerton, North Yorkshire: Resource sheet SE 45. J. R. A. Giles. ISBN 0 11 884207 2 £10.00
- 85 The sand and gravel resources of the country around Nayland, Suffolk: Resource sheet TL 93. P. M. Hopson. ISBN 0 11 884208 0 £11.25
- 86 The sand and gravel resources of the country around Wem, Shropshire: Resource sheet SJ 42, 52. B. Cannell and W. J. R. Harries. ISBN 0 11 884209 9 £15.50
- 87 The sand and gravel resources of the country around Ranskill and East Retford, Nottinghamshire: Resource sheet SK 68 and part 78. D. Thomas. ISBN 0 11 884210 2 £8.50
- 88 The sand and gravel resources of the country around Tholthorpe, North Yorkshire: Resource sheet SE 46. R. Stanczyszyn. ISBN 0 11 884211 0 £13.00
- 89 The sand and gravel resources of the country around Newport-on-Tay, Fife Region: Resource sheet NO 42 and parts 32, 52. J. L. Laxton and D. L. Ross. ISBN 0 11 887413 6 £12.75
- 90 The sand and gravel resources of the country around Shrewsbury, Shropshire: Resource sheet SJ 41, 51. B. Cannell. ISBN 0 11 884213 7 £17.00
- 91 The conglomerate resources of the Sherwood Sandstone Group of the country east of Stoke-on-Trent, Staffordshire: Resource sheet SJ 94. D. Piper. ISBN 0 11 884214 5 £7.00
- 92 The sand and gravel resources of the country around Armthorpe, South Yorkshire: Resource sheet SE 60. D. Price and D. P. Best. ISBN 0 11 884215 3 £10.00
- 93 The sand and gravel resources of the country around Whittlesey, Cambridgeshire: Resource sheet TF 20, TL 29. S. J. Booth. ISBN 0 11 884216 1 £12.50
- 94 The sand and gravel resources of the country north and west of Woodhall Spa, Lincolnshire: Resource sheet TF 16 and part 17. I. Jackson. ISBN 0 11 884217 X £14.75
- 95 The sand and gravel resources of the country around Biggar, Strathclyde Region: Resource sheet NS 93, NT 03, and parts NS 92, NT 02. A. J. Shaw and J. W. Merritt. ISBN 0 11 887414 4 £15.00
- 96 The sand and gravel resources of the country around Potter Hanworth and Reepham, Lincolnshire: Resource sheet TF 06, 07. R. G. Crofts. ISBN 0 11 884219 6 £9.75
- 97 The sand and gravel resources of the country around Clare, Suffolk: Resource sheet TL 74. R. Marks. ISBN 0 11 884297 8 £10.00
- 98 The limestone and dolomite resources of the country around Tideswell, Derbyshire: Resource sheet SK 17 and parts 18, 27. R. W. Gatliff. ISBN 0 11 884298 6 £14.50
- 99 The sand and gravel resources of the country north and west of Billingham, Cleveland: Resource sheet NZ 42 and part 52. J. W. C. James. ISBN 0 11 884299 4 £10.50
- 100 The sand and gravel resources of the country around Billingham, Lincolnshire: Resource sheet TF 15 and part 05. J. B. L. Wild. ISBN 0 11 884300 1 £13.75
- 101 The sand and gravel resources of the country around Glenrothes, Fife Region: Resource sheet NO 20 and parts 21, 30, 31. A. M. Aitken and D. L. Ross. ISBN 0 11 887415 2 £15.00
- 102 The sand and gravel resources of the country around Coggeshall, Essex: Resource sheet TL 82. S. J. Booth and J. W. Merritt. ISBN 0 11 887416 0 £16.00
- 103 The sand and gravel resources of the country between Dorchester and Wareham, Dorset: Resource sheets comprising parts of SY 68, 69, 78, 79, 88, 89, 98, 99. S. J. Mathers. ISBN 0 11 884303 6 £17.00
- 104 The sand and gravel resources of the country around Stansted Mountfitchet, Essex: Resource sheet TL 52. P. M. Hopson. ISBN 0 11 884304 4 £11.75

- 105 The sand and gravel resources of the Welshampton area, Shropshire and Clwyd: Resource sheet SJ 43. Institute of Geological Sciences. ISBN 0 11 884305 2 £12.00
- 106 The sand and gravel resources of the country south of Wrexham, Clwyd: Resource sheet SJ 34 and part 24. D. F. Ball. ISBN 0 11 884306 0 £11.00
- 107 The sand and gravel resources of the country between Rugby and Northampton, Warwickshire and Northamptonshire: Resource sheet SP 66 and parts 56, 57, 65, 67, 75 and 76. M. R. Clarke and E. R. Moczarski. ISBN 0 11 884307 9 £20.00
- 108 The sand and gravel resources of the country south of Horncastle, Lincolnshire: Resource sheet TF 26. G. Power and J. B. L. Wild. ISBN 0 11 884308 7 £9.75
- 109 The sand and gravel resources of the country around Great Dunmow, Essex: Resource sheet TL 62. C. W. Thomas. ISBN 0 11 884309 5 £12.75
- 110 The sand and gravel resources of the country north of Newmarket, Cambridgeshire and Suffolk: Resource sheet TL 67 and part 66. C. E. Corser. ISBN 0 11 884310 9 £14.50
- 111 The sand and gravel resources of the country east and south-east of Darlington, Durham: Resource sheet NZ 30, 31. J. R. Gozzard and D. Price. ISBN 0 11 884311 7 £14.25
- 112 The sand and gravel resources of the country around Hertford, Hertfordshire: Resource sheet TL 31. P. M. Hopson and M. D. A. Samuel. ISBN 0 11 884312 5 £11.75
- 113 The sand and gravel resources of the country around Mold, Clwyd: Resource sheet SJ 26 and part 16. D. F. Ball and K. A. McL. Adlam. ISBN 0 11 884313 3 £12.00
- 114 The sand and gravel resources of the country around Kettering and Wellingborough, in parts of Northamptonshire, Cambridgeshire and Bedfordshire: Resource sheets SP 97 and parts SP 87, TL 07; and SP 86, 96. A. M. Harrison. ISBN 0 11 884314 1 £18.00
- 115 The sand and gravel resources of the country east of Solihull, Warwickshire: Resource sheet comprising parts of SP 17, 18, 27, 28. B. Cannell. ISBN 0 11 884315 X £10.75
- 116 The limestone resources of the Craven Lowlands: Resource sheet comprising parts of 1:50000 geological sheets 59, 69, 61, 67, 68 and 69. D. J. Harrison. ISBN 0 11 884316 8 £15.00
- 117 The sand and gravel resources of the country around Redgrave, Suffolk: Resource sheet TM 07 and part 08. C. A. Auton. ISBN 0 11 884317 6 £15.00
- 118 The sand and gravel resources of the country around Sudbury, Suffolk: Resource sheet TL 84. P. M. Hopson. ISBN 0 11 884318 4 £12.50
- 119 The sand and gravel resources of the country around Bedale, North Yorkshire: Resource sheet SE 28. J. R. A. Giles. ISBN 0 11 884319 2 £11.75
- 120 The sand and gravel resources of the country around Catterick, North Yorkshire: Resource sheet SE 29. J. H. Lovell. ISBN 0 11 884320 6 £10.75
- 121 The sand and gravel resources of the country around Callander and Dunblane, Central Region: Resource sheet NN 60, 70. J. W. Merritt and J. L. Laxton. ISBN 0 11 887417 9 £15.00
- 122 The sand and gravel resources of the country around Lymington and Beaulieu, Hampshire: Resource sheet comprising parts of SU 20, 30, 40, and SZ 29, 39, 49. S. J. Mathers. ISBN 0 11 884322 2 £17.00
- 123 The sand and gravel resources of the country between Mildenhall and Barrow, Suffolk: Resource sheet TL 76, 77 and part 87. A. R. Clayton. ISBN 0 11 884323 0 £15.50
- 124 The sand and gravel resources of the country around Chatteris, Cambridgeshire: Resource sheet TL 38 and part 37. J. R. Gozzard. ISBN 0 11 884324 9 £12.50
- 125 The sand and gravel resources of the country between Coventry and Rugby, Warwickshire: Resource sheet SP 47 and part 37. ISBN 0 11 884325 7 £12.75
- 126 The limestone and dolomite resources of the country around Settle and Malham, North Yorkshire: Resource sheet comprising parts of 1:50000 geological sheets 50 and 60. D. W. Murray. ISBN 0 11 884326 5 £9.75
- 127 The sand and gravel resources of the country around Woolpit, Suffolk: Resource sheet TL 96. M. R. Clarke. ISBN 0 11 884327 3 £13.00
- 128 The sand and gravel resources of the country around Coningsby, Lincolnshire: Resource sheet TF 25. I. Jackson and M. D. Issaias. ISBN 0 11 884328 1 £11.75
- 129 The limestone and dolomite resources of the country north and west of Ashbourne, Derbyshire: Resource sheet SK 15 and parts 04, 05, 14. D. McC. Bridge and D. S. Kneebone. ISBN 0 11 884329 X £15.25
- 130 The sand and gravel resources of the country between Bourne and Crowland, Lincolnshire: Resource sheet TF 11 and parts 01, 21. S. J. Booth. ISBN 0 11 884430 X £20.00
- 131 The sand and gravel resources of the country west of Stirling, Central Region: Resource sheet NS 69, 79. J. L. Laxton and D. L. Ross. ISBN 0 11 887421 7 £14.50
- 132 The sand and gravel resources of Strathallan, Tayside Region: Resource sheet comprising parts of NN 80, 81, 90, 91. A. M. Aitken and A. J. Shaw. ISBN 0 11 887422 5 £15.50
- 133 The sand and gravel resources of the country north-east of Thaxted, Essex: Resource sheet TL 63. R. J. Marks. ISBN 0 11 884433 4 £11.50
- 134 The sand and gravel resources of the country around Prees, Shropshire: Resource sheet SJ 53. J. W. C. James. ISBN 0 11 884434 2 £16.00
- 135 The sand and gravel resources of the country around West Tanfield, North Yorkshire: Resource sheet SE 27. G. E. Strong and J. R. A. Giles. ISBN 0 11 884435 0 £10.75
- 136 The sand and gravel resources of the country around Whitchurch and Malpas, Clwyd, Cheshire and Shropshire: Resource sheet SJ 44, 54. I. Jackson, D. J. Lowe, A. N. Morigi and S. J. Mathers. ISBN 0 11 884436 9 £16.00
- 137 The sand and gravel resources of the country around Diss, Norfolk: Resource sheet TM 17 and part 18. C. J. Wilcox and R. Stanczysyn. ISBN 0 11 884437 7 £15.00
- 138 The sand and gravel resources of the country around Chichester and north of Bognor Regis, Sussex: Resource sheet SU 80, 90. J. H. Lovell and P. H. A. Nancarrow. ISBN 0 11 884438 5 £16.00

Reports of the Institute of Geological Sciences

Other Reports

- 69/9 Sand and gravel resources of the Inner Moray Firth.
A. L. Harris and J. D. Peacock.
ISBN 0 11 880106 0 35p
- 70/4 Sands and gravels of the southern counties of
Scotland. G. A. Goodlet.
ISBN 0 11 880105 8 90p
- 72/8 The use and resources of moulding sand in Northern
Ireland. R. A. Old.
ISBN 0 11 881594 0 30p
- 73/9 The superficial deposits of the Firth of Clyde and its
sea lochs. C. E. Deegan, R. Kirby, I. Rae and R. Floyd.
ISBN 0 11 880617 3 95p
- 77/1 Sources of aggregate in Northern Ireland (2nd edition).
I. B. Cameron.
ISBN 0 11 881279 3 70p
- 77/2 Sand and gravel resources of the Grampian Region.
J. D. Peacock and others
ISBN 0 11 881282 3 80p
- 77/5 Sand and gravel resources of the Fife Region.
M. A. E. Browne.
ISBN 0 11 884004 5 60p
- 77/6 Sand and gravel resources of the Tayside Region.
I. B. Paterson.
ISBN 0 11 884008 8 £1.40
- 77/8 Sand and gravel resources of the Strathclyde Region.
I. B. Cameron and others.
ISBN 0 11 884028 2 £2.50
- 77/9 Sand and gravel resources of the Central Region,
Scotland. M. A. E. Browne.
ISBN 0 11 884016 9 £1.35
- 77/19 Sand and gravel resources of the Borders Region,
Scotland. A. D. McAdam.
ISBN 0 11 884025 8 £1.00
- 77/22 Sand and gravel resources of the Dumfries and
Galloway Region. I. B. Cameron.
ISBN 0 11 884021 5 £1.20
- 78/1 Sand and gravels of the Lothian Region of Scotland.
A. D. McAdam.
ISBN 0 11 884042 8 £1.00
- 78/8 Sand and gravel resources of the Highland Region.
W. Mykura, D. L. Ross and F. May.
ISBN 0 11 884050 9 £3.00

Dd 717438 C10

Printed in England for Her Majesty's Stationery Office by
Commercial Colour Press, London E7

THE SAND AND GRAVEL RESOURCES OF THE COUNTRY AROUND CHICHESTER AND NORTH OF BOGNOR REGIS, SUSSEX

Scale 1:25 000 or about 2½ Inches to 1 Mile

ORDNANCE SURVEY
SHEETS SU 80 & 90
PROVISIONAL EDITION

THE SAND AND GRAVEL RESOURCES OF SHEETS SU 80 AND 90
(CHICHESTER AND NORTH OF BOGNOR REGIS, SUSSEX)

This map should be read in conjunction with the accompanying Report which contains details of the assessment of resources

EXPLANATION OF SYMBOLS AND ABBREVIATIONS

- LANDSLIP**
- Landslip
- DRIFT**
- Aluminium - clay, silt, sand and some gravel
 - Dry Valley Deposits - angular flints in brown loam and silt
 - River Terrace Deposits - sand, gravel and clay
 - Fan Gravel - flint gravel in matrix of chalky silt and clay
 - Marine Beach and Tidal Flat Deposits - soft organic mud, silt, clay and sand
 - Marine or Estuarine Alluvium - soft, shelly silt, clay and sand
 - Brickearth - yellow brown silt, pebbly in parts
 - Head, undifferentiated - flinty, clayey loam and reworked Brickearth
 - Head Gravel - angular flint gravel in brown clay matrix
 - Raised Storm Beach Deposits - topographic mounds of sand and gravel
 - Raised Beach Deposits (Younger) - widespread, fossiliferous sand and gravel
 - Raised Beach Deposits (Older) - patches of fossiliferous, intertidal sand and gravel
 - Clay-with-Flints - broken flints in reddish brown clay

- SOLID**
- London Clay - blue-grey clays, weathering brown
 - Woodwich and Reading Beds - silty clays, mottled reddish brown and grey with chalk and flint clasts
 - Upper Chalk - white, microporous limestone, deeply weathered at top, with nodular and tabular flints
- Made Ground**
- Made Ground
 - Worked-out ground, sand and gravel

- BOUNDARY LINES**
- Geological boundary, Drift
 - Geological boundary, Solid
 - Fault, onemark indicates downthrow side
 - Inferred boundary between recognised categories of deposit
 - Resource Block boundary
 - Broken lines denote uncertainty

- BOREHOLE DATA**
- SITE LOCATIONS**
- Industrial Minerals Assessment Unit (I.M.A.U.) boreholes
- I.M.A.U. BOREHOLES**
- Borehole Registration Number → 90 NE 39
 - Borehole Site → 17.0
 - Geological Classification → 16.0
 - Grading Diagram → 16.0

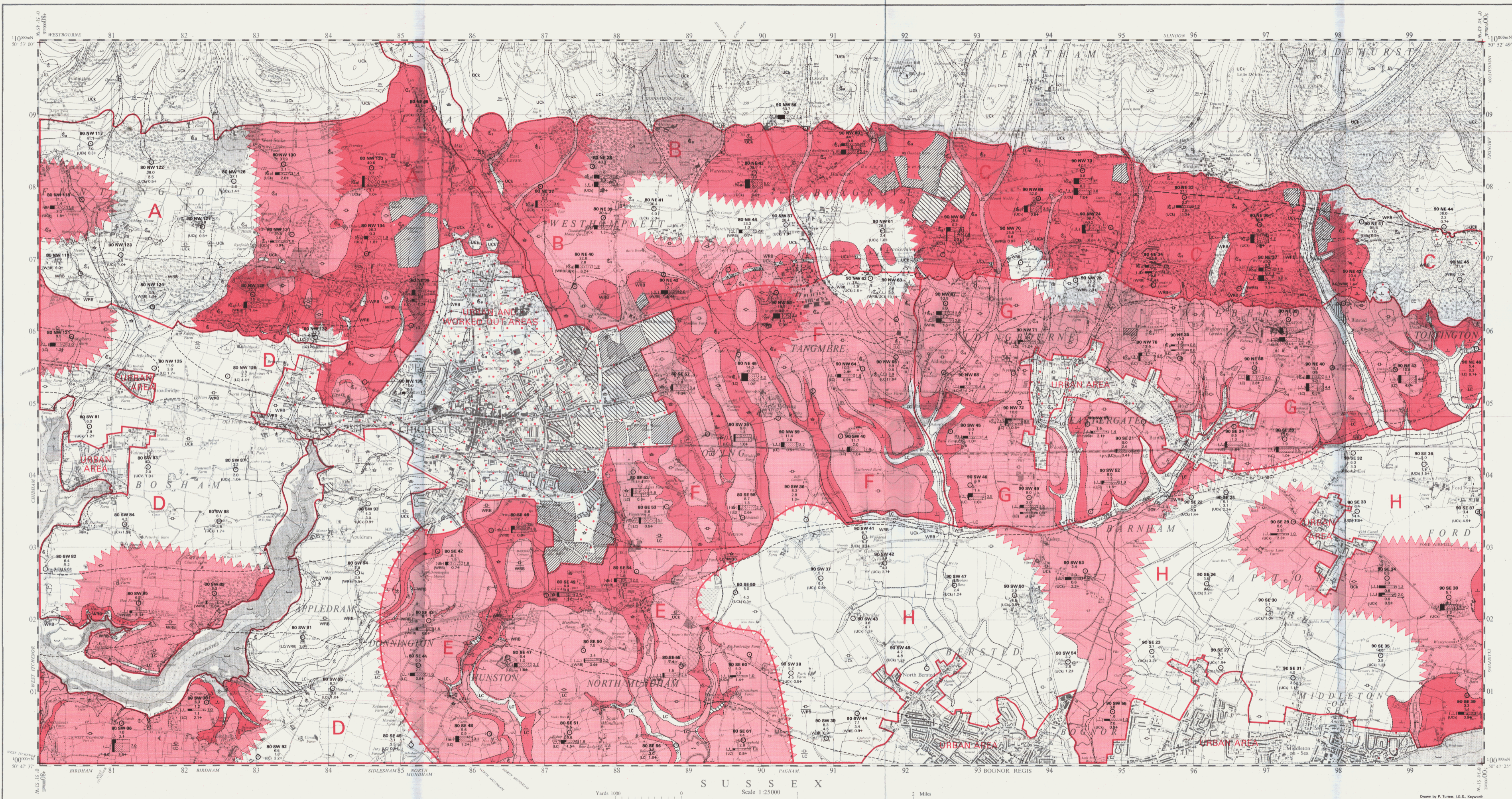
- NOTE**
- (a) Figures underlined denote thicknesses used in the assessment of resources
 - (b) The * sign indicates that the base of the deposit was not reached
 - (c) The Geological Classification is given only for mineral and bedrock
- Borehole Registration Number**
- Each I.M.A.U. borehole is identified by a Registration Number, e.g. 90 NE 39. The first number and letters refer to the quarter sheet, and the second number is the I.G.S. Serial number for that quarter. The unique designation for borehole 90 NE 39 is SU 90 NE 39.
- Grading Diagrams**
- Each grading diagram shows the mean particle size distribution of a distinct deposit of mineral
- The height of the diagram is proportional to the mineral thickness. The width of the diagram shows the proportions of Sand, Silt and Gravel but small amounts of gravel may be omitted or reassigned.

- CATEGORIES OF DEPOSITS**
- Exposed mineral (average thickness of overburden less than 1.0m)
 - Continuous or almost continuous spreads of mineral beneath overburden
 - Sand and gravel either not potentially workable (see Report) or absent
 - Sand and gravel at the surface not assessed

- RESOURCE BLOCKS**
- For the purpose of assessment the mineral is divided into Resource Blocks (see Report). Each is designated by a letter.

Detailed records may be consulted on application to the Head, Industrial Minerals Assessment Unit, Institute of Geological Sciences, Keyworth, Nottingham, NG 12 5GG

Compiled and produced by the Keyworth Drawing Office of the Institute of Geological Sciences.



S U S S E X
Scale 1:25 000
Yards 1000 2 Miles
Metres 1000 2 Kilometres

The representation on this map of a Road, Track or Footpath is no evidence of the existence of a right of way.
Geological lines from 1:10 000 survey by F. G. Berry, F. R. Shepherd-Thorn and R. J. Wray in 1981-82; W. A. Reed, District Geologist.
Sand and Gravel survey by P. M. Hopper, P. H. A. Nossaman and D. Thomas in 1981; R. G. Thomas, Head, Industrial Minerals Assessment Unit.
1:25 000 Sand and Gravel Resource Sheet published 1982; G. M. Brown, G.S., F.R.S., Director, Institute of Geological Sciences.

The GRID lines on this sheet are at 1 kilometre interval. Heights are in feet above Mean Sea Level or Newlyn. Contour values are as first shown on this map.

Data quoted for an individual borehole refer strictly to that site. Reliable conclusions cannot be drawn about the thickness and grading structure of the deposit, particularly in respect of sand and gravel. However estimates of the volume and mean grading of the mineral at a site, in each Resource Block are given in the Report.

Compiled from 5" sheets last fully revised 1969-34. Other partial systems (version 1958-57) have been incorporated. Major roads revised 1972.

SU 71	SU 81	SU 91	TO 01
316	317	318	319
SU 70	SU 80	SU 90	TO 00
311	312	313	314
SZ 79	SZ 89	SZ 99	

Diagram showing the relationship of this sheet to the National Grid 1:25 000 sheets, and the main sheet Geological Sheets 316, 317, 321 and 322.

