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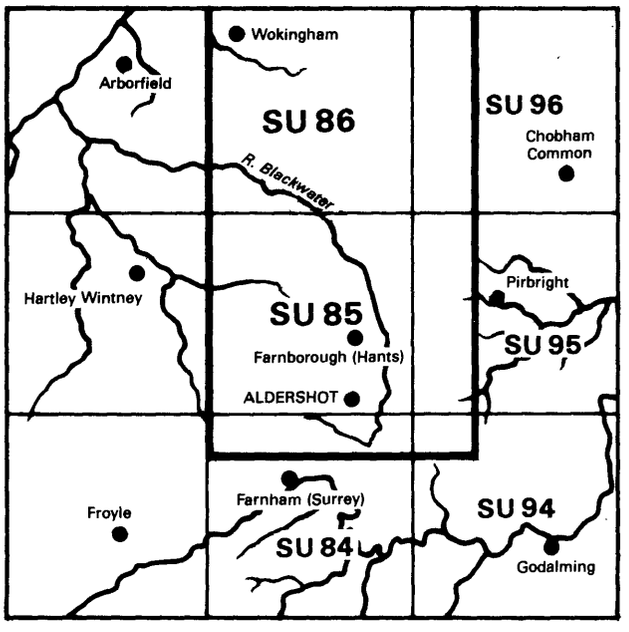

The sand and gravel resources of the Blackwater Valley (Aldershot) area

Description of 1:25 000 sheets SU 85, 86 and parts of SU 84, 94, 95 and 96

M. R. Clarke, A. J. Dixon and M. Kubala

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The first twelve reports on the assessment of British sand and gravel resources appeared in the Report Series of the Institute of Geological Sciences as a subseries. Report No. 13 onwards are appearing in the Mineral Assessment Report Series of the Institute. Details of published reports 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, Keyworth, Nottingham, NG12 5GG.

*The asterisk on the front cover indicates that parts of sheets adjacent to those quoted are described in this report.

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.

This report describes the resources of sand and gravel of 286 km^2 of the Blackwater Valley (Aldershot) area shown on the accompanying 1:25 000 resource sheet. The survey was conducted by M.R. Clarke and D.J. Havard in 1974 to 1975. The work is based on geological surveys at the 1:10 560 scale, carried out principally by H. Dewey and C.E.N. Bromehead (one-inch sheet 269) in 1910 to 1911 and by H.G. Dines and F.H. Edmunds (one-inch sheet 285) in 1924 to 1926. Minor amendments and additions to terrace boundaries have been made, based upon additional surveys in 1971 by B.C. Worssam and in 1976 by M.R. Clarke and A.J. Dixon.

P.J. Moore and J.A. Bain have been responsible for the analysis of bedrock sands and a pipe clay, by staff in the Institute's Analytical and Ceramics Unit and Mineralogy Unit respectively. The results of this work are given in Appendices H and J.

Officers of the Property Services Agency under the supervision of the Defence Land Agent, Aldershot, have been responsible for negotiating access to land for drilling. The ready co-operation of landowners, tenants and gravel operators in this work, and the assistance of officials of the Berkshire County Council, Hampshire County Council and Surrey County Council are gratefully acknowledged.

Austin W. Woodland
Director

Institute of Geological Sciences
Exhibition Road
South Kensington
London SW7 2DE

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Plate 1 Caesar's Camp Gravel near Beacon Hill, Hants [823 494]
This pit section shows the general nature of the Caesar's Camp Gravel, which consists mainly of large nodule (and partly worn) flint cobbles, set in a fine to coarse quartz sand matrix. Occasional laminated and cross-bedded sand lenses are found within the gravels, in places occurring as channel-fill material (as seen in the lower part of this section) and suggesting a fluvial origin, at least in part, for these deposits.

The pale strongly leached A_2 horizon and associated dark carbon/iron illuviated B_1 zone, are conspicuous in the sandy layer overlying the main gravel deposits.

Plate 2 River Terrace Deposits, near Farnborough, Hants [875 550]
Recent workings in the floodplain of the River Blackwater have exposed this pit section in the River Terrace Deposits (2nd Terrace). The sands and gravels which are approximately 4.0 m thick, show fairly uniform distribution overlying the almost level bedrock surface (Blackwater Beds). Overburden, approximately 1.5 m thick, comprising alluvial silts and clays has been partially removed from the mineral, and forms the 'bench' seen in the background of the photograph. Large, broken blocks of sarsen can be seen scattered upon the bedrock surface.

The sand and gravel resources of the Blackwater Valley (Aldershot) area

Description of 1:25 000 sheets SU 85, 86 and parts of SU 84, 94, 95 and 96

M. R CLARKE, A. J. DIXON and M. KUBALA

SUMMARY

The geological maps of the Institute of Geological Sciences, pre-existing borehole information and 90 boreholes specially drilled for the Industrial Minerals Assessment Unit form the basis of the assessment of sand and gravel resources in the Blackwater Valley area.

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

The 1:25 000 map is divided into four resource blocks containing from 5.7 to 16.8 km^2 of sand and gravel and the geology of the deposits in each block is described. For all four blocks, a statistical assessment of the sand and gravel resources is made and the mineral-bearing areas, the mean thickness of overburden and mineral and the mean grading are given.

The position of boreholes and exposures and data recorded from them, the geology, and the outlines of the blocks are shown on the accompanying composite resource sheet covering sheets SU 85, 86 and parts of SU 84, 94, 95 and 96.

Note

National Grid references in this publication all lie within the 100-km grid square SU.

Bibliographic reference

CLARKE, M.R., DIXON, A.J. and KUBALA, M. 1979. The sand and gravel resources of the Blackwater Valley (Aldershot) area. Description of 1:25 000 sheets SU 85, 86 and parts of SU 84, 94, 95 and 96. Miner. Assess. Rep. Inst. Geol. Sci., No. 39.

Authors

M. R. CLARKE, BSc, A. J. DIXON, BA,
M. KUBALA, BSc
Institute of Geological Sciences, Keyworth
Nottingham NG12 5GG

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, both the economic and the social factors used to decide whether a deposit may be workable in the future cannot 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; 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 geological evidence. The sites available for inspection, measurement, and sampling, are too widely 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 one metre 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 the No. 240 mesh BS sieve, about 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.

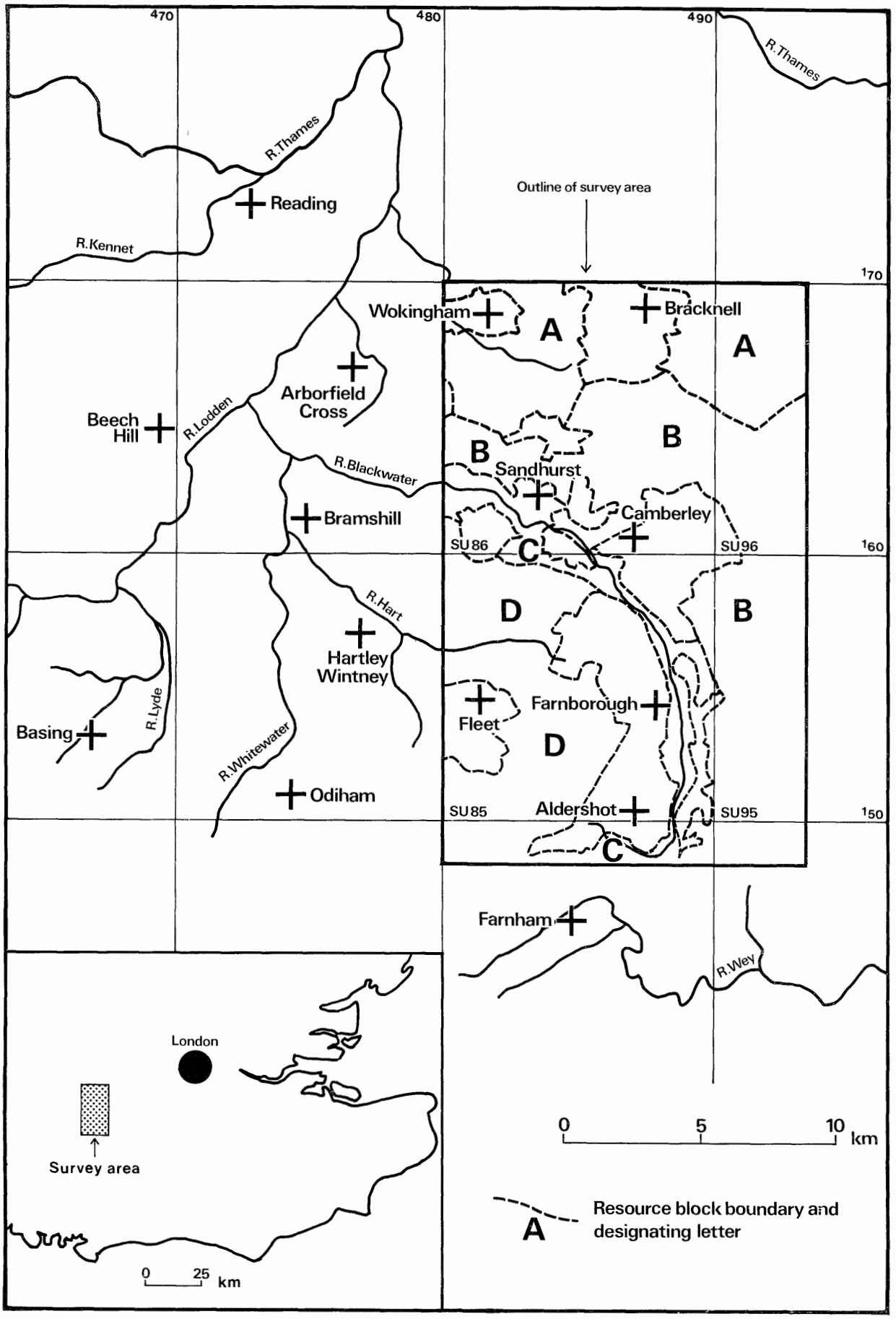


Fig. 1 Location sketch-map for the Blackwater Valley area, showing the resource block boundaries

A deposit of sand and gravel which 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.

For the particular needs of assessing sand and gravel resources, a grain-size classification based on the geometric scale 1/16 mm, 1/4 mm, 1 mm, 4 mm, 16 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 1/16 mm and 4 mm respectively (see Appendix C).

The volume and other characteristics are assessed within resource blocks, each of which, ideally, contains approximately 10 km^2 of sand and gravel. No account is taken of any factors, for example, roads, villages and 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 the mineral in parts of a block, except in the immediate vicinity of the sample points.

DESCRIPTION OF THE RESOURCE SHEET

GENERAL

This report gives an assessment of the sand and gravel resources of 286 km^2 of country between the towns of Wokingham and Bracknell in the north and Aldershot in the south (Fig. 1).

The survey area includes parts of the counties of Berkshire, Hampshire and Surrey, which were traditionally characterised by large areas of woodland and open heath, with some agricultural land. In recent years, however, rapid expansion and development of local towns has occurred, so that 81.4 km^2 (28 per cent) of the area is now built-up.

The mineral-bearing ground covers 43.8 km^2 (15 per cent) of the total survey area, of which the low-lying River Terrace Deposits (in block C) of the River Blackwater make up 11.2 km^2 and the higher level River Terrace Deposits (formerly called Plateau Gravels), ranging in height from approximately 84 to 129 m above Ordnance Datum, make up 22. 6 km^2. The scattered patches of sand and gravel in block A, the Downwash Gravel and the Caesar's Camp Gravel form the remaining 10 km^2.

Bulk samples of the bedrock sands (Bagshot Beds, Bracklesham Beds and Barton Beds) from assessment boreholes, have been analysed for particle-size distribution and the results included in this report. No assessment of the resources of the bedrock sands has been made, although an indication of their quality and extent is given.

This report, together with that on the adjoining Loddon Valley area (Clarke, Raynor and Sobey, 1979), deal with the sand and gravel resources within the Loddon and Blackwater drainage system, which lies in the south-western part of the London Basin.

TOPOGRAPHY

Within the survey area, four main topographic features (Fig. 2) can be identified; the Caesar's Camp plateau, the Easthampstead Ridges - Chobham Ridges - Fox Hills plateau, the Yateley Common plateau and the Blackwater Valley itself.

Caesar's Camp forms a well-defined plateau, which lies generally between 152 and 183 m above Ordnance Datum, to the south-west of Aldershot. It has a very irregular outline with remnants of formerly extensive sand and gravel deposits, which cap and protect the softer bedrock sands and clays.

The Chobham Ridges form a flat-topped feature rising to over 120 m above Ordnance Datum, extending for 9 km northwards from the Ash Vale area to Camberley, where they trend to the north-north-west and continue for a further 5 km as the Easthampstead Ridges. Throughout its length, the highest points of the feature carry spreads of high-level River Terrace Deposits. Where these have been washed away by streams, deep gullies have been cut in the underlying bedrock sands and clays, resulting in a highly irregular margin to the plateau.

At Yateley Common a protective cover of gravelly deposits again gives rise to an extensive well-marked plateau, at a height of about 91 m above Ordnance Datum. This feature continues westwards into the adjoining Loddon Valley survey area.

The River Blackwater, which occupies a pronounced valley, in places over $1\frac{1}{2}$ km wide, crosses the area from Badshot Lea (866 487) in the south, to Camberley in the north, where it turns to the west to pass through Sandhurst (840 610). The well developed flood-plain, falling from 75 to 50 m above Ordnance Datum, is flanked mainly on it's eastern side by extensive spreads of River Terrace Deposits (principally Third Terrace).

GEOLOGY

The geological succession of mapped deposits within the survey area is shown in Table 1.

Structurally the area lies within the south-western part of the London Basin; the Paleogene bedrock strata, which lie mainly on the southern limb of the main east-west syncline, have gentle dips to the north and north-east and crop out over large areas. Minor flexuring, associated with the main synclinal axis, gives rise to local variations in dip. In the extreme south, the dip increases rapidly and becomes nearly vertical along the line of the Hog's Back monoclinal fold, where Cretaceous rocks are exposed.

The Paleogene formations were laid down

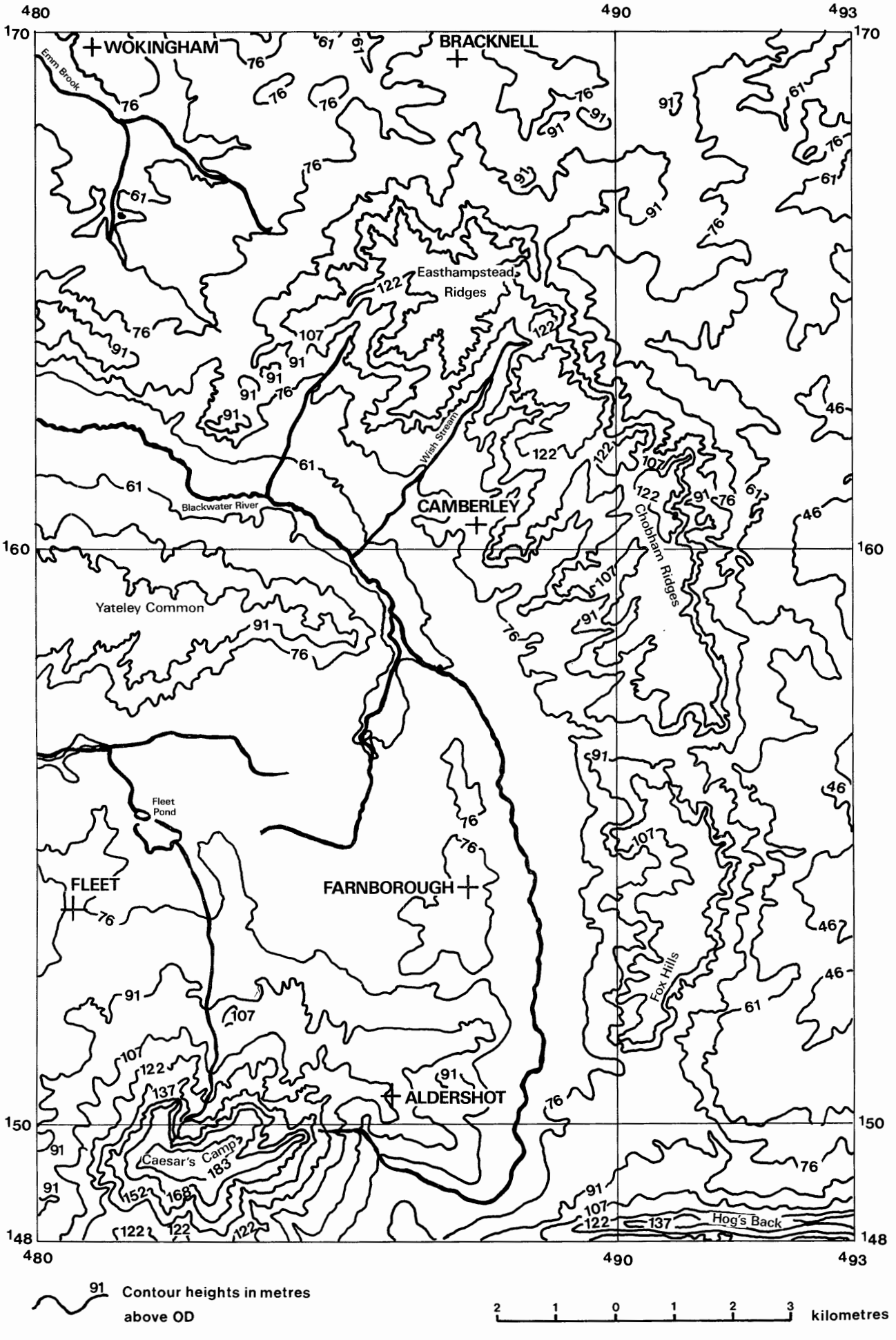


Fig. 2 Topography of the area of the resource sheet

Table 1. Geological classification of deposits within the Blackwater Valley area

DRIFT	
Recent and Pleistocene	
Peat	Dark brown partially decomposed organic matter found at various levels in the Drift deposits
Alluvium	Silty clay and loam of fluvial origin with organic material and scattered flint pebbles
Downwash Gravel	Thin, patchy sand and gravel of variable composition, derived by solifluxion from adjacent Solid and Drift deposits
River Terrace Deposits	Fluviatile sand and gravel, mainly of flint with minor amounts of sandstone and vein-quartz
Unknown Age	
River Terrace Deposits Undifferentiated	Thin, patchy sand and gravel of limited extent and of uncertain origin
Caesar's Camp Gravel	High-level sand and gravel with nodular flint cobbles
SOLID	
Paleogene	
Barton Beds	Yellow and pale grey silty, fine quartz sands
Bracklesham Beds	Yellow and, where glauconitic , greenish yellow, fine with some medium quartz sands
Bagshot Beds	Orange, yellow and pale grey, fine and medium quartz sands
London Clay	Firm bluish grey clay, silty in parts and with bluish grey sands near the top
Reading Beds	Mottled red and green sands and clays
Upper Cretaceous	
Upper Chalk	Soft white limestone with nodular flints
Middle Chalk	Soft white limestone with scattered flints, hard nodular limestone (Melbourn Rock) at base
Lower Chalk	Grey and white limestone, marly in lower part
Upper Greensand	Pale grey sands and loosely cemented sandstone beds
Gault	Firm bluish grey and grey clays

within the London Basin, which was similar in area to that of the present-day outcrop of the Tertiary strata. Thinning and change of facies takes place towards the edges of the basin, with the result that within the survey area both the Thanet Sands and Claygate Beds, found further to the east, are absent.

The lithostratigraphic classification of the Eocene sands as originally mapped, has been retained for the purposes of this survey despite faunal evidence (Curry, 1965) to suggest that their threefold subdivision into Bagshot Beds, Bracklesham Beds and Barton Beds may be biostratigraphically incorrect.

Drift deposits, comprising mainly the terrace sands and gravels of the River Blackwater, cap and protect the higher outliers of sandy bedrock and give rise to the extensive plateau-like features.

A brief account of the nature of each deposit is given below, more detailed descriptions are given in the Geological Survey sheet memoirs (see References p. 136).

SOLID

Gault

The Gault occupies a narrow outcrop along the southern edge of the Hog's Back and consists of bluish grey clay, which ranges in thickness from 12 to 27 m (see Appendix K for conversions from metres to feet).

Upper Greensand

The Upper Greensand which overlies the Gault, comprises grey sands and sandstone ranging in thickness from 12 to 24 m.

Lower, Middle and Upper Chalk

The chalk strata are exposed in the Hog's Back monocline. The Lower Chalk, about 37 m thick, comprises alternating beds of grey and white soft marls and harder marly limestone, with a sandy glauconite-rich bed (up to 1 m thick) known as the Glauconite Marl, at the base. The Middle Chalk, about 46 m thick, is a grey to greyish white, soft limestone, with a hard nodule bed (the Melbourn Rock) at its base. The Upper Chalk is about 152 m thick and forms the greater part of the Hog's Back crest and dip slope. It is principally composed of soft white limestone, with hard, nodular chalk at intervals and abundant bands of flint nodules. It was proved in only one borehole, SU 84 NE 35, where 1.2 m of soft white limestone lay beneath the River Terrace Deposits.

Reading Beds

Records show that these mottled, predominantly red and green sands and clays are up to 27 m thick and rest unconformably on the underlying Upper Chalk. They crop out on the north side of the Hog's Back, and were proved in boreholes 84 NE 38 and 84 NE 41 as greenish grey silty sand and mottled red and pale blue clay respectively.

London Clay

The typical stiff, bluish grey, silty clay of the London Clay was proved in the southern part of the survey area, in boreholes 85 SE 20, 84 NE 34, 84 NE 36 and also in borehole 84 NW 2, where 0.9 m of sandy orange and grey mottled (weathered) London Clay was proved. Borehole 85 SE 19, penetrated 3.5 m of orange-brown fine quartz sands (Bagshot Beds) and then passed into bluish grey, silty, fine and medium quartz sands, which are thought to represent the transition between the Bagshot Beds and the London Clay.

Bagshot Beds

The Bagshot Beds crop out principally in the south, from Crookham (800 520) to Normandy

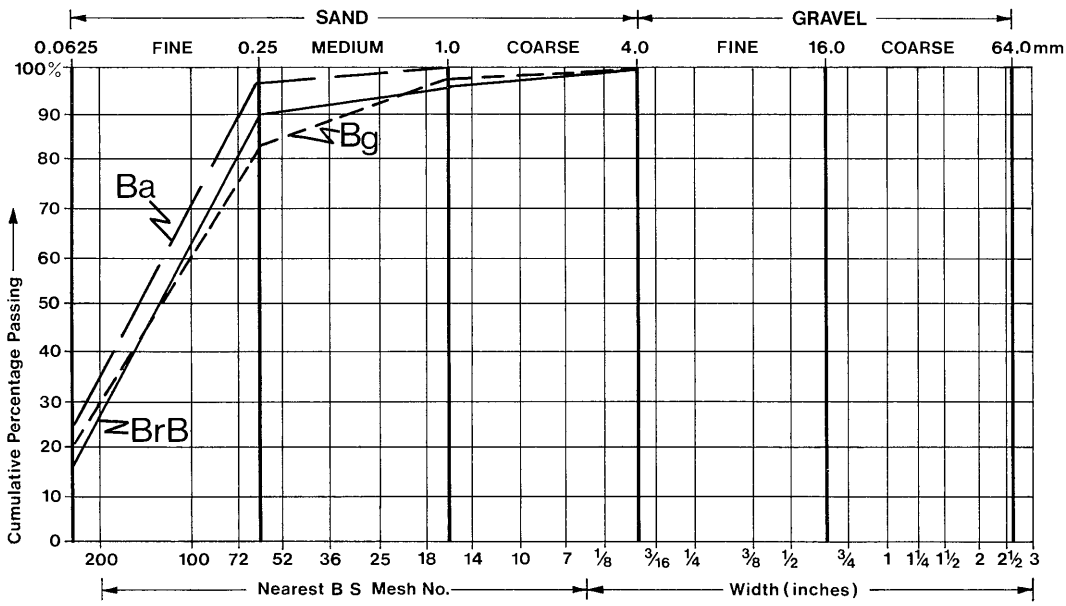


Fig. 3 Mean grading of bedrock sand formations based upon data from 75 boreholes. Bg means Bagshot Beds; BrB, Bracklesham Beds; and Ba, Barton Beds

(929 515) and in the north as a broad belt from Ascot (925 687) to south of Wokingham (800 670). They were proved, in twelve assessment boreholes, to be typically yellow, orange and pale grey, fine to medium quartz sands. Their thickness is variable but is about 27 m near the centre of the area decreasing to approximately 18 m in the south at Ewshott (820 500).

Bracklesham Beds

The Bracklesham Beds were originally thought to be represented by upper and lower clays separated by glauconitic sands, but it is now recognised that the sequence is more complex than this (Fig. 4). Characteristically, the Bracklesham Beds were recognised in assessment boreholes as yellowish green glauconitic quartz sands (for example, in borehole 85 NE 99). However, in the south, at Caesar's Camp, they are of more variable colour and include thin, pale grey, pipe-clay seams and occasional pebble beds consisting of well-rounded flint pebbles, as seen in borehole 84 NW 4. Silty grey clay was proved within these sands at various levels, for example in boreholes 86 SW 9 and 84 NW 3. In the north-west, at Earleywood (920 660), bright green sands and interbedded, stiff, dark brown clays were proved in borehole 96 NW 3.

Because of facies variations, it is difficult to assess accurately the thickness of these beds, but they are approximately 21 m thick. An apparently continuous pipe-clay horizon was proved in boreholes 84 NW 1 (8232 4952) and 84 NW 5 (8313 4935) at a height of approximately 180 m above Ordnance Datum in both boreholes. The results of laboratory tests, and a report on the potential commercial value of the clay are given in Appendix H.

Barton Beds

The outcrop of these mainly orange-brown and grey, fine and medium quartz sands is concealed by a cover of high-level River Terrace Deposits. They contain a higher proportion of fines than the other Eocene sands (Fig. 3) and are generally characterised by their uniformity of colour and texture as seen, for example, in boreholes 96 NW 1, 95 NW 7 and 85 NE 101. The maximum recorded thickness of these beds, proved in the well at Bagshot Orphanage, is 70 m (Dewey and Bromehead, 1915).

DRIFT

Caesar's Camp Gravel

These deposits form a small, but distinct plateau, at 152-183 m above Ordnance Datum to the south-west of Aldershot. Although they have been the subject of previous research (Bury, 1922), their origin and age are still in some doubt. The deposit is composed mainly of flint gravel, which is notable for its large proportion of cobble-size flints, but also contains traces of sandstone and quartz pebbles (Table 4 and p. 16) in a matrix of quartz sand. The five assessment boreholes drilled in these deposits proved the variations of the base level of the deposits (Fig. 4) and of the thickness of the sand and gravel. At one exposure (823 494) sedimentary structures, including sand lenses, current bedding and clayey channel-fill deposits, suggest a fluvial origin for some of these deposits. However, the presence of large and relatively unworn nodular flints indicates that some of the material has not travelled far. Examination of pit sections suggests that in places the deposits channel deeply into the underlying bedrock sands.

River Terrace Deposits

Previous work (Thomas, 1961) has shown that areas of mapped Plateau Gravel in the lower part of the Blackwater Valley may be reclassified as a series of river terraces. Using the large amount of new data available from the boreholes drilled in this and the adjacent (Loddon) survey area, a detailed investigation of these deposits has been made. Projected profile studies of the Drift deposits and geomorphological mapping have confirmed that the areas of Plateau Gravel as shown on the one-inch Geological Survey sheets of 1920 and 1928 should be reclassified as River Terrace Deposits of the River Blackwater and numbered sequentially with the lower terraces. Simplified diagrams showing the results of this work are shown in Figs. 5 and 6.

The River Terrace Deposits proved throughout the survey area form extensive spreads of sand and gravel composed principally of flint gravels, with minor amounts of sandstone and quartz, and quartz-rich sand (see Table 4). There is no significant difference between the composition of any of the River Terrace Deposits, despite the large variation in height between them.

In borehole 84 NE 35, the lower part of the gravels contains chalk pebbles, which is a reflection of the local bedrock at that site.

The similarity in mean grading of each terrace (Table 3) supports the argument for a similar mode of origin for all of these high-level sand and gravel deposits.

The grading characteristics of the Drift deposits proved in 87 assessment boreholes, are shown in Fig. 7, and the mean grading of each terrace given in Table 3. The floodplain gravel, (mainly 2nd terrace) contains the largest amount of gravel (52 per cent), whilst the lowest gravel content is seen in the 4th and 11th terraces. The mean grain-size distribution of the River Terrace Deposits ranges between the limits of the 2nd and 11th terraces as demonstrated in Fig. 9.

For some small isolated patches of gravelly terrace deposits (for example near Whitmoor Bog [893 680]) profile studies do not help with their classification and such deposits are shown as River Terrace Deposits (Undifferentiated).

Downwash Gravel

Thin and irregularly distributed patches of clayey and sandy gravels thought to have been formed by solifluxion are mapped as Downwash Gravel throughout the area. They may also be described as Head or Head Gravel.

These deposits characteristically have a high surface gradient (in contrast to the almost flat surfaces of the River Terrace Deposits) degrading away from the source area. This is particularly

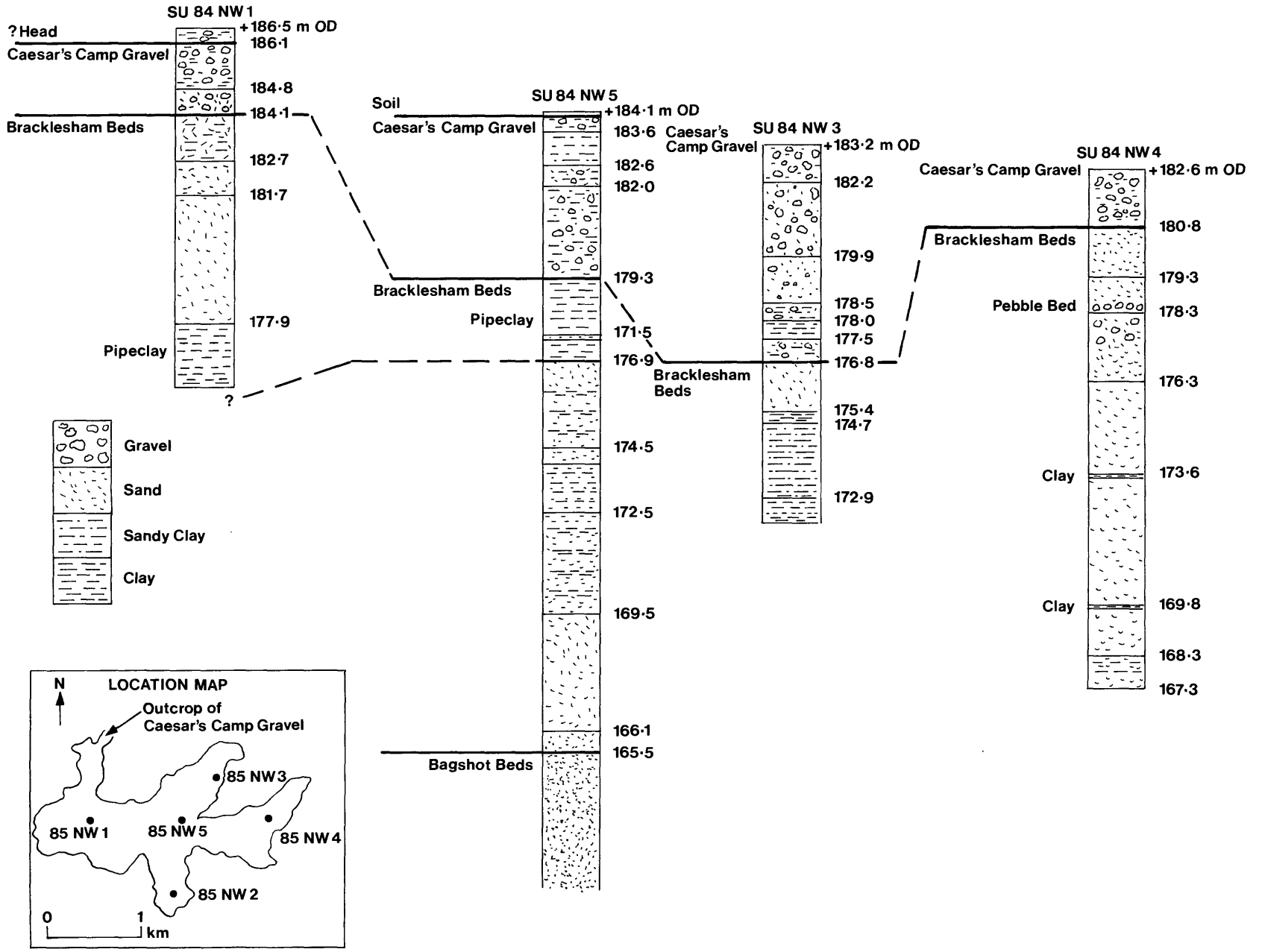


Fig. 4 Cross-section of Caesar's Camp

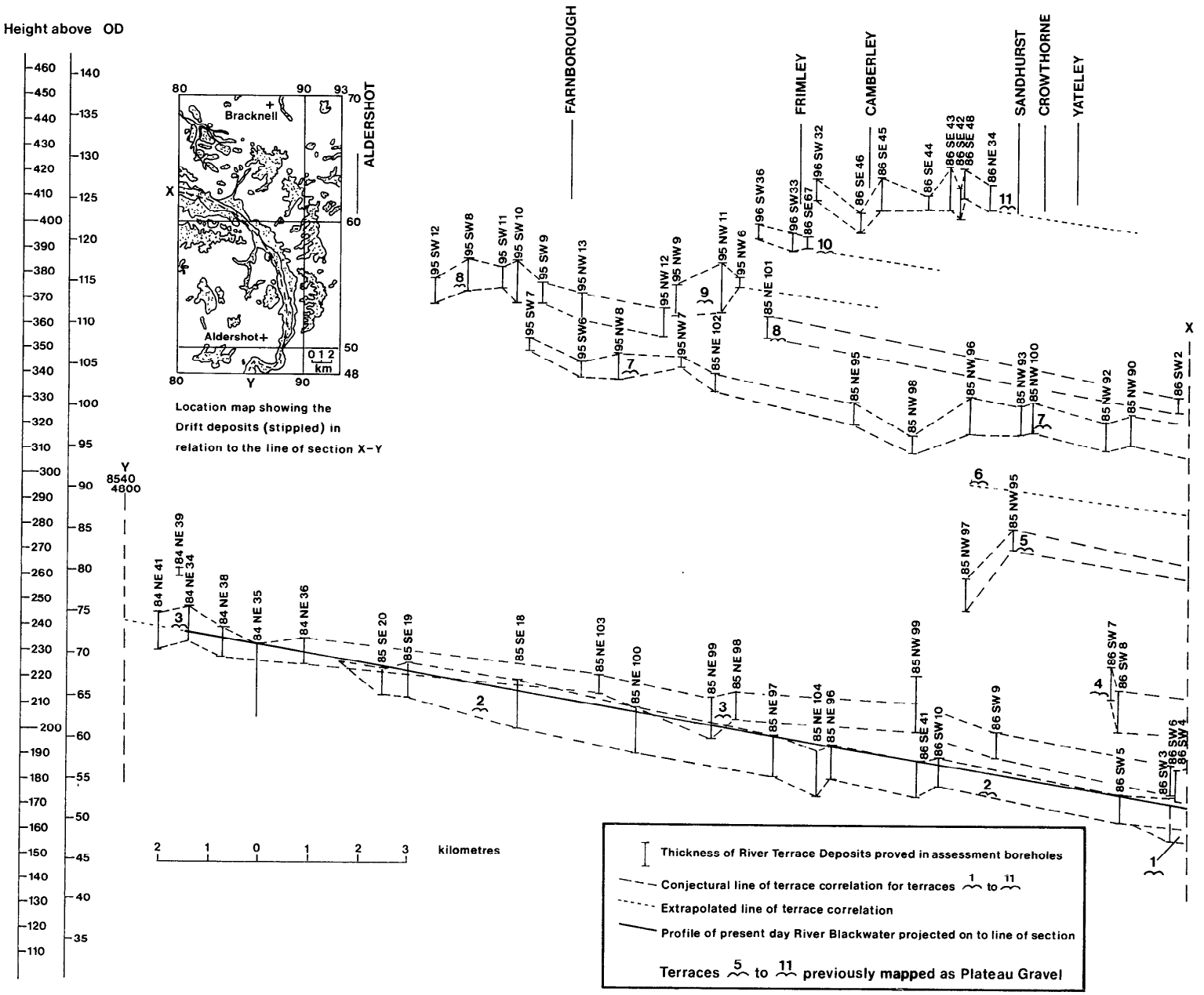


Fig. 5 Profile of the River Blackwater and its terraces

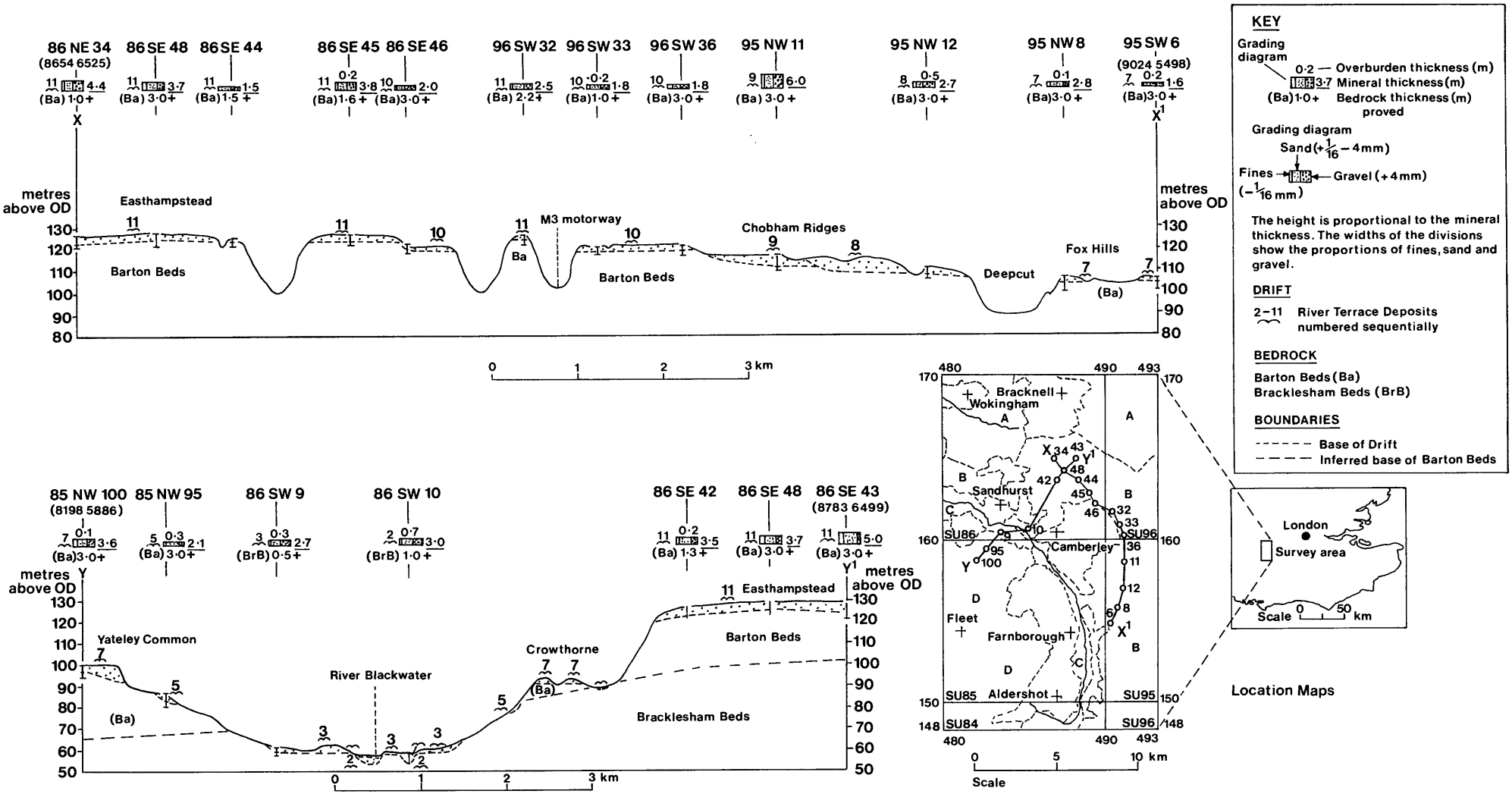


Fig. 6 Cross-sections of the terraces of the River Blackwater

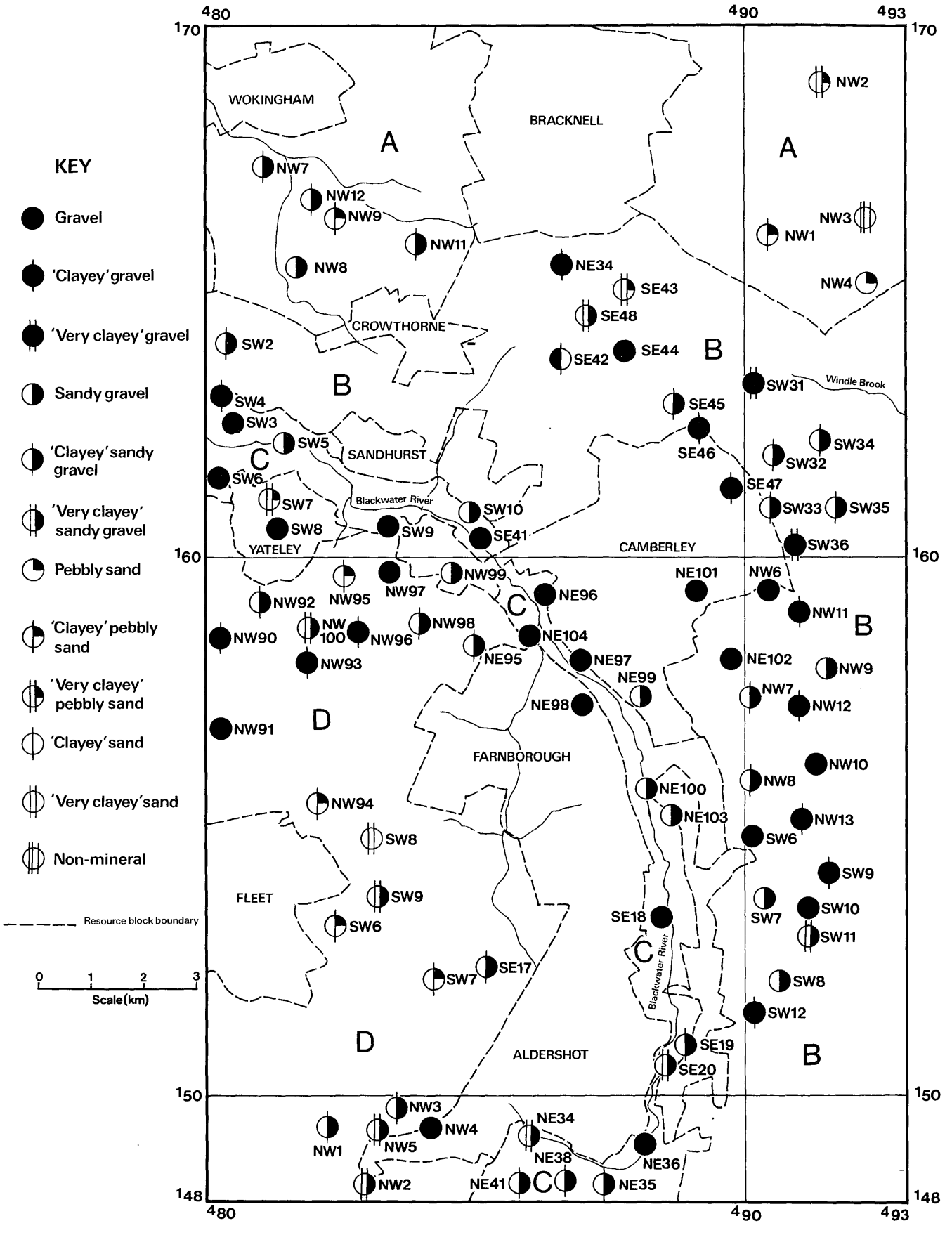


Fig. 7 Mean grading of the Drift deposits based on data at 87 boreholes

well demonstrated by the patch of Downwash Gravel to the east of the Chobham Ridges at Hangmoor (918 610).

The Downwash Gravel in the areas to the east of Fleet (815 545) is thought to have been derived from the Caesar's Camp Gravel to the south, and contains a characteristically small amount of sandstone pebbles (Table 4). In contrast, the soliflucted deposits to the east of Chobham Ridges contain a larger and significant amount (about 8 per cent) of sandstone pebbles, reflecting the composition of the nearby River Terrace Deposits from which they are derived.

Although the Downwash Gravel may not provide a major source of aggregate, a separate assessment of the deposits near Fleet has been made. (See notes on resource block D and Table 6.)

The Downwash Gravel near Chobham Ridges has been assessed together with the main spreads of River Terrace Deposits in block B.

Alluvium

Alluvium consisting of pebbly silty sands and clays and organic material, is found over the present-day flood plain of the River Blackwater; it is generally less than one metre thick, and covers mineral deposits (Terraces 1 and 2) with a mean thickness of 3.6 m (see p. 23).

Thin, clayey alluvium is also found in most of the smaller tributary valleys, where hand augering has proved that the underlying sand and gravel is locally thin or absent, for example in Windle Brook (925 632).

In places, assessment boreholes show the alluvium to be sandy, for example near Farnborough, in boreholes 85 SE 18 and 85 NE 100.

Little or no alluvium overlies the higher terrace deposits, which reflects either non-deposition, or removal of the finer material.

Peat

Deposits of peat are found locally in many of the small tributary streams and within the alluvium of the River Blackwater. Hand augering of the alluvium at Ravenswood (825 650) showed it to overlie a thin peat bed which has been dated (by carbon isotope analysis) at approximately 8-9000 years BP. This age is similar to that obtained for a peat bed at 2.25 to 2.50 m depth in borehole 85 SE 18 and dated at 7891 years BP.

The extensive peat deposits, which fill a depression near Windle Brook, have been proved, by hand augering, to be greater than 4 m thick, and near to the present-day stream they overlie thin 'clayey' sand and gravel. Thin peat beds have been penetrated in some of the assessment boreholes sited on the higher terrace deposits, notably in boreholes 95 SW 7, 95 SW 9 and 95 SW 10, near Romping Downs (910 536).

COMPOSITION OF THE SAND AND GRAVEL

The major resources of sand and gravel are in the extensive River Terrace Deposits which form three main spreads; the Yateley Common plateau, the Easthampstead Ridges - Chobham Ridges - Fox Hills plateau, and the floodplain terraces of the Blackwater Valley.

Smaller spreads of sand and gravel such as the Caesar's Camp Gravel and Downwash Gravel also contain more limited resources of aggregate.

The grading characteristics of the Drift deposits as proved in boreholes are shown in Fig. 7 and the mean composition based upon pebble-count studies of samples from boreholes sited in each of the main deposits is shown in Table 4.

Over much of the survey area, the Eocene bedrock sands have been investigated to a shallow depth (about 3 m) and bulk samples of these sands have been sieved in order to provide an indication of the mean grading of the deposits as a whole. The grading characteristics of the bedrock sands proved in assessment boreholes are shown in Fig. 8 and the mean grading of each formation is shown in Fig. 3.

Laboratory tests were carried out on +10-14 mm material from 10 boreholes to determine the 10 per cent fines and oven-dried specific gravity values; the results are shown in Table 5.

Bagshot Beds

The Bagshot Beds were proved in 12 IMAU boreholes to be generally yellow and brown, 'clayey' to 'very clayey', fine and medium quartz sands.

The mean grading is fines 20 per cent, fine sand 63 per cent, medium sand 16 per cent and coarse sand 1 per cent. Locally, the proportion of medium sand in some horizons increases, for example, in boreholes 86 NW 8 (8175 6552) and 86 NW 10 (8218 6501).

Bracklesham Beds

The sandy strata in the Bracklesham Beds form extensive areas of bedrock and have been proved in 24 IMAU boreholes. They comprise mainly 'clayey' to 'very clayey', yellow quartz sands, with some glauconite, which gives a greenish appearance to the sands and distinguishes them from the underlying Bagshot Beds. Their mean grading is fines 18 per cent, fine sand 73 per cent, medium sand 8 per cent and coarse sand 1 per cent (Fig. 3 and Table 2).

Well-sorted gravelly beds up to 5 m in thickness and comprising well-rounded flint pebbles and clean quartz sands crop out on the side of Hungry Hill (845 499); a sample of this gravelly material gave the following grading results: fines 1 per cent, sand 36 per cent, gravel 63 per cent. A similar but much thinner pebble bed was proved nearby, in borehole 84 NW 4 (8417 4960) (Fig. 4).

A clean, free-running sand was proved in borehole 85 NE 97 (8695 5818), which may correlate with the clean sands proved in borehole 85 NE 100 (8813 5578) at a similar level (56 to 58 m above Ordnance Datum).

Although in places part of the sequence may approximate to a Zone 4 sand (British Standard 882, 1965), in general the Bracklesham Beds have a high percentage of silt.

Barton Beds

The Barton Beds proved on the higher ground in

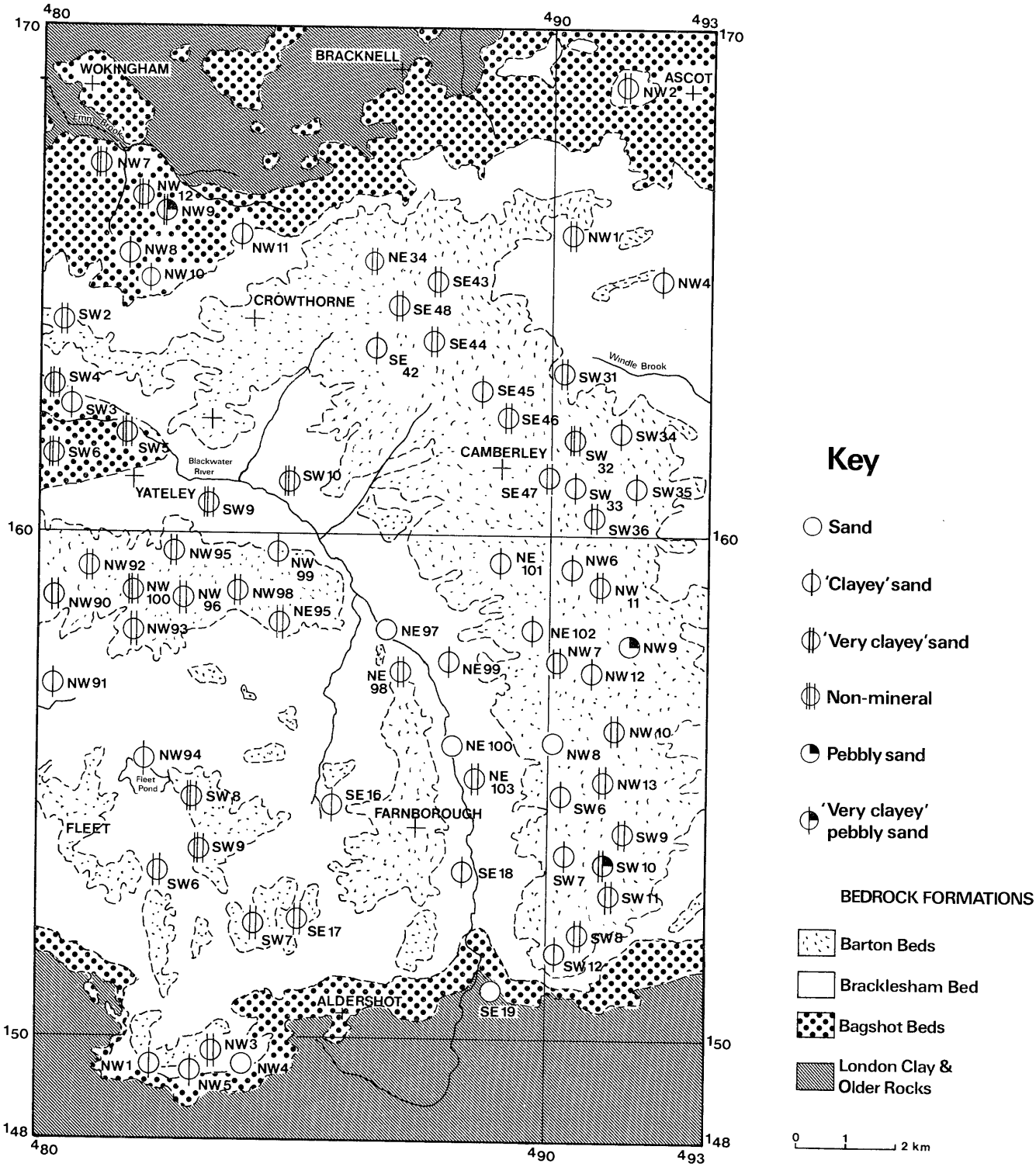
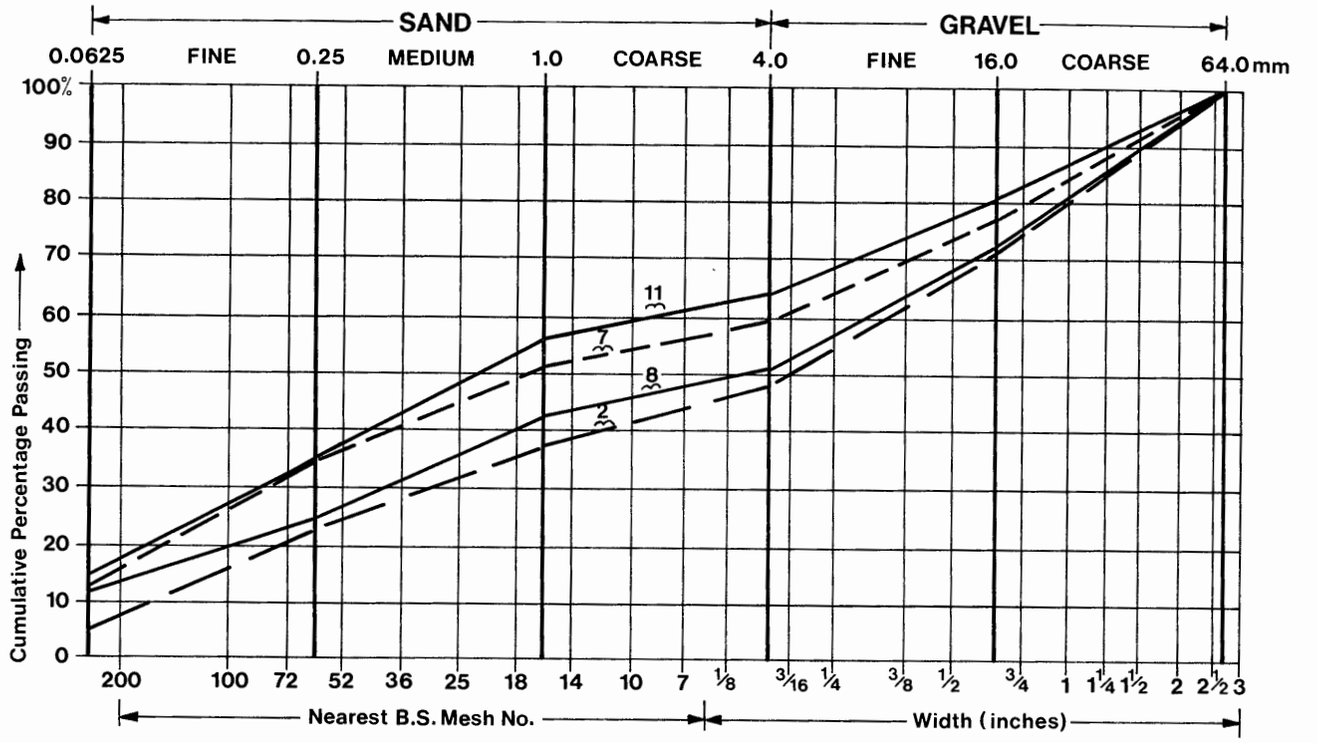


Fig. 8 Mean grading of the Bagshot Beds, Bracklesham Beds and Barton Beds based on data at 75 boreholes



~ River Terrace Deposits (2nd, 7th, 8th and 11th terraces)

D_F Downwash Gravel, near Fleet

D_C Downwash Gravel, of Chobham Ridges

Ç Caesar's Camp Gravel

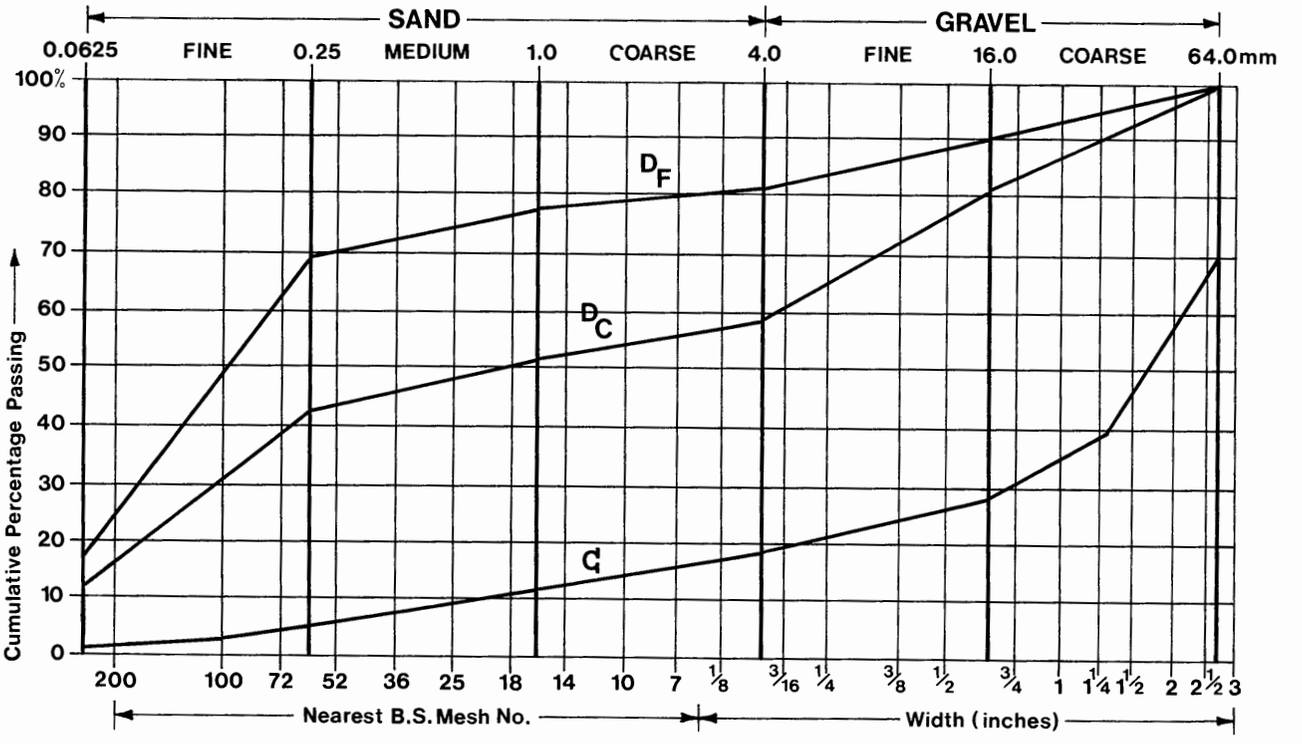


Fig. 9 Mean gradings of the gravel-bearing Drift deposits

Table 2. Mean grading of the deposits in the Blackwater Valley area

Symbols	Deposit	Mean grading percentages					
		-1/16 mm	+1/16-¼ mm	+¼-1 mm	+1-4 mm	+4-16 mm	+16-64 mm
C	Caesar's Camp Gravel	15	18	21	9	12	25
$D_{(F)}$	Downwash Gravel (near Fleet)	18	55	7	4	8	8
7-11	River Terrace Deposits (Chobham Ridges)	13	20	17	8	20	22
D_C	Downwash Gravel (East of Chobham Ridges)	12	31	10	7	20	20
7	River Terrace Deposits (Yateley Common)	12	20	20	8	19	21
1-5	River Terrace Deposits (Blackwater Valley) (assessed in Resource Block C)	8	18	17	10	23	24
Ba	Barton Beds	25	73	2	-	-	-
BrB	Bracklesham Beds	18	73	8	1	-	-
Bg	Bagshot Beds	20	63	16	1	-	-

Table 3. Mean grading of the River Terrace Deposits in the Blackwater Valley area

River Terrace	No. of sample points	Mean thickness	Mean grading percentages					
			-1/16 mm	+1/16-¼ mm	+¼-1 mm	+1-4 mm	+4-16 mm	+16 mm
2	10	4.3	6	15	16	11	24	28
3	11	3.5	10	17	21	9	23	20
4	2	4.4	15	26	17	7	16	19
5	2	3.0	7	20	23	9	17	24
6	no data available							
7	12	2.6	12	20	20	8	19	21
8	9	2.9	12	14	17	9	22	26
9	3	3.5	10	22	18	8	21	21
10	3	1.6	16	12	18	8	20	26
11	8	3.3	15	20	22	8	16	19

the area, in 46 IMAU boreholes, are very uniform in nature and comprise pale yellow to yellowish-brown, 'clayey' to 'very clayey' fine quartz sand with a mean grading of fines 25 per cent, fine sand 73 per cent and medium sand 2 per cent.

The mean gradings for the Eocene strata show a general fining upwards in the succession (Fig. 3) but a logarithmic plot of the ratios of the various fine sand-size fractions for each sample showed only partial resolution of the deposits into distinct fields.

Caesar's Camp Gravel

The Caesar's Camp Gravel is characterised by a large amount of cobble-size (+64 mm) flint which may make up as much as 30 per cent of the deposit (see below). Because the nodules of flint are broken during drilling, the cobble fractions are not properly represented by the weighted borehole mean grading figures of fines 15 per cent, sand 48 per cent and gravel 37 per cent. The results of sieve analysis carried out on large bulk samples collected from pit sections in the Caesar's Camp Gravel are shown in Fig. 9.

The gravel fraction comprises angular to sub-angular, with some well rounded, flint and traces of sandstone and vein-quartz. It is distinct from other gravels in the area because of its small sandstone content (Table 4) and the low percentage of fine gravel (Fig. 9).

The sand fraction, typically yellowish brown quartz, is composed of roughly equal amounts of fine and medium with some coarse grades; the mean grading is fine sand 18 per cent, medium sand 21 per cent and coarse sand 9 per cent (see notes on resource block D, p. 23).

River Terrace Deposits of Yateley Common and Chobham Ridges

The extensive spreads of sand and gravel (terraces 6 to 11 inclusive), which form the plateaux of Yateley Common and Easthampstead Ridges - Chobham Ridges - Fox Hills vary in their distribution and composition according to the topographic level. They have, however, been treated as two continuous spreads for the purpose of grading and compositional analyses, which are assessed in resource blocks D and B respectively.

The high-level deposits on the north and eastern sides of the Blackwater Valley extend from Easthampstead in the north to Surprise Hill (902 515) in the south, and lie between heights of approximately 90 to over 120 m above Ordnance Datum. They have a collective weighted mean grading of fines 13 per cent, sand 45 per cent and gravel 42 per cent. The gravel fraction consists of fine to coarse, angular to subrounded with some rounded, flint, with subangular to subrounded sandstone and with some rounded vein-quartz. The composition of the +4.75 to -16 mm fractions of samples taken from randomly selected boreholes is given in Table 4. The sand comprises mainly pale grey and yellow, fine and medium quartz and some coarse quartz and flint; the mean grading is fine sand 20 per cent, medium sand 17 per cent and coarse sand 8 per cent.

The deposits on Yateley Common form a conspicuous level feature at a height of between 90 m and 100 m above Ordnance Datum and have a mean grading of fines 12 per cent, sand 48 per cent and gravel 40 per cent. They lie at a similar height and appear to be very similar in composition to the western spurs of the deposits on Chobham Ridges, as seen at Frith Hill Road (897 582) (Fig. 6 and Table 4). The gravel fraction is made up of fine to coarse, angular to subrounded flint with some rounded flint and sandstone and traces of vein-quartz. The sands comprise mainly fine and medium quartz sand with some coarse quartz and flint sand (fine sand 20 per cent, medium sand 20 per cent, coarse sand 8 per cent).

Downwash Gravel

The Downwash Gravel near Fleet has a mean grading of fines 18 per cent, sand 66 per cent and gravel 16 per cent. The gravel comprises mainly fine to coarse angular to subrounded with some rounded flint, and traces of sandstone and vein-quartz. The sand fraction consists mainly of glauconitic fine quartz sand (fine sand 55 per cent, medium sand 7 per cent and coarse sand 4 per cent) probably derived from re-worked bedrock sand (Bracklesham Beds).

The small amount of sandstone (0.6 per cent) present in these deposits suggests that they might have been derived from the Caesar's Camp Gravel to the south (Table 4).

The Downwash Gravel of the Chobham Ridges area has a mean grading of fines 12 per cent, sand 48 per cent, gravel 40 per cent, and is distinctly more gravelly than that found near Fleet. Like the nearby high-level River Terrace Deposits (terraces 6 to 11) they are composed of fine to coarse subangular to subrounded with some rounded flint, and some sandstone and vein-quartz. As in the Downwash Gravel near Fleet the sand fraction shows a predominance of fine sand (fine sand 31 per cent, medium sand 10 per cent and coarse sand 7 per cent) which suggests partial incorporation of sand from the bedrock.

River Terrace Deposits of the Blackwater Valley

The lower lying River Terrace Deposits (terraces 1 to 5 inclusive) of the River Blackwater form the extensive spreads of sand and gravel assessed together in resource block C; they have a weighted mean grading of fines 8 per cent, sand 45 per cent and gravel 47 per cent.

The gravel consists of fine to coarse, mainly subangular with some subrounded to rounded flint, with sandstone and some vein-quartz. The sand fraction comprises equal amounts of fine and medium, with a subordinate amount of coarse quartz (fine sand 18 per cent, medium sand 17 per cent and coarse sand 10 per cent). Some glauconite and flint is present in the medium and coarse grades respectively.

There is a similarity in texture and composition between these lower-lying River Terrace Deposits and the high-level deposits of Yateley Common and Chobham Ridges (Fig. 7 and Table 4).

Analyses of the grading data from each terrace (Table 3) indicates that the percentage of gravel is greatest in terrace 2. Additionally, the gravel

Table 4. Mean composition of the +4.75 to -16 mm material, based on pebble count results of samples selected from IMAU boreholes

B.H. No.	Gravel thickness	% Flint	% Rounded flint	% Sandstone	% Quartz	% Chalk
River Terrace Deposits (Chobham Ridges - terraces 6 to 11)						
95 NW 11	6.0 m	86.9	2.9	8.9	1.5	0
95 NW 13	1.6	86.5	3.0	9.5	1.0	0
95 SW 8	3.3	90.0	5.0	4.0	1.0	0
96 SW 32	3.5	82.6	9.8	5.6	2.0	0
Mean values		86.5	5.1	7.0	1.5	0
River Terrace Deposits (Yateley Common)						
85 NW 92	1.1 m	90.0	5.0	4.0	1.0	0
85 NW 98	1.9	88.8	2.4	6.8	2.2	0
Mean values		89.1	3.4	5.7	1.8	0
Caesar's Camp Gravel						
84 NW 1	1.3 m	89.1	8.1	0.6	2.2	0
Downwash Gravel (near Fleet)						
85 SW 9	1.9 m	96.4	2.0	0.6	1.0	0
River Terrace Deposits (Blackwater Valley terraces 1 to 5)						
86 SE 41	3.7 m	87.7	8.7	7.3	1.9	0
85 NE 99	1.0	85.0	5.0	8.0	2.0	0
85 NE 100	3.2	83.2	3.5	10.9	2.4	0
84 NE 35	6.3	88.3	3.0	3.9	1.9	2.5
Mean values		86.8	4.7	6.7	2.0	1.1

No attempt has been made in this report to distinguish chert from flint; the 'sandstone' identified in borehole samples refers strictly to granular, grey to buff cherty sandstone thought to have been derived from the Hythe Beds of the Weald.

content in the flood plain gravels (terraces 2 and 3) increases downstream, at the expense of the fines (Fig. 7).

The percentage of sandstone in the flood-plain gravels also increases downstream, towards Camberley, where it reaches a maximum of 11 per cent by weight in borehole 85 NE 100 (8813 5578). Below Camberley, it decreases to an average of about 7 to 8 per cent by weight.

Ten per cent fines and specific gravity values

The results of 10 per cent fines and specific gravity tests carried out on the 10 to 14 mm size material from randomly selected bulk samples, are shown in Table 5. The compositional similarity of the deposits on Chobham Ridges, Yateley Common and in the Blackwater Valley (Table 4) is reflected in the consistency of the 10 per cent fines and specific gravity values.

THE MAP

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

Geological data

The geological boundary lines shown, are taken from the 1:10 560-scale maps surveyed by H. Dewey and C. E. N. Bromehead (Sheet 269) in 1910 to 1911, and by H. G. Dines and F. H. Edmunds (Sheet 285) in 1924 to 1926. The results of a survey at the 1:10 560 scale in the Badshot Lea area, by B. C. Worssam in 1971, have been incorporated in the map. Additionally, minor amendments to terrace boundaries have been made based upon a survey in 1976 by M. R. Clarke and A. J. Dixon. The new data available from assessment boreholes has enabled a re-classification of some of the Drift deposits (p. 7) to be made. The high-level gravels, formerly called Plateau Gravels have been assigned to the various terrace levels of the River Blackwater, and where possible the recognition of the numerous patches of Downwash Gravel has been confirmed.

Borehole data, which include the stratigraphic relationship and mean particle-size distribution of sand and gravel (including bedrock sand) samples collected during the assessment survey, are also shown.

The geological boundaries are regarded as the best interpretation of the information available at the time of survey. However, because of the difficulty of mapping Drift deposits where thick solifluxion material occurs, it is inevitable that local irregularities or discrepancies will be revealed by boreholes. These are taken into account in the assessment of resources (see below and Appendix B).

Mineral resource information

For assessment purposes, the map is divided into areas where mineral is present and areas where sand and gravel is either absent or not potentially workable (p. 1).

The mineral, which everywhere has a mean overburden of less than one metre, is classified as exposed, and is sub-divided into four resource blocks that contain spreads of continous sand and gravel.

The whole of the area of the exposed mineral, as measured from the mapped geological boundary lines, is assumed to contain sand and gravel, but it may include small areas where it is either absent or not potentially workable (for example, in borehole 96 NW 4).

RESULTS

A simple statistical procedure, explained in Appendix B, has been used to calculate the resources in the four resource blocks A, B, C and D; the results are shown in Table 6. The block boundaries have been drawn so that deposits of a similar nature are assessed together.

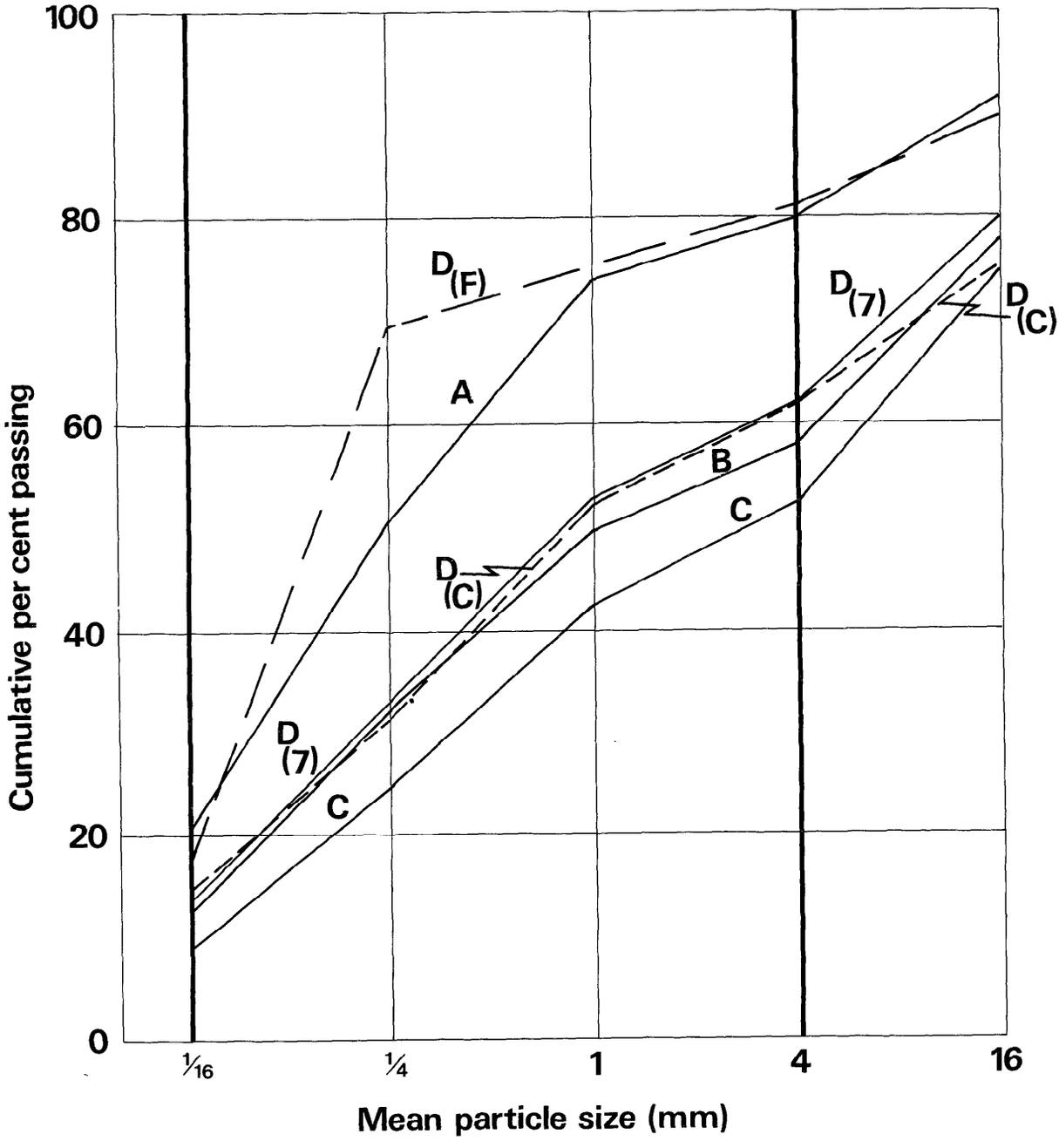
Bedrock sands have been proved by assessment boreholes, and details are given in the borehole logs (Appendix F). No attempt has been made to assess the resources present within these bedrock sands, but the borehole information is given as a guide to the variation in lithology.

Particle-size distributions for the assessed thicknesses of mineral in blocks A to D are shown in Fig. 10, which incorporates a separate curve for each of the three deposits in block D (that is the River Terrace Deposits of Yateley Common, Downwash Gravel near Fleet, and the Caesar's Camp Gravel).

Accuracy of results

For each of the four blocks, A, B, C and D, assessed statistically, the accuracy of the results at the symmetrical 95 per cent probability level (that is, it is probable that nineteen times out of twenty, the true volume of mineral present lies within the given limits) varies from 14 per cent to 40 per cent. However, the true values are more likely to be nearer the volume calculated than either of the limits. Moreover, it is probable that roughly 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 (as provided by say, ten boreholes) were used in the calculation. Thus, if closer limits are needed for the quotation of reserves of part of a block, it can be expected that data from more than ten sample points would be required, even if the area is quite small. This point can be illustrated by considering the whole of the statistically assessed sand and gravel on the resource sheet. The total volume (121 million m^3) can be estimated to limits of $\pm$ 10 per cent at the 95 per cent probability level by a calculation based on the data from the 87 sample points spread across the four resource blocks.

However, it must be emphasised that this quoted volume of mineral has no simple relationship with the amount that could be extracted in



A = Mean grading of deposits in block A
B = " " " " block B
C = " " " " block C
$D_{(F)}$ = Mean grading of Downwash Gravel in block D
$D_{(C)}$ = Mean grading of Caesar's Camp Gravel in block D
$D_{(7)}$ = Mean grading of River Terrace Deposits in block D

Fig. 10 Particle-size distribution for the assessed sand and gravel resources of the Blackwater Valley area

Table 5. Results of 10 per cent fines and specific gravity tests on +10 to -14 mm sized material selected from IMAU boreholes

Borehole No.	Sample No.	10 per cent Fines (tons)	Oven dry (105° C) specific gravity
River Terrace Deposits at Chobham Ridges			
SU 86 SW 2	L 783	-	2.421
			2.392
SU 86 NE 34	L 465	25.6	2.452
			2.456
SU 95 SW 12	L 945	27.2	2.450
			2.451
Mean values		26.4	2.437
River Terrace Deposits of Yateley Common			
SU 85 SW 90	L 318	-	2.391
SU 85 NW 93	L 332	-	2.346
SU 85 NW 96	L 345	26.3	2.461
			2.455
Mean values		26.3	2.413
River Terrace Deposits of the Blackwater Valley			
SU 86 SW 4	L 493	26.0	2.475
			2.471
SU 86 SW 9	L 379	26.0	2.436
			2.242
SU 85 NE 104	L 913	25.6	2.365
			2.357
Mean values		25.9	2.391
Downwash Gravel of Chobham Ridges			
SU 96 SW 35	L 457	27.1	2.392
			2.394
Mean values		27.1	2.393

Table 6. Statistical assessment of the sand and gravel resources of the Blackwater Valley area

Resource block	Area		Mean thickness		Volume of mineral	Limits at 95% confidence level		Mean grading percentages					
								Sand				Gravel	
	Block	Mineral	Overburden	Mineral	million								
	km^2	km^2	m	m	m^3	±%	±Volume million m^3	-1/16 mm	+1/16-¼ mm	+¼-1 mm	+1-4 mm	+4-16 mm	+16-64 mm
A (8)*	45.7	5.7	0.2	2.0	11.3	40	4.5	20	31	23	6	12	8
B (32)	86.0	16.8	0.1	2.7	45.1	16	7.2	13	20	17	8	20	22
C (27)	17.8	11.2	0.9	3.6	40.0	14	5.2	8	18	17	10	23	24
D (21)	55.1	10.1	0.2	2.4	24.2	24	5.8	13	24	19	8	16	20
A+B+C+D (87)	204.6	43.8	0.3	2.8	121.0	10	12.0	12	20	20	8	19	21
Statistical assessment of the sand and gravel resources of the River Terrace Deposits of the River Blackwater (Terraces 1 to 11)													
Terraces 1 to 11 (68)	-	33.8	0.4	3.1	104	10	10	11	18	18	9	21	23
Statistical assessment of the River Terrace Deposits and Downwash Gravel in block D													
River Terrace Deposits (9)	-	5.8	0.1	3.2	18.5	20	3.7	12	20	20	8	19	21
Downwash Gravel (8)	-	2.9	0.3	1.2	3.6	27	1.0	18	55	7	4	8	8

Inferred assessment of the sand and gravel resources of the Caesar's Camp Gravel in block D

Mineral Area km^2	Mean thickness		Volume of mineral	No. of sample points					
	Overburden m	Mineral m	million m^3						
1.5	0.0	2.8	4.2	(5)	15	18	21	9	12	25

*Bracketed figures show the total number of sample points used in the statistical assessment of resources (for explanation of term 'sample point', see footnote of Table 8)

practice, because, apart from the exclusion of the urban areas, no allowance has been made in the calculations for any restraints (such as existing buildings and roads) on the use of the land for mineral working.

NOTES ON RESOURCE BLOCKS

Block A

This block, which contains 5.7 km^2 of discontinuous spreads of mineral, is divided into two parts by the urban area of Bracknell. To the west of the town, thin spreads of terrace sand and gravel of variable composition have been dissected by Emm Brook and its tributaries, which flow north-westwards. Hand-augering and borehole 86 NW 10 show that the areas of alluvium in these small streams are not underlain by mineral, although thin patches of clayey gravel occur locally.

Small, isolated patches of River Terrace Deposits are mapped throughout the block, particularly to the east of Bracknell in the Earlywood area (915 670), where they appear to be generally too thin and clayey to be classified as mineral as shown by boreholes 96 NW 3 and 4. However, some of the larger patches are mineral-bearing (as proved, for example, by boreholes 96 NW 1 and 96 NW 2).

Although of various origins, all the deposits in this block have been assessed together; they have collective recorded overburden thicknesses ranging from nil in boreholes 96 NW 1, 96 NW 4 and 86 NW 8 to 0.7 m in borehole 86 NW 11 and recorded sand and gravel thicknesses ranging from 0.5 m in borehole 96 NW 4 to 4.2 m in borehole 86 NW 12. The mean thicknesses of overburden and mineral are 0.2 and 2.0 m respectively.

Generally, the deposits in this block are more clayey and sandy than the spreads of River Terrace Deposits in the other blocks (Fig. 7). Using data from 8 sample points (see footnote, Table 8) the volume of mineral is calculated at the 95 per cent confidence level to be 11.3 million m^3 $\pm$ 40 per cent.

The weighted mean grading for the deposits in this block is fines 20 per cent, sand 60 per cent and gravel 20 per cent.

Clean Bagshot Beds sands are currently being worked at Chavey Down (898 697) as a source of building sand. However, nearby, in borehole 96 NW 2, the Bagshot Beds were proved to be 'very clayey' sand.

Block B

This is the largest block in the area and contains 16.8 km^2 of mineral distributed as River Terrace Deposits (and associated Downwash Gravel) extending from Easthampstead (870 650) southwards through Camberley (900 620) to Fox Hills (913 527). The related deposits (Eighth Terrace) near Finchampstead Ridges (807 633) are also included in this block.

The terrace sand and gravel deposits range in height from 130 m above Ordnance Datum at Easthampstead to 90 m above Ordnance Datum near Mychett (890 555), and the Downwash Gravel descends from approximately 100 m to 60 m above Ordnance Datum near Pirbright Common (920 543). Areas of non-deposition between different terraces within the main spreads of gravels have not been identified, but may be hidden by soliflucted sands and gravels from the higher levels.

Overburden is generally thin or absent and comprises peaty sand ranging in recorded thickness from nil (for example in borehole 86 NE 34) to 0.5 m in borehole 96 SW 31; the mean is 0.1 m.

The exposed and continous spreads of sand and gravel, proved in all of the assessment boreholes in this block, show a range of thickness from 0.7 m in borehole 96 SW 31 to 6.0 m in borehole 95 NW 11, with a mean of 2.7 m. The variations of mineral thickness proved (for example in borehole 86 SE 44) appear to be related to the proximity of the assessment boreholes to the edges of the deposits, which are affected by marginal slumping and surface creep.

Thirty-two sample points enable the mineral volume of 45.1 million m^3 to be calculated to limits of $\pm$ 16 per cent at the 95 per cent confidence level. The deposits all show a similar range of composition and texture (Tables 2 and 4) and have a mean grading of fines 13 per cent, sand 45 per cent and gravel 42 per cent. Although the deposits in the block are not worked at present, a large area of old workings exists at Surprise Hill (904 517) and numerous small hand-worked areas are found scattered throughout the mineral area.

Borehole records from the site investigation reports for the M3 motorway suggest that there is a mineral deposit beneath the thick and extensive peat in the valley of the Windle Brook (925 632), but hand-augering and field inspection during the survey proved only generally thin and discontinuous clayey gravels close to the present-day stream.

Block C

This block includes 11.2 km^2 of continuous spreads of exposed mineral in the River Terrace Deposits of the lower terraces (terraces 1 to 5) of the River Blackwater. Large areas of the mineral are within the urban areas of Camberley, Mychett and Ash, and have not been assessed. Extensive areas of worked-out ground occur in the floodplain area, where two active workings exist (Appendix G).

The results of boreholes 84 NE 34, 38 and 41 show that the main course of the River Blackwater formerly occupied the floodplain area between Weybourne (853 480) and Badshot Lea (867 487) (p. 18), thus confirming the ancient link between the River Blackwater and the River Wey near Farnham, just beyond the limits of the survey area.

The continuous spreads of mainly clayey and silty floodplain alluvium are shown in some places to be more sandy, (for example, in boreholes 85 SE 18 and 85 NE 100), although generally they are classified as overburden (i.e. non-mineral), which ranges in recorded thickness from 0.1 m (as in borehole 85 SE 19) to 1.9 m proved in borehole 85 SE 18. It has a mean of 0.9 m.

The mineral, which is classified as exposed, is of very uniform texture and composition and ranges in recorded thickness from 1.8 m in borehole 84 NE 36 to an exceptional 8.0 m in borehole 84 NE 35, which, together with data from other boreholes, verified a channel-like feature cut into the chalk bedrock of the area. The mean mineral thickness for the block as a whole, is 3.6 m.

The total volume of mineral calculated at the 95 per cent confidence level using data from 27 sample points is 40.0 million $m^3 \pm 14$ per cent. The mean grading of these deposits is fines 8 per cent, sand 45 per cent and gravel 47 per cent.

Borehole 84 NE 39, proved an alluvium-like deposit of clayey silt with flint pebbles, which is non-mineral. It is thought to correlate with the fourth terrace at Badshot Lea (862 484).

Block D

Because of the differences in distribution, composition, texture and thickness, the 10.1 km^2 of mineral in the block has been assessed both as a whole, and as three distinct component deposits (see Table 6): the River Terrace Deposits of Yateley Common, the Downwash Gravel of the Fleet area, and the Caesar's Camp Gravel near Farnham.

River Terrace Deposits of Yateley Common

The Yateley Common plateau is formed of an extensive (5.8 km^2) and continuous spread of terrace sand and gravel (p. 16 and Fig. 5) on which overburden is generally thin or absent: for example, thicknesses range from nil in borehole 85 NW 90 to only 0.3 m in borehole 85 NW 95; the mean is 0.1 m. The sand and gravel has a generally uniform texture and composition and ranges in thickness from 2.1 m in borehole 85 NW 95 to 4.5 m in borehole 85 NW 96, with a mean of 3.2 m. Using data from 9 sample points the volume estimate at the 95 per cent confidence level is 18.5 million $m^3 \pm 20$ per cent. The mean grading of the deposit is fines 12 per cent, sand 48 per cent and gravel 40 per cent.

Downwash Gravel

These deposits extend over 2.9 km^2 and include all the thin and patchy spreads of soliflucted sandy gravel in the Fleet area: they are assessed together with the small area of River Terrace Deposits mapped at Litchett Plain (804 568). Overburden, comprising soil and silty, pebbly sand, ranges in recorded thickness from nil to 0.5 m and has a mean of 0.3 m. The sand and gravel deposits range in thickness from 0.6 m in borehole 85 NW 91 to 1.7 m in borehole 85 SW 6 and have a mean of 1.2 m.

In general the mineral is sandier than elsewhere in the sheet area (Fig. 7) and has a mean grading of fines 18 per cent, sand 66 per cent and gravel 16 per cent. The volume, calculated with data from 8 sample points, is 3.6 million $m^3 \pm 27$ per cent at the 95 per cent confidence level.

Data from site investigation boreholes for the M3 motorway suggest that other small and isolated patches of thin sandy gravels not shown on the resource sheet may be found overlying the bedrock sands within this block.

Caesar's Camp Gravel

The Caesar's Camp Gravel extends over only 1.5 km^2 and therefore an inferred assessment has been made based upon data from 5 sample points. The mineral forms a very irregular although apparently continuous spread, which shows wide variation in thickness (Fig. 4) ranging from 1.6 m in borehole 84 NW 2 to 6.4 m in borehole 84 NW 3; the mean is 2.8 m. An inferred volume of 4.2 million m^3 is estimated to be present. Much of the mineral has already been worked out (see resource map); it continues to be worked on a small scale at the present day to provide 'fill' material.

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, 10 km^2, 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 at a diameter of about 200 mm 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 depth. The samples, each weighing between 25 and 45 kg are despatched in heavy duty polythene bags to a laboratory for grading. The grading procedure is based on British Standard 1377 (1967b). Random checks on the accuracy of the grading are made in the laboratories of the Institute's Geochemical Division.

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 F.

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

APPENDIX B: STATISTICAL PROCEDURE

Statistical Assessment

1. A statistical assessment is made of an area of mineral greater than 2 km^2, if there is a minimum of 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. Conventional symmetrical confidence limits are calculated for the 95 per cent probability level, that is, there is a 5 per cent or one in twenty chance of a result falling outside the stated limits.

3. The volume estimate (V) for the mineral in a given block is the product of the 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

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

4. The above relationship may be transposed such that

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

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 mean 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 $l_{m_1}, l_{m_2}, \ldots l_{m_n}$, then the best estimate of mean thickness, $\bar{l}_m$, is given by

$$\frac{\sum(l_{m_1} + l_{m_2} \ldots l_{m_n})}{n}$$

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, $S_{\bar{l}}$, expressed as a proportion of the mean thickness is given by

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

where l_m is any value in the series l_{m_1} to l_{m_n}.

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 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 $S_A/S_{\bar{l}_m} \leqslant 1/3$ is assumed in all cases. It follows from equation [2] that

$$S_{\bar{l}_m} \leqslant S_V \leqslant 1.05\, S_{\bar{l}_m} \qquad [3]$$

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, 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: $L_{\bar{l}_m} \leqslant L_V \leqslant 1.05\, L_{\bar{l}_m}$

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 Figs. 11 and 12.

12. If the sampled area of mineral in a resource block is between 0.25 km² and 2 km² an assessment is inferred, based on 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 need 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 within the zone as the weighting factor.

APPENDIX C: CLASSFICATION 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 (less than 1/16 mm) and coarser than pebbles (more than 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 not considered to be 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 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 Fig. 13). The procedure is as follows:

1. Classify according to ratio of sand to gravel.
2. Describe 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 Note 11, p.30).

Many differing proposals exist 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 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 (Table 7), which is used in this 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 (−¼ +1/16 mm), medium (−1 +¼ mm) and coarse (−4 +1 mm). The boundary at 16 mm distinguishes a range of finer gravel (−16 +4 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 Standard 1377: 1967b). The grading is tabulated on the borehole record sheets (Appendix F), the intercepts corresponding with the simple geometric scale 1/16 mm, ¼ mm, 1 mm, 4 mm, 16 mm and so on as required. The sample grading curves are available for reference at the Keyworth 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 very approximate 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 types, 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.

Table 7. Classification of gravel, sand and fines

Size limits	Grain size description	Qualification	Primary classification
64 mm	Cobble		Gravel
16 mm	Pebble	Coarse	
		Fine	
4 mm	Sand	Coarse	Sand
1 mm		Medium	
¼ mm		Fine	
1/16 mm	Fines (silt and clay)		Fines

Block Calculation 1:25 000 Block } Fictitious (see map in Fig. 12)

Area
- **Block:** 11.08 km^2
- **Mineral:** 8.32 km^2

Volume
- **Overburden:** 21 million m^3
- **Mineral:** 54 million m^3

Mean Thickness
- **Overburden:** 2.5 m
- **Mineral:** 6.5 m

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 m^3

Thickness estimate: measurements in metres
l_o = overburden thickness l_m = mineral thickness

Sample point	Weighting w	Overburden l_o	Overburden wl_o	Mineral l_m	Mineral wl_m	Remarks
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	½	1.2	1.6	9.8	7.2	Hydrogeological Dept record
123/45	½	2.0		4.6		
1	¼	2.7	2.6	7.3	5.8	Close group of four boreholes (commercial)
2	¼	4.5		3.2		
3	¼	0.4		6.8		
4	¼	2.8		5.9		
Totals	$\Sigma w = 8$	$\Sigma wl_o = 20.2$		$\Sigma wl_m = 52.0$		
Means		$\bar{l}_o = 2.5$		$\bar{l}_m = 6.5$		

Calculation of confidence limits

l_m	$(l_m - \bar{l}_m)$	$(l_m - \bar{l}_m)^2$
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

$\Sigma(l_m - \bar{l}_m)^2 = 15.82$

$n = 8$

$t = 2.365$

L_V is calculated as

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

$$= 1.05 \times \frac{2.365}{6.5} \sqrt{\frac{15.82}{8 \times 7}} \times 100$$

$$= 20.3$$

$$\simeq 20 \text{ per cent}$$

Fig. 11 Example of resource block assessment: calculations and results

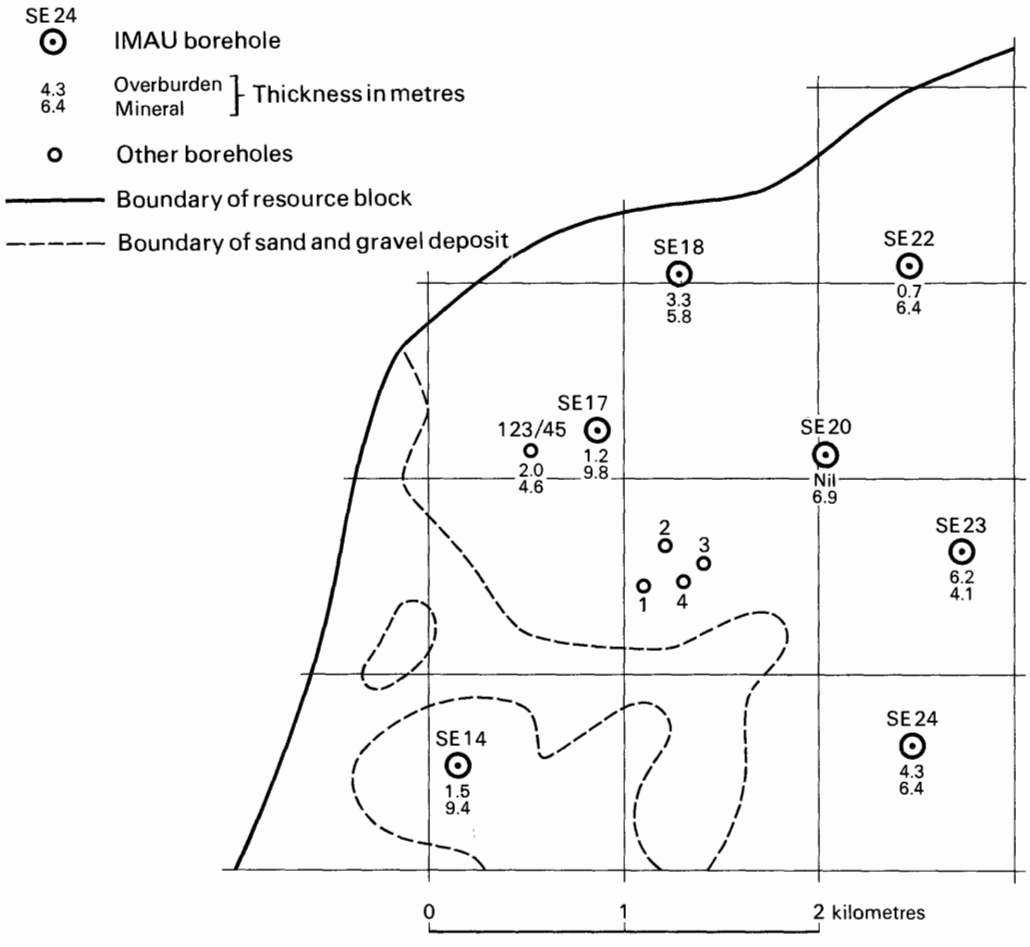
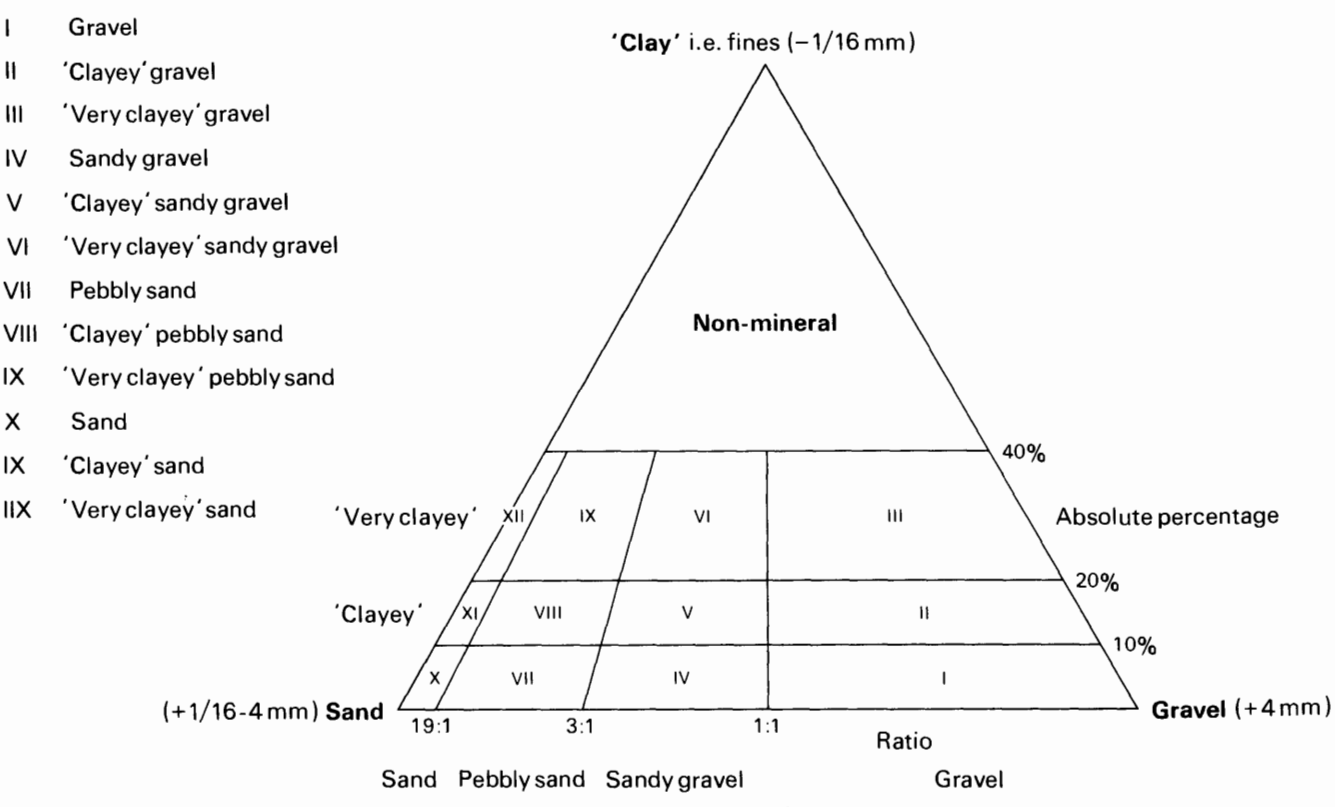


Fig. 12 Example of resource block assessment: map of a fictitious block

Fig. 13 Diagram to show the descriptive categories used in the classification of sand and gravel



APPENDIX D: EXPLANATION OF THE BOREHOLE RECORDS

ANNOTATED EXAMPLE

SU 95 SW 8[1] 9063 5232[2] Richochet Hill, Normandy,[3] Block B

Surface level (+117.7 m) +386 ft[4]
Water struck at +115.5 m[5]
Shell and auger (152 mm) 6 in diameter[6]
April 1974

Overburden 0.1 m[7]
Mineral 3.9 m
Bedrock 3.0 m+[9]

LOG

Geological Classification	Lithology	Thickness m	Depth[8] m
[10] Peat	[11] Brownish black organic matter	0.1	0.1
River Terrace Deposits (Eighth Terrace)	(a) Sandy gravel; with peat between 0.4 and 0.5 m Gravel: fine to coarse, angular to subrounded brown flint, with occasional black rounded flint with some sandstone and traces of vein-quartz. Subrounded flint cobbles between 0.7 and 3.7 m Sand: fine and medium, becoming medium and coarse below 1.7 m, quartz with flint, with traces of ironstone; grey becoming yellowish brown and below 2.1 m, brown. Lower 0.3 m clayey	3.9	4.0
Barton Beds	(b) 'Very clayey' sand Sand: fine quartz, yellow, silty	3.0+	7.0

GRADING

[14] Mean for Deposit				[12] Depth below surface (m)		[13] Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	43	+16	23	0.1	0.7	9	30	12	6	19	24
		-16 + 4	20	0.7	1.7	8	25	22	6	15	24
				1.7	2.7	9	6	19	12	27	27
Sand	48	- 4 + 1	12	2.7	3.7	13	7	28	22	14	16
		- 1 + ¼	20	3.7	4.0	7	8	9	10	32	34
		- ¼ + 1/16	16								
Fines	9	- 1/16	9								
B.											
Gravel	0	+16	0	4.0	5.0	19	79	1	1	0	0
		-16 + 4	0	5.0	6.0	62	38	0	0	0	0
				6.0	7.0	20	80	0	0	0	0
Sand	67	- 4 + 1	0								
		- 1 + ¼	1								
		- ¼ + 1/16	66								
Fines	33	- 1/16	33								

The numbered paragraphs below correspond with the annotations given on the specimen record above:

1. Borehole Registration Number
Each Industrial Minerals Assessment Unit (IMAU) borehole is identified by a Registration Number. This consists of two statements:
1) The number of the 1:25 000 sheet on which the borehole lies, for example SU 95.
2) 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, for example SW 8.

Thus the full Registration Number is SU 95 SW 8. Usually this is abbreviated to 95 SW 8 in the text.

2. The National Grid reference
All National Grid references in this publication lie within the 100-km square SU unless otherwise stated. Grid references are given to eight figures, accurate to within 10 m for borehole locations. (In the text, six-figure grid references are used for more approximate locations, for example, for farms).

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 it lies is stated.

4. Surface level
The surface level at the borehole site is given in metres and feet above Ordnance Datum. Where measurements were made in feet approximate conversions to metres are given in brackets and vice versa.

5. Groundwater conditions
Three kinds of entry are made: 1) the record indicates the level at which groundwater stood on completion of drilling (in metres above or below Ordnance Datum) 2) water was not encountered 3) no note of groundwater conditions was made.

6. Type of drill and date of drilling
All boreholes were drilled by a shell and auger rig using 152 or 200 mm (6 or 8-in) diameter casing. The month and year of completion of the borehole 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'. In this survey bedrock sands have been drilled and graded in order to give an indication of their nature but no assessment of their resources is given. Waste is any material other than bedrock or mineral. Where waste occurs between the surface and mineral it is classified as overburden.

8. Thickness and depth
All thickness and depth measurements were made in metres. A conversion table for metres to feet is given in Appendix K.

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

10. Geological classification
The geological classification (p. 5) is given whenever possible.

11. Lithological description
When sand and gravel is recorded a general description based on the mean grading characteristics (for details see Appendix C) is followed by more detailed particulars. The description of other rocks is based on visual examination, in the field.

12. Sampling
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 within the sand and gravel or at every 1 m of depth.

13. Grading results
The limits are as follows: gravel, +4 mm; sand, -4+1/16 mm; fines, -1/16 mm (see Appendix C).

14. Mean grading
The grading of the full thickness of the mineral horizon identified in the log is the mean of the individual sample gradings weighted by the thicknesses represented, if these vary. The classification used is shown in Table 7. Unless otherwise stated all the material passes the 64 mm sieve.

Fully representative sampling of sand and gravel is difficult to achieve, particularly where groundwater levels are high. Comparison between boreholes and adjacent exposures suggests that in borehole samples the proportion of sand may be higher and the proportions of fines and coarse gravel (+16 mm) may be lower.

Table 8. Boreholes used in the assessment of resources for each resource block

Block	IMAU Boreholes	Hydrogeological Department Boreholes	Site Investigation Boreholes (M3)	Commercial Sample Points*
A	9	1	0	1
B	32	3	55	0
C	23	7	30	16
D	22	5	30	2
Totals	86	16	115	19
D River Terrace Deposits	9	0	2	0
D Downwash Gravel	7	5	28	0
D Caesar's Camp Gravel	5	0	0	2
Totals	21	5	30	2

*The term "sample point", as used here and in Table 6, may include a number of closely spaced site investigation boreholes which, in the calculations , have been given a weighting factor of one. Therefore, the number of sample points used in the assessment of resources may be less than the total number of borehole records available for the block.

APPENDIX E: LIST OF BOREHOLES USED IN THE ASSESSMENT OF RESOURCES

a) INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLES

Borehole No. by sheet quadrants	Grid Reference	Page No.
SU 84 NW		
1	8232 4952	35
2	8297 4837	37
3	8345 4974	38
4	8417 4960	39
5	8313 4935	40
SU 84 NE		
34	8609 4925	42
35	8754 4857	43
36	8810 4921	44
38	8674 4846	45
39	8620 4847	46
41	8593 4842	47
SU 85 NW		
90	8034 5856	48
91	8022 5693	49
92	8100 5929	50
93	8184 5816	51
94	8204 5558	52
95	8262 5959	53
96	8289 5871	54
97	8351 5961	55
98	8399 5873	56
99	8460 5969	57
100	8198 5886	58
SU 85 NE		
95	8507 5846	59
96	8641 5927	60
97	8695 5818	61
98	8705 5735	62
99	8822 5744	63
100	8813 5578	64
101	8917 5942	66
102	8974 5824	67
103	8864 5514	68
104	8608 5860	69
SU 85 SW		
6	8249 5328	70
7	8427 5233	71
8	8313 5496	73
9	8321 5377	74
SU 85 SE		
16	8574 5473	75
17	8520 5238	76
18	8848 5339	77
19	8894 5116	79
20	8859 5066	81
SU 86 NW		
7	8116 6729	82
8	8175 6552	83
9	8241 6638	84
10	8218 6501	85
11	8393 6589	86
12	8198 6674	87
SU 86 NE		
34	8654 6525	88
SU 86 SW		
2	8050 6401	89
3	8035 6264	90
4	8026 6287	91
5	8149 6206	92
6	8014 6140	93
7	8128 6060	94
8	8121 6076	95
9	8344 6056	96
10	8495 6090	97
SU 86 SE		
41	8515 6041	98
42	8658 6369	99
43	8783 6499	100
44	8771 6387	101
45	8868 6291	102
46	8920 6254	103

b) HYDROGEOLOGICAL DEPARTMENT BOREHOLE RECORDS

One-inch Geological Sheet No.	Borehole No.	Grid Reference	Surface level m	Surface level ft	Thickness in metres: Overburden	Mineral	Bedrock	Bedrock classification	Final depth recorded (O.D.) m	Final depth recorded (O.D.) ft
268	78	805 640	(100.9)	331	0.3	2.7	12.8	Barton Beds	(-76.2)	-250
269	26	8999 6132	(121.9)	400	0.0	2.7	34.8	Barton Beds	(-75.0)	-246
269	216	8317 6625	(64.0)	210	0.0	3.0	12.8	Bagshot Beds	(45.1)	+148
285	19	9004 5735	(105.2)	345	0.0	1.9	22.9	Barton Beds	(73.2)	+240
285	81 g	877 491	(74.7)	245	0.3	1.6	20.1	London Clay	(8.2)	+27
285	83	864 494	(74.4)	244	0.3	3.7	28.0	London Clay	(-32.3)	-106
285	84 a	883 495	(71.0)	233	0.9	3.4	33.8+	London Clay	(-38.4)	-126
285	129	8546 5975	(59.4)	195	0.6	3.0	0.1+	Bracklesham Beds	(55.5)	+182
285	132 a	8353 5384			0.0	0.5	5.3	Barton Beds		
	b	8390 5461	(84.7)	278	0.0	0.5	11.6	Bracklesham Beds	(69.5)	+228
	c	8342 5408			0.0	2.0	13.1	Barton Beds		
285	153 b	8330 5480	(80.8)	265	0.4	0.7	4.3+	Barton Beds	(65.5)	+215
285	157 e	8305 5479	(82.6)	271.1	0.2	2.0	13.0+	Bracklesham Beds	(67.4)	+221.1
285	173	8775 4838	(76.5)	251	0.9	5.2	1.9	Reading Beds	(-362.4)	-1189
285	210	8835 4943	(11.0)	233	0.8	4.6	25.5	London Clay	(-397.8)	-1305
285	215	8829 5072	(70.1)	230	1.5	2.6	2.0+	London Clay	(+64.0)	+210

c) SITE INVESTIGATION BOREHOLES

Borehole data from site investigation reports for the M3 motorway and the reports of sand and gravel operators have been used in the assessment of resources. Much of this information is held in confidence by the Institute.

APPENDIX F: INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLE RECORDS

SU 84 NW 1 | 8232 4952 | Near Heath House, Crondall | Block D

Surface level (+186.5 m) +612 ft
Water struck at +185 m
Shell and auger, (152 mm) 6 in diameter
March 1974

Mineral 2.4 m
Bedrock 8.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Caesar's Camp Gravel	Pebbly sand Gravel: fine to coarse, subangular to rounded, brown and black flint; some flints patinated Sand: fine quartz, greyish brown, peaty between 0.3 and 0.4 m	0.4	0.4
	A. 'Clayey' sandy gravel Gravel: fine to coarse, angular with subangular and rounded flint with traces of subangular sandstone and vein-quartz. Cobbles of flint abundant Sand: fine to medium quartz, brown, peat-stained in upper part	2.0	2.4
Barton Beds	B. 'Clayey' sand Sand: fine to medium quartz, brown with an upper pinkish grey, clayey sand. Passing into yellowish green, glauconitic sand, which occurs between 3.8 and 4.8 m	6.2	8.6
	Mottled pink and grey clay with orange-stained, fine sandy laminations	1.8+	10.4

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	33	+16	21	0.0	0.4	8	48	13	8	6	17
		-16 + 4	12	0.4	1.3	1	24	19	9	15	32
				1.3	1.7	18	9	21	18	22	12
Sand	53	- 4 + 1	9	1.7	2.4	33	31	10	4	8	14
		- 1 + ¼	16								
		- ¼ + 1/16	28								
Fines	14	- 1/16	14								
B.											
Gravel	0	+16	0	2.4	3.8	30	55	14	1	0	0
		-16 + 4	0	3.8	4.8	30	54	16	0	0	0
				4.8	5.8	19	74	7	0	0	0
Sand	81	- 4 + 1	1	5.8	6.8	23	66	11	0	0	0
		- 1 + ¼	10	6.8	7.8	4	89	6	1	0	0
		- ¼ + 1/16	70	7.8	8.6	5	83	6	2	1	3
Fines	19	- 1/16	19								

SU 84 NW 2 8297 4837 Near Lawday House Farm, Farnham Block D

Surface level (+155.8 m) +511 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 1.6 m
Waste 1.3 m
Bedrock 2.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.1	0.1
Caesar's Camp Gravel	A. 'Very clayey' sandy gravel Gravel: fine to coarse, subangular and subrounded flints with some subangular sandstone. Cobbles of flint abundant Sand: fine to medium quartz and flint	1.6	1.7
	Mottled grey and orange clay with occasional subangular flint cobbles becoming silty at 2.2 m	1.1	2.8
	B. 'Clayey' gravel Gravel: fine to coarse, subangular and subrounded flints Sand: medium to coarse quartz orange, clayey	0.2	3.0
London Clay	Orange, clayey, fine sand, passing into mottled grey and orange silty clay	0.9	3.9
	Firm, liver-coloured silty clay, with some iron-staining	0.5	4.4
	Silty clay, grey	1.1+	5.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
A.											
Gravel 22	+16	14		0.1	0.6	27	5	9	9	14	36
	-16 + 4	8		0.6	1.7	24	43	18	5	7	3
Sand 53	- 4 + 1	6									
	- 1 + $\frac{1}{4}$	16									
	- $\frac{1}{4}$ + 1/16	31									
Fines 25	- 1/16	25									
B.											
Gravel 57	+16	38		2.8	3.0	18	2	15	8	19	38
	-16 + 4	19									
Sand 25	- 4 + 1	8									
	- 1 + $\frac{1}{4}$	15									
	- $\frac{1}{4}$ + 1/16	2									
Fines 18	- 1/16	18									

SU 84 NW 3 8345 4974 Bricksbury Hill, Farnham Block D

Surface level (+183.2 m) +601 ft
Water struck at +179.9 m and 176.8 m
Shell and auger, (152 mm) 6 in diameter
March 1974

Mineral 6.4 m
Bedrock 4.6 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Caesar's Camp Gravel	A. 'Clayey' sandy gravel Gravel: fine to coarse, subangular and subrounded, with some rounded flint. With some sandstone present. Angular flints in top 1 m; rounded flints between 3.7 and 6.4 m with a thin clay band at 5.2 m. Cobbles of flint abundant Sand: medium and fine quartz, with some chert and flint	6.4	6.4
Bracklesham Beds	B. 'Very clayey' sand Sand: fine, silty quartz, clayey, orange with orange and yellowish green laminations in places. Carbonaceous material present between 8.0 and 8.5 m. Dark grey clay with occasional dark green glauconitic partings at base.	4.6+	11.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	35	+16	22	0.0	1.0	5	4	13	14	18	46
		-16 + 4	13	1.0	2.0	6	6	15	16	26	31
				2.0	3.0	9	18	14	9	23	27
Sand	55	- 4 + 1	10	3.0	3.3	6	24	16	5	13	36
		- 1 + ¼	29	3.3	3.7	13	17	59	6	4	1
		- ¼ + 1/16	16	3.7	4.7	13	17	59	6	4	1
				4.7	5.7	16	23	40	7	6	8
Fines	10	- 1/16	10	5.7	6.4	17	51	18	4	2	8
B.											
Gravel	1	+16	0	6.4	7.5	22	72	5	0	1	0
		-16 + 4	1								
Sand	77	- 4 + 1	0								
		- 1 + ¼	5								
		- ¼ + 1/16	72								
Fines	22	- 1/16	22								

SU 84 NW 4 8417 4960 Near Hungry Hill, Farnham Block D

Surface level (170.4 m) +559 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
March 1974

Mineral 1.8 m
Bedrock 13.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Caesar's Camp Gravel	A. Gravel Gravel: fine to coarse, subangular and subrounded flint with some sandstone; cobbles of flint abundant Sand: fine to medium, quartz, peat-stained	1.8	1.8
Bracklesham Beds	B. Sand Sand: fine to medium quartz, orange, passing into fine pale yellow sand at 4.3 m. Black rounded pebbles present between 4.0 and 5.3 m. Pipe clay laminae occur between 9.0 and 9.05, and 12.8 and 12.85 m. Orange and yellow sand with pipe clay towards base, with ? shelly material	13.5+	15.3

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	67	+16	45	0.0	1.0	4	8	7	6	20	55
		-16 + 4	22	1.0	1.8	6	15	12	9	24	34
Sand	28	- 4 + 1	7								
		- 1 + ¼	9								
		- ¼ + 1/16	12								
Fines	5	- 1/16	5								
B.											
Gravel	3	+16	1	1.8	3.3	30	43	24	3	0	0
		-16 + 4	2	3.3	4.3	6	49	17	3	11	14
				4.3	5.3	6	70	9	2	7	6
Sand	88	- 4 + 1	1	5.3	6.3	5	88	7	0	0	0
		- 1 + ¼	6	6.3	7.3	4	90	5	1	0	0
		- ¼ + 1/16	81	7.3	8.3	9	88	2	1	0	0
				8.3	9.3	7	90	3	0	0	0
Fines	9	- 1/16	9	9.3	10.3	8	89	2	0	1	0
				10.3	11.3	5	89	4	1	1	0
				11.3	12.3	6	92	2	0	0	0
				12.3	13.3	6	91	3	0	0	0
				13.3	14.3	8	90	1	1	0	0
				14.3	15.3	7	92	1	0	0	0

SU 84 NW 5 8313 4935 Near Lawday House Farm, Farnham Block D

Surface level (+184.1 m) +604 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 4.7 m
Bedrock 18.8 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Caesar's Camp Gravel	A. 'Very clayey' sandy gravel, with red and grey mottled sandy silt with occasional flints between 0.5 and 1.5 m Gravel: fine to coarse subrounded and rounded with subangular brown flint. Cobbles occur between 1.5 and 4.8 m Sand: fine quartz, yellowish black, peat-stained at top, passing into medium, reddish brown and grey quartz with flint sand below 2.1 m	4.7	4.8
Bracklesham Beds	B. 'Clayey' sand Sand: fine quartz, pale grey, yellowish brown, pale orange and pale pink, clayey with bands of greyish white, pink and yellow clay. Becomes fine to medium sand and less clayey below 14.6 m	13.8	18.6
Bagshot Beds	C. 'Very clayey' sand Sand: very fine quartz, silty, pale pink, pale orange and with pale grey clay laminae	5.0+	23.6

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	36	+16	26	0.1	0.5	23	23	10	9	15	20
		-16 + 4	10	0.5	1.5	56	20	8	4	6	6
				1.5	2.1	38	18	12	5	14	13
Sand	41	- 4 + 1	8	2.1	3.0	4	15	27	5	8	41
		- 1 + ¼	19	3.0	4.0	11	4	22	8	12	43
		- ¼ + 1/16	14	4.0	4.8	6	11	28	11	21	23
Fines	23	- 1/16	23								
B.											
Gravel	0	+16	0	7.2	8.2	16	73	11	0	0	0
		-16 + 4	0	8.2	9.2	13	75	12	0	0	0
				9.2	9.6	12	80	8	0	0	0
Sand	87	- 4 + 1	0	9.6	10.2	33	62	4	1	0	0
		- 1 + ¼	22	11.6	12.6	13	62	24	1	0	0
		- ¼ + 1/16	65	12.6	13.6	17	70	12	1	0	0
				13.6	14.6	13	72	15	0	0	0
Fines	13	- 1/16	13	14.6	15.6	6	44	50	0	0	0
				15.6	16.6	9	57	34	0	0	0
				16.6	17.6	8	59	33	0	0	0
				17.6	18.6	12	62	26	0	0	0
C.											
Gravel	0	+16	0	18.6	19.6	18	75	6	1	0	0
		-16 + 4	0	19.6	20.6	27	71	2	0	0	0
				20.6	21.6	28	70	2	0	0	0
Sand	77	- 4 + 1	0	21.6	22.6	20	77	3	0	0	0
		- 1 + ¼	3	22.6	23.6	24	74	2	0	0	0
		- ¼ + 1/16	74								
Fines	23	- 1/16	23								

SU 84 NE 34 8609 4925 Sports Ground, Farnham Block C

Surface level (+75.6 m) +248 ft
Water struck at +72.4 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.5 m
Mineral 3.8 m
Bedrock 1.9 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Silty, loamy soil	0.5	0.5
River Terrace Deposits (Third Terrace)	'Very clayey' sandy gravel Gravel: fine below 1.5 m, becoming fine to coarse between 3.2 and 4.3 m. Mainly subangular with subrounded and occasional rounded flint Sand: fine, silty, clayey, mottled pale grey and yellowish brown; dark blue and dark grey below 2.3 m. Medium to coarse grey sand between 3.2 and 4.3 m	3.8	4.3
London Clay	Silty, sandy clay, becoming firm grey clay below 5.7 m	1.9+	6.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	27	+16	11	0.5	1.5	25	62	11	1	0	1
		-16 + 4	16	1.5	2.5	34	41	8	1	16	0
				2.5	3.2	28	31	11	6	19	5
Sand	51	- 4 + 1	6	3.2	4.3	1	2	16	14	29	38
		- 1 + ¼	11								
		- ¼ + 1/16	34								
Fines	22	- 1/16	22								

SU 84 NE 35 8754 4857 Near Kiln Copse, Farnham Block C

Surface level (+71.3 m) +234 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.8 m
Mineral 8.0 m
Bedrock 1.2 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Alluvium	Peaty clay	0.8	0.8
River Terrace Deposits (Third Terrace)	'Clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded brown flint, with some yellow sandstone and traces of vein-quartz. Occasional flint cobbles occur between 5.5 and 6.5 m Sand: fine, silty, mottled pale greenish yellow and brown, becoming medium to coarse, pale yellow and brown quartz with flint at 2.5 m. Fine pale grey chalky sand present between 7.5 and 8.8 m. Grey clayey sand occurs between 3.6 and 3.8 m and a chalky clay occurs between 6.9 and 7.1 m	8.0	8.8
Upper Chalk	Soft white chalk	1.2+	10.0

GRADING

Mean for Deposit			Depth below surface (m)		Bulk Samples Percentages					
					Fines	Sand			Gravel	
%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel 42	+16	21	0.8	1.8	36	37	12	9	2	4
	-16 + 4	21	1.8	2.5	28	31	18	9	12	2
			2.5	3.5	8	6	16	10	34	26
Sand 47	- 4 + 1	11	3.5	4.5	3	4	22	16	32	23
	- 1 + ¼	17	4.5	5.5	3	3	25	13	22	34
	- ¼ + 1/16	19	5.5	6.5	1	2	16	15	29	37
			6.5	7.5	5	2	18	16	28	31
Fines 11	- 1/16	11	7.5	8.8	8	53	15	3	12	9

SU 84 NE 36 8810 4921 Near Aldershot Park, Aldershot Block C

Surface level (+71.9 m) +236 ft
Water struck at +70.5 m
Shell and auger, (152 mm) 6 in diameter
October 1974

Overburden 1.4 m
Mineral 1.8 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.2	0.2
Alluvium	A. Light brown, fine, sandy clay, becoming more sandy with depth	1.2	1.4
River Terrace Deposits (Third Terrace)	B. Gravel Gravel: fine to coarse, angular to subangular, with subrounded and rounded brown flint. Flint becomes black with white patina below 3 m Sand: medium and coarse quartz with flint	1.8	3.2
London Clay	Stiff, grey silty clay	1.0+	4.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
A.											
Gravel	0	+16	0	0.2	1.4	43	44	9	4	0	0
		-16 + 4	0								
Sand	57	- 4 + 1	4								
		- 1 + $\frac{1}{4}$	9								
		- $\frac{1}{4}$ + 1/16	44								
Fines	43	- 1/16	43								
B.											
Gravel	59	+16	32	1.4	2.5	7	5	16	12	31	29
		-16 + 4	27	2.5	3.2	6	3	23	10	22	36
Sand	34	- 4 + 1	12								
		- 1 + $\frac{1}{4}$	18								
		- $\frac{1}{4}$ + 1/16	4								
Fines	7	- 1/16	7								

SU 84 NE 38 8674 4846 Badshot Lea Block C

Surface level +73.0 m (+240 ft)
Water struck at +69.4 m
Shell and auger, (152 mm) 6 in diameter
July 1976

Overburden 1.9 m
Mineral 1.9 m
Bedrock 6.2 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Brown silty, clayey soil	0.2	0.2
Alluvium	Orange and grey mottled silty sand, becoming pebbly with depth	1.7	1.9
River Terrace Deposits (Third Terrace)	'Clayey' sandy gravel Gravel: mainly fine subangular to subrounded flint with occasional subrounded sandstone Sand: fine to medium, subangular to subrounded quartz, with some coarse angular flint, brown	1.9	3.8
London Clay	Bluish grey clay with occasional seams of carbonaceous matter, becoming silty with depth	5.5	9.3
Reading Beds	Greyish green, clayey, fine to medium quartz sand	0.7+	10.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel 39	+16	17		1.9	2.9	15	16	30	9	16	14
	-16 + 4	22		2.9	3.8	6	6	25	15	28	20
Sand 50	- 4 + 1	11									
	- 1 + ¼	28									
	- ¼ + 1/16	11									
Fines 11	- 1/16	11									

SU 84 NE 39 8620 4847 Near Moat, Badshot Lea Block C

Surface level +81.2 m (+266 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
July 1976

Overburden 1.9 m
Bedrock 1.6 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Made Ground	Chalk rubble with brick and flint	0.6	0.6
Alluvium (?Fourth Terrace)	Grey-green, clayey silt with occasional fine subangular flint and chalk pebbles, becoming sandy with depth	1.3	1.9
Reworked London Clay	Mottled blue and brown clay with iron-stained sandy partings and occasional subangular flint pebbles	1.4	3.3
London Clay	Firm bluish grey silty clay	0.2+	3.5

SU 84 NE 41 8593 4842 Green Lane Farm, Badshot Lea Block C

Surface level +75.1 m (+246 ft)
Water struck at +72.9 m
Shell and auger, (152 mm) 6 in diameter
July 1976

Overburden 0.8 m
Mineral 3.8 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Dark brown pebbly, sandy soil	0.8	0.8
River Terrace Deposits (Third Terrace)	'Clayey' gravel Gravel: fine to coarse, angular to subangular flint with some sandstone Sand: fine to medium quartz with some coarse flint. Becoming coarser and less clayey with depth	3.8	4.6
Reading Beds	Grey and red mottled clay	1.0+	5.6

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel 56	+16	25		0.8	2.2	21	12	10	9	25	23
	-16 + 4	31		2.2	3.2	0	2	24	16	38	20
				3.2	4.6	11	1	14	11	32	31
Sand 32	- 4 + 1	12									
	- 1 + ¼	15									
	- ¼ + 1/16	5									
Fines 12	- 1/16	12									

SU 85 NW 90 8034 5856 Hartford Bridge Flats, Hartley Wintney Block D

Surface level (+98.8 m) +324 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
April/May 1974

Mineral 3.6 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. 'Clayey' gravel Gravel: fine to coarse, subangular to subrounded, with occasional rounded flint, with some sandstone Sand: fine and medium, quartz with flint, clayey, yellowish brown and grey; clay at base	3.6	3.6
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, clayey, silty; yellowish green, becoming orange and pale grey below 5.6 m	3.0+	6.6

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+16-4	+¼-1	+1-4	+4-16	+16
A.											
Gravel	47	+16	24	0.0	0.3	11	26	14	6	21	22
		-16 + 4	23	0.3	0.5	27	38	15	3	8	9
				0.5	1.5	6	14	21	6	25	28
Sand	40	- 4 + 1	7	1.5	2.4	12	8	16	7	24	33
		- 1 + ¼	17	2.4	2.8	36	34	15	6	9	0
		- ¼ + 1/16	16	2.8	3.6	11	6	17	11	33	22
Fines	13	- 1/16	13								
B.											
Gravel	0	+16	0	3.6	4.6	28	66	5	1	0	0
		-16 + 4	0	4.6	5.6	25	71	3	1	0	0
				5.6	6.6	15	82	3	0	0	0
Sand	77	- 4 + 1	1								
		- 1 + ¼	3								
		- ¼ + 1/16	73								
Fines	23	- 1/16	23								

SU 85 NW 91 8022 5693 Litchett Plain, Hartley Wintney Block D

Surface level (+70.7 m) +232 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
May 1974

Waste 0.7 m
Bedrock 3.4 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Pebbly, sandy soil	0.1	0.1
River Terrace Deposits (Fourth Terrace)	A.	Gravel Gravel: fine to coarse, subangular to subrounded, flint with some sandstone Sand: fine and medium quartz, grey	0.6	0.7
Bracklesham Beds	B.	'Clayey' sand Sand: fine, quartz, clayey, silty, mottled orange and yellow between 0.7 and 2.1 m, becoming grey below 2.1 m	3.4+	4.1

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 55	+16	29		0.1	0.7	6	17	13	9	26	29
	-16 + 4	26									
Sand 39	- 4 + 1	9									
	- 1 + ¼	13									
	- ¼ + 1/16	17									
Fines 6	- 1/16	6									
B.											
Gravel 0	+16	0		0.7	2.1	16	77	6	1	0	0
	-16 + 4	0		2.1	3.1	14	81	5	0	0	0
				3.1	4.1	12	88	0	0	0	0
Sand 86	- 4 + 1	0									
	- 1 + ¼	4									
	- ¼ + 1/16	82									
Fines 14	- 1/16	14									

SU 85 NW 92 8100 5929 Blackbushe Airfield, Yateley Block D

Surface level (+97.8 m) +321 ft
Water struck at +95.2 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 3.1 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Peaty, pebbly soil	0.2	0.2
River Terrace Deposits (Seventh Terrace)	A.	'Clayey' sandy gravel Gravel: fine to coarse, angular to subrounded, with rounded black and brown flint, with some subrounded sandstone Sand: fine and medium quartz, with flint and traces of glauconite, clayey throughout, orange-grey, becoming mottled orange and grey with depth	3.1	3.3
Barton Beds	B.	'Very clayey' sand Sand: fine silty quartz, greenish orange to 4.3 m, becoming greenish yellow	3.0+	6.3

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
A.											
Gravel	25	+16	13	0.2	1.2	13	54	12	1	7	13
		-16 + 4	12	1.2	2.2	16	58	14	2	5	5
				2.2	3.3	12	12	22	8	25	21
Sand	61	- 4 + 1	4								
		- 1 + $\frac{1}{4}$	18								
		- $\frac{1}{4}$ + 1/16	39								
Fines	14	- 1/16	14								
B.											
Gravel	2	+16	0	3.3	4.3	21	65	7	2	5	0
		-16 + 4	2	4.3	5.3	20	75	4	1	0	0
				5.3	6.3	29	65	2	4	0	0
Sand	75	- 4 + 1	2								
		- 1 + $\frac{1}{4}$	5								
		- $\frac{1}{4}$ + 1/16	68								
Fines	23	- 1/16	23								

SU 85 NW 93 | 8184 5816 | Near Minley Manor, Hawley | Block D

Surface level (+100.0 m) +328 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 3.3 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
Peat		Dark brown, silty peat	0.2	0.2
River Terrace Deposits (Seventh Terrace)	A.	'Clayey' gravel Gravel: fine to coarse, subangular to subrounded, with occasional rounded flint, with some sandstone Sand: fine, becoming fine to coarse below 1.2 m, quartz with flint, yellow-brown and pale green and grey, becoming orange-brown with depth	3.3	3.5
Barton Beds	B.	'Very clayey' sand Sand: fine quartz, clayey throughout, greenish grey becoming orange	3.0+	6.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	45	+16	19	0.2	1.2	15	43	13	5	11	13
		-16 + 4	26	1.2	2.0	9	13	18	10	26	24
				2.0	2.5	9	10	19	14	29	19
Sand	42	- 4 + 1	8	2.5	3.5	15	5	13	8	36	23
		- 1 + ¼	15								
		- ¼ + 1/16	19								
Fines	13	- 1/16	13								
B.											
Gravel	0	+16	0	3.5	4.5	25	73	2	0	0	0
		-16 + 4	0	4.5	5.5	17	81	1	1	0	0
				5.5	6.5	28	69	2	0	0	0
Sand	77	- 4 + 1	1								
		- 1 + ¼	8								
		- ¼ + 1/16	68								
Fines	23	- 1/16	23								

SU 85 NW 94 8204 5558 Near Fleet Farm House, Fleet Block D

Surface level (+68.3 m) +224 ft
Water struck at +65.8 m
Shell and auger, 152 mm 6 in diameter
March 1974

Overburden 0.5 m
Mineral 1.0 m
Bedrock 6.5 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Silty, clayey soil with pebbles	0.5	0.5
Downwash Gravel	A.	'Clayey' pebbly sand Gravel: fine, angular to subangular, flint Sand: fine, quartz with flint, silty and clayey, orange-brown becoming laminated brown and pale green between 0.7 and 1.1 m and pale grey and glauconitic below 1.1 m	1.0	1.5
Bracklesham Beds	B.	'Clayey' sand Sand: fine quartz, silty and clayey, glauconitic, yellowish brown and green, becoming dark grey at about 5.7 m	6.5+	8.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	4	+16	1	0.5	1.5	15	73	6	2	3	1
		-16 + 4	3								
Sand	81	- 4 + 1	2								
		- 1 + ¼	6								
		- ¼ + 1/16	73								
Fines	15	- 1/16	15								
B.											
Gravel	0	+16	0	1.5	2.5	20	71	9	0	0	0
		-16 + 4	0	2.5	3.5	14	81	5	0	0	0
				3.5	4.7	12	85	3	0	0	0
Sand	86	- 4 + 1	0	4.7	5.7	13	84	3	0	0	0
		- 1 + ¼	4	5.7	6.7	12	86	2	0	0	0
		- ¼ + 1/16	82	6.7	8.0	20	79	1	0	0	0
Fines	14	- 1/16	14								

SU 85 NW 95 8262 5959 Near Hill Farm, Yateley Block D

Surface level (+85.3 m) +280 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.3 m
Mineral 2.1 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Silty, clayey soil on 0.2 m of peat	0.3	0.3
River Terrace Deposits (Fifth Terrace)	A.	'Clayey' pebbly sand; peaty sand between 0.3 and 0.6 m and silty sand between 1.5 and 1.9 m Gravel: fine to coarse, subangular with angular and occasional subrounded, brown and black flint, with traces of sandstone and vein-quartz. Some flints patinated Sand: fine and medium quartz with flint and with some chert; clayey, yellowish brown and pale greenish grey	2.1	2.4
Barton Beds	B.	'Very clayey' sand Sand: fine quartz, clayey, silty, yellowish brown	3.0+	5.4

GRADING

Mean for Deposit				Depth below surface (m)		Fines	Bulk Samples Percentages Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	21	+16	12	0.3	0.6	13	56	18	3	4	2
		-16 + 4	9	0.6	1.5	12	45	14	3	9	17
				1.5	1.9	15	65	16	1	1	2
Sand	66	- 4 + 1	4	1.9	2.4	8	29	23	5	16	19
		- 1 + ¼	17								
		- ¼ + 1/16	45								
Fines	13	- 1/16	13								
B.											
Gravel	0	+16	0	2.4	3.4	20	75	4	1	0	0
		-16 + 4	0	3.4	4.4	23	74	2	1	0	0
				4.4	5.4	21	77	1	1	0	0
Sand	79	- 4 + 1	1								
		- 1 + ¼	2								
		- ¼ + 1/16	76								
Fines	21	- 1/16	21								

SU 85 NW 96 8289 5871 Near Hornley Common, Hawley Block D

Surface level (+100.9 m) +331 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 4.5 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. 'Clayey' gravel Gravel: fine to coarse, subangular to subrounded with occasional rounded flint, with some sandstone. Sub-rounded flint cobbles occur between 0.3 and 3.3 m Sand: fine and medium, becoming medium and coarse below 2.3 m, quartz with some flint, clayey, brown, becoming yellowish brown below 2.3 m	4.5	4.5
Barton Beds	B. 'Very clayey' sand Sand: fine, silty, clayey, quartz, top weathered orange-brown, becoming mottled yellow and orange	3.0+	7.5

GRADING

Mean for Deposit			Depth below surface (m)		Bulk Samples Percentages					
					Fines	Sand			Gravel	
%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.										
Gravel 46	+16	28	0.0	0.3	13	34	17	7	16	13
	-16 + 4	18	0.3	1.3	9	25	18	5	15	28
			1.3	2.3	14	11	27	5	14	29
Sand 43	- 4 + 1	11	2.3	3.3	10	4	19	9	24	34
	- 1 + ¼	19	3.3	4.5	11	8	20	14	22	25
	- ¼ + 1/16	13								
Fines 11	- 1/16	11								
B.										
Gravel 0	+16	0	4.5	5.5	30	67	2	1	0	0
	-16 + 4	0	5.5	6.5	43	55	1	1	0	0
			6.5	7.5	24	72	3	1	0	0
Sand 68	- 4 + 1	1								
	- 1 + ¼	2								
	- ¼ + 1/16	65								
Fines 32	- 1/16	32								

SU 85 NW 97 8351 5961 Near Darbygreen House, Yateley Block D

Surface level (+79.6 m) +261 ft
Water struck at +78.4 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 3.8 m
Bedrock 1.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Sandy, clayey soil with pebbles	0.2	0.2
River Terrace Deposits (Fifth Terrace)	Gravel, sand occurs between 0.6 and 0.8 m Gravel: fine to coarse, subangular to subrounded, with occasional rounded flint; and with some sandstone Sand: fine and medium, becoming medium and coarse below 0.8 m, quartz with some flint and traces of sandstone, peaty between 0.4 and 0.6 m, becoming yellowish brown	3.8	4.0
Barton Beds	Yellow silty sand	1.5+	5.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	52	+16	31	0.2	0.6	10	10	19	6	20	35
		-16 + 4	21	0.6	0.8	9	21	62	3	5	0
				0.8	1.2	3	5	27	14	25	26
Sand	44	- 4 + 1	11	1.2	3.2	2	3	22	14	22	37
		- 1 + ¼	27	3.2	4.0	6	9	27	14	21	23
		- ¼ + 1/16	6								
Fines	4	- 1/16	4								

SU 85 NW 98 8399 5873 Near Hornley Farm, Hawley Block D

Surface level (+96.3 m) +316 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 2.2 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. 'Clayey' sandy gravel Gravel: fine to coarse, angular to subrounded, with occasional rounded black and brown flint, with subrounded yellow sandstone with some vein-quartz Sand: fine and medium quartz with some flint, red-stained, clayey throughout. Greyish black and peaty to 0.3 m, becoming reddish brown and pale greenish grey between 0.3 and 1.3 m and yellowish brown from 1.3 to 2.2 m	2.2	2.2
Barton Beds	B. 'Very clayey' sand Sand: fine quartz with some glauconite, silty, clayey, mottled orange and yellow	3.0+	5.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	36	+16	17	0.0	0.3	6	20	32	10	14	18
		-16 + 4	19	0.3	1.3	14	27	28	9	10	12
				1.3	1.9	9	8	29	7	27	20
Sand	54	- 4 + 1	8	1.9	2.2	6	11	12	7	33	31
		- 1 + ¼	27								
		- ¼ + 1/16	19								
Fines	10	- 1/16	10								
B.											
Gravel	1	+16	0	2.2	3.2	30	68	1	0	1	0
		-16 + 4	1	3.2	4.2	29	66	2	1	2	0
				4.2	5.2	31	67	2	0	0	0
Sand	69	- 4 + 1	0								
		- 1 + ¼	2								
		- ¼ + 1/16	67								
Fines	30	- 1/16	30								

SU 85 NW 99 8460 5969 Near Frogmore Park, Hawley

Surface level (+67.7 m) +222 ft
Water struck at +65.6 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.2 m
Mineral 6.4 m
Bedrock 2.4 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Silty, loamy soil	0.2	0.2
River Terrace Deposits (Third Terrace)	A. Sandy gravel, sand between 1.0 and 1.6 m Gravel: fine to coarse, subangular and subrounded with occasional rounded brown and black flint with some sandstone. Cobbles present between 0.2 and 0.5 m and 4.1 and 6.6 m becoming more rounded with depth Sand: fine to coarse quartz with flint; peaty, dark brown and black, becoming yellowish brown at 0.5 to 6.6 m	6.4	6.6
Bracklesham Beds	B. 'Clayey' sand Sand: fine quartz, silty, clayey, yellow becoming greenish yellow with depth	2.4+	9.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	46	+16	25	0.2	0.5	6	19	16	9	30	20
		-16 + 4	21	0.5	1.0	1	3	23	14	18	41
				1.0	1.6	18	64	16	1	1	0
Sand	49	- 4 + 1	8	1.6	2.1	7	32	24	8	20	9
		- 1 + ¼	27	2.1	3.1	1	6	50	19	15	9
		- ¼ + 1/16	14	3.1	4.1	2	4	31	14	21	28
				4.1	5.1	2	2	26	14	19	37
Fines	5	- 1/16	5	5.1	6.1	4	13	8	15	20	40
				6.1	6.6	3	19	18	9	20	31
B.											
Gravel	0	+16	0	6.6	7.6	11	74	12	2	1	0
		-16 + 4	0	7.6	9.0	15	76	9	0	0	0
Sand	87	- 4 + 1	1								
		- 1 + ¼	11								
		- ¼ + 1/16	75								
Fines	13	- 1/16	13								

SU 85 NW 100 8198 5886 Near Hotel, Yateley Common, Hawley Block D

Surface level (+100.3 m) +329 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
October 1974

Overburden 0.1 m
Mineral 3.6 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.1	0.1
River Terrace Deposits (Seventh Terrace)	A. 'Very clayey' sandy gravel; sand between 0.1 and 0.8 m Gravel: fine to coarse, subangular to subrounded, brown patinated flint, with occasional rounded black flint. Cobbles present between 2.3 and 3.3 m Sand: fine to coarse, quartz with flint; brown, passing into mottled grey and orange and becoming light brown with depth	3.6	3.7
Barton Beds	B. Silty sand Orange-brown and green mottled sandy clay, becoming light brown	3.0+	6.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	34	+16	14	0.1	0.8	27	51	19	3	0	0
		-16 + 4	20	0.8	1.3	30	23	27	2	9	9
				1.3	2.3	27	6	18	9	24	16
Sand	45	- 4 + 1	8	2.3	3.3	11	4	24	11	30	20
		- 1 + ¼	21	3.3	3.7	10	2	17	13	34	24
		- ¼ + 1/16	16								
Fines	21	- 1/16	21								
B.											
Gravel	0	+16	0	3.7	4.7	43	55	2	0	0	0
		-16 + 4	0	4.7	5.7	37	61	2	0	0	0
				5.7	6.7	45	54	1	0	0	0
Sand	58	- 4 + 1	0								
		- 1 + ¼	2								
		- ¼ + 1/16	56								
Fines	42	- 1/16	42								

SU 85 NE 95 8507 5846 Near Hawley Place, Hawley Block D

Surface level (+100.3 m) +329 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
April 1974

Mineral 2.7 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. 'Clayey' sandy gravel Gravel: coarse, becoming finer, subangular to subrounded with some rounded flint; occasional flint cobbles Sand: fine to coarse becoming fine with medium, orange-brown and greenish grey; peat-stained from 0.3 to 0.7 m. Yellowish brown, medium, clayey, silty sand occurs between 1.7 and 2.7 m	2.7	2.7
Barton Beds	B. 'Very clayey' sand Sand: fine, silty, yellowish orange	3.0+	5.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 36	+16	23		0.0	0.3	5	7	9	6	13	60
	-16 + 4	13		0.3	0.7	11	38	19	4	8	20
				0.7	1.7	11	29	19	11	19	11
Sand 51	- 4 + 1	9		1.7	2.7	17	12	27	8	20	16
	- 1 + ¼	21									
	- ¼ + 1/16	21									
Fines 13	- 1/16	13									
B.											
Gravel 0	+16	0		2.7	3.7	20	79	1	0	0	0
	-16 + 4	0		3.7	4.7	64	36	0	0	0	0
				4.7	5.7	23	77	0	0	0	0
Sand 64	- 4 + 1	0									
	- 1 + ¼	0									
	- ¼ + 1/16	64									
Fines 36	- 1/16	36									

SU 85 NE 96 8641 5927 Watchetts Wood, Frimley Block C

Surface level (+59.7 m) +196 ft
Water struck at +58.2 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.2 m
Mineral 4.0 m
Bedrock 2.3 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Silty, clayey soil	0.2	0.2
River Terrace Deposits (Second Terrace)	Gravel Gravel: fine to coarse, subangular to subrounded with occasional rounded flint, with some sandstone. Flint cobbles present between 1.5 and 3.5 m Sand: medium to fine, quartz with flint, greyish brown, becoming medium to coarse, grey and yellowish brown	4.0	4.2
Bracklesham Beds	Dark greenish grey, sandy silt	2.3+	6.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	58	+16	27	0.2	1.2	4	17	26	10	28	15
		-16 + 4	31	1.2	1.5	2	9	23	11	30	25
				1.5	2.5	0	4	15	13	32	36
Sand	40	- 4 + 1	13	2.5	3.5	1	6	17	15	30	31
		- 1 + ¼	19	3.5	4.2	2	6	16	14	33	29
		- ¼ + 1/16	8								
Fines	2	- 1/16	2								

SU 85 NE 97 8695 5818 Near Park Farm, Frimley

Surface level (+60.7 m) +199 ft
Water struck at +59.2 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.2 m
Mineral 4.8 m
Bedrock 1.4 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Silty, clayey soil	0.2	0.2
River Terrace Deposits (Second Terrace)	A. Gravel Gravel: fine, becoming coarse, subangular to subrounded with some rounded flint, with some sandstone Sand: fine to medium quartz, orange-brown and greenish grey to 1.5 m, becoming medium to coarse grey. Fine grey sand occurs between 4.5 5.0 m	4.8	5.0
Bracklesham Beds	B. Sand Sand: fine, grey, silty	1.4+	6.4

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	5	+16	33	0.2	0.8	9	25	16	11	33	6
		-16 + 4	26	0.8	1.5	8	18	12	8	29	25
				1.5	2.5	2	5	20	14	29	30
Sand	37	- 4 + 1	10	2.5	3.5	1	3	14	13	29	40
		- 1 + ¼	16	3.5	4.5	2	11	20	8	19	40
		- ¼ + 1/16	11	4.5	5.0	3	20	6	3	14	54
Fines	4	- 1/16	4								
B.											
Gravel	0	+16	0	5.0	6.4	8	83	8	1	0	0
		-16 + 4	0								
Sand	92	- 4 + 1	1								
		- 1 + ¼	8								
		- ¼ + 1/16	83								
Fines	8	- 1/16	8								

SU 85 NE 98 8705 5735 near The Grange, Farnborough

Surface level (+65.8 m) +216 ft
Water struck at +58.5 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.6 m
Mineral 2.8 m
Bedrock 4.6 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Clayey, loamy soil	0.4	0.4
Alluvium	A.	'Clayey' sand Sand: fine quartz, pale brown	0.2	0.6
River Terrace Deposits (Third Terrace)	B.	Sandy gravel Gravel: fine to coarse, subangular to subrounded, with some rounded flint and with some sandstone Sand: medium to coarse quartz with flint, reddish brown becoming yellowish with depth. Some thin clay bands present	2.8	3.4
Bracklesham Beds	C.	'Very clayey' sand Sand: fine quartz, yellow and green, becoming grey at 7.0 m	4.6+	8.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	0	+16	0	0.4	0.6	14	72	13	1	0	0
		-16 + 4	0								
Sand	86	- 4 + 1	1								
		- 1 + ¼	13								
		- ¼ + 1/16	72								
Fines	14	- 1/16	14								
B.											
Gravel	47	+16	19	0.6	1.6	8	9	23	11	27	22
		-16 + 4	28	1.6	2.6	8	6	23	14	30	19
				2.6	3.4	5	8	32	13	27	15
Sand	46	- 4 + 1	13								
		- 1 + ¼	25								
		- ¼ + 1/16	8								
Fines	7	- 1/16	7								
C.											
Gravel	1	+16	0	3.4	4.4	14	76	5	2	2	1
		-16 + 4	1	4.4	5.4	21	77	2	0	0	0
				5.4	5.8	18	79	3	0	0	0
Sand	78	- 4 + 1	0	5.8	6.8	24	75	1	0	0	0
		- 1 + ¼	3	6.8	7.3	27	73	0	0	0	0
		- ¼ + 1/16	75								
Fines	21	- 1/16	21								

SU 85 NE 99 8822 5744 Manor Farm, Frimley

Surface level +65.1 m (+214 ft)
Water struck at +62.6 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.3 m
Mineral 4.6 m
Bedrock 1.6 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Clayey, loamy soil	0.3	0.3
River Terrace Deposits (Third Terrace)	A.	Sandy gravel; with peat between 0.4 and 0.6 m, and sand between 2.5 and 3.9 m Gravel: fine to coarse, subangular to subrounded, and occasional angular and rounded, brown and black flint, with sandstone and traces of vein-quartz Sand: mainly fine and medium quartz, brown and greenish grey, becoming orange with depth	4.6	4.9
Bracklesham Beds	B.	'Clayey' sand Sand: fine quartz, yellowish green, glauconitic, silty and clayey	1.6+	6.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	27	+16	6	0.3	0.4	1	6	21	14	38	20
		-16 + 4	21	0.4	2.5	12	32	16	4	36	0
				2.5	3.5	6	59	32	1	2	0
Sand	65	- 4 + 1	4	3.5	3.9	6	34	43	8	7	2
		- 1 + ¼	26	3.9	4.9	2	22	33	7	13	23
		- ¼ + 1/16	35								
Fines	8	- 1/16	8								
B.											
Gravel	0	+16	0	4.9	5.9	14	82	3	1	0	0
		-16 + 4	0	5.9	6.5	14	84	2	0	0	0
Sand	86	- 4 + 1	1								
		- 1 + ¼	2								
		- ¼ + 1/16	83								
Fines	14	- 1/16	14								

SU 85 NE 100 8813 5578 near Coleford Bridges, Frimley Block C

Surface level (+63.9 m) +210 ft
Water struck at +61.4 m
Shell and auger, (152 mm) 6 in diameter
October 1974

Overburden 2.3 m
Mineral 3.2 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, silty, loamy soil	0.4	0.4
Alluvium	A. 'Very clayey' pebbly sand; with 'very clayey' sand between 0.4 and 1.0 m Gravel: fine to coarse, subangular to subrounded, flint with sandstone Sand: fine, quartz with flint, yellowish brown becoming greenish grey	1.9	2.3
River Terrace Deposits (Second Terrace)	B. Sandy gravel Gravel: fine to coarse, mainly sub-angular with angular to rounded, brown and black flint, with yellow sandstone and with some chert and vein-quartz. Flint cobbles occur between 3.5 and 4.5 m Sand: fine to coarse, quartz with flint, greenish grey, becoming grey at 2.5 m	3.2	5.5
Bracklesham Beds	C. Sand Sand: fine quartz, silty, grey	1.0+	6.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	8	+16	3	0.4	1.0	27	67	5	1	0	0
		-16 + 4	5	1.0	2.3	19	52	14	3	7	5
Sand	70	- 4 + 1	4								
		- 1 + ¼	10								
		- ¼ + 1/16	56								
Fines	22	- 1/16	22								
B.											
Gravel	47	+16	24	2.3	2.5	11	28	16	7	21	17
		-16 + 4	23	2.5	3.5	1	7	18	14	27	33
				3.5	4.5	1	4	13	26	26	30
Sand	49	- 4 + 1	15	4.5	5.5	3	41	15	9	20	12
		- 1 + ¼	15								
		- ¼ + 1/16	19								
Fines	4	- 1/16	4								
C.											
Gravel	1	+16	0	5.5	6.5	9	78	11	1	1	0
		-16 + 4	1								
Sand	90	- 4 + 1	1								
		- 1 + ¼	11								
		- ¼ + 1/16	78								
Fines	9	- 1/16	9								

SU 85 NE 101 8917 5942 near Camberley Heath Golf Club House, Frimley

Surface level +110.5 m (+363 ft)
Water level not recorded
Shell and auger, (152 mm) 6in diameter
April 1974

Mineral 2.8 m
Bedrock 2.2 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eighth Terrace)	A. Gravel Gravel: fine to coarse, angular to subrounded with occasional rounded brown flint, with some subangular yellow sandstone and traces of vein-quartz. Cobbles of flint between 0.7 and 1.2 m Sand: fine to coarse, quartz with flint, grey, becoming orange-brown at 1.2 m	2.8	2.8
Barton Beds	B. 'Clayey' sand Sand: fine quartz, clayey and silty, greenish yellow and orange, becoming pale yellow at 3.8 m	2.2+	5.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages						
						Fines	Sand			Gravel		
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.												
Gravel	53	+16	32	0.0	0.7	3	22	23	13	13	26
		-16 + 4	21	0.7	1.2	9	7	15	9	21	39
				1.2	2.2	8	7	18	8	26	33
Sand	40	- 4 + 1	9	2.2	2.8	8	16	14	7	22	33
		- 1 + ¼	18								
		- ¼ + 1/16	13								
Fines	7	- 1/16	7								
B.												
Gravel	0	+16	0	2.8	3.8	19	78	2	0	1	0
		-16 + 4	0	3.8	5.0	17	82	0	1	0	0
Sand	82	- 4 + 1	1								
		- 1 + ¼	1								
		- ¼ + 1/16	80								
Fines	18	- 1/16	18								

SU 85 NE 102 8974 5824 near Frith Hill Road, Frimley Block B

Surface level (+103.6 m) +340 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
April 1974

Mineral 2.0 m
Bedrock 4.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. Gravel Gravel: fine to coarse, subangular to subrounded with occasional angular and rounded brown flint with some sandstone Sand: fine to coarse quartz with flint, grey and peaty in top 0.2 m, becoming yellowish brown; clayey in parts	2.0	2.0
Barton Beds	B. 'Clayey' sand Sand: fine quartz, silty, clayey, yellowish orange with occasional pebbles between 2.0 and 3.0 m	4.0+	6.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	56	+16	31	0.2	1.0	8	9	11	10	26	36
		-16 + 4	25	1.0	1.5	9	6	17	10	26	32
				1.5	2.0	7	23	19	8	20	23
Sand	35	- 4 + 1	9								
		- 1 + ¼	15								
		- ¼ + 1/16	11								
Fines	9	- 1/16	9								
B.											
Gravel	1	+16	0	2.0	3.0	12	81	2	1	4	0
		-16 + 4	1	3.0	4.0	9	88	2	1	0	0
				4.0	5.0	12	86	2	0	0	0
Sand	86	- 4 + 1	0	5.0	6.0	17	82	1	0	0	0
		- 1 + ¼	2								
		- ¼ + 1/16	84								
Fines	13	- 1/16	13								

SU 85 NE 103 8864 5514 Linsford Farm, Frimley Block C

Surface level +67.5 m (+222 ft)
Water struck at +65.9 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.3 m
Mineral 2.9 m
Bedrock 2.8 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Sandy, peaty soil	0.3	0.3
River Terrace Deposits (Third Terrace)	A. Sandy gravel; with fine and medium clayey sand between 0.3 and 1.0 m, becoming pebbly with depth Gravel: fine to coarse, subangular to subrounded, black with brown flints, with some sandstone. Some flints patinated Sand: fine to coarse, quartz with flint, greenish yellow and brown between 0.3 and 0.6 m, becoming orange	2.9	3.2
Bracklesham Beds	B. 'Very clayey' sand; with bright green sandy clay between 3.2 and 4.2 m Sand: fine quartz, silty, clayey, green	2.8+	6.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	43	+16	18	0.3	1.2	8	53	15	3	12	9
		-16 + 4	25	1.2	2.2	3	4	22	19	25	27
				2.2	3.2	2	3	25	16	37	17
Sand	53	- 4 + 1	13								
		- 1 + ¼	21								
		- ¼ + 1/16	19								
Fines	4	- 1/16	4								
B.											
Gravel	0	+16	0	3.2	4.2	35	62	1	1	1	0
		-16 + 4	0	4.2	5.2	27	71	1	1	0	0
				5.2	6.0	34	65	0	1	0	0
Sand	71	- 4 + 1	1								
		- 1 + ¼	1								
		- ¼ + 1/16	69								
Fines	29	- 1/16	29								

SU 85 NE 104 8608 5860 near Edenbrook, Hawley Block C

Surface level (+59.1 m) +194 ft
Water struck at +57.6 m
Shell and auger, (152 mm) 6 in diameter
January 1975

Overburden 0.6 m
Mineral 5.2 m
Bedrock 0.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Pebbly soil	0.2	0.2
Alluvium	Orange-brown and grey silty clay	0.4	0.6
River Terrace Deposits (Second Terrace)	Gravel Gravel: fine to coarse, angular to rounded, brown and black flints, with some subrounded yellow sandstone. Some flints patinated Sand: fine quartz between 0.6 and 1.6 m, becoming medium and coarse from 1.6 to 5.8 m; greenish grey and slightly clayey	5.2	5.8
Bracklesham Beds	Fine, quartz, sand, grey, clayey	0.5+	6.3

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	60	+16	33	0.6	1.6	23	35	13	8	17	4
		-16 + 4	27	1.6	2.6	2	4	12	11	32	39
				2.6	3.6	1	5	13	12	30	39
Sand	34	- 4 + 1	12	3.6	4.6	1	5	15	13	28	38
		- 1 + ¼	13	4.6	5.8	2	1	10	15	29	43
		- ¼ + 1/16	9								
Fines	6	- 1/16	6								

SU 85 SW 6 8249 5328 Near Pondtail Bridge, Fleet Block D

Surface level (+80.5 m) +264 ft
Water Struck at +75.8 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Mineral 1.7 m
Bedrock 4.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Downwash Gravel	A. 'Clayey' pebbly sand Gravel: fine to coarse, angular to subrounded, brown flint, with a pebble band between 1.3 and 1.5 m Sand: fine, quartz, pinkish grey and peaty to 0.7 m, becoming greenish yellow and brown, fine clayey sand with green clay at 1.2 m	1.7	1.7
Bracklesham Beds	B. 'Very clayey' sand Sand: fine quartz clayey, silty, greenish yellow, becoming orange below 5.3 m	4.5+	6.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	11	+16	4	0.0	0.7	15	66	12	1	4	2
		-16 + 4	7	0.7	1.7	17	57	8	4	8	6
Sand	73	- 4 + 1	3								
		- 1 + ¼	9								
		- ¼ + 1/16	61								
Fines	16	- 1/16	16								
B.											
Gravel	0	+16	0	1.7	2.7	27	68	4	1	0	0
		-16 + 4	0	2.7	3.7	23	71	6	0	0	0
				3.7	4.7	20	77	3	0	0	0
Sand	78	- 4 + 1	0	4.7	5.7	18	80	2	0	0	0
		- 1 + ¼	4	5.7	6.2	20	78	2	0	0	0
		- ¼ + 1/16	74								
Fines	22	- 1/16	22								

SU 85 SW 7 8427 5233 Ravine Head, Aldershot Block D

Surface level (+94.8 m) +311 ft
Water struck at +84.3 m
Shell and auger, (152 mm) 6 in diameter
March 1974

Overburden 0.1 m
Mineral 1.6 m
Bedrock 18.8 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Silty, sandy pebbly soil	0.1	0.1
Downwash Gravel	A. 'Clayey' pebbly sand Gravel: fine to coarse angular to subangular with some rounded flint with occasional sandstone Sand: fine quartz, pinkish grey to 0.4 m, passing into 0.1 m of dark brown peaty sand. Pale green and orange-brown fine sand between 0.5 and 1.7 m	1.6	1.7
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, clayey, orange-brown between 1.7 and 2.7 m, passing into fine clayey orange-brown sand, with greenish yellow and grey bands	9.8	12.5
Bracklesham Beds	C. 'Clayey' sand Sand: fine quartz, green and yellowish brown, becoming less silty and clayey below 14.0 m	9.0+	21.5

GRADING

Mean for Deposit				Depth below surface (m)		Fines	Bulk Samples Percentages Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	12	+16	13	0.1	0.6	14	66	10	3	4	3
		-16 + 4	9	0.6	1.2	17	72	1	1	7	2
				1.2	1.7	16	58	2	1	17	6
Sand	72	- 4 + 1	2								
		- 1 + ¼	5								
		- ¼ + 1/16	65								
Fines	16	- 1/16	16								
B.											
Gravel	0	+16	0	1.7	2.7	20	75	4	1	0	0
		-16 + 4	0	2.7	3.7	18	78	4	0	0	0
				3.7	4.5	20	77	2	1	0	0
Sand	78	- 4 + 1	1	4.5	5.5	21	77	2	0	0	0
		- 1 + ¼	1	5.5	6.5	20	79	1	0	0	0
		- ¼ + 1/16	76	6.5	7.9	20	79	1	0	0	0
				7.9	8.5	25	74	1	0	0	0
Fines	22	- 1/16	22	8.5	9.5	25	75	0	0	0	0
				9.5	10.5	24	76	0	0	0	0
				10.5	11.5	23	76	0	1	0	0
				11.5	12.5	26	72	2	0	0	0
C.											
Gravel	0	+16	0	12.5	13.5	34	63	3	0	0	0
		-16 + 4	0	13.5	14.0	30	66	4	0	0	0
				14.0	15.0	15	79	6	0	0	0
Sand	86	- 4 + 1	0	15.0	16.0	13	80	6	1	0	0
		- 1 + ¼	6	16.0	17.0	2	90	7	1	0	0
		- ¼ + 1/16	80	17.0	18.0	8	85	7	0	0	0
				18.0	19.0	11	85	4	0	0	0
Fines	14	- 1/16	14	19.0	20.0	9	84	7	0	0	0
				20.0	21.5	10	83	6	1	0	0

SU 85 SW 8 8313 5496 Near Fleet Pond, Hawley Block D

Surface level (+79.2 m) +260 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
October 1974

Overburden 0.1 m
Mineral 1.0 m
Bedrock 2.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Silty, clayey pebbly soil	0.1	0.1
Downwash Gravel	A.	'Very clayey' sand Sand: fine, grey and peaty to 0.8 m, becoming fine, mottled light brown and orange-brown	1.0	1.1
Barton Beds	B.	Clay Greyish brown sandy clay	2.0+	3.1

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16+¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	0	+16	0	0.1	0.8	29	55	7	9	0	0
		-16 + 4	0	0.8	1.1	30	61	5	4	0	0
Sand	71	- 4 + 1	7								
		- 1 + ¼	7								
		- ¼ + 1/16	57								
Fines	29	- 1/16	29								
B.											
Gravel	0	+16	0	1.1	2.1	48	51	1	0	0	0
		-16 + 4	0	2.1	3.1	39	60	1	0	0	0
Sand	56	- 4 + 1	0								
		- 1 + ¼	1								
		- ¼ + 1/16	55								
Fines	44	- 1/16	44								

SU 85 SW 9 8321 5377 Pyestock Hill, Hawley Block D

Surface level (+86.9 m) +285 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
October 1974

Overburden 0.1 m
Mineral 2.6 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Silty, pebbly, clayey soil	0.1	0.1
Downwash Gravel	A.	'Very clayey' sandy gravel Gravel: fine to coarse, mainly angular, brown patinated flint with some rounded sandstone and vein-quartz Sand: fine quartz, peaty to 0.7 m becoming grey and orange-brown, clayey, with traces of glauconite	2.6	2.7
Barton Beds	B.	Sandy silt Mottled greyish brown and orange-brown glauconitic sandy silt	3.0+	5.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	22	+16	14	0.1	0.7	14	41	6	3	13	23
		-16 + 4	8	0.6	1.3	22	39	6	3	8	22
				1.3	2.0	27	64	7	2	0	0
Sand	57	- 4 + 1	3	2.0	2.7	21	44	6	4	11	14
		- 1 + ¼	6								
		- ¼ + 1/16	48								
Fines	21	- 1/16	21								
B.											
Gravel	0	+16	0	2.7	3.7	93	6	1	0	0	0
		-16 + 4	0	3.7	4.7	53	47	0	0	0	0
				4.7	5.7	52	48	0	0	0	0
Sand	34	- 4 + 1	0								
		- 1 + ¼	0								
		- ¼ + 1/16	34								
Fines	66	- 1/16	66								

SU 85 SE 16 8574 5473 Nr. Eelmoor Farm, Farnborough Block D

Surface level (+62.2 m) +204 ft
Water struck at +57.8 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Waste 0.7 m
Bedrock 4.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.2	0.2
Alluvium	Brown and yellow mottled silty clay	0.5	0.7
Bracklesham Beds	'Clayey' sand Sand: fine quartz, grey and green, silty, clayey	4.0+	4.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages						
						Fines	Sand			Gravel		
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	0	+16	0	0.7	1.7	17	76	5	1	0	1
		-16 + 4	0	1.7	2.7	16	76	6	2	0	0
				2.7	3.7	18	76	6	0	0	0
Sand	83	- 4 + 1	1	3.7	4.7	18	78	4	0	0	0
		- 1 + ¼	5								
		- ¼ + 1/16	77								
Fines	17	- 1/16	17								

SU 85 SE 17 8520 5238 Claycart Hill, Aldershot Block D

Surface level (+82.6 m) +271 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
March 1974

Overburden 0.5 m
Mineral 1.1 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Soil	0.1	0.1
Peat		Very sandy peat	0.4	0.5
Downwash Gravel	A.	'Clayey' sandy gravel Gravel: fine to coarse, subangular brown flint with cobbles. Some flints patinated Sand: fine, quartz, yellowish orange, clayey	1.1	1.6
Barton Beds	B.	'Very clayey' sand Sand: fine, quartz with flint, yellow, clayey	3.0+	4.6

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	25	+16	11	0.5	1.6	14	46	8	7	14	11
		-16 + 4	14								
Sand	61	- 4 + 1	7								
		- 1 + ¼	8								
		- ¼ + 16	46								
Fines	14	- 1/16	14								
B.											
Gravel	0	+16	0	1.6	2.6	30	66	2	1	1	0
		-16 + 4	0	2.6	3.6	21	74	4	1	0	0
				3.6	4.6	18	77	5	0	0	0
Sand	77	- 4 + 1	2								
		- 1 + ¼	3								
		- ¼ + 1/16	72								
Fines	23	- 1/16	23								

SU 85 SE 18 8848 5339 near Lynchford Corner, Farnborough Block C

Surface level (+67.1 m) +220 ft
Water struck at +65.3 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 1.9 m
Mineral 3.9 m
Bedrock 0.9 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Made Ground		0.9	0.9
Alluvium	A. 'Clayey' sand Sand: fine quartz, buff, clayey, becoming orange and peat-stained. At 1.4 m green and orange sand occurs	1.0	1.9
River Terrace Deposits (Second Terrace)	B. Gravel Gravel: fine to coarse, subangular and angular black and brown flint with some green sandstone. Pebbles subangular and subrounded below 4.8 m. Some flints patinated Sand: fine quartz, clayey, peaty, mottled green and brown between 1.9 and 2.6 m. Peat present between 2.25 and 2.5 m. Coarse and medium dark blue and green sand from 2.6 m, becoming fine green sand at 4.8 m	3.9	5.8
Bracklesham Beds	C. 'Clayey' sand Sand: fine quartz, silty, bluish grey	0.9+	6.7

GRADING

Mean for Deposit				Depth below surface (m)		Fines	Bulk Samples Percentages Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
A.											
Gravel	3	+16	2	0.9	1.9	16	73	8	0	1	2
		-16 + 4	1								
Sand	81	- 4 + 1	0								
		- 1 + $\frac{1}{4}$	8								
		- $\frac{1}{4}$ + 1/16	73								
Fines	16	- 1/16	16								
B.											
Gravel	49	+16	26	1.9	2.8	18	47	10	5	11	9
		-16 + 4	23	2.8	3.8	1	4	11	14	31	39
				3.8	4.8	1	3	13	17	40	26
Sand	46	- 4 + 1	12	4.8	5.8	3	38	12	8	12	27
		- 1 + $\frac{1}{4}$	11								
		- $\frac{1}{4}$ + 1/16	23								
Fines	5	- 1/16	5								
C.											
Gravel	2	+16	0	5.8	6.7	13	81	3	1	2	0
		-16 + 4	2								
Sand	85	- 4 + 1	1								
		- 1 + $\frac{1}{4}$	3								
		- $\frac{1}{4}$ + 1/16	81								
Fines	13	- 1/16	13								

SU 85 SE 19 8894 5116 near Shawfield Farm, Ash Block C

Surface level (+68.9 m) +226 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
March 1974

Overburden 0.1 m
Mineral 3.9 m
Bedrock 6.8 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.1	0.1
River Terrace Deposits (Third Terrace)	A. 'Clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded flint, becoming angular to subangular below 1.5 m. Some subangular sandstone. Some flints patinated Sand: fine quartz with flints, peat from 0.1 to 0.8 m; becoming fine and medium, clayey, pale greenish grey and yellowish brown quartz with flint sand. Medium, pale yellowish brown sand with clay patches between 1.5 and 4.0 m	3.9	4.0
Bagshot Beds	B. Sand Sand: fine quartz, orange-brown becoming bluish grey and brown at 7.2 m	3.5	7.5
?London Clay	C. 'Very clayey' sand Sand: fine to medium quartz greenish grey, silty, becoming bluish grey with grey clay	3.3+	10.8

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages				
						Fines	Sand			Gravel	
	%	mm	-%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	38	+16	18	0.1	0.8	16	59	13	2	4	6
		-16 + 4	20	0.8	1.1	11	25	18	9	22	15
				1.1	1.5	29	41	16	7	6	1
Sand	52	- 4 + 1	8	1.5	2.5	9	11	28	10	24	18
		- 1 + ¼	21	2.5	3.2	5	4	21	11	29	30
		- ¼ + 1/16	23	3.2	4.0	3	19	22	11	22	23
Fines	10	- 1/16	10								
B.											
Gravel	0	+16	0	4.0	5.0	7	81	11	1	0	0
		-16 + 4	0	5.0	6.5	8	83	9	0	0	0
				6.5	7.5	12	57	30	1	0	0
Sand	91	- 4 + 1	1								
		- 1 + ¼	15								
		- ¼ + 1/16	75								
Fines	9	- 1/16	9								
C.											
Gravel	0	+16	0	7.5	8.5	53	26	21	0	0	0
		-16 + 4	0	8.5	9.5	13	44	42	1	0	0
				9.5	10.8	30	51	19	0	0	0
Sand	68	- 4 + 1	0								
		- 1 + ¼	27								
		- ¼ + 1/16	41								
Fines	32	- 1/16	32								

SU 85 SE 20 8859 5066 Shawfield House, Ash Block C

Surface level (+68.3 m) +224 ft
Water struck at +65.8 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 2.8 m
Bedrock 1.1 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.1	0.1
River Terrace Deposits (Second Terrace)	'Very clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded, brown flint Sand: fine quartz with flint, brown, clayey, becoming less clayey and coarser below 1.5 m	2.8	2.9
London Clay	Grey silty clay	1.1+	4.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel 21	+16	10		0.1	1.5	31	47	13	3	4	2
	-16 + 4	11		1.5	2.9	14	18	25	7	19	17
Sand 56	- 4 + 1	5									
	- 1 + ¼	19									
	- ¼ + 1/16	32									
Fines 23	- 1/16	23									

SU 86 NW 7 8116 6729 Luckly Park, Wokingham Within Block A

Surface level (+57.0 m) +187 ft
Water struck at +54.7 m
Shell and auger, (152 mm) 6 in diameter
June 1974

Overburden 0.2 m
Mineral 2.5 m
Bedrock 1.3 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Sandy soil	0.2	0.2
River Terrace Deposits (Second Terrace)	'Clayey' sandy gravel, sandy in upper 1.0 m, gravelly in lower 1.5 m Gravel: fine to coarse, subangular to subrounded flint, with occasional flint cobbles Sand: fine to coarse quartz with flint, silty and clayey throughout, light brown becoming orange with depth	2.5	2.7
Bagshot Beds	Grey sandy clay and brown silt becoming mottled brown and grey silty clay and then grey clayey silt	1.3+	4.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
Gravel	25	+16	13	0.2	1.2	12	42	31	10	5	0
		-16 + 4	12	1.2	2.2	12	14	26	12	15	21
				2.2	2.7	9	9	28	13	19	22
Sand	64	- 4 + 1	11								
		- 1 + $\frac{1}{4}$	28								
		- $\frac{1}{4}$ + 1/16	25								
Fines	11	- 1/16	11								

SU 86 NW 8 8175 6552 Gorrick Plantation, Wokingham Without Block A

Surface level (+65.5 m) +215 ft
Water not struck
Shell and auger (152 mm) 6 in diameter
June 1974

Mineral 1.3 m
Bedrock 4.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Third Terrace)	A. Sandy gravel Gravel: fine to coarse, subangular to subrounded with occasional rounded flint Sand: fine and medium quartz with flint, dark brown, becoming reddish brown with depth	1.3	1.3
Bagshot Beds	B. 'Clayey' sand Sand: fine, becoming fine and medium, quartz; mottled grey and reddish brown, less silty with depth	4.0+	5.3

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	43	+16	12	0.0	0.5	12	35	17	7	25	4
		-16 + 4	31	0.5	1.3	8	26	10	9	32	15
Sand	48	- 4 + 1	8								
		- 1 + ¼	12								
		- ¼ + 1/16	28								
Fines	9	- 1/16	9								
B.											
Gravel	0	+16	0	1.3	2.3	23	76	1	0	0	0
		-16 + 4	0	2.3	3.3	11	73	16	0	0	0
				3.3	4.3	7	33	60	0	0	0
Sand	88	- 4 + 1	0	4.3	5.3	6	35	59	0	0	0
		- 1 + ¼	34								
		- ¼ + 1/16	54								
Fines	12	- 1/16	12								

SU 86 NW 9 8241 6638 Near Birchin Inhams, Wokingham Without Block A

Surface level (+63.4 m) +208 ft
Water struck at +61.4 m
Shell and auger, (152 mm) 6 in diameter
November 1974

Overburden 0.5 m
Mineral 1.5 m
Bedrock 2.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Made Ground		0.5	0.5
River Terrace Deposits (Third Terrace)	A. 'Clayey' pebbly sand Gravel: fine, angular to subangular, brown flint with some rounded flint; some flint patinated Sand: medium and fine quartz, orange-brown and brown, clayey	1.5	2.0
Bagshot Beds	B. 'Very clayey' pebbly sand Sand: fine quartz, orange-brown, alternating with light grey and orange-brown sandy clay. Thin bands of dark grey clay occur below 3.0 m	2.0+	4.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	5	+16	0	0.5	1.5	19	55	20	2	4	0
		-16 + 4	5	1.5	2.0	19	55	18	3	5	0
Sand	76	- 4 + 1	2								
		- 1 + ¼	19								
		- ¼ + 1/16	55								
Fines	19	- 1/16	19								
B.											
Gravel	5	+16	2	2.0	3.0	35	43	10	2	5	5
		-16 + 4	3	3.0	4.0	38	53	8	1	0	0
Sand	58	- 4 + 1	1								
		- 1 + ¼	9								
		- ¼ + 1/16	48								
Fines	37	- 1/16	37								

SU 86 NW 10 8218 6501 Near Ravenswood Wokingham Without Block A

Surface level (+63.1 m) +207 ft
Water struck at +62.1 m
Shell and auger, (152 mm) 6 in diameter
November 1974

Waste 0.2 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Black peaty sandy soil	0.2	0.2
Bagshot Beds	'Clayey' sand Sand: fine to medium quartz brownish grey becoming grey at 2.2 m	3.0+	3.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
Gravel	0	+16	0	0.2	1.2	14	73	12	1	0	0
		-16 + 4	0	1.2	2.2	12	48	40	0	0	0
				2.2	3.2	9	49	42	0	0	0
Sand	89	- 4 + 1	0								
		- 1 + $\frac{1}{4}$	32								
		- $\frac{1}{4}$ + 1/16	57								
Fines	11	- 1/16	11								

SU 86 NW 11 8393 6589 Pinewood Hospital, Wokingham Without Block A

Surface level (+71.0 m) +233 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.7 m
Mineral 2.0 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Made Ground	Ash and stony sandy soil	0.7	0.7
River Terrace Deposits (Third Terrace)	A. 'Clayey' sandy gravel, with alternating sand and sandy gravel between 1.2 and 2.2 m Gravel: fine to coarse, angular to subrounded with occasional well rounded flint. Flint cobbles present between 2.2 and 2.5 m Sand: fine and medium quartz with flint, reddish brown becoming greyish brown. Clayey at about 2.6 m	2.0	2.7
Bagshot Beds	B. 'Clayey' sand Sand: fine quartz, pale yellow becoming orange at 5.0 m. Clayey throughout	3.0+	5.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	41	+16	20	0.7	1.2	6	19	18	4	25	28
		-16 + 4	21	1.2	2.2	10	37	18	4	18	13
				2.2	2.7	12	22	10	6	23	27
Sand	49	- 4 + 1	5								
		- 1 + ¼	15								
		- ¼ + 1/16	29								
Fines	10	- 1/16	10								
B.											
Gravel	0	+16	0	2.7	3.7	18	75	6	0	1	0
		-16 + 4	0	3.7	4.7	18	76	6	0	0	0
				4.7	5.7	14	78	8	0	0	0
Sand	83	- 4 + 1	0								
		- 1 + ¼	7								
		- ¼ + 1/16	76								
Fines	17	- 1/16	17								

SU 86 NW 12 8198 6674 Near Gorrick Well, Wokingham Without Block A

Surface level (+60.4 m) +198 ft
Water struck at +57.9 m
Shell and auger, (152 mm) 6 in diameter
November 1974

Overburden 0.3 m
Mineral 4.2 m
Bedrock 1.3 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	'Clayey' sandy gravel Gravel: fine to coarse, angular to subrounded red and brown flint and black rounded flint Sand: fine and medium quartz with flint, greyish brown, orange-brown and brown. Clayey at top, becoming less clayey with depth	4.2	4.5
Bagshot Beds	Grey sandy clay with occasional pebbles, becoming silty sandy clay at 5.0 m	1.3+	5.8

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
Gravel 23	+16	9		0.3	1.0	29	30	20	5	11	5
	-16 + 4	14		1.0	2.0	26	26	24	6	12	6
				2.0	2.9	20	20	38	6	10	6
Sand 61	- 4 + 1	7		2.9	3.9	3	4	48	12	21	12
	- 1 + $\frac{1}{4}$	36		3.9	4.5	2	11	49	8	17	13
	- $\frac{1}{4}$ + 1/16	18									
Fines 16	- 1/16	16									

SU 86 NE 34 8654 6525 Near Caesars Camp, Easthampstead Block B

Surface level (+126.5 m) +415 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 4.4 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eleventh Terrace)	A. 'Clayey' gravel; sand in upper 0.7 m, gravel in lower 3.7 m Gravel: fine to coarse, angular to subangular, with occasional subrounded and rounded flint Sand: fine and medium, becoming fine to coarse below 1.6 m, quartz with some flint; light orange-brown	4.4	4.4
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, light orange-brown	1.0+	5.4

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	50	+16	29	0.0	0.1	19	49	19	3	6	4
		-16 + 4	21	0.1	0.6	11	60	24	2	3	0
				0.6	1.6	7	15	13	5	23	37
Sand	40	- 4 + 1	7	1.6	2.6	8	5	11	6	17	53
		- 1 + ¼	15	2.6	3.6	9	4	14	14	29	30
		- ¼ + 1/16	18	3.6	4.4	16	24	17	9	25	9
Fines	10	- 1/16	10								
B.											
Gravel	0	+16	0	4.4	5.4	23	75	1	1	0	0
		-16 + 4	0								
Sand	77	- 4 + 1	1								
		- 1 + ¼	1								
		- ¼ + 1/16	75								
Fines	23	- 1/16	23								

SU 86 SW 2 8050 6401 Armholes, Finchampstead Block B

Surface level (+100.9 m) +331 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Overburden 0.1 m
Mineral 1.7 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.1	0.1
River Terrace Deposits (Eighth Terrace)	A. 'Clayey' sandy gravel; gravel mainly between 0.1 and 0.8 m; sand layer between 0.8 and 1.8 m Gravel: fine to coarse, angular to rounded, brown flint Sand: fine and medium quartz with flint, brown from 0.1 to 0.8 m, becoming dark orange-brown and grey, with laminations, from 0.8 to 1.8 m	1.7	1.8
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, light orange-brown, becoming mottled dark orange-brown and grey at 2.8 m	3.0+	4.8

GRADING

Mean for Deposit				Depth below surface (m)		Fines	Bulk Samples Percentages Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 21	+16	11		0.1	0.8	13	11	19	7	23	27
	-16 + 4	10		0.8	1.8	20	48	29	2	1	0
Sand 62	- 4 + 1	4									
	- 1 + ¼	25									
	- ¼ + 1/16	33									
Fines 17	- 1/16	17									
B.											
Gravel 0	+16	0		1.8	2.8	34	65	1	0	0	0
	-16 + 4	0		2.8	3.8	36	63	1	0	0	0
				3.8	4.8	36	61	3	0	0	0
Sand 65	- 4 + 1	0									
	- 1 + ¼	2									
	- ¼ + 1/16	63									
Fines 35	- 1/16	35									

SU 86 SW 3 8035 6264 Near Moorgreen Farm, Finchampstead Block C

Surface level +53.3 m (+175 ft)
Water struck at +52.3 m
Shell and auger, (152 mm) 6 in diameter
June 1974

Overburden 1.0 m
Mineral 4.4 m
Bedrock 3.6 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Clayey, loamy soil	0.2	0.2
Alluvium		Dark grey, silty clay	0.8	1.0
River Terrace Deposits (First Terrace)	A.	Gravel; sandy below 4.0 m Gravel: fine to coarse, angular to subrounded, brown flint with occasional well rounded black flint. Some flint patinated Sand: fine to coarse quartz with flint; greyish brown	4.4	5.4
Bagshot Beds	B.	'Clayey' sand Sand: fine quartz, grey, with grey clay laminae	3.6+	9.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	55	+16	29	1.0	2.0	5	13	11	9	27	35
		-16 + 4	26	2.0	3.0	4	12	9	4	33	38
				3.0	4.0	1	5	15	7	31	41
Sand	40	- 4 + 1	7	4.0	5.4	7	36	21	8	19	9
		- 1 + ¼	15								
		- ¼ + 1/16	18								
Fines	5	- 1/16	5								
B.											
Gravel	0	+16	0	5.4	9.0	10	67	21	2	0	0
		-16 + 4	0								
Sand	90	- 4 + 1	2								
		- 1 + ¼	21								
		- ¼ + 1/16	67								
Fines	10	- 1/16	10								

SU 86 SW 4 8026 6287 Near Moorgreen Farm, Finchampstead Block C

Surface level +56.6 m (+186 ft)
Water struck at +55.1 m
Shell and auger, (152 mm) 6 in diameter
October 1974

Overburden 0.5 m
Mineral 3.4 m
Bedrock 2.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Dark brown, stony soil	0.2	0.2
Alluvium		Sandy clay	0.3	0.5
River Terrace Deposits (Third Terrace)	A.	'Clayey' gravel Gravel: fine to coarse, angular to rounded, flint Sand: fine to coarse quartz with flint, orange-brown	3.4	3.9
Bagshot Beds	B.	Clay Orange-brown fine sandy clay becoming grey at 5.0 m	2.0+	5.9

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	55	+16	24	0.5	1.5	11	16	14	9	33	17
		-16 + 4	31	1.5	2.5	16	15	14	14	30	11
				2.5	3.9	6	9	9	7	32	37
Sand	35	- 4 + 1	10								
		- 1 + ¼	12								
		- ¼ + 1/16	13								
Fines	10	- 1/16	10								
B.											
Gravel	0	+16	0	3.9	4.9	46	41	12	1	0	0
		-16 + 4	0								
Sand	54	- 4 + 1	1								
		- 1 + ¼	12								
		- ¼ + 1/16	41								
Fines	46	- 1/16	46								

SU 86 SW 5 | 8149 6206 | Near Mill Farm, Yateley | Block C

Surface level (+53.9 m) +177 ft
Water struck at +52.4 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.3 m
Mineral 3.2 m
Bedrock 1.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.3	0.3
River Terrace Deposits (Second Terrace)	Sandy gravel; top 1.0 m sandy silt Gravel: fine to coarse, subangular to subrounded with occasional well rounded flint Sand: fine to coarse quartz with flint; grey	3.2	3.5
Bagshot Beds	Grey, silty clay	1.5+	5.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
Gravel	42	+16	23	0.3	1.3	21	43	23	2	4	7
		-16 + 4	19	1.3	1.5	12	18	25	8	21	16
				1.5	2.5	2	4	15	8	33	38
Sand	49	- 4 + 1	8	2.5	3.5	5	10	27	12	21	25
		- 1 + $\frac{1}{4}$	22								
		- $\frac{1}{4}$ + 1/16	19								
Fines	9	- 1/16	9								

SU 86 SW 6 8014 6140 Watmore Farm, Eversley Block C

Surface level (+57.6 m) +189 ft
Water struck at +55.8 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.4 m
Mineral 3.4 m
Bedrock 3.2 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.4	0.4
River Terrace Deposits (Third Terrace)	Gravel Gravel: fine to coarse, subangular to subrounded, with occasional rounded, flint and traces of sandstone Sand: fine to coarse quartz, with some flint; yellowish brown	3.4	3.8
Bagshot Beds	Grey clay with silty and sandy bands, wood fragments in places	3.2+	7.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	54	+16	34	0.4	1.4	5	10	28	11	20	26
		-16 + 4	20	1.4	1.8	5	7	25	16	27	20
				1.8	2.8	1	4	24	13	21	37
Sand	43	- 4 + 1	12	2.8	3.8	2	4	23	10	16	45
		- 1 + ¼	25								
		- ¼ + 1/16	6								
Fines	3	- 1/16	3								

SU 86 SW 7 8128 6060 Near Yateley Hall, Yateley

Surface level (+68.9 m) +226 ft
Water Struck at +65.5 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.4 m
Mineral 4.0 m
Bedrock 0.6 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.4	0.4
River Terrace Deposits (Fourth Terrace)	'Very clayey' pebbly sand Gravel: fine to coarse, subangular to subrounded, flint with some sandstone Sand: fine and medium quartz, silty and clayey throughout; orange-brown, becoming pale grey below 1.9 m	4.0	4.4
Bracklesham Beds	Pale grey sand	0.6+	5.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	13	+16	6	0.4	0.9	16	44	15	5	7	13
		-16 + 4	7	0.9	1.9	26	40	11	3	8	12
				1.9	3.4	21	50	17	2	7	3
Sand	65	- 4 + 1	3	3.4	4.4	21	51	20	2	2	4
		- 1 + ¼	15								
		- ¼ + 1/16	47								
Fines	22	- 1/16	22								

SU 86 SW 8 8121 6076 Near Yateley Green, Yateley

Surface level +65.9 m (+217 ft)
Water struck at +63.9 m
Shell and auger, (152 mm) 6 in diameter
January 1975

Overburden 0.2 m
Mineral 4.7 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.2	0.2
River Terrace Deposits (Fourth Terrace)	Gravel Gravel: fine to coarse, angular to rounded, brown and grey flint. Some black rounded flint present. Some flint patinated Sand: fine and medium, becoming medium and coarse below 2.0 m, quartz, clayey, orange-brown and grey	4.7	4.9
Bracklesham Beds	Dark green silty, fine and medium sand	1.0+	5.9

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
Gravel	53	+16	29	0.2	1.3	7	15	13	9	29	27
		-16 + 4	24	1.3	2.0	37	26	13	4	12	8
				2.0	3.0	2	3	12	11	35	37
Sand	38	- 4 + 1	10	3.0	4.0	1	4	29	14	18	34
		- 1 + $\frac{1}{4}$	19	4.0	4.9	2	5	30	11	17	35
		- $\frac{1}{4}$ + 1/16	9								
Fines	9	- 1/16	9								

SU 86 SW 9 | 8344 6056 | Near Darby Green, Yateley | Block C

Surface level (+61.3 m) +201 ft
Water struck at +59.6 m
Shell and auger (152 mm) 6 in diameter
May 1974

Overburden 0.3 m
Mineral 2.7 m
Bedrock 0.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey loamy soil	0.3	0.3
River Terrace Deposits (Third Terrace)	Gravel Gravel: fine to coarse, subangular to subrounded with occasional rounded flint, with some sandstone Sand: fine to coarse quartz with some flint; yellowish brown	2.7	3.0
Bracklesham Beds	Grey clay	0.5+	3.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	50	+16	26	0.3	1.3	5	9	24	12	26	24
		-16 + 4	24	1.3	1.7	3	6	18	16	33	24
				1.7	2.7	2	6	21	16	23	32
Sand	46	- 4 + 1	15	2.7	3.0	5	12	39	17	14	13
		- 1 + ¼	24								
		- ¼ + 1/16	7								
Fines	4	- 1/16	4								

SU 86 SW 10 | 8495 6090 | Near Fort Narrien, Sandhurst | Block C

Surface level (+58.2 m) +191 ft
Water struck at +56.3 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.7 m
Mineral 3.0 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey, loamy soil	0.1	0.1
Alluvium	Silty clay	0.6	0.7
River Terrace Deposits (Third Terrace)	Gravel; silty sand between 0.7 and 1.4 m Gravel: fine to coarse, subangular to subrounded, with occasional rounded flint, with some sandstone Sand: fine and medium, becoming medium and coarse at 1.4 m, quartz, with some flint; green, becoming grey at 1.4 m	3.0	3.7
Bracklesham Beds	Grey clay	1.0+	4.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel 48	+16	27		0.7	1.4	19	56	18	7	0	0
	-16 + 4	21		1.4	2.4	2	4	16	10	25	43
				2.4	3.4	6	2	9	12	34	37
Sand 44	- 4 + 1	10		3.4	3.7	2	8	23	13	28	26
	- 1 + ¼	15									
	- ¼ + 1/16	19									
Fines 8	- 1/16	8									

SU 86 SE 41 8515 6041 Near Oak Grove, Sandhurst Block C

Surface level (+57.9 m) +190 ft
Water struck at +57.0 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.9 m
Mineral 3.7 m
Bedrock 1.9 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Clayey loamy soil	0.2	0.2
Alluvium	Silty clay	0.7	0.9
River Terrace Deposits (Second Terrace)	Gravel Gravel: fine to coarse, subangular to subrounded, with angular and rounded flint, with subangular sandstone and traces of vein-quartz Sand: fine to coarse yellow quartz with some flint, sandstone and traces of glauconite	3.7	4.6
Bracklesham Beds	Grey silty sand	1.9+	6.5

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	64	+16	36	0.9	1.9	1	6	10	11	33	39
		-16 + 4	28	1.9	2.9	1	6	11	12	30	40
				2.9	3.9	4	13	12	11	25	35
Sand	34	- 4 + 1	11	3.9	4.6	3	22	13	11	23	28
		- 1 + ¼	12								
		- ¼ + 1/16	11								
Fines	2	- 1/16	2								

SU 86 SE 42 8658 6369 Near Windmill Stem, Crowthorne Block B

Surface level (+126.2 m) +414 ft
Water struck at +123.2 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 3.5 m
Bedrock 1.3 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Dark brown, sandy, stony soil	0.2	0.2
River Terrace Deposits (Eleventh Terrace)	A.	'Clayey' sandy gravel Gravel: fine to coarse, angular to subrounded, patinated flints, with occasional black rounded flint Sand: fine and medium (becoming fine to coarse below 1.5 m), quartz with flint; clayey throughout, very clayey between 1.5 and 2.0 m; brown	3.5	3.7
Barton Beds	B.	'Clayey' sand Sand: fine quartz, dark yellow	1.3+	5.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm		%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 36	+16		15	0.2	1.5	9	20	36	4	16	15
	-16 + 4		21	1.5	2.5	19	19	21	11	19	11
				2.5	3.5	10	7	28	12	26	17
Sand 51	- 4 + 1		9	3.5	3.7	9	8	11	11	33	28
	- 1 + ¼		28								
	- ¼ + 1/16		14								
Fines 13	- 1/16		13								
B.											
Gravel 3	+16		0	3.7	5.0	18	77	1	1	3	0
	-16 + 4		3								
Sand 79	- 4 + 1		1								
	- 1 + ¼		1								
	- ¼ + 1/16		77								
Fines 18	- 1/16		18								

SU 86 SE 43 8783 6499 Near Old Gravel Pits, Easthampstead Block B

Surface level (+128.6 m) +422 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Mineral 5.0 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eleventh Terrace)	A. 'Very clayey' pebbly sand; soily sand in top 0.2 m; laminated clayey sand between 2.6 and 3.6 m and laminated sandy clay between 4.6 and 5.0 m Gravel: mainly fine with some coarse, subangular to subrounded with occasional angular, brown, patinated flint, with some black rounded flint Sand: fine and medium quartz, with some flint, clayey throughout, brown, becoming grey and orange-brown below 0.6 m	5.0	5.0
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, orange-brown and grey, pinkish grey in parts	3.0+	8.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	14	+16	6	0.0	0.2	20	49	18	13	0	0
		-16 + 4	8	0.2	0.6	10	59	18	5	7	1
				0.6	1.6	32	36	22	3	5	2
Sand	60	- 4 + 1	5	1.6	2.6	16	7	32	8	18	19
		- 1 + ¼	22	2.6	3.6	22	55	22	1	0	0
		- ¼ + 1/16	33	3.6	4.6	26	27	20	6	13	8
				4.6	5.0	65	20	8	7	0	0
Fines	26	- 1/16	26								
B.											
Gravel	0	+16	0	5.0	6.0	24	70	2	4	0	0
		-16 + 4	0	6.0	7.0	22	76	2	0	0	0
				7.0	8.0	29	71	0	0	0	0
Sand	75	- 4 + 1	1								
		- 1 + ¼	2								
		- ¼ + 1/16	72								
Fines	25	- 1/16	25								

SU 86 SE 44 8771 6387 Near Lower Star Post, Easthampstead Block B

Surface level (+125.3 m) +411 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 1.5 m
Bedrock 1.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eleventh Terrace)	A. Gravel Gravel: fine to coarse, subangular to subrounded flint with some sandstone, with occasional rounded flint. Some cobbles present Sand: fine to coarse, quartz with flint, grey to 0.4 m, becoming brown	1.5	1.5
Barton Beds	B. 'Very clayey' sand Sand: fine, silty, clayey, quartz, mottled grey and brown becoming yellow at 2.5 m	1.5+	3.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
%	mm	%		From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 48	+16	30		0.1	1.0	7	12	29	7	15	30
	-16 + 4	18		1.0	1.5	7	9	19	10	24	31
Sand 45	- 4 + 1	8									
	- 1 + ¼	26									
	- ¼ + 1/16	11									
Fines 7	- 1/16	7									
B.											
Gravel 3	+16	3		1.5	2.5	24	68	2	1	1	4
	-16 + 4	0		2.5	3.0	18	82	0	0	0	0
Sand 75	- 4 + 1	1									
	- 1 + ¼	1									
	- ¼ + 1/16	73									
Fines 22	- 1/16	22									

SU 86 SE 45 8868 6291 Paschal Wood, Frimley Block B

Surface level +127.4 m (+418 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 3.8 m
Bedrock 1.6 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.2	0.2
River Terrace Deposits (Eleventh Terrace)	A. 'Clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded flint, with some sandstone. Some subrounded flint cobbles between 2.6 and 4.0 m Sand: fine and medium quartz with some flint and traces of sandstone; brownish black and peaty from 0.2 to 0.6 m, becoming yellowish brown and pale greenish grey between 0.6 and 2.6 m and reddish brown from 2.6 to 4.0 m	3.8	4.0
Barton Beds	B. 'Clayey' sand Sand: fine, silty, clayey, quartz, yellow	1.6+	5.6

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
%	mm	%		From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 42	+16	23		0.2	0.6	14	42	16	4	9	15
	-16 + 4	19		1.0	1.6	11	22	28	7	17	15
				1.6	2.6	9	13	28	9	18	23
Sand 47	- 4 + 1	9		2.6	4.0	12	5	17	10	26	30
	- 1 + ¼	22									
	- ¼ + 1/16	16									
Fines 11	- 1/16	11									
B.											
Gravel 0	+16	0		4.0	5.6	18	80	1	1	0	0
	+16 + 4	0									
Sand 82	- 4 + 1	1									
	- 1 + ¼	1									
	- ¼ + 1/16	80									
Fines 18	- 1/16	18									

SU 86 SE 46 8920 6254 Paschal Wood, Frimley Block B

Surface level +123.0 m (+404 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 2.0 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eleventh Terrace)	A. 'Clayey' gravel; peaty in top 0.1 m Gravel: fine to coarse, subangular to subrounded, with occasional rounded flint Sand: fine to coarse, quartz with flint, becoming dark brown and clayey	2.0	2.0
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, clayey	3.0+	5.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 53	+16	29		0.0	0.1	13	16	13	8	21	29
	-16 + 4	24		0.1	1.3	8	5	20	12	28	27
				1.3	2.0	14	12	14	7	20	33
Sand 36	- 4 + 1	10									
	- 1 + ¼	17									
	- ¼ + 1/16	9									
Fines 11	- 1/16	11									
B.											
Gravel 0	+16	0		2.0	3.0	26	70	2	2	0	0
	-16 + 4	0		3.0	4.0	15	84	1	0	0	0
				4.0	5.0	22	77	1	0	0	0
Sand 79	- 4 + 1	1									
	- 1 + ¼	1									
	- ¼ + 1/16	77									
Fines 21	- 1/16	21									

SU 86 SE 47 8999 6129 Near Collingwood Farm, Frimley

Surface level +120.2 m (+394 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.1 m
Mineral 1.3 m
Bedrock 1.6 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Stony, sandy soil	0.1	0.1
River Terrace Deposits (Tenth Terrace)	A.	'Clayey' gravel Gravel: fine to coarse, subangular to subrounded flint with some sandstone Sand: fine to coarse quartz, brownish black and soily from 0.1 to 0.9 m, becoming brown	1.3	1.4
Barton Beds	B.	'Very clayey' sand Sand: fine, silty, clayey quartz	1.6+	3.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
A.											
Gravel	62	+16	39	0.1	0.9	9	9	11	9	25	37
		-16 + 4	23	0.9	1.4	15	5	9	9	19	43
Sand	26	- 4 + 1	9								
		- 1 + $\frac{1}{4}$	11								
		- $\frac{1}{4}$ + 1/16	6								
Fines	12	- 1/16	12								
B.											
Gravel	0	+16	0	1.4	3.0	21	78	0	1	0	0
		-16 + 4	0								
Sand	79	- 4 + 1	1								
		- 1 + $\frac{1}{4}$	0								
		- $\frac{1}{4}$ + 1/16	78								
Fines	21	- 1/16	21								

SU 86 SE 48 8706 6452 Roman Star, Easthampstead Block B

Surface level (+128.6 m) +422 ft
Water struck at +125.9 m
Shell and auger, (152 mm) 6 in diameter
November 1974

Mineral 3.7 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eleventh Terrace)	A. 'Very clayey' sandy gravel; sandy between 0.3 and 1.7 m Gravel: fine to coarse, subangular to subrounded, with occasional angular and rounded, flint Sand: fine and medium, quartz with flint, dark brown, becoming orange-brown and grey at 0.3 m; clayey and silty throughout, especially between 1.7 and 2.7 m	3.7	3.7
Barton Beds	B. 'Very clayey' sand Sand: fine quartz; light orange-brown, clayey	3.0+	6.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	25	+16	13	0.0	0.3	27	38	17	3	5	10
		-16 + 4	12	0.3	0.6	18	52	19	11	0	0
				0.6	1.7	28	54	17	1	0	0
Sand	52	- 4 + 1	6	1.7	2.7	34	13	15	4	16	18
		- 1 + ¼	17	2.7	3.7	7	6	20	13	28	26
		- ¼ + 1/16	29								
Fines	23	- 1/16	23								
B.											
Gravel	0	+16	0	3.7	4.7	27	64	7	2	0	0
		-16 + 4	0	4.7	5.7	33	66	1	0	0	0
				5.7	6.7	32	67	1	0	0	0
Sand	67	- 4 + 1	1								
		- 1 + ¼	3								
		- ¼ + 1/16	63								
Fines	33	- 1/16	33								

SU 95 NW 6 9044 5933 Brompton Hospital, Frimley Block B

Surface level +115.1 m (+378 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Mineral 1.1 m
Bedrock 2.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Ninth Terrace)	A. Gravel, with peat at base Gravel: fine to coarse, subangular to subrounded flint with some sandstone Sand: fine and medium quartz with flint, pale grey, peaty in parts	1.1	1.1
Barton Beds	B. 'Clayey' sand Sand: fine quartz, pebbly from 1.1 to 1.6 m, yellowish brown, becoming laminated orange and grey	2.0+	3.1

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	51	+16	30	0.0	1.1	5	29	11	4	21	30
		-16 + 4	21								
Sand	44	- 4 + 1	4								
		- 1 + ¼	11								
		- ¼ + 1/16	29								
Fines	5	- 1/16	5								
B.											
Gravel	4	+16	2	1.1	2.1	20	65	6	1	3	5
		-16 + 4	2	2.1	3.1	12	85	2	1	0	0
Sand	80	- 4 + 1	1								
		- 1 + ¼	4								
		- ¼ + 1/16	75								
Fines	16	- 1/16	16								

SU 95 NW 7 9015 5748 West Frith Barracks, Frimley Block B

Surface level +105.7 m (+342 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Waste 1.0 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
Made Ground		Earthy rubble	0.1	0.1
River Terrace Deposits (Seventh Terrace)	A.	'Clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded with occasional angular and rounded flint with some sandstone Sand: fine and medium quartz, dark grey, becoming yellowish orange, yellow, brown and black	0.9	1.0
Barton Beds	B.	'Very clayey' sand Sand: fine quartz, silty, occasional pebbles, reddish brown and grey laminations, becoming mottled yellow and orange	3.0+	4.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	36	+16	17	0.1	0.3	4	6	5	4	17	64
		-16 + 4	19	0.3	0.4	14	31	17	10	21	7
				0.4	1.0	7	33	15	10	16	19
Sand	53	- 4 + 1	10								
		- 1 + ¼	15								
		- ¼ + 1/16	28								
Fines	11	- 1/16	11								
B.											
Gravel	0	+16	0	1.0	2.0	30	68	1	0	1	0
		-16 + 4	0	2.0	3.0	24	75	1	0	0	0
				3.0	4.0	17	82	1	0	0	0
Sand	76	- 4 + 1	0								
		- 1 + ¼	1								
		- ¼ + 1/16	75								
Fines	24	- 1/16	24								

SU 95 NW 8 9012 5597 Old Guildford Road, Frimley Block B

Surface level (+106.1 m) +348 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 2.8 m
Bedrock 4.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony topsoil	0.1	0.1
River Terrace Deposits (Seventh Terrace)	A. 'Clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded with rounded flint with some sandstone Sand: fine, quartz, with some flint, laminated between 0.3 and 0.8 m, silty, becoming clayey with depth, yellow and black becoming orange-brown and greenish grey	2.8	2.9
Barton Beds	B. Sand Sand: fine, silty quartz, yellow	4.0+	6.9

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	25	+16	15	0.1	0.3	16	44	12	5	5	18
		-16 + 4	10	0.3	1.0	14	48	15	2	5	16
				1.0	2.0	15	57	15	2	4	7
Sand	61	- 4 + 1	3	2.0	2.7	11	34	10	5	20	20
		- 1 + ¼	13	2.7	2.9	20	8	10	7	25	30
		- ¼ + 1/16	45								
Fines	14	- 1/16	14								
B.											
Gravel	2	+16	1	2.9	3.9	11	79	2	1	2	5
		-16 + 4	1	3.9	4.9	9	86	3	0	2	0
				4.9	5.9	6	92	1	1	0	0
Sand	89	- 4 + 1	1	5.9	6.9	11	87	1	1	0	0
		- 1 + ¼	2								
		- ¼ + 1/16	86								
Fines	9	- 1/16	9								

SU 95 NW 9 9154 5793 Near Blackdown Barracks, Pirbright Block B

Surface level (+114.3 m) +375 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.2 m
Mineral 3.3 m
Bedrock 2.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Peat	Dark brown organic matter	0.2	0.2
River Terrace Deposits (Ninth Terrace)	A. Sandy gravel; sand between 1.0 and 2.1 m Gravel: angular to subrounded, with occasional rounded, flint Sand: fine and medium quartz with flint, grey becoming yellow and yellowish orange at 0.7 m. Peaty between 0.7 and 1.0 m	3.3	3.5
Barton Beds	B. Pebbly sand Sand: fine silty quartz, yellowish orange becoming yellow	2.0+	5.5

GRADING

Mean for Deposit			Depth below surface (m)		Bulk Samples Percentages					
					Fines	Sand			Gravel	
%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.										
Gravel 31	+16	16	0.2	1.1	15	50	14	3	3	15
	-16 + 4	15	1.1	2.1	9	54	34	3	0	0
			2.1	3.2	4	12	18	10	27	29
Sand 62	- 4 + 1	7	3.2	3.5	3	6	19	12	33	27
	- 1 + ¼	23								
	- ¼ + 1/16	32								
Fines 7	- 1/16	7								
B.										
Gravel 5	+16	2	3.5	4.5	6	77	4	2	6	5
	-16 + 4	3	4.5	5.5	8	90	2	0	0	0
Sand 88	- 4 + 1	1								
	- 1 + ¼	3								
	- ¼ + 1/16	84								
Fines 7	- 1/16	7								

SU 95 NW 10 9149 5620 Gapemouth Road, Pirbright Block B

Surface level (+80.2 m) +263 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 3.6 m
Bedrock 4.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.1	0.1
Downwash Gravel	A. Gravel; with sandy peat between 0.3 and 0.4 m Gravel: fine to coarse, subrounded becoming subangular to subrounded flint with sandstone. Subrounded flint cobbles to 1.2 m Sand: fine and medium quartz with flint, grey and orange-brown becoming orange-yellow below 1.2 m. Some bands of greenish yellow, silty sand	3.6	3.7
Barton Beds	B. 'Very clayey' sand Sand: fine silty quartz, orange and greenish grey. Some parts mottled and laminated	4.0+	7.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	46	+16	23	0.1	0.3	10	43	12	3	13	19
		-16 + 4	23	0.4	0.6	26	27	11	3	16	17
				0.6	1.2	8	25	14	8	29	16
Sand	45	- 4 + 1	9	1.2	2.2	8	43	8	8	29	4
		- 1 + ¼	9	2.2	3.2	5	17	8	11	43	16
		- ¼ + 1/16	27	3.2	3.7	10	14	8	9	28	31
Fines	9	- 1/16	9								
B.											
Gravel	0	+16	0	3.7	4.7	37	60	2	0	1	0
		-16 + 4	0	4.7	5.7	24	76	0	0	0	0
				5.7	6.7	23	76	1	0	0	0
Sand	75	- 4 + 1	0	6.7	7.7	15	84	1	0	0	0
		- 1 + ¼	1								
		- ¼ + 1/16	74								
Fines	25	- 1/16	25								

SU 95 NW 11 9100 5908 Near Colony Gate, Frimley Block B

Surface level (+117.0 m) +384 ft
Water struck at +115.0 m
Shell and auger, (152 mm) 6 in diameter
November 1974

Mineral 6.0 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Ninth Terrace)	A. 'Clayey' gravel Gravel: fine to coarse, angular to rounded brown flint with sandstone. Some flint patinated Sand: fine to coarse becoming medium and coarse at 1.2 m and fine at 5.3 m, quartz with flint, greyish brown, becoming orange-brown at 1.2 m. Clayey between 0.7 and 1.2 m	6.0	6.0
Barton Beds	B. 'Very clayey' sand Sand: fine, clayey, silty, quartz, orange-brown	3.0+	9.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 47	+16	22		0.0	0.7	19	7	7	5	17	45
	-16 + 4	25		0.7	1.2	22	15	19	10	21	13
				1.2	2.2	14	4	37	9	20	16
Sand 41	- 4 + 1	10		2.2	3.2	8	2	16	16	34	24
	- 1 + ¼	16		3.2	4.3	4	2	18	14	35	27
	- ¼ + 1/16	15		4.3	5.3	12	52	6	5	16	9
				5.3	6.0	10	25	11	7	24	23
Fines 12	- 1/16	12									
B.											
Gravel 0	+16	0		6.0	7.0	30	65	2	3	0	0
	-16 + 4	0		7.0	8.0	25	73	1	1	0	0
				8.0	9.0	17	83	0	0	0	0
Sand 76	- 4 + 1	1									
	- 1 + ¼	1									
	- ¼ + 1/16	74									
Fines 24	- 1/16	24									

SU 95 NW 12 9095 5735 Deepcut Barracks, Frimley Block B

Surface level (+111.6 m) +366 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Overburden 0.5 m
Mineral 2.7 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
Made Ground		Sandy soil and brick rubble	0.5	0.5
River Terrace Deposits (Eighth Terrace)	A.	'Clayey' gravel Gravel: fine to coarse, angular to rounded, brown flint. Some flint patinated Sand: fine to coarse, silty quartz with flint, brown and grey	2.7	3.2
Barton Beds	B.	'Clayey' sand Sand: fine quartz, grey and orange	3.0+	6.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	53	+16	26	0.5	1.0	16	14	7	5	22	36
		-16 + 4	27	1.0	2.0	23	2	11	12	25	27
				2.0	3.2	13	6	21	9	29	22
Sand	30	- 4 + 1	9								
		- 1 + ¼	15								
		- ¼ + 1/16	6								
Fines	17	- 1/16	17								
B.											
Gravel	0	+16	0	3.2	4.2	19	79	1	1	0	0
		-16 + 4	0	4.2	5.2	16	81	2	1	0	0
				5.2	6.2	15	85	0	0	0	0
Sand	83	- 4 + 1	1								
		- 1 + ¼	1								
		- ¼ + 1/16	81								
Fines	17	- 1/16	17								

SU 95 NW 13 9115 5514 Tunnel Hill, Pirbright Block B

Surface level (+113.4 m) +372 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Overburden 0.1 m
Mineral 1.9 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Stony, sandy soil	0.1	0.1
River Terrace Deposits (Eighth Terrace)	A. 'Clayey' gravel; with sand from 0.1 to 0.4 m Gravel: fine to coarse, mainly angular with subangular to rounded, heavily patinated brown flint, with sandstone and traces of vein-quartz Sand: fine, silty quartz with flint and sandstone, becoming medium and coarse with depth, greyish brown becoming reddish brown below 0.9 m	1.9	2.0
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, mottled orange-brown and reddish brown	1.0+	3.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm		%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 50	+16		29	0.1	0.4	25	66	6	3	0	0
	-16 + 4		21	0.4	0.9	11	14	11	5	23	36
				0.9	2.0	19	4	16	9	18	34
Sand 32	- 4 + 1		3								
	- 1 + ¼		13								
	- ¼ + 1/16		16								
Fines 18	- 1/16		18								
B.											
Gravel 0	+16		0	2.0	3.0	27	72	1	0	0	0
	-16 + 4		0								
Sand 73	- 4 + 1		0								
	- 1 + ¼		1								
	- ¼ + 1/16		72								
Fines 27	- 1/16		27								

Surface level (+105.2 m) +345 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.2 m
Mineral 1.6 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Peaty, sandy soil	0.2	0.2
River Terrace Deposits (Seventh Terrace)	A. Gravel Gravel: fine to coarse, subangular to subrounded with occasional rounded flint, with some sandstone. Subrounded flint cobbles between 0.6 and 1.8 m Sand: fine to coarse quartz with flint, grey, becoming reddish brown below 0.6 m. Peaty and silty above 0.6 m, clayey below	1.6	1.8
Barton Beds	B. 'Clayey' sand Sand: fine quartz, orange-yellow	3.0+	4.8

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 62	+16	37		0.2	0.6	6	10	10	6	24	44
	-16 + 4	25		0.6	1.8	10	10	11	8	27	34
Sand 29	- 4 + 1	9									
	- 1 + ¼	10									
	- ¼ + 1/16	10									
Fines 9	- 1/16	9									
B.											
Gravel 1	+16	0		1.8	2.8	14	82	1	1	2	0
	-16 + 4	1		2.8	3.8	12	85	2	0	1	0
				3.8	4.8	8	91	1	0	0	0
Sand 88	- 4 + 1	0									
	- 1 + ¼	2									
	- ¼ + 1/16	86									
Fines 11	- 1/16	11									

SU 95 SW 7 9035 5374 Scarp Hill, Normandy Block B

Surface level (+107.9 m) +354 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Mineral 1.4 m
Bedrock 2.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. Sandy gravel, peat between 0.2 and 0.4 m Gravel: fine to coarse, subangular to rounded brown flint. Subangular, brown flint cobbles in the upper 0.2 m Sand: fine quartz, grey, becoming greenish grey and reddish grey and brown below 0.6 m. Brown, silty sand below 1.1 m	1.4	1.4
Barton Beds	B. 'Clayey' sand Sand: fine quartz, silty, yellowish brown becoming yellowish green, then pale yellow below 2.4 m	2.0+	3.4

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 47	+16	36		0.0	0.6	4	38	11	3	10	34
	-16 + 4	11		0.6	1.4	8	31	7	4	12	38
Sand 47	- 4 + 1	4									
	- 1 + ¼	9									
	- ¼ + 1/16	34									
Fines 6	- 1/16	6									
B.											
Gravel 0	+16	0		1.4	2.4	14	83	2	0	1	0
	-16 + 4	0		2.4	3.4	11	88	1	0	0	0
Sand 87	- 4 + 1	0									
	- 1 + ¼	1									
	- ¼ + 1/16	86									
Fines 13	- 1/16	13									

SU 95 SW 8 9063 5232 Ricochet Hill, Normandy Block B

Surface level (+117.7 m) +386 ft
Water struck at +115.5 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 3.9 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
Peat		Brownish black organic matter	0.1	0.1
River Terrace Deposits (Eighth Terrace)	A.	Sandy gravel; with peat between 0.4 and 0.5 m Gravel: fine to coarse, angular to subrounded brown flint with occasional black rounded flint, with some sandstone and traces of vein-quartz. Subrounded flint cobbles between 0.7 and 3.7 m Sand: fine and medium, becoming medium and coarse below 1.7 m, quartz with flint, with traces of ironstone, grey becoming yellowish brown, and below 2.1 m brown. Lower 0.3 m clayey	3.9	4.0
Barton Beds	B.	'Very clayey' sand Sand: fine quartz, yellow, silty	3.0+	7.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	43	+16	23	0.1	0.7	9	30	12	6	19	24
		-16 + 4	20	0.7	1.7	8	25	22	6	15	24
				1.7	2.7	9	6	19	12	27	27
Sand	48	- 4 + 1	12	2.7	3.7	13	7	28	22	14	16
		- 1 + ¼	20	3.7	4.0	7	8	9	10	32	34
		- ¼ + 1/16	16								
Fines	9	- 1/16	9								
B.											
Gravel	0	+16	0	4.0	5.0	19	79	1	1	0	0
		-16 + 4	0	5.0	6.0	62	38	0	0	0	0
				6.0	7.0	20	80	0	0	0	0
Sand	67	- 4 + 1	0								
		- 1 + ¼	1								
		- ¼ + 1/16	66								
Fines	33	- 1/16	33								

SU 95 SW 9 | 9154 5418 | Near Scragley Hill, Pirbright | Block B

Surface level (+114.6 m) +376 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
April 1974

Overburden 0.1 m
Mineral 2.3 m
Bedrock 2.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Peat	Brownish black organic matter	0.1	0.1
River Terrace Deposits (Eighth Terrace)	A. 'Clayey' gravel; with peat between 0.4 and 0.5 m Gravel: fine to coarse, subangular to subrounded with occasional rounded flint. Cobbles between 1.0 and 2.4 m Sand: fine and medium quartz with flint, becoming coarser with depth; grey and peat-stained, becoming reddish brown with depth; more clayey toward base	2.3	2.4
Barton Beds	B. 'Very clayey' sand Sand: fine silty quartz, orange-brown becoming yellow below 2.9 m	2.0+	4.4

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
%	mm	%		From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 47	+16	27		0.1	0.6	8	39	15	3	9	26
	-16 + 4	20		0.6	1.0	10	11	13	8	21	37
				1.0	2.4	13	6	19	13	25	24
Sand 42	- 4 + 1	10									
	- 1 + ¼	17									
	- ¼ + 1/16	15									
Fines 11	- 1/16	11									
B.											
Gravel 0	+16	0		2.4	3.4	19	78	2	1	0	0
	-16 + 4	0		3.4	4.4	28	71	1	0	0	0
Sand 76	- 4 + 1	0									
	- 1 + ¼	1									
	- ¼ + 1/16	75									
Fines 24	- 1/16	24									

SU 95 SW 10 9112 5314 Near Bastion Hill, Normandy Block B

Surface level (+117.3 m) +385 ft
Water struck at +115.0 m
Shell and auger, (152 mm) 6 in diameter
April 1974

Mineral 5.0 m
Bedrock 1.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eighth Terrace)	A. Gravel, with peat between 0.5 and 0.6 m Gravel: fine to coarse, subangular to subrounded with occasional rounded flint, with some sandstone. Subrounded to rounded cobbles throughout Sand: fine to coarse quartz with flint, clayey in parts, grey becoming orange and yellowish brown with depth	5.0	5.0
Barton Beds	B. 'Very clayey' pebbly sand Sand: fine, yellowish, silty quartz	1.0+	6.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	57	+16	30	0.0	0.8	7	7	15	7	25	39
		-16 + 4	27	0.8	1.8	16	9	20	5	22	28
				1.8	2.3	15	15	25	7	22	16
Sand	34	- 4 + 1	12	2.3	3.4	4	4	20	12	28	32
		- 1 + ¼	15	3.4	3.9	4	3	14	11	33	35
		- ¼ + 1/16	7	3.9	4.7	5	3	13	16	34	29
				4.7	5.0	17	9	8	8	29	29
Fines	9	- 1/16	9								
B.											
Gravel	11	+16	7	5.0	6.0	29	58	1	1	4	7
		-16 + 4	4								
Sand	60	- 4 + 1	1								
		- 1 + ¼	1								
		- ¼ + 1/16	58								
Fines	29	- 1/16	29								

SU 95 SW 11 9118 5352 Cleygate Common, Normandy Block B

Surface level (+116.7 m) +383 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Overburden 0.1 m
Mineral 2.7 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Black, peaty, silty, sandy soil	0.1	0.1
River Terrace Deposits (Eighth Terrace)	A. 'Very clayey' sandy gravel Gravel: fine to coarse, angular to rounded brown flint with rounded black flint. Some flint patinated Sand: fine and medium quartz with flint, becoming coarser with depth; orange-brown and grey becoming brown at 1.5 m	2.7	2.8
Barton Beds	B. 'Very clayey' sand Sand: fine, silty, clayey quartz, greyish brown and orange-brown	3.0+	5.8

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 36	+16	19		0.1	0.5	21	41	14	3	11	10
	-16 + 4	17		0.5	1.5	28	25	12	5	12	18
				1.5	2.5	15	7	27	9	22	20
Sand 43	- 4 + 1	7		2.5	2.8	18	3	16	8	25	30
	- 1 + ¼	18									
	- ¼ + 1/16	18									
Fines 21	- 1/16	21									
B.											
Gravel 0	+16	0		2.8	3.8	27	72	0	1	0	0
	-16 + 4	0		3.8	4.8	30	70	0	0	0	0
				4.8	5.8	27	72	1	0	0	0
Sand 72	- 4 + 1	0									
	- 1 + ¼	1									
	- ¼ + 1/16	71									
Fines 28	- 1/16	28									

SU 95 SW 12 9019 5159 Gravelpit Hill, Ash Block B

Surface level (+115.2 m) +378 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
January 1975

Overburden 0.2 m
Mineral 2.9 m
Bedrock 1.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Stony, earthy sand	0.2	0.2
River Terrace Deposits (Eighth Terrace)	A.	'Clayey' gravel Gravel: fine to coarse, angular to rounded flint with some black rounded flint Sand: fine to coarse quartz with flint, dark brown, becoming orange-brown below 0.7 m; more clayey with depth	2.9	3.1
Barton Beds	B.	'Clayey' sand Sand: fine, silty quartz, brownish yellow	1.0+	4.1

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	53	+16	24	0.2	0.7	5	19	13	7	22	34
		-16 + 4	29	0.7	1.7	8	11	14	13	32	22
				1.7	2.7	13	7	18	10	29	23
Sand	37	- 4 + 1	10	2.7	3.1	13	7	19	11	29	21
		- 1 + ¼	17								
		- ¼ + 1/16	10								
Fines	10	- 1/16	10								
B.											
Gravel	3	+16	0	3.1	4.1	18	67	10	2	3	0
		-16 + 4	3								
Sand	79	- 4 + 1	2								
		- 1 + ¼	10								
		- ¼ + 1/16	67								
Fines	18	- 1/16	18								

SU 96 NW 1 9051 6605 Near Tower Hill, Winkfield Block A

Surface level (+96.6 m) +317 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Mineral 1.2 m
Bedrock 3.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A.	'Clayey' pebbly sand, with sand from 0.2 to 1.2 m Gravel: fine to coarse, angular to rounded flint Sand: fine quartz, brown, becoming orange-brown and grey	1.2	1.2
Barton Beds	B.	'Very clayey' sand Sand: fine quartz, orange brown and yellowish brown becoming mottled orange-brown and grey	3.0+	4.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	8	+16	5	0.0	0.2	10	32	7	3	18	30
		-16 + 4	3	0.2	1.2	20	59	17	4	0	0
Sand	74	- 4 + 1	4								
		- 1 + ¼	15								
		- ¼ + 1/16	55								
Fines	18	- 1/16	18								
B.											
Gravel	0	+16	0	1.2	2.2	22	69	8	1	0	0
		-16 + 4	0	2.2	3.2	22	71	7	0	0	0
				3.2	4.2	19	74	7	0	0	0
Sand	79	- 4 + 1	0								
		- 1 + ¼	8								
		- ¼ + 1/16	71								
Fines	21	- 1/16	21								

SU 96 NW 2 9144 6888 Near Kings Stable, Ascot Block A

Surface level (+93.6 m) +307 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 3.2 m
Bedrock 5.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Topsoil and brick rubble	0.2	0.2
River Terrace Deposits (Eighth Terrace)	A. 'Very clayey' pebbly sand; sandy at top, gravelly towards base Gravel: fine to coarse, angular to rounded, yellow to grey flint and fine to coarse subangular yellow sandstone Sand: fine and medium, quartz with flint and traces of sandstone	3.2	3.4
Bracklesham Beds	B. 'Very clayey' sand Sand: fine, clayey quartz, orange-brown with green glauconitic specks, becoming pale grey	2.0	5.4
Bagshot Beds	C. 'Very clayey' sand Sand: fine, clayey, quartz, pale grey	3.0+	8.4

GRADING

Mean for Deposit				Depth below surface (m)		Fines	Bulk Samples Percentages Sand			Gravel	
%	mm	%		From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel 15	+16	5		0.2	1.2	30	42	19	3	4	2
	-16 + 4	10		1.2	2.2	23	20	33	7	12	5
				2.2	3.4	18	8	39	13	15	7
Sand 62	- 4 + 1	8									
	- 1 + ¼	31									
	- ¼ + 1/16	23									
Fines 23	- 1/16	23									
B.											
Gravel 0	+16	0		3.4	4.4	32	52	15	1	0	0
	-16 + 4	0		4.4	5.4	25	72	3	0	0	0
Sand 71	- 4 + 1	0									
	- 1 + ¼	9									
	- ¼ + 1/16	62									
Fines 29	- 1/16	29									
C.											
Gravel 0	+16	0		5.4	6.4	12	84	3	1	0	0
	-16 + 4	0		6.4	6.9	16	77	7	0	0	0
				6.9	8.4	41	52	7	0	0	0
Sand 73	- 4 + 1	0									
	- 1 + ¼	6									
	- ¼ + 1/16	67									
Fines 27	- 1/16	27									

SU 96 NW 3 | 9232 6631 | Near Earleywood, Winkfield | Block A

Surface level (+75.6 m) +248 ft
Water struck + 68.0 m
Shell and auger, (152 mm) 6 in diameter
May 1974

Waste 3.0 m
Bedrock 5.3 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
	Brown, silty, sandy soil with pebbles	0.4	0.4
River Terrace Deposits (Fifth Terrace)	Brown and grey mottled, clayey, pebbly sand becoming a sandy clay below 0.8 m	2.6	3.0
Bracklesham Beds	'Very clayey' sand Sand: fine quartz, dark green with dark brown clay bands, becoming purple below 7.5 m	5.3+	8.3

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
Gravel	0	+16	0	5.5	6.5	51	32	17	0	0	0
		-16 + 4	0	6.5	7.5	74	20	6	0	0	0
				7.5	8.3	23	62	15	0	0	0
Sand	49	- 4 + 1	0								
		- 1 + ¼	12								
		- ¼ + 1/16	37								
Fines	51	- 1/16	51								

SU 96 NW 4 9211 6511 Near Erlwood House, Windlesham Block A

Surface level (+77.7 m) +255 ft
Water level not recorded
Shell and auger, (152 mm) 6 in diameter
May 1974

Waste 0.5 m
Bedrock 4.5 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Seventh Terrace)	A. Pebbly sand Gravel: fine to coarse, subangular to subrounded flint Sand: fine quartz, dark brown	0.5	0.5
Bracklesham Beds	B. 'Clayey' sand Sand: fine quartz, yellow, mottled brown and grey, becoming yellowish orange, clayey, throughout	4.5+	5.0

GRADING

Mean for Deposit				Depth below surface (m)		Fines	Bulk Samples Percentages Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-$\frac{1}{4}$	+$\frac{1}{4}$-1	+1-4	+4-16	+16
A.											
Gravel	18	+16	5	0.0	0.5	5	66	9	2	13	5
		-16 + 4	13								
Sand	79	- 4 + 1	2								
		- 1 + $\frac{1}{4}$	9								
		- $\frac{1}{4}$ + 1/16	66								
Fines	5	- 1/16	5								
B.											
Gravel	1	+16	0	0.5	1.5	17	68	10	1	4	0
		-16 + 4	1	1.5	2.4	19	75	6	0	0	0
				2.4	4.0	15	78	7	0	0	0
Sand	84	- 4 + 1	0	4.0	5.0	10	85	5	0	0	0
		- 1 + $\frac{1}{4}$	7								
		- $\frac{1}{4}$ + 1/16	77								
Fines	15	- 1/16	15								

SU 96 SW 31 9015 6318 Near Pennyhill House, Windlesham Block B

Surface level (+82.3 m) +270 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
November 1974

Waste 1.2 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Made Ground	Dark brown, gravelly with coke and cement	0.5	0.5
Downwash Gravel	A. 'Very clayey' gravel Gravel: fine to coarse, rounded with angular to subrounded, black and brown flint Sand: fine and medium quartz, grey and light orange-brown	0.7	1.2
Barton Beds	B. 'Very clayey' sand Sand: fine quartz sand, mottled orange-brown and grey	3.0+	4.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	46	+16	26	0.5	0.8	12	19	7	6	23	33
		-16 + 4	20	0.8	1.2	41	10	7	5	17	20
Sand	25	- 4 + 1	5								
		- 1 + ¼	8								
		- ¼ + 1/16	12								
Fines	29	- 1/16	29								
B.											
Gravel	0	+16	0	1.2	2.2	29	67	4	0	0	0
		-16 + 4	0	2.2	3.2	32	64	4	0	0	0
				3.2	4.2	21	73	6	0	0	0
Sand	73	- 4 + 1	0								
		- 1 + ¼	5								
		- ¼ + 1/16	68								
Fines	27	- 1/16	27								

SU 96 SW 32 9046 6195 Black Hill, Windlesham Block B

Surface level (+127.1 m) +417 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 2.5 m
Bedrock 2.2 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Eleventh Terrace)	A. 'Clayey' sandy gravel; peaty in top 0.5 m Gravel: fine to coarse angular with subangular to rounded brown flint, with yellow to grey sub-angular sandstone and traces of vein-quartz. Many flint pebbles patinated Sand: medium with fine and coarse, quartz with flint, grey becoming light brown below 1.0 m	2.5	2.5
Barton Beds	B. 'Very clayey' sand Sand: fine, silty quartz	2.2+	4.7

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	36	+16	22	0.0	0.5	5	9	18	10	24	34
		-16 + 4	14	0.5	1.5	14	5	31	11	14	25
				1.5	2.5	10	16	42	10	9	13
Sand	53	- 4 + 1	10								
		- 1 + ¼	33								
		- ¼ + 1/16	10								
Fines	11	- 1/16	11								
B.											
Gravel	0	+16	0	2.5	3.5	23	76	1	0	0	0
		-16 + 4	0	3.5	4.7	58	42	0	0	0	0
Sand	58	- 4 + 1	0								
		- 1 + ¼	0								
		- ¼ + 1/16	58								
Fines	42	- 1/16	42								

SU 96 SW 33 9050 6114 Near Collingwood Farm, Frimley Block B

Surface level (+120.7 m) +396 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.2 m
Mineral 1.8 m
Bedrock 1.0 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Sandy soil with coarse flints	0.2	0.2
River Terrace Deposits (Tenth Terrace)	A.	'Clayey' sandy gravel; with sand between 0.8 and 1.2 m Gravel: fine to coarse, subangular to subrounded with occasional rounded flint Sand: fine and medium quartz, clayey, mottled grey and red becoming brown at 0.8 m	1.8	2.0
Barton Beds	B.	'Clayey' sand Sand: fine quartz, yellow, silty throughout	1.0+	3.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	38	+16	18	0.2	0.8	7	22	18	7	24	22
		-16 + 4	20	0.8	2.0	14	15	26	11	18	16
Sand	50	- 4 + 1	10								
		- 1 + ¼	23								
		- ¼ + 1/16	17								
Fines	12	- 1/16	12								
B.											
Gravel	1	+16	0	2.0	3.0	15	82	2	0	1	0
		-16 + 4	1								
Sand	84	- 4 + 1	0								
		- 1 + ¼	2								
		- ¼ + 1/16	82								
Fines	15	- 1/16	15								

SU 96 SW 34 9149 6216 Bagshot Heath, Windlesham Block B

Surface level (+90.2 m) +296 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Overburden 0.1 m
Mineral 2.3 m
Bedrock 7.6 m+

LOG

Geological Classification		Lithology	Thickness m	Depth m
		Topsoil, dark brown, with coarse flint	0.1	0.1
Downwash Gravel	A.	'Clayey' sandy gravel Gravel: fine to coarse, subangular to subrounded with occasional rounded flint and traces of vein-quartz Sand: fine and medium quartz, brown	2.3	2.4
Barton Beds	B.	'Clayey' sand Sand: fine quartz, yellowish brown, becoming orange-brown at 8.4 m	7.6+	10.0

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	33	+16	14	0.1	1.4	5	22	8	7	33	25
		-16 + 4	19	1.4	2.4	18	46	24	3	5	4
Sand	55	- 4 + 1	5								
		- 1 + ¼	16								
		- ¼ + 1/16	34								
Fines	12	- 1/16	12								
B.											
Gravel	0	+16	0	2.4	3.4	19	73	7	1	0	0
		-16 + 4	0	3.4	4.4	14	73	13	0	0	0
				4.4	5.4	13	80	7	0	0	0
Sand	84	- 4 + 1	0	5.4	6.4	14	80	6	0	0	0
		- 1 + ¼	7	6.4	7.4	13	82	5	0	0	0
		- ¼ + 1/16	77	7.4	8.4	17	78	5	0	0	0
				8.4	10.0	20	78	2	0	0	0
Fines	16	- 1/16	16								

SU 96 SW 35 9177 6097 Hangmoor, Chobham Block B

Surface level +90.9 m (+299 ft)
Water not struck
Shell and auger, (152 mm) 6 in diameter
May 1974

Mineral 3.2 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
Downwash Gravel	A. 'Clayey' sandy gravel; with topmost 1.0 m of peaty soil and bottom 1.0 m with reworked bedrock Gravel: fine to coarse, subangular to subrounded with occasional rounded flint Sand: fine quartz, mottled yellow and grey	3.2	3.2
Barton Beds	B. 'Clayey' sand Sand: fine quartz, yellow becoming mottled orange and grey with depth	3.0+	6.2

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
						Fines	Sand			Gravel	
	%	mm	%	From	To	-1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	39	+16	20	0.0	1.0	8	24	9	8	25	26
		-16 + 4	19	1.0	2.2	10	28	6	6	20	30
				2.2	3.2	15	66	2	3	11	3
Sand	50	- 4 + 1	6								
		- 1 + ¼	8								
		- ¼ + 1/16	36								
Fines	11	- 1/16	11								
B.											
Gravel	0	+16	0	3.2	4.2	16	81	1	1	1	0
		-16 + 4	0	4.2	5.2	18	82	0	0	0	0
				5.2	6.2	20	79	1	0	0	0
Sand	82	- 4 + 1	1								
		- 1 + ¼	0								
		- ¼ + 1/16	81								
Fines	18	- 1/16	18								

SU 96 SW 36 9087 6020 Near Heatherside Nursery, Frimley Block B

Surface level (+121.9 m) +400 ft
Water not struck
Shell and auger, (152 mm) 6 in diameter
October 1974

Mineral 1.8 m
Bedrock 3.0 m+

LOG

Geological Classification	Lithology	Thickness m	Depth m
River Terrace Deposits (Tenth Terrace)	A. 'Very clayey' gravel Gravel: fine to coarse, angular to rounded flint Sand: fine quartz with flint, becoming medium and coarse with depth, grey and orange-brown	1.8	1.8
Barton Beds	B. 'Very clayey' sand Sand: fine quartz, orange-brown clayey throughout	3.0+	4.8

GRADING

Mean for Deposit				Depth below surface (m)		Bulk Samples Percentages					
							Sand			Gravel	
	%	mm	%	From	To	Fines -1/16	+1/16-¼	+¼-1	+1-4	+4-16	+16
A.											
Gravel	41	+16	24	0.0	0.5	20	18	9	4	13	36
		-16 + 4	17	0.5	1.3	26	14	22	6	11	21
				1.3	1.8	21	3	18	13	27	18
Sand	36	- 4 + 1	6								
		- 1 + ¼	18								
		- ¼ + 1/16	12								
Fines	23	- 1/16	23								
B.											
Gravel	0	+16	0	1.8	2.8	27	70	0	3	0	0
		-16 + 4	0	2.8	3.8	23	76	0	1	0	0
				3.8	4.8	23	77	0	0	0	0
Sand	76	- 4 + 1	1								
		- 1 + ¼	0								
		- ¼ + 1/16	75								
Fines	24	- 1/16	24								

APPENDIX G: LIST OF WORKINGS

A list of the main working and worked-out pits in the Aldershot area is given below: there are also many minor excavations for which no details are recorded.

Name of Pit	Location	Grid Reference	Status
Chandlers Farm	Yateley	810 620	Working
Home Farm	Frimley	880 570	Working
Minehurst Farm	Farnborough	885 560	Working
Mill Lane	Sandhurst	825 615	Worked out
Tri Lakes	Sandhurst	830 610	Worked out
Rosemary Farm	Yateley	840 605	Worked out/Redeveloped
Mychett Farm	Mychett	890 540	Worked out
Lynchford Corner	Farnborough	885 530	Worked out
-	Farnborough	885 520	Worked out
Government Road	Ash Vale	885 515	Worked out
Shawfield Farm	Ash Vale	885 510	Worked out
-	Badshot Lea	865 490	Worked out
-	Caesar's Camp	825 490	Partially worked
-	Abury Hill	820 500	Partially worked
-	Surprise Hill	905 515	Worked out

APPENDIX H:

REPORT ON A PIPE CLAY IN THE BRACKLESHAM BEDS

J.A. Bain, D.J. Morgan, F.R. Stacey

A sample of clay was recovered in borehole 84 NW 5 whilst penetrating the Bracklesham Beds. Because of its consistency (in conjunction with the presence of kaolinite) it was thought likely to be of 'ball clay' type.

The sample was a grey to buff-coloured silty clay of fine texture with a noticeable absence of grittiness when moulded between the fingers. As a quantitative guide to plasticity, Atterberg Limits were determined with the following results:

Liquid limit	=	95 (wt. per cent moisture)
Plastic limit	=	50 (" " " ")
Plasticity index		45

The plasticity index is high even for a ball clay and such a figure is seldom approached by silty or siliceous ball clays unless enhanced by the presence of montmorillonite. This was confirmed both by thermal analysis and X-ray diffraction, the latter identifying quartz (about 30 per cent?) and Ca-montmorillonite as the major constituents accompanied by smaller amounts of mica and kaolinite.

Measurement of cation exchange capacity by the methylene blue dye adoption technique yielded a figure of 30 m. eq. /100g which, on past experience would indicate a montmorillonite content of up to 40 per cent. The influence of montmorillonite on the physical properties of the clay was illustrated by repeated Atterberg Limit determinations after adding sodium carbonate to convert the montmorillonite to its sodium (bentonitic) form. The Liquid Limit increased from 95 to 155. A comparable test on a reference sample of London Clay, used because of the high montmorillonite and overall clay content, produced figures of 100 and 172 before and after sodium carbonate treatment.

The sample is not, therefore, a ball clay in the usual sense of the term. In composition it is more akin to the London Clay although it is markedly different in colour (the total absence of organic matter and pyrite may be noted) and it fires to a pale orange-buff colour, signifying an unusually low iron content for this type of clay. The montmorillonite content, although high, falls short of that acceptable as a commercial fuller's earth, and other clay minerals, although minor in amount, are also present.

The use of such a mixed assemblage clay as bulk raw material for constructional ceramics, e.g. brick making, would be hampered by the high montmorillonite content, which would lead to high water requirements and excessive shrinkage. Volumetric drying shrinkage from the plastic limit consistency (the minimum water requirement for moulding) was found to be 45 per cent. This is partly due to the very low porosity of the dried clay (at 8.5 ml per 100 grams clay the lowest recorded in these laboratories), which indicates a very dense body in the dry state and probably high bonding strength.

The clay's bonding power may, in fact, be one of its few obvious commercial uses - as pelletising media or foundry clay. As an indication of the magnitude of this property, breaking strengths of a number of $\frac{1}{2}$-in diameter rods, extruded at the plastic limit consistency and oven dried at 105°C, were measured using a Hounsfield tensometer. A result of 169 K/cm^2 (s = 5.6) for modulus of rupture is high and generally only exceeded by the bentonitic clays themselves. Further investigation of this feature as a commercially useful property would seem warranted, provided the bed is reasonably uniform in composition and texture and is sufficiently thick and accessible for economic working.

APPENDIX J:

REPORT ON THE SIZE GRADING AND CHEMICAL COMPOSITION OF BEDROCK SANDS

D. Hutchison, F. R. Stacey and P. J. Moore

A series of 13 sand samples from the Bagshot Beds, Bracklesham Beds and Barton Beds collected from the survey area were submitted for analysis as possible glass sands.

LABORATORY PROCEDURE

The samples, which were received from the field in a damp condition in polyethylene bags, were air-dried and the dry weights recorded as a check on subsequent grading tests. The dried samples were thoroughly disaggregated in water and wet-screened through No. 36, 100 and 240 B.S. sieves. The material retained at each stage was dried and weighed, the suspension passing a No. 240 mesh screen de-watered and the residue dried and weighed. Results of the grading analyses are shown in Table 9.

CHEMICAL ANALYSIS

The sand fraction of each sample passing a No. 36 sieve and retained on a No. 100 sieve was dried to constant weight at 105° C and chemically analysed for silica, alumina, iron oxide and titanium dioxide.

Silica was determined gravimetrically by fusion of the sample with sodium carbonate, dissolution of the fusion cake in dilute hydrochloric acid, double dehydration in the presence of the same acid and ignition of the separated silica residues. The impure silica was weighed, silica removed by volatilisation as fluorides and determined by difference.

The residue from the silica determination was fused with hydrogen potassium sulphate, dissolved and added to the main silica filtrate. Ammonia group oxides were precipitated from the combined solution, separated by filtration, dissolved in hydrochloric acid and reprecipitated, ignited at 1050° C and weighed.

The ignited oxides were fused with hydrogen potassium sulphate, the fusion cake dissolved in dilute sulphuric acid and iron and titanium determined absorptiometrically as o-phenanthroline and peroxy complexes respectively. Aluminium oxide was estimated by difference.

Loss on ignition at 950° C was determined gravimetrically.

The results of the chemical analyses are shown in Table 10.

DISCUSSION OF RESULTS

British Standard 2975 gives specifications for sand for making colourless glasses in which the items of particular relevance to the present investigation are particle-size distribution, silica content and iron content. At least 80 per cent of the sand grains constituting the sample of raw material should pass a No. 36 sieve and be retained on a No. 100 sieve. The only sample examined which substantially meets this specification is L 41. All the other samples fall well below this requirement, mainly owing to the large proportion of fine sand (-100 +240 mesh) which they contain.

Again, BS 2975 specifies a minimum silica content of 98.5 per cent and a maximum total iron (as Fe_2O_3) content of 0.03 per cent for sand to be used in the manufacture of general colourless glassware, including containers. The only sample to meet the silica specification is L 735, with 98.7 per cent SiO_2, whilst none of them meets the specification for total iron.

Sand for use in the manufacture of glass for coloured containers is subject to a somewhat less stringent specification for silica and iron contents than those given in BS 2975, though the particle-size distribution requirement remains the same. Thus a minimum silica content of 97.0 per cent and a total iron (as Fe_2O_3) content of 0.25 per cent is generally acceptable for this purpose. Of the samples examined, four of them, namely L 41, L 449, L 478 and L 735 meet the silica and iron specification, but only one of them, L 41, has a satisfactory grain-size distribution.

The least demanding specification for glass sand is that for sand used in the manufacture of glass-fibre insulation, though of course the material commands a commensurately low price. A minimum silica content of 94.5 per cent, a total iron (as Fe_2O_3) content of 0.3 per cent and a size grading of 80 per cent passing a No. 60 sieve are the main requirements. All of these are met by samples L 41, L 449, L 478 and L 735.

In the manufacture of colourless glasses of all kinds, trace mineralogy of the sand is important. However, since none of the present samples qualified for this use on the basis of size grading and chemical composition, no attempt was made to characterise the trace minerals present. For the same reason, colouring oxides such as chromium, vanadium, copper, lead and cobalt were not determined.

CONCLUSION

None of the samples submitted for examination met the specification for sand for making colourless glasses, one appeared suitable for making glass for coloured containers and four were acceptable for manufacture of glass fibre insulation.

The main shortcomings of this group of sands for glass making purposes are the large proportion of fine sand and clay and relative abundance of iron-containing minerals.

Table 9. Size-grading (weight per cent retained) of bedrock sands

Sample No.	Borehole No.	Per cent retained (on B.S. sieves)			
		+ 36 #	+ 100 #	+ 240 #	- 240 #
Barton Beds					
L 20	85 SW 7	0.33	5.7	70.4	23.6
L 211	85 NE 95	0.78	5.3	77.8	16.1
L 432	86 SE 44	0.05	4.0	78.0	18.0
L 735	95 NW 12	0.47	16.2	74.5	8.8
L 786	86 SW 2	0.54	3.1	70.4	26.0
Bracklesham Beds					
L 6	85 NW 94	0.07	22.3	65.8	11.8
L 24	85 SW 7	0.62	50.4	32.3	16.7
L 105	85 SE 18	0.97	29.8	54.6	14.7
L 196	85 NE 96	2.78	56.8	28.9	11.6
L 453	96 NW 4	0.49	40.0	40.0	19.4
Bagshot Beds					
L 41	85 SE 19	0.15	79.9	15.1	4.9
L 449	96 NW 2	0.22	33.2	55.1	11.5
L 478	86 NW 8	0.09	57.0	33.5	9.4

Table 10. Results of chemical analyses of bedrock sands

Sample No.	Borehole No.	Loss on Ignition	SiO_2	Total Fe as Fe_2O_3	TiO_2	Al_2O_3
L 20	85 SW 7	0.91	91.7	3.48	0.04	1.80
L 211	85 NE 95	0.40	96.5	1.01	0.03	1.15
L 432	86 SE 44	0.86	93.1	2.52	0.05	1.81
L 735	95 NW 12	0.22	98.7	0.18	0.04	0.62
L 786	86 SW 2	3.17	76.9	8.20	0.20	6.87
Bracklesham Beds						
L 6	85 NW 94	0.38	93.3	0.98	0.03	2.48
L 24	85 SW 7	0.19	97.7	0.41	0.04	0.86
L 105	85 SE 18	0.33	94.6	0.84	0.05	2.24
L 196	85 NE 96	0.47	95.6	1.43	0.06	1.35
L 453	96 NW 4	0.32	97.5	0.58	0.05	0.94
Bagshot Beds						
L 41	85 SE 19	0.18	97.5	0.23	0.05	1.17
L 449	96 NW 2	0.15	97.8	0.15	0.05	0.94
L 478	86 NW 8	0.27	97.2	0.22	0.06	1.47

APPENDIX K: CONVERSION TABLE: METRES TO FEET

m	ft	m	ft	m	ft	m	ft	m	ft
0.1	0.5	6.1	20	12.1	39.5	18.1	59.5	24.1	79
0.2	0.5	6.2	20.5	12.2	40	18.2	59.5	24.2	79.5
0.3	1	6.3	20.5	12.3	40.5	18.3	60	24.3	79.5
0.4	1.5	6.4	21	12.4	40.5	18.4	60.5	24.4	80
0.5	1.5	6.5	21.5	12.5	41	18.5	60.5	24.5	80.5
0.6	2	6.6	21.5	12.6	41.5	18.6	61	24.6	80.5
0.7	2.5	6.7	22	12.7	41.5	18.7	61.5	24.7	81
0.8	2.5	6.8	22.5	12.8	42	18.8	61.5	24.8	81.5
0.9	3	6.9	22.5	12.9	42.5	18.9	62	24.9	81.5
1.0	3.5	7.0	23	13.0	42.5	19.0	62.5	25.0	82
1.1	3.5	7.1	23.5	13.1	43	19.1	62.5	25.1	82.5
1.2	4	7.2	23.5	13.2	43.5	19.2	63	25.2	82.5
1.3	4.5	7.3	24	13.3	43.5	19.3	63.5	25.3	83
1.4	4.5	7.4	24.5	13.4	44	19.4	63.5	25.4	83.5
1.5	5	7.5	24.5	13.5	44.5	19.5	64	25.5	83.5
1.6	5	7.6	25	13.6	44.5	19.6	64.5	25.6	84
1.7	5.5	7.7	25.5	13.7	45	19.7	64.5	25.7	84.5
1.8	6	7.8	25.5	13.8	45.5	19.8	65	25.8	84.5
1.9	6	7.9	26	13.9	45.5	19.9	65.5	25.9	85
2.0	6.5	8.0	26	14.0	46	20.0	65.5	26.0	85.5
2.1	7	8.1	26.5	14.1	46.5	20.1	66	26.1	85.5
2.2	7	8.2	27	14.2	46.5	20.2	66.5	26.2	86
2.3	7.5	8.3	27	14.3	47	20.3	66.5	26.3	86.5
2.4	8	8.4	27.5	14.4	47	20.4	67	26.4	86.5
2.5	8	8.5	28	14.5	47.5	20.5	67.5	26.5	87
2.6	8.5	8.6	28	14.6	48	20.6	67.5	26.6	87.5
2.7	9	8.7	28.5	14.7	48	20.7	68	26.7	87.5
2.8	9	8.8	29	14.8	48.5	20.8	68	26.8	88
2.9	9.5	8.9	29	14.9	49	20.9	68.5	26.9	88.5
3.0	10	9.0	29.5	15.0	49	21.0	69	27.0	88.5
3.1	10	9.1	30	15.1	49.5	21.1	69	27.1	89
3.2	10.5	9.2	30	15.2	50	21.2	69.5	27.2	89
3.3	11	9.3	30.5	15.3	50	21.3	70	27.3	89.5
3.4	11	9.4	31	15.4	50.5	21.4	70	27.4	90
3.5	11.5	9.5	31	15.5	51	21.5	70.5	27.5	90
3.6	12	9.6	31.5	15.6	51	21.6	71	27.6	90.5
3.7	12	9.7	32	15.7	51.5	21.7	71	27.7	91
3.8	12.5	9.8	32	15.8	52	21.8	71.5	27.8	91
3.9	13	9.9	32.5	15.9	52	21.9	72	27.9	91.5
4.0	13	10.0	33	16.0	52.5	22.0	72	28.0	92
4.1	13.5	10.1	33	16.1	53	22.1	72.5	28.1	92
4.2	14	10.2	33.5	16.2	53	22.2	73	28.2	92.5
4.3	14	10.3	34	16.3	53.5	22.3	73	28.3	93
4.4	14.5	10.4	34	16.4	54	22.4	73.5	28.4	93
4.5	15	10.5	34.5	16.5	54	22.5	74	28.5	93.5
4.6	15	10.6	35	16.6	54.5	22.6	74	28.6	94
4.7	15.5	10.7	35	16.7	55	22.7	74.5	28.7	94
4.8	15.5	10.8	35.5	16.8	55	22.8	75	28.8	94.5
4.9	16	10.9	36	16.9	55.5	22.9	75	28.9	95
5.0	16.5	11.0	36	17.0	56	23.0	75.5	29.0	95
5.1	17	11.1	36.5	17.1	56	23.1	76	29.1	95.5
5.2	17	11.2	36.5	17.2	56.5	23.2	76	29.2	96
5.3	17.5	11.3	37	17.3	57	23.3	76.5	29.3	96
5.4	17.5	11.4	37.5	17.4	57	23.4	77	29.4	96.5
5.5	18	11.5	37.5	17.5	57.5	23.5	77	29.5	97
5.6	18.5	11.6	38	17.6	57.5	23.6	77.5	29.6	97
5.7	18.5	11.7	38.5	17.7	58	23.7	78	29.7	97.5
5.8	19	11.8	38.5	17.8	58.5	23.8	78	29.8	98
5.9	19.5	11.9	39	17.9	58.5	23.9	78.5	29.9	98
6.0	19.5	12.0	39.5	18.0	59	24.0	78.5	30.0	98.5

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INSTITUTE OF GEOLOGICAL SCIENCES

INDUSTRIAL MINERALS ASSESSMENT UNIT

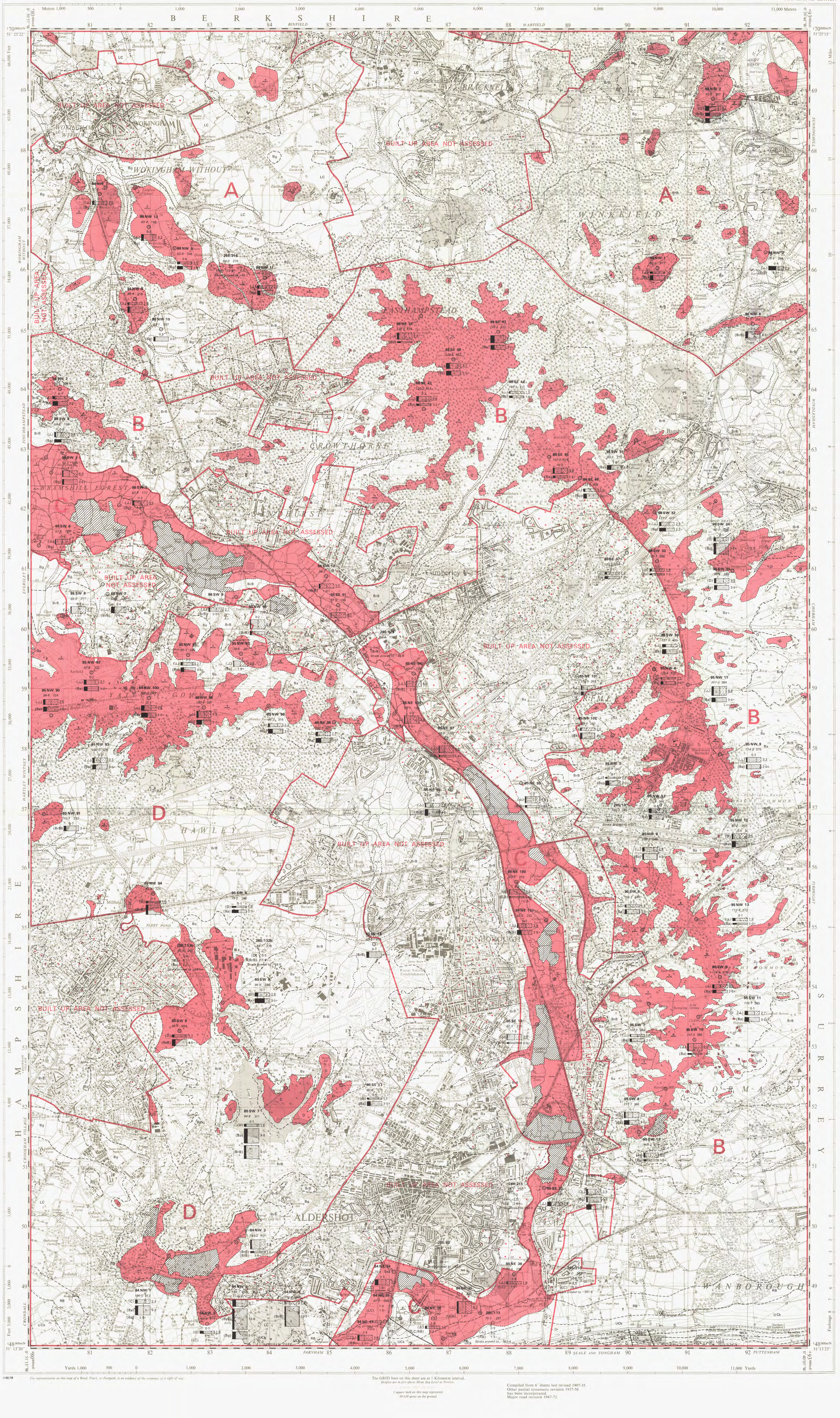
THE SAND AND GRAVEL RESOURCES OF THE BLACKWATER VALLEY (ALDERSHOT) AREA SHEETS SU 85, 86 AND PARTS OF SU 84, 94, 95, 96.

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

ORDNANCE SURVEY

SHEET SU 85,86 & Pts SU 84,94,95,96

PROVISIONAL EDITION



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

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EXPLANATION OF SYMBOLS AND ABBREVIATIONS

DRIFT

	Peat -dark brown, partially decomposed organic matter, found at various levels in the drift deposits. P-4	RECENT AND PLEISTOCENE
	Alluvium -silty clay and loam of fluvial origin, with organic material and scattered flint pebbles. A-27	
D	**Downwash Gravel** - thin, patchy sand and gravel of variable composition derived by solifluxion from adjacent solid and drift deposits. D-1	
	River Terrace Deposits - fluviatile sand and gravel mainly of flint with minor amounts of sandstone and vein-quartz RT-8	
	River Terrace Deposits (Undifferentiated) - thin, patchy sand and gravel of limited extent and of uncertain origin. RT-9	UNKNOWN AGE
C	**Caesar's Camp Gravel** - high level sand and gravel with nodular flint cobbles. C-1	

SOLID

Ba	**Barton Beds** - yellow and pale grey silty, fine quartz sands.	PALAEOGENE
BrB	**Bracklesham Beds** - yellow, and where glauconitic, greenish yellow, fine and medium quartz sands.	
Bg	**Bagshot Beds** - orange, yellow and pale grey, fine and medium quartz sands.	
LC	**London Clay** - firm bluish-grey clay, silty in parts and with bluish-grey sands near the top.	
RB	**Reading Beds** - mottled red and green sands and clays.	
UCk	**Upper Chalk** - soft white limestone with nodular flints.	CRETACEOUS
MCk	**Middle Chalk** - soft white limestone with scattered flints, hard nodular limestone (Melbourn Rock) at base.	
LCk	**Lower Chalk** - grey and white limestone, marly in lower part.	
UGS	**Upper Greensand** - pale grey sands and loosely cemented sandstone beds.	
G	**Gault** - firm bluish-grey and grey clays.	

Areas of Worked-out sand and gravel WO-13

BOUNDARY LINES

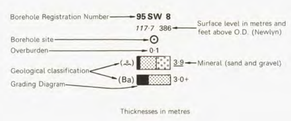
- Geological boundary, Drift.
- Geological boundary, Solid.
- Line of fault at surface, crossmark indicates downthrow side
- Resource Block Boundary
- Inferred boundary between recognised categories of deposits

BOREHOLE DATA

SITE LOCATIONS

- Industrial Minerals Assessment Unit (I.M.A.U.) boreholes
- Other boreholes

I.M.A.U. BOREHOLES



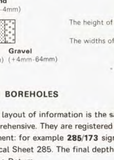
Note:
1. Figures underlined denote thicknesses used in the assessment of resources.
2. The + sign indicates that the base of the deposit was not reached.
3. The figures in *italics* are conversions to metres of measurements recorded in feet.
4. The Geological Classification is given only for mineral and bedrock.

Borehole Registration Number

Each I.M.A.U. borehole is identified by a Registration Number eg **95 SW 8**. The letters refer to the quarter sheet and the figures to the I.G.S. serial number for that quarter. The unique designation for borehole **95 SW 8** is **SU 95 SW 8**.

Grading Diagrams

Each grading diagram shows the mean particle size distribution of a distinct deposit of sand and gravel



The height of the diagram is proportional to the mineral thickness.

The widths of the divisions show the proportions of **Fines**, **Sand** and **Gravel**

OTHER BOREHOLES

The layout of information is the same as for I.M.A.U. boreholes, although data available may not be as comprehensive. They are registered in the same series, except for records in the Hydrogeological Department: for example **285/173** signifies Hydrogeological Department borehole 173 on New Series One-inch Geological Sheet 285. The final depth of deep boreholes is given in metres above (+) or below (−) Ordnance Datum

CATEGORIES OF DEPOSITS

- **Exposed Mineral.** CAT-E6
- **Sand and gravel either not potentially workable (see Report) or absent.** CAT-A2
- **Sand and gravel not assessed.** CAT-N1

RESOURCE BLOCKS

For the purpose of assessment, the mineral-bearing land 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, Notts. NG12 5GG.

Data quoted for an individual borehole refer strictly to that site; reliable conclusions cannot be drawn about the thickness and grading elsewhere in the deposit, particularly in material as variable as sand and gravel. However, estimates of the volume and mean grading of the mineral as a whole in each Resource Block are given in the Report.

SU 77	SU 87	SU 97	TQ 07
268		269	
SU 76	SU 86	SU 96	TQ 06
SU 75	SU 85	SU 95	TQ 05
284		285	
SU 74	SU 84	SU 94	TQ 04

Diagram showing the relation of the National Grid 1:25 000 sheets with the One-Inch and 1:50 000 Geological Sheets 268, 269, 284 and 285.

Geological lines from a six-inch survey, principally by H. Dewey and C. E. N. Bromehead in 1910-11, C. Reid District Geologist, and by H. G. Dines and F. H. Edmunds in 1924-26, H. Dewey District Geologist. Included in One-Inch Geological Sheets 269 and 285 respectively Amendments by B. C. Worssam in 1971, S. C. A. Holmes District Geologist, and by M. R. Clarke and A. J. Dixon in 1976, W. A. Read District Geologist.

Sand and Gravel Survey by M. R. Clarke and D. J. Havard in 1974-75. R. G. Thurrell, Head, Industrial Minerals Assessment Unit

1:25 000 Sand and Gravel Resource Sheet published 1978
Austin W. Woodland C.B.E. *Director, Institute of Geological Sciences, incorporating the Geological Survey of Great Britain, the Museum of Practical Geology and Overseas Geological Surveys.*

Made and published by the Director General of the Ordnance Survey, Southampton, for the Institute of Geological Sciences.

The representation on this map of a Road, Track, or Footpath, is no evidence of the existence of a right of way.

The GRID lines on this sheet are at 1 Kilometre interval.
Heights are in feet above Mean Sea Level at Newlyn.
Contours are at 50 feet
1 square inch on this map represents 99·639 acres on the ground.

Compiled from 6″ sheets last revised 1907-35.
Other partial systematic revision 1937-56 has been incorporated.
Major road revision 1947-72.

1100/78

THE SAND AND GRAVEL RESOURCES OF THE BLACKWATER VALLEY (ALDERSHOT) AREA. SHEETS SU 85, 86 AND PARTS OF SU 84, 94, 95, 96.