

## The sand and gravel resources of the country around Lymington and Beaulieu, Hampshire

Description of parts of 1:25 000 sheets SU 20, 30 and 40, and SZ 29, 39 and 49

S. J. Mathers

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 and subsequent reports appear as Mineral Assessment Reports of the Institute.

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

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*The asterisk on the cover indicates that parts of sheets adjacent to those cited are described in the 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 sand and gravel resources of 263 km<sup>2</sup> of country around Lymington and Beaulieu, Hampshire, shown on the two accompanying 1:25 000 resource sheets. The survey was conducted by Mr S. J. Mathers, who was assisted in the drilling and sampling programme by Messrs K. A. McL Adlam, D. Thomas and J. B. L. Wild. Mr Mathers compiled the report. The work is based on a geological survey at 1:10 560 by C. Reid and W. Whitaker.

Mr G. I. Coleman (Land Agent) was responsible for negotiating access to land for drilling. The ready co-operation of landowners and tenants in this work is gratefully acknowledged.

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## SUMMARY

The geological maps of the Institute of Geological Sciences, pre-existing borehole information, and 135 boreholes drilled for the Industrial Minerals Assessment Unit form the basis of the assessment of the sand and gravel resources of the country around Lymington and Beaulieu, Hampshire.

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

The 1:25 000 map (printed as two overlapping sheets, western and eastern) is divided into five resource blocks, containing between 8.8 and 45.0 km<sup>2</sup> of sand and gravel. For each block the geology of the deposits is described, and the mineral-bearing area, the mean thickness of overburden and mineral and the mean gradings are stated. Detailed borehole data are also given. The geology, the position of the boreholes and the outlines of the resource blocks are shown on the accompanying map.

## Notes

- 1 Localities within the survey area are accompanied by a six-figure grid reference when first referred to in the text and are shown on the locality map (Figure 2).
- 2 Each borehole registered with the Institute is identified by a 4-element code (eg SZ 39 NW 15). The first two elements define the 10-km square (of the National Grid) in which the borehole is situated; the third element defines a quadrant of that square, and the fourth is the accession number of the borehole. In the text the borehole is referred to by the last three elements (eg 39 NW 15).
- 3 Colour codes and descriptions quoted in the documentation of geological samples accord with those of the Rock Color Chart of the Geological Society of America (1979).

## Bibliographical reference

MATHERS, S. J. 1982. The sand and gravel resources of the country around Lymington and Beaulieu, Hampshire: description of parts of 1:25 000 sheets SU 20, 30 and 40 and SZ 29, 39 and 49. *Miner. Assess. Rep. Inst. Geol. Sci.*, No. 122.

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## INTRODUCTION

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

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

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

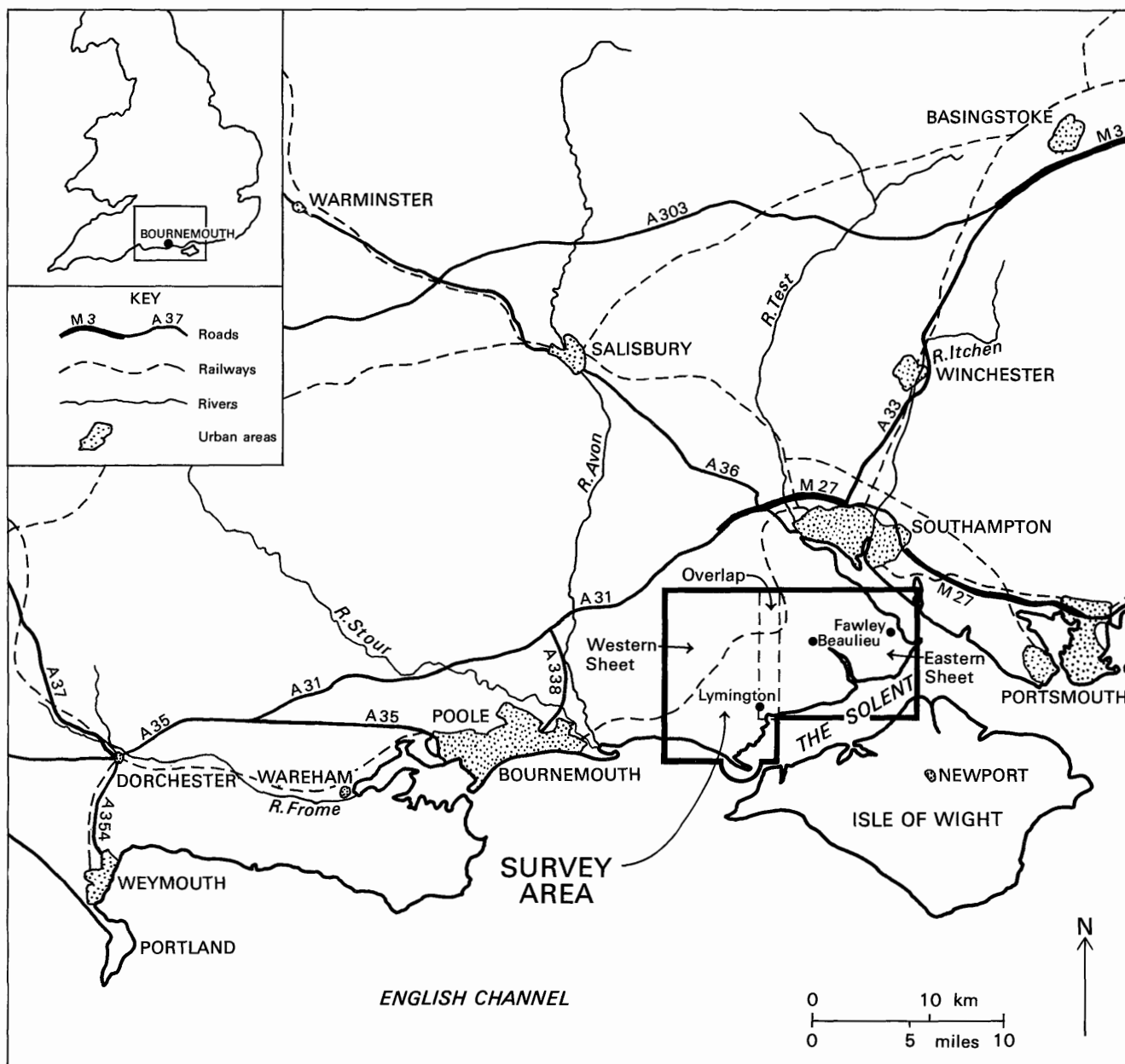
- a The deposit should average at least 1 m in thickness.
- b The ratio of overburden to sand and gravel should be no more than 3:1.
- c The proportion of fines (particles passing a 0.063 mm B.S. sieve) should not exceed 40 per cent.
- d The deposit should lie within 25 m of the surface, this being taken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

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

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

For the particular needs of assessing sand and gravel resources, a grain-size classification based on the geometric scale  $\frac{1}{8}$  mm,  $\frac{1}{4}$  mm, 1 mm, 4 mm, 16 mm, 64 mm has been adopted. The boundaries between fines (that is, the clay and silt fractions) and sand, and between sand and gravel grade material, are placed at  $\frac{1}{8}$  mm and 4 mm respectively (see Appendix C).

The volume and other characteristics are assessed within resource blocks, each of which, ideally, contains



**Figure 1** Location of the survey area.

approximately 10 km<sup>2</sup> of sand and gravel. No account is taken of any factors, for example roads, villages or land of high agricultural or landscape value, which might stand in the way of sand and gravel being exploited, although towns are excluded. The estimated total volume therefore bears no simple relationship to the amount that could be extracted in practice.

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

**DESCRIPTION OF THE DISTRICT**

**General**

The survey area (Figures 1 and 2) described in this report comprises the coastal region around Lympington [322 954] and Beaulieu [386 022], Hampshire. The area, which includes the southern part of the New Forest, is famous for its scenic beauty and recreational facilities. Lympington is the major centre and port within the area; the nearest large conurbations are Bournemouth (20 km

west of Lympington) and Southampton (15 km north-east of Brockenhurst [302 022]). The main rail link between Bournemouth and Southampton passes through the area, for which Brockenhurst is the principal station. A branch line to Lympington Quay links up with the Isle of Wight ferry. Only a few major trunk roads serve this mainly rural area. The west bank of Southampton Water between Hythe [425 076] and Calshot [475 015] is heavily industrialised, notably at Fawley [455 035] where a major oil refinery and power station are situated. This industrial sector and the built-up areas of Lympington, New Milton [240 950] and Barton on Sea [235 930] have been excluded from this survey.

**Topography**

The area comprises high ground in the north-west which gives way to lower ground to the south and east near the coast. The former is typically covered by the woodland and heath of the New Forest (for example, Beaulieu Heath [355 000]) where heights of 40 to 50 m above Ordnance Datum are common, but the ground rises to over 65 m OD at Spy Holms [242 025], the highest point in the area. Tertiary sands and clays crop out widely,

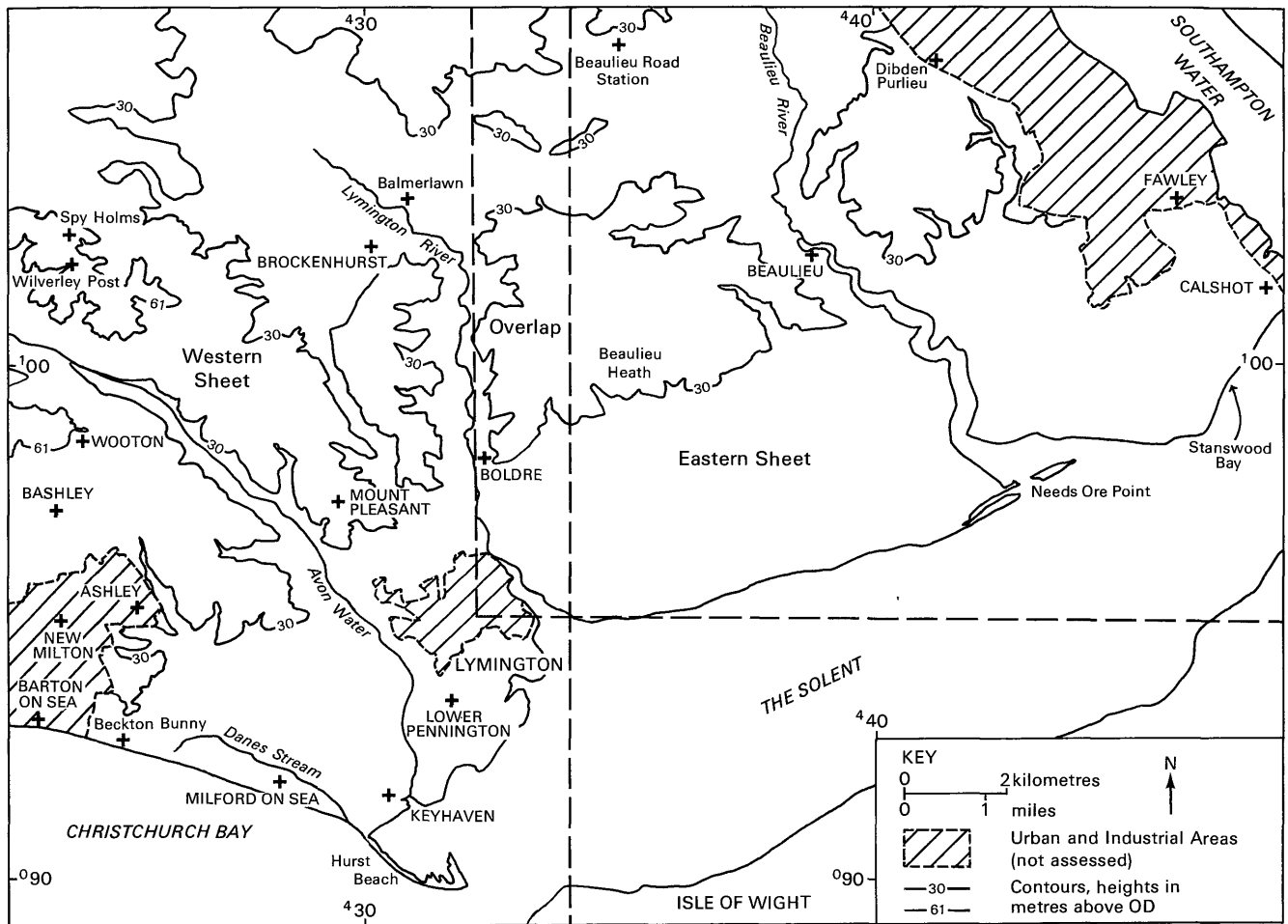


Figure 2 Locality map.

with Plateau Gravel forming protective cappings to the highest hills.

To the south-east, the higher elevations give way to a broad tract of ground averaging 20 to 40 m OD. This area is underlain by Plateau Gravel which forms a series of SW-NE-trending level tracts separated by steeper 'bluffs', (in reality, gentle slopes). The southern part of this area supports mixed agriculture. The Lyminster and Beaulieu rivers and Avon Water drain southwards across narrow alluvial tracts in deeply incised valleys.

The coastline of the high area exhibits a variety of geomorphological forms. Cliffs up to 40 m high at Barton on Sea fall away eastwards towards Milford on Sea [282 918] where they reach 10 to 15 m. Erosion of these and other gravel-capped cliffs has produced substantial volumes of loose shingle that has been transported eastwards by longshore drift to form spits (for example, Hurst Beach [305 900]) and bars (for example, Needs Ore Point [429 976]). These have protected adjacent parts of the coastline from a dominantly south-westerly wave action, allowing the development of broad 'low energy' intertidal mudflats and supratidal salt marshes such as those between Hurst Beach and the Lyminster River estuary.

### Geology

The survey area lies in the central part of the Hampshire Basin, a broad sedimentary basin composed of soft Tertiary sands and clays unconformably overlain by drift deposits and bordered by the Chalk outcrop. The elliptical basin extends approximately 120 km in an east-west direction from Dorchester to Bognor Regis. At its widest, (ie from Romsey to the Isle of Wight) the basin is 35 km across. The dip of the strata is generally shallow except on the faulted monoclinical southern limb where

vertically-bedded Chalk forms the "backbone" of the Isle of Wight and Purbeck ridges.

The major episode of folding is probably Miocene in age since Oligocene strata are affected by the folding, and Pliocene benches are cut into the folded strata (Everard, 1956; Sparks, 1949); the benches may not, however, be marine as hitherto supposed (Hodgson and others, 1974). Nevertheless, the absence of Miocene deposits in southern England lends support to the view that, during this period, the survey area underwent uplift and erosion.

The folded Tertiary bedrock is overlain by Plateau Gravel which, in this area, rests on several distinct benches or levels from over 60 m OD down to sea-level. The gravels are probably Pleistocene in age and reflect successive periods of downcutting and deposition. River terrace deposits remain in the main valleys. Alluvium is developed along the valleys of the major rivers and along parts of the coast; there are local developments of peat, brickearth, and storm beach deposits.

### SOLID

**Barton Beds** The Barton Beds comprise a lower clay facies (Barton Clay) and an upper sandy facies (Barton Sand). The junction between them is diachronous and the facies are therefore lithostratigraphical units with no chronostratigraphical significance (Curry and others, 1978).

Barton Clay is exposed at the base of the cliffs at Barton on Sea, and crops out along the west bank of Southampton Water, in the north-western part of the survey area, and as small inliers in the north. The facies comprises about 30 m of olive grey and greenish grey clays which weather yellowish brown. The clays are commonly sandy and contain thin glauconitic sands and

layers rich in sideritic concretions. Abundant marine mollusca and other marine phyla occur.

Barton Sand crops out over much of the northern part of the area and in the incised valleys of the Lymington River and Avon Water. This facies is about 30 m thick and includes two units. The lower unit, the 'Chama' Bed (named after the bivalve *Chama squamosa*, which occurs in profusion), consists of a bluish to greenish grey, commonly glauconitic, fine clayey sand that becomes more argillaceous with depth. The upper unit is thicker and comprises greenish grey, fine-grained, well sorted sand which weathers yellowish-white. A thin lensoid sandy clay, the Becton Bunny Bed, contains an abundant marine fauna at Beckton Bunny [253 926]. Farther west, this bed becomes carbonaceous and wedges out, and it is also absent around Fawley where the sands are particularly micaceous.

**Headon Beds** Headon Beds crop out primarily in the central and southern part of the area in the sides of incised valleys. The sequence consists of about 50 m of sands and clay that can be sub-divided into lower, middle and upper units. The Lower Headon Beds are 15 to 20 m thick and comprise pale greenish grey plastic clays, commonly with bands of freshwater bivalves and gastropods and layers of finely comminuted shells. Near the base, an 'oyster bed', seen in coastal exposures, is overlain by a carbonaceous silt containing lignite. The Middle Headon Beds comprise about 13 m of olive grey sandy clays and clayey sands with thinly bedded clays; strata such as the Brockenhurst Bed, near the base, and the 'Venus' Bed, both of which yield thick-shelled bivalves and gastropods believed to be of marine to brackish water origin, are richly fossiliferous. The Upper Headon Beds include over 20 m of greenish grey plastic clays which are sometimes sandy and contain freshwater bivalves and gastropods and layers of finely comminuted shells.

**Table 1** Geological classification of strata cropping out in the survey area.

	Deposit	Major lithologies
<b>DRIFT</b>		
<b>Recent and Pleistocene</b>	Storm Beach Deposits	Coarse gravels, cobbles
	Alluvium	Silt, clay
	Peat	Peat
	Brickearth	Sandy silt
	River Terrace Deposits	Gravel
	Plateau Gravel	Gravel
<b>SOLID</b>		
<b>Eocene</b>	Headon Beds	Grey and green clays with sands
	Barton Beds	
	Barton Sand	Yellowish brown fine-grained sands with thinly bedded clays
	Barton Clay	Grey and green clays with thinly bedded sands

**DRIFT**

**Plateau Gravel** Plateau Gravel has been mapped within the area at heights ranging from above 65 m OD at Spy Holms to sea-level at Keyhaven [304 916]. The deposit was originally described as a single unit (Reid, 1902; Osborne White, 1915) but subsequent detailed morphological mapping (Green, 1946; Everard, 1952; Swanson, 1970) has established the presence of several broad, near horizontal, levels, trending ENE-WSW and separated by

narrow and steeper bluffs. The levels have negligible if any longitudinal gradient, although slopes of half a degree are common in a transverse direction. The mapped levels shown in Figure 3 are based on Everard (1952) with minor amendment by M. R. Clarke and S. J. Mathers in 1981. The numbering of the levels is consistent with that used in adjacent resource sheet areas (Clarke, 1981; Kubala, 1980) but the term Plateau Gravel has been retained here because no genesis for the deposits is implied. Assessment boreholes suggest that the levels are commonly underlain by 2.5 m to 5.0 m of Plateau Gravel deposits whereas thinner and often more clayey deposits occur in the bluffs. Because the bluffs are difficult to position accurately due to mass-movement and erosion, the limits of the levels (Figure 3) are drawn tentatively and they are not shown on the resource maps.

In the north-west of the area, the highest deposits (levels 8-10) are preserved but in the north-east, deep dissection has exposed the underlying Tertiary bedrock. Levels 5-7 are well preserved as broad tracts up to 3 km wide from around Barton on Sea to the Fawley area. The lower levels (2-4) are less well developed due to reworking of some of these deposits. Level 1 was proved beneath alluvium in boreholes 39 SW 2 and 5 and is graded to below present day sea-level.

Lower levels supporting submerged gravel deposits have been described (Curry and others, 1968; Hodson and West, 1972) and a deep drowned river valley has been reported under the East Solent (Dyer, 1975).

In pit and cliff sections, the upper parts of the Plateau Gravel are commonly cryoturbated and, locally, thin mass-movement deposits are developed. Flint pebbles near the surface are commonly strongly patinated. Beneath this upper layer, the deposits appear to be massively bedded, well-sorted flint gravels in which thin stringers of sand commonly occur. Restricted developments of cross-bedding, imbrication and open-work texture occur within the gravels.

The base of the deposits is commonly planar though undulating (scalloped) and deeply channelled contacts occur. In cliff exposures along Stanswood Bay [476 005], the junction between Plateau Gravel and Barton Sand is an irregular one with several deep (3-m) channels. Clasts of Barton Sand up to 200 mm in diameter in the base of the Plateau Gravel suggest that the bedrock was frozen at the time of excavation. In assessment boreholes 40 SW 166, 39 NW 4 and 39 NE 5, very thick (over 8.0 m) Plateau Gravel deposits were encountered resting on Barton Sand. These deposits probably represent the infilling of channels.

The origin of the Plateau Gravel deposits is, despite extensive study, still controversial. Keen (1980), on the basis of a comprehensive review of the literature, favours formation in braided periglacial streams at the onset of successive glacial episodes.

**River Terrace Deposits (undifferentiated)** This category includes mapped patches of river gravels related to the drainage of Lymington River, its tributaries, and the Beaulieu River and Southampton Water. Detailed classification of these deposits has not been attempted because their restricted extent and occurrence in several different drainage systems makes any correlation scheme uncertain; further studies would be needed.

These deposits have been assessed only in the Lymington River basin to the north-west of Brockenhurst and downstream from Boldre [322 982]. The deposits commonly consist of 2 to 4 m of flint gravel. The evolution of the Lymington and Beaulieu rivers and their associated deposits may be a response to an intermittently falling base level leading to the deep incision of these valleys (Everard, 1957). This concept is linked with Everard's interpretation of the Plateau Gravel as a deposit 'supplanted' onto a series of marine benches cut by successively lower sea-levels.



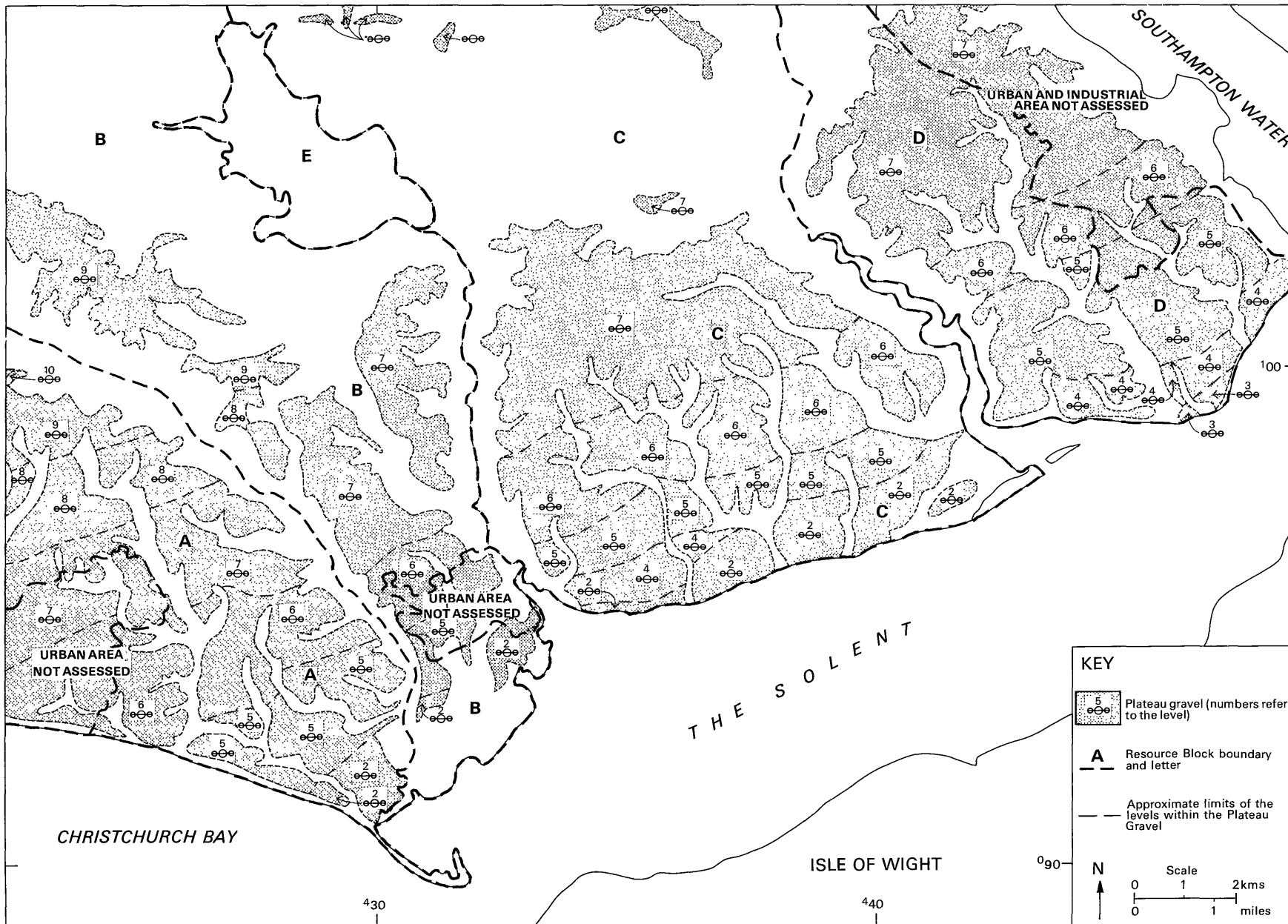
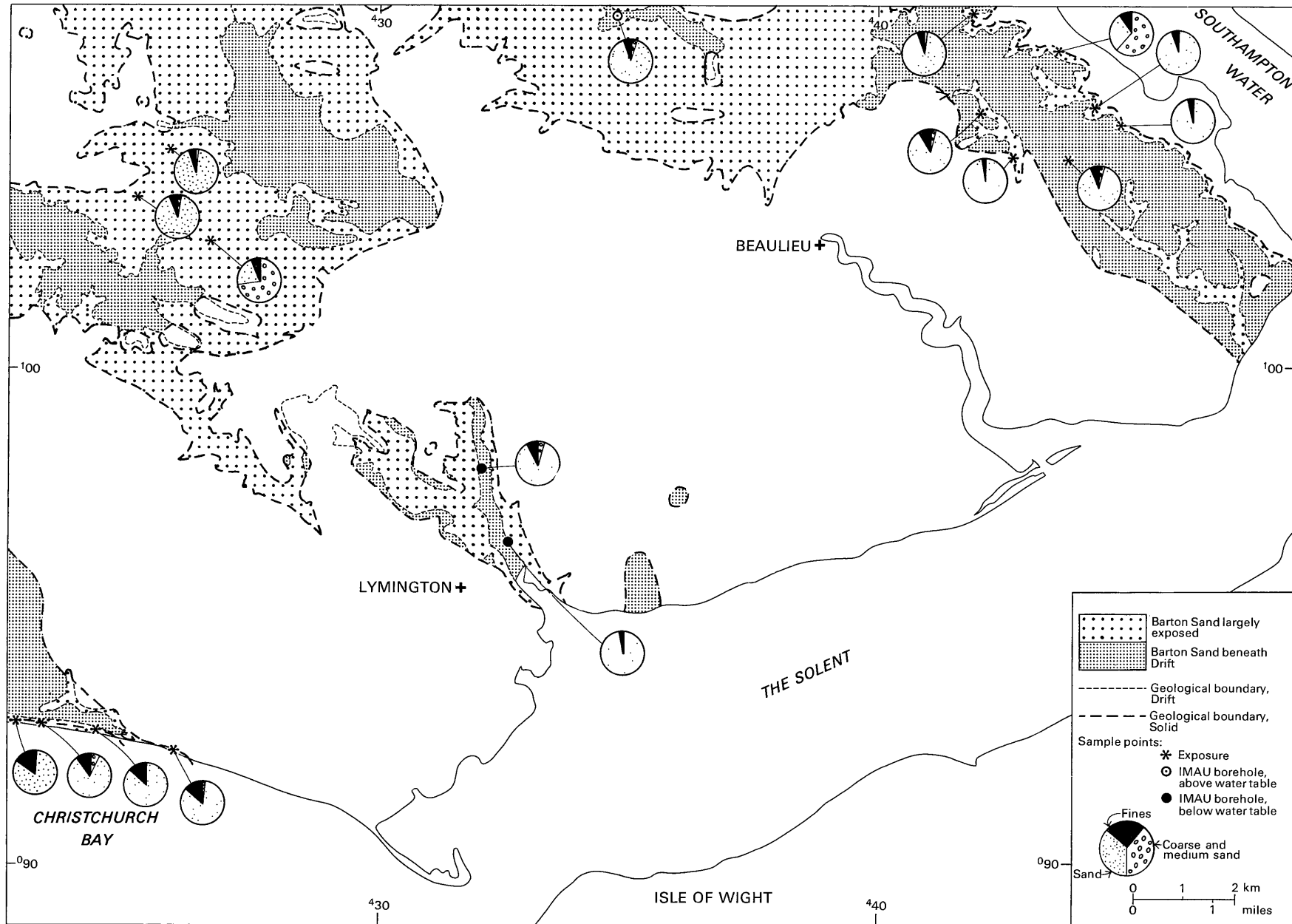


Figure 3 Distribution of Plateau Gravel.



**Figure 4** Distribution and grading characteristics of the Barton Sand.

**Brickearth** Three outcrops of brickearth, mapped in the south-west of the area, overlie Plateau Gravel. The largest and most southerly outcrop is exposed in cliffs at Barton on Sea where the deposit is up to 2 m thick. The distribution of brickearth is much more extensive than is shown on the published geological maps; it was recorded in most IMAU boreholes in the south-west of the area and also in several around Fawley (see Fisher, 1971). However, the brickearth in many of these boreholes is less than 1 m thick and thus it has not been distinguished as a separate mappable unit over much of the area.

The brickearth is typically a sandy, silty clay (loam), usually dark yellowish orange (10 YR 6/6) to light brown (5 YR 5/6) in colour. The deposit may be either a loess or a floodloam associated with the underlying gravels. Grading analyses (Swanson, 1970; Lewin, 1966; Fisher, 1971; Everard, 1952) show poor sorting, favouring the latter hypothesis, but the presence of similar brickearths extending over several adjacent Plateau Gravel levels (believed to be of different ages) supports a loessic origin. Dating of a sample of brickearth by thermoluminescence (Wintle, 1981) has yielded an age of 14,500 years BP  $\pm$  20 per cent.

**Peat** Peat bogs are developed within surface depressions and on the floors of small valleys in the northern part of the area where they commonly overlie Barton Sands in which high watertable conditions exist.

**Alluvium** Alluvium, comprising silts and clays and generally less than 1.0 m thick, has been mapped overlying river terrace deposits along the valley floors of the larger rivers, whereas along the coast, it overlies Plateau Gravel graded to sea-levels below that of the present day. There the alluvium includes estuarine muds, silts and intertidal mudflat and supratidal saltmarsh deposits.

**Storm Beach Deposits** Storm beach deposits exist in the form of spits (Hurst Beach) and bars (Needs Ore Point). The deposits are dominantly coarse gravels and cobbles derived from nearby cliffs and transported eastwards along the coast by longshore drift. The aggregate potential of these deposits (which were excluded from the resource survey) is not considered in this report.

#### Composition of the Sand and Gravel Deposits

Plateau Gravel and river terrace deposits constitute the potentially workable drift sand and gravel deposits in the area. The Barton Sand was investigated to a shallow depth in IMAU boreholes where it underlies mineral deposits in the drift, and bulk samples were graded, but this deposit has not been assessed as mineral in this report.

**Barton Sand** The outcrop and subcrop of the Barton Sand beneath potentially workable sand and gravel deposits is shown in Figure 4; the gradings of sand samples collected from outcrops (Dr R. C. Scrivener, personal communication) and from IMAU boreholes are also shown. The mean grading is fines 7 per cent and sand 93 per cent. The sands are dominantly fine-grained and comprise subangular and subrounded quartz grains.

**Plateau Gravel** Plateau Gravel deposits constitute the major sand and gravel resource of the area. The resource comprises 118.6 km<sup>2</sup> of mineral bearing ground of which 26.1 km<sup>2</sup> has been classified as concealed (Block A) and 92.5 km<sup>2</sup> as exposed (Blocks B, C, D).

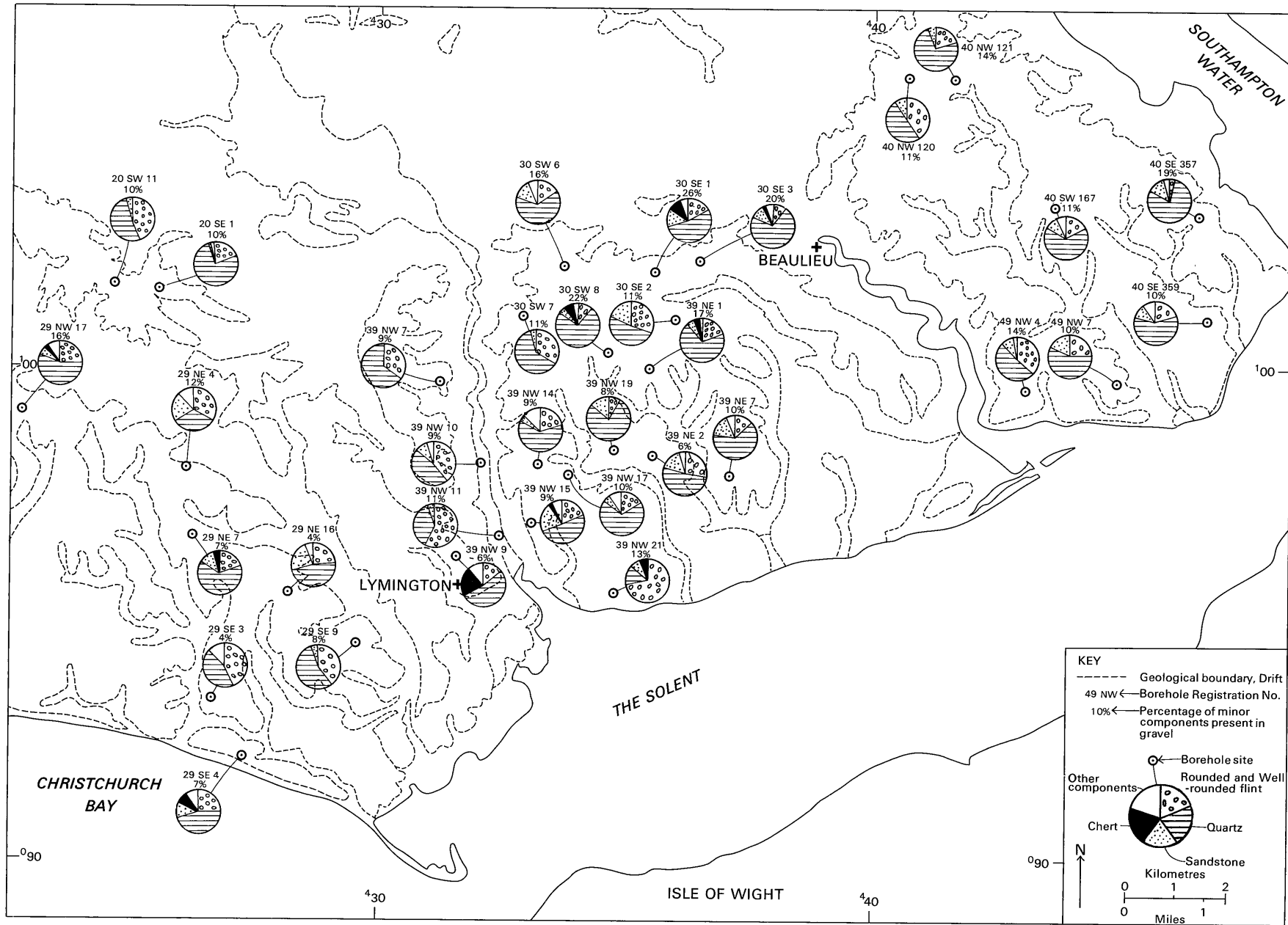
Plateau Gravel, with a mean proven thickness of 3.4 m, is a flint-rich gravel that often has a 'clayey' superficial layer which has commonly been affected by cryoturbation and mass-movement. The clay-rich part of the deposit is best developed along the steeper bluffs (transverse slopes up to 2°) where the clay-poor gravel sequences are often attenuated. Up-slope, for several hundred metres from the approximate positions of the bases of these bluffs (Figure 3), the ground is probably poor in mineral. Waste partings within the mineral are extremely rare although, for example, 1.7 m of clay, peat and silt was proved within mineral deposits in borehole 49 NW 3. The mean grading of the Plateau Gravel deposits is fines 5 per cent, sand 45 per cent and gravel 50 per cent.

The composition of the minor components within the fine gravel fraction (+4 to -16 mm) from selected IMAU boreholes is shown in Figure 5; angular flint is the major component. Reid (1902) recorded the following lithologies in gravels from a pit near Dibden Purlieu [415 063] "Fresh and worn flints, Greensand Chert, Palaeozoic grit, Schorl, Jasper and Silicified Purbeck Limestone" but many of these components are present in only minor amounts in the borehole samples and fall within the "other components" category included in Figure 5. The sand-size fraction of the mineral deposits consists of subrounded quartz and subangular flint. The degradation of silica by acidic ground-water solutions in the upper parts of the deposit has led to patination of the surface of the flints, leading to a reduction in the strength of these clasts (Fairbairn and Robertson, 1972). Further descriptions of the characteristics of the Plateau Gravel within individual resource blocks are given elsewhere in this report.

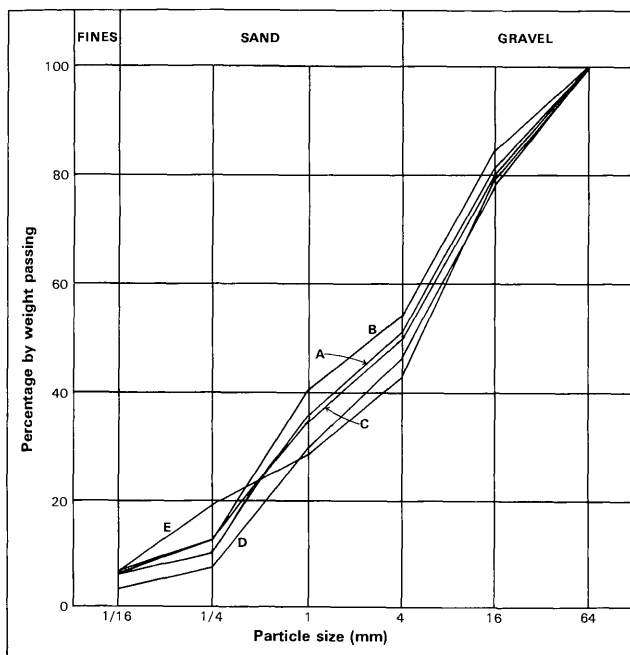
**River Terrace Deposits (undifferentiated)** These deposits proved to be mineral to the north-west of Brockenhurst (Block E) and along the lower reaches of the Lymington River (Block C). These areas together comprise 9.9 km<sup>2</sup> of mineral-bearing ground. The

**Table 2** Summary of statistical results.

Block	Area		Mean thickness		Volume of sand and gravel			Mean grading percentage		
	Block	Mineral	Over-burden	Mineral	Limits at the 95% probability level			Fines	Sand	Gravel
	km <sup>2</sup>	km <sup>2</sup>	m	m	m <sup>3</sup> x 10 <sup>6</sup>	± %	± m <sup>3</sup> x 10 <sup>6</sup>	- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ -4 mm	+4 mm
A	39.4	26.1	1.3	3.4	89	13	12	5	46	49
B	68.7	21.8	0.9	3.8	83	20	16	6	49	45
C	102.3	45.0	0.9	3.3	149	13	19	5	45	50
D	43.6	26.8	0.7	3.3	88	24	21	3	43	54
E	9.3	8.8	0.9	1.9	17	72	12	6	37	57
<b>Total or mean values</b>	<b>263.3</b>	<b>128.5</b>	<b>0.9</b>	<b>3.3</b>	<b>426</b>	<b>9</b>	<b>38</b>	<b>5</b>	<b>45</b>	<b>50</b>



**Figure 5** Composition of the minor components of the gravel in the +4-16 mm size range from IMAU boreholes. The gravel is predominantly of angular flint.



Block Percentage by weight passing

Block	1/16 mm	1/4 mm	1 mm	4 mm	16 mm	64 mm
A	5	11	37	51	81	100
B	6	13	40	55	85	100
C	5	13	36	50	80	100
D	3	8	30	46	78	100
E	6	19	29	43	79	100

**Figure 6** Particle size distribution for the assessed thickness of mineral in resource blocks A to E.

deposits consist of flint-rich gravels with subordinate amounts of quartz, sandstone and chert. Compositional data for the two boreholes located in Block C (39 NW 10 and 11) are shown in Figure 5. The river terrace deposits are, on average, thinner and more gravel-rich than the Plateau Gravel. Details of mean thicknesses and gradings for the two mineral-bearing areas of terrace deposits are given in the relevant block descriptions.

### The Map

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

**Geological data** The geological boundary lines, symbols, etc., shown are taken from the geological map of this area, which was surveyed at the scale of 1:10 560. The geological boundaries are the best interpretation of the information available at the time of survey. However, it is inevitable that local irregularities and discrepancies will be revealed as new evidence from boreholes and excavations becomes available.

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

**Mineral resource information** The mineral-bearing ground is divided into resource blocks (see Appendix A).

Within a resource block the mineral is subdivided into areas where it is exposed, that is where the overburden averages less than 1 m in thickness, and areas where it is present in continuous, or almost continuous, spreads beneath overburden.

Areas where bedrock crops out, where boreholes indicate absence of sand and gravel beneath cover, and where sand and gravel beneath cover is interpreted to be not potentially workable, are uncoloured on the map; where appropriate, the relevant criterion is noted. In such cases it has been assumed that mineral is absent except in infrequent and relatively minor patches that can neither be outlined nor assessed quantitatively in the context of this survey. Areas of unassessed sand and gravel, for example in built-up areas, are indicated by a red stipple.

The area of the mineral-bearing ground is measured, where possible, from the mapped geological boundary lines, even though it may include small areas where sand and gravel is not present or is not potentially workable. Inferred boundaries have been inserted to delimit areas where sand and gravel beneath cover is interpreted to be not potentially workable or absent. Such boundaries (for which a distinctive zigzag symbol is used) are drawn primarily for the purpose of volume estimation. The symbol is intended to indicate an approximate location within a likely zone of occurrence rather than to represent the breadth of the zone, its size being determined only by cartographic considerations. For the purpose of measuring areas the centre line of the symbol is used.

### Results

The results of the assessment are summarised in Table 2. Fuller grading particulars are shown in Figure 6 and Tables 3 to 7.

**Accuracy of results** For the five resource blocks, the accuracy of the volume estimates at the 95 per cent probability level (that is, on average nineteen out of every twenty sets of limits constructed in this way contain the true value for the volume of mineral) varies between 13 per cent and 72 per cent. However, the true volumes are more likely to be nearer the figure estimated 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 quotation of reserves, data from more sample points would be required, even if the area were quite small. This point can be illustrated by considering the whole of the potentially workable sand and gravel in Blocks A to E. The total volume (426 million m<sup>3</sup>) can be estimated to limits of  $\pm 9$  per cent at the 95 per cent probability level by a calculation based on the data from the 140 sample points spread across the five resource blocks. However, it must be emphasised that the quoted volume of mineral has no simple relationship with the amount that could be extracted in practice, as 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 the Resource Blocks

The survey area has been divided into five resource blocks, A - E, using, where possible, major river valleys as the boundaries. Along the coast, the Mean High Water Mark bounds the assessed area and the resource blocks. The mineral deposits of Blocks A - D are dominantly Plateau Gravel whereas the deposits in Block E are exclusively river terrace deposits.

**Block A** This block occupies 39.4 km<sup>2</sup> of ground south-west of the valley of the Avon Water. The aggregate resources sterilised beneath the urban areas of Barton on Sea and New Milton (6.8 km<sup>2</sup>) have been excluded from this assessment. In the south, the block is bounded by a coastline dominated by cliffs 40 m high at Barton on Sea and declining eastwards towards Milford on Sea. Inland, the ground rises northwards to heights of over 50 m OD around Bashley [242 972] and Wootton [243 984]. The 26.1 km<sup>2</sup> of mineral deposits within Block A comprise exclusively Plateau Gravel (levels 10-2, Figure 3). These deposits are dissected by a network of small valleys, the largest of which contains Danes Stream; near the coast, a narrow tract of alluvium has been mapped along this valley floor but, because of its small area, the deposit has not been assessed. The storm beach deposits forming Hurst Beach (a hooked spit) are composed predominantly of coarse gravel and cobbles but were excluded from the assessment.

The Plateau Gravel mineral deposits within the block have a mean proven thickness of 3.4 m and range from 1.2 m in borehole 29 SE 8 to 5.6 m in borehole 29 SE 4. Exceptionally, borehole 29 NE 5, sited near the margin of the mapped deposit failed to prove mineral. The overburden has a mean proven thickness of 1.3 m and comprises brickearth, soil and pebbly clays that form the upper part of some of the Plateau Gravel deposits. Thus, on average, the mineral deposits fall into the concealed mineral category with only 6 of the 26 boreholes (Table 3) proving overburden less than 1.0 m thick. The thickest overburden proved was 2.3 m in borehole 29 SE 8. The mean grading of the mineral deposits recovered from IMAU boreholes is fines 5 per cent, sand 46 per cent, gravel 49 per cent (Figure 6). Because the bedrock in the block is almost exclusively impermeable Headon Beds, perched water tables are developed and in only one borehole (29 NW 17) was the mineral deposit proved to

be 'dry' throughout its thickness. Extraction of approximately 0.1 km<sup>2</sup> of mineral has occurred [254 945] south of Ashley [256 954] and the pit is now used for the processing of aggregate.

The calculation of resources in this block is based on information from 26 IMAU boreholes (Table 3) and one Hydrogeology Unit record. The estimated volume of mineral is 89 million m<sup>3</sup> ± 13 per cent (12 million m<sup>3</sup>).

**Block B** This block occupies 68.7 km<sup>2</sup> of ground bounded to the west and east by the valleys of the Avon Water and the Lymington River respectively. Along the coast, which forms the southern edge of the block, saltmarshes and mud-flats are developed in the lee of Hurst Beach. The north-western part of the block is deeply dissected, with Plateau Gravel capping the higher ground which rises to over 60 m OD around Wilverley Post [242 019]. The urban area of Lymington (3.4 km<sup>2</sup>), and the mineral resources sterilised beneath it, have not been assessed.

The mineral deposits of this block comprise 21.8 km<sup>2</sup> of Plateau Gravel (levels 9-2, Figure 3). These deposits occur as patches on the interfluvies and their outcrop shapes reflect the topography and incised drainage. The floor of the Avon Water valley and numerous small valleys west and south-west of Brockenhurst contain narrow tracts of peat and alluvium, which may overlies mineral deposits, and small patches of river terrace deposits. These areas contain some sand and gravel but the deposits are probably thin, impersistent and clayey, and their total volume is considered to be insufficient to constitute a potentially workable resource; they have not been assessed.

The Plateau Gravel mineral deposits within the block have a mean proven thickness of 3.8 m and range from 1.4 m in borehole 39 SW 4 to 9.2 m in borehole 39 NW 4. Borehole 20 NE 9 was drilled outside the mapped limits

**Table 3** Block A: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
	Mineral	Overburden/waste	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
29 NW 17	1.8	2.1	4	7	23	14	32	20
29 NW 18	3.3	1.5	3	2	16	14	37	28
29 NW 19	2.3	1.2	9	4	19	16	33	19
29 NW 20	4.2	1.3	4	4	20	15	43	14
29 NW 21	3.2	2.2	7	6	39	13	24	11
29 NE 3	5.2	0.8	8	7	33	16	25	11
29 NE 4	3.1	0.2	8	10	35	15	21	11
29 NE 5	-	1.2	-	-	-	-	-	-
29 NE 6	1.8	1.2	12	5	26	15	26	16
29 NE 7	3.4	1.0	8	5	26	17	31	13
29 NE 8	3.8	1.3	9	6	28	13	30	14
29 NE 12	4.7	1.1	6	4	19	12	32	27
29 NE 13	4.1	1.1	5	5	29	15	33	13
29 NE 16	3.9	1.2	3	5	31	10	32	19
29 SE 1	2.6	1.1	7	8	28	12	28	17
29 SE 2	1.9	1.2	2	1	15	16	43	23
29 SE 3	3.0	0.8	3	5	23	18	33	18
29 SE 4	5.6	0.9	3	4	23	13	31	26
29 SE 5	3.3	0.9	8	10	28	16	27	11
29 SE 6	4.0	0.7	2	9	29	9	24	27
29 SE 7	2.6	1.6	3	2	23	15	30	27
29 SE 8	1.2	2.3	1	2	26	15	42	14
29 SE 9	2.7	1.1	5	5	28	14	28	20
29 SE 10	4.8	1.5	2	10	31	10	25	22
29 SE 11	3.5	1.8	6	9	31	12	24	18
39 SW 1	3.4	1.8	1	2	25	15	33	24
<b>Mean</b>			<b>5</b>	<b>6</b>	<b>26</b>	<b>14</b>	<b>30</b>	<b>19</b>

of drift deposits and did not encounter mineral; it has not been included in the calculation of resources. Boreholes 39 SW 2 and 5 proved mineral beneath alluvium but an adjacent borehole (39 SW 3), drilled near the mapped margin of the deposit, failed to do so; this 'nil' value has been included in the calculation of the resource. Although the average overburden thickness exceeds 1.0 m within some restricted areas, the mean proven thickness of overburden in the block is 0.9 m and the mineral as a whole is classified as exposed. The overburden comprises brickearth, alluvium, soil and pebbly clays developed at the top of the Plateau Gravel deposits.

The mean grading of samples of mineral deposits recovered from IMAU boreholes is fines 6 per cent, sand 49 per cent and gravel 45 per cent (Figure 6). About 0.5 km<sup>2</sup> of the resource has been extracted around Lower Pennington [317 935] and south of Mount Pleasant [294 978].

The calculation of resources is based on information from 25 IMAU boreholes (Table 4) and one Hydrogeology Unit record. The estimated volume of mineral in the block is 83 million m<sup>3</sup> ± 20 per cent (16 million m<sup>3</sup>).

**Block C** This block, which occupies 102.3 km<sup>2</sup> of ground in the centre of the survey area, is bounded in the west and east by the valleys of the Lymington and Beaulieu rivers, respectively. The ground rises northwards from the coast to around 40 m OD on Beaulieu Heath and then falls away farther north around Beaulieu Road Station [349 062]. The mineral deposits (45.0 km<sup>2</sup>) of this block comprise Plateau Gravel (43.9 km<sup>2</sup>) and river terrace deposits (1.1 km<sup>2</sup>).

Areas of mapped alluvium adjacent to the coast and along the floors of valleys near the coast may overlies sand and gravel, but such deposits are believed to be thin and impersistent and have not been assessed. Three small

patches of river terrace deposits adjacent to the Beaulieu River and its tributaries upstream from Beaulieu have not been assessed owing to their small area (collectively less than 0.25 km<sup>2</sup>). The alluvial deposits of the Lymington River have not been assessed between Boldre and Balmerlawn [310 031] where wet ground conditions and difficult access for drilling and sampling made investigation impractical. Boreholes 39 NW 10 and 11 may provide a guide to the likely nature and thickness of deposits in this unassessed area.

Several patches of Plateau Gravel mapped in the north of the block were investigated in five IMAU boreholes; because these generally proved pebbly clays (non-mineral) the data have not been used in the calculation of the resource.

The Plateau Gravel mineral deposits from levels 7-2 (Figure 3) have a mean proven thickness of 3.4 m and are overlain by overburden with a mean proven thickness of 0.9 m. The mineral is classified as exposed even though some boreholes proved overburden in excess of 1.0 m thick. The overburden comprises soil, brickearth and pebbly clay (mapped as Plateau Gravel). A waste parting comprising 1.7 m of alluvium and peat was encountered in borehole 49 NW 3. The Plateau Gravel deposits are usually wet at the base except where the deposits are very thin. Impermeable Headon Beds underlie much of the Plateau Gravel, giving rise to perched water tables.

The river terrace deposits proved in the lower part of the Lymington River valley comprise 1.1 km<sup>2</sup> of exposed mineral. The deposits were investigated with two IMAU boreholes (39 NW 10 and 11) which, because of access difficulties, were drilled near the edge of the deposit. The mean proven thickness of mineral in these two boreholes is 1.65 m. It should be noted that the made ground in borehole 39 NW 11 has been discounted from the calculation of the mean overburden thickness which is therefore 0.85 m. The overburden comprises soil and

**Table 4** Block B: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
	Mineral	Overburden/waste	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
20 NE 9	-	1.9	-	-	-	-	-	-
20 SW 9	6.2	0.6	9	7	29	18	26	11
20 SW 10	3.4	0.4	4	7	36	11	26	16
20 SW 11	5.7	0.6	11	9	40	14	20	6
20 SE 1	3.7	0.6	12	10	31	14	25	8
20 SE 2	1.9	0.8	2	2	29	11	27	29
29 NE 9	3.2	1.1	10	10	34	16	23	7
29 NE 10	1.8	0.8	2	1	25	19	34	19
29 NE 11	4.5	1.1	8	5	30	16	29	12
29 NE 14	5.2	1.2	4	3	17	15	40	21
29 NE 15	2.5	0.8	12	7	28	15	26	12
29 NE 17	3.7	1.0	9	7	24	16	33	11
29 NE 18	3.2	0.9	3	15	41	9	21	11
30 SW 4	2.4	1.2	11	5	22	15	31	16
30 SW 5	3.2	1.3	4	5	24	14	38	15
39 NW 3	4.9	0.6	4	5	21	16	34	20
39 NW 4	9.2	0.7	2	4	17	16	38	23
39 NW 5	2.7	1.6	2	11	23	14	33	17
39 NW 6	2.5	0.7	5	6	26	13	32	18
39 NW 7	6.1	0.2	7	11	29	15	25	13
39 NW 8	2.4	1.2	8	10	27	11	28	16
39 NW 9	4.1	1.1	5	7	28	14	27	19
39 SW 2	4.8	0.7	3	2	23	20	37	15
39 SW 3	-	3.9	-	-	-	-	-	-
39 SW 4	1.4	0.9	7	7	16	16	29	25
39 SW 5	5.6	1.0	1	6	32	12	29	20
<b>Mean</b>			<b>6</b>	<b>7</b>	<b>27</b>	<b>15</b>	<b>30</b>	<b>15</b>

**Table 5** Block C: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
			Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	Mineral	Overburden/waste	- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
30 NW 7	-	4.0	-	-	-	-	-	-
30 NW 8	-	1.9	-	-	-	-	-	-
30 NW 9	1.0	1.5	12	39	11	8	21	9
30 NE 1	-	2.0	-	-	-	-	-	-
30 NE 2	-	1.4	-	-	-	-	-	-
30 SW 6	4.3	1.1	3	7	33	13	28	16
30 SW 7	4.6	0.3	8	8	32	12	26	14
30 SW 8	5.2	0.7	4	4	24	14	34	20
30 SE 1	4.3	0.9	7	10	23	13	26	21
30 SE 2	3.6	0.9	10	10	26	12	24	18
30 SE 3	2.1	0.8	3	5	21	16	37	18
30 SE 4	4.6	0.3	4	22	38	11	15	10
30 SE 5	3.9	0.6	4	4	22	11	31	28
30 SF 6	3.7	1.3	3	6	19	14	37	21
30 SE 8	3.3	0.6	4	2	25	13	31	25
30 SE 9	3.3	0.8	4	4	22	16	35	19
30 SE 11	3.4	0.8	5	3	14	15	42	21
39 NW 10	2.2	0.3	4	13	4	8	34	37
39 NW 11	1.1	3.0	3	34	4	5	24	30
39 NW 12	3.6	1.6	2	1	21	16	29	31
39 NW 13	2.0	1.7	6	8	19	15	34	18
39 NW 14	2.7	3.0	8	7	13	10	33	29
39 NW 15	3.4	0.3	11	6	27	15	28	13
39 NW 17	2.8	1.1	2	2	15	18	43	20
39 NW 18	2.6	0.8	4	3	23	13	35	22
39 NW 19	4.1	0.5	8	11	31	14	26	10
39 NW 20	3.5	1.0	7	9	32	17	22	13
39 NW 21	2.6	1.4	1	3	23	15	36	22
39 NE 1	4.7	0.5	5	4	20	18	33	20
39 NE 2	3.5	0.8	10	8	19	16	31	15
39 NE 3	1.9	0.7	15	15	22	9	26	13
39 NE 4	1.1	0.9	9	6	37	10	23	15
39 NE 5	8.5	0.5	1	8	23	11	22	35
39 NE 6	3.4	0.6	3	4	22	19	38	14
39 NE 7	1.7	0.3	6	5	24	18	34	13
39 NE 8	0.9	2.6	5	7	25	16	38	9
39 NE 9	3.4	0.9	2	3	30	15	30	20
39 NE 10	2.3	0.9	3	3	23	17	35	19
39 NE 11	3.2	0.8	2	2	19	15	37	25
39 NE 12	1.8	0.8	15	4	18	12	28	23
39 NE 13	2.4	0.7	4	4	27	15	35	15
39 NE 14	4.8	0.5	12	30	21	6	21	10
39 NE 15	4.0	0.6	2	7	24	14	30	23
39 NE 16	4.3	0.6	4	6	27	14	30	19
39 NE 17	-	2.0	-	-	-	-	-	-
49 NW 2	4.2	0.9	4	5	24	16	34	17
49 NW 3	3.1	1.9	9	10	14	14	35	18
<b>Mean</b>			<b>5</b>	<b>8</b>	<b>23</b>	<b>14</b>	<b>30</b>	<b>20</b>

peat. Much of the area is regularly flooded, and reed beds and water meadows flank the river.

The overall mean proven thicknesses in the block are mineral 3.3 m and overburden 0.9 m. The overall mean grading of the deposits is fines 5 per cent, sand 45 per cent and gravel 50 per cent (Figure 6).

The calculation of resources is based on information from 42 IMAU boreholes (Table 5) and one Hydrogeology Unit record. The estimated volume of mineral in this block is 149 million m<sup>3</sup> ± 13 per cent (19 million m<sup>3</sup>).

**Block D** This block comprises 43.6 km<sup>2</sup> of ground bounded in the west by the Beaulieu River valley, and in the east by the urban and industrial area between Hythe and Calshot. This developed area, and the sterilised

gravel resources beneath it, have been excluded from the assessment.

The block contains 26.8 km<sup>2</sup> of mineral deposits which are exclusively Plateau Gravel (levels 7-3; Figure 3). Several narrow tracts of alluvium occur along river valleys and adjacent to the coast. However, although sand and gravel deposits probably underlie some of these tracts, the deposits are considered to be too thin and impersistent to warrant assessment.

The Plateau Gravel mineral deposits have a mean proven thickness of 3.3 m although, exceptionally, borehole 40 SW 166, which was probably drilled on the site of a channel cut into the underlying Barton Sand, proved 11.1 m of mineral. Boreholes 40 NW 120, 40 SW 158 and 49 NW 6 proved little or no mineral but as they are all located within the mapped outcrop of Plateau Gravel,



**Table 6** Block D: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
	Mineral	Over-burden/ waste	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
30 SE 7	3.0	0.1	5	5	21	16	39	14
30 SE 10	5.0	0.2	8	18	23	12	28	11
40 NW 119	1.9	1.2	10	11	29	16	23	11
40 NW 120	0.5	1.8	7	4	12	12	40	25
40 NW 121	3.6	1.2	4	10	31	12	27	16
40 SW 158	-	0.8	-	-	-	-	-	-
40 SW 159	2.9	0.8	8	6	22	12	32	20
40 SW 160	3.7	0.5	2	4	14	18	38	24
40 SW 161	2.1	0.4	1	2	11	25	44	17
40 SW 162	3.4	0.5	5	7	23	19	28	18
40 SW 163	1.9	0.6	4	3	22	23	27	21
40 SW 164	2.7	1.2	2	6	24	20	34	14
40 SW 165	4.4	0.7	1	3	24	14	32	25
40 SW 166	11.1	0.9	2	5	28	19	32	14
40 SW 167	4.4	0.7	2	4	22	17	33	22
40 SW 168	3.4	0.4	1	2	34	15	30	18
40 SE 355	2.8	0.6	5	5	20	18	34	18
40 SE 356	3.4	0.5	1	3	21	15	38	22
40 SE 357	4.0	1.1	1	3	12	10	23	50
40 SE 358	2.6	0.3	5	15	15	15	20	20
40 SE 359	7.3	0.5	1	3	25	17	28	26
40 SE 360	2.8	0.6	1	2	13	14	34	36
49 NW 4	2.7	0.6	2	2	19	16	34	27
49 NW 5	2.8	0.8	2	3	26	11	30	28
49 NW 6	-	0.6	-	-	-	-	-	-
49 NW 7	5.3	0.4	2	5	20	11	34	28
49 NE 7	1.6	1.5	10	3	18	16	37	16
<b>Mean</b>			<b>3</b>	<b>5</b>	<b>22</b>	<b>16</b>	<b>32</b>	<b>22</b>

**Table 7** Block E: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage					
	Mineral	Over-burden/ waste	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
			- $\frac{1}{16}$ mm	+ $\frac{1}{16}$ - $\frac{1}{4}$ mm	+ $\frac{1}{4}$ -1 mm	+1 -4 mm	+4 -16 mm	+16 mm
20 NE 8	-	1.4	-	-	-	-	-	-
20 SE 3	3.9	1.1	8	14	11	14	37	16
20 SE 4	3.1	1.1	11	22	10	12	33	12
20 SE 5	-	2.0	-	-	-	-	-	-
20 SE 6	1.4	1.1	10	16	11	16	32	15
20 SE 7	4.3	0.2	3	6	8	13	36	34
20 SE 8	-	2.8	-	-	-	-	-	-
30 SW 2	2.8	1.0	4	5	9	17	43	22
30 SW 3	2.1	1.1	6	20	8	12	35	18
<b>Mean</b>			<b>6</b>	<b>13</b>	<b>10</b>	<b>14</b>	<b>36</b>	<b>21</b>

the results have been used in the calculation of resources. The mean proven thickness of overburden in this block is 0.7 m, comprising brickearth, soil and pebbly clay (mapped as Plateau Gravel). The deposits thus fall, on average, into the exposed mineral category although six of the 27 IMAU boreholes proved over 1.0 m of overburden.

The mean grading of samples of mineral recovered from IMAU boreholes is fines 3 per cent, sand 43 per cent and gravel 54 per cent (Figure 6).

Approximately 0.3 km<sup>2</sup> of mineral has been worked-out in the block; several worked-out pits have been incorporated into the unassessed developed area to the east. The Plateau Gravel deposits overlie Headon Beds and Barton Sand in this block. The impermeable Headon Beds have caused the development of perched water tables, whereas the Barton Sand is in hydrological continuity with the Plateau Gravel deposits, thus leaving much of the drift succession dry (at the time of drilling).

The calculation of resources is based on information from 27 IMAU boreholes (Table 6) and two Hydrogeology Unit records. The estimated volume of the resource is 88 million m<sup>3</sup> ± 24 per cent (21 million m<sup>3</sup>).

**Block E** This block comprises 9.3 km<sup>2</sup> of ground north-west of Brockenhurst and contains 8.8 km<sup>2</sup> of mineral, exclusively in river terrace deposits.

The area consists of a broad valley floor, underlain by river terrace deposits, that extends along the upper reaches of the Lymington River. The mean thickness of mineral is 1.9 m although it was only proved in six of the nine IMAU boreholes drilled to investigate the deposit. The three boreholes that did not prove mineral (20 NE 8 and 20 SE 5 and 8) were all drilled near the mapped margins. All nine boreholes have been used in calculating the mineral volume since they all lie within the mapped area of the deposit and are presumed to reflect the variation in its thickness and distribution. The mineral deposits, where present, are overlain by overburden of mean proven thickness 0.9 m and the mineral is therefore classified as exposed. The mean grading of the mineral deposits is fines 6 per cent, sand 37 per cent and gravel 57 per cent (Figure 6). Barton Sand was proved beneath river terrace deposits in all boreholes in the block.

Eight boreholes, which were sited on the valley floor, encountered a water table in the river terrace deposits but borehole 20 SE 6, sited on those deposits at a higher level on the valley side, was dry.

The calculation of resources is based on information from nine IMAU boreholes (Table 7), and the estimated volume of mineral in the block is 17 million m<sup>3</sup> ± 72 per cent (12 million m<sup>3</sup>).

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## APPENDIX A

### FIELD AND LABORATORY PROCEDURES

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

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

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

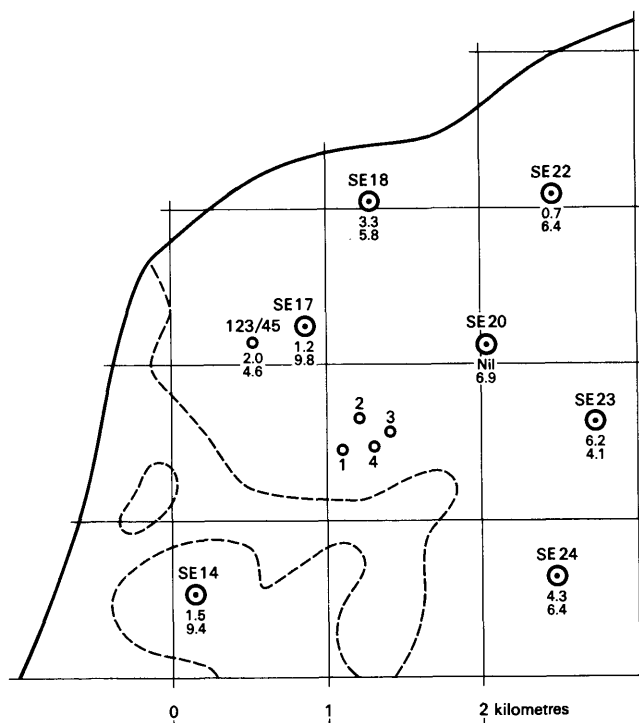
The drilling machine employed should be capable of providing a continuous sample representative of all unconsolidated deposits, so that the in-situ grading can be determined, if necessary, to a depth of 30 m (100 ft) at a diameter of about 200 mm (8 in), beneath different types of overburden. It should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

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

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

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

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



- SE 24
- IMAU borehole
- 4.3 Overburden } Thickness in metres
- 6.4 Mineral }
- Other boreholes
- Boundary of resource block
- - - Boundary of sand and gravel deposit

Example of resource block assessment: map of a fictitious block

## APPENDIX B

### STATISTICAL PROCEDURE

#### Statistical assessment

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

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

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

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

4 The above relationship may be transposed such that

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

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

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

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

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

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

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

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

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

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

7 The limits on the estimate of mean thickness of mineral,  $L_{\bar{l}_m}$ , may be expressed in absolute units

$$\pm (t/\sqrt{n}) \times S_{\bar{l}_m} \text{ or as a percentage}$$

$$\pm (t/\sqrt{n}) \times S_{\bar{l}_m} \times (100/\bar{l}_m) \text{ per cent, where } t \text{ is}$$

Student's  $t$  at the 95 per cent probability level for  $(n - 1)$  degrees of freedom, evaluated by reference to statistical tables. (In applying Student's  $t$  it is assumed that the measurements are distributed normally).

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

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

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

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

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

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

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

and when  $n$  is greater than 20, as

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

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

#### Inferred assessment

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

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

14 No assessment is attempted for an isolated area of mineral less than 0.25 km<sup>2</sup>.

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

## Block calculation

Scale: 1:25 000  
Block: Fictitious

**Area**  
Block: 11.08 km<sup>2</sup>  
Mineral: 8.32 km<sup>2</sup>

**Mean thickness**  
Overburden: 2.5 m  
Mineral: 6.5 m

**Volume**  
Overburden: 21 million m<sup>3</sup>  
Mineral: 54 million m<sup>3</sup>

Confidence limits of the estimate of mineral volume at the 95 per cent probability level:  $\pm 20$  per cent  
That is, the volume of mineral (with 95 per cent probability):  $54 \pm 11$  million m<sup>3</sup>

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

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

## Calculation of confidence limits

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

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

$$n = 8$$

$$t = 2.365$$

$L_V$  is calculated as

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

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

$$= 20.3$$

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

## APPENDIX C

### CLASSIFICATION AND DESCRIPTION OF SAND AND GRAVEL

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

The terminology commonly used by geologists when describing sedimentary rocks (Wentworth, 1922) is not entirely satisfactory for this purpose. For example, Wentworth proposed that a deposit should be described as a 'gravelly sand' when it contains more sand than gravel and there is at least 10 per cent of gravel, provided that there is less than 10 per cent of material finer than sand ( $< \frac{1}{8}$  mm) and coarser than pebbles ( $> 64$  mm in diameter). Because deposits containing more than 10 per cent fines are not embraced by this system, a modified binary classification based on Willman (1942) has been adopted.

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

The term 'clay' (as written, with single quote marks) is used to describe all material passing  $\frac{1}{8}$  mm. Thus it has no mineralogical significance and includes particles falling within the size range of silt. The normal meaning applies to the term clay where it does not appear in single quotation marks.

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

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

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

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

Many differing proposals have been made for the classification of the grain size of sediments (Atterberg, 1905; Udden, 1914; Wentworth, 1922; Wentworth, 1935; Allen, 1936; Twenhofel, 1937; Lane and others, 1947). As Archer (1970a, b) has emphasised, there is a pressing need for a simple metric scale acceptable to both scientific and engineering interests, for which the class limit sizes correspond closely with certain marked changes in the natural properties of mineral particles. For example, there is an important change in the degree of cohesion between particles at about the  $\frac{1}{8}$ -mm size, which approximates to the generally accepted boundary between silt and sand. These and other requirements are met by a system based on Udden's geometric scale and a simplified form of Wentworth's terminology (see the accompanying table), which is used in the Report.

The fairly wide intervals in the scale are consistent with the general level of accuracy of the qualitative assessments of the resource blocks. Three sizes of sand are recognised, fine ( $+\frac{1}{8} - \frac{1}{4}$  mm), medium ( $+\frac{1}{4} - 1$  mm) and coarse ( $+1 - 4$  mm). The boundary at 16 mm distinguishes a range of finer gravel ( $+4 - 16$  mm), often characterised by abundance of worn tough pebbles of vein quartz, from larger pebbles, often of notably different materials. The boundary at 64 mm distinguishes pebbles from cobbles. The term 'gravel' is used loosely to denote both pebble-sized and cobble-sized material.

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

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

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

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

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

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

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

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

**Well rounded:** not original faces, edges or corners left. The entire surface consists of broad curves; flat areas are absent. The original shape is suggested by the present form of the grain.

Classification of gravel, sand and fines

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

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

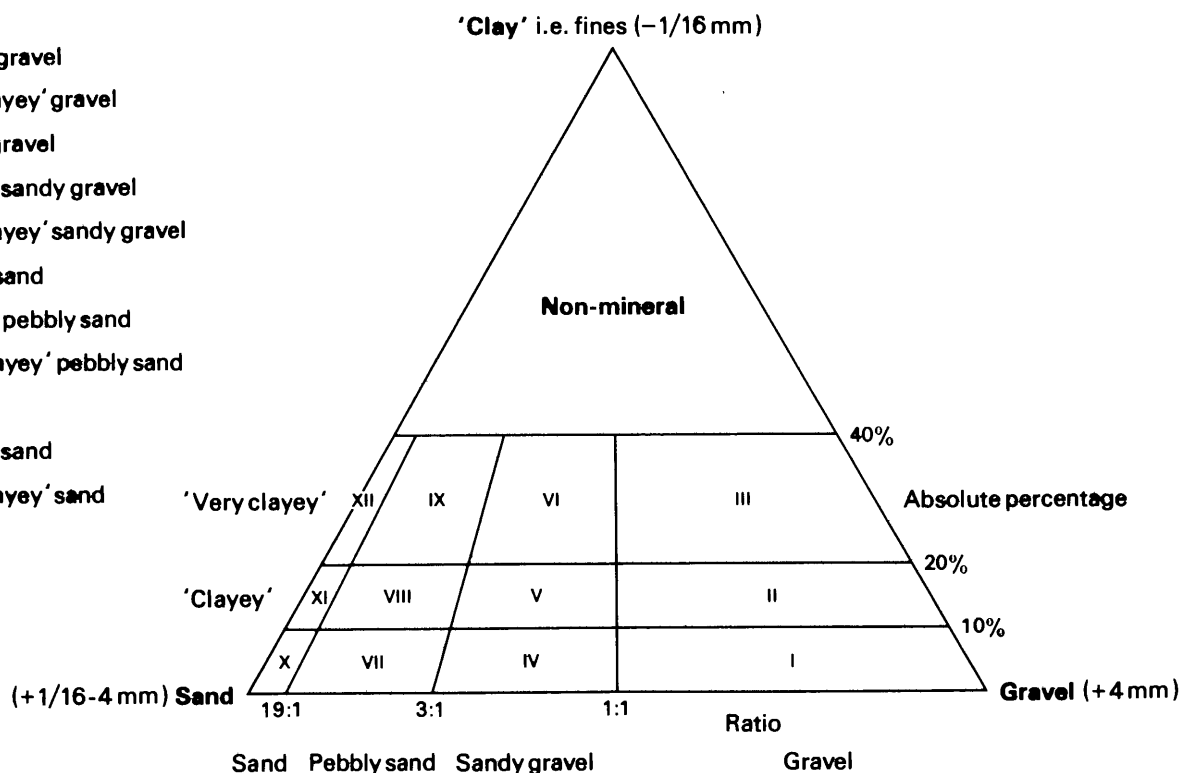


Diagram showing the descriptive categories used in the classification of sand and gravel

**APPENDIX D**

**EXPLANATION OF THE BOREHOLE RECORDS**

**Annotated fictitious example**

<b>CK 66 NW 5<sup>1</sup></b>	<b>6191 6962<sup>2</sup></b>	<b>Northfields<sup>3</sup></b>	<b>Block B</b>
Surface level (+49.7 m) +163 ft <sup>4</sup>			Overburden <sup>7</sup> 2.8 m
Water struck at +45.9 m <sup>5</sup>			Mineral 5.4 m
October 1972 <sup>6</sup>			Waste 1.1 m
			Mineral 1.4 m
			Bedrock 0.7 m+ <sup>8</sup>

**LOG**

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

**GRADING<sup>10</sup>**

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

**COMPOSITION<sup>11</sup>**

Depth below surface (m)	percentages by weight in the +8-16 mm fraction					
	Flint	Quartz	Limestone	Chalk	Ironstone	
3.8-4.8	41	5	50	1	3	250
4.8-5.8	39	3	45	5	8	300
5.8-6.8	45	2	42	5	6	240
6.8-8.2	19	6	61	3	11	325
<b>Mean</b>	<b>35</b>	<b>4</b>	<b>51</b>	<b>3</b>	<b>7</b>	



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

#### 1 Borehole Registration Number

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

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

Thus the full Registration Number is CK 66 NW 5.

#### 2 National Grid Reference

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

#### 3 Location

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

#### 4 Surface level

The surface level at the borehole site is given in metres and feet above Ordnance Datum. All measurements were made in feet; approximate conversions to metres are given in brackets.

#### 5 Groundwater conditions

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

#### 6 Type of drill and date of drilling

The type of rig used, the diameter of the casing and the month and year of completion of drilling are stated.

#### 7 Overburden, mineral, waste and bedrock

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

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

#### 9 Lithological description

When sand and gravel is recorded a general description based on the grading characteristics (for details see Appendix C) is followed by more detailed particulars. Where more than one bed of mineral is recognised each is designated by a letter, e.g. **a**, **b**, etc. The description of other deposits is based on visual examination in the field. Where possible, the colours of deposits are recorded with reference to the rock-color chart (Geological Society of America, 1979).

#### 10 Grading data

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

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

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

mean grading for the whole of the mineral in the borehole may be given. Where necessary, in calculating mean gradings, data for individual samples are weighted by the thickness represented.

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

#### 11 Composition

Details of the composition of selected samples or groups of samples may be given. The figure in the last column indicates the number of clasts counted.

APPENDIX E

INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLE RECORDS

SU 20 NE 8 2706 0653 Warwickslade Bridge, Rhinefield Block E

Surface level +22.8 m Waste 1.4 m  
 Water struck at +21.9 m Bedrock 2.1 m+  
 September 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
River Terrace Deposits (undifferentiated)	Clay, sandy, silty, dark yellowish orange (10 YR 6/6)	0.8	0.9
	Gravel, very clayey, flint-rich	0.5	1.4
Barton Sand (Chama Bed)	Clay, sandy, shelly (bivalves and gastropods) dark greenish grey (5 GY 4/1)	2.1+	3.5

SU 20 NE 9 2703 0552 Brock Hill, Rhinefield Block B

Surface level +22.8 m Waste 1.9 m  
 Water not struck Bedrock 4.1 m+  
 September 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.1	0.1
River Terrace Deposits (undifferentiated)	Clay, sandy, soft, very plastic, dark yellowish orange (10 YR 6/6)	1.4	1.5
	Gravel, very clayey, flint-rich	0.4	1.9
Barton Sand (Chama Bed)	Clay, sandy, shelly (bivalves and gastropods), weathered to 3.0 m, then dark greenish grey (5 GY 4/1)	4.1+	6.0

SU 20 SW 9 2370 0267 Rock Hills, Burley Block B

Surface level +64.5 m Overburden 0.6 m  
 Water struck at +62.1 m Mineral 6.2 m  
 September 1980 Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Sandy Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint.	6.2	6.8
Barton Sand	Sand, clayey, fine grained, dark yellowish orange (10 YR 6/6)	0.7+	7.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+\mathbf{\frac{1}{8}} -\mathbf{\frac{1}{4}}	+\mathbf{\frac{1}{4}} -\mathbf{1}	+1 -4	+4 -16	+16 -64	+64 mm
9	54	37	0.6-2.6	10	10	35	13	25	7	0
			2.6-4.6	7	6	30	14	27	16	0
			4.6-6.8	10	6	22	25	26	11	0
			Mean	9	7	29	18	26	11	0

SU 20 SW 10 2424 0194 Wilverley Post, Rhinefield Block E

Surface level +61.9 m Overburden 0.4 m  
 Water struck at +60.0 m Mineral 3.4 m  
 September 1980 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Sandy gravel Gravel: fine and medium, mainly flint Sand: medium with coarse and fine, quartz with flint	3.4	3.8
Barton Sand	Sand: fine and medium subangular quartz sand, dark yellowish orange (10 YR 6/6)	1.2+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+\mathbf{\frac{1}{8}} -\mathbf{\frac{1}{4}}	+\mathbf{\frac{1}{4}} -\mathbf{1}	+1 -4	+4 -16	+16 -64	+64 mm
4	54	42	0.4-2.4	6	8	34	11	26	15	0
			2.4-3.8	1	6	39	11	26	17	0
			Mean	4	7	36	11	26	16	0

SU 20 SW 11 2489 0143 Wilverley Plain, Rhinefield Block B

Surface level +63.2 m Overburden 0.6 m  
 Water not struck Mineral 5.7 m  
 September 1980 Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	'Clayey' sandy gravel Gravel: fine with coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	5.7	6.3
Barton Sand	Sand, fine, dusky yellow (5Y 6/4)	1.7+	8.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
11	63	26	0.6-2.6	13	7	44	15	17	4	0
			2.6-4.6	11	8	34	13	25	9	0
			4.6-6.3	9	11	42	14	18	6	0
			<b>Mean</b>	<b>11</b>	<b>9</b>	<b>40</b>	<b>14</b>	<b>20</b>	<b>6</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.6-6.3	90	4	5	1	0	0	0	296

**SU 20 SE 1 2576 0132 Horseshoe Earth, Rhinefield**

Surface level +63.0 m  
Water not struck  
September 1980

**Block B**

Overburden 0.6 m  
Mineral 3.7 m  
Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	'Clayey' sandy gravel Gravel: fine with coarse, angular to subangular flint with some quartz and rounded to well-rounded flint Sand: medium with coarse and fine, quartz with flint	3.7	4.3
Barton Sand	Sand, fine-grained, dusky yellow (5Y 6/4)	1.2+	5.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
12	55	33	0.6-2.6	12	12	33	13	24	6	0
			2.6-4.3	12	7	28	16	26	11	0
			<b>Mean</b>	<b>12</b>	<b>10</b>	<b>31</b>	<b>14</b>	<b>25</b>	<b>8</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.6-4.3	90	2	8	trace	0	0	trace	316

**SU 20 SE 2 2552 0092 Yewtree Bottom, Rhinefield**

Surface level +60.1 m  
Water struck at +58.7 m  
September 1980

**Block B**

Overburden 0.8 m  
Mineral 1.9 m  
Bedrock 2.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Plateau Gravel	Clay, sandy, with flint pebbles	0.7	0.8
	Gravel Gravel: coarse and fine, mainly flint Sand: medium and coarse with fine, quartz with flint	1.9	2.7
Headon Beds(?)	Clay, weathered, dark yellowish orange (10 YR 6/6)	0.1	2.8
Barton Sand	Sand, clayey, greyish orange (10 YR 7/4)	2.2+	5.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	42	56	0.8-2.7	2	2	29	11	27	29	0

**SU 20 SE 3 2745 0455 Poundhill Inclosure, Brockenhurst**

Surface level +18.0 m  
Water struck at +14.6 m  
September 1980

**Block E**

Overburden 1.1 m  
Mineral 3.9 m  
Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.1	0.1
River Terrace Deposits (undifferentiated)	Clay, silty, sandy, brownish grey (5 YR 4/1)	1.0	1.1
	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: coarse and fine with medium, quartz with flint	3.9	5.0
Barton Sand (Chama Bed)	Sand, silty, micaceous, fine-grained, medium bluish grey (5B 5/1)	2.0+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	39	53	1.1-3.4	11	16	11	13	37	12	0
			3.4-5.0	4	12	10	16	36	22	0
			<b>Mean</b>	<b>8</b>	<b>14</b>	<b>11</b>	<b>14</b>	<b>37</b>	<b>16</b>	<b>0</b>

**SU 20 SE 4 2813 0482 Poundhill Heath, Brockenhurst Block E**

Surface level +17.0 m  
Water struck at +15.0 m  
September 1980

Overburden 1.1 m  
Mineral 3.1 m  
Bedrock 10.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
River Terrace Deposits (undifferentiated)	Clay, sandy, soft, brownish grey (5 YR 4/1)	0.6	1.1
	'Clayey' gravel Gravel: fine with coarse, mainly flint Sand: fine, coarse and medium, quartz with flint	3.1	4.2
Barton Sand (Chama Bed)	Sand, fine-grained, shelly, glauconitic, micaceous, medium bluish grey (5b 5/1)	5.9	10.1
Barton Clay	Clay, shelly (bivalves and gastropods), dark greenish grey (5 GY 4/1)	4.4+	14.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
11	44	45	1.1-4.2	11	22	10	12	33	12	0

**SU 20 SE 5 2813 0341 Aldridgehill Cottage, Brockenhurst Block E**

Surface level +17.6 m  
Water struck at +16.1 m  
September 1980

Waste 2.0 m  
Bedrock 2.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
River Terrace Deposits (undifferentiated)	Clay, sandy, silty, laminated, soft, dark yellowish orange (10 YR 6/6)	1.0	1.5
	Gravel, very clayey	0.5	2.0
Barton Sand	Pebbly sand, traces of carbonaceous material, dusky yellow (5 Y 6/4)	2.5+	4.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
6	89	5	2.0-4.5	6	86	1	2	3	2	0

**SU 20 SE 6 2842 0256 Ober House, Brockenhurst Block E**

Surface level +26.8 m  
Water not struck  
September 1980

Overburden 1.1 m  
Mineral 1.4 m  
Bedrock 3.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
River Terrace Deposits (undifferentiated)	Clay, sandy, silty, soft, dark yellowish orange (10 YR 6/6)	0.7	1.1
	'Clayey' gravel Gravel: fine and coarse, mainly flint Sand: fine and coarse with medium, quartz with flint	1.4	2.5
Barton Sand	Sand, fine-grained, micaceous, dusky yellow (5 Y 6/4)	3.0+	5.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
10	43	47	1.1-2.5	10	16	11	16	32	15	0

**SU 20 SE 7 2897 0401 Bolderford Bridge, Brockenhurst Block E**

Surface level +14.7 m  
Water struck at +13.4 m  
September 1980

Overburden 0.2 m  
Mineral 4.3 m  
Bedrock 7.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
River Terrace Deposits (undifferentiated)	Gravel Gravel: fine and coarse, mainly flint Sand: coarse with medium and fine, quartz with flint	4.3	4.5
Barton Sand (Chome Bed)	Sand, fine-grained, glauconitic, medium bluish grey (5 B 5/1)	7.5+	12.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	27	70	0.2-1.4	6	8	13	17	39	17	0
			1.4-4.5	2	6	5	12	35	40	0
			<b>Mean</b>	<b>3</b>	<b>6</b>	<b>8</b>	<b>13</b>	<b>36</b>	<b>34</b>	<b>0</b>

**SU 20 SE 8**      **2973 0302**      **Butts Lawn, Brockenhurst**      **Block E**

Surface level +13.1 m      Waste 2.8 m  
 Water struck at +11.6 m      Bedrock 1.7 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
River Terrace Deposits (undifferentiated)	Clay, sandy, soft, dark yellowish orange (10 YR 6/6)	0.7	1.0
	Clay, becoming pebbly (flint) towards base	1.8	2.8
Barton Sand (Chama Bed)	Sand, fine-grained, clayey, micaceous, medium bluish grey (5 B 5/1)	1.7+	4.5

**SZ 29 NW 17**      **2306 9882**      **Rhinefield Farm, Christchurch and Lymington**      **Block A**

Surface level +63.5 m      Overburden 2.1 m  
 Water not struck      Mineral 1.8 m  
 September 1980      Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, silty, with flint pebbles near base	1.8	2.1
	Gravel Gravel: fine and coarse, angular to subangular flint with quartz and some rounded to well- rounded flint Sand: medium and coarse with fine, quartz with flint	1.8	3.9
Headon Beds	Clay, weathered to 5.0 m, below 5.0 m greenish grey (5 G 6/1)	2.0+	5.9

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	44	52	2.1-3.9	4	7	23	14	32	20	0

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
2.1-3.9	84	4	9	1	0	trace	2 332

**SZ 29 NW 18**      **2371 9873**      **Wootton Heath Farm, Rhinefield**      **Block A**

Surface level +62.7 m      Overburden 1.5 m  
 Water struck at +61.1 m      Mineral 3.3 m  
 September 1980      Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Silt, very clayey, medium grey (N 5)	0.3	0.6
	Clay, with flint pebbles, medium grey (N 5)	0.9	1.5
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	3.3	4.8
Headon Beds	Clay, shelly, weathered to 5.8 m, dark yellowish orange (10 YR 6/6); below 5.8 m, greyish green (5 G 5/2)	1.7+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	32	65	1.5-3.5	4	2	14	11	36	33	0
			3.5-4.8	1	3	18	18	38	22	0
			<b>Mean</b>	<b>3</b>	<b>2</b>	<b>16</b>	<b>14</b>	<b>37</b>	<b>28</b>	<b>0</b>

**SZ 29 NW 19**      **2340 9592**      **Bashley Manor Farm, Christchurch and Lymington**      **Block A**

Surface level +43.7 m      Overburden 1.2 m  
 Water struck at +41.2 m      Mineral 2.3 m  
 September 1980      Bedrock 1.2 m

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Plateau Gravel	Clay, silty, with flint pebbles, light brown (5 YR 5/6)		
	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine	2.3	3.5
Barton Sand	Sand, fine-grained, micaceous, dark yellowish orange (10 YR 6/6)	1.2+	4.7

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
9	39	52	1.2-2.5	12	4	21	14	32	17	0
			2.5-3.5	6	5	15	18	34	22	0
			<b>Mean</b>	<b>9</b>	<b>4</b>	<b>19</b>	<b>16</b>	<b>33</b>	<b>19</b>	<b>0</b>

**SZ 29 NW 20 2419 9782 Marlpit Farm, Christchurch and Lyvington Block A**

Surface level +56.2 m Overburden 1.3 m  
 Water struck at +54.2 m Mineral 4.2 m  
 September 1980 Bedrock 2.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Clay, silty, becoming pebbly to base (flint)	0.8	1.3
	Gravel, 'clayey' and sandy at top Gravel: fine with coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.2	5.5
Headon Beds	Clay, stiff, weathered to 6.0 m, then greyish green (5 G 5/2)	2.5+	8.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	39	57	1.3-2.0	15	8	27	13	30	7	0
			2.0-5.5	2	3	18	16	45	16	0
			<b>Mean</b>	<b>4</b>	<b>4</b>	<b>20</b>	<b>15</b>	<b>43</b>	<b>14</b>	<b>0</b>

**SZ 29 NE 3 2502 9808 Wootton Hall, Christchurch and Lyvington Block A**

Surface level +55.9 m Overburden 0.8 m  
 Water struck at +53.7 m Mineral 5.2 m  
 September 1980 Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, silty, soft, light brown (5 YR 5/6)	0.6	0.8
Plateau Gravel	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz and flint	5.2	6.0
Headon Beds	Clay, shelly (bivalves), greyish grey (5 G 5/1)	2.0+	8.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	56	36	0.8-2.2	13	5	28	17	27	10	0
			2.2-4.0	9	10	31	13	24	13	0
			4.0-6.0	3	5	38	18	25	11	0
			<b>Mean</b>	<b>8</b>	<b>7</b>	<b>33</b>	<b>16</b>	<b>25</b>	<b>11</b>	<b>0</b>

**SZ 29 NW 21 2433 9654 Fernhill Gate, Christchurch and Lyvington Block A**

Surface level +46.3 m Overburden 2.2 m  
 Water level not recorded Mineral 3.2 m  
 October 1980 Bedrock 1.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, silty, pebbly	1.0	1.4
	Clay, sandy, pebbly	0.8	2.2
	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	3.2	5.4
Headon Beds	Clay, weathered at the top, traces of carbonaceous material, greyish green (5 G 5/2)	1.6+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
7	58	35	2.2-4.2	10	7	43	10	22	8	0
			4.2-5.4	3	5	33	17	27	15	0
			<b>Mean</b>	<b>7</b>	<b>6</b>	<b>39</b>	<b>13</b>	<b>24</b>	<b>11</b>	<b>0</b>

**SZ 29 NE 4 2612 9790 Tiptoe, Sway Block A**

Surface level +48.6 m Overburden 0.2 m  
 Water struck at +46.6 m Mineral 3.1 m  
 September 1980 Bedrock 2.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Sandy gravel Gravel: fine and coarse, angular to subangular flint with some rounded to well-rounded flint, quartz and sandstone Sand: medium and coarse with fine, quartz with flint	3.1	3.3
Headon Beds	Clay, weathered to 3.6 m, shelly, stiff, greenish grey (5 G 5/1)	2.8+	6.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	60	32	0.2-3.3	8	10	35	15	21	11	0

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.2-3.3	88	4	4	2	0	0	2	312

**SZ 29 NE 5 2526 9698 Danestream Farm, Christchurch and Lynton Block A**

Surface level +45.3 m  
 Water not struck  
 October 1980

Waste 1.2 m  
 Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, silty, with some flint pebbles	0.9	1.2
Headon Beds	Clay, weathered at top becoming greyish green (5 G 5/2) at base, contains lignitic fragments	0.9+	2.1

**SZ 29 NE 6 2662 9750 Crabbswood Farm, Sway Block A**

Surface level +46.0 m  
 Water struck at +43.5 m  
 October 1980

Overburden 1.2 m  
 Mineral 1.8 m  
 Bedrock 3.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, silty, with flint pebbles, soft	0.7	1.2
Plateau Gravel	'Clayey' sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	1.8	3.0
Headon Beds	Clay, weathered to 3.3 m, stiff, greyish green (5 G 5/2)	3.0+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
12	46	42	1.2-3.0	12	5	26	15	26	16	0

**SZ 29 NE 7 2635 9646 Vaggs Farm, Christchurch and Lynton Block A**

Surface level +41.5 m  
 Water struck at +38.3 m  
 October 1980

Overburden 1.0 m  
 Mineral 3.4 m  
 Bedrock 1.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Clay, sandy, pebbly at base, soft, dark yellowish orange (10 YR 6/6)	0.8	1.0
Plateau Gravel	Sandy gravel, 'clayey' at top Gravel: fine with coarse, angular to subangular flint with some quartz Sand: medium and coarse with fine, quartz with flint	3.4	4.4
Headon Beds	Clay, stiff, dark greenish grey (5 GY 4/1)	1.6+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	48	44	1.0-3.0	10	6	28	14	26	16	0
			3.0-4.4	6	4	22	21	38	9	0
			<b>Mean</b>	<b>8</b>	<b>5</b>	<b>26</b>	<b>17</b>	<b>31</b>	<b>13</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.0-4.4	93	1	5	1	0	trace	trace	301

**SZ 29 NE 8 2687 9580 Hordle, Christchurch and Lynton Block A**

Surface level +37.2 m  
 Water struck at +33.2 m  
 October 1980

Overburden 1.3 m  
 Mineral 3.8 m  
 Bedrock 1.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, sandy, pebbles near base, soft, dark yellowish orange (10 YR 6/6)	0.9	1.3
Plateau Gravel	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.8	5.1
Headon Beds	Clay, weathered to 5.3 m, stiff, greyish green (5 G 5/2)	1.9+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
9	47	44	1.3-3.3	14	9	36	11	20	10	0
			3.3-5.1	3	3	20	16	40	18	0
			<b>Mean</b>	<b>9</b>	<b>6</b>	<b>28</b>	<b>13</b>	<b>30</b>	<b>14</b>	<b>0</b>

**SZ 29 NE 9      2726 9984      Fox Holes, Rhinefield      Block B**

Surface level +60.8 m      Overburden 1.1 m  
 Water struck at +57.7 m      Mineral 3.2 m  
 October 1980      Bedrock 2.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Plateau Gravel	Clay, sandy, with flint pebbles	1.0	1.0
	'Clayey' sandy gravel Gravel: fine with coarse, mainly flint Sand: medium with coarse and fine, quartz and flint	3.2	4.3
Headon Beds	Clay, weathered to 5.5 m, greyish blue green (5 BG 5/2)	2.7+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
10	60	30	1.1-3.1	14	15	35	10	20	6	0
			3.1-4.3	2	1	33	27	28	9	0

**SZ 29 NE 10      2786 9981      Marlipit Oak, Boldre      Block B**

Surface level +58.5 m      Overburden 0.8 m  
 Water struck at +56.6 m      Mineral 1.8 m  
 September 1980      Bedrock 1.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay with flint pebbles	0.4	0.4
	Gravel Gravel: fine with coarse, mainly flint Sand: medium and coarse, quartz with flint	1.8	2.6
Headon Beds	Clay, weathered to 3.8 m, pale green (10 G 6/2)	1.9+	4.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	45	53	0.8-2.6	2	1	25	19	34	19	0

**SZ 29 NE 11      2729 9914      Kettlethorns, Sway      Block B**

Surface level +54.7 m      Overburden 1.1 m  
 Water struck at +50.7 m      Mineral 4.5 m  
 September 1980      Bedrock 2.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Brickearth	Clay, sandy, with flint pebbles	1.0	1.1
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.5	5.6
Headon Beds	Clay, weathered to 6.5 m	1.5	7.1
Barton Sand	Sand, fine-grained, micaceous, dark yellowish orange (10 YR 6/6)	0.6+	7.7

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	51	41	1.1-2.6	9	8	39	12	22	10	0
			2.6-4.0	10	4	16	16	37	17	0
			4.0-5.6	4	4	35	21	26	10	0
			<b>Mean</b>	<b>8</b>	<b>5</b>	<b>30</b>	<b>16</b>	<b>29</b>	<b>12</b>	<b>0</b>

**SZ 29 NE 12      2748 9712      Downlands Farm, Sway      Block A**

Surface level +38.5 m      Overburden 1.1 m  
 Water struck at +35.5 m      Mineral 4.7 m  
 October 1980      Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, sandy, with flint pebbles	0.8	1.1
Plateau Gravel	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.7	5.8
Headon Beds	Clay, greyish green (5 G 5/2) with partings of light grey (N7)	1.7+	7.5



**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
6	35	59		1.1-2.2	16	8	24	16	26	10
			2.2-4.2	3	3	14	11	36	33	0
			4.2-5.8	2	2	21	10	32	33	0
			<b>Mean</b>	<b>6</b>	<b>4</b>	<b>19</b>	<b>12</b>	<b>32</b>	<b>27</b>	<b>0</b>

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	35	61		1.2-3.2	8	5	24	16	35	12
			3.2-5.2	1	2	14	16	42	25	0
			5.2-6.4	3	3	9	13	45	27	0
			<b>Mean</b>	<b>4</b>	<b>3</b>	<b>17</b>	<b>15</b>	<b>40</b>	<b>21</b>	<b>0</b>

**SZ 29 NE 13 2731 9510 King's Farm, Christchurch and Lynton Block A**

Surface level +30.9 m Overburden 1.1 m  
 Water struck at +28.4 m Mineral 4.1 m  
 September 1980 Bedrock 1.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Brickearth	Clay, sandy, silty, flint pebbles at base, dark yellowish orange (10 YR 6/6)	0.5	1.1
Plateau Gravel	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.1	5.2
Headon Beds	Clay, weathered to 6.6 m, pale green (10 G 6/2)	1.8+	7.0

**SZ 29 NE 15 2792 9816 Birchy Hill, Sway Block B**

Surface level +44.1 m Overburden 0.8 m  
 Water not struck Mineral 2.5 m  
 September 1980 Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, with flint pebbles, moderate reddish brown (10 R 4/6)	0.4	0.8
Plateau Gravel	'Clayey' sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.5	3.3
Headon Beds	Clay, greyish olive green (5 GY 3/2)	2.0+	5.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	49	46		1.1-2.5	12	9	30	12	29	8
			2.5-5.2	1	3	29	16	35	16	0
			<b>Mean</b>	<b>5</b>	<b>5</b>	<b>29</b>	<b>15</b>	<b>33</b>	<b>13</b>	<b>0</b>

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
12	50	38		0.8-1.7	16	10	37	10	19	8
			1.7-3.3	10	5	23	18	30	14	0
			<b>Mean</b>	<b>12</b>	<b>7</b>	<b>28</b>	<b>15</b>	<b>26</b>	<b>12</b>	<b>0</b>

**SZ 29 NE 14 2863 9873 Durns Town, Sway Block B**

Surface level +42.7 m Overburden 1.2 m  
 Water struck at +39.9 m Mineral 5.2 m  
 September 1980 Bedrock 1.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, with flint pebbles	0.9	1.2
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine quartz with flint	5.2	6.4
Headon Beds	Clay	1.6+	8.0

**SZ 29 NE 16 2828 9539 Arne Wood, Chistchurch and Lynton Block A**

Surface level +32.0 m Overburden 1.2 m  
 Water struck at +30.0 m Mineral 3.9 m  
 September 1980 Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, laminated, silty, with flint pebbles	0.9	1.2
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, angular to subangular flint Sand: medium with coarse and fine, quartz with flint	3.9	5.1
Headon Beds	Clay, with carbonaceous flakes, greyish green (10 GY 5/2)	2.0+	7.1

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
3	46	51	1.2-2.2	6	9	47	9	23	6	0
			2.2-4.2	1	4	25	12	35	23	0
			4.2-5.1	2	4	26	10	31	27	0
			<b>Mean</b>	<b>3</b>	<b>5</b>	<b>31</b>	<b>10</b>	<b>32</b>	<b>19</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.2-5.1	96	1	2	1	0	0	trace	307

**SZ 29 NE 17 2942 9776 Mount Pleasant, Sway**

Surface level +37.2 m  
Water struck at +33.0 m  
September 1980

**Block B**

Overburden 1.0 m  
Mineral 3.7 m  
Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.3	0.3
	Soil	0.2	0.5
Brickearth	Clay with flint pebbles	0.5	1.0
Plateau Gravel	Sandy gravel, 'clayey' at the top Gravel: fine with coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.7	4.7
Headon Beds(?)	Clay, sandy, light brown (5 YR 5/6)	0.1	4.8
	Sand, clayey	0.6	5.4
Barton Sand	'Very clayey' sand, fine-grained, light brown (5 YR 5/6)	0.6+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
9	47	44	1.0-2.0	10	6	24	18	27	15	0
			2.0-4.7	9	7	24	16	35	9	0
			<b>Mean</b>	<b>9</b>	<b>7</b>	<b>24</b>	<b>16</b>	<b>33</b>	<b>11</b>	<b>0</b>
34	66	0	5.4-6.0	34	66	0	0	0	0	0

**SZ 29 NE 18 2973 9692 Pitmore Farm, Sway**

Surface level +30.4 m  
Water struck at +27.8 m  
September 1980

**Block B**

Overburden 0.9 m  
Mineral 3.2 m  
Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, with flint pebbles	0.6	0.9
Plateau Gravel	Sandy gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and fine with coarse, quartz with flint	3.2	4.1
Headon Beds (?)	Clay, sandy, weathered	0.6	4.7
Barton Sand	Sand, fine-grained	0.8+	5.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
3	65	32	0.9-2.6	4	26	64	2	4	0	0
			2.6-4.1	1	2	15	18	40	24	0
			<b>Mean</b>	<b>3</b>	<b>15</b>	<b>41</b>	<b>9</b>	<b>21</b>	<b>11</b>	<b>0</b>

**SZ 29 SE 1 2547 9320 Beckton Farm, Christchurch and Lynton**

Surface level +30.7 m  
Water struck at +27.5 m  
October 1980

**Block A**

Overburden 1.1 m  
Mineral 2.6 m  
Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty, flint pebbles at base	0.7	1.1
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	2.6	3.7
Headon Beds	Clay, weathered	1.3+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
7	48	45	1.1-3.1	9	9	31	12	27	12	0
			3.1-3.7	1	2	19	12	31	35	0
			<b>Mean</b>	<b>7</b>	<b>8</b>	<b>28</b>	<b>12</b>	<b>28</b>	<b>17</b>	<b>0</b>

SZ 29 SE 2 2698 9392 Ashley Bridge, Christchurch and Lympington Block A

Surface level +27.5 m  
Water struck at +26.1 m  
October 1980

Overburden 1.2 m  
Mineral 1.9 m  
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, silty, with flint pebbles	0.7	1.2
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: coarse and medium, quartz with flint	1.9	3.1
Headon Beds	Clay, shelly, weathered at the top	1.3+	4.4

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	32	66	1.2-3.1	2	1	15	16	43	23	0

SZ 29 SE 3 2678 9316 Downton, Christchurch and Lympington Block A

Surface level +24.2 m  
Water struck at +21.9 m  
October 1980

Overburden 0.8 m  
Mineral 3.0 m  
Bedrock 3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.8	0.8
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, angular to subangular flint with some rounded and well-rounded flint and quartz Sand: medium and coarse with fine, quartz with flint	3.0	3.8
Headon Beds	Sand with thin clay layers	3.5+	7.3

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	46	51	0.8-2.3	5	10	28	15	27	15	0
			2.3-3.8	1	1	18	20	39	21	0
			<b>Mean</b>	<b>3</b>	<b>5</b>	<b>23</b>	<b>18</b>	<b>33</b>	<b>18</b>	<b>0</b>

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
0.8-3.8	96	2	2	0	0	trace	0 206

SZ 29 SE 4 2724 9213 Hordle Cliff, Christchurch and Lympington Block A

Surface level +19.9 m  
Water struck at +14.3 m  
October 1980

Overburden 0.9 m  
Mineral 5.6 m  
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.9	0.9
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, angular to subangular flint with some quartz and rounded to well-rounded flint Sand: medium and coarse with fine, quartz with flint	5.6	6.5
Barton Sand	Sand, silty	1.6	8.1
	Clay	0.1	8.2
	Clay, silty	0.3+	8.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	40	57	0.9-2.9	5	6	31	12	28	18	0
			2.9-4.9	2	3	23	13	31	28	0
			4.9-6.5	0	3	14	13	35	35	0
			<b>Mean</b>	<b>3</b>	<b>4</b>	<b>23</b>	<b>13</b>	<b>31</b>	<b>26</b>	<b>0</b>

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
0.9-6.5	93	2	3	1	0	trace	1 198

SZ 29 SE 5 2770 9382 Leagreen Farm, Christchurch and Lymington Block A  
 Surface level +25.0 m Overburden 0.9 m  
 Water struck at +22.0 m Mineral 3.3 m  
 October 1980 Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, soft, pebbly at the base	0.6	0.9
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium, coarse and fine, quartz with flint	3.3	4.2
Headon Beds	Clay, shelly, stiff, greyish green (5G 5/2)	1.8+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	54	38	0.9-3.0	9	9	30	17	27	8	0
			3.0-4.2	7	13	25	14	25	16	0
			Mean	8	10	28	16	27	11	0

SZ 29 SE 7 2839 9280 Barnes Farm, Christchurch and Lymington Block A  
 Surface level +20.2 m Overburden 1.6 m  
 Water struck at +17.6 m Mineral 2.6 m  
 October 1980 Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Clay, silty, sandy, with flint pebbles	1.3	1.6
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	2.6	4.2
Headon Beds	Clay	1.8+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	40	57	1.6-2.6	6	5	30	14	27	18	0
			2.6-4.2	1	1	18	16	32	32	0
			Mean	3	2	23	15	30	27	0

32

SZ 29 SE 6 2859 9424 Manor House, Christchurch and Lymington Block A  
 Surface level +25.8 m Overburden 0.7 m  
 Water struck at +24.2 m Mineral 4.0 m  
 October 1980 Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.7	0.7
Plateau Gravel	Gravel, sandy at the top Gravel: coarse and fine, mainly flint Sand: medium with coarse and fine, quartz with flint	4.2	4.9
Headon Beds	Clay, weathered at the top	1.4+	6.3

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	47	51	0.7-2.7	4	17	39	6	18	16	0
			2.7-4.9	1	2	19	11	29	38	0
			Mean	2	9	29	9	24	27	0

SZ 29 SE 8 2906 9388 Everton Grange, Christchurch and Lymington Block A  
 Surface level +22.2 m Overburden 2.3 m  
 Water struck at +19.9 m Mineral 1.2 m  
 October 1980 Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.5	0.5
	Soil	0.3	0.8
Brickearth	Clay, silty, sandy at base	1.5	2.3
Plateau Gravel	Gravel Gravel: fine with coarse, mainly flint Sand: medium and coarse, quartz with flint	1.2	3.5
Headon Beds	Clay, soft, weathered at the top	1.4+	4.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
1	43	56	2.3-3.5	1	2	26	15	42	14	0

**SZ 29 SE 9      2957 9445      Efford House, Christchurch and Lymington      Block A**

Surface level +24.3 m  
 Water struck at +22.2 m  
 October 1980

Overburden 1.1 m  
 Mineral 2.7 m  
 Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Brickearth	Clay, silty	0.6	1.1
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, angular to subangular flint with some quartz and well-rounded flint Sand: medium and coarse with fine, quartz with flint	2.7	3.8
Headon Beds	Clay, weathered at the top	1.5+	5.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
5	47	48	1.1-3.1	7	7	30	14	26	16	0
			3.1-3.8	1	1	21	14	34	29	0
			<b>Mean</b>	<b>5</b>	<b>5</b>	<b>28</b>	<b>14</b>	<b>28</b>	<b>20</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.1-3.8	92	3	4	1	0	0	0	275

**SZ 29 SE 10      2994 9326      Lymore, Christchurch and Lymington      Block A**

Surface level +14.0 m  
 Water struck at +11.0 m  
 October 1980

Overburden 1.5 m  
 Mineral 4.8 m  
 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, sandy	1.1	1.5
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	4.8	6.3
Headon Beds	Clay, weathered at the top	0.7+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
2	51	47	1.5-3.3	5	13	57	9	12	4	0
			3.3-6.3	1	8	17	10	32	32	0
			<b>Mean</b>	<b>2</b>	<b>10</b>	<b>31</b>	<b>10</b>	<b>25</b>	<b>22</b>	<b>0</b>

**SZ 29 SE 11      2998 9220      Knold, Christchurch and Lymington      Block A**

Surface level +5.0 m  
 Water level not recorded  
 October 1980

Overburden 1.8 m  
 Mineral 3.5 m  
 Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Clay, silty	1.4	1.8
Plateau Gravel	Sandy gravel, 'very clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	3.5	5.3
Headon Beds	Clay, weathered at the top	1.2+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	52	42	1.8-2.4	27	43	26	1	2	1	0
			2.4-5.3	2	3	32	14	28	21	0
			<b>Mean</b>	<b>6</b>	<b>9</b>	<b>31</b>	<b>12</b>	<b>24</b>	<b>18</b>	<b>0</b>

**SU 30 NW 7      3029 0678      Park Ground Inclosure, Lyndhurst      Block C**

Surface level +51.8 m  
 Water not struck  
 October 1980

Waste 4.0 m  
 Bedrock 3.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Clay, with flint pebbles at base	3.8	4.0
Headon Beds	Clay, weathered moderate yellowish brown (10 YR 5/4) to 5.5 m, then light grey (N7)	3.0+	7.0

**SU 30 NW 8 3142 0626 Park Hill, Lyndhurst Block C**  
 Surface level +48.1 m Waste 1.9 m  
 Water not struck Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Plateau Gravel	Clay, with flint pebbles and carbonaceous material at the base	1.8	1.9
Headon Beds(?)	Clay with thin sandy layers	0.9	2.8
Barton Sand	Sand, fine-grained, angular to subangular quartz, dark yellowish orange (10 YR 6/6)	1.1+	3.9

**SU 30 NW 9 3480 0675 Shatterford Bottom, Denny Lodge Block C**  
 Surface level +33.3 m Overburden 1.5 m  
 Water not struck Mineral 1.0 m  
 October 1980 Bedrock 6.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, sandy, flint pebbles at the base	1.1	1.5
	'Clayey' sandy gravel Gravel: fine and coarse, mainly flint Sand: fine with medium and coarse, quartz with flint	1.0	2.5
Barton Sand	Sand, pebbly at the top, dark yellowish orange (10 YR 6/6)	6.0+	8.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-R	+R - 1/2	+ 1/2 - 1	+ 1 - 4	+ 4 - 16	+ 16 - 64	+ 64 mm
12	58	30	1.5-2.5	12	39	11	8	21	9	0
5	92	3	2.5-4.5	6	86	2	1	4	1	0
			4.5-8.5	4	93	1	0	1	1	0
			<b>Mean</b>	<b>5</b>	<b>91</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>

**SU 30 NE 1 3570 0690 Black Down, Denny Lodge Block C**  
 Surface level +29.4 m Waste 2.0 m  
 Water not struck Bedrock 1.0 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, pebbly, stiff, moderate yellowish brown (10 YR 5/4) mottled greyish brown (5 YR 3/2)	1.6	2.0
Barton Sand	'Clayey' sand, fine-grained quartz	1.0+	3.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				-R	+R - 1/2	+ 1/2 - 1	+ 1 - 4	+ 4 - 16	+ 16 - 64	+ 64 mm
12	87	1	2.0-3.0	12	86	1	0	1	0	0

**SU 30 NE 2 3641 0640 Yew Tree Heath, Denny Lodge Block C**  
 Surface level +28.6 m Waste 1.4 m  
 Water not struck Bedrock 2.6 m+  
 September 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, stiff, pebbly, sandy, moderate reddish brown (10 R 4/6), mottled light grey (N7)	1.0	1.4
Barton Sand	Sand, fine-grained, well sorted, dark yellowish orange (10 YR 6/6)	2.6+	4.0

**SU 30 SW 2 3021 0340 Brockenhurst, Brockenhurst Block E**

Surface level +11.3 m  
Water struck at +9.3 m  
September 1980

Overburden 1.0 m  
Mineral 2.8 m  
Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.2	0.2
Alluvium	Clay, silty, sandy, soft and plastic	0.8	1.0
River Terrace Deposits (undifferentiated)	Gravel Gravel: fine and coarse, mainly flint Sand: coarse and medium with fine, quartz with flint	2.8	3.8
Barton Sand (Chame Bed)	Sand, clayey, fine-grained, micaceous, medium bluish grey (5 B 5/1)	0.7+	4.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	31	65	1.0-1.7	9	10	14	17	37	13	0
			1.7-3.8	2	3	7	17	45	26	0
			<b>Mean</b>	<b>4</b>	<b>5</b>	<b>9</b>	<b>17</b>	<b>43</b>	<b>22</b>	<b>0</b>

**SU 30 SW 3 3070 0323 Balmerlawn, Brockenhurst Block E**

Surface level +11.1 m  
Water struck at +9.3 m  
September 1980

Overburden 1.1 m  
Mineral 2.1 m  
Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
River Terrace Deposits (undifferentiated)	Clay, sandy, with flint pebbles	0.8	1.1
	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: fine, coarse and medium, quartz with flint	2.1	3.2
Barton Sand	Sand, clayey with depth, grey green (5 GY 4/1)	2.0+	5.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
6	41	53	1.1-1.8	10	14	12	13	34	17	0
			1.8-3.2	4	24	7	11	36	18	0
			<b>Mean</b>	<b>6</b>	<b>20</b>	<b>8</b>	<b>12</b>	<b>35</b>	<b>18</b>	<b>0</b>

**SU 30 SW 4 3065 0148 Brockenhurst Park, Brockenhurst Block B**

Surface level +43.5 m  
Water struck at +40.5 m  
September 1980

Overburden 1.2 m  
Mineral 2.4 m  
Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Clay, sandy, with flint pebbles	1.0	1.2
	'Clayey' gravel, less 'clayey' at the base Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.4	3.6
Headon Beds	Clay, weathered at the top, olive grey (5Y 5/2)	2.0+	5.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
11	42	47	1.2-3.2	13	5	21	14	31	16	0
			3.2-3.6	2	2	28	17	33	18	0
			<b>Mean</b>	<b>11</b>	<b>5</b>	<b>22</b>	<b>15</b>	<b>31</b>	<b>16</b>	<b>0</b>

**SU 30 SW 5 3015 0020 Setley Plain, Boldre Block B**

Surface level +42.0 m  
Water not struck  
September 1980

Overburden 1.3 m  
Mineral 3.2 m  
Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Clay, sandy	0.7	1.3
	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.2	4.5
Headon Beds	Clay, weathered to 5.3 m	2.0+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	43	53	1.3-3.3	7	7	32	14	33	7	0
			3.3-4.5	0	2	9	15	47	27	0
			<b>Mean</b>	<b>4</b>	<b>5</b>	<b>24</b>	<b>14</b>	<b>38</b>	<b>15</b>	<b>0</b>

**SU 30 SW 6 3371 0180 Lodge Heath, Denny Lodge Block C**

Surface level +41.2 m  
 Water struck at +36.7 m  
 October 1980

Overburden 1.1 m  
 Mineral 4.3 m  
 Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, plastic, pebbly at base, yellowish grey (5 Y 7/2)	0.8	1.1
	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, angular to subangular flint with quartz and some sandstone and well-rounded flint Sand: medium with coarse and fine, quartz with flint	4.3	5.4
Headon Beds	Clay, weathered at the top, then greyish yellow green (5 GY 7/2)	1.3+	6.7

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	53	44		10	22	40	8	14	6	0
				0	2	16	18	43	21	0
				2	5	53	8	16	12	4
			<b>Mean</b>	<b>3</b>	<b>7</b>	<b>33</b>	<b>13</b>	<b>28</b>	<b>15</b>	<b>1</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.1-5.4	84	2	11	2	trace	0	1	354

**SU 30 SW 7 3295 0082 Dilton Farm, Brockenhurst Block C**

Surface level +40.2 m  
 Water struck at +36.3 m  
 September 1980

Overburden 0.3 m  
 Mineral 4.6 m  
 Bedrock 2.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, angular to subangular flint with quartz and some well-rounded flint Sand: medium with coarse and fine, quartz with flint	4.6	4.9
Headon Beds	Clay, weathered at the top, then dusky green (5 G 3/2)	2.1+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	52	40	0.3-2.3	11	13	35	13	20	8	0
			2.3-4.9	5	5	29	12	30	19	0
			<b>Mean</b>	<b>8</b>	<b>8</b>	<b>32</b>	<b>12</b>	<b>26</b>	<b>14</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
0.3-4.9	89	4	7	trace	0	0	0
							362

**SU 30 SW 8 3459 0021 Two Bridges Bottom, East Boldre Block C**

Surface level +39.5 m  
 Water struck at +37.0 m  
 September 1980

Overburden 0.7 m  
 Mineral 5.2 m  
 Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
	Clay, sandy, yellowish grey (5 Y 7/2)	0.3	0.7
Plateau Gravel	Gravel, 'clayey' at the top Gravel: fine and coarse, angular to subangular flint with quartz and some rounded to well-rounded flint Sand: medium and coarse with fine, quartz with flint	5.2	5.9
Headon Beds	Clay, stiff, bluish grey (5 B 5/1)	2.0+	7.9

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	42	54	0.7-2.5	10	6	26	14	30	14	0
			2.5-4.5	1	2	21	15	34	27	0
			4.5-5.9	2	2	27	11	39	19	0
			<b>Mean</b>	<b>4</b>	<b>4</b>	<b>24</b>	<b>14</b>	<b>34</b>	<b>20</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
0.7-5.9	78	3	16	1	0	1	1
							368



SU 30 SE 1 3542 0168 Little Wood, East Boldre Block C

Surface level +39.8 m Overburden 0.9 m  
 Water struck at +36.9 m Mineral 4.3 m  
 September 1980 Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, sandy, with sporadic flint pebbles, yellowish grey (5 Y 7/2)	0.5	0.9
	Gravel, 'clayey' at the top Gravel: fine and coarse, angular to subangular flint with quartz and some rounded to well-rounded flint and sandstone Sand: medium with coarse and fine, quartz with flint	4.3	5.2
Headon Beds	Clay, weathered at the top, greyish yellow green (5 GY 7/2)	1.1+	6.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
7	46	47	0.9-2.9	13	14	29	15	20	9	0
			2.9-5.2	2	6	18	12	30	32	0
			<b>Mean</b>	<b>7</b>	<b>10</b>	<b>23</b>	<b>13</b>	<b>26</b>	<b>21</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.9-5.2	74	4	14	4	0	2	2	518

SU 30 SE 2 3577 0077 Hatchet Moor, East Boldre Block C

Surface level +39.3 m Overburden 0.9 m  
 Water struck at +37.2 m Mineral 3.6 m  
 September 1980 Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, sandy, yellowish grey (5 Y 7/2)	0.5	0.9
	'Clayey' sandy gravel Gravel: fine and coarse, angular to subangular flint with quartz and some rounded to well-rounded flint and sandstone Sand: medium, coarse and fine, quartz with flint	3.6	4.5
Headon Beds	Clay, shelly, medium bluish grey (5 B 5/1)	2.0+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
10	48	42	0.9-2.1	1	3	31	13	21	28	3
			2.1-4.5	15	13	23	11	26	12	0
			<b>Mean</b>	<b>10</b>	<b>10</b>	<b>26</b>	<b>12</b>	<b>24</b>	<b>17</b>	<b>1</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.9-4.5	89	3	6	2	trace	0	0	325

SU 30 SE 3 3648 0177 Hatchet Pond, East Boldre Block C

Surface level +38.0 m Overburden 0.8 m  
 Water struck at +37.2 m Mineral 2.1 m  
 September 1980 Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, sandy, yellowish grey (5 Y 7/2)	0.4	0.8
	Gravel Gravel: fine and coarse, angular to subangular flint with quartz and some sandstone and well-rounded flint Sand: medium and coarse with fine, quartz with flint	2.1	2.9
Headon Beds	Clay, stiff, pale olive (10 Y 6/2)	1.4+	4.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	42	55	0.8-2.9	3	5	21	16	37	18	0

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.8-2.9	80	3	11	4	0	trace	2	513

SU 30 SE 4 3664 0050 Bagshot Moor, East Boldre Block C  
 Surface level +38.4 m Overburden 1.3 m  
 Water struck at +1.8 m Mineral 4.6 m  
 September 1980 Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and fine with coarse, quartz with flint	4.6	4.9
Headon Beds	Clay, with shelly material, weathered to 5.1 m, then greyish green (10 GY 5/2)	2.1+	6.7

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
4	71	25	0.3-2.1	1	16	30	16	19	18	0
			2.1-4.9	5	26	42	8	13	6	0
			Mean	4	22	38	11	15	10	0

SU 30 SE 6 3717 0066 East Boldre, East Boldre Block C  
 Surface level +36.7 m Overburden 1.3 m  
 Water struck at +32.8 m Mineral 3.7 m  
 September 1980 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Plateau Gravel	Clay, sandy	1.2	1.3
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.7	5.0
Headon Beds	Clay, weathered at the top, greyish green (5 G 5/2)	1.5+	6.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
3	39	58	1.3-2.0	8	9	21	11	34	17	0
			2.0-5.0	2	5	19	14	38	22	0
			Mean	3	6	19	14	37	21	0

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SU 30 SE 5 3731 0179 Hazlecopse Farm, Beaulieu Block C  
 Surface level +38.2 m Overburden 0.6 m  
 Water struck at +36.1 m Mineral 3.9 m  
 October 1980 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, pebbly, sandy	0.2	0.6
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.9	4.5
Headon Beds	Clay, greenish grey (5 GY 6/1)	0.5+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
4	37	59	0.6-2.1	7	8	28	10	28	19	0
			2.1-4.5	2	2	19	12	32	33	0
			Mean	4	4	22	11	31	28	0

SU 30 SE 7 3862 0339 Hides Close, Beaulieu Block D  
 Surface level +34.8 m Overburden 0.1 m  
 Water struck at +33.0 m Mineral 3.0 m  
 October 1980 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.0	3.1
Headon Beds	Clay, greenish grey (5 G 6/1)	0.9+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
5	42	53	0.1-1.8	8	7	26	14	34	11	0
			1.8-3.1	1	2	15	19	45	18	0
			Mean	5	5	21	16	39	14	0

**SU 30 SE 8 3852 0107 Beufre Farm, Beaulieu Block C**

Surface level +34.9 m Overburden 0.6 m  
 Water struck at +33.1 m Mineral 3.3 m  
 October 1980 Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Silt, sandy	0.2	0.4
Plateau Gravel	Clay, with flint pebbles	0.2	0.6
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with some fine, quartz with flint	0.3	3.9
Headon Beds	Clay, sandy, with black carbonaceous traces, medium bluish grey (5 B 5/1)	0.9+	4.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	40	56	0.6-1.8	9	3	28	12	30	18	0
			1.8-3.9	1	2	23	13	32	29	0
			<b>Mean</b>	<b>4</b>	<b>2</b>	<b>25</b>	<b>13</b>	<b>31</b>	<b>25</b>	<b>0</b>

**SU 30 SE 9 3821 0020 Newhouse Farm, Beaulieu Block C**

Surface level +29.5 m Overburden 0.8 m  
 Water struck at +27.6 m Mineral 3.3 m  
 October 1980 Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Brickearth	Sand, silty	0.4	0.8
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.3	4.1
Headon Beds	Clay, with carbonaceous traces, greenish grey (5 G 6/1)	0.9+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	42	54	0.8-1.9	8	6	23	14	32	17	0
			1.9-4.1	2	3	21	17	37	20	0
			<b>Mean</b>	<b>4</b>	<b>4</b>	<b>22</b>	<b>16</b>	<b>35</b>	<b>19</b>	<b>0</b>

**SU 30 SE 10 3942 0439 Hartford House, Beaulieu Block D**

Surface level +38.9 m Overburden 0.2 m  
 Water struck at +34.9 m Mineral 5.0 m  
 October 1980 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Sandy gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium, fine and coarse, quartz with flint	5.0	5.2
Barton Sand	Sand, fine-grained, quartzose, silty, dark yellowish orange (10 YR 6/6)	0.6+	5.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	53	39	0.2-1.1	19	56	20	1	3	1	0
			1.1-3.1	9	13	28	14	27	9	0
			3.1-4.0	6	6	30	15	32	11	0
			4.0-5.2	1	6	12	15	46	20	0
			<b>Mean</b>	<b>8</b>	<b>18</b>	<b>23</b>	<b>12</b>	<b>28</b>	<b>11</b>	<b>0</b>

**SU 30 SE 11 3986 0035 Keeping, Beaulieu Block C**

Surface level +27.7 m Overburden 0.8 m  
 Water struck at +25.9 m Mineral 3.4 m  
 October 1980 Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Brickearth	Sand, silty	0.4	0.6
	Clay, with flint pebbles	0.2	0.8
Plateau Gravel	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: coarse and medium with fine, quartz with flint	3.4	4.2
Headon Beds	Clay, shelly, dusky yellow green (5 GY 5/2)	0.8+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	32	63	0.8-1.8	12	5	13	15	42	13	0
			1.8-4.2	2	2	14	15	43	24	0
			<b>Mean</b>	<b>5</b>	<b>3</b>	<b>14</b>	<b>15</b>	<b>42</b>	<b>21</b>	<b>0</b>

**SZ 39 NW 3 3019 9936 Cobblers Corner, Boldre Block B**  
 Surface level +41.2 m Overburden 0.6 m  
 Water struck at +37.1 m Mineral 4.9 m  
 September 1980 Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.9	5.5
Headon Beds	Clay, weathered at the top, then greyish blue green (5 BG 5/2)	1.5+	7.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	42	54	0.6-2.6	9	10	29	14	31	7	0
			2.6-5.5	1	2	15	17	36	29	0
			<b>Mean</b>	<b>4</b>	<b>5</b>	<b>21</b>	<b>16</b>	<b>34</b>	<b>20</b>	<b>0</b>

**SZ 39 NW 5 3004 9592 Ramley, Christchurch and Lymington Block B**  
 Surface level +27.3 m Overburden 1.6 m  
 Water struck at +23.9 m Mineral 2.7 m  
 September 1980 Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Made ground	1.6	1.6
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium, coarse and fine, quartz with flint	2.7	4.3
Headon Beds	Clay, weathered at the top, dusky yellow green (5 GY 5/2)	1.7+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	48	50	1.6-3.6	2	14	25	14	31	14	0
			3.6-4.3	0	2	18	15	40	25	0
			<b>Mean</b>	<b>2</b>	<b>11</b>	<b>23</b>	<b>14</b>	<b>33</b>	<b>17</b>	<b>0</b>

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**SZ 39 NW 4 3102 9688 Battramsley Cross, Boldre Block B**  
 Surface level +29.2 m Overburden 0.7 m  
 Water not struck Mineral 9.2 m  
 September 1980 Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	9.2	9.9
Barton Sand	Sand, silty, dark yellowish orange (10 YR 6/6); fine-grained angular quartz	1.3+	11.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	37	61	0.7-2.7	9	8	21	13	34	15	0
			2.7-4.7	2	3	16	15	36	28	0
			4.7-6.7	0	3	17	15	30	35	0
			6.7-8.2	0	2	21	19	40	18	0
			8.2-9.9	0	2	8	21	54	15	0
			<b>Mean</b>	<b>2</b>	<b>4</b>	<b>17</b>	<b>16</b>	<b>38</b>	<b>23</b>	<b>0</b>

**SZ 39 NW 6 3080 9516 Upper Pennington, Christchurch and Lymington Block B**  
 Surface level +22.9 m Overburden 0.7 m  
 Water struck at +20.4 m Mineral 2.5 m  
 September 1980 Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Silt, sandy, with flint pebbles Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	0.4	0.7
Headon Beds	Clay, weathered dark yellowish orange (10 YR 6/6) at the top, then dark greenish grey (5 G 4/1)	1.3+	4.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	45	50	0.7-2.5	6	8	29	13	31	13	0
			2.5-3.2	0	2	19	13	35	31	0
			<b>Mean</b>	<b>5</b>	<b>6</b>	<b>26</b>	<b>13</b>	<b>32</b>	<b>18</b>	<b>0</b>

**SZ 39 NW 7 3124 9959 Sandy Down, Boldre Block B**

Surface level +37.8 m Overburden 0.2 m  
 Water not struck Mineral 6.1 m  
 September 1980 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Sandy gravel Gravel: fine and coarse, angular to subangular flint with quartz and some well-rounded flint Sand: medium, coarse and fine, quartz with flint	6.1	6.3
Headon Beds	Clay, medium bluish grey (5 B 5/1)	1.0+	7.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand		Gravel			
			-1/16	+1/16 - 1/4	+1/4 - 1/2	+1/2 - 3/4	+3/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
7	55	38	0.2-2.2	9	11	30	16	28	6	0	
			2.2-4.2	5	11	28	12	24	20	0	
			4.2-6.3	8	10	28	16	24	14	0	
			<b>Mean</b>	<b>7</b>	<b>11</b>	<b>29</b>	<b>15</b>	<b>25</b>	<b>13</b>	<b>0</b>	

**SZ 39 NW 8 3102 9888 Buckland Rings, Christchurch and Lymington Block B**

Surface level +35.2 m Overburden 1.2 m  
 Water struck at +32.0 m Mineral 2.4 m  
 October 1980 Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Clay, sandy, with flint pebbles	0.6	1.2
	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	2.4	3.6
Headon Beds	Clay, sandy, moderate yellowish brown (10 YR 5/4)	0.7	4.3
Barton Sand	Sand, fine-grained, clayey	0.7+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand		Gravel			
			-1/16	+1/16 - 1/4	+1/4 - 1/2	+1/2 - 3/4	+3/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
8	48	44	1.2-3.6	8	10	27	11	28	16	0	

**SZ 39 NW 9 3159 9602 Buckland, Christchurch and Lymington Block B**

Surface level +23.0 m Overburden 1.1 m  
 Water struck at +18.8 m Mineral 4.1 m  
 October 1980 Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, sandy, with flint pebbles	0.8	1.1
	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.1	5.2
Headon Beds	Clay, with thin layers of comminuted shell debris, weathered at the top, greyish blue green (5 BG 5/2)	1.7+	6.9

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand		Gravel			
			-1/16	+1/16 - 1/4	+1/4 - 1/2	+1/2 - 3/4	+3/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
5	49	46	1.1-3.1	8	10	29	15	27	11	0	
			3.1-5.2	1	3	28	14	27	27	0	
			<b>Mean</b>	<b>5</b>	<b>7</b>	<b>28</b>	<b>14</b>	<b>27</b>	<b>19</b>	<b>0</b>	

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
1.1-5.8	94	1	3	1	0	1	0 132

**SZ 39 NW 10 3206 9786 Vicars Hill Farm, Boldre Block C**

Surface level +1.1 m Overburden 0.3 m  
 Water struck at 0 m Mineral 2.2 m  
 September 1980 Bedrock 2.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
River Terrace Deposits (undifferentiated)	Gravel Gravel: coarse and fine, angular to subangular flint with some quartz and well-rounded flint Sand: fine and coarse with some medium, quartz with flint	2.2	2.5
Barton Sand	Sand, fine-grained, micaceous, dark yellowish orange (10 YR 6/6)	1.8	4.3
	Sand, clayey, greyish green (5 B 5/2)	0.7+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{8}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
4	25	71	0.3-2.5	4	13	4	8	34	37	0	
6	94	0	2.5-4.3	6	91	2	1	0	0	0	

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction								
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others		
0.3-2.5	91	4	4	1	0	0	trace	312	

**SZ 39 NW 11 3252 9647 Lower Buckland, Boldre**

**Block C**

Surface level +1.5 m  
Water struck at -1.0 m  
September 1980

Overburden 3.0 m  
Mineral 1.1 m  
Bedrock 3.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Made ground	1.6	1.6
Peat	Peat	1.4	3.0
River Terrace Deposits (undifferentiated)	Gravel Gravel: coarse and fine, angular to subangular flint with rounded to well-rounded flint and quartz Sand: fine with coarse and medium, quartz	1.1	4.1
Barton Sand	Sand, fine-grained, dark yellowish orange (10 YR 6/6)	3.7+	7.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{8}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
3	43	54	3.0-4.1	3	34	4	5	24	30	0	
3	97	0	4.1-7.8	3	96	0	1	0	0	0	

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction								
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others		
3.0-4.1	89	7	4	trace	0	0	0	385	

**SZ 39 NW 12 3357 9958 Greenmoor, Boldre**

**Block C**

Surface level +32.7 m  
Water not struck  
September 1980

Overburden 1.6 m  
Mineral 3.6 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Clay, sandy, with flint pebbles	1.1	1.6
	Gravel Gravel: coarse and fine, mainly flint Sand: medium and coarse with some fine, quartz with flint	3.6	5.2
Headon Beds	Clay, greyish green (10 G 4/2)	1.0+	6.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{8}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
2	38	60	1.6-3.6	2	1	17	19	31	30	0	
			3.6-5.2	1	2	25	13	26	33	0	
			<b>Mean</b>	<b>2</b>	<b>1</b>	<b>21</b>	<b>16</b>	<b>29</b>	<b>31</b>	<b>0</b>	

**SZ 39 NW 13 3344 9906 Pilley Bailey, Boldre**

**Block C**

Surface level +32.2 m  
Water struck at +29.5 m  
September 1980

Overburden 1.7 m  
Mineral 2.0 m  
Bedrock 2.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Clay, sandy, with flint pebbles	1.5	1.7
	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium, coarse and fine, quartz with flint	2.0	3.7
Headon Beds	Clay, medium bluish grey (5 B 5/1)	2.0+	5.7

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages							
Fines	Sand	Gravel		Fines		Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{8}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
6	42	52	1.7-2.7	11	12	22	14	34	7	0	
			2.7-3.7	1	3	17	15	35	29	0	
			<b>Mean</b>	<b>6</b>	<b>8</b>	<b>19</b>	<b>15</b>	<b>34</b>	<b>18</b>	<b>0</b>	

SZ 39 NW 14 3308 9787 Warborne Farm, Boldre

Block C

Surface level +29.5 m  
Water struck at +24.5 m  
September 1980

Overburden 3.0 m  
Mineral 2.7 m  
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, sandy, light olive grey (5 Y 6/1)	2.7	3.0
	Gravel Gravel: fine and coarse, mainly flint Sand: medium, coarse and fine, quartz with flint	2.7	5.7
Headon Beds	Clay, shelly, greenish black (5 GY 2/1)	0.8+	6.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	30	62	3.0-5.7	8	7	13	10	33	29	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction								
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others		
3.0-5.7	91	2	5	trace	0	0	2	439	

SZ 39 NW 15 3295 9679 Pleasure Copse, Boldre

Block C

Surface level +25.9 m  
Water struck at +23.6 m  
September 1980

Overburden 0.3 m  
Mineral 3.4 m  
Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	'Clayey' sandy gravel Gravel: fine and coarse, angular to subangular flint with quartz and some well-rounded flint	3.4	3.7
Headon Beds	Clay, shelly, medium bluish grey (5 B 5/1)	1.4+	5.1

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
11	48	41	0.3-2.3	11	6	26	14	30	13	0
			2.3-3.7	10	6	29	17	24	14	0
			Mean	11	6	27	15	28	13	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.3-3.7	91	2	5	1	trace	trace	1	436

SZ 39 NW 17 3376 9771 Portmore, Boldre

Block C

Surface level +26.7 m  
Water not struck  
September 1980

Overburden 1.1 m  
Mineral 2.8 m  
Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	1.1	1.1
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint with quartz Sand: coarse and medium, quartz with flint	2.8	3.9
Headon Beds	Clay, shelly greyish green (5 G 5/2)	2.1+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	35	63	1.1-3.1	2	2	14	18	46	18	0
			3.1-3.9	2	2	17	18	37	24	0
			Mean	2	2	15	18	43	20	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.1-3.9	90	2	7	trace	0	0	1	434

**SZ 39 NW 18 3433 9923 Crockford Bridge, Boldre Block C**

Surface level +32.6 m  
Water struck at +30.1 m  
September 1980

Overburden 0.6 m  
Mineral 2.6 m  
Bedrock 1.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, sandy	0.2	0.6
	Gravel, 'clayey' at the base Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	2.6	3.2
Headon Beds	Clay, medium bluish grey (5 B 5/1)	1.6+	4.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	39	57	0.6-2.5	2	2	26	13	34	23	0
			2.5-3.2	11	7	16	13	36	17	0
			<b>Mean</b>	<b>4</b>	<b>3</b>	<b>23</b>	<b>13</b>	<b>35</b>	<b>22</b>	<b>0</b>

**SZ 39 NW 19 3448 9818 Bull Hill Farm, Boldre Block C**

Surface level +28.0 m  
Water struck at +23.8 m  
September 1980

Overburden 0.5 m  
Mineral 4.1 m  
Bedrock 1.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	4.1	4.6
Headon Beds	Clay, shelly, pale green (10 G 6/2)	1.7+	6.3

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	56	36	0.5-2.5	8	14	40	11	20	7	0
			2.5-4.6	8	9	22	17	30	14	0
			<b>Mean</b>	<b>8</b>	<b>11</b>	<b>31</b>	<b>14</b>	<b>26</b>	<b>10</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.5-4.6	92	1	6	1	trace	0	0	479

**SZ 39 NW 20 3435 9599 Snooks Farm, Boldre Block C**

Surface level +12.9 m  
Water struck at +9.9 m  
November 1980

Overburden 0.6 m  
Mineral 1.0 m  
Waste 0.4 m  
Mineral 2.5 m  
Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	a 'Very clayey' sandy gravel Gravel: fine with coarse, mainly flint Sand: fine, medium and coarse, quartz with flint	1.0	1.6
	Clay, pebbly, light grey (N7)	0.4	2.0
	b Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.5	4.5
Headon Beds	Clay, stiff, greenish grey (5 G 6/1)	1.0+	5.5

**GRADING**

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	20	47	33	0.6-1.6	20	19	18	10	29	4	0
b	1	63	36	2.0-4.5	1	5	38	20	19	17	0
a + b	7	58	35	<b>Mean</b>	<b>7</b>	<b>9</b>	<b>32</b>	<b>17</b>	<b>22</b>	<b>13</b>	<b>0</b>



SZ 39 NW 21 3455 9536 Lisle Court, Boldre

Block C

Surface level +10.8 m  
Water struck at +9.1 m  
November 1980

Overburden 1.4 m  
Mineral 2.6 m  
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, pebbly	1.1	1.4
	Gravel, sandy at the top Gravel: fine and coarse, angular to subangular flint with well-rounded flint and some quartz Sand: medium and coarse, quartz with flint	2.6	4.0
Headon Beds	Clay, firm, light grey (N7) mottled moderate yellowish brown (10 YR 5/4)	1.0+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
1	41	58	4	5	40	18	23	10	0	
			1	3	19	15	38	24	0	
			<b>Mean</b>	<b>1</b>	<b>3</b>	<b>23</b>	<b>15</b>	<b>36</b>	<b>22</b>	<b>0</b>

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.4-4.0	87	9	2	1	0	1	0	289

SZ 39 NE 1 3539 9989 Deep Moor, East Boldre

Block C

Surface level +38.7 m  
Water struck at +36.2 m  
September 1980

Overburden 0.5 m  
Mineral 4.7 m  
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Gravel, 'clayey' at the top Gravel: fine and coarse, angular to subangular flint with quartz Sand: medium and coarse with fine, quartz with flint	4.7	5.2
Headon Beds	Clay, stiff, medium bluish grey (5 B 5/1)	1.8+	7.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
5	42	53	10	7	26	14	31	12	0	
			2	1	16	20	35	26	0	
			<b>Mean</b>	<b>5</b>	<b>4</b>	<b>20</b>	<b>18</b>	<b>33</b>	<b>20</b>	<b>0</b>

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							Others
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert		
0.5-5.2	83	3	13	1	trace	trace	trace	435

SZ 39 NE 2 3540 9808 Norley Inclosure, Boldre

Block C

Surface level +25.7 m  
Water struck at +23.6 m  
September 1980

Overburden 0.8 m  
Mineral 3.5 m  
Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.8	0.8
Plateau Gravel	Gravel, 'clayey' at the top Gravel: fine and coarse, angular to subangular flint with some quartz and well-rounded flint Sand: medium and coarse with fine, quartz with flint	3.5	4.3
Headon Beds	Clay, shelly, grey-green (5 G 5/2)	1.7+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm	
10	44	46	12	11	23	16	31	7	0	
			9	6	16	16	31	22	0	
			<b>Mean</b>	<b>10</b>	<b>8</b>	<b>19</b>	<b>16</b>	<b>31</b>	<b>15</b>	<b>0</b>

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							Others
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert		
0.8-4.3	94	2	3	1	trace	0	trace	358

**SZ 39 NE 3 3585 9739 Carters Farm, Boldre Block C**  
 Surface level +15.8 m Overburden 0.7 m  
 Water not struck Mineral 1.9 m  
 November 1980 Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Plateau Gravel	'Clayey' sandy gravel Gravel: fine and coarse, mainly flint Sand: medium, fine and coarse, quartz and flint	1.9	2.6
Barton Sand	'Very clayey' sand, pale yellowish orange (10 YR 8/6)	1.4+	4.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
15	46	39	0.7-2.6	15	15	22	9	26	13	0
34	66	0	2.6-4.0	34	63	2	1	0	0	0

**SZ 39 NE 4 3528 9712 South Baddesley, Boldre Block C**  
 Surface level +18.2 m Overburden 0.9 m  
 Water not struck Mineral 1.1 m  
 November 1980 Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.9	0.9
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	1.1	2.0
Headon Beds	Clay	0.8+	2.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
9	53	38	0.9-2.0	9	6	37	10	23	15	0

**SZ 39 NE 5 3526 9610 Pylewell Park, Boldre Block C**  
 Surface level +11.4 m Overburden 0.5 m  
 Water struck at +9.6 m Mineral 8.5 m  
 November 1980 Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Gravel Gravel: coarse and fine, mainly flint Sand: medium, coarse and fine, quartz with flint	8.5	9.0
Barton Sand	Sand, medium with fine, quartz	1.2+	10.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
1	42	57	0.5-2.5	0	3	23	15	29	30	0
			2.5-4.5	1	2	26	13	27	31	0
			4.5-6.5	1	2	20	16	29	32	0
			6.5-9.0	3	20	22	3	7	45	0
			<b>Mean</b>	<b>1</b>	<b>8</b>	<b>23</b>	<b>11</b>	<b>22</b>	<b>35</b>	<b>0</b>
1	99	0	9.0-10.2	1	44	55	0	0	0	0

**SZ 39 NE 6 3537 9554 Pylewell House, Boldre Block C**  
 Surface level +8.2 m Overburden 0.6 m  
 Water level not recorded Mineral 3.4 m  
 November 1980 Bedrock 0.8 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.4	4.0
Barton Sand	'Clayey' sand, fine, quartz, dark yellowish orange (10 YR 6/6)	0.8+	4.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	45	52	0.6-1.7	6	6	27	16	28	17	0
			1.7-4.0	2	3	20	20	42	13	0
			<b>Mean</b>	<b>3</b>	<b>4</b>	<b>22</b>	<b>19</b>	<b>38</b>	<b>14</b>	<b>0</b>
18	82	0	4.0-4.8	18	80	2	0	0	0	0

**SZ 39 NE 7 3689 9763 Coombes Gate Farm, East Boldre Block C**

Surface level +16.2 m Overburden 0.3 m  
 Water not struck Mineral 1.7 m  
 September 1980 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Sandy gravel Gravel: fine and coarse, angular to subangular flint with quartz Sand: medium and coarse with fine, quartz with flint	1.7	2.0
Headon Beds	Clay, shelly, greyish olive green (5 GY 3/2) and greenish grey (5 G 6/1)	1.0+	3.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
6	47	47	0.3-2.0	6	5	24	18	34	13	0

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.3-2.0	90	1	7	1	0	0	1	396

**SZ 39 NE 8 3615 9658 Bridge Farm, Boldre Block C**

Surface level +12.3 m Overburden 0.9 m  
 Water struck at +11.3 m Mineral 0.9 m  
 November 1980 Waste 1.7 m  
 Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Clay	0.4	0.9
	Gravel Gravel: fine with coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	0.9	1.8
	Clay, sandy, with pebbles	1.7	3.5
Headon Beds	Clay, greenish grey (5 G 6/1)	1.3+	4.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
5	48	47	0.9-1.8	5	7	25	16	38	9	0

**SZ 39 NE 9 3637 9558 Otters Hill Copse, Boldre Block C**

Surface level +4.8 m Overburden 0.9 m  
 Water struck at +3.4 m Mineral 3.4 m  
 November 1980 Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Plateau Gravel	Clay, pebbly	0.2	0.9
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.4	4.3
Headon Beds	Clay, with gastropod shells, greyish blue-green (5 BG 5/2)	1.2+	5.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
2	48	50	0.9-1.4	6	6	31	17	27	13	0
			1.4-3.5	1	2	18	15	36	28	0
			3.5-4.3	1	2	62	13	16	6	0
			<b>Mean</b>	<b>2</b>	<b>3</b>	<b>30</b>	<b>15</b>	<b>30</b>	<b>20</b>	<b>0</b>

**SZ 39 NE 10 3724 9956 Newhouse Copse, Beaulieu Block C**

Surface level +29.0 m Overburden 0.9 m  
 Water struck at +27.6 m Mineral 2.3 m  
 November 1980 Bedrock 0.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, pebbly Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	0.6	0.9
Headon Beds	Clay, pale green (10 G 5/2)	0.4+	3.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
3	43	54	0.9-2.3	3	3	23	17	35	19	0

**SZ 39 NE 11 3780 9782 Beck Farm, Beaulieu Block C**

Surface level +16.6 m Overburden 0.8 m  
 Water struck at +14.2 m Mineral 3.2 m  
 November 1980 Bedrock 1.0 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, sandy, with pebbles	0.5	0.8
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	3.2	4.0
Headon Beds	Clay, shelly, pale green (5 BG 6/2)	1.0+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
2	36	62	0.8-2.8	2	2	19	14	40	23	0
			2.8-4.0	1	2	20	17	31	29	0
			<b>Mean</b>	<b>2</b>	<b>2</b>	<b>19</b>	<b>15</b>	<b>37</b>	<b>25</b>	<b>0</b>

**SZ 39 NE 12 3745 9638 Sowley Farm, Boldre Block C**

Surface level +6.6 m Overburden 0.8 m  
 Water struck at +4.9 m Mineral 1.8 m  
 November 1980 Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Silt, with flint pebbles, light brown (5 YR 5/6)	0.5	0.8
Plateau Gravel	'Clayey' gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine	1.8	2.6
Headon Beds	Clay, weathered at the top, with rootlets, then pale green (10 G 6/2)	1.4+	4.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
15	32	53	0.8-2.6	15	4	18	12	28	23	0

**SZ 39 NE 13 3811 9870 Longmead Copse, Beaulieu Block C**

Surface level +23.4 m Overburden 0.7 m  
 Water level not recorded Mineral 2.4 m  
 November 1980 Bedrock 1.5 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, sandy	0.4	0.7
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.4	3.1
Headon Beds	Clay, medium bluish grey (5 B 5/1)	1.5+	4.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
4	46	50	0.7-2.0	6	6	30	10	33	15	0
			2.0-3.1	2	2	24	20	38	14	0
			<b>Mean</b>	<b>4</b>	<b>4</b>	<b>27</b>	<b>15</b>	<b>35</b>	<b>15</b>	<b>0</b>

**SZ 39 NE 14 3855 9738 Thorns Cottages, Beaulieu Block C**

Surface level +16.1 m Overburden 0.5 m  
 Water struck at +3.4 m Mineral 4.8 m  
 November 1980 Bedrock 1.3 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.5	0.5
Plateau Gravel	'Clayey' sandy gravel Gravel: fine and coarse, mainly flint Sand: fine and medium with coarse, quartz	4.8	5.3
Headon Beds	Clay, shelly, dark greyish green (5 G 4/1)	1.3+	6.6

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
12	57	31	0.5-2.8	22	58	11	2	6	1	0
			2.8-5.3	2	4	30	11	34	19	0
			<b>Mean</b>	<b>12</b>	<b>30</b>	<b>21</b>	<b>6</b>	<b>21</b>	<b>10</b>	<b>0</b>

**SZ 39 NE 15 3967 9973 Little Purnel, Beaulieu Block C**

Surface level +24.9 m Overburden 0.6 m  
 Water struck at +23.5 m Mineral 4.0 m  
 October 1980 Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Brickearth	Silt, sandy, light brown (5 YR 5/6)	0.3	0.6
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine	4.0	4.6
Headon Beds	Clay	0.9+	5.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
2	45	53	0.6-1.4	8	23	38	6	16	9	0
			1.4-3.4	1	5	24	12	30	28	0
			3.4-4.6	1	1	14	22	38	24	0
			<b>Mean</b>	<b>2</b>	<b>7</b>	<b>24</b>	<b>14</b>	<b>30</b>	<b>23</b>	<b>0</b>

**SZ 39 NE 16 3980 9767 Bergerie Farm, Beaulieu Block C**

Surface level +14.0 m Overburden 0.6 m  
 Water level not recorded Mineral 4.3 m  
 November 1980 Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel, sandy at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.3	4.9
Headon Beds	Clay, shelly, weathered at the top, then dark greyish green (5 G 4/1)	1.1+	6.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
4	47	49	0.6-2.6	8	10	35	14	25	8	0
			2.6-4.9	1	2	20	15	34	28	0
			<b>Mean</b>	<b>4</b>	<b>6</b>	<b>27</b>	<b>14</b>	<b>30</b>	<b>19</b>	<b>0</b>

**SZ 39 NE 17 3991 9657 Thorns Beach, Beaulieu Block C**

Surface level +2.0 m Waste 2.0 m  
 Water struck at +0.7 m Bedrock 1.2 m  
 November 1980

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, with flint pebbles becoming more common at the base	1.6	2.0
Headon Beds	Clay, greenish grey (5 GY 6/1)	1.2+	3.2

**SZ 39 SW 1 3001 9135 Keyhaven, Christchurch and Lymington Block A**

Surface level +3.1 m Overburden 1.8 m  
 Water struck at +0.9 m Mineral 3.4 m  
 October 1980 Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, sandy	1.4	1.8
	Gravel Gravel: coarse and fine, mainly flint Sand: medium and coarse, quartz with flint	3.4	5.2
Headon Beds	Clay, weathered at the top, medium bluish grey (5 B 5/1)	1.2+	6.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
1	42	57	1.8-3.8	0	2	24	14	30	30	0
			3.8-5.2	2	2	27	17	37	15	0
			<b>Mean</b>	<b>1</b>	<b>2</b>	<b>25</b>	<b>15</b>	<b>33</b>	<b>24</b>	<b>0</b>

SZ 39 SW 2 3116 9200 Keyhaven Marshes, Christchurch and Lympington Block B

Surface level +0.9 m Overburden 0.7 m  
 Water struck at +0.2 m Mineral 4.8 m  
 October 1980 Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Alluvium	Sand, clayey	0.3	0.7
Plateau Gravel	Gravel, sandy at the base Gravel: fine and coarse, mainly flint Sand: medium and coarse	4.8	5.5
Headon Beds	Clay, with thin layers of finely comminuted shell debris, weathered at the top, then medium bluish grey (5 B 5/1)	1.4+	6.9

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
3	45	52								
			0.7-2.7	5	2	15	16	46	16	0
			2.7-5.5	1	2	29	33	31	14	0
			Mean	3	2	23	20	37	15	0

SZ 39 SW 3 3180 9260 Pennington Marshes, Christchurch and Lympington Block B

Surface level +0.9 m Waste 3.9 m  
 Water struck at -0.5 m Bedrock 1.2 m+  
 October 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Peat	0.5	0.5
Alluvium	Silt, sandy, with flint pebbles, greenish grey (5 G 6/1)	0.8	1.3
	Silt, clayey, medium bluish grey (5 B 5/1)	2.2	3.5
Plateau Gravel	Gravel, sandy, silty, flint-rich	0.4	3.9
Headon Beds	Clay, greenish grey (5 G 6/1)	1.2+	5.1

SZ 39 SW 4 3248 9466 Woodside, Christchurch and Lympington Block B

Surface level +4.5 m Overburden 0.9 m  
 Water not struck Mineral 1.4 m  
 October 1980 Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.6	0.6
Plateau Gravel	Clay, silty	0.3	0.9
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	1.4	2.3
Headon Beds	Clay, dark greenish grey (5 GY 4/1), weathered at the top	1.7+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
7	39	54								
			0.9-2.3	7	7	16	16	29	25	0

SZ 39 SW 5 3265 9323 Oxey Marsh, Christchurch and Lympington Block B

Surface level +1.0 m Overburden 1.0 m  
 Water struck at 0 m Mineral 5.6 m  
 October 1980 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat	0.5	0.5
Alluvium	Clay, sandy	0.5	1.0
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium with coarse and fine, quartz with flint	5.6	6.6
Headon Beds	Clay, greenish grey (5 G 6/1)	1.0+	7.6

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
1	50	49								
			1.0-3.0	1	6	34	11	27	21	0
			3.0-5.0	1	6	28	12	32	21	0
			5.0-6.6	1	6	35	13	26	15	0
			Mean	1	6	32	12	29	20	0

SU 40 NW 119 4050 0620 Dibden Inclosure, Denny Lodge Block D

Surface level +38.6 m Overburden 1.2 m  
 Water not struck Mineral 1.9 m  
 October 1980 Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Clay, sandy, with sporadic flint pebbles	0.7	1.2
	'Clayey' sandy gravel Gravel: fine and coarse, mainly flint Sand: medium, coarse and fine quartz with flint	1.9	3.1
Barton Sand	Sand, fine, well-sorted quartz, dark yellowish orange (10 YR 6/6)	0.4+	3.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
10	56	34	1.2-2.4	10	10	27	16	23	14	0
			2.4-3.1	11	12	33	16	24	4	0
			Mean	10	11	29	16	23	11	0

SU 40 NW 120 4053 0544 The Noads, Denny Lodge Block D

Surface level +38.1 m Overburden 1.8 m  
 Water struck at +36.4 m Mineral 0.5 m  
 October 1980 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, stiff, with angular flint pebbles, light grey (N7) mottled dark reddish brown (10 R 3/4)	1.4	1.8
	Gravel Gravel: fine and coarse, angular to subangular flint with some quartz and well-rounded flint Sand: coarse and medium with fine, quartz with flint	0.5	2.3
Headon Beds	Clay, weathered dark reddish brown (10 R 3/4)	0.5+	2.8

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
7	28	65	1.8-2.3	7	4	12	12	40	25	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.8-2.3	89	4	5	2	0	0	0	283

SU 40 NW 121 4141 0550 Fawley Inclosure, Denny Lodge Block D

Surface level +38.9 m Overburden 1.2 m  
 Water struck at +34.3 m Mineral 3.6 m  
 October 1980 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, with sporadic flint pebbles, light brown (5 YR 6/4) mottled dark reddish brown (10 YR 3/4)	0.8	1.2
	Sandy gravel Gravel: fine and coarse, angular to subangular flint with quartz and some well-rounded flint Sand: medium with coarse and fine, quartz with flint	3.6	4.8
Barton Sand	Sand, fine and medium quartz, dark yellowish orange (10 YR 6/6)	0.8+	5.6

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	53	43	1.2-3.2	5	11	31	11	30	12	0
			3.2-4.8	2	8	31	14	23	22	0
			Mean	4	10	31	12	27	16	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
1.2-4.8	86	3	10	1	0	0	0	423

SU 40 SW 158 4028 0441 Beaulieu Heath, Denny Lodge Block D  
 Surface level +39.9 m Waste 0.8 m  
 Water not struck Bedrock 1.9 m+  
 October 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, with angular flint pebbles, light grey (N7) mottled moderate yellowish brown (10 YR 5/4)	0.5	0.8
Headon Beds	Clay, weathered, light grey (N7) mottled light brown (5 YR 5/6)	1.9+	2.7

SU 40 SW 159 4052 0331 Hill Top, Denny Lodge Block D  
 Surface level +37.7 m Overburden 0.8 m  
 Water not struck Mineral 2.9 m  
 October 1980 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Clay, with flint pebbles, sandy	0.4	0.8
	Gravel, 'clayey' at the top Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.9	3.7
Headon Beds	Clay, shelly, greenish grey (5 G 6/1)	0.8+	4.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
8	40	52	0.8-1.9	17	12	20	10	27	14	0
			1.9-3.7	2	2	24	13	36	23	0
			Mean	8	6	22	12	32	20	0

SU 40 SW 160 4078 0260 Moonhills Gate, Denny Lodge Block D  
 Surface level +32.7 m Overburden 0.5 m  
 Water struck at +31.3 m Mineral 3.7 m  
 October 1980 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	Clay, sandy, with pebbles	0.3	0.5
	Gravel Gravel: fine and coarse, mainly flint Sand: coarse, medium and fine, quartz with flint	3.7	4.2
Headon Beds	Clay, weathered light brown (5 YR 5/6) mottled dark yellowish orange (10 YR 6/6)	0.8+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	36	62	0.5-1.4	6	8	21	14	26	25	0
			1.4-4.2	1	2	12	19	41	24	0
			Mean	2	4	14	18	38	24	0

SU 40 SW 161 4117 0490 Flash Pond, Denny Lodge Block D  
 Surface level +36.4 m Overburden 0.4 m  
 Water not struck Mineral 2.1 m  
 October 1980 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: coarse and medium, quartz with flint	2.1	2.5
Headon Beds	Clay, greenish grey (5 G 6/1)	0.5+	3.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
1	38	61	0.4-2.5	1	2	11	25	44	17	0



SU 40 SW 162 4129 0323 Ipers Bridge Farm, Denny Lodge Block D  
 Surface level +36.2 m Overburden 0.5 m  
 Water struck at +33.7 m Mineral 3.4 m  
 October 1980 Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	3.4	3.9
Headon Beds	Clay, sandy, medium bluish grey (5 B 5/1)	1.1+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
5	49	46	0.5-2.5	8	9	28	14	26	15	0
			2.5-3.9	1	3	16	27	32	21	0
			Mean	5	7	23	19	28	18	0

SU 40 SW 164 4214 0497 Hardley Bridge, Denny Lodge Block D  
 Surface level +36.4 m Overburden 1.2 m  
 Water struck at +33.4 m Mineral 2.7 m  
 October 1980 Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, with numerous flint pebbles, dark reddish brown (10 R 3/4) mottled light grey (N7)	0.9	1.2
	Sandy gravel Gravel: fine with coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.7	3.9
Barton Sand	Sand, fine and medium quartz, moderate yellowish brown (10 YR 5/4)	0.6+	4.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	50	48	1.2-3.9	2	6	24	20	34	14	0

SU 40 SW 163 4166 0150 Steerleys Copse, Beaulieu Block D  
 Surface level +27.7 m Overburden 0.6 m  
 Water struck at +26.0 m Mineral 1.9 m  
 October 1980 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: coarse and medium with fine, quartz with flint	1.9	2.5
Headon Beds	Clay, greyish green (10 GY 5/2)	1.0+	3.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	48	48	0.6-2.5	4	3	22	23	27	21	0

SU 40 SW 165 4265 0079 Exbury Bridge, Exbury and Lepe Block D  
 Surface level +22.8 m Overburden 0.7 m  
 Water level not recorded Mineral 4.4 m  
 November 1980 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.4	5.1
Headon Beds	Clay, silty, moderate olive brown (5 Y 4/4)	0.9+	6.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
1	41	58	0.7-2.7	1	2	21	15	35	26	0
			2.7-5.1	1	4	26	14	30	25	0
			Mean	1	3	24	14	33	25	0

**SU 40 SW 166 4300 0416 Little Holbury, Fawley Block D**

Surface level +37.6 m  
Water struck at +35.5 m  
October 1980

Overburden 0.9 m  
Mineral 11.1 m  
Bedrock 0.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.9	0.9
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	11.1	12.0
Barton Sand	Sand, fine-grained quartz, dark yellowish orange (10 YR 6/6)	0.2+	12.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
2	52	46	0.9-1.7	10	18	43	12	14	3	0
			1.7-2.7	2	7	33	15	23	20	0
			2.7-5.5	1	3	18	19	37	22	0
			5.5-7.2	1	4	25	19	40	11	0
			7.2-9.9	2	4	36	25	25	8	0
			9.9-12.0	2	2	24	17	37	18	0
			<b>Mean</b>	<b>2</b>	<b>5</b>	<b>28</b>	<b>19</b>	<b>32</b>	<b>14</b>	<b>0</b>

**SU 40 SW 167 4339 0284 Rollestone Farm, Fawley Block D**

Surface level +30.8 m  
Water struck at +29.1 m  
October 1980

Overburden 0.7 m  
Mineral 4.4 m  
Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Plateau Gravel	Gravel Gravel: fine and coarse, angular to subangular flint with quartz Sand: medium and coarse with fine, quartz with flint	4.4	5.1
Headon Beds	Clay, stiff, medium bluish grey (5 B 6/1) mottled light grey (N7)	1.1+	6.2

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
2	43	55	0.7-3.1	2	4	23	17	32	22	0
			3.1-5.1	2	4	21	18	34	21	0
			<b>Mean</b>	<b>2</b>	<b>4</b>	<b>22</b>	<b>17</b>	<b>33</b>	<b>22</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
0.7-5.1	89	2	7	1	0	0	1 613

**SU 40 SW 168 4361 0157 Blackwell Common, Denny Lodge Block D**

Surface level +23.4 m  
Water not struck  
October 1980

Overburden 0.4 m  
Mineral 3.4 m  
Bedrock 1.2 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Sandy gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	3.4	3.8
Barton Sand	Sand, fine-grained quartz, dark yellowish orange (10 YR 6/6)	1.2+	5.0

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
				-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
1	51	48	0.4-2.4	1	2	36	15	25	19	0
			2.4-3.8	1	1	31	16	36	15	0
			<b>Mean</b>	<b>1</b>	<b>2</b>	<b>34</b>	<b>15</b>	<b>30</b>	<b>18</b>	<b>0</b>

**SU 40 SE 355 4567 0086 King's Rew Copse, Fawley Block D**

Surface level +16.2 m  
Water not struck  
November 1980

Overburden 0.6 m  
Mineral 2.8 m  
Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	2.8	3.4
Headon Beds	Clay, sandy, with carbonaceous traces, light grey (N7) mottled moderate yellowish brown (10 YR 5/4)	1.1+	4.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages								
Fines	Sand	Gravel		Fines			Sand			Gravel		
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
5	43	52	0.6-2.3	7	6	20	16	28	23	0		
			2.3-3.4	2	3	21	20	43	11	0		
			<b>Mean</b>	<b>5</b>	<b>5</b>	<b>20</b>	<b>18</b>	<b>34</b>	<b>18</b>	<b>0</b>		

**SU 40 SE 356 4513 0023 Whitefield Rough, Fawley Block D**

Surface level +17.0 m Overburden 0.5 m  
 Water not struck Mineral 3.4 m  
 November 1980 Bedrock 0.9 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	3.4	3.9
Headon Beds (?)	Clay, light olive brown (5 Y 5/6)	0.6	4.5
Barton Sand	Sand, clayey, fine quartz, moderate yellowish brown (10 YR 5/4)	0.3+	4.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages								
Fines	Sand	Gravel		Fines			Sand			Gravel		
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
1	39	60	0.5-2.5	1	3	19	14	39	24	0		
			2.5-3.9	1	4	24	16	36	19	0		
			<b>Mean</b>	<b>1</b>	<b>3</b>	<b>21</b>	<b>15</b>	<b>38</b>	<b>22</b>	<b>0</b>		

**SU 40 SE 357 4636 0264 Stone Hill Farm, Fawley Block D**

Surface level +26.2 m Overburden 1.1 m  
 Water not struck Mineral 4.0 m  
 November 1980 Bedrock 0.7 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Plateau Gravel	Clay, with flint pebbles, reddish brown (10 R 4/4) mottled moderate yellowish brown (10 YR 5/4)	0.4	1.1
	Gravel, sandy at the base Gravel: coarse and fine, angular to subangular flint with quartz Sand: medium and coarse with fine, quartz with flint	4.0	5.1
Barton Sand	Sand, fine quartz, moderate yellowish brown (10 YR 5/4)	0.7+	5.8

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages								
Fines	Sand	Gravel		Fines			Sand			Gravel		
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
1	25	74	1.1-3.7	1	2	4	5	20	65	1		
			3.7-5.1	1	4	27	21	28	19	0		
			<b>Mean</b>	<b>1</b>	<b>3</b>	<b>12</b>	<b>10</b>	<b>23</b>	<b>49</b>	<b>1</b>		

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
1.1-5.1	81	1	15	2	0	0	1 339

**SU 40 SE 358 4633 0163 Badminton Common, Fawley Block D**

Surface level +17.3 m Overburden 0.3 m  
 Water not struck Mineral 2.6 m  
 October 1980 Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Sandy gravel, flint-rich	2.6	2.9
Barton Sand	Sand, fine-grained quartz, dark yellowish orange (10 YR 6/6)	1.1+	4.0

**GRADING\***

Mean for deposit percentages			Depth below surface (m)	Percentages								
Fines	Sand	Gravel		Fines			Sand			Gravel		
				- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
6	54	40	0.3-2.9	6	18	18	18	20	20	0		

\* Estimated from field description

SU 40 SE 359 4633 0046 Stanswood Farm, Fawley Block D

Surface level +15.9 m Overburden 0.5 m  
 Water struck at +13.4 m Mineral 7.3 m  
 November 1980 Bedrock 0.6 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Plateau Gravel	Gravel Gravel: fine and coarse, angular to subangular flint with quartz Sand: medium and coarse with fine, quartz with flint	7.3	7.8
Headon Beds	Clay, silty, dark greenish grey (5 G 4/1)	0.6+	8.4

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
			-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
1	45	54	0.5-2.8	1	2	18	15	31	33	0
			2.8-4.7	0	4	28	15	28	25	0
			4.7-6.8	3	3	30	21	24	19	0
			6.8-7.8	3	4	22	17	29	25	0
			<b>Mean</b>	<b>1</b>	<b>3</b>	<b>25</b>	<b>17</b>	<b>28</b>	<b>26</b>	<b>0</b>

**COMPOSITION**

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.5-7.8	90	2	6	1	0	0	1	250

SU 40 SE 360 4733 0113 Eaglehurst, Fawley Block D

Surface level +14.4 m Overburden 0.6 m  
 Water not struck Mineral 2.8 m  
 November 1980 Bedrock 1.1 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel Gravel: coarse and fine, mainly flint Sand: coarse and medium, flint with quartz	2.8	3.4
Headon Beds	Clay, sandy, weathered, light grey (N7)	1.1+	4.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
			-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
1	29	70	0.6-2.7	1	2	15	16	34	32	0
			2.7-3.4	1	1	6	10	36	46	0
			<b>Mean</b>	<b>1</b>	<b>2</b>	<b>13</b>	<b>14</b>	<b>34</b>	<b>36</b>	<b>0</b>

SZ 49 NW 2 4082 9970 Clobb Farm, Beaulieu Block C

Surface level +21.8 m Overburden 0.9 m  
 Water struck at +19.0 m Mineral 4.2 m  
 November 1980 Bedrock 1.4 m+

**LOG**

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, pebbly, sandy	0.6	0.9
	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with fine, quartz with flint	4.2	5.1
Headon Beds	Clay, greenish grey (5 G 6/1)	1.4+	6.5

**GRADING**

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines			Gravel			
			-1/16	+1/16 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
4	45	51	0.9-2.8	8	8	25	13	30	1	16
			2.8-5.1	1	3	23	19	37	17	0
			<b>Mean</b>	<b>4</b>	<b>5</b>	<b>24</b>	<b>16</b>	<b>34</b>	<b>17</b>	<b>0</b>

SZ 49 NW 3 4074 9783 St. Leonard's Farm, Beaulieu

Block C

Surface level +3.7 m  
Water struck at +2.7 m  
November 1980

Overburden 0.2 m  
Mineral 2.4 m  
Waste 1.7 m  
Mineral 0.7 m  
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Plateau Gravel	a 'Clayey' gravel Gravel: fine and coarse, mainly flint Sand: medium, coarse and fine, quartz with flint	2.4	2.6
Alluvium	Clay, stiff, medium bluish grey (5 B 6/1)	0.3	2.9
Peat	Peat	0.3	2.9
Alluvium	Silt, grey	1.1	4.3
Plateau Gravel	b Gravel Gravel: fine and coarse, mainly flint Sand: coarse, medium and fine, quartz with flint	0.7	5.0
Headon Beds	Clay, weathered, medium bluish grey (5 B 5/1)	1.0+	6.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	Percentages						
	Fines	Sand	Gravel		Percentages						
					- $\frac{1}{2}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
a	11	41	48	0.2-1.5	11	10	15	15	30	19	0
				1.5-2.6	11	12	17	12	34	14	0
				Mean	11	11	16	14	32	16	0
b	4	27	69	4.3-5.0	4	6	9	12	47	22	0
a + b	9	38	53	Mean	9	10	14	14	35	18	0

SZ 49 NW 4 4263 9929 Aldermoor, Exbury and Lepe

Block D

Surface level +14.4 m  
Water struck at +5.9 m  
November 1980

Overburden 0.6 m  
Mineral 2.7 m  
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Plateau Gravel	Gravel Gravel: fine and coarse, angular to subangular flint with quartz and some rounded to well-rounded flint Sand: medium and coarse quartz with flint	2.7	3.3
Headon Beds	Clay, firm, plastic, light olive grey (5 Y 6/1)	0.7+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{2}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	37	61	0.6-2.3	2	2	19	16	35	26	0
			2.3-3.3	2	2	19	17	32	28	0
			Mean	2	2	19	16	34	27	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction						
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others
0.6-3.3	86	4	7	2	0	0	1 378

SZ 49 NW 5 4365 9973 The Green, Exbury and Lepe

Block D

Surface level +16.0 m  
Water struck at +13.9 m  
November 1980

Overburden 0.8 m  
Mineral 2.8 m  
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.8	0.8
Plateau Gravel	Gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse, quartz with flint	2.8	3.6
Headon Beds	Clay, greyish green (10 G 4/2)	0.9+	4.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{2}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	40	58	0.8-2.8	3	3	28	10	28	28	0
			2.8-3.6	1	2	19	14	35	29	0
			Mean	2	3	26	11	30	28	0

SZ 49 NW 6 4390 9879 Inchmery House, Exbury and Lepe Block D  
 Surface level +9.6 m Waste 0.6 m  
 Water not struck Bedrock 0.9 m+  
 November 1980

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Headon Beds	Clay, firm, weathered at the top, olive grey (5 Y 4/1)	0.9+	1.5

SZ 49 NW 7 4460 9930 Pophams Wood, Exbury and Lepe Block D  
 Surface level +12.5 m Overburden 0.4 m  
 Water struck at +10.7 m Mineral 5.3 m  
 November 1980 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Plateau Gravel	Gravel Gravel: fine and coarse, angular to subangular flint with quartz Sand: medium and coarse with fine, quartz with flint	5.3	5.7
Headon Beds	Clay, stiff, dark greenish grey (5 G 4/1)	0.8+	6.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
2	36	62	0.4-2.4	4	6	20	11	35	24	0
			2.4-5.7	1	4	20	11	34	30	0
			Mean	2	5	20	11	34	28	0

COMPOSITION

Depth below surface (m)	Percentages by number in 4 to 16 mm fraction							
	Angular to sub-angular flint	Rounded to well rounded flint	Quartz	Sandstone	Ironstone	Chert	Others	
0.4-5.7	90	2	6	2	0	0	0	330

SZ 49 NE 7 4609 9981 Stanswood Copse, Fawley Block D  
 Surface level +11.5 m Overburden 1.5 m  
 Water not struck Mineral 1.6 m  
 November 1980 Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Plateau Gravel	Clay, with flint pebbles, moderate yellowish brown (10 YR 5/4)  'Clayey' gravel Gravel: fine and coarse, mainly flint Sand: medium and coarse with some fine, quartz with flint	1.2  1.6	1.5  3.1
Headon Beds	Clay, shelly, stiff, dark greenish grey (5 G 4/1)	0.9+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
10	37	53	1.5-3.1	10	3	18	16	37	16	0

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

### Reports of the Institute of Geological Sciences

#### *Assessment of British Sand and Gravel Resources*

1 The sand and gravel resources of the country south-east of Norwich, Norfolk: Resource sheet TG 20.  
E. F. P. Nickless.

Report 71/20 ISBN 0 11 880216 X £1.15

2 The sand and gravel resources of the country around Witham, Essex: Resource sheet TL 81. H. J. E. Haggard.  
Report 72/6 ISBN 0 11 880588 6 £1.20

3 The sand and gravel resources of the country south and west of Woodbridge, Suffolk: Resource sheet TM 24.  
R. Allender and S. E. Hollyer.

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E. F. P. Nickless.

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#### Mineral Assessment Reports

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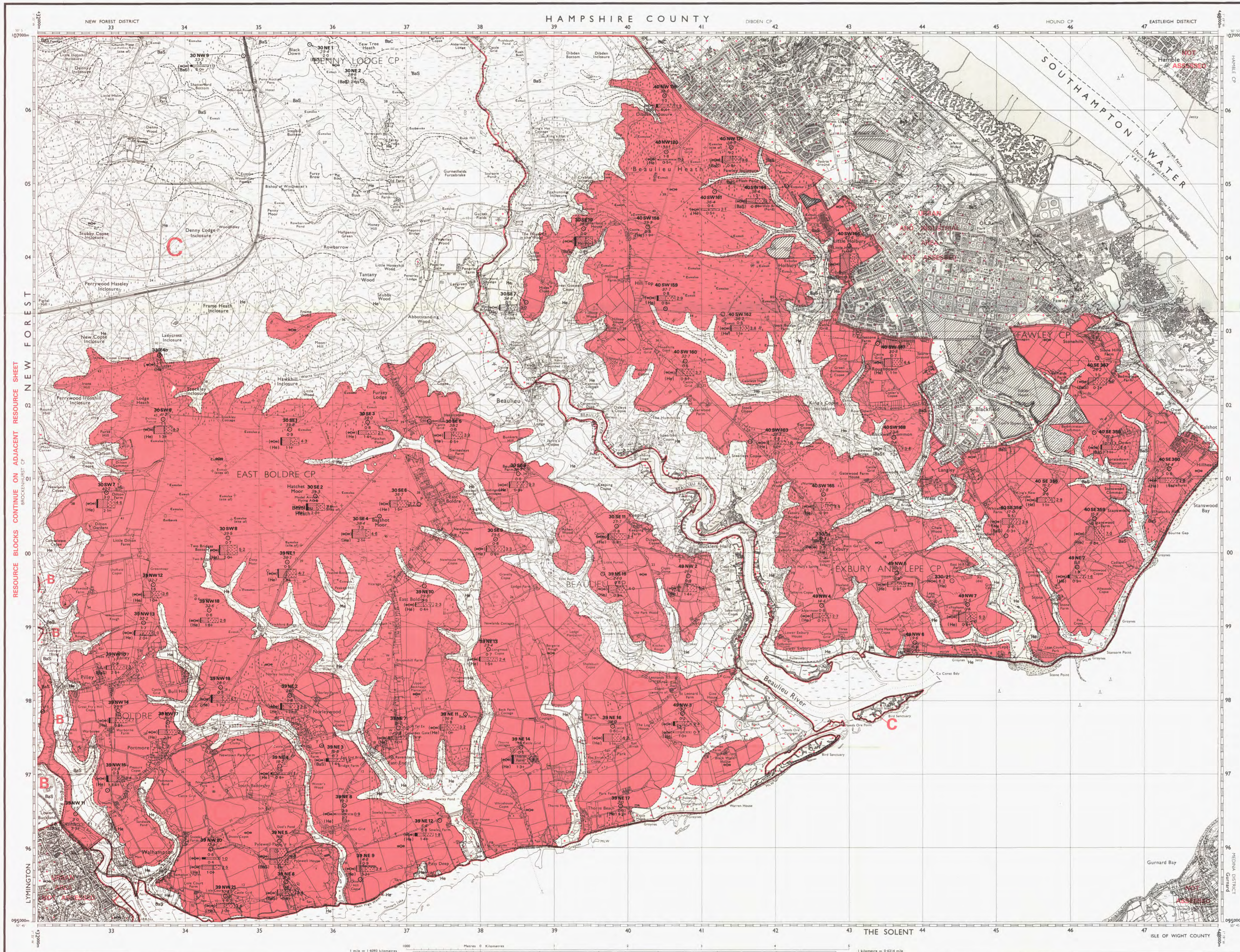
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THE SAND AND GRAVEL RESOURCES OF THE AREA AROUND LYMINGTON AND BEAULIEU, HAMPSHIRE - EASTERN SHEET

122 (EAST)

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

PARTS OF SHEETS SU30,40 & SZ39,49

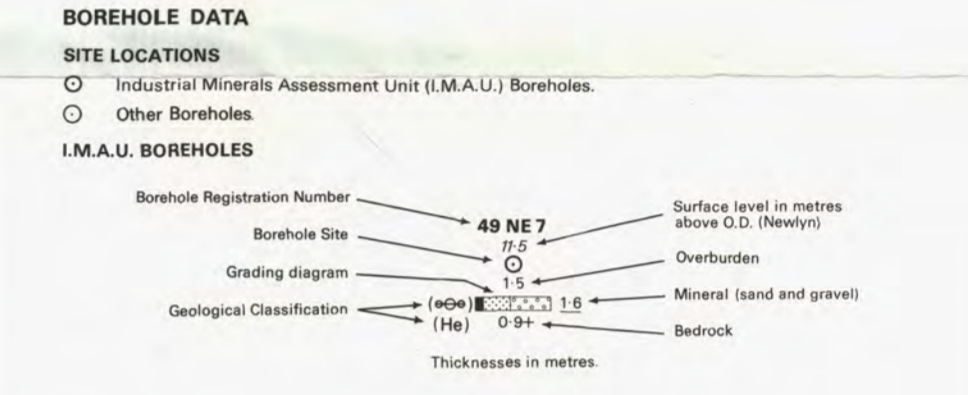


EXPLANATION OF SYMBOLS AND ABBREVIATIONS

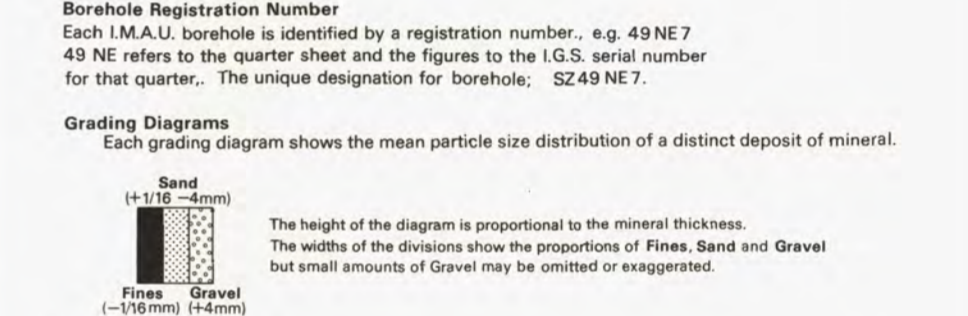
- DRIFT**
- Storm Beach Deposits - coarse gravel and cobbles. ST-3
  - Alluvium - silts and clays. A-35
  - Peat - dark brown partially decomposed organic matter. P-4
  - Brickearth - brown sandy silts. B-15
  - River Terrace Deposits (undifferentiated) - flint gravels. RT-30
  - Plateau Gravel - flint gravels. PL-6

- SOLID**
- Headon Beds - fossiliferous bluish grey clays with thin sand partings.
  - Barton Sand - pale yellow, fine quartz sands.
  - Barton Clay - dark greyish green silty clays.
- Worked-out areas of sand and gravel** W0-9

- BOUNDARY LINES**
- Geological boundary, Drift
  - Geological boundary, Solid (broken line denotes uncertainty)
  - Inferred boundary between recognised categories of deposits
  - Resource Block boundary



- Note:**
- Figures underlined denote thicknesses used in assessment of resources.
  - The + sign indicates that the base of the deposit was not reached.
  - The geological classification is given only for sand and gravel and bedrock.



**OTHER BOREHOLES**

The layout of information is the same as for I.M.A.U. boreholes although data available may not be as comprehensive. Some Hydrogeological Department records are registered according to the One-Inch Geological Sheet on which they occur, for example 330/21 signifies Hydrogeological Department borehole 21 on sheet 330.

- CATEGORIES OF DEPOSITS**
- Exposed mineral (assessed). CAT-E2
  - Continuous or almost continuous spreads of mineral beneath overburden (assessed). CAT-C1
  - 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 is divided into Resource Blocks (see Report). Each is designated by a letter.

Detailed records may be consulted on application to the Head, Industrial Minerals Assessment Unit, Institute of Geological Sciences, Keyworth, Nottingham NG12 5GG.

The representation on this map of a Road, Track or footpath, is no evidence of the existence of a right of way.  
Geological lines from a survey at the scale of six inches to one mile by C. Reid and W. Whitaker 1893-9.  
So Archibald Gairns F.R.S. Director General.  
Sand and gravel survey by S.J. Mathew, K.A. McLAdam, D. Thomas and J.B.L. Wild in 1980.

125 000 Sand and Gravel Resource sheet published in 1982.  
R.G. Thurnell, Head, Industrial Minerals Assessment Unit.  
G.M. Brown, D.Sc., F.R.S., Director, Institute of Geological Sciences.

Surface heights are to the nearest metre above Mean Sea Level.  
Contour values are in metres.  
Compiled from 1:10 560 or 1:10 000 scale maps last revised 1974-77.  
Boundaries revised 1975-77.  
Major roads revised 1975-77.

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

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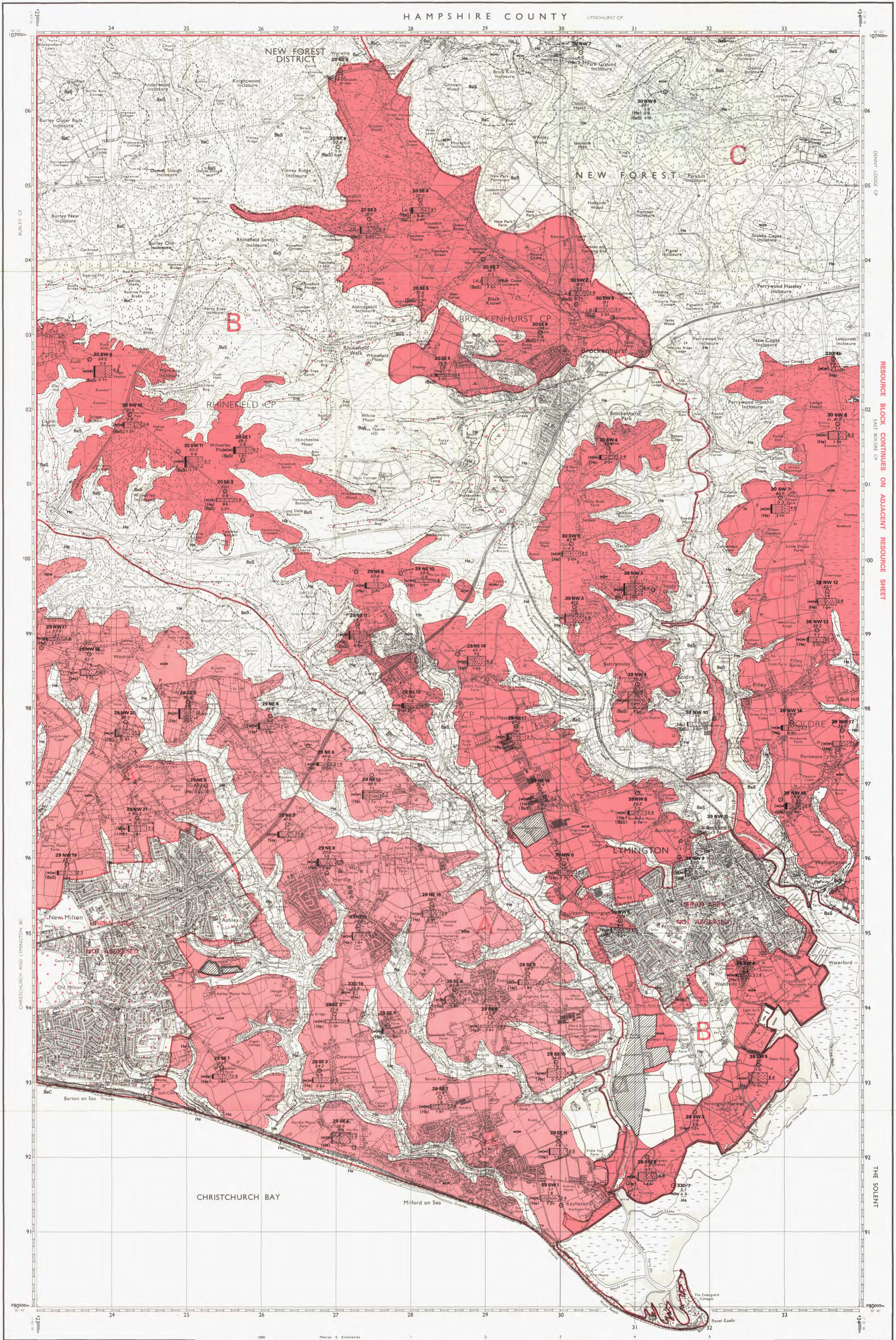
3200	3200	3240
330	330	324
329	339	328
328	328	328

Diagram showing the relationship of the resource sheets with the National 25 000 sheets and the New One Inch Geological Sheets 34, 35, 329 and 330. (in map)

THE SAND AND GRAVEL RESOURCES OF THE AREA AROUND LYMINGTON AND BEAULIEU, HAMPSHIRE - WESTERN SHEET

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

PARTS OF SHEETS SU 20, 30 & SZ 29, 39



RESOURCE BLOCK CONTINUES ON ADJACENT RESOURCE SHEET

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

Surface heights are to the nearest metre above Mean Sea Level

Contours values are in metres

Compiled from 1:10 560 or 1:10 000 Scale maps last revised 1974-76.  
Boundaries revised 1975-77.  
Major roads revised 1975-77.

FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS SEE EASTERN SHEET

Data quoted for an individual Resource Block 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.