

The sand and gravel resources of the country around Whittlesey, Cambridgeshire

Description of 1:25 000 sheets TF 20 and TL 29

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The first twelve reports on the assessment of British sand and gravel resources appeared in the Report Series of the Institute of Geological Sciences as a subseries. Report No. 13 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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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 cooperation of the Sand and Gravel Association of Great Britain.

This report describes the resources of sand and gravel of 200.0 km² of country around Whittlesey, Cambridgeshire, shown on the accompanying 1:25 000 resource map TF 20 and TL 29. The survey was conducted during 1976-1978 by S. J. Booth who supervised the drilling and sampling programme, assisted by J. L. Knight. J. B. L. Wild assisted in compiling the report.

The work is based on six-inch scale geological surveys carried out by members of the Institute's Field Staff. The area contained within grid-lines Eastings 20-22 and Northings 94-05, which includes part of Peterborough New Town, was surveyed in 1968 and published in map form (at a scale of 1:25 000) in 1972 with an accompanying geological description in 1974. A six-inch scale reconnaissance survey of the remaining areas was specifically commissioned by the Department of the Environment and completed in 1976 by J. M. Ridgway. Additional localised mapping on the six-inch scale was undertaken in 1977-78 by R. J. Wyatt who also provided a contribution which formed the basis of the Geology section.

Officers of the Property Services Agency based at Newmarket were responsible on behalf of the Institute for negotiating access to land for drilling. The ready co-operation of landowners, tenants and gravel companies in this work and the assistance of officials of the Anglian Water Authority, East Midlands Electricity Board, East Midlands Gas Council, Peterborough Development Corporation and the Cambridgeshire and Lincolnshire County Councils are gratefully acknowledged.

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CONTENTS

Summary 1

Introduction 1

Description of the resource sheet area 2

General 2

Topography 2

Geology 3

Composition of the sand and gravel deposits 9

The Map 9

Results 11

Worked-out ground (sand and gravel): details 12

Notes on the resource blocks 12

Conclusions 40

List of active sand and gravel pits 40

References 40

Appendix A: Field and laboratory procedures 42

Appendix B: Statistical procedure 43

Appendix C: Classification and description of sand and gravel 44

Appendix D: Explanation of the borehole records 46

Appendix E: Industrial Minerals Assessment Unit borehole records 48

FIGURES

1 Locality map 2

2 Relief and drainage of the Upland and Fenland 3

3 Drift deposits in the resource sheet area 6

4 Sections across the resource sheet area 7

5a Mean composition by weight of gravel (+4-64 mm fraction) in sub-blocks D₁ to H₁ (sample density at the indicated level) 10

5b Mean composition by weight of gravel (+4-64 mm fraction) in sub-blocks A₁ to G₁ (sample density at the inferred level) 11

6 Mean composition by weight of gravel (+4-64 mm fraction) in some IMAU boreholes (where compositional data are available) 13

7a Mean particle size distribution for the mineral in sub-blocks D₁ to H₁ (sample density at the indicated level) 14

7b Mean particle size distribution for the mineral in sub-blocks A₁, E₂ and G₁ (sample density at the inferred level) 15

8 Mean grading characteristics of the sand and gravel 16

9 Worked ground 17

10 Location of resource blocks and sub-blocks 19

11 Grading characteristics of the resources within sub-block A₁ 21

12 Grading characteristics of the resources within sub-block D₁ 23

13 Grading characteristics of the resources within sub-block D₂ 25

14 Grading characteristics of the resources within sub-block D₃ 27

15 Grading characteristics of the resources within sub-block E₁ 29

16 Grading characteristics of the resources within sub-block E₂ 31

17 Grading characteristics of the resources within sub-block F₁ 33

18 Grading characteristics of the resources within sub-block F₂ 35

19 Grading characteristics of the resources within sub-block G₁ 36

20 Grading characteristics of the resources within sub-block H₁ 39

MAP

The sand and gravel resources of the country around Whittlesey, Cambridgeshire **in pocket**

TABLES

- 1 Geological succession proved at the surface and in IMAU boreholes 4
- 2 Summary of results: the sand and gravel resources of the area assessed 12
- 3 Areas and estimated volumes of worked-out sand and gravel in the resource sheet area (shown to June 1978) 12
- 4 The relationship of the block letters to the classification of the Drift deposits 17
- 5 Sub-block A₁: data from IMAU boreholes 20
- 6 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block A₁ 20
- 7 Sub-block D₁: data from IMAU boreholes 22
- 8 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block D₁ 22
- 9 Sub-block D₂: data from IMAU boreholes 24
- 10 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block D₂ 24
- 11 Sub-block D₃: data from IMAU boreholes 26
- 12 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block D₃ 26
- 13 Sub-block E₁: data from IMAU boreholes 28
- 14 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block E₁ 28
- 15 Sub-block E₂: data from IMAU boreholes 30
- 16 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block E₂ 30
- 17 Sub-block F₁: data from IMAU boreholes 32
- 18 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block F₁ 32
- 19 Sub-block F₂: data from IMAU boreholes 34
- 20 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block F₂ 34
- 21 Sub-block H₁: data from IMAU boreholes 38
- 22 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block H₁ 38

The sand and gravel resources of the country around Whittlesey, Cambridgeshire

Description of 1:25 000 sheets TF 20 and TL 29

S. J. BOOTH

SUMMARY

The geological maps of the Institute of Geological Sciences, pre-existing borehole information, and 186 boreholes drilled for the Industrial Minerals Assessment Unit form the basis of the assessment of the sand and gravel resources of the country around Whittlesey, Cambridgeshire.

All the deposits in the resource sheet area 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 accompanying 1:25 000 map is divided into nine main resource blocks. The geology of the deposits is described and the mineral-bearing areas within each block are distinguished by sub-blocks. The mean thicknesses of overburden and mineral and the mean gradings, together with detailed borehole data, are also given. The geological lines and symbols, the positions of all non-confidential boreholes used in the assessment (and grading information for most IMAU boreholes) and the outlines of the resource blocks and sub-blocks are shown on the accompanying Map.

The principal mineral resources are First Terrace fluvial gravels (up to 8.2 m thick) and their marine/estuarine facies; boreholes indicate that the latter is more extensive than hitherto known. The thickness of the overburden in the central part of the resource sheet area increases towards the east and south and in the northern part towards the north-east.

The survey supports a twofold altimetric subdivision of the 'Fen Gravel' and indicates that those gravels which are equated with the Nene Second Terrace represent a continuation westwards of the March Gravels.

The drilling occasionally encountered a 'leaf' of the Lower Peat and indicated an eastwards extension of the Tinwell-Marholm Fault.

Notes

Each borehole registered with the Institute is identified by a four-element code (e.g. TF 20 SE 27). The first two elements define the 10-km square (of the National Grid) in which the borehole is situated; the third element defines a quadrant of that square, and the fourth is the accession number of the borehole. In the text of the report the borehole is normally referred to by the last three elements alone (e.g. 20 SE 27).

All National Grid references in this publication lie within the 100-km square TF or TL unless otherwise stated. Grid references are given to eight figures, accurate to within 10 m for borehole locations (in the text, four- and six-figure grid references are used for more extensive locations, for example for farms).

Bibliographical reference

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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).

In this report the assessment is in most cases calculated at the indicated level of assurance. However, in those areas where the available information is insufficient the assessment is conducted at the inferred level (see Appendix B, para. 12). In the former "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."

At the inferred level "quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition, of which there is geologic evidence: this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence" (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 the No. 240-mesh B.S. sieve, about 1/16 mm) should not exceed 40 per cent.
- d The deposit should lie within 25 m of the surface, this being taken as the likely maximum working depth under most circumstances. It follows from the second criterion that boreholes are drilled no deeper than 18 m if no sand and gravel has been proved.

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.

Pre-Pleistocene rocks, which are usually consolidated and devoid of potentially workable sand and gravel, are

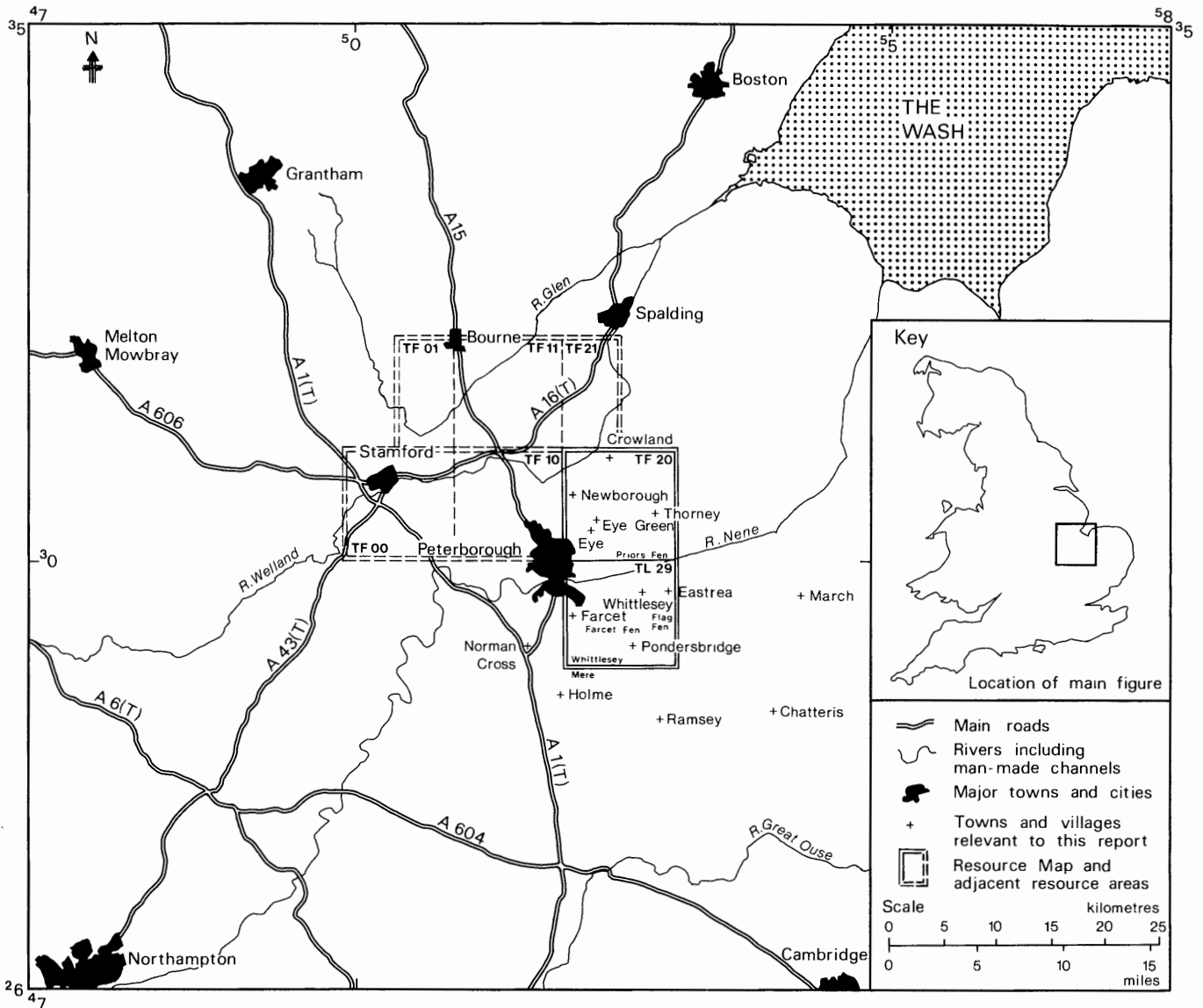


Figure 1 Locality map.

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 1/16 mm, 1/4 mm, 1 mm, 4 mm, 16 mm, etc., has been adopted. The boundaries between fines (that is, the clay and silt fractions) and sand, and between sand and gravel material, are placed at 1/16 mm and 4 mm respectively (see Appendix C).

The characteristics of the sand and gravel are assessed within resource blocks and, generally, deposits thought to be of the same formation (and of approximately the same age) throughout the assessed area are given the same block letter, whether they contain potentially workable sand and gravel or not: for example, block F embraces all First Terrace deposits (Table 4).

Those parts of a block containing mineral are designated as sub-blocks and are identified by a subscript figure, for example F₁.

Resource block O, the exception to this scheme, is an omnibus block which, in this resource sheet area, contains mainly Glacial Lake Deposits together with Glacial Sand and Gravel, Head deposits and Oxford Clay bedrock.

In the assessment of mineral no account is taken of factors such as roads, villages and land of high

agricultural or landscape value, which might stand in the way of sand and gravel exploitation, although towns are excluded. The estimated total volume of mineral, therefore, bears no simple relationship to the amount that could be extracted in practice.

It must be emphasised that the quantitative assessment applies to the mineral in a sub-block as a whole. Valid conclusions cannot be drawn about parts of the mineral area except in the immediate vicinity of the actual sample points.

DESCRIPTION OF THE RESOURCE SHEET AREA

GENERAL

Sheets TF 20 and TL 29 comprise 200 km² of country, most of which is low-lying Fenland situated around Whittlesey [TL 270 971] (Figure 1). Of this area, 104.0 km² contains potentially workable sand and gravel; other sand and gravel deposits within Greater Peterborough (see the Map) have not been assessed.

TOPOGRAPHY

The area is characteristically flat throughout but may be divided into two physiographical regions: the Upland (that is, in the sense of Seale, 1975) and the Fenland (see Figure 2). The Upland, which includes all of Greater Peterborough, is generally above 3 m (10 ft) OD and rises to a maximum of 21 m (50 ft) OD in the west. Moreover,

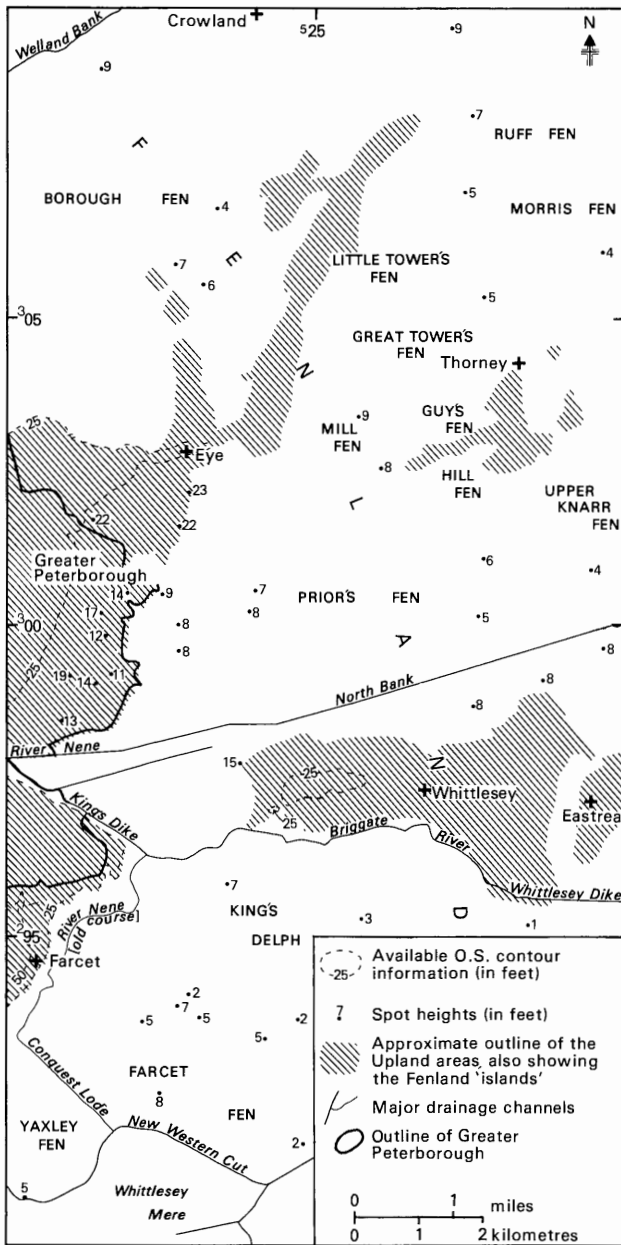


Figure 2 Relief and drainage of the Upland and Fenland.

gravel-capped 'highs', known locally as 'islands', occur, namely at Eye [TF 229 029], Crowland [TF 240 100], Thorney [TF 283 043], Whittlesey and Eastrea [TL 295 972]. The area is drained principally by the eastward-flowing River Nene which emerges onto the Fenland at Peterborough.

By contrast, the Fenland usually lies well below 3 m (10 ft) OD and in places is below sea-level (for example, borehole 20 SE 27 is at -0.4 m (-1.5 ft) OD). The extensive and characteristically dark soils are organically rich and hence the agricultural value of the land is high with intensive arable cropping of potatoes, sugar beet, other root crops and cereals.

There are relatively few natural drainage systems apart from the 'fossil' traces of old river systems (that is, roddons - see p. 8) which are more easily seen on aerial photographs. Since the Roman occupation, several drainage schemes have been implemented (Skertchly,

*There are insufficient OS topographical data to distinguish accurately the 'islands' on Figure 2 but spot heights are shown as a guide. An appreciation of the relative relief may be gained by comparing Figures 2 and 3 with the Map.

1877, pp. 5-7; Godwin, 1978, pp. 134-144), resulting in a rectilinear network of ditches, drains and counter-drains. The waters of the most important of these are pumped into the River Welland (the Welland Bank) in the north-west and into the River Nene (the North Bank channel and King's Dike - see Figure 2) east of Greater Peterborough.

GEOLOGY

Introduction and previous work

The resource sheet area was originally geologically surveyed on the one-inch scale by J. W. Judd, W. H. Holloway and S. B. J. Skertchly and published on the Old Series Sheet 64 in 1872 (Solid) and 1877 (Drift). The earliest geological observations (Mitchell, 1838) described the nature and origin of the Drift deposits. However, the most authoritative early account, concentrating on the Fenland, was that of Skertchly (1877).

The area between grid-lines Eastings 20-22 and Northings 94-05 was geologically surveyed in 1968 on the

six-inch scale by A. Horton, R. D. Lake and B. C. Coppack. This work, undertaken to investigate the Peterborough New Town area, was published in map form (at a scale of 1:25 000) in 1972 with a descriptive account of the geology (Horton and others, 1974).

The remainder of the ground included in the present assessment was mapped on the six-inch scale by J. M. Ridgway (at the reconnaissance level) during 1975-1976 under the supervision of A. Horton and continued (1977-78) by R. J. Wyatt.

The following account, while based mainly on the work of Horton and others (1974), has been updated to take account of the IMAU borehole data and more recent fieldwork undertaken by S. J. Booth and members of the Institute's East Anglia and South-Eastern England Field Unit, notably R. J. Wyatt. The deposits are listed (Table 1), and described in order of decreasing age.

Table 1 Geological succession proved at the surface and in IMAU boreholes.

	Thickness (m)
DRIFT	
Quaternary	
Recent and Pleistocene	
Flandrian Deposits	
Alluvium-freshwater deposits	2.1 to 5.8
Shell Marl-freshwater deposits	<0.5
Nordelph Peat (Upper Peat of some authors)	<5.3
Barroway Drove Beds (including an intermediate 'leaf' of the Lower Peat and silty deposits - estuarine and marine alluvium - infilling roddons+)	1.2 to 9.4
Lower Peat - proved only in boreholes	0.5 to 2.9
River Terrace Deposits	
First Terrace* (including a marine/estuarine facies)	1.0 to 8.2
Second Terrace* - mainly gravels	0.9 to 6.0
March Gravels* - marine/estuarine sandy gravels	0.9 to 8.0
Third Terrace - very clayey sandy gravels	<2.5
Head	<2
Boulder Clay	<7
Glacial Sand and Gravel	unknown
Glacial Lake Deposits	>7.5
SOLID	
Jurassic	
Upper Jurassic	
Corallian Beds	unknown
Oxford Clay	<33
Kellaways Beds (includes Kellaways Sand and Kellaways Clay)	4.5 to 5.8
Upper and Middle Jurassic	
Cornbrash	1.8 to 2.7

* Mapped as 'Fen Gravel' in some areas on the Peterborough 1:25 000 sheet (Horton and others, 1974).

† See footnote on p. 8.

Structure

The solid rocks cropping out in the resource sheet area consist of Cornbrash to Corallian strata of Middle to Upper Jurassic age. Non-IMAU boreholes have proved strata older than the Cornbrash but consideration of them is unnecessary for the purposes of this assessment.

The geological structure is relatively simple (Figure 4). The regional dip is uniformly to the east-south-east and does not exceed five degrees. The only important disturbance is the west-north-west-trending Tinwell-Marholm Fault, which has an estimated downthrow of 15 to 30 m to the north. Relative uplift of the strata on the south side of the fault has resulted in an eastward displacement of the Middle Jurassic outcrops. Subsequent erosion of the relatively less resistant Oxford Clay on the north side of the fault has produced an embayment of low ground now covered with Drift deposits.

An analysis of the microfauna of the Oxford Clay samples from the assessment boreholes (by B. E. Coleman and A. W. Medd of the Institute's Palaeontology Unit, London and Leeds, respectively) has demonstrated an east-west displacement of the zonal sequences, thus enabling the Tinwell-Marholm Fault to be extended from Peterborough eastwards through Eye Green [TF 230 038] to near Thorney. The small Corallian outcrop at Cat's Water Farm [TF 246 041] probably occupies a narrow downfaulted block associated with this major fault.

Stratigraphy

Solid

Cornbrash The Cornbrash consists mainly of indurated, bioclastic limestone which is blue-hearted and massive when unweathered but reddish brown and rubbly at outcrop. It usually produces flat, bench-like features, for example at Fengate [TL 202 988].

Kellaways Beds

The Kellaways Beds comprise dark grey clays (Kellaways Clay) overlain by silts or fine-grained sands (Kellaways Sand) which may be patchily cemented to form 'doggers'. These beds crop out south of the Tinwell-Marholm Fault within Greater Peterborough.

Oxford Clay The Oxford Clay comprises mainly bluish grey and greenish grey mudstone which weathers to a pale grey plastic clay and produces a heavy clay soil. The clay is completely decalcified at outcrop typically to a depth of about a metre. The mudstone consists mainly of the clay mineral illite with subsidiary kaolinite. Thin bands of sandy argillaceous limestone or layers of septaria are common. Weathering of the abundant pyrites and calcium carbonate gives rise to numerous selenite (calcium sulphate) crystals in the superficial brown oxidised layers of the clay.

Three major lithological divisions broadly coinciding with three faunal divisions may be recognised within the Oxford Clay, namely the Lower, Middle and Upper Oxford Clay. In the resource sheet area the Lower and Middle Oxford Clay crop out on both sides of the Tinwell-Marholm Fault near Peterborough. Oxford Clay (including the Upper Oxford Clay) also crops out around the 'islands' of higher ground such as those at Eye, Thorney and Whittlesey, and is present as an extensive subcrop beneath Pleistocene and Recent deposits throughout the Fenland.

The Oxford Clay contains abundant ammonites together with bivalves (notably *Gryphaea*), brachiopods, gastropods, belemnites and annelids and is renowned for its well-preserved specimens of marine reptiles, including plesiosaurs, ichthyosaurs and crocodiles (Horton and others, 1974, p. 50); fragments of invertebrate fossils (particularly *Gryphaea* and belemnites) are commonly found in the Glacial Sand and Gravel, the River Terrace Deposits and the marine/estuarine gravels.

The Oxford Clay is particularly important in this area for brick-making since its high carbonaceous content is sufficient to bring the bricks to their full firing temperature with the addition of little extra coal or other fuel - that is, the 'Fletton process' (Shingler, 1957);

hence, the clay is currently exploited in large pits west of Whittlesey (see Figure 9).

Corallian Beds These deposits, of unproved thickness, occur only at Cat's Water Farm where there is a poorly exposed outcrop of shelly, sandy and fine-grained limestone yielding a Corallian fauna (macrofossil determination by B. M. Cox of the Institute's Palaeontology Unit in London).

Drift

Pleistocene

The most widespread Pleistocene deposits in this area comprise river terrace sands and gravels and less extensive marine/estuarine gravels. Outcrops of glacial material occur only in the area south of Greater Peterborough.

Glacial Lake Deposits These are mainly silts and fine-grained sands at least 7.5 m thick (Horton and others, 1974, p. 51), often finely laminated and containing thin beds of unsorted, silty pebbly clay; they infill an elongate north-east to south-west-trending depression underlying the ridge between Stanground [TL 206 971] and Norman Cross [TL 160 908] (the latter just outside the resource sheet area).

These deposits probably formed in an ice-dammed lake occupying a pre-glacial valley which formerly drained into the Fenland area.

Glacial Sand and Gravel A small patch [TL 216 962] of sand and gravel of unknown thickness has been mapped near Park Farm. It consist mainly of flint with quartzite and Middle Jurassic limestones. Its stratigraphical relationship with the Glacial Lake Deposits and its proximity to the Boulder Clay suggest a glacial origin.

Boulder Clay (that is, the 'Chalky Boulder Clay' of Horton and others, 1974, p. 51 and the 'Chalky/Jurassic till' of Gallois, 1979, p. 32) Boulder Clay overlies the Glacial Lake Deposits and caps the north-east- to south-west-trending ridge extending from Farcet [TL 203 946] to Norman Cross. The clay is grey to greyish blue, up to 7 m thick in the resource sheet area and contains abundant chalk and flint fragments, together with subrounded Bunter-derived quartzite pebbles, far-travelled erratics (Sabine, 1949) and locally-derived rock debris; upon exposure the clay weathers greyish brown to dark brown.

In the north-east of the resource sheet area, up to 2.8 m of chalky pebbly clay, interpreted as Boulder Clay, was proved beneath River Terrace Deposits and Flandrian deposits (IMAU boreholes 20 NE 10, 20 NE 11, 20 NE 15, 20 NE 20 and 20 NE 21). Boulder Clay flooring other parts of the adjacent Fenland has been reported by Prentice (1950), and confirmed by more recent IGS field work and borehole evidence between Spalding [TF 243 228] and March [TL 417 968], both outside the resource sheet area.

Head Three localised deposits of Head up to 2 m thick occur at [TL 207 951, TF 207 017 and TF 209 032]. Because these deposits have accumulated through soil creep or solifluction, their composition varies widely dependent on the local parent rock. In this area Head includes loams, stony clays and unsorted rock debris.

Third Terrace Third Terrace deposits up to 2.5 m thick underlie the northern part of Greater Peterborough and the adjacent area to the north. They comprise sandy clay and gravel, the latter often very clayey. They are extensively cryoturbated and admixed with the top of the underlying solid formations. The terrace surface falls gently north-eastwards.

'Fen Gravel' In an area encompassing parts of Lincolnshire, Northamptonshire, Huntingdonshire,

Cambridgeshire, Suffolk and Norfolk, Skertchly (1877) described three types of exposed sand and gravel deposits collectively as 'fen gravels'. More specifically, Horton and others (1974, p. 57) applied this term to an 'extensive flat' north-west of Werrington (that is, north-east of Peterborough). Skertchly (1877, p. 183) - by inference - and Horton and others (1974, p. 58), also applied the term to gravels beneath later 'fen deposits' (that is, Flandrian deposits) of the Fenland.

These gravels, all originally thought to be marine (Seeley, 1866, p. 480; Skertchly, 1877, p. 183) because of the occurrence of sporadic non-fluviatile shell fragments, were compared by Skertchly (1877, p. 192) and correlated with (for example, Marr and King, 1928, p. 210) the March Gravels on the basis of a similarity of the molluscan faunas. The presence of '... a curious intermixture of freshwater and marine shells ...' (Skertchly, 1877, p. 183), notably south of Crowland, Eye, Peterborough and Whittlesey (Skertchly, 1877, p. 183), Eye (Marr and King, 1928, p. 211) and at March, Eye and Whittlesey (Baden-Powell, 1934, pp. 209-210) is taken in this account to suggest that the shelly gravels are marine/estuarine in origin rather than exclusively marine (see also Castleden, 1980, p. 38)

Furthermore, the present survey confirms the two-fold subdivision of the 'Fen-margin gravels' proposed by Prentice (1950, p. 136) by demonstrating that they may be differentiated altimetrically into two divisions. In addition, the survey has shown that each division has both a fluvialite and a marine/estuarine facies, viz.

Relative altimetric level	West	East
Low	Nene First Terrace (alluvial river gravels)	Marine/estuarine gravels (e.g. at Crowland)
High	Nene Second Terrace (alluvial river gravels)	March Gravels (marine/estuarine gravels)

March Gravels (marine/estuarine gravels) The marine/estuarine facies of the higher suite of gravels forms a capping to the 'islands' of Whittlesey, Eastrea, Eye and Thorney. In these gravels a molluscan fauna similar to that of the March Gravels has been recorded (Baden-Powell, 1934, pp. 194-195 and pp. 204-205; Skertchly, 1877, pp. 189-191), but many of the sites previously described are no longer exposed.

The present survey's borehole data indicate that the basal level of these marine/estuarine gravels ranges from +2 m OD east of Eastrea to +3 m OD west of Whittlesey, from whence the basal level appears to rise westwards into the base of the Second Terrace River Nene gravels at Peterborough - a conclusion arrived at independently by Castleden (1980, p. 38).

However, north of Eye, the base level of these marine/estuarine gravels falls locally (for example, -3.1 m OD in borehole 20 SE 153) where the lithology changes from coarsely bedded and poorly sorted ferruginous sand with gravel to fine, well-sorted sand. These basal sandy deposits, which probably represent local infilled scour channels, were examined in numerous ditch sections, for example, at [TF 226 050] and [TF 224 056], and found to contain abundant shells similar to the marine/estuarine shells described by earlier authors.

Along the Whittlesey outcrop these deposits have a recorded thickness of 3.0 to 3.5 m whereas near Eye they proved to be from 0.9 to 8.0 m thick, the maximum thicknesses occurring within localised scour-channels.

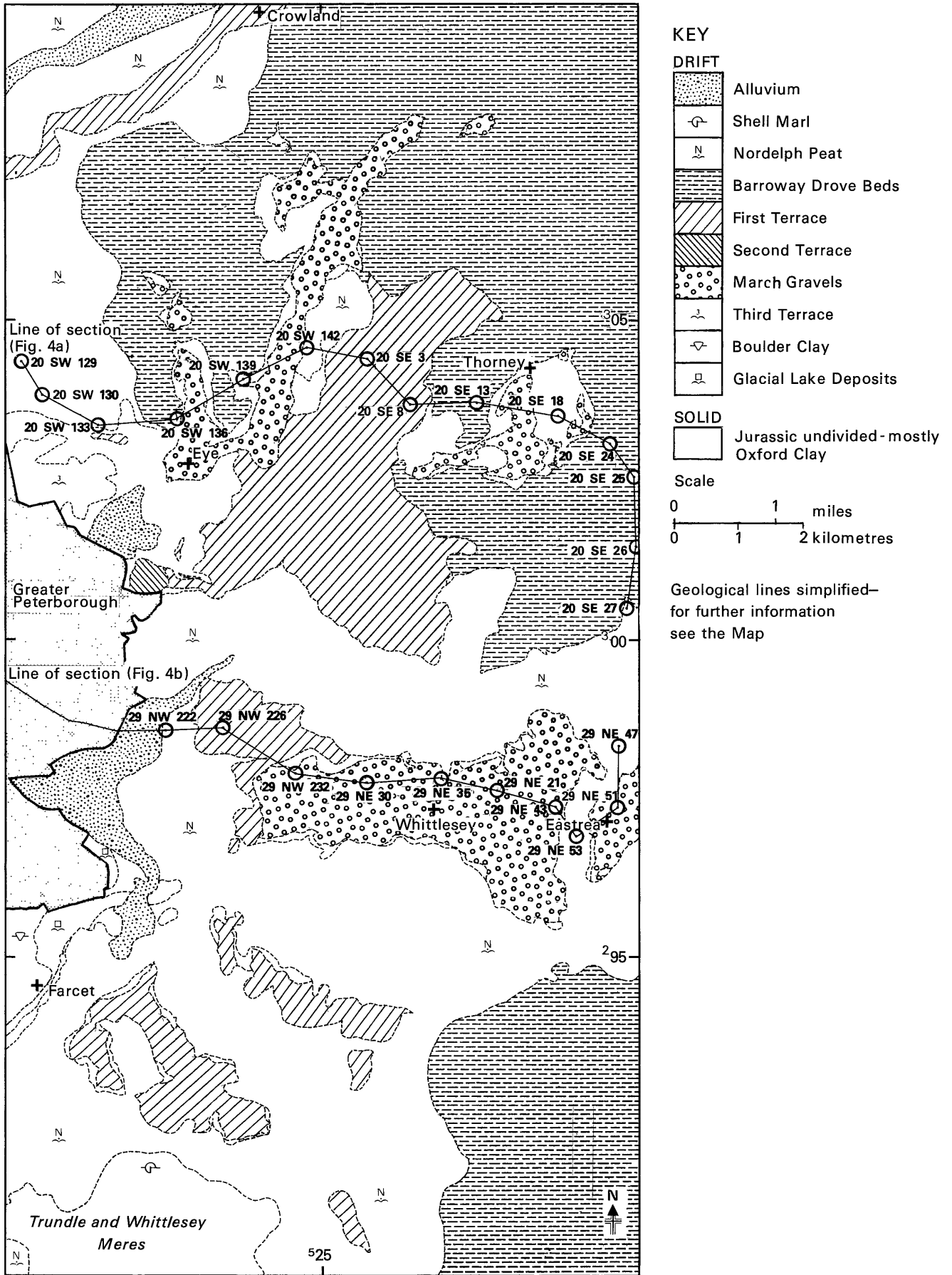
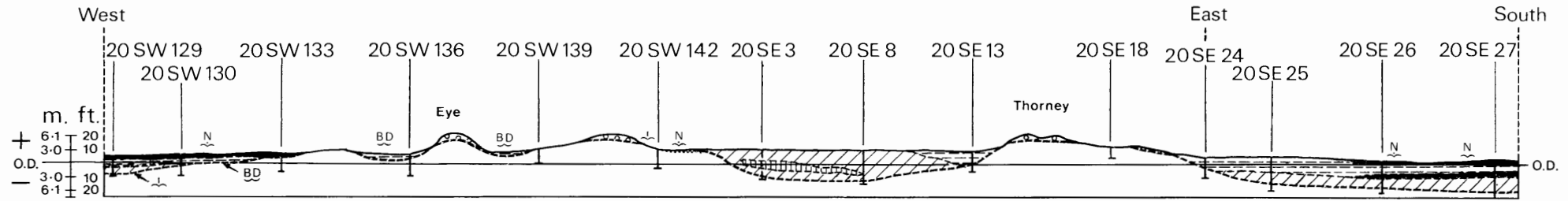
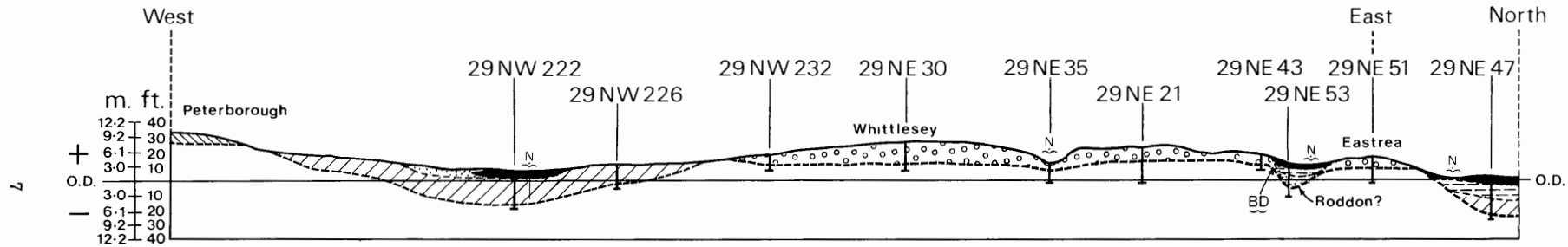


Figure 3 Drift deposits in the resource sheet area

A. Section through Eye and Thorney 'islands'

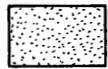


B. Section through Whittlesey and Eastrea 'islands'



Key

Drift



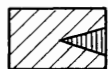
Alluvium



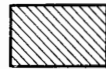
Nordelph Peat (N) and Lower Peat



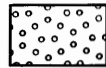
Barroway Drove Beds (BD)



First Terrace (1) with clay intercalation

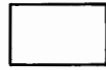


Second Terrace - fluvial deposits



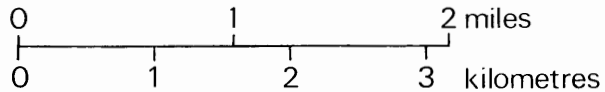
March Gravels - marine/estuarine deposits

Solid



Jurassic undivided - mostly Oxford Clay

Geological lines simplified - for further information see the Map



Vertical scale: 40 times the horizontal

Figure 4 Sections across the resource sheet area

The deposits are poorly bedded, often strongly stained by iron-oxide and have lenses and sporadic infilled scour-channels of cross-bedded sand.

The generally poor sorting, limited rounding and presence of well-preserved shells suggest rapid deposition of the gravels into a body of relatively quiet water.

Second Terrace The fluvial deposits of the higher suite of 'Fen Gravel' constitute the Nene Second Terrace. They occur in small patches (with a maximum recorded thickness of 6 m -Horton and others, 1974, p. 55) for example near Car Dyke [TL 205 995], at [TL 210 970] and at [TF 220 010].

The one IMAU borehole sited in this deposit proved gravel composed mainly of locally-derived shelly and oolitic limestone with flint and some ironstone, quartzite and sandstone.

First Terrace (river gravels with a marine/estuarine facies) The fluvial deposits representing the lower suite of 'Fen Gravel' with a basal level of 1.5 m OD or below correspond to the Nene First Terrace. They have a recorded thickness of 1.0 to 8.2 m and constitute the major mineral-bearing deposits in the area; they were derived principally from the outwash of the River Nene and are mostly overlain by Flandrian sediments.

Exposure of the First Terrace has substantially increased in an eastwards direction due to drainage schemes implemented since Roman times, notably post-1750; the resultant fall in the water-table has led to the drying out and wastage of the former peat cover (Darby, 1940; Fillenham, 1963; Fowler, 1933a; Godwin, 1978; Hutchinson, 1980; Richardson and Smith, 1977; Robinson, 1968).

Thickness variations suggest that these deposits were formed as coalescing fans of gravel deposited by the Rivers Nene and Welland as they debouched from their relatively narrow valleys within the Jurassic Upland onto the broad, low-lying Fenland. Former main channels of the River Nene can be traced either side of the Whittlesey 'island'.

The long 'tongue' of marine/estuarine gravel (the March Gravels - sub-block H₁) extending from Eye to The Engine [TF 259 079] may represent a watershed between the Rivers Nene and Welland during First Terrace times. To the north-west, First Terrace deposits are thin or absent except for a north-east to south-west-trending gravel-filled channel reaching as far as Crowland (sub-block F₂); these thin deposits may be the attenuated representatives of a large fan-like spread of gravel deposited into the Fenland by the River Welland (see also Prentice, 1950, p. 136).

For the most part, the absence of a marine fauna and the presence of the molluscs *Valvata piscinalis* (Müller) and *Pisidium henslowanum* (Sheppard) (identified by D. K. Graham of the Institute's Palaeontology Unit in Edinburgh) in organic clay lenses in First Terrace deposits in an adjacent area (at Maxey [TF 125 078]) indicate a freshwater environment.

However, the presence in IMAU boreholes [20 NE 25, 20 NE 26, 20 NE 29, 20 SE 28, 29 NE 36 and 29 NE 50] and in several ditch sections [for example at TF 269 081] near Crowland of fragmentary shells seems to confirm a marine/estuarine environment of deposition as suggested by Skertchly (1877, p. 202) who recorded *Macoma* (formerly *Tellina*) *balthica* and *Turritella communis*.

The grading and compositional characteristics of these shelly gravels are similar to those of the First Terrace deposits cropping out farther west in the resource sheet area, and the two deposits are laterally continuous; thus they are considered to be penecontemporaneous, although additional data are required to establish this relationship unequivocally. Because of insufficient evidence, no attempts have been made either to determine the boundary between the marine/estuarine facies and the river deposits on the

Map and in Figure 3, or to distinguish between them in cross-sections or in the borehole logs.

Over much of their outcrop the First Terrace gravels are overlain by a relatively thin (recorded thicknesses from 0.4 to 2.0 m) spread of loamy sands or silts which contain scattered pebbles; these uppermost deposits, which for mapping purposes are considered to be an integral part of the First Terrace, are interpreted either as the final stages of First Terrace aggradation - an older alluvium (pers. comm. A. Horton and R. J. Wyatt) or as a soil resulting from weathering of the terrace (pers. comm. A. J. Dixon).

Beneath the Flandrian deposits of the Fenland the gravels are overlain by a thin heterogeneous deposit of silty, sandy clays and clayey sand containing scattered pebbles. This deposit, called here the Crowland Bed, (to be described by R. J. Wyatt elsewhere) appears to correspond stratigraphically to the 'older alluvium' noted above, but its origin remains uncertain. No distinction is made between the Crowland Bed and First Terrace gravels in the borehole logs.

Recent

These deposits include the peats, silts and clays of the Fenland basin which collectively represent the Flandrian stage (Godwin and Clifford, 1938-1940; Willis, 1961).

Lower Peat The Lower Peat, less extensively distributed than the later Fenland deposits, was proved in boreholes (for example 20 NE 20, 20 NE 28, 20 NE 29, 29 SE 1 and 29 SE 3) and in some of the deeper drains. In much of the area it is less than 0.5 m thick and is often impersistent, but it tends to become thicker and more continuous towards the south-east where a maximum thickness of 2.9 m was recorded (confidential borehole record).

The Lower Peat sensu stricto overlies River Terrace Deposits whereas peat layers occasionally encountered in the Barroway Drove Beds (for example in boreholes 29 NE 36 and 29 SE 2) probably represent a 'leaf' of the Lower Peat (see Godwin and Clifford, 1938, p. 370, figure 27); these are classified in the borehole logs as ? Lower Peat.

Barroway Drove Beds (Gallois, 1979) The Barroway Drove Beds, which crop out extensively in the flat low-lying Fenland north-east of Peterborough and south-south-east of Whittlesey, consist of soft, wet, bluish grey clays and silts with occasional silt laminae, often containing carbonaceous root traces and scattered shell fragments. This deposit is the 'buttery clay' of earlier authors (for example, Skertchly, 1877, p. 173), so-called because of its thixotropic properties; within the assessed area a maximum thickness of 9.4 m was recorded in borehole 29 SE 12. These clays were probably deposited in a salt marsh dissected by numerous silt-filled tidal creeks.

The Barroway Drove Beds are traversed by many silt-filled channels (locally known as roddons*) which occur at various levels within the deposit; they are generally very sinuous and when exposed form dendritic patterns of silt ridges across the Fenland. Although they are sometimes difficult to trace on the ground they can often be more clearly distinguished on aerial photographs and in ditch sections.

Nordelph Peat (Gallois, 1979) The Nordelph Peat (or Upper Peat of some authors, for example Skertchly, 1877, p. 128) crops out in a broad belt north of Peterborough, and in the low-lying Fenland north and south of the Whittlesey 'island'; it usually overlaps the

*Rodham (Astbury, 1958); roddam (Skertchly, 1877); roddon (Fowler, 1933b, 1934); roddon (Godwin, 1938, 1978).

underlying Barroway Drove Beds onto either First Terrace deposits or bedrock.

Formerly, the peat extended farther westward but it has been lost from these areas by shrinkage and erosion since the mid-eighteenth century (p. 8).

Both the Lower Peat and the Nordelph Peat comprise mainly reed and sedge remains with older brushwood in places. Tree trunks (locally known as 'bog oaks' (Seale, 1975, p. 7) are commonly ploughed up from the present-day peat/soil layers. The peats produce the dark humic soils of the 'Black Fens' (Astbury, 1958). Original thicknesses are unknown; the present survey proved up to 3.9 m (borehole 29 NE 38) but elsewhere in the area up to 5.3 m has been recorded (borehole 29 NE 12).

Shell Marl The areas formerly occupied by the Whittlesey and Trundle meres were drained in the early 1850's (Skertchly, 1877, p. 54). The sites of the meres are covered by a layer, generally less than 0.5 m thick, of shell marl, a deposit formed largely from the calcareous remains of aquatic plants, notably Chara, and numerous fragments of freshwater snails, for example Pisidium, Sphaerium, Bithinia, Succinea and Limnaea (Godwin, 1978, pp. 91-101; Godwin and Vishnu-Mittre, 1975).

Alluvium Alluvium (proved up to 5.8 m thick) floors the valleys of the River Nene and its minor tributaries; it also occurs in the Crowland High Wash as a consequence of deposition from flood waters confined within the artificial banks.

The Alluvium comprises mottled greyish brown clay with plant debris and occasional pebbles, but there are discontinuous beds of organic silt, peat and lenses of sand and gravel.

In the area of Stanground North [TL 215 975], boreholes sited on the Alluvium have proved up to 1.4 m of silty clay overlying up to 4.4 m of peat, peaty clays and peaty silts resting on First Terrace gravels. The peaty beds probably represent the lateral pencontemporaneous passage of alluvial deposits onto the Nordelph Peat and Barroway Drove Beds.

The Alluvium north-east of Newark [TF 210 005] consists of up to 2 m of slightly stony clay, usually resting directly on Kellaways Beds or Oxford Clay.

COMPOSITION OF THE SAND AND GRAVEL DEPOSITS
Potentially workable sand and gravel is present in the River Terrace Deposits and in the marine/estuarine gravels. First Terrace deposits, including their contiguous marine/estuarine facies (see p. 8), occupy 89 per cent of the mineral area and represent the major resource. The March Gravels and the Second Terrace deposits occupy approximately 11 per cent and less than 0.2 per cent of the mineral area, respectively.

These different mineral deposits are broadly similar in composition (see Figures 5a, 5b, 6, 7a, 7b and 8 for summary information); thus in the following account the deposits are not differentiated unless otherwise stated.

The dominant components of the gravel fraction are flint and limestone. The mean variation for flint is from 30 per cent to 54 per cent whereas the limestone mean varies between 18 per cent and 53 per cent with an overall mean for the sub-blocks of flint 39 per cent and limestone 36 per cent.

Quartzite and ironstone occur next in frequency in approximately equal amounts (overall means of 12 per cent and 9 per cent, respectively). Within the sub-blocks quartzite ranges between 4 per cent and 26 per cent; exceptionally, it may represent up to 36 per cent of the deposit (for example borehole 29 NW 216). Similarly, ironstone ranges typically between 4 per cent and 12 per cent with a maximum of 18 per cent in borehole 29 NW 230. However, towards the north-east of the assessed area, ironstone becomes a relatively minor constituent.

Subsidiary components include sandstones, derived and indigenous fossil fragments and igneous rock erratics, sandstones being predominant. Of the minor constituents not distinguished separately, chalk is included with the limestone determinations since the frequency of chalk pebbles is low.

Flint is usually angular to subangular, generally white or brown, although black varieties also occur. Iron staining is common. No quantitative assessment was made of white flint (Roeder, 1977; Figg, 1977), which may be present in deleterious amounts. The more significant quantities of flint were derived from a former widespread Boulder Clay cover (Horton and others, 1974, p. 51), remnants of which cap the higher ground to the west.

The shelly and oolitic limestone pebbles were derived from Jurassic rocks outcropping extensively to the west and south of the resource sheet area. They are generally subangular to subrounded and often tabular. Some are veneered with re-precipitated iron.

The rounded to subrounded quartzitic and sandstone pebbles and cobbles (maximum recorded dimension 0.3 m) were probably derived from the Sherwood Sandstone Group (formerly the 'Bunter Pebble Beds' and 'Bunter Sandstones') of the Midlands. They were probably transported within the Boulder Clay during an ice advance before later fluvial reworking and subsequent deposition.

Ironstone is derived principally from the sideritic facies of the Northampton Sand (Taylor, 1949, pp. 1-2), which crops out on the higher ground in the upper reaches of the Nene valley and west of the resource sheet area. The pebbles are generally fine-grained, irregularly shaped, moderately rounded and vary in colour from black to dark red dependent on the iron:quartz ratio of the ironstone.

Material in trace amounts includes indigenous and derived fossil fragments. Within the River Terrace Deposits the fossils are mainly derived Oxfordian bivalves (for example Gryphaea) together with belemnites and often pyritised ammonites. Within the contiguous marine/estuarine gravels the fossils are principally indigenous and include bivalves and gastropods (p. 8).

The scarcity of chalk (previously noted) is highlighted by its comparative abundance in gravels both north (around Witham, Lincolnshire) and south (in Cambridgeshire) of the district (pers. comm., G. Power and A. J. Dixon, respectively). In these areas, the interfluvies were formed partly by chalk escarpments, whereas within the catchment areas of the Rivers Nene and Welland chalk bedrock is not exposed, the only potential local source being the Boulder Clay. However, any chalk derived from this source would probably disintegrate and be carried in solution by the time it reached the Fenland floodplain.

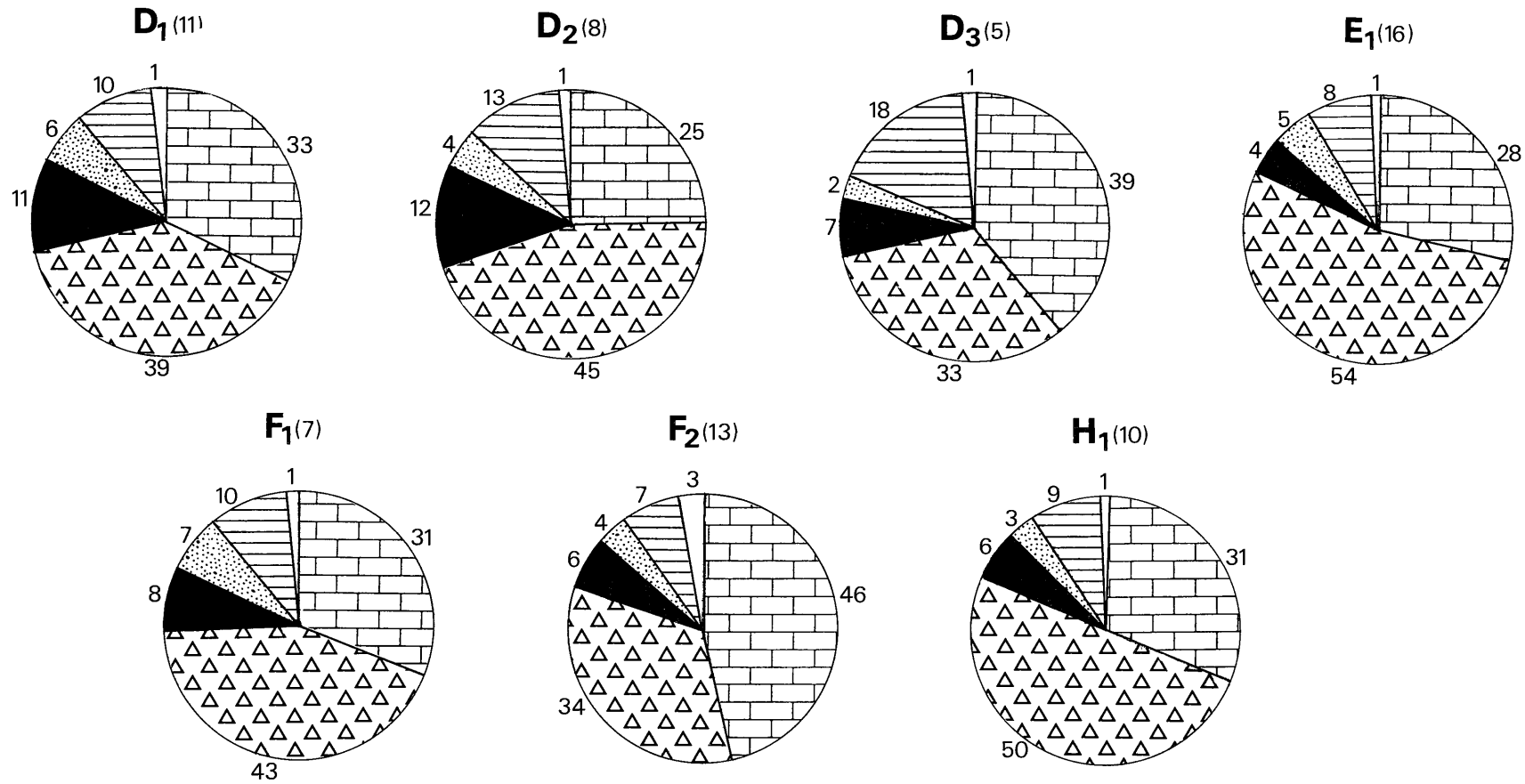
Dark, fine-grained igneous and metamorphic erratics (Sabine, 1949) also occur in trace amounts.

The mean grading data show little variation between deposits (see Figures 7a and 7b), each of which is poorly sorted. Locally, there are wide variations between boreholes in the same sub-block (for example in sub-block E₁, borehole 20 NE 20 has fines:sand:gravel ratios of 14:81:5, compared with borehole 20 SE 25 with ratios of 2:39:59). Similarly, in sub-block F₁, boreholes 20 SW 143 and 20 SE 15 (with ratios of 20:76:4 and 6:43:51, respectively) demonstrate comparable variations.

In most sub-blocks, the mineral is classified as sandy gravel with a fines content of less than 10 per cent. However, in sub-blocks D₃, F₂ and E₂ the mineral is graded as 'clayey' to 'very clayey' with an exceptional maximum fines content of 39 per cent in borehole 20 NE 9. Data from the March Gravels (sub-block H₁) show that the deposit is generally of 'clayey' sandy gravel.

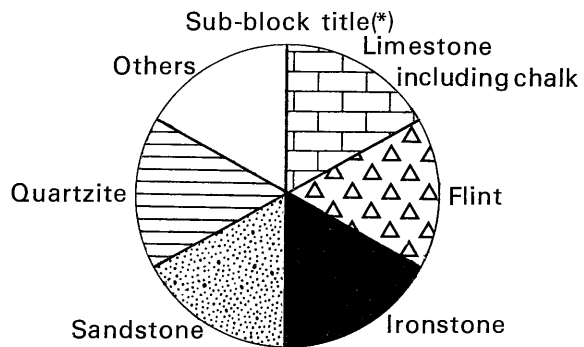
THE MAP

The sand and gravel resource map is folded into the



10

KEY

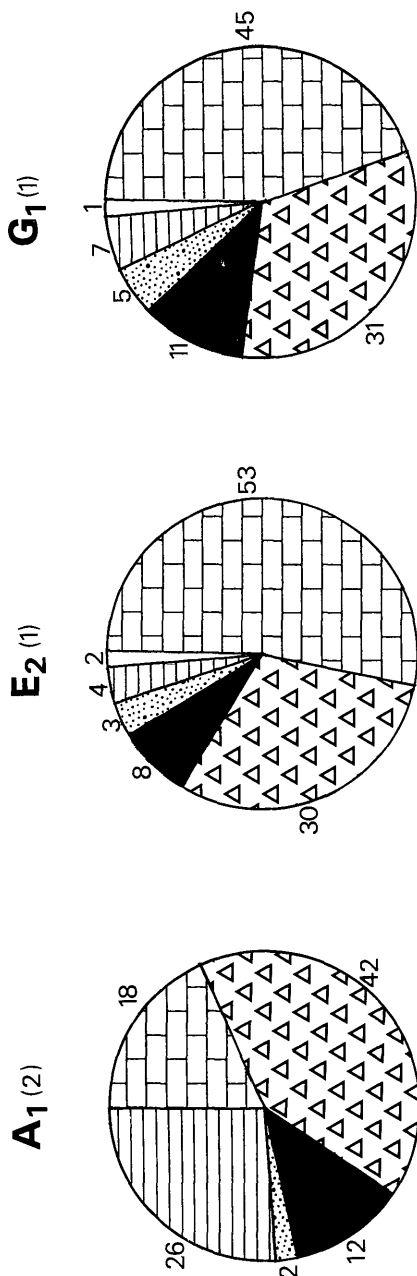


(*) Figures in brackets show the number of sample points for which compositional data are available

Composition percentages are shown around the diagrams. These, and all subsequent compositional data, exclude a weighting factor (Appendix B para. 15)

Figure 5a Mean composition by weight of gravel (+4-64 mm fraction) in sub-blocks D₁ to H₁ (sample density at the indicated level)

Figure 5b Mean composition by weight of gravel (+4-64 mm fraction) in sub-blocks A₁ to G₁ (sample density at the inferred level)



Ornament as for Fig. 5a

pocket at the end of this report. The base map is the Ordnance Survey 1:25 000 Outline Edition in grey, with the geological data in black and the mineral resource information in shades of red. The boundary of Greater Peterborough is taken from the Peterborough Development Corporation structure map published in 1970 (Anon., 1970; also Hancock and Hawkes, 1967).

Geological data The geological boundary lines include those from previous surveys and the results of more detailed and recent mapping carried out in conjunction with this assessment (see p. 3); as such, they therefore represent the best interpretation of the information available. However, it is inevitable, particularly with deposits (such as those represented in this area) which change rapidly vertically and laterally, that local irregularities or discrepancies may occur. These are taken into account in the assessment of the resources (see Appendix B).

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

Mineral resource information For assessment purposes the Map is divided into resource blocks within which there are areas of 'mineral' (that is, sub-blocks) and areas where sand and gravel is not potentially workable, absent or not assessed (for definitions of 'mineral' and 'potentially workable' and for discussion of resource blocks and sub-blocks, see Introduction).

Where 'mineral' is shown it is subdivided into one of two categories: 'exposed', where the thickness of overburden, commonly only soil and subsoil, averages less than 1 m and as 'continuous or almost continuous spreads beneath overburden'. However, within both these categories there may be small areas where sand and gravel is absent or not potentially workable, for example around boreholes 20 SE 26 and 29 NE 38. Uncoloured parts of the Map show bedrock outcrops, areas of non-mineral-bearing superficial deposits and sand and gravel considered to be not potentially workable. Areas of unassessed sand and gravel, for example in built-up areas, are indicated by a red stipple.

For the most part the distribution of categories of deposits is based on the mapped geological boundaries. Where there is a transition from one category to another, which cannot be related to the geological mapping and which could not be accurately delineated during this survey, inferred boundaries have been inserted. Such boundaries are shown by a distinctive red zigzag symbol, which is intended to convey an approximate location within a likely zone of occurrence rather than to represent the breadth of the zone; its width is dictated by cartographical considerations. For the purpose of measuring areas the centre-line of the symbol is used.

Worked areas and made ground The approximate extent is shown on the Map of mineral workings and backfilled areas known up to June 1978; no distinction is made there between sand and gravel workings and workings in the Oxford Clay bedrock. For further details of the workings, see below, Figure 9 and Appendix F.

RESULTS

The statistical results are summarised in Table 2. Additional compositional data are shown in Tables 5 to 22 and Figures 5a to 8 and 11 to 20.

Accuracy of results Seven of the ten resource sub-blocks (D₁ to H₁ - see Table 2a) have been statistically assessed at the indicated level. Within these resource sub-blocks the confidence limits at the symmetrical 95 per cent probability level range from 19 to 40 percent (that is, it is probable that 19 times out of 20 the true

Table 2 Summary of results: the sand and gravel resources of the area assessed.

Sub-blocks	Area		Mean thickness		Volume of mineral	Mean grading percentage				
	Sub-block	Mineral	Over-burden	Mineral		Limits at the 95% probability level		Fines	Sand	Gravel
	km ²	km ²	m	m	m ³ × 10 ⁶	± %	± m ³ × 10 ⁶	- $\frac{1}{8}$ mm	+ $\frac{1}{8}$ -4 mm	+4 mm
a Assessment of sub-blocks D ₁ to H ₁ at the indicated level										
D ₁ (27)*	14.8	14.4	4.0	2.8	40.3	25	10.1	6	50	44
D ₂ (74)	22.5	21.9	3.4	2.8	61.3	19	11.6	7	56	37
D ₃ (6)	6.0	6.0	2.5	1.3	7.8	40	3.1	22	57	21
E ₁ (21)	22.4	22.3	3.2	3.1	69.1	22	15.2	9	56	35
F ₁ (45)	16.1	15.1	1.1	3.1	46.8	22	10.3	8	50	42
F ₂ (16)	6.7	6.7	1.2	1.6	10.7	34	3.6	13	59	28
H ₁ (44)	13.6	11.7	0.7	2.0	23.4	28	6.6	12	56	32
Sub-blocks										
D ₁ -H ₁ (239)	102.1	98.1	2.6	2.6	255.1	10	25.5	9	54	37
b Assessment of sub-blocks A ₁ , E ₂ and G ₁ at the inferred level										
A ₁ (6)*	3.2	3.0	3.4	3.5	10.5			6†	50	44
E ₂ (9)	2.7	2.7	3.2	1.6	4.3			17‡	62	21
G ₁ (2)	0.3	0.2	0.4	1.6	0.3			6‡	47	47
Totals										
A ₁ -G ₁ (17)	6.2	5.9	3.2	2.6	15.3			9	53	38

* Figures in brackets show the number of sample points used in the assessment of the volume.

† Based on two grading data points.

‡ Based on one grading data point.

volume lies within the given limits of the mean). However, the true values are more likely to be nearer the figures estimated than the limits. Where the mineral within a sub-block is subdivided, the limits for each subdivision are usually greater than for the whole, thereby reflecting the variable thickness of the respective deposits and the reduced number of sample points available for the calculation. Moreover, it is probable that in each sub-block approximately the same percentage limits would apply for the estimate of volume of a very much smaller parcel of ground (say 100 hectares) containing similar sand and gravel deposits if the results from the same number of sample points (as provided by, say, ten boreholes) were used in the calculation. Thus if closer limits are needed for the quotation of the reserves in part of a sub-block, it can be expected that data from more than ten sample points will be required, even if the area is quite small. This point can be illustrated by considering the whole of the potentially workable sand and gravel associated within the sub-blocks in the assessed area. The total volume (255.1 million m³) at the indicated level can be estimated to limits of ± 10 per cent at the 95 per cent probability level by a calculation based on data from 239 sample points spread across the seven sub-blocks.

The total volume of mineral at the inferred level of assessment in sub-blocks A₁, E₂ and G₁ (see Table 2b) is estimated at 15.3 million m³ by a calculation based on data from 17 sample points; confidence limits are not quoted in this instance.

It must again be emphasised that the quoted volume of sand and gravel has no simple relationship with the amount that could be extracted in practice, since no allowance has been made in the calculations for any restraints (such as existing building and roads) on the use of land for mineral working.

Worked-out ground (sand and gravel): details The areas and estimated volumes of worked-out sand and gravel deposits in the various sub-blocks are shown in Table 3.

Table 3 Areas and estimated volumes of worked-out sand and gravel in the resource sheet area (shown to June 1978).

Sub-block	Approximate area (km ²)	Estimated volume (million m ³)
A ₁ *	0.2	0.7
D ₁	-	-
D ₂	0.4	1.1
D ₃	-	-
E ₁	-	-
E ₂ *	-	-
F ₁	1.0	3.1
F ₂	-	-
G ₁ *	~0.1	~0.2
H ₁	1.9	3.8

* The assessment of sand and gravel resources in these sub-blocks is at the inferred level only.

Some worked-out pits in sand and gravel have been restored to ground level by infilling with refuse or landscaped and allowed to fill with water so as to form lagoons suitable for recreational or wildlife conservation purposes. The locations of mineral workings in the resource sheet area are shown in Figure 9, in which the mineral worked (that is, either clay or sand and gravel) is indicated.

NOTES ON THE RESOURCE BLOCKS

The block letters (A-I) follow the approximate stratigraphical order of the superficial deposits mapped in the Bourne [TF 095 202], Stamford and Peterborough 'project area' of which this report forms a part; for example, block A includes the most recent deposits (Alluvium) and block I the oldest deposits (Third Terrace). Block O is the

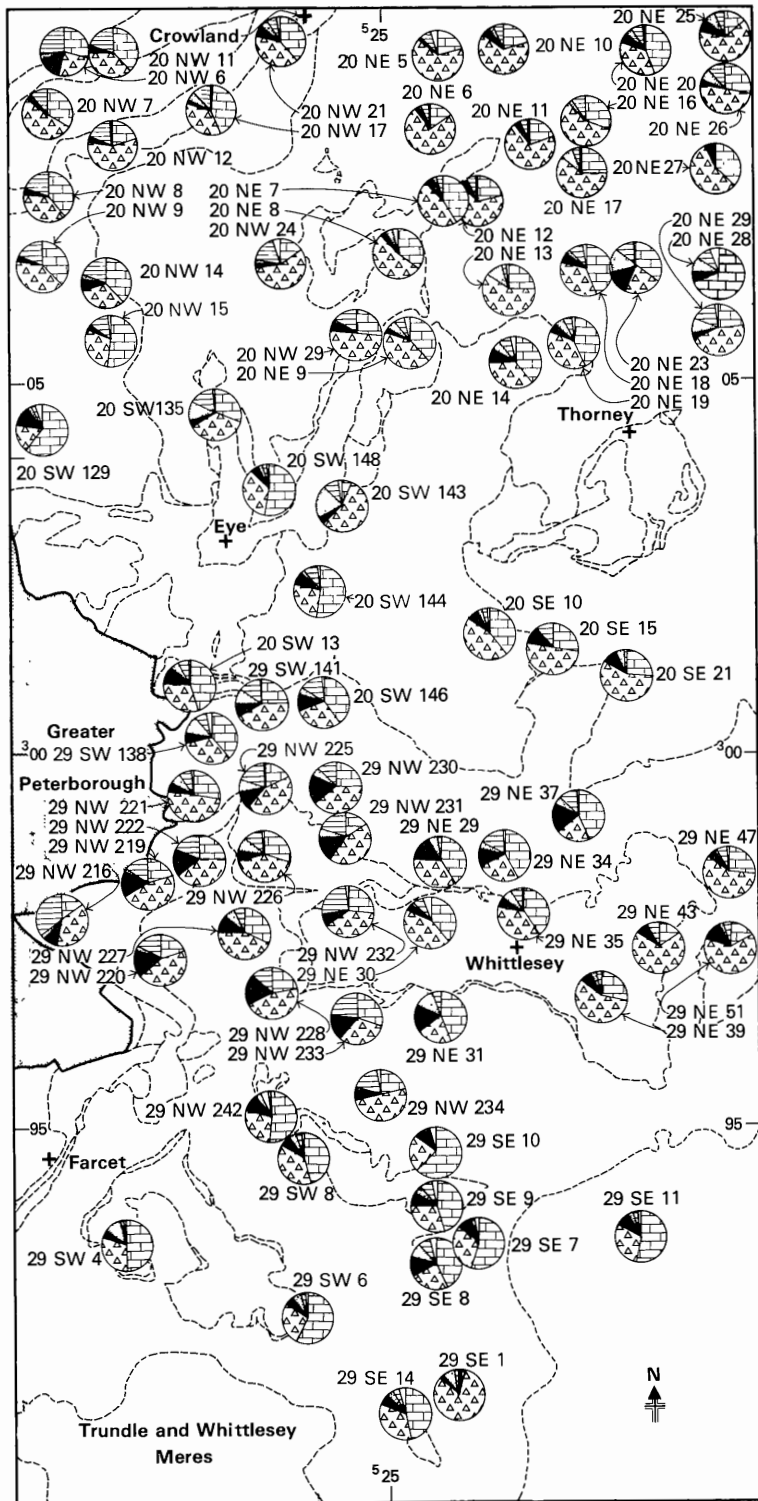


Figure 6 Mean composition by weight of gravel (+4-64 mm fraction) in some IMAU boreholes (where compositional data are available).

KEY Borehole Number
 Others Limestone
 Quartzite +chalk
 Sandstone Flint
 Ironstone

Scale
 0 1 2 miles
 0 1 2 3 km

Geological lines simplified - for further information see the Map.

exception to this scheme: it contains scattered occurrences of glacial deposits and Jurassic clays. For further details regarding blocks, sub-blocks and subscript figures (see Introduction, Table 4 and Figure 10).

In this report there is no representative of block C because Terrington Beds do not crop out in the present Map area. However, it is incorporated in Table 4 in order to preserve the continuity between this resource scheme and subsequent publications concerned with the areas referred to above.

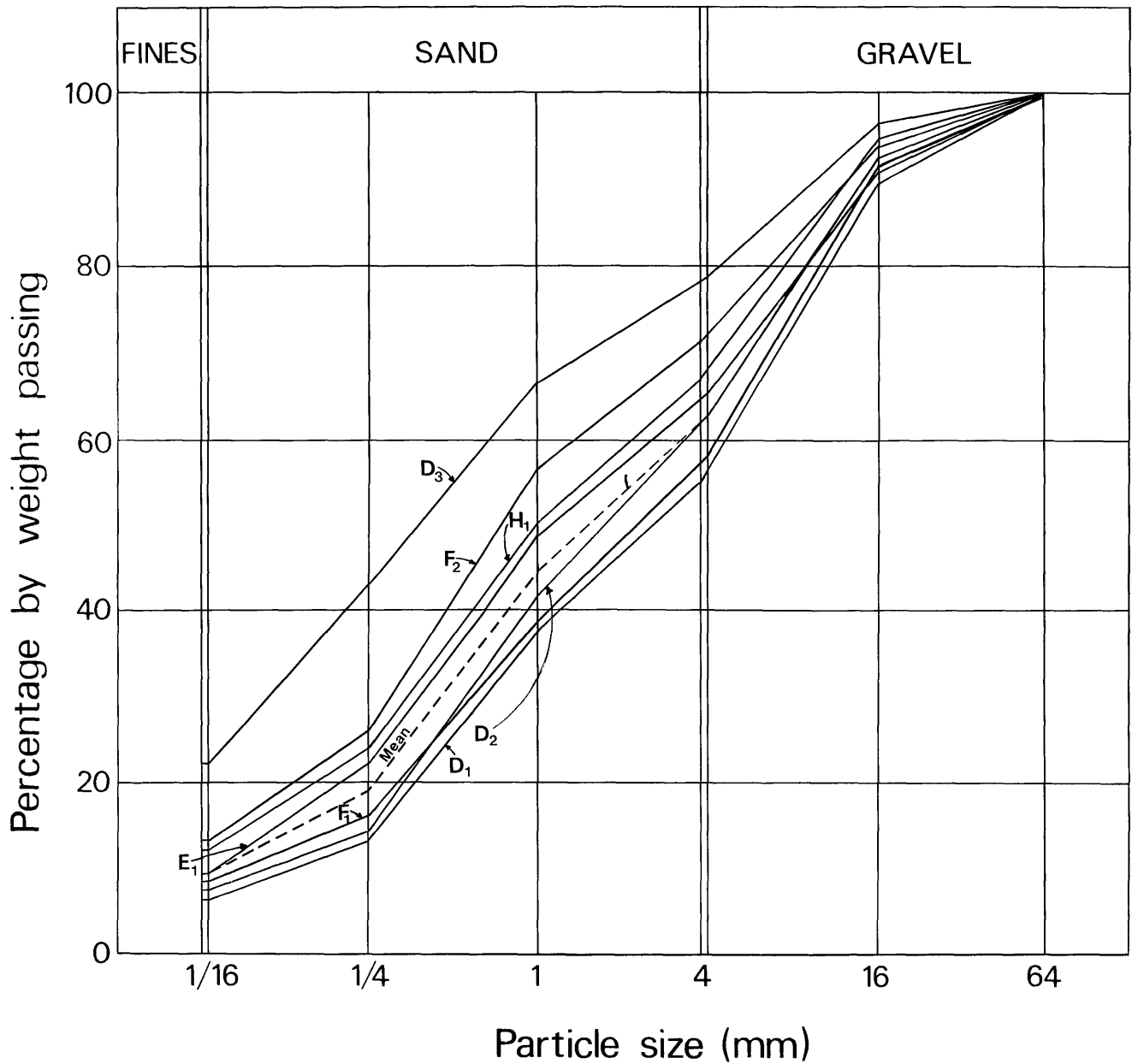
Block A (including sub-block A₁)

This block encompasses the floodplain deposits of the

rivers Nene and Welland. These deposits, which consist of alluvial silts and clays interbedded with lenses of sand and gravel, overlie peat, First Terrace or bedrock.

The block, comprising four separate units, is 5.2 km² in area of which 3.0 km² (described below in sub-block A₁; see also Figure 10) is assessed as continuous or almost continuous mineral beneath overburden. A further 0.2 km² has been worked for sand and gravel (see Table 3, Figure 9).

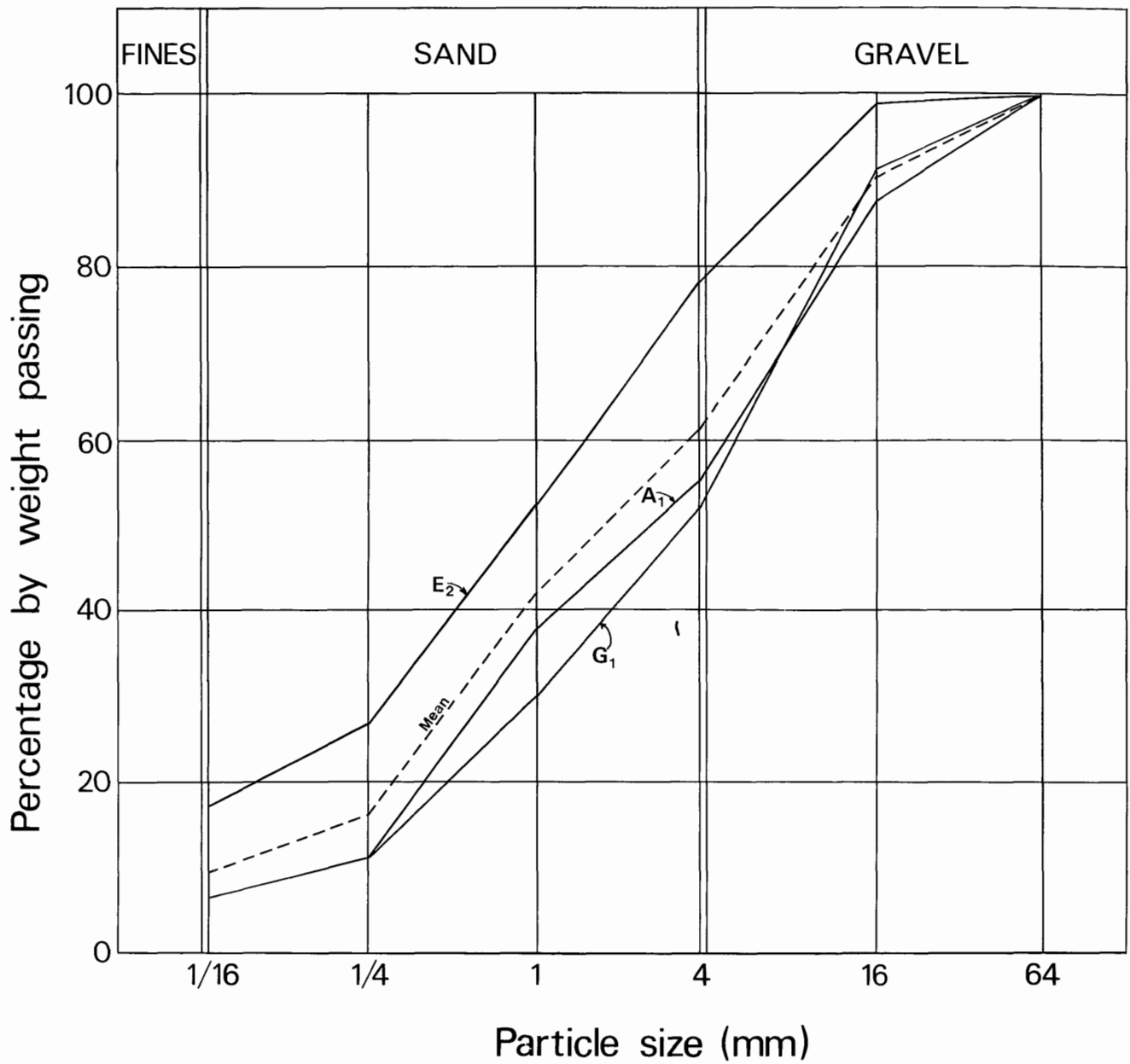
The assessment is based on five IMAU boreholes and 16 others (of which one remains commercial-in-confidence).



Resource block	Percentage by weight passing				
	1/16 mm	1/4 mm	1 mm	4 mm	16 mm
D ₁ [17]*	6	13	38	56	90
D ₂ [14]	7	14	42	63	93
D ₃ [5]	22	43	67	79	97
E ₁ [19]	9	22	49	65	93
F ₁ [16]	8	16	39	58	92
F ₂ [6]	13	26	57	72	94
H ₁ [12]	12	24	51	68	95
Mean [89]	9	19	45	63	93

* Figures in square brackets show the number of sample points for which grading data are available.

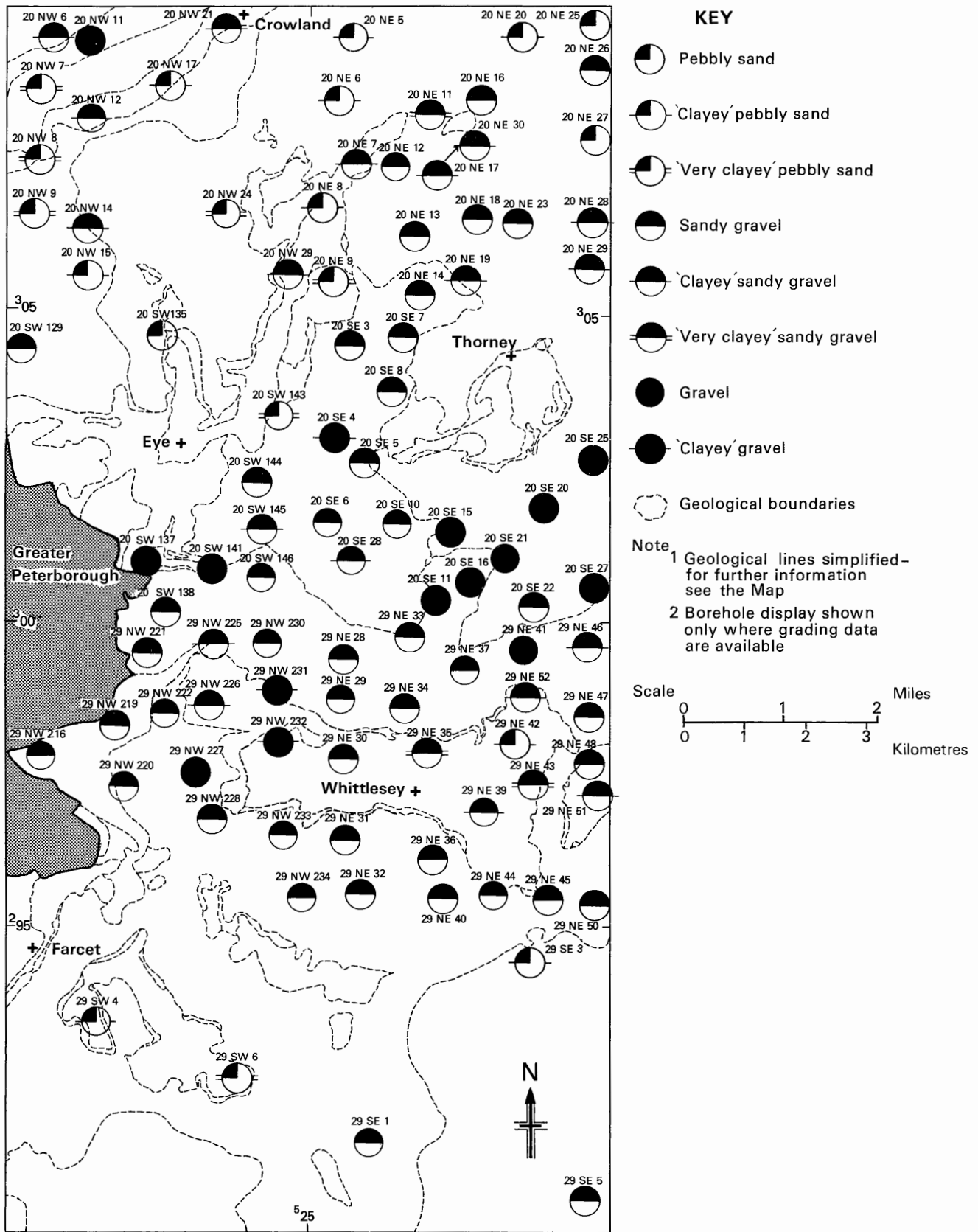
Figure 7a Mean particle size distribution of the mineral in sub-blocks D₁ to H₁ (sample density at the indicated level).



Resource sub-block	Percentage by weight passing				
	1/16 mm	1/4 mm	1 mm	4 mm	16 mm
A ₁ [2]*	6	11	39	56	88
E ₂ [1]	17	27	53	79	99
G ₁ [1]	6	11	31	53	92
Mean [4]	9	16	43	62	91

* Figures in square brackets show the number of sample points for which grading data are available.

Figure 7b Mean particle size distribution of the mineral in sub-blocks A₁, E₂ and G₁ (sample density at the inferred level).



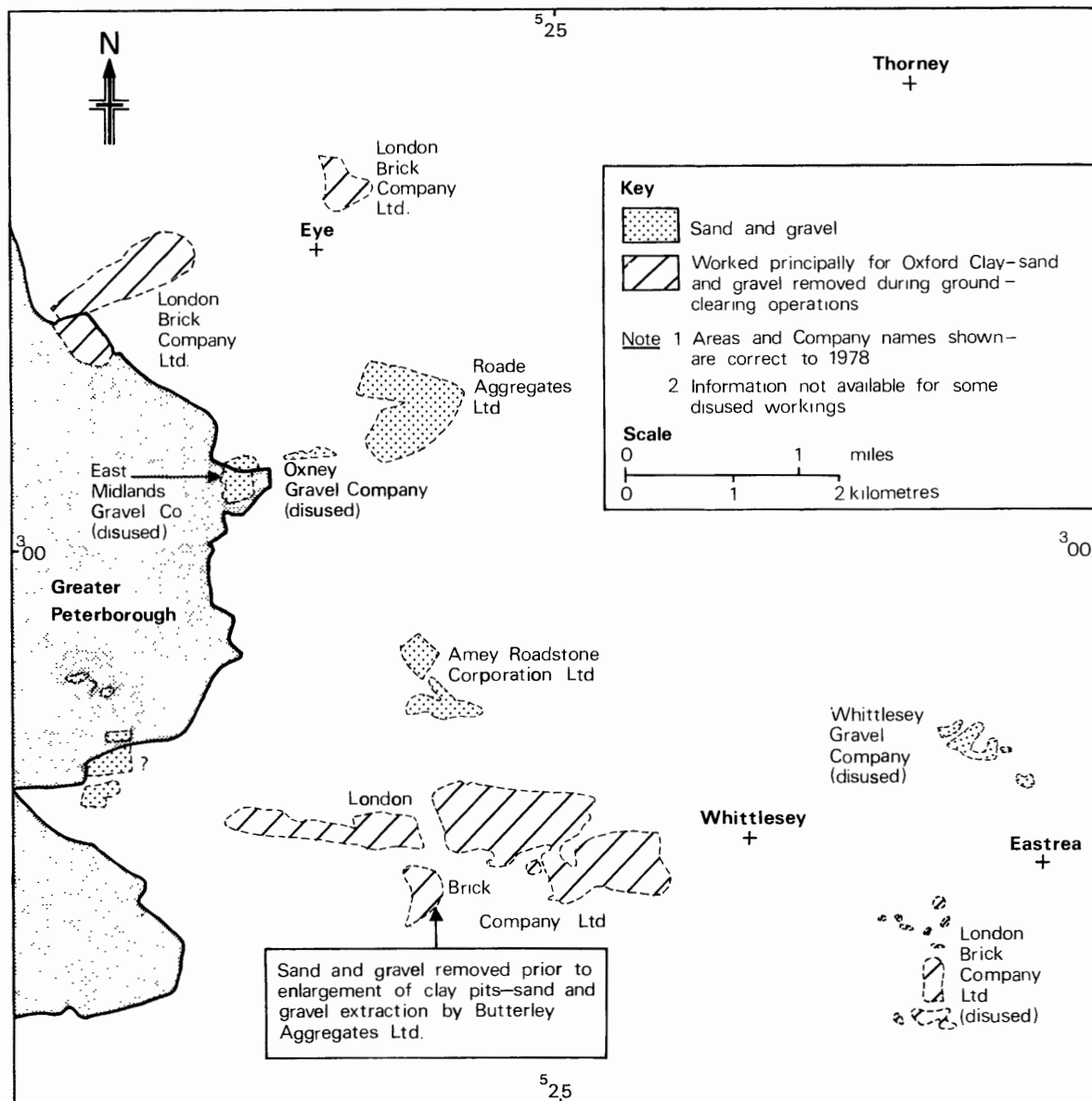


Figure 9 Worked ground.

Table 4 The relationship of the block letters to the classification of the Drift deposits.

Block letter	Drift deposits covered by each block
A	Alluvium - overlying First Terrace
B	Shell Marl (Whittlesey area)
C*	Terrington Beds (Bourne area)
D	Nordelph Peat - overlying First Terrace
E	Barroway Drove Beds - overlying First Terrace
F	First Terrace - Rivers Nene and Welland
G	Second Terrace - River Nene
H	March Gravels (Whittlesey area)
I	Third Terrace (Whittlesey area)
O	Other deposits - including non-mineral glacial deposits and Jurassic clay

* Not used in this report.

Sub-block A₁ An inferred assessment is offered based on two IMAU boreholes and four others (of which one remains commercial-in-confidence).

The recorded thickness of overburden ranged from 2.1 to 5.8 m with a mean thickness of 3.4 m. The proven mineral ranged from 1.1 to 5.1 m thick with a mean thickness of 3.5 m.

The IMAU boreholes proved mineral classified as sandy gravel (Figure 11, Table 5) with a gravel component (+4-64 mm fraction) of mainly angular to subangular flint (with a mean for the sub-block of 42 per cent), quartzitic 'Bunter' pebbles (26 per cent), oolitic and shelly limestone (18 per cent) and ironstone (12 per cent) (Table 6, Figure 5b).

The mean grading for the sub-block is gravel 44 per cent, sand 50 per cent and fines 6 per cent. The estimated volume of mineral at the inferred level is 10.5 million m³.

Block B

Block B, which is 6.2 km² in area, encloses the Whittlesey and Trundle meres. Previous work (for example, Skertchly, 1877; Godwin and Vishnu-Mittre, 1975; Godwin, 1978) together with data from three non-IMAU boreholes demonstrate that Shell Marl

overlies bedrock; there are no known records of sand and gravel within this block.

Block D (including sub-blocks D₁, D₂ and D₃)
Block D is, with block E, the largest of the blocks assessed. The total area is 68.6 km² of which 42.3 km² is assessed as continuous or almost continuous mineral beneath overburden.

The overburden comprises Nordelph Peat overlying Barroway Drove Beds which rest on either an impersistent intermediate peat (see p. 8) or the more persistent Lower Peat. The assessment is based on 70 IMAU boreholes and 74 others (of which 57 remain commercial-in-confidence).

For assessment purposes the mineral-bearing areas are divided into three sub-blocks (D₁, D₂ and D₃); sub-blocks D₁ and D₂ are the largest and most continuous of the three, whereas sub-block D₃ comprises three discontinuous parts (see Figure 10). The subscript order 1-3 indicates the order of decreasing mineral potential of the deposits (as elsewhere in this report).

Inferred boundaries are used extensively where the available data do not allow a more accurate delineation of mineral (see p. 11).

Sub-block D₁ This sub-block is 14.8 km² in area of which 14.4 km² is mineral-bearing; the remainder is bedrock. No large-scale extraction has occurred. The assessment is based on 18 IMAU boreholes and nine others (of which four remain commercial-in-confidence).

The recorded thickness of overburden ranged from 0.9 to 10.4 m with a mean thickness of 4.0 m; generally, thicknesses increase towards the east. The proven mineral ranged from 0.7 to 5.5 m thick (in boreholes 29 NE 35 and 29 NE 34, respectively) with a mean thickness of 2.8 m. Sand and gravel was absent from two boreholes (29 NE 38 and one confidential borehole).

The mineral ranged from 'very clayey' sandy gravel to gravel (Table 7; Figure 12). The gravel (+4-64 mm fraction) consists of nearly equal proportions of angular to subangular flint with oolitic and shelly limestone (with means for the sub-block of 39 per cent and 33 per cent, respectively) and minor amounts of ironstone, quartzite and sandstone (Table 8, Figure 5a).

The mean grading for the sub-block is gravel 44 per cent, sand 50 per cent and fines 6 per cent - with sandy gravel as the overall classification. The volume of mineral is estimated at 40.3 million m³ ± 25 per cent at the 95 per cent confidence level.

Sub-block D₂ This sub-block is 22.5 km² in area, of which 21.9 km² is mineral-bearing; the remaining 0.6 km² comprises 0.4 km² of worked ground (in the Drysides Barn [TL 226 976] area - see Table 3 and Figure 9) and 0.2 km² of exposed Oxford Clay.

The assessment is based on 19 IMAU boreholes and 55 others (of which 47 remain commercial-in-confidence). The inferred boundaries near Must Farm [TL 234 966] and Pondersbridge are drawn on the basis of confidential data. These and other inferred boundaries detract from the resource status of this sub-block.

The recorded thickness of overburden ranged from 0.8 to 7.5 m with a mean thickness of 3.4 m; generally thicknesses increase towards the east and south. The proven mineral ranged from 0.5 to 5.5 m thick with a mean thickness of 2.8 m. Sand and gravel was absent from borehole 29 SE 18.

In 14 boreholes, the mineral ranged from sandy gravel to gravel (Table 9, Figure 13). The gravel (+4-64 mm fraction) comprises mainly angular to subangular flint (with a mean for the sub-block of 45 per cent) with some oolitic and shelly limestone (25 per cent) and small amounts of quartzite (13 per cent), ironstone (12 per cent) and sandstone (4 per cent) (Table 10, Figure 5a).

The mean grading for the sub-block is gravel 37 per cent, sand 56 per cent and fines 7 per cent - with sandy gravel as the overall classification. The volume of

mineral is estimated at 61.3 million m³ ± 19 per cent, at the 95 per cent confidence level.

Sub-block D₃ The sub-block comprises three small occurrences of mineral with a total area of 6.0 km².

The assessment is based on 5 IMAU boreholes and one other borehole. Inferred boundaries around Newborough [TF 204 060], at [TF 237 090] and at [TF 249 050] are drawn on the basis of borehole data.

The recorded thickness of overburden ranged from 0.6 to 3.6 m (in boreholes 20 NE 4 and 20 NW 15, respectively) with a mean thickness of 2.5 m. The proven mineral ranged from 0.9 to 2.0 m thick (in boreholes 20 NW 15 and 20 NW 6, respectively) with a mean thickness of 1.3 m.

In five boreholes, the mineral ranged from 'very clayey' pebbly sand to 'clayey' sandy gravel (Table 11, Figure 14). The gravel (+4-64 mm fraction) comprises oolitic and shelly limestone (with a mean for the sub-block of 39 per cent) and angular to subangular flint (33 per cent) with some quartzite (18 per cent) and minor amounts of ironstone (7 per cent) and sandstone (2 per cent) (Table 12, Figure 5a).

The mean grading for the sub-block is gravel 21 per cent, sand 57 per cent and fines 22 per cent - with 'very clayey' sandy gravel as the overall classification. The volume of mineral is estimated at 7.8 million m³ ± 40 per cent at the 95 per cent confidence level.

Block E (including E₁ and E₂)

Block E is 68.6 km² in area of which 25.0 km² is assessed as continuous or almost continuous mineral (that is, First Terrace deposits) beneath overburden. Sand and gravel has not been extracted in commercial quantities.

The overburden consists mainly of silts and clays (including discontinuous roddons) together with an impersistent intermediate peat (see p. 8) and the more persistent Lower Peat. Over most of the resource block area, the bedrock is Oxford Clay; however, Boulder Clay was proved beneath mineral in several boreholes (for example, 20 NE 15, 20 NE 20, 20 NE 21, 20 NE 22 and 20 NE 28). This occurrence roughly coincides with the sigmoidal barren tract outlined by inferred boundaries extending from Greenlodge [TF 266 094] near Crowland south-eastwards to Priest's Farm [TF 289 063] in the north-east of the resource sheet area. Two other non-mineral areas are highlighted by inferred boundaries: around Thorney 'island' and in the south of the resource sheet area at [TL 277 910] and [TL 285 933]; in the latter instance, the boundaries are determined primarily on the basis of confidential data.

The assessment is based on 54 IMAU boreholes and 19 others (of which 14 remain commercial-in-confidence) and one temporary pit exposure. Two mineral-bearing sub-blocks (E₁ and E₂) are distinguished.

Sub-block E₁ This sub-block, which lies north and south of Thorney 'island', is 22.4 km² in area, of which 22.3 km² is mineral-bearing; the remaining 0.1 km² is an outcrop of Oxford Clay north of Buke Horn Toll Farm [TF 254 056].

The assessment is based on 20 IMAU boreholes and one other borehole. The inferred boundaries are drawn on the basis of borehole data.

The recorded thickness of overburden ranged from 1.2 to 6.1 m (in boreholes 20 NE 19 and 20 NE 25, respectively) with a mean thickness of 3.2 m; generally the greatest thicknesses occur in the north-east of the assessed area. The proven mineral ranged from 0.8 to 5.1 m thick (in boreholes 20 NE 5 and 20 NE 23, respectively) with a mean thickness of 3.1 m; sand and gravel was absent from borehole 20 SE 26.

The mineral ranged from 'clayey' pebbly sand to gravel (Table 13, Figure 15). The gravel (+4-64 mm fraction) comprises mainly angular to subangular flint (with a mean for the sub-block of 54 per cent) together

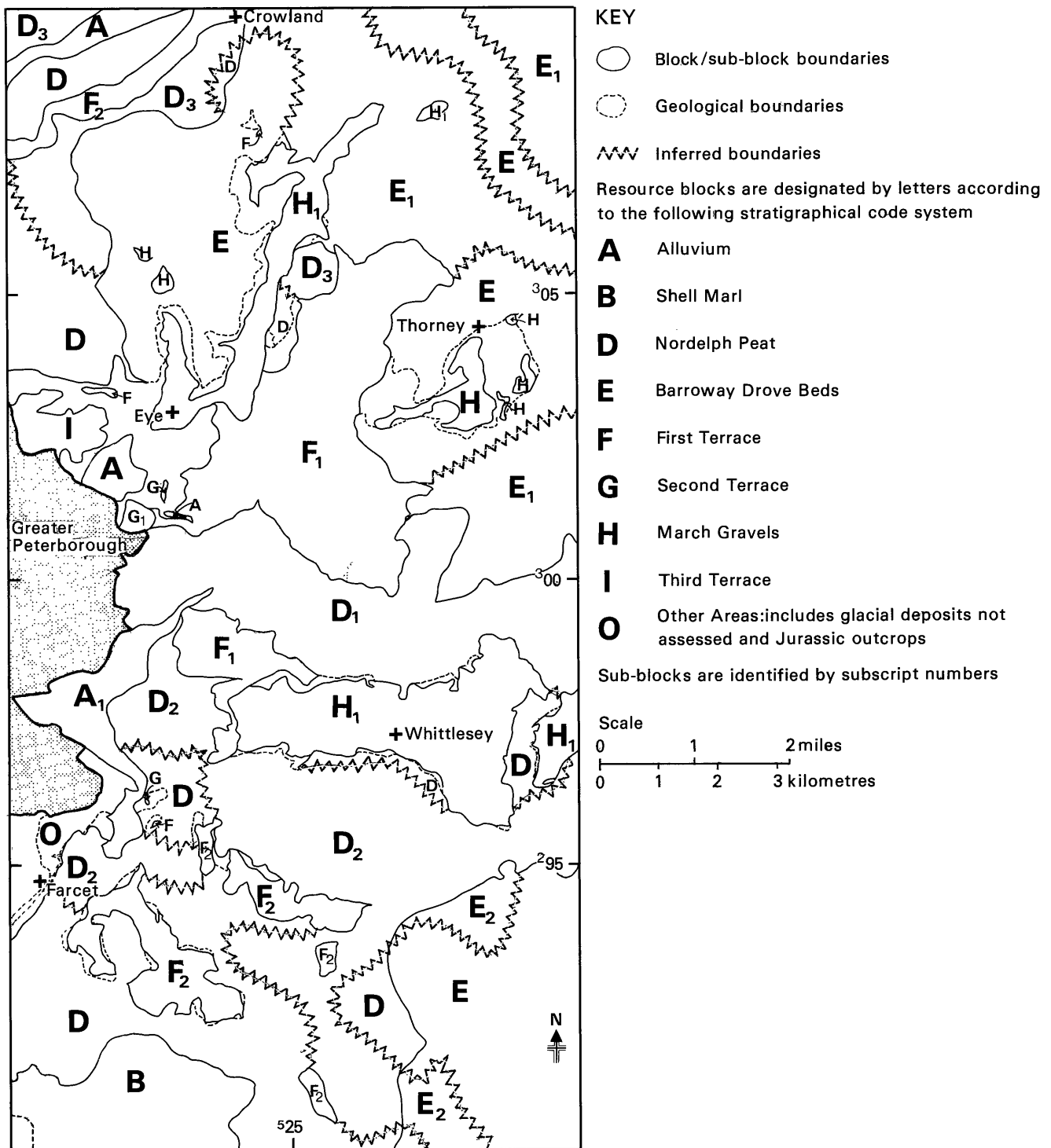


Figure 10 Location of resource blocks and sub-blocks.

with some oolitic and shelly limestone (28 per cent) and minor amounts of quartzite (8 per cent), sandstone (5 per cent) and ironstone (4 per cent) (Table 14, Figure 5a).

The mean grading for the sub-block is gravel 35 per cent, sand 56 per cent and fines 9 per cent - with sandy gravel as the overall classification. The volume of mineral is estimated at 69.1 million m³ ± 22 per cent at the 95 per cent confidence level.

Sub-block E₂ An inferred assessment is based on two IMAU boreholes, seven other boreholes (of which six remain commercial-in-confidence), and one temporary pit exposure. The whole area (2.7 km²) is mineral-bearing.

The recorded thickness of overburden ranged from 1.2 to 8.5 m with a mean thickness of 3.2 m. Proved mineral ranged from 0.3 to 3.5 m thick with a mean thickness of 1.6 m.

The one IMAU borehole (29 SE 3) for which grading data are available proved 'clayey' pebbly sand, with 21 per cent gravel, 62 per cent sand and 17 per cent fines (Table 15, Figure 16). A compositional analysis of the mineral from IMAU borehole 29 SE 11 showed that the gravel (+4-64 mm fraction) comprised mainly oolitic and shelly limestone (53 per cent) with some angular to subangular flint (30 per cent) and minor amounts of ironstone (8 per cent), quartzite (4 per cent) and sandstone (3 per cent) (Table 16, Figure 5b).

The estimated volume of mineral in the sub-block at the inferred level is 4.3 million m³.

Table 5 Sub-block A₁: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification (see Key below)
	Over-burden	Mineral	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 mm	
29 NW 216	2.7	4.2*	4	3	30	17	31	15	SG
29 NW 219	2.6	4.4	8	7	26	17	32	10	SG
Mean	3.4†	3.5†	6	5	28	17	32	12	SG

* Sum of three beds separated by 0.8 and 0.2 m of waste.

† Based on data from 6 boreholes.

Key to abbreviations

G Gravel

S Sand/sandy

Table 6 Mean composition by weight of the gravel (+4-64 mm) fraction in IMAU boreholes in sub-block A₁.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
29 NW 216	15	38	8	3	36	0
29 NW 219	20	47	16	2	15	0
Mean	18	42	12	2	26	0

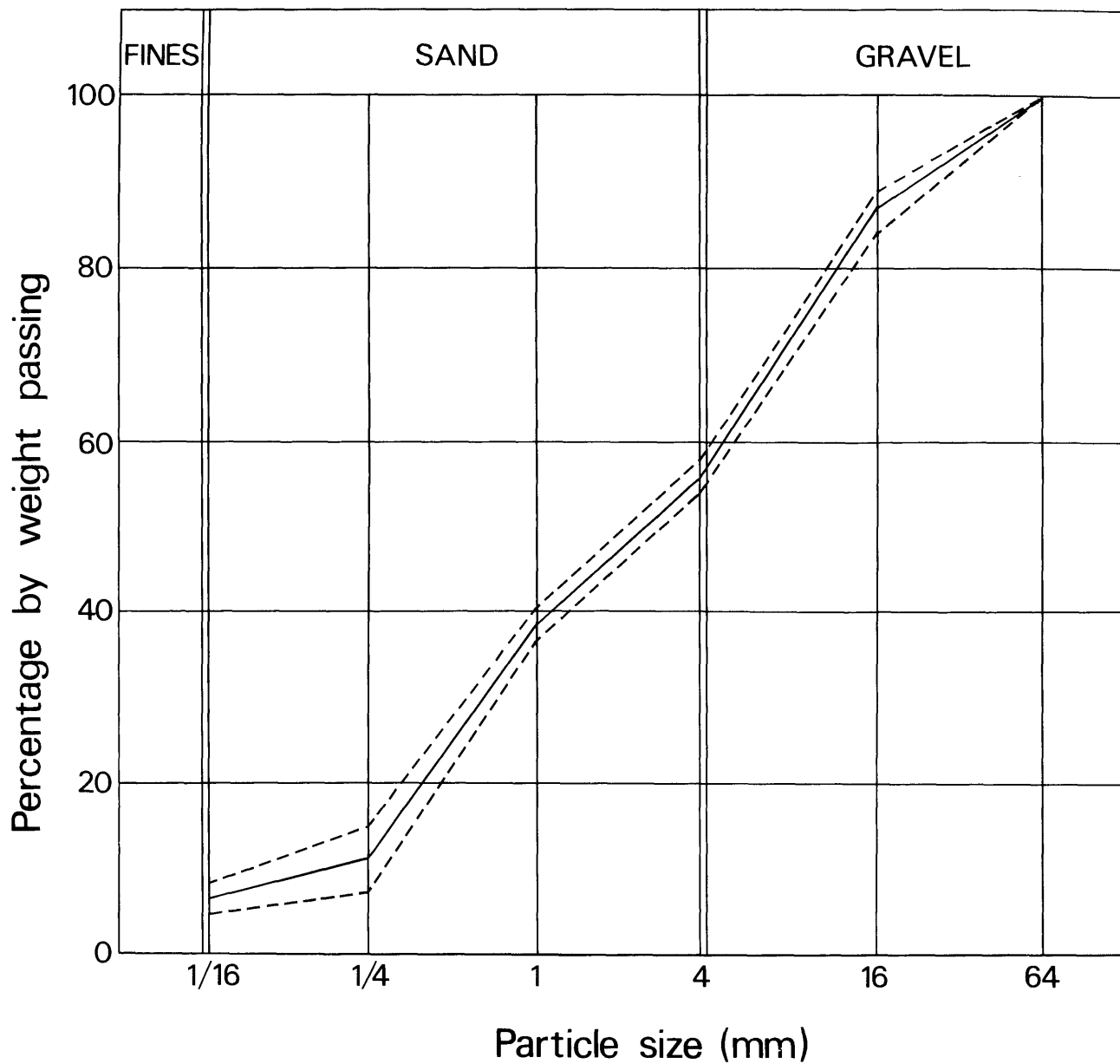


Figure 11 Grading characteristics of the resources within sub-block A₁(based on two boreholes). The continuous line represents the weighted mean grading of the resource; the broken lines denote the envelope containing the mean grading curves for individual boreholes proving mineral.

Table 7 Sub-block D₁: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Over-burden	Mineral	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 SE 11	1.4	2.4	3	2	11	17	54	13	G
20 SE 16	4.8	3.1	4	6	24	16	38	12	G
20 SE 27	3.5	3.5*	6	3	23	20	34	14	G
20 SW 138	2.6	3.8	4	9	40	13	26	8	SG
20 SW 141	2.0	1.1	4	4	25	15	40	12	G
20 SW 146	2.5	3.1	3	7	36	17	30	7	SG
29 NE 28	4.1	2.4	7	10	22	17	37	7	SG
29 NE 29	5.1	3.9	4	6	22	18	36	14	SG
29 NE 34	4.7	5.5	7	6	22	20	34	11	SG
29 NE 35	0.9	(0.7)	22	7	21	18	28	4	VCSG
29 NE 37	4.7	4.7	5	6	26	22	32	9	SG
29 NE 38	Non-mineral								
29 NE 41	2.7	1.5	6	2	20	19	40	13	G
29 NE 46	7.1	3.9	10	6	18	21	35	10	CSG
29 NE 47	4.2	3.7†	6	10	22	18	38	6	SG
29 NW 221	2.6	5.3	6	11	25	23	28	7	SG
29 NW 225	1.7	1.8	13	13	30	13	24	7	SG
29 NW 230	2.8	2.3‡	7	11	27	17	31	7	SG
Mean	4.0x	2.8x	6	7	25	18	34	10	SG

Key to abbreviations

C	'Clayey'
G	Gravel
S	Sand/sandy
VC	'Very clayey'

* Sum of three beds separated by 0.4 m and 0.2 m of waste

† Sum of two beds separated by 0.1 m of waste

‡ Sum of two beds separated by 1.2 m of waste

Brackets show that the sand and gravel in the individual borehole do not meet the criteria (a) and/or (b) of the definition of mineral (see Introduction)

x Based on data from 27 boreholes

Table 8 Mean composition by weight of gravel (+4-64mm fraction) in IMAU boreholes in sub-block D₁.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
20 SE 11	No data available					
20 SE 16	No data available					
20 SE 27	No data available					
20 SW 138	39	33	6	11	6	5
20 SW 141	24	43	9	8	15	1
20 SW 146	41	29	11	3	15	1
29 NE 28	No data available					
29 NE 29	41	35	15	6	2	1
29 NE 34	40	29	11	4	15	1
29 NE 35	40	39	6	8	6	1
29 NE 37	44	21	18	5	11	1
29 NE 38	Non-mineral					
29 NE 41	No data available					
29 NE 46	No data available					
29 NE 47	26	59	5	2	7	1
29 NW 221	28	50	6	6	8	2
29 NW 225	18	44	10	8	19	1
29 NW 230	24	41	18	5	12	0
Mean	33	39	11	6	10	1

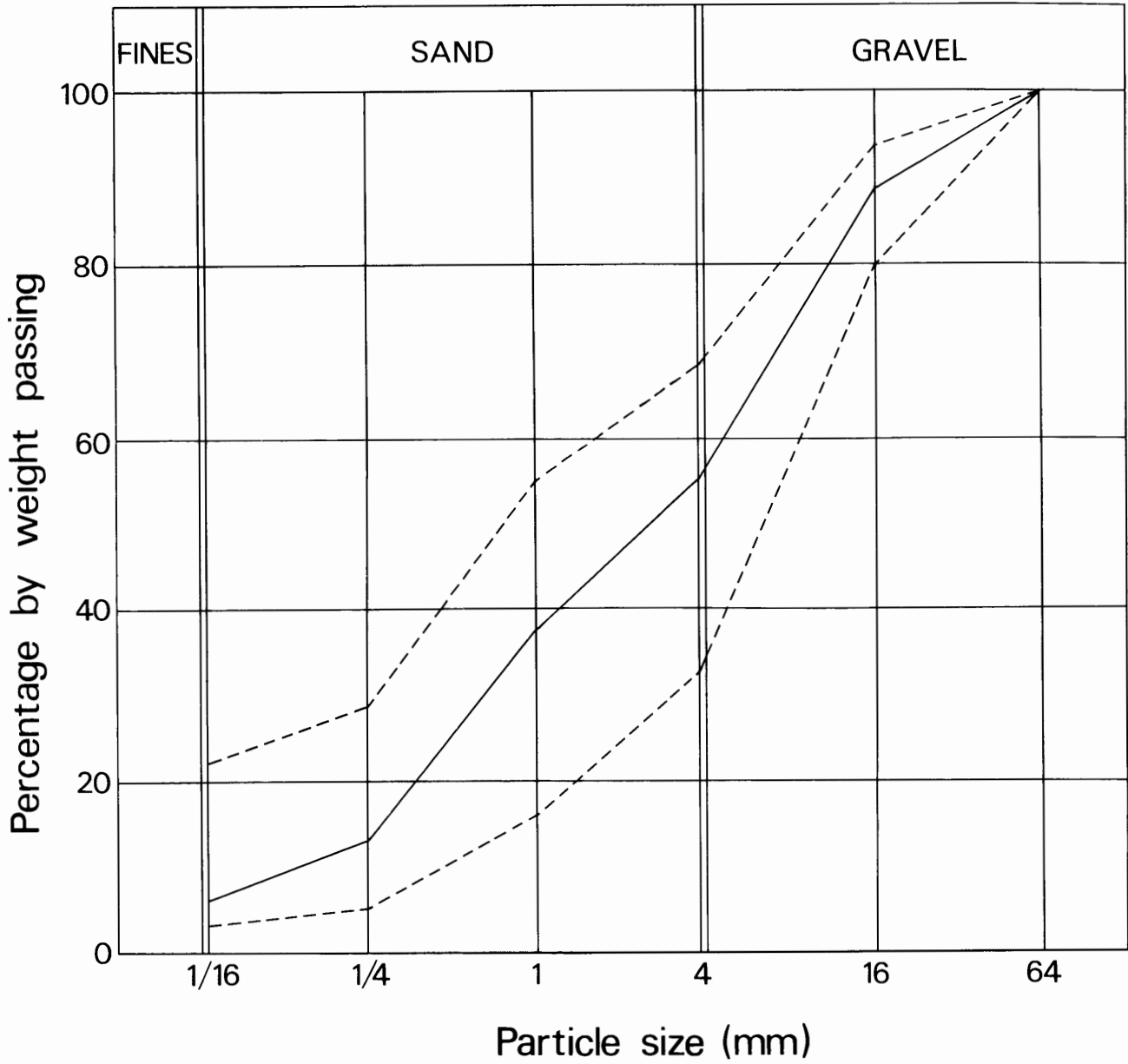


Figure 12 Grading characteristics of the resources within sub-block D₁ (based on 17 boreholes). For explanation, see Figure 11.

Table 9 Sub-block D₂: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Mineral	Overburden	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 mm	
29 NE 31	3.0	3.6	7	5	20	26	36	6	SG
29 NE 32	5.3	2.7	4	11	29	14	33	9	SG
29 NE 36	4.6	3.9	7	7	28	27	25	6	SG
29 NE 40	4.0	4.8	7	6	33	28	21	5	SG
29 NE 44	4.1	2.7	6	7	27	26	30	4	SG
29 NE 45	4.7	3.2	8	8	22	28	30	4	SG
29 NE 50	6.3	2.5	6	7	32	20	31	4	SG
29 NW 220	2.5	4.8	9	9	33	19	24	6	SG
29 NW 222	2.3	4.7	6	8	29	19	31	7	SG
29 NW 227	1.5	2.9	5	7	18	13	40	17	G
29 NW 228	4.5	2.3	7	6	20	23	38	6	SG
29 NW 233	3.9	3.7	4	4	30	19	30	13	SG
29 NW 234	2.8	2.4	7	12	38	11	27	5	SG
29 SW 14†	2.5	(0.6+)	No data available						
29 SW 15†	5.6	2.3	No data available						
29 SW 18†	4.0	2.0	No data available						
29 SE 1	4.4	2.0	7	6	32	20	29	6	SG
29 SE 18†	Non-mineral								
29 SE 19†	3.4	1.2	No data available						
Mean	3.4*	2.8*	7	7	28	21	30	7	SG

Key to abbreviations

G Gravel

S Sand/sandy

* Based on data from 74 boreholes

† Minuteman borehole (See Appendix A)

Brackets show that the sand and gravel in the individual borehole do not meet the criteria (a) and/or (b) of the definition of mineral (see Introduction)

Table 10 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block D₂.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
29 NE 31	46	22	16	11	5	0
29 NE 32	No data available					
29 NE 36	No data available					
29 NE 40	No data available					
29 NE 44	No data available					
29 NE 45	No data available					
29 NE 50	No data available					
29 NW 220	22	42	16	3	17	0
29 NW 222	25	40	16	0	19	0
29 NW 227	32	43	11	6	8	0
29 NW 228	23	46	16	1	14	0
29 NW 233	30	31	16	0	23	0
29 NW 234	22	51	5	3	17	2
29 SW 14	No data available					
29 SW 15	No data available					
29 SW 18	No data available					
29 SE 1	2	86	2	7	2	1
29 SE 18	Non-mineral					
29 SE 19	No data available					
Mean	25	45	12	4	13	1

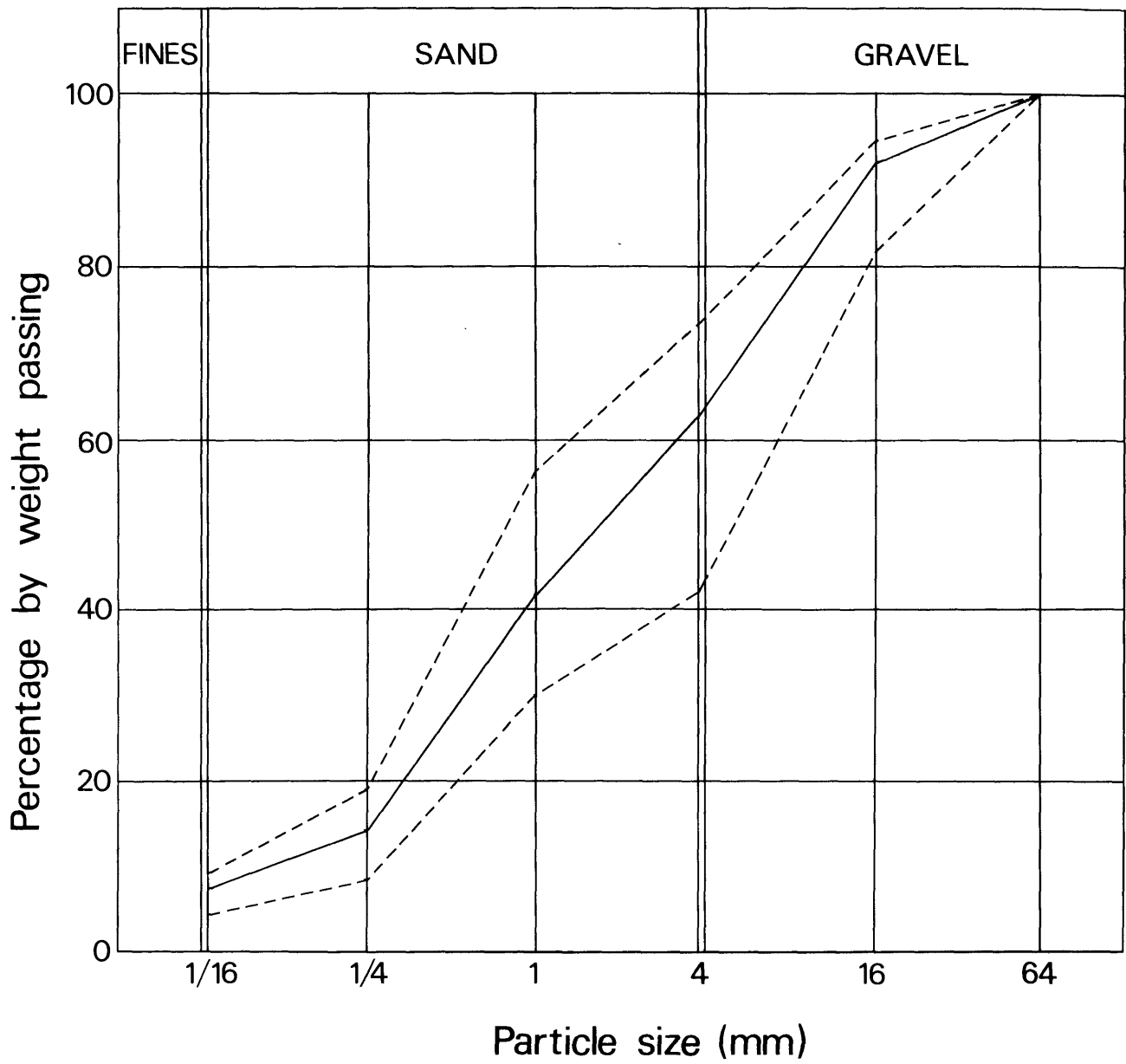


Figure 13 Grading characteristics of the resources within sub-block D₂ (based on 14 boreholes). For explanation see Figure 11.

Table 11 Sub-block D₃: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Overburden	Mineral	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 mm	
20 NE 9	1.4	1.7	39	30	18	7	6	0	VCPS
20 NW 6	2.9	2.0*	16	14	19	16	27	8	CSG
20 NW 9	2.6	1.3	25	35	25	7	8	0	VCPS
20 NW 14	2.1	1.1	10	12	27	18	31	2	CSG
20 NW 15	3.6	(0.9)	16	7	40	13	23	1	CPS
Mean	2.5†	1.3†	22	21	24	12	18	3	VCSG

Key to abbreviations

C	'Clayey'
G	Gravel
P	Pebbly
S	Sand/sandy
VC	'Very clayey'

* Sum of two beds separated by 0.6 m of waste.

† Based on data from 6 boreholes.

Brackets show that the sand and gravel in the individual borehole do not meet the criteria (a) and/or (b) of the definition of mineral (see Introduction).

Table 12 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block D₃.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
20 NE 9	38	42	4	5	8	3
20 NW 6	29	26	15	3	27	0
20 NW 9	37	38	4	0	21	0
20 NW 14	39	31	7	3	20	0
20 NW 15	52	29	3	0	15	1
Mean	39	33	7	2	18	1

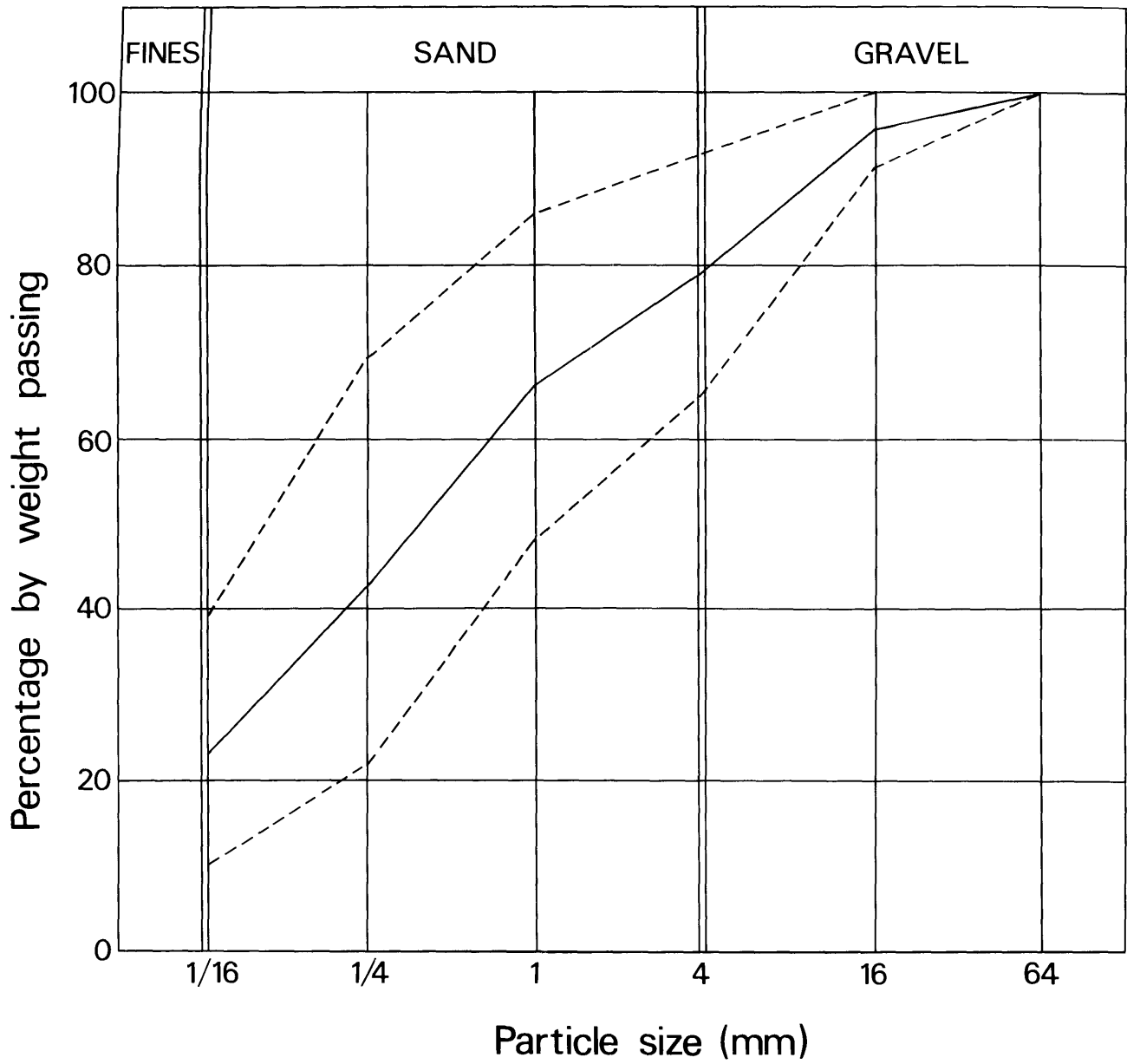


Figure 14 Grading characteristics of the resources within sub-block D₃ (based on five boreholes). For explanation see Figure 11.

Table 13 Sub-block E₁: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Over-burden	Mineral	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 5	1.7	(0.8)	14	11	38	22	14	1	CPS
20 NE 6	3.8	1.4	12	47	27	5	8	1	CPS
20 NE 11	1.4	1.5	22	4	10	30	29	5	VCSG
20 NE 12	2.4	3.5*	9	14	30	17	26	4	SG
20 NE 13	1.3	4.5	8	11	34	15	23	9	SG
20 NE 16	3.1	3.1	9	21	22	13	28	7	SG
20 NE 17	3.1	3.2†	16	15	23	14	27	5	CSG
20 NE 18	2.0	4.9	9	9	28	20	30	4	SG
20 NE 19	1.2	4.9	13	16	23	12	29	7	CSG
20 NE 20	4.7	1.3	14	55	24	2	4	1	CPS
20 NE 23	2.8	5.1‡	5	4	28	23	32	8	SG
20 NE 25	6.1	3.0	8	17	37	16	19	3	PS
20 NE 26	4.5	2.4	3	6	24	26	34	7	SG
20 NE 27	4.0	4.6	8	20	46	9	10	7	PS
20 NE 29	4.0	4.8	14	16	25	13	27	5	CSG
20 SE 20	2.4	1.9	3	3	15	20	48	11	G
20 SE 21	4.1	2.9	3	2	20	23	37	15	G
20 SE 22	5.1	3.3	3	7	25	19	35	11	SG
20 SE 25	3.4	3.1	2	2	18	19	47	12	G
20 SE 26	Non-mineral								
Mean	3.2x	3.1x	9	13	27	16	28	7	SG

Key to abbreviations

C 'Clayey'

G Gravel

P Pebbly

S Sand/sandy

VC 'Very clayey'

* Sum of two beds separated by 2.2 m of waste.

† Sum of two beds separated by 1.6 m of waste.

‡ Sum of two beds separated by 0.6 m of waste.

x based on data from 21 boreholes.

Brackets show that the sand and gravel in the individual borehole do not meet the criteria (a) and/or (b) of the definition of mineral (see Introduction).

Table 14 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block E₁.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
20 NE 5	16	71	1	1	5	6
20 NE 6	15	75	1	3	6	1
20 NE 11	20	69	2	1	8	0
20 NE 12	23	60	4	0	12	1
20 NE 13	25	61	0	9	4	1
20 NE 16	30	58	0	2	10	0
20 NE 17	25	61	0	9	4	1
20 NE 18	44	36	6	1	11	2
20 NE 19	43	38	6	5	7	1
20 NE 20	43	38	6	5	7	1
20 NE 23	35	23	14	15	12	1
20 NE 25	17	63	8	7	5	0
20 NE 26	29	49	2	8	12	0
20 NE 27	37	56	3	1	2	1
20 NE 29	24	46	2	9	17	2
20 SE 20	No data available					
20 SE 21	26	58	8	6	2	0
20 SE 22	No data available					
20 SE 25	No data available					
20 SE 26	Non-mineral					
Mean	28	54	4	5	8	1

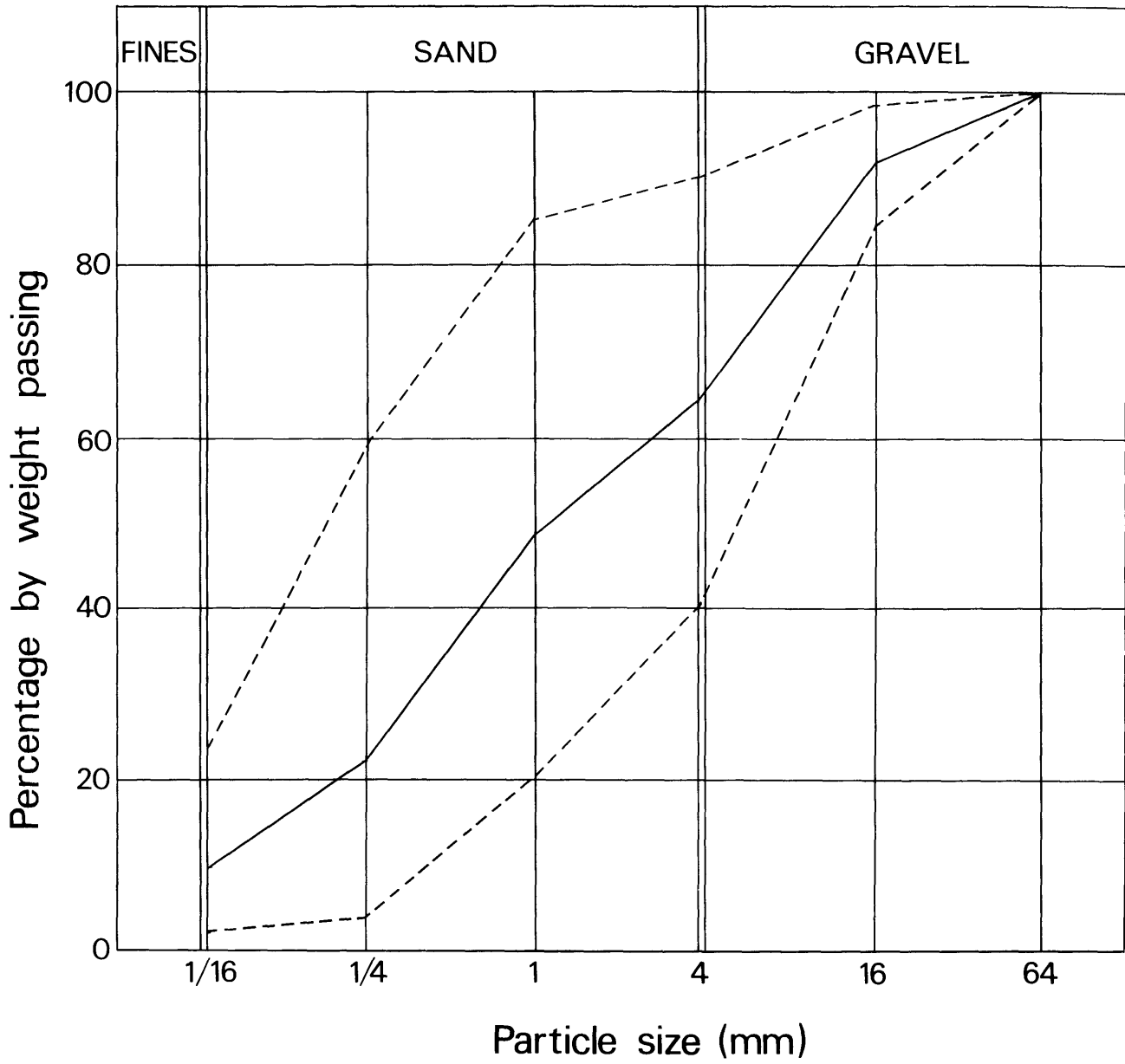


Figure 15 Grading characteristics of the resources within sub-block E₁ (based on 19 boreholes). For explanation see Figure 11.

Table 15 Sub-block E₂: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						
	Over-burden	Mineral	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 mm	Grading Classification
29 SE 3	3.0	1.1	17	10	26	26	20	1	CPS
29 SE 11†	2.2	1.0	No data available						
Mean	3.2*	1.6*	17	10	26	26	20	1	CPS

Key to abbreviations

C 'Clayey'

P Pebbly

S Sand/sandy

* Based on data from 9 boreholes and one temporary pit exposure

† Minuteman borehole (see Appendix A)

Table 16 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block E₂.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
29 SE 3	No data available					
29 SE 11	53	30	8	3	4	2
Mean	53	30	8	3	4	2

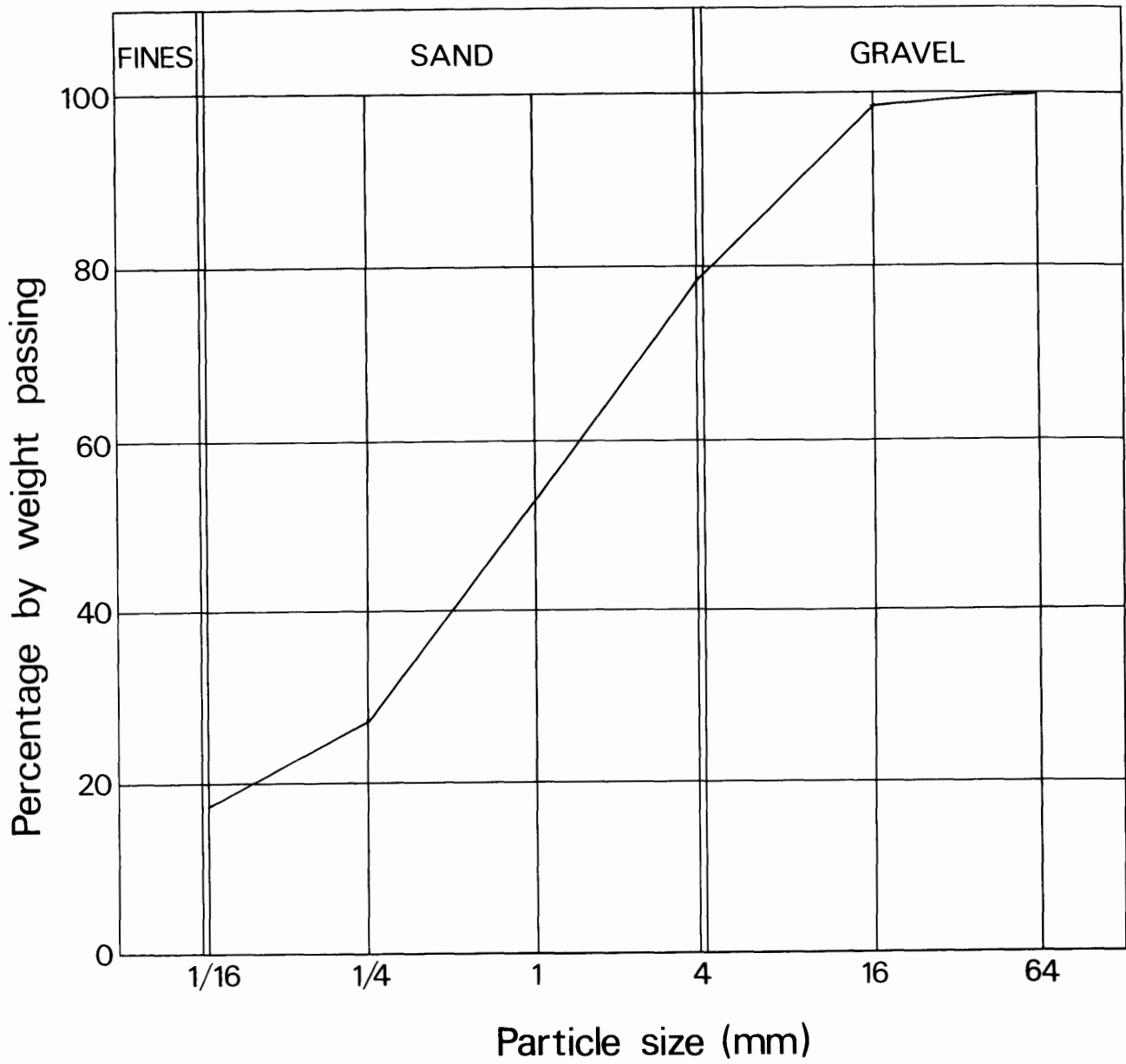


Figure 16 Grading characteristics of the resources within sub-block E₂ (based on one borehole).

Table 17 Sub-block F₁: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Over-burden	Mineral	Fines - $\frac{1}{8}$ mm	Fine sand + $\frac{1}{8}$ - $\frac{1}{4}$ mm	Medium sand + $\frac{1}{4}$ -1 mm	Coarse sand +1 -4 mm	Fine gravel +4 -16 mm	Coarse gravel +16 mm	
20 NE 14	1.4	3.2*	5	8	20	21	38	8	SG
20 SE 3	1.0	2.3†	5	4	23	21	42	5	SG
20 SE 4	0.4	3.8‡	11	7	22	15	32	13	CG
20 SE 5	1.3	3.8	5	5	20	25	35	10	SG
20 SE 6	1.5	3.1	5	8	21	20	37	9	SG
20 SE 7	1.2	4.1	4	4	27	25	36	4	SG
20 SE 8	0.9	5.5	3	5	24	20	39	9	SG
20 SE 10	0.9	3.1	9	9	28	15	30	9	SG
20 SE 15	2.6	2.3	6	3	18	22	43	8	G
20 SE 28	1.5	1.9	10	13	29	17	26	5	CSG
20 SW 143	0.7	1.2x	20	47	27	2	3	1	VCPS
20 SW 144	0.6	5.1	6	10	29	21	29	5	SG
20 SW 145	0.4	3.2	13	9	23	21	31	3	CSG
29 NE 33	2.0	1.3	9	7	15	25	33	11	SG
29 NW 226	0.6	3.8	11	11	22	14	29	13	CSG
29 NW 231	0.5	2.7	10	4	13	17	44	12	CG
Mean	1.1**	3.1**	8	8	23	19	34	8	SG

Key to abbreviations

C 'Clayey'

G Gravel

P Pebbly

S Sand/sandy

VC 'Very clayey'

* Sum of two beds separated by 1.4 m of waste.

† Sum of two beds separated by 2.3 m of waste.

‡ Sum of two beds separated by 1.4 m of waste.

x Sum of two beds separated by 0.3 m of waste.

** Based on data from 45 boreholes.

Table 18 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block F₁.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
20 NE 14	41	37	8	5	6	3
20 SE 3	No data available					
20 SE 4	No data available					
20 SE 5	No data available					
20 SE 6	No data available					
20 SE 7	No data available					
20 SE 8	No data available					
20 SE 10	39	47	6	3	4	1
20 SE 15	28	50	10	2	10	0
20 SE 28	No data available					
20 SW 143	7	56	5	20	10	2
20 SW 144	53	27	8	2	9	1
20 SW 145	No data available					
29 NE 33	No data available					
29 NW 226	30	42	6	9	11	2
29 NW 231	16	44	15	6	19	0
Mean	31	43	8	7	10	1

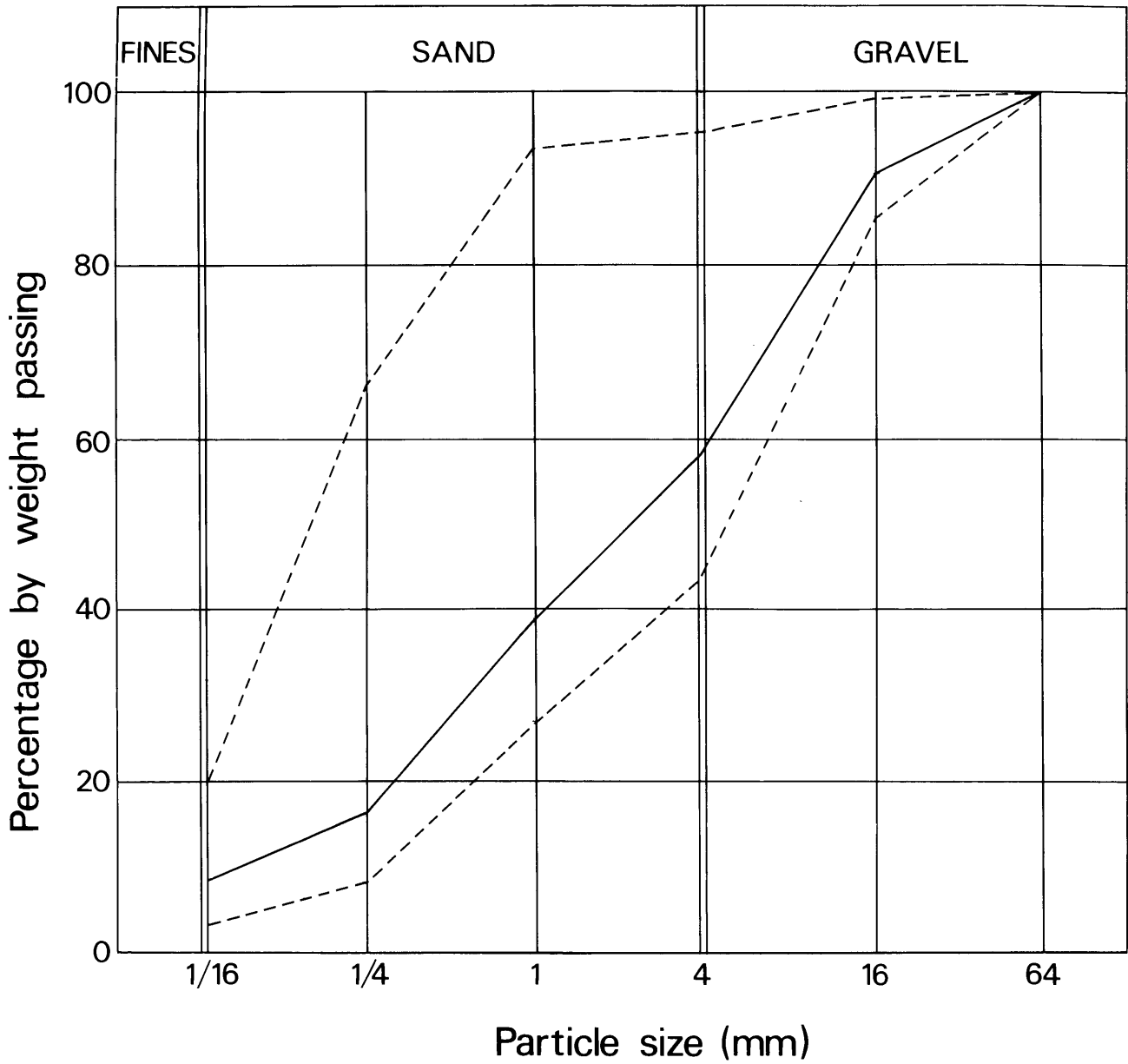


Figure 17 Grading characteristics of the resources within sub-block F₁ (based on 16 boreholes).
For explanation see Figure 11.

Table 19 Sub-block F₂: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Over-burden	Mineral	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 mm	
20 NW 8	2.0	0.5	21	37	29	5	7	1	VCPS
20 NW 12	0.5	2.1*	10	15	36	10	21	8	CSG
20 NW 17	1.3	1.3	16	11	45	23	1	4	CPS
20 NW 21	1.0	3.2	10	8	20	17	36	9	CSG
29 NW 242†	1.2	2.0	No data available						
29 SW 4	0.6	1.6	13	14	37	17	16	3	CPS
29 SW 6	1.0	(0.9)	23	11	24	15	23	4	VCPS
29 SW 8‡	1.3	2.0	No data available						
29 SW 9	Non-mineral								
29 SW 13‡	1.0	1.1	No data available						
29 SE 7‡	1.2	1.9	No data available						
29 SE 8‡	2.8	1.0	No data available						
29 SE 9	1.2	1.9	No data available						
29 SE 10‡	1.2	2.2	No data available						
29 SE 13‡	1.2	2.3	No data available						
29 SE 14‡	2.2	2.4	No data available						
Mean	1.2†	1.6†	13	13	31	15	22	6	CSG

Key to abbreviations

C 'Clayey'

G Gravel

P Pebbly

S Sand/sandy

VC 'Very clayey'

* Sum of two beds separated by 0.5 m of waste.

† Based on data from 16 boreholes.

‡ Minuteman borehole (see Appendix A).

Brackets show that the sand and gravel in the individual borehole do not meet the criteria (a) and/or (b) of the definition of mineral (see Introduction).

Table 20 Mean composition by weight of gravel (+4-64 mm) in IMAU boreholes in sub-block F₂.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
20 NW 8	38	40	3	0	19	0
20 NW 12	19	60	2	0	17	2
20 NW 17	43	34	1	6	15	1
20 NW 21	39	41	5	6	6	3
29 NW 242	51	30	9	3	3	4
29 SW 4	50	29	5	12	2	2
29 SW 6	57	26	5	7	3	2
29 SW 8	47	36	7	4	5	1
29 SW 9	Non-mineral					
29 SW 13	No data available					
29 SE 7	54	33	6	1	2	4
29 SE 8	43	24	13	9	7	4
29 SE 9	46	29	8	5	7	5
29 SE 10	63	25	6	1	2	3
29 SE 13	No data available					
29 SE 14	47	34	6	4	5	4
Mean	46	34	6	4	7	3

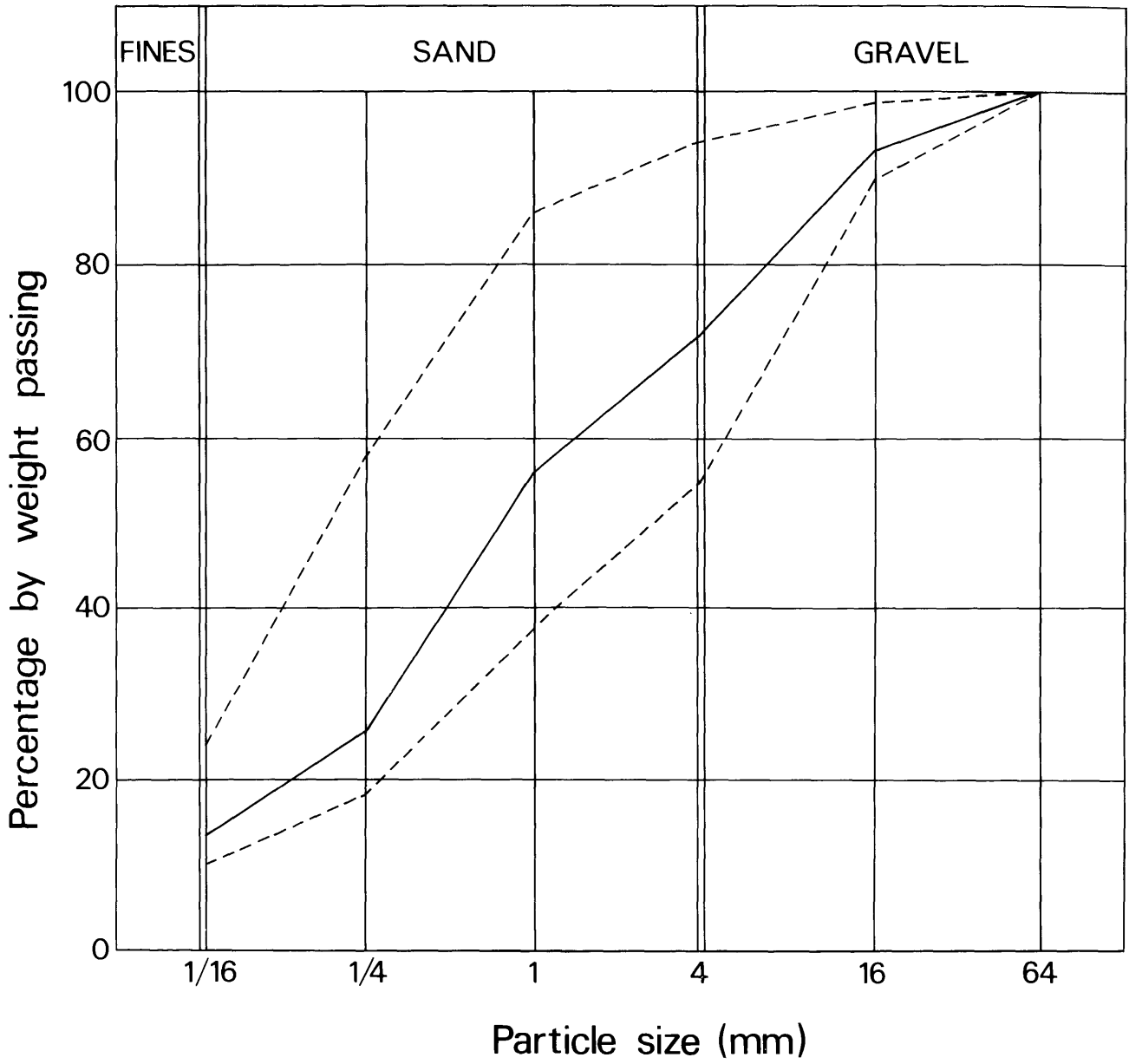


Figure 18 Grading characteristics of the resources within sub-block F₂ (based on six boreholes). For explanation see Figure 11.

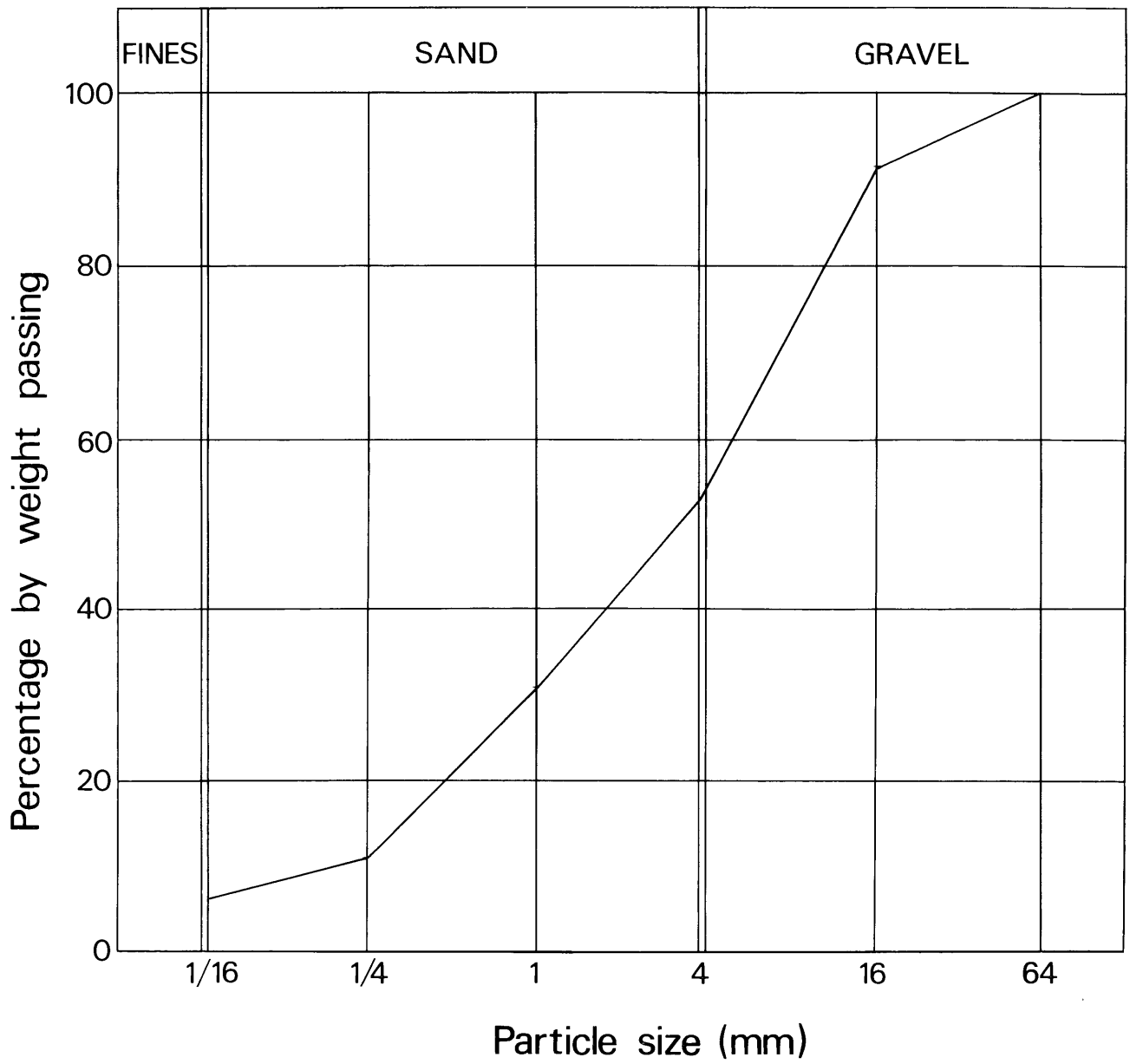


Figure 19 Grading characteristics of the resources within sub-block G₁ (based on one borehole).

Block F (including F₁ and F₂)

Block F, which includes all First Terrace deposits, is 22.9 km² in area, of which 21.8 km² is mineral-bearing. The remaining 1.1 km² comprises non-mineral areas, for example at [TF 244 076, TF 215 032 and TF 229 010] and worked-out ground (see Table 3 and Figure 9).

Although these First Terrace deposits are mapped as exposed terraces, for assessment purposes the ground has been subdivided into exposed mineral (5.0 km² in area around Northey Lodge [TL 238 985] and Park House [TL 227 934]) and continuous or almost continuous mineral beneath overburden elsewhere - excepting two very small barren areas at [TF 244 077] and at [TL 224 957].

The overburden comprises soil with either loamy sands, silts, sandy clays or clays with scattered pebbles. The bedrock is Oxford Clay.

The assessment is based on 32 IMAU boreholes and 29 others (of which 27 remain commercial-in-confidence). Two sub-blocks (F₁ and F₂) are distinguished, the former comprising the larger sand and gravel resource.

Sub-block F₁ This sub-block, which is 16.1 km² in area, is divided into two parts. The larger (13.7 km²) part is centred on Bar Pasture Farm [TF 253 025] and is assessed as continuous or almost continuous mineral beneath overburden. The other (2.4 km²) is exposed mineral and lies at the north-western tip of Whittlesey 'island'.

These two areas are currently worked for sand and gravel and up to June 1978, 0.6 and 0.4 km² of mineral, respectively, had been extracted (Table 3 and Figure 9).

The assessment is based on 16 IMAU boreholes and 29 others (of which 27 remain commercial-in-confidence).

The recorded thickness of overburden ranged from 0.3 to 3.0 m with a mean thickness of 1.1 m. The proven mineral ranged from 0.8 to 7.6 m thick with a mean thickness of 3.1 m. Mineral was not proved in two of the confidential boreholes.

The mineral ranged from 'very clayey' pebbly sand to gravel (Table 17, Figure 17). The gravel (+4-64 mm fraction) comprises angular to subangular flint (with a mean for the sub-block of 43 per cent) with oolitic and shelly limestone (31 per cent) and some quartzite (10 per cent), ironstone (8 per cent) and sandstone (7 per cent) (Table 18, Figure 5a).

The mean grading for the sub-block is gravel 42 per cent, sand 50 per cent and fines 8 per cent - with sandy gravel as the overall classification. The volume of mineral is estimated at 46.8 million m³ ± 22 per cent at the 95 per cent confidence level.

Sub-block F₂ This sub-block comprises six small irregular areas, five of which lie south of Whittlesey 'island' (see Figure 10). Individually, they range from 0.2 to 2.9 km² in area, with a total area of 6.7 km² (see Appendix B, para. 14); 3.8 km² of the sub-block is assessed as continuous or almost continuous mineral beneath overburden. The remaining area (2.9 km²), centred on Park House, is exposed mineral. The assessment is based on 16 IMAU boreholes.

The recorded thickness of overburden ranged from 0.5 to 2.8 m (in boreholes 20 NW 12 and 20 SE 8, respectively) with a mean thickness of 1.2 m. The proven mineral ranged from 0.5 to 3.2 m thick (in boreholes 20 NW 8 and 20 NW 21 respectively) with a mean thickness of 1.6 m. Mineral was not proved in borehole 29 SW 9.

The mineral ranged from 'very clayey' pebbly sand to 'clayey' sandy gravel (Table 19, Figure 18). The gravel (+4-64 mm fraction) comprises mainly oolitic and shelly limestone (with a mean for the sub-block of 46 per cent) with some angular and subangular flint (34 per cent) and minor amounts of quartzite (7 per cent), ironstone (6 per cent) and sandstone (4 per cent) (Table 20, Figure 5a).

The mean grading for the sub-block is gravel 28 per cent, sand 59 per cent and fines 13 per cent - with

'clayey' sandy gravel as the overall classification. The volume of mineral is estimated at 10.7 million m³ ± 34 per cent at the 95 per cent confidence level.

Block G (including sub-block G₁)

This block, the smallest in the area assessed, comprises Second Terrace deposits and is 0.4 km² in area of which 0.3 km² is exposed mineral (sub-block G₁). Approximately 0.1 km² of the mineral-bearing ground has been worked-out (see Table 3 and Figure 9) - and the underlying Oxford Clay has been sterilised by recent industrial development. An inferred assessment is based on one IMAU borehole and one other borehole.

The recorded thickness of overburden ranged from nil to 0.7 m with a mean thickness of 0.4 m; the proven mineral ranged from 0.9 to 2.3 m thick with a mean thickness of 1.6 m. The IMAU borehole proved mineral classified as gravel with 47 per cent gravel, 47 per cent sand and 6 per cent fines (Figure 19). In this borehole the gravel (+4-64 mm fraction) consisted mainly of oolitic and shelly limestone (45 per cent) with angular to subangular flint (31 per cent) and some ironstone (11 per cent), quartzite (7 per cent) and sandstone (5 per cent) (Figure 5b).

The estimated volume of mineral in this sub-block at the inferred level is 0.3 million m³.

Block H (including sub-block H₁)

This block, which includes all outcrops of the March Gravels, is 15.1 km² in area of which 11.7 km² is exposed mineral. The remaining 3.4 km² includes non-mineral areas (around Thorney and north of Eye Green) and 1.9 km² of worked ground (Table 3, Figure 9). At present, sand and gravel extraction has not been of primary importance as the major mineral resource is the underlying Oxford Clay bedrock.

The assessment is based on 22 IMAU boreholes and 23 others (of which 17 remain commercial-in-confidence); all but one (20 SE 19) occur within sub-block H₁.

Sub-block H₁ This sub-block comprises the gravel-capped 'islands' of Eye and Whittlesey and two smaller patches at [TF 275 082] and at [TL 294 972], the latter centred on Eastrea (see Figure 10).

The overburden, which is mainly soil with clay or sandy clay, has a recorded thickness of between 0.2 and 2.2 m (in boreholes 20 SW 149 and 20 NE 30, respectively) with a mean thickness of 0.7 m. The proven mineral ranged from 0.5 to 7.7 m thick (in boreholes 20 NE 48 and 20 SE 148, respectively) with a mean thickness of 2.0 m.

The mineral ranged from 'very clayey' sandy gravel to sandy gravel (Table 21, Figure 20). The gravel (+4-64 mm fraction) comprises mainly angular to subangular flint (with a mean for the sub-block of 50 per cent) with oolitic and shelly limestone (31 per cent) and minor amounts of quartzite (9 per cent), ironstone (6 per cent) and sandstone 3 per cent. The remaining one per cent consists almost entirely of shell fragments (Table 22, Figure 5a).

The mean grading for the sub-block is gravel 32 per cent, sand 56 per cent and fines 12 per cent - with 'clayey' sandy gravel as the overall classification. The volume of mineral is estimated at 23.4 million m³ ± 28 per cent at the 95 per cent confidence level.

Block I

Block I, with an area of 1.3 km², lies at the northern end of Greater Peterborough and comprises Third Terrace deposits.

Although these deposits contain up to 2.1 m of sand and gravel beneath overburden (proved in borehole 20 SW 99), the area is not assessed as mineral-bearing since most of the available borehole data (comprising 2 IMAU boreholes and 2 others) indicate that the terrace is

Table 21 Sub-block H₁: data from IMAU boreholes.

Borehole	Recorded thickness (m)		Mean grading percentage						Grading Classification
	Over-burden	Mineral	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 7	0.4	3.1	11	13	32	17	20	7	CSG
20 NE 8	1.2	1.9	14	16	35	15	18	2	CPS
20 NE 30*	2.2	2.3	No data available						
20 NW 27	Non-mineral								
20 NW 29	0.8	1.2	10	9	27	29	22	3	CSG
20 SW 135	0.3	1.0	9	36	25	8	15	7	PS
20 SW 148*	0.3	7.7	No data available						
20 SW 149*	0.2	2.6	No data available						
20 SW 150*	1.0	5.0	No data available						
20 SW 151*	0.7	2.8	No data available						
20 SW 152*	1.0	1.5	No data available						
20 SW 153*	0.5	6.8	No data available						
20 SW 154*	0.2	2.1	No data available						
29 NE 30	1.7	3.3	9	5	26	17	36	7	SG
29 NE 39	0.4	3.5	14	7	25	17	34	3	CSG
29 NE 42	0.2	2.0	10	20	30	18	18	4	CPS
29 NE 43	0.4	1.7	21	8	23	17	28	3	VCSG
29 NE 48	1.5	0.5	7	6	27	16	23	21	SG
29 NE 51	0.3	2.7	14	14	24	17	27	4	CSG
29 NE 52	0.7	1.8†	11	12	26	13	28	10	CSG
29 NW 232	1.2	1.1	15	9	17	15	40	4	CG
Mean	0.7‡	2.0‡	12	12	27	17	27	5	CSG

Key to abbreviations

C 'Clayey'

G Gravel

P Pebbly

S Sand/sandy

VC 'Very clayey'

* Minuteman borehole (see Appendix A)

† Sum of two beds separated by 0.5 m of waste

‡ Based on data from 44 boreholes

Table 22 Mean composition by weight of gravel (+4-64 mm fraction) in IMAU boreholes in sub-block H₁.

Borehole	Composition percentage					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
20 NE 7	41	48	5	2	4	0
20 NE 8	34	55	4	3	4	0
20 NE 30	No data available					
20 NW 27	Non-mineral					
20 NW 29	26	51	4	3	16	0
20 SW 135	31	36	4	12	16	1
20 SW 148	53	36	5	3	1	2
20 SE 149	No data available					
20 SW 150	No data available					
20 SW 151	No data available					
20 SW 152	No data available					
20 SW 153	No data available					
20 SW 154	No data available					
29 NE 30	38	45	4	1	7	5
29 NE 39	27	56	8	4	5	0
29 NE 42	No data available					
29 NE 43	15	70	6	0	9	0
29 NE 48	No data available					
29 NE 51	17	65	11	1	6	0
29 NE 52	No data available					
29 NW 232	26	40	7	0	26	1
Mean	31	50	6	3	9	1

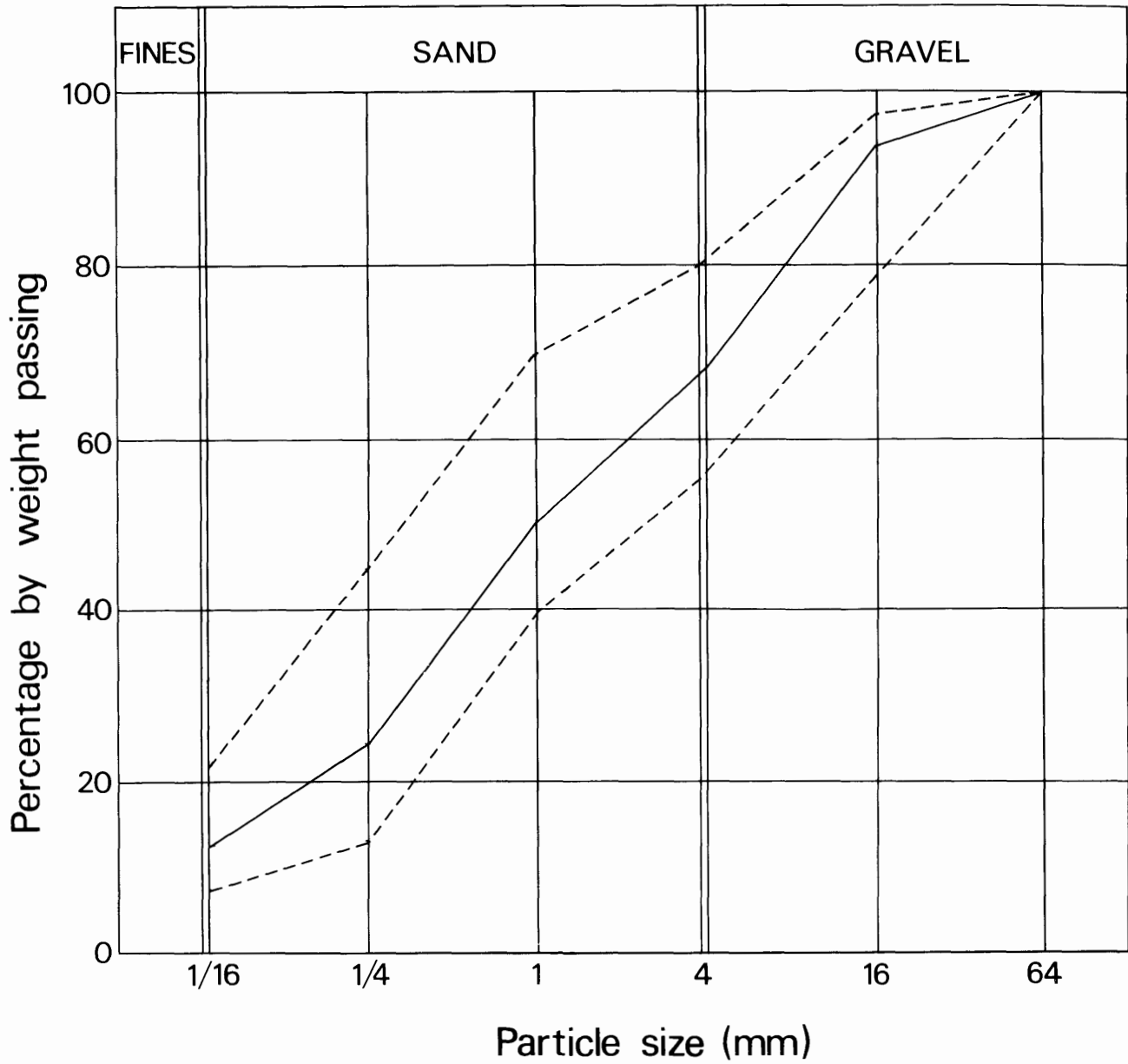


Figure 20 Grading characteristics of the resources within sub-block H₁ (based on 12 boreholes). For explanation, see Figure 11.

either of clay or of clayey pebbly sand less than 1 m thick.

An area of 0.4 km² has been worked for Oxford Clay at [TF 210 025] (Figure 9).

Block O

This omnibus block encloses outcrops of Boulder Clay, Glacial Lake Deposits, one small area of Glacial Sand and Gravel and Oxford Clay.

No borehole information is available and it is considered unlikely that there is potentially workable sand and gravel in the block.

CONCLUSIONS

The district around Whittlesey in Cambridgeshire is one of prime agricultural land (mainly drained Fenland) underlain in the north-eastern part by Boulder Clay and elsewhere by Oxford Clay. The main extractive industry is the digging of the Oxford Clay for brick-making; relatively little extraction of sand and gravel has taken place except between Eye and Whittlesey.

The most widespread gravel-bearing deposits in the district are the Pleistocene First and Second terraces of the proto-River Nene and their less extensive marine/estuarine facies, whereas Glacial Sand and Gravel crops out only in small areas south-east of Greater Peterborough.

The deposits (in part, formerly mapped as 'Fen Gravel') can be differentiated altimetrically into two divisions, both having a fluvial and a marine/estuarine facies. The mainly molluscan fauna is well preserved. The altimetrically higher gravels probably represent a westward extension of the March Gravels. IMAU boreholes indicate that the marine/estuarine facies of the 'lower' gravels are more extensive than hitherto known, although there are still insufficient data to map this facies precisely.

The terrace deposits, which are thickest (8.2 m) within localised scour channels, are poorly sorted and consist mainly of flint and limestone clasts; most of the flint is derived from a former and more widespread Boulder Clay cover which caps the higher ground beyond the western boundary of the resource sheet area. The limestone was derived from Jurassic rocks outcropping extensively to the west and south.

The major mineral-bearing deposits are those gravels of the Nene First Terrace which are mostly overlain by Flandrian sediments.

The thickness of the overburden in the central part of the resource sheet area increases towards the east and south, and, in the northern part, towards the north-east.

Whereas shrinkage and erosion has reduced the outcrop of the Nordelph Peat in the west of the district, the exposure of other deposits, for example, First Terrace river gravels, has substantially increased in an easterly

direction due to drainage schemes implemented mainly since 1750.

Data from IMAU boreholes have confirmed that the Tinwell-Marholm Fault extends 8 km eastwards from Peterborough to beyond Thorney.

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LIST OF ACTIVE SAND AND GRAVEL PITS (see also Figure 9)

Operator	Locality	Geological Formation	Grid Reference
Roade Aggregates Ltd Tel: Peterborough 222 255	Near Eyebury Farm, Eye	First Terrace (beneath overburden)	TF 235 015
Amey Roadstone Corporation Ltd Tel: Peterborough 222 592	North Bank, Peterborough	First Terrace	TL 240 985
Butterley Aggregates Ltd (RMC Group) Tel: Peterborough 203132	King's Dyke, Whittlesey	March Gravels	TL 250 970

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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.

In this report the mineral shown on the 1:25 000 sheet is divided into resource blocks and sub-blocks designated by a letter and subscript numbers, respectively. The block boundaries are determined by geological boundaries and each mineral-bearing formation is separately assessed.

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 rigs have proved to be almost ideal: these are described as 'percussion' rigs in the borehole logs.

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.

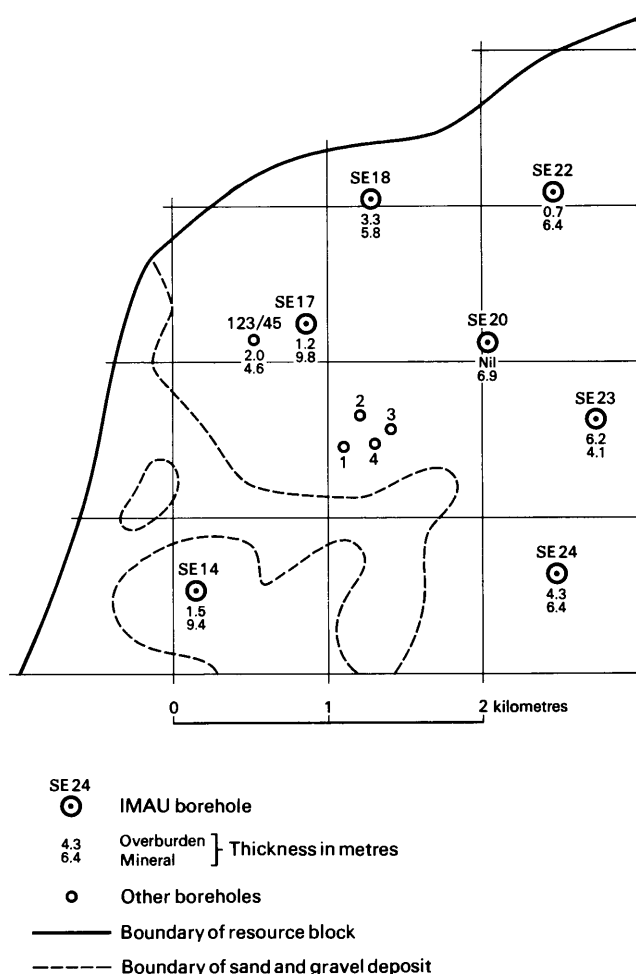
A continuous series of bulk samples is taken throughout the sand and gravel. Ideally samples are composed exclusively of the whole of the material encountered in the borehole between stated depths. However, care is taken to discard, as far as possible, material which has caved or has been pumped from 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.

In this survey further exploratory drilling was undertaken using a Minuteman power auger rig. This machine, which is small and portable (it will fit into the rear of a long wheelbase Landrover) may be operated by one person; its use is restricted to those occasions when access to land is not possible with shell rigs or when information is required quickly.

The auger tool comprises a continuous 'flight' 76 mm (3 in) auger; the use of this equipment, in addition to 'open hole' drilling methods, inevitably results in mixing and contamination of the sampled material. Thus, data relating to depth and particularly composition cannot be as accurately determined as with shell rigs. Therefore, in this report the Minuteman borehole logs do not show grading data; composition data when present are intended as a guide only.

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

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



Example of resource block assessment: map of a fictitious block

APPENDIX B

STATISTICAL PROCEDURE

Statistical assessment

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

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

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

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

4 The above relationship may be transposed such that

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

per cent,

and when n is greater than 20, as

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

per cent.

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

Inferred assessment

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

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

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

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

Block calculation

Scale: 1:25 000
Block: Fictitious

Area
Block: 11.08 km²
Mineral: 8.32 km²

Mean thickness
Overburden: 2.5 m
Mineral: 6.5 m

Volume
Overburden: 21 million m³
Mineral: 54 million m³

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

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

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

Calculation of confidence limits

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

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

$$n = 8$$

$$t = 2.365$$

L_y 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 'gravelly sand' when it contains more sand than gravel and there is at least 10 per cent of gravel, provided that there is less than 10 per cent of material finer than sand ($< \frac{1}{16}$ mm) and coarser than pebbles (> 64 mm in diameter). Because deposits containing more than 10 per cent fines are not embraced by this system, a modified binary classification based on Willman (1942) has been adopted.

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

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

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

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

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

For example, a deposit grading 51 per cent gravel, 34 per cent sand and 15 per cent fines is classified as 'clayey' gravel. This short description is included in the borehole log (see Appendix D)

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

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

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

Each bulk sample is described, subjectively, by a geologist at the borehole site. Subsequently, the descriptive categories of the mineral in each borehole are modified, where necessary, according to results obtained from the mean particle size analyses of these samples.

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, 1957), 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	Coarse	Gravel
16 mm	Pebble	Fine	
4 mm	Sand	Coarse	Sand
1 mm		Medium	
$\frac{1}{4}$ mm		Fine	
$\frac{1}{16}$ mm	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

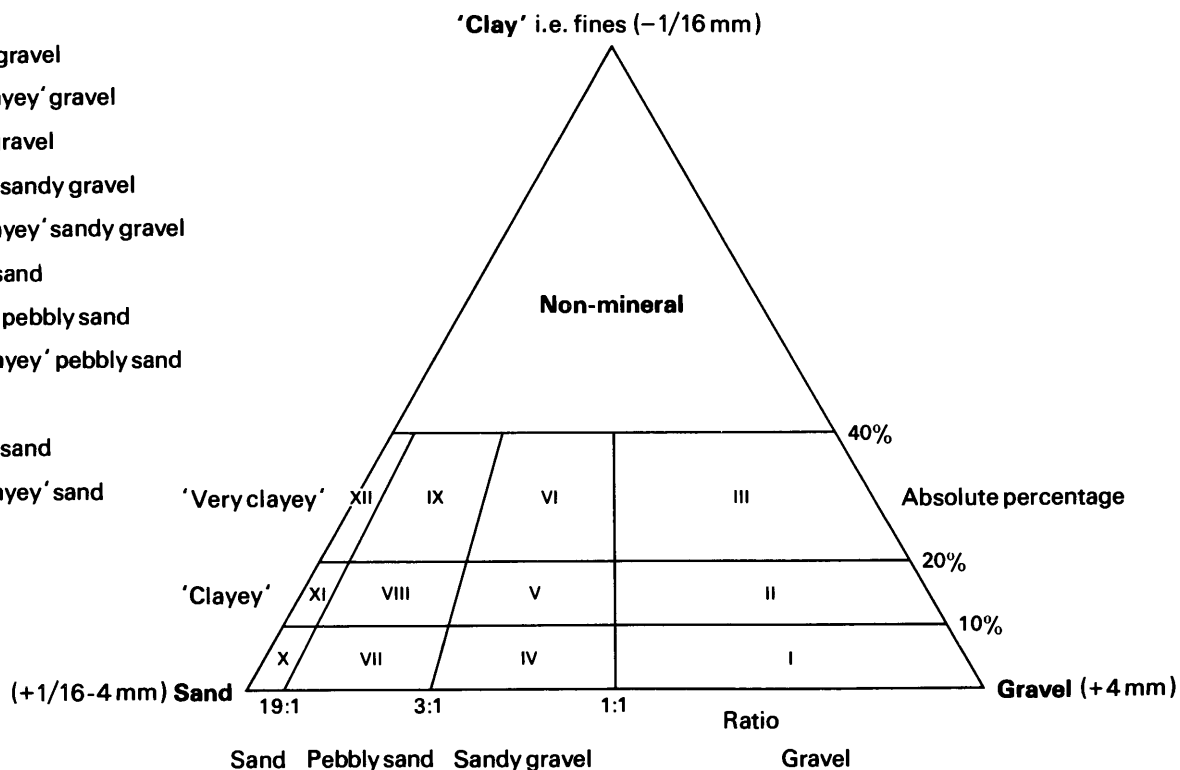


Diagram showing the descriptive categories used in the classification of sand and gravel

APPENDIX D

EXPLANATION OF THE BOREHOLE RECORDS

Annotated example

TF 20 SE 27 2981 0053 Green Drove, Bassenhally Moor¹

Sub-block D₁

Surface level (-0.4 m) -1.5 ft²
 Water struck at (-3.9 m)³
 152 mm percussion⁴
 January 1975⁴

Overburden 3.5 m
 Mineral 1.3 m
 Waste 0.4 m
 Mineral 1.2 m
 Waste 0.2 m
 Mineral 1.0 m
 Bedrock 1.1 m+⁵

LOG

Geological classification ⁶	Lithology ⁷	Thickness ⁸ Depth	
		m	m
	Soil, dark brown to black, peaty	0.4	0.4
Nordelph Peat	Peat, dark brown, silty	0.7	1.1
Barroway Drove Beds	Clay, soft, blue, with orange sandy patches	1.4	2.5
Lower Peat	Peat, black	1.0	3.5
River Terrace Deposits (First Terrace)	a Gravel Gravel: fine with some coarse, trace cobble, angular flint with oolitic and shelly limestone, sandstone, ironstone and some chalk Sand: medium and coarse with trace fine Fines: buff-grey	1.3	4.8
	Clay, alternate layers of firm, yellowish brown, sand with traces of gravel with softer, blue clay; with shell fragments	0.4	5.2
	b 'Clayey' gravel Gravel: fine to cobble Sand: medium and coarse with trace fine Fines: yellow	1.2	6.4
?Boulder Clay	Clay, stiff, mottled grey to dark grey, sandy, traces of flint and chalk gravel	0.2	6.6
?Glacial Sand and Gravel	c Sandy gravel Gravel: fine to coarse, trace cobble, flint, sandstone and ironstone, with bivalve shells Sand: coarse and medium, trace fine Fines: greyish buff	1.0	7.6
Oxford Clay	Clay, stiff, greenish blue, silty, selenite crystals throughout, occasional bivalve shell fragments	1.1+	8.7

GRADING⁹

	Mean for deposit percentages			Depth below surface (m)	percentages							
	Fines	Sand	Gravel		Fines				Gravel			
					- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	5	45	50	3.5-4.5	4	5	29	13	33	13	3	
				4.5-4.8	6	3	17	17	39	18	0	
				Mean	5	5	26	14	34	14	2	
				4.8-5.2	Waste							
b	15	34	51	5.2-6.4	15	3	16	15	36	9	6	
				6.4-6.6	Waste							
c	3	65	32	6.6-7.6	3	2	31	32	27	2	3	
a+b+c	6	46	48	Mean	6	3	23	20	34	11	3	

COMPOSITION¹⁰

Depth below surface (m)	percentages by weight in gravel (+4 -64 mm) fraction					
	Limestone including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
	No data available					

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

1 Location

The position of the borehole is generally referred to the nearest named locality on the 1:25 000 base map, followed by the resource block or sub-block in which it lies.

2 Surface level

The surface level at the borehole site is given in metres and feet above and below Ordnance Datum. Most height measurements were made in feet; their approximate conversions to metres above OD are given in brackets and vice versa.

3 Groundwater conditions

Four kinds of entry are made: the record indicates (1) the level at which the groundwater was struck (in metres above or below OD); or (2) that water was encountered but its level not recorded; or (3) that water was not struck; or (4) that no note of groundwater conditions was made.

4 Type of drill and date of drilling

Modified shell rigs and a portable Minuteman drill were used. The external diameter of the casing used, the type of machine and the month and year when the borehole was completed are stated.

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

6 Geological classification

The geological classification (Table 1) is given wherever possible.

7 Lithological description

When sand and gravel is recorded a general description based on the mean grading characteristics (for details see Appendix C) is followed by more detailed particulars of the gravel and/or sand and silt fraction. Where more than one mineral stratum is recognised, each is designated by a letter, for example, **a**, **b**, etc. The description of other deposits is based on visual examination in the field and, in some instances, laboratory inspection of special samples.

8 Thickness and depth

All drilling measurements were made in metres.

9 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 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 cobbles ($+64$ mm) are stated.

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

10 Composition of gravel (+4-64 mm fraction)

Details of the gravel composition of grouped samples from selected boreholes when available are given. However, the percentages shown are intended as a guide only and in this instance do not include any weighting factor (Appendix B, para. 15).

**APPENDIX E
INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLE RECORDS**

TF 20 NW 6 2080 0947 Ward's Farm, Welland Bank Sub-block D₃

Surface level (+1.9 m) +6ft
Water struck at (-1.7 m)
152 mm percussion
November 1975

Overburden 2.9 m
Mineral 1.6 m
Waste 0.6 m
Mineral 0.4 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown to black, peaty	0.6	0.6
Barroway Drove Beds	Clay, indurated, pale yellowish brown, with traces of flint gravel	0.7	1.3
	Clay, very soft to glutinous, greyish blue, with peat 'rafts'	1.6	2.9
River Terrace Deposits (First Terrace)	a 'Clayey' sand gravel Gravel: fine with trace coarse, limestone with subangular flint and quartzite with some ironstone and trace amounts of sandstone Sand: medium with fine and coarse, mainly quartz with some white flint Fines: pale greyish brown	1.6	4.5
	Clay, firm, bluish grey, silty	0.6	5.1
	b Gravel Gravel: fine with some coarse, subangular flint with limestone and quartzite Sand: coarse with fine and medium Fines: pale greyish brown	0.4	5.5
Oxford Clay	Clay, stiff grey mottled brown in upper 0.1 m, occasional calcareous pellets	0.7+	6.2

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}} - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
a	18	54	28	2.9-3.9	20	22	26	11	18	2	0
				3.9-4.5	13	9	15	22	32	9	0
				Mean	18	17	22	15	23	5	0
				4.5-5.1	Waste						
b	6	31	63	5.1-5.5	6	5	9	17	43	20	0
a+b	16	49	35	Mean	16	14	19	16	27	8	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.9-3.9	29	26	15	3	27	0

TF 20 NW 7 2058 0865 Willow Barn Farm, Willow Drove Block D

Surface level (+2.6 m) +8.5 ft
Water struck at (-0.6 m)
152 mm percussion
November 1975

Waste 3.7 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, well indurated upper layer, peaty	0.7	0.7
Nordelph Peat	Peat, dark brown to black	0.6	1.3
Barroway Drove Beds	Clay, very soft to glutinous, bluish grey, silty, gravelly towards base	1.8	3.1
River Terrace Deposits (First Terrace)	'Very clayey' pebbly sand Gravel: fine, flint with some limestone and quartzite and traces of ironstone Sand: fine and medium with coarse Fines: greyish brown	0.6	3.7
Oxford Clay	Clay, stiff, grey mottled brown in upper 0.3 m	0.9+	4.6

GRADING

Mean for deposit percentages	Depth below surface (m)	percentages								
		Fines	Sand	Gravel	Gravel					
		- $\frac{1}{8}$	+\mathbf{\frac{1}{8}} - \mathbf{\frac{1}{4}}	+\mathbf{\frac{1}{4}} - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
29	64	7	3.1-3.7	29	27	24	13	7	0	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.1-3.7	33	53	3	0	11	0

TF 20 NW 8 2057 0750 Mill Drove, Alderland Sub-block F₂

Surface level (+3.5 m) +11.5 ft
Water not struck
152 mm percussion
November 1975

Overburden 2.0 m
Mineral 0.5 m
Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, dark greyish brown with brick fragments overlying concrete rubble	1.0	1.0
Nordelph Peat	Clay, dark brown, peaty	0.2	1.2

River Terrace Deposits (First Terrace)	Clay, yellowish brown to grey, variegated, sandy in parts	0.8	2.0
	'Very clayey' pebbly sand	0.5	2.5
	Gravel: trace, fine with coarse		
	Sand: fine with medium and trace coarse, well rounded quartz		
	Fines: greyish brown		
Oxford Clay	Clay, stiff, mottled grey to yellowish brown becoming predominantly bluish grey, many selenite crystals	1.4+	3.9

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	
21	71	8	2.0-2.5	21	37	29	5	7	1	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.0-2.5	38	40	3	0	19	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	
25	67	8	2.6-3.9	25	35	25	7	8	0	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.6-3.9	37	38	4	0	21	0

TF 20 NW 10 2052 0533 Middle Road, Newborough

Block D

Surface level (+1.8 m) +6 ft
Water not struck
152 mm percussion
January 1976

Waste 4.0 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark greyish brown	0.4	0.4
Nordelph Peat	Peat, friable, dark brown to black	0.7	1.1
Barroway Drove Beds	Clay, soft to glutinous, grey, with much peaty material	1.0	2.1
Lower Peat	Peat, friable, dark brown to black	0.4	2.5
River Terrace Deposits (First Terrace)	Clay, soft to firm, khaki-yellow mottled with pale grey becoming predominantly grey below 2.9 m, sandy in upper 0.4 m and below 3.8 m otherwise silty	1.5	4.0
Oxford Clay	Clay, firm to stiff, greyish brown, abundant shell fragments towards base	1.6+	5.6

49

TF 20 NW 9	2046 0662	Willow Drove, Borough Fen	Sub-block D ₃		
Surface level (+2.0 m) +6.5 ft Water struck at (-1.2 m) 152 mm percussion November 1975			Overburden 2.6 m Mineral 1.3 m Bedrock 0.5 m+		
LOG		Geological classification	Lithology	Thickness m	Depth m
			Soil, dark brown, peaty	0.4	0.4
		Nordelph Peat	Peat, dark brown to black	0.2	0.6
		Barroway Drove Beds	Clay, very soft to glutinous, bluish grey, silty, pebbly at base	2.0	2.6
		River Terrace Deposits (First Terrace)	'Very clayey' pebbly sand Gravel: fine, mainly flint and limestone with some quartzite and traces of ironstone Sand: fine and medium with some coarse; mainly quartz Fines: orange-brown mottled pale brown	1.3	3.9
		Oxford Clay	Clay, very stiff, grey	0.5+	4.4

TF 20 NW 11 2140 0946 Crowland High Wash Block A
 Surface level (+4.2 m) +14 ft
 Water struck at (-0.3 m)
 152 mm percussion
 November 1975
 Waste 5.3 m
 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil dark brown	0.2	0.2
Alluvium	Clay, pale grey mottled with orange-brown silty	1.1	1.3
Nordelph Peat	Peat, dark grey to black	1.7	3.0
Barroway Drove Beds	Clay, soft to glutinous, dark grey, silty, with peaty layer between 4.2 and 4.3 m	1.5	4.5
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with trace coarse, tabular limestone with angular to subangular, brown and white flint, with quartzite and ironstone Sand: coarse and fine with some medium Fines: greyish brown	0.8	5.3
Oxford Clay	Clay, stiff becoming very stiff below 5.9 m, mottled brown with grey in upper 0.6 m, then grey, sandy between 5.7 and 5.9 m, traces of fossil fragments from 5.9 m to base	1.5+	6.8

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
			- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
4	44	52	4.5-5.3	4	16	9	19	46	6	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.5-5.3	38	37	7	0	18	0

TF NW 12 2142 0817 East of The Willows, Borough Fen Sub-block F₂
 Surface level (+3.1 m) +10 ft
 Water struck at (+0.3 m)
 152 mm percussion
 November 1975
 Overburden 0.5 m
 Mineral 1.8 m
 Waste 0.5 m
 Mineral 0.3 m
 Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, with brick and stone rubble	0.5	0.5
River Terrace Deposits (First Terrace)	a 'Clayey' sandy gravel Gravel: fine with some coarse, mainly white and brown, angular to subangular flint with some limestone and quartzite and traces of ironstone Sand: medium with fine and coarse, quartz Fines: dark orange-brown	1.8	2.3
	Clay, stiff, variegated khaki-brown to grey, with occasional orange-brown oxidised patches	0.5	2.8
	b 'Clayey' sandy gravel - as above	0.3	3.1
Oxford Clay	Clay, stiff, grey mottled khaki in upper 0.5 m, occasional black, phosphatic nodules throughout, silty, traces of fossil fragments e.g. a corroded belemnite guard and a complete <u>Gryphaea</u>	2.1+	5.2

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages							
Fines	Sand	Gravel		Fines	Sand		Gravel				
			- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1 -4	+4 -16	+16 -64	+64 mm		
a	10	61	29	0.5-1.5	10	13	40	9	19	9	0
				1.5-2.3	11	18	31	11	23	7	0
				Mean	10	15	36	10	21	8	0
				2.3-2.8	Waste						
b	No data available			2.8-3.1	No data available						

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction						
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others	
a	0.5-2.3	19	60	2	0	17	2

TF 20 NW 13 2153 0727 East of The Avenue Farm, Borough Fen

Block E

Surface level (+1.6 m) +5 ft
Water struck at (-1.6 m and -2.1 m)
152 mm percussion
November 1975

Waste 4.0 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black	0.3	0.3
Nordelph Peat	Peat, dark brown to black	0.2	0.5
Barroway Drove Beds	Clay, very soft to glutinous, variegated grey with yellow and beige, becoming bluish grey, silty	2.1	2.6
Lower Peat	Peat, dark brown to black	0.4	3.0
River Terrace Deposits (First Terrace)	Clay, soft becoming stiff, dark grey with orange-brown, with patches of sand and subrounded flint pebbles	1.0	4.0
Oxford Clay	Clay, very stiff, pale khaki becoming bluish grey, traces of flint pebbles in upper 0.4 m, shell fragments towards base	1.0+	5.0

TF 20 NW 14 2139 0640 Crowtree Farm, Borough Fen

Sub-block D₃

Surface level (+0.9 m) +3 ft
Water not struck
152 mm percussion
November 1975

Overburden 2.2 m
Mineral 1.1 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty passes into peaty silt	1.1	1.1
Barroway Drove Beds	Clay, mottled grey to dark brown, many oxidised patches, silty, many white shell fragments	1.1	2.2
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine with trace coarse, limestone and flint with quartzite, some ironstone and traces of sandstone Sand: medium with coarse and fine, mainly quartz Fines: pale yellowish brown	1.1	3.3
Oxford Clay	Clay, stiff, brown in upper 0.2 m becoming grey, silty, with traces of fossil fragments at base	0.8+	4.1

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{4}$	+\mathcal{K}-\frac{1}{4}	+\mathcal{K}-1	+1-4	+4-16	+16-64	+64 mm
10	57	33	2.2-3.3	10	12	27	18	31	2	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.2-3.3	39	31	7	3	20	0

TF 20 NW 15 2137 0560

Northwest of Culpin's Farm, Newborough

Sub-block D₃

Surface level (+0.9 m) +3 ft
Water struck at (-2.9 m)
152 mm percussion
November 1975

Overburden 3.6 m
Mineral 0.9 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty	0.8	0.8
Barroway Drove Beds	Clay, soft to glutinous, greyish blue, silty	2.2	3.0
Lower Peat	Peat, dark brown to black	0.4	3.4
Barroway Drove Beds	Clay, soft, bluish grey to dark brown, sandy with some gravel	0.2	3.6
River Terrace Deposits (First Terrace)	'Clayey' pebbly sand Gravel: fine with trace coarse, mainly limestone with subangular to subrounded flint and same quartzite with traces of ironstone Sand: medium with some coarse and fine, mainly quartz Fines: dark greyish brown	0.9	4.5
Oxford Clay	Clay, stiff, brown in upper 0.2 m becoming greyish blue, silty, traces of fossil fragments	0.7+	5.2

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{4}$	+\mathcal{K}-\frac{1}{4}	+\mathcal{K}-1	+1-4	+4-16	+16-64	+64 mm
16	60	24	3.6-4.5	16	7	40	13	23	1	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.6-4.5	52	29	3	0	15	1

TF 20 NW 16 2239 0994 Middle Road, Crowland High Wash

Surface level (+4.0 m) +13 ft
Water struck at (-0.1 m)
152 mm percussion
November 1975

Block A

Waste 6.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark greyish brown to fawn, with shell fragments	0.2	0.2
Alluvium	Clay, dark grey, silty, becoming sandy below 0.9 m	1.1	1.3
Nordelph Peat	Peat, dark grey to black, with wood fragments	1.2	2.5
Barroway Drove Beds	Clay, very soft to glutinous, bluish grey, becoming slightly sandy and pebbly below 5.6 m	3.6	6.1
River Terrace Deposits (First Terrace)	Clay, stiff, pale grey mottled khaki to orange-brown, with sandy patches	0.7	6.8
Oxford Clay	Clay, stiff, grey, silty, with traces of shell fragments	1.2+	8.0

TF 20 NW 17 2273 0872 Wright's Drove, near Crowland

Surface level (+1.7 m) 5.5 ft
Water struck at (-0.3 m)
152 mm percussion
November 1975

Sub-block F₂

Overburden 1.3 m
Mineral 1.3 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Ditch material overlying brown to black peaty soil	0.5	0.5
River Terrace Deposits (First Terrace)	Clay, fairly stiff, dark orange-brown, silty, flint gravel at base	0.8	1.3
	'Clayey' pebbly sand Gravel: traces only, coarse with fine, limestone and angular to subangular flint with quartzite and some sandstone, traces of ironstone Sand: medium with some coarse and fine, mainly quartz with some flint Fines: orange-brown	1.3	2.6
Oxford Clay	Clay, stiff, grey, with many Gryphaea fragments in weathered upper 0.4 m	1.3+	3.9

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
16	79	5	1.3-2.6	16	11	45	23	1	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.3-2.6	43	34	1	6	15	1

TF 20 NW 18 2264 0711 Pepperpot Farm, Borough Fen

Surface level (+0.8 m) +2.5 ft
Water not struck
152 mm percussion
April 1976

Block E

Waste 2.2 m
Bedrock 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, peaty	0.9	0.9
Barroway Drove Beds	Clay, very soft to glutinous, mottled dark grey with bluish grey and pale yellow some fine quartz sand	1.3	2.2
Oxford Clay	Clay, firm to stiff, mottled pale khaki brown to pale bluish grey, with 'trails' of selemite crystals and traces of fossil fragments	2.8+	5.0

TF 20 NW 19 2251 0620 Near Flood Farm, Borough Fen

Surface level (+0.8 m) + 2.5 ft
Water not struck
152 mm percussion
November 1975

Block E

Waste 5.6 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, black, peaty	0.4	0.4
Barroway Drove Beds (?Roddon)	Silt, laminated pale grey to fawn, with reddish brown clay intercalations	1.3	1.7
Barroway Drove Beds	Clay, soft to glutinous, bluish grey mottled reddish brown, with occasional plant rootlets in upper 0.5 m	3.9	5.6
Oxford Clay	Clay, stiff, grey, silty	0.5+	6.1

TF 20 NW 20 2254 0553 Fletcher's Farm, Newborough

Block E

Surface level (+1.1 m) +3.5 ft
Water not struck
152 mm percussion
November 1975

Waste 1.9 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.5	0.5
?Lower Peat	Peat, dark brown to black	0.2	0.7
?River Terrace Deposits (?First Terrace)	Clay, mottled yellow with grey, sandy with traces of white flint gravel	1.2	1.9
Oxford Clay	Clay, grey mottled brown, with corroded selenite crystals and traces of belemnite fragments	1.1+	3.0

TF 20 NW 21 2364 0964 Crease Drove, near Crowland

Sub-block F2

Surface level (+2.2 m) +7 ft
Water struck at (+0.2 m)
152 mm percussion
November 1975

Overburden 1.0 m
Mineral 3.2 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, peaty	0.4	0.4
River Terrace Deposits (First Terrace)	Clay, dark brown to pale orange-brown, silty	0.6	1.0
	'Clayey' sandy gravel Gravel: fine with some coarse, trace cobble between 3.0 and 4.2 m, angular to subangular flint with subrounded, tabular limestone and traces of quartzite, sandstone and ironstone Sand: medium and coarse with some fine Fines: brown to greyish brown	3.2	4.2
Oxford Clay	Clay, stiff, grey, silty	0.5+	4.7

GRADING

Mean for deposit percentages	Depth below surface (m)	percentages								
		Fines			Sand			Gravel		
		-k	+k - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
10	45	45	1.0-2.0	14	16	25	13	26	7	0
			2.0-3.0	12	6	16	18	41	9	0
			3.0-4.2	4	3	19	21	42	10	1
			Mean	10	8	20	17	36	9	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.0-4.2	39	41	5	6	6	3

TF 20 NW 22 2371 0849 Kennulph's Drove, near Crowland

Block D

Surface level (+0.7 m) +2.5 ft
Water struck at (-2.6 m)
152 mm percussion
November 1976

Waste 4.1 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, block, peaty	0.2	0.2
Nordelph Peat	Peat, friable, dark brown to black	1.0	1.2
Barroway Drove Beds	Clay, very soft to glutinous, bluish grey	1.6	2.8
Lower Peat	Peat, dark brown to black	0.4	3.2
River Terrace Deposits (First Terrace)	Clay, grey, greenish grey with black alternations with silt layers, peat and wood fragments common	0.9	4.1
Oxford Clay	Clay, stiff, grey, silty, with pyritised modules	0.8+	4.9

TF 20 NW 23 2348 0744 Fern House, Borough Fen

Block E

Surface level (+0.7 m) +2.5 ft
Water not struck
152 mm percussion
November 1975

Waste 3.5 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
?Nordelph Peat	Soil, dark brown to black, peaty, becomes clayey towards base	1.4	1.4
Barroway Drove Beds	Clay, very soft to glutinous, bluish grey, silty, abundant wood fragments in upper 0.7 m	2.1	3.5
Oxford Clay	Clay, stiff, mottled brown with grey, many patches of corroded selenite crystals, occasional fossil shell fragments	0.7+	4.2

TF 20 NW 24 2363 0664 Hill Farm, Borough Fen

Block E

Surface level (+0.6 m) +2 ft
Water not struck
152 mm percussion
November 1975

Waste 3.0 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty, becoming clayey with white, calcareous patches below 0.2 m to base	0.5	0.5
Barroway Drove Beds	Clay, stiff, variegated greyish khaki to pale brown, with rust patches	0.5	1.0
Lower Peat	Peat, dark brown, silty, with wood fragments	0.2	1.2
River Terrace Deposits (First Terrace)	'Very clayey' pebbly sand Gravel: traces only, fine to coarse, mainly flint with some quartzite and limestone with traces of ironstone and sandstone Sand: fine and medium with trace coarse, mainly quartz Fines: orange-brown mottled with pale greyish fawn	1.0	2.2
	Clay, pale yellowish grey sandy, in places, with occasional pebbles of flint, limestone and ironstone	0.8	3.0
Oxford Clay	Clay, very stiff, mottled greyish brown to orange-brown in upper 0.9 m becoming greyish blue, with traces of shell fragments	1.8+	4.8

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
35	61	4	1.2-2.2	35	36	22	3	3	1	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-2.2	16	56	2	3	18	5

TF 20 NW 25 2354 0545 Near Hurn Farm, Newborough

Block E

Surface level (+0.9 m) +3 ft
Water Struck at (-2.3 m)
152 mm percussion
November 1975

Waste 3.2 m
Bedrock 4.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, very stiff, clayey, mottled khaki brown brown to pale bluish grey, occasional peaty pockets	1.5	1.5
?Nordenph Peat	Peat, dark grey, silty	0.2	1.7
?Barroway Drove Beds/River Terrace Deposits (First Terrace)	Clay, soft, pale brown to grey, with much fine to medium grained quartz sand, occasional isolated ironstained patches	1.5	3.2
Oxford Clay	Clay, very stiff, dark grey to khaki-grey traces of selenite crystals below 6.5 m with shell fragments below 7.0 m	4.4+	7.6

TF 20 NW 26 2482 0913 Green Bank, near Crowland

Block E

Surface level (+1.9 m) +6 ft
Water struck at (-3.0 m)
152 mm percussion
April 1976

Waste 4.3 m
Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark greyish brown to chocolate brown, silty, clayey towards base, with peaty material	1.0	1.0
Barroway Drove Beds	Clay, very soft to glutinous, brown mottled with pale grey becoming pale grey below 1.9 m, silty	3.3	4.3
Oxford Clay	Clay, firm to stiff, grey, sandy between 4.9 and 5.1 m, traces of shell fragments	1.5+	5.8

TF 20 NW 27 2440 0722 Gray's Farm, Borough Fen Sub-block H₁
 Surface level (+1.0 m) +3.5 ft
 Water not struck
 152 mm percussion
 November 1975
 Waste 0.9 m
 Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Marine/Estuarine Deposits March Gravels	Soil Clay, indurated, grey mottled brown, sandy with some flint gravel	0.4 0.5	0.4 0.9
Oxford Clay	Clay, stiff to very well indurated, grey to brown, corroded selenite crystals in upper 1.2 m	1.8+	2.7

TF 20 NW 28 2443 0647 Hill Farm, Borough Fen Block E
 Surface level (+2.8 m) +9 ft
 Water not struck
 152 mm percussion
 November 1975
 Waste 0.7 m
 Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, black and peaty, becomes very well indurated, pale grey to orange-brown clay below 0.4 m	0.7	0.7
Oxford Clay	Clay, very stiff, dark grey, with corroded selenite crystals and traces of fossil fragments	2.3+	3.0

TF 20 NW 29 2466 0565 Powder Blue Farm, Borough Fen Sub-block H₁
 Surface level (+3.0 m) +10 ft
 Water struck at (+1.5 m)
 152 mm percussion
 November 1975
 Waste 0.8 m
 Mineral 1.2 m
 Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty, passes into silty clay with some sand	0.8	0.8
March Gravels	'Clayey' sandy gravel Gravel: fine with trace coarse, mainly angular to subangular flint with some limestone and quartzite and traces of ironstone and sandstone Sand: medium and coarse with some fine, quartz, flint and ironstone Fines: orange-brown	1.2	2.0
Oxford Clay	Clay, variegated khaki to bluish grey, with corroded selenite crystals and belemnite fragments	1.4+	3.4

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
10	65	25	0.8-2.0	10	9	27	29	22	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.8-2.0	26	51	4	3	16	0

TF 20 NW 30 2192 0920 Mill Drove, near Crowland

Surface level: No data available
Water level not recorded
76 mm Minuteman
October 1977

Block D

Waste 3.2 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Peat, dark brown to black, with greenish grey clayey layers	0.7	0.7
Barroway Drove Beds	Silt, soft to firm, glutinous below 1.2 m, variegated greenish grey to reddish brown, micaceous, with much organic material	2.5	3.2
Oxford Clay	Clay, mottled pale green to grey with orange-brown, calcareous, abundant shell fragments and selenite crystals	1.8+	5.0

TF 20 NW 31 2269 0942 Mill Drove, near Crowland

Surface level: No data available
Water level not recorded
76 mm Minuteman
October 1977

Block D

Waste 2.3 m
Bedrock 2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Peat, reddish brown becoming dark grey to black	0.9	0.9
River Terrace Deposits (First Terrace)	Sandy gravel, mainly angular to subangular flint with some coarse and medium sand Clay, mottled grey to pale yellow and white, with medium to fine - grained sand pockets	0.4 0.8	1.5 2.3
Oxford Clay	Clay, firm to stiff, dark grey to bluish grey, many shell fragments	2.2+	4.5

TF 20 NE 5 2574 0951 Sheppard's Drove, near Crowland

Surface level (+1.1 m) +3.5 ft
Water struck at (-0.7 m)
152 mm percussion
December 1975

Sub-block E1

Waste 1.7 m
Mineral 0.8 m
Waste 2.8 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown	0.4	0.4
Barroway Drove Beds	Clay, stiff, chocolate-brown mottled dark reddish brown in occasional iron-stained patches, trace white, calcareous patches throughout	1.3	1.7
River Terrace Deposits (First Terrace)	'Clayey' pebbly sand Gravel: fine with trace coarse, mostly angular flint with some limestone, trace amounts of quartzite, sandstone and ironstone Sand: medium and coarse with fine, quartz with some ironstone and white flint Fines: yellow to greyish brown	0.8	2.5
Boulder Clay	Clay, stiff, brown mottled with dark grey, with abundant chalk race and occasional subangular to subrounded white to brown flint gravel	2.8	5.3
Oxford Clay	Clay, stiff, bluish grey, trace ammonite remains	1.0+	6.3

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages							
Fines	Sand	Gravel		Fines	Sand	Gravel					
				-10	+10 -1	+1 -1	+1 -4	+4 -16	+16 -64	+64 mm	
14	71	15	1.7-2.5	14	11	38	22	14	1	0	

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.7-2.5	16	71	1	1	5	6

TF 20 NE 6 2552 0849 Near The Engine, Bonnett's Pieces Sub-block E₁

Surface level (+1.5 m) +5 ft
 Water struck at (-2.3 m)
 152 mm percussion
 December 1975

Overburden 3.8 m
 Mineral 1.4 m
 Bedrock 15 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown	0.3	0.3
Barroway Drove Beds	Silt, firm, greyish brown mottled dark orange-red, with flint pebbles	1.4	1.7
	Clay, glutinous, bluish grey, silty, some silt patches, sandy towards base	2.1	3.8
River Terrace Deposits (First Terrace)	'Clayey' pebbly sand Gravel: fine with trace coarse, mainly angular to subangular white and brown flint with some limestone and quartzite, traces of sandstone and ironstone Sand: mainly fine with some medium and trace coarse, quartz, ironstone with some white flint Fines: greyish brown	1.4	5.2
Oxford Clay	Clay, stiff, grey mottled brown to khaki-brown, with pockets of selenite crystals below 5.9 m	1.5+	6.7

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	
12	79	9	3.8-5.2	12	47	27	5	8	1	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.8-5.2	15	75	1	2	6	1

TF 20 NE 7 2579 0745 St. Vincent's Cross, Singlesole Drove Sub-block H₁

Surface level (+1.5 m) +5 ft
 Water struck at O.D.
 152 mm percussion
 December 1975

Overburden 0.4 m
 Mineral 3.1 m
 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
March Gravels	'Clayey' sandy gravel Gravel: mainly fine with some coarse, angular to subangular flint and subrounded limestone with trace amounts of ironstone, quartzite and sandstone Sand: medium with coarse and fine, quartz and flint Fines: orange-brown to greyish brown	3.1	3.5
Oxford Clay	Clay, grey to greyish brown, silty, occasional flint pebbles in upper 0.3 m, trace shell fragments and pyritic concretions below 3.8 m	1.5+	5.0

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	
11	62	27	0.4-1.4	9	14	36	19	20	2	0
			1.4-2.4	19	17	29	18	18	4	0
			2.4-3.5	5	14	31	15	21	14	0
			Mean	11	13	32	17	20	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.4-3.5	41	48	5	2	4	0

TF 20 NE 8 **2523 0674** **Near Singlesole Farm, St. Vincent's Cross** **Sub-block H₁**

Surface level (+3.0 m) +10 ft
 Water struck at (+0.7 m)
 152 mm percussion
 December 1975

Overburden 1.2 m
 Mineral 1.9 m
 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.5	0.5
Barroway Drove Beds	Silt, firm, yellowish grey mottled orange brown, becoming clayey sand below 0.9 m with trace flint and ironstone gravel	0.7	1.2
March Gravels	'Clayey' pebbly sand Gravel: fine with trace, white and brown angular to subangular flint with limestone and trace amounts of quartzite, ironstone and sandstone Sand: medium with fine and coarse, quartz, ironstone and flint Fines: grey to yellowish brown	1.9	3.1
Oxford Clay	Clay, stiff, bluish grey, occasional fossil fragments	0.5+	3.6

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
14	66	20	1.2-2.2	15	18	23	17	24	3	0
			2.2-3.1	14	13	48	12	11	1	0
			Mean	14	16	35	15	18	2	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-3.1	34	55	4	3	4	0

TF 20 NE 9 **2541 0554** **Buke Horn Toll Farm, Little Tower's Fen** **Sub-block D₃**

Surface level (+1.5 m) + 5 ft
 Water not struck
 152 mm percussion
 January 1976

Overburden 1.4 m
 Mineral 1.7 m
 Bedrock 3.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown	0.3	0.3
Nordelph Peat	Peat, dark brown	0.4	0.7
Barroway Drove Beds	Clay, pale grey mottled orange-red silty	0.7	1.4
River Terrace Deposits (First Terrace)	'Very clayey' pebbly sand Gravel: trace oily, fine, angular flint with limestone Sand: fine with medium and some coarse, quartz and flint Fines: pale brown to orange-brown	1.7	3.1
Oxford Clay	Clay, soft becoming stiff below 4.0 m, predominantly grey mottled orange-brown to fawn in upper 1.9 m traces of ammonite, belemnite and <u>Gryphaea</u>	3.3+	6.4

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
39	55	6	1.4-3.1	39	30	18	7	6	0	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.4-3.1	38	42	4	5	8	3

TF 20 NE 10 2675 0936 Empson's Farm, formerly Green Lodge, Crowland

Block E

Surface level (+3.0 m) +10 ft
 Water struck at (-0.4 m and at -3.9 m)
 152 mm percussion
 December 1975

Waste 8.2 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown	0.2	0.2
Barroway Drove Beds	Silt, firm to soft below 2.8 m, greyish fawn mottled dark orange-brown becoming dark grey to bluish grey, becomes clayey below 2.8 m, micaceous	5.5	5.7
River Terrace Deposits (First Terrace)	Clay, firm, grey mottled pale yellowish brown; trace angular to subangular brown flint gravel between 6.9 and 7.1 m, sandy	2.1	7.8
?Boulder Clay	Clay, grey mottled orange-brown with trace small chalk race	0.4	8.2
Oxford Clay	Clay, firm to stiff, pale greyish brown becoming grey below 8.5 m, silty, with many fossil fragments	0.8+	9.0

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
39	49	12	6.9-7.1	39	16	22	11	9	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
6.9-7.1	22	65	4	2	7	0

TF 20 NE 11 2704 0824

Old Hall Farm, New South Eau

Sub-block E₁

Surface level (+1.5 m) +5 ft
 Water struck at (-0.7 m)
 152 mm percussion
 November 1975

Overburden 1.4 m
 Mineral 1.5 m
 Waste 2.8 m
 Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, brick rubble, clay and peat mixture	0.5	0.5
River Terrace Deposits (First Terrace)	Silt, indurated, greenish fawn to pale yellowish brown with pockets of flint gravel, clayey in lower 0.4 m	0.9	1.4
	'Very clayey' sandy gravel Gravel: fine with trace coarse, brown subrounded flint with some limestone and quartzite and trace amounts of ironstone and sandstone Sand: coarse with some medium and trace fine, flint, ironstone and quartz Fines: orange-brown to yellowish brown	1.5	2.9
Boulder Clay	Clay, stiff, yellowish brown in upper 0.4 m becoming grey to dark brown, with chalk race and flint gravel	2.8	5.7
Oxford Clay	Clay, stiff, dark greyish blue with trace shell fragments	1.3+	6.8

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
22	44	34	1.4-2.9	22	4	10	30	29	5	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.4-2.9	20	69	2	1	8	0

TF 20 NE 12 2636 0743

St. Vincent's Cross Farm, Bonnett's Pieces

Sub-block E₁

Surface level (+1.2 m) +4 ft
Water struck at (-1.5 m)
152 mm percussion
December 1975

Overburden 2.4 m
Mineral 1.1 m
Waste 2.2 m
Mineral 2.4 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black	0.3	0.3
Barroway Drove Beds	Silt, laminated pale yellowish fawn to orange-brown, becoming dark grey and clayey below 1.5 m	1.7	2.0
Lower Peat	Peat, friable, black, trace gravel towards base	0.4	2.4
River Terrace Deposits (First Terrace)	a 'Clayey' pebbly sand Gravel: fine with trace coarse, angular to subangular white and brown flint, with limestone and quartzite Sand: mainly medium with coarse and fine quartz with some flint Fines: yellowish brown to grey	1.1	3.5
	Clay, very soft to glutinous, grey, silty, occasional carbonaceous patches	2.2	5.7
	b Sandy gravel Gravel: mainly fine with trace coarse, angular to subangular brown flint with limestone quartzite and some black ironstone Sand: fine to coarse, quartz flint and some ironstone Fines: greyish brown	2.4	8.1
Oxford Clay	Clay, stiff, dark bluish grey, silty, with ammonite remains	0.9+	9.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand			Gravel		
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	15	65	20	2.4-3.5 3.5-5.7	15	11	42	12	19	1	0
				5.7-6.7	5	8	28	17	32	10	0
				6.7-7.7	6	22	22	23	24	3	0
				7.7-8.1	6	20	24	15	31	4	0
b	6	60	34	Mean	6	17	25	18	29	5	0
a+b	9	61	30	Mean	9	14	30	17	26	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.4-8.1	23	60	4	0	12	1

TF 20 NE 13 2674 0626

Single Cote Farm, Little Tower's Fen

Sub-block E₁

Surface level (+0.6 m) +2 ft
Water struck at (-1.3 m)
152 mm percussion
January 1976

Overburden 1.3 m
Mineral 4.5 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.6	0.6
Barroway Drove Beds	Silt, indurated, laminated dark grey to black with orange-brown ironstained layers, trace flint gravel at base	0.7	1.3
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, angular to subangular white and brown flint with limestone, some sandstone and traces of quartzite and fossil debris Sand: medium with some coarse and fine, subrounded quartz, flint and ironstone Fines: greyish brown	4.5	5.8
Oxford Clay	Clay, very stiff, bluish grey, traces of fossil fragments	0.7+	6.5

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		percentages						
				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	1.3-2.3	5	4	21	21	43	6	0
			2.3-3.3	17	20	45	10	6	2	0
			3.3-4.3	7	14	38	14	20	7	0
			4.3-5.8	4	7	29	18	28	14	0
			Mean	8	11	34	15	23	9	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.3-5.8	25	61	0	9	4	1

TF 20 NE 14 2684 0527

Buke Horn Farm, Little Tower's Fen

Sub-block F₁

Surface level (+1.5 m) +5 ft
Water struck at (-0.3 m)
152 mm percussion
January 1976

Overburden 1.4 m
Mineral 2.0 m
Waste 1.4 m
Mineral 1.2 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Mixture of peaty soil with brick rubble and gravel	1.3	1.3
River Terrace Deposits (First Terrace)	Clay, orange-brown, sandy, trace flint gravel	0.1	1.4
	a Sandy gravel Gravel: fine with trace coarse, limestone with white, brown, grey and red angular to subangular flint with some ironstone, sandstone and quartzite, occasional well-worn <i>Gryphaea</i> Sand: coarse and medium with some fine, quartz and flint Fines: dark orange-brown	2.0	3.4
	Silt, greyish brown sandy in parts with occasional lumps of clay containing flint gravel	1.4	4.8
	b Gravel Gravel: fine with some coarse, limestone with subangular to subrounded, brown and grey flint with some subrounded ironstone and sandstone Sand: medium and coarse with some fine, quartz and flint Fines: dark grey	1.2	6.0
Oxford Clay	Clay, stiff, bluish grey, silty, traces of ammonite fragments	0.9	6.9

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand			Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
a	5	54	41	1.4-2.4	4	8	24	22	40	2	0
				2.4-3.4	6	7	21	26	34	6	0
				Mean	5	7	23	24	37	4	0
				3.4-4.8	42	31	17	4	9	5	1
b	6	40	54	4.8-6.0	6	8	16	16	39	15	0
a+b	5	49	46	Mean	5	8	20	21	38	8	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.4-6.0	41	37	8	5	6	3

TF 20 NE 15

2778 0996

Dowdsdale Bank, Whaplode

Block E

Surface level (+2.7 m) +9 ft
Water struck at (-1.5 m, -3.2 m and -4.3 m)
152 mm percussion
December 1975

Waste 7.2 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown	0.3	0.3
Barroway Drove Beds	Silt, pale greyish fawn mottled pale brown, clayey in parts with traces of mica and patches of reddish brown iron-staining	1.5	1.8
	Clay, soft to glutinous, greyish blue, becomes sandy below 4.0 m	4.1	5.9
River Terrace Deposits (First Terrace)	'Clayey' sand, pale khaki-grey with traces of gravel	0.9	7.0
Boulder Clay	Clay, stiff, variegated khaki-brown to grey, silty, many chalk race with trace flint gravel	0.9	7.0
Glacial Sand and Gravel	'Clayey' sand, pale khaki-grey with trace gravel	0.2	7.2
Oxford Clay	Clay, soft and silty in upper 0.6 m, becoming stiff, grey with traces of ammonite fragments	1.3+	8.5

TF 20 NE 16 2783 0850 Fall's Farm Drove, New South Eau

Sub-block E₁

Surface level (+0.9 m) +3 ft
Water struck at (-2.7 m)
152 mm percussion
December 1975

Overburden 3.1 m
Mineral 3.1 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, black, peaty	0.8	0.8
Barroway Drove Beds + ?Lower Peat	Clay, soft to glutinous, brownish grey becoming bluish grey below 2.6 m, silty, peat fragments occur between 2.6 and 3.1 m	2.3	3.1
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, angular to subangular brown flint, with some limestone and quartzite and traces of sandstone and chalk Sand: fine to coarse, quartz with flint and chalk Fines: greyish brown	3.1	6.2
Oxford Clay	Clay, stiff, grey, traces of shell fragments	2.0+	8.2

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	
9	56	35	3.1-4.1	18	16	38	11	15	2	0
			4.1-5.1	7	31	12	11	29	10	0
			5.1-6.2	4	18	14	16	40	8	0
			Mean	9	21	22	13	28	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.2-6.2	30	58	0	2	10	0

TF 20 NE 17 2770 0780 Bell Drove, Bonnett's Pieces

Sub-block E₁

Surface level (+1.5 m) + 5 ft
Water struck at (-1.6 m and -5.2 m)
152 mm percussion
November 1975

Overburden 3.1 m
Mineral 2.0 m
Waste 1.6 m
Mineral 1.2 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, peaty	0.4	0.4
Barroway Drove Beds (?Roddon)	Silt, pale yellow to fawn becoming deep orange-brown	0.5	0.9
Barroway Drove Beds	Silt, firm, grey to greyish brown, with 'rafts' of peat	1.8	2.7
Lower Peat	Peat, dark brown to black, with grey silt and trace gravel in lower 0.2 m	0.4	3.1
River Terrace Deposits (First Terrace)	a 'Very clayey' pebbly sand Gravel: fine with trace coarse, mainly angular to subangular, white and brown flint with limestone, some sandstone and trace quartzite Sand: medium and fine with some coarse, quartz and flint Fines: grey to khaki-brown Clay, stiff laminated dark bluish grey to fawn with black carbonaceous matter, traces of small gastropod fragments	2.0	5.1
	b Gravel Gravel: fine with some coarse, angular to subangular brown and grey flint with rounded to subrounded limestone and subrounded quartzite, some subrounded chalk Sand: medium and coarse with trace fine, quartz with some flint Fines: dark grey	1.2	7.9
Oxford Clay	Clay, very stiff, grey, silty	0.9+	8.8

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
a	22	59	19	3.1-4.0	30	33	21	4	11	1	0
				4.0-5.1	14	12	30	19	23	2	0
				Mean	22	22	25	12	17	2	0
				5.1-6.7	Waste						
b	7	41	52	6.7-7.9	7	4	19	18	41	11	0
a+b	16	52	32	Mean	16	15	23	14	27	5	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.1-7.9	25	61	0	9	4	1

TF 20 NE 18 2778 0651 Near Dodge Farm, Black Drove

Sub-block E₁

Surface level (+0.3 m) +1 ft
Water struck at (-2.0 m)
152 mm percussion
December 1975

Overburden 2.0 m
Mineral 4.9 m
Waste 0.6 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark grey to black	0.4	0.4
Barroway Drove Beds	Silt, friable, greyish fawn becoming bluish grey below 0.7 m, with occasional peaty patches	0.5	0.9
River Terrace Deposits (First Terrace)	Clay, khaki-brown with black carbonaceous patches, sandy	1.1	2.0
	Sandy gravel Gravel: fine with trace coarse, tabular limestone and angular to subrounded white and grey flint with some subrounded quartzite and ironstone and traces of sandstone, occasional well-worn <i>Gryphaea</i> shells Sand: medium and coarse with some fine, quartz, flint and some ironstone Fines: khaki-brown to greyish brown	4.9	6.9
Boulder Clay	Clay, stiff to indurated, grey, with flint gravel and chalk race	0.6	7.5
Oxford Clay	Clay, stiff, grey, with traces of shell fragments	0.8+	8.3

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	
9	57	34	2.0-3.0	19	8	24	18	30	1	0
			3.0-4.0	11	15	26	21	24	3	0
			4.0-5.0	5	6	35	14	34	6	0
			5.0-6.0	5	3	27	25	37	3	0
			6.0-6.9	8	9	28	23	24	8	0
			Mean	9	9	28	20	30	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.0-6.9	44	36	6	1	11	2

TF 20 NE 19 2759 0554 Harley's Drove, Little Tower's Fen

Sub-block E₁

Surface level (+0.9 m) +3 ft
Water not struck at (-0.8 m)
152 mm percussion
January 1976

Overburden 1.2 m
Mineral 4.9 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown	0.4	0.4
Barroway Drove Beds	Clay, pale grey mottled pale yellow, silty	0.8	1.2
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine with some coarse, subrounded limestone and angular to subrounded brown, grey and white flint with some ironstone, quartzite and traces of sandstone Sand: medium with coarse and fine, quartzite ironstone and flint Fines: orange-brown to greyish brown	4.9	6.1
Oxford Clay	Clay, firm to stiff, grey mottled brown in upper 0.1 m, silty	0.5+	6.6

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	
13	51	36	1.2-2.2	5	11	28	17	35	4	0
			2.2-3.3	6	8	30	19	34	3	0
			3.3-4.6	47	39	15	2	4	3	0
			4.6-6.1	3	4	21	14	44	14	0
			Mean	13	16	23	12	29	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-6.1	43	38	6	5	7	1

TF 20 NE 20 2855 0952 French Farm Drove, Whaplode Sub-block E₁

Surface level (+1.2 m) +4 ft
 Water struck at (-3.5 m)
 152 mm percussion
 December 1975

Overburden 4.7 m
 Mineral 1.3 m
 Waste 2.3
 Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Mixture of brick rubble, clay and gravel overlying brown to black peaty soil	0.7	0.7
Barroway Drove Beds	Clay, stiff, pale grey with ironstained pockets of orange-brown in upper 0.8 m becoming soft to glutinous, grey to brown with occasional black peat 'rafts'	3.1	3.8
Lower Peat	Peat, dark brown to black	0.9	4.7
River Terrace Deposits (First Terrace)	a 'Clayey' pebbly sand Gravel: trace only, fine to coarse, mainly angular to subangular patinated flint with some limestone and trace amounts of quartzite and sandstone Sand: predominantly fine with medium and trace coarse, mostly quartz Fines: grey	1.3	6.0
Boulder Clay	Clay, brown, with chalk race and flint gravel	0.3	6.3
Glacial Sand and Gravel	b 'Clayey' pebbly sand Gravel: traces only, fine with coarse Sand: predomently fine with some medium and coarse Fines: grey	0.3	6.6
Boulder Clay	Clay, stiff, greyish brown, abundant chalk race with flint and limestone gravel up to cobble size, with sandy layers below 7.5 m	1.7	8.3
Oxford Clay	Clay, stiff, dark grey, silty, with traces of ammonite impressions	1.3+	9.6

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{16}$	$+\frac{1}{16}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
a	14	81	5	4.7-6.0 6.0-6.3	14 Waste	55	24	2	4	1	0
b	17	72	11	6.3-6.6	17	43	23	6	8	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.7-6.0	43	38	6	5	7	1

TF 20 NE 21 2864 0846 French Farm, Ruff Fen Block E

Surface level (+1.2 m) + 4 ft
 Water struck at (-4.8 m)
 152 mm percussion
 December 1975

Waste 6.6 m
 Bedrock 2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey with tree roots in lower 0.3 m	0.5	0.5
Barroway Drove Beds (?Roddon)	Silt, greenish brown to pale khaki laminations in upper 0.5 m becoming firm, grey to brown with orange-red patches	1.9	2.4
Barroway Drove Beds	Clay, glutinous, dark bluish grey with many black carbonaceous patches with occasional 'rafts' of peat, silty in parts	1.2	3.6
Lower Peat	Peat, dark brown to black	0.7	4.3
Boulder Clay	Clay, brownish grey, slightly silty, with flint gravel with chalk race	2.3	6.6
Oxford Clay	Clay, firm to stiff, greyish brown becoming grey below 7.8 m silty, traces of shell fragments at base	2.4+	9.0

TF 20 NE 22 2863 0734 Middle Farm Drove, Morris Fen Block E

Surface level (+1.2 m) +4 ft
 Water level not recorded
 152 mm percussion
 December 1975

Waste 5.0 m
 Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, with brick rubble and clay	0.5	0.5
Barroway Drove Beds (?Roddon)	Silt, firm, greyish fawn mottled dark orange brown with occasional black carbonaceous patches, clayey in parts	1.5	2.0
Barroway Drove Beds	Clay, soft to glutinous, bluish grey, silty	0.8	2.8
Boulder Clay	Clay, firm to stiff, grey partly mottled khaki-brown with some flint gravel and chalk race, sandy below 4.6 m	2.2	5.0
Oxford Clay	Clay, stiff, grey, trace ammonite debris at base	0.7+	5.7

TF 20 NE 23 2845 0655 Near Lodge Farm, Morris Fen

Surface level (+0.6 m) +2 ft
Water struck at (-2.2 m)
152 mm percussion
December 1975

Sub-block E₁

Overburden 2.8 m
Mineral 3.8 m
Waste 0.6 m
Mineral 1.3 m
Bedrock 1.5 m+

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.8-8.5	35	23	14	15	12	1

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to greyish brown, clayey	0.5	0.5
Barroway Drove Beds	Clay, firm, grey with reddish brown ironstained, becoming glutinous and bluish grey below 1.4 m with occasional peat 'rafts' especially between 2.2 and 2.4 m, traces of sand and gravel at base	2.0	2.5
River Terrace Deposit (First Terrace)	Clay, khaki-brown with trace flint gravel	0.3	2.8
	a Sandy gravel Gravel: fine with some coarse, mostly limestone with angular to subangular brown and white flint, and some subrounded to rounded sandstone, ironstone and quartzite, with trace amounts of chalk especially below 5.8 m, occasional <i>Gryphaea</i> shells and gastropod fragments Sand: medium with coarse and trace fine, mainly quartz with ironstone and flint Fines: greyish brown to khaki-brown	3.8	6.6
	Clay, dark bluish grey with, laminated layers of carbonaceous material with some coarse flint gravel	0.6	7.2
	b Gravel Gravel: fine with some coarse, mainly subangular to subrounded brown, white and red flint with oolitic limestone and subrounded to rounded chalk, and some sandstone, ironstone and quartzite Sand: coarse and medium with trace fine, quartz, ironstone and chalk Fines: chalky-grey	1.3	8.5
Oxford Clay	Clay, stiff, grey, silty, traces of shell fragments at base	1.5+	10.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Gravel			
					- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
a	5	58	37	2.8-3.8	8	8	27	23	32	2	0
				3.8-4.8	6	5	43	29	16	1	0
				4.8-5.8	3	2	25	18	33	19	0
				5.8-6.6	3	4	27	19	34	13	0
				Mean	5	5	31	22	28	9	0
				6.6-7.0	Waste						
b	4	46	50	7.2-8.5	4	4	19	23	42	8	0
a+b	5	55	40	Mean	5	4	28	23	32	8	0

TF 20 NE 24 2874 0526 White Hart Farm, Thorney Block E

Surface level (-0.1 m) -0.5 ft
Water struck at (-3.5 m)
152 mm percussion
January 1976

Waste 3.8 m
Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark grey, clayey	0.2	0.2
Barroway Drove Beds (Roddon)	Clay, firm, mainly grey to dark grey streaked and mottled by orange-yellow throughout, with black carbonaceous patches and trace flint gravel below 1.7 m, silty	2.8	3.0
	Clay, stiff, khaki to orange-brown, silty sandy in parts especially between 3.4 and 3.5 m, silty generally	0.8	3.8
Oxford Clay	Clay, firm to stiff, variegated dark bluish grey to khaki-brown, patches of selenite crystals throughout, rare fragments of belemnite, ammonite with <i>Gryphaea</i> towards base	2.5+	6.3

TF 20 NE 25 2978 0995 Avenue Farm, Whaplode Sub-block E₁

Surface level (+2.4 m) +8 ft
Water struck at (-2.1 m)
152 mm percussion
December 1975

Overburden 6.2 m
Mineral 3.0 m
Waste 0.1 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.2	0.2
Barroway Drove Beds (?Roddon)	Silt, firm to thixotropic, variegated orange-brown to grey, many dark reddish brown ironstains throughout	4.1	4.3
Barroway Drove Beds	Clay, glutinous, dark bluish grey to grey, silty in parts, micaceous, trace carbonaceous matter, sandy with trace gravel towards the base	1.8	6.1
River Terrace Deposits (First Terrace)	Pebbly sand Gravel: fine with trace coarse, mostly angular to subangular brown and grey flint with some oolitic limestone, subrounded ironstone, sandstone and quartzite, many shell fragments Sand: medium with coarse and fine, mostly quartz with white flint chips Fines: dark grey to black	3.0	9.1

	Silt, soft to glutinous, dark grey to black	0.1	9.2
Oxford Clay	Clay, stiff, grey, rare pockets of corroded selenite crystals, trace belemnite fragment at base	1.6+	10.8

GRADING

Mean for deposit percentages	Depth below surface (m)	percentages								
		Fines		Sand			Gravel			
		- $\frac{1}{8}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
8	70	22	6.1-6.6	20	39	23	5	12	1	0
			6.6-7.6	5	15	31	20	26	3	0
			7.6-9.1	6	11	46	16	17	4	0
			Mean	8	17	37	16	19	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
6.1-9.1	17	63	8	7	5	0

TF 20 NE 26 2974 0892 Portsand Farm Drove, Whaplode

Sub-block E₁

Surface level (+1.3 m) +4.5 ft
Water struck at (-3.5 m)
152 mm percussion
December 1975

Overburden 4.5 m
Mineral 2.4 m
Waste 0.2 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown	0.4	0.4
Barroway Drove Beds	Clay, glutinous, greyish fawn to greyish blue, silty, with black carbonaceous material throughout	4.1	4.5
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, angular to subangular flint with some limestone, quartzite and sandstone and traces of ironstone, occasional shell fragments Sand: coarse and medium with trace fine, quartz, ironstone and flint Fines: predominantly grey with khaki-brown mottling	2.4	6.9
Boulder Clay	Clay, stiff, khaki-brown with chalk race and flint gravel	0.2	7.1
Oxford Clay	Clay, stiff, grey, traces of fossil fragments including belemnites	1.1+	8.2

GRADING

Mean for deposit percentages	Depth below surface (m)	percentages								
		Fines		Sand			Gravel			
		- $\frac{1}{8}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm		
3	56	41	4.5-5.5	2	8	27	25	31	7	0
			5.5-6.9	4	3	21	28	37	7	0
			Mean	3	6	24	26	34	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.5-6.9	29	49	2	8	12	0

TF 20 NE 27 2970 0783 Green Drove Farm, Ruff Fen

Sub-block E₁

Surface level (+1.5 m) +5 ft
Water struck at (-2.7 m)
152 mm percussion
December 1975

Overburden 4.0 m
Mineral 4.6 m
Waste 0.4 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Mixture of brick rubble sand and soil	0.5	0.5
Barroway Drove Beds (?Roddon)	Silt, predominantly grey mottled orange-brown by ironstaining, occasional peaty patches	2.2	2.7
Barroway Drove Beds	Clay, dark grey with many black root fragments	0.3	3.0
Lower Peat	Peat, dark grey to black, with some silt	0.4	3.4
River Terrace Deposits (First Terrace)	Silt, grey, with patches of sand and gravel, passes into pale khaki clay at base	0.6	4.0
	Pebbly sand Gravel: fine with coarse, mainly angular to subangular brown flint with limestone and trace amounts of ironstone, quartzite and sandstone Sand: mainly medium with some fine and coarse, subangular to subrounded quartz with ironstone, flint and ?shell fragments Fines: greyish brown	4.6	8.6
	Silt, greyish brown, traces of coarse sand with gravel	0.4	9.0
Oxford Clay	Clay, stiff, grey	1.0+	10.0

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	75	17	4.0-5.1	10	17	42	11	17	3	0
			5.1-6.1	11	30	54	3	2	0	0
			6.1-7.2	8	28	56	4	3	1	0
			7.2-8.6	5	10	38	17	17	13	0
			Mean	8	20	46	9	10	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.0-8.6	37	56	3	1	2	1

TF 20 NE 28 2988 0648 Priest's Farm, Morris Fen Block E

Surface level (+2.1 m) +7 ft
 Water struck at (-2.4 m, -3.8 m and -6.4 m)
 152 mm percussion
 January 1976
 Waste 10.9 m
 Bedrock 2.4 m+

67

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark greyish brown	0.4	0.4
Barroway Drove Beds (Roddon)	Silt, firm, friable in parts, laminated pale orange-brown with fawn to grey	2.6	3.0
Barroway Drove Beds	Silt, firm, grey to dark grey, micaceous, traces of white shell fragments and patches of black carbonaceous matter	1.9	4.9
Lower Peat	Peat, dark brown to black	0.6	5.5
River Terrace Deposits (First Terrace)	Clay, pale brown, silty in parts with traces of sand and gravel at base	0.3	5.8
	a 'Very clayey' sandy gravel Gravel: fine with trace coarse, angular to subangular flint with limestone, some sandstone and quartzite and traces of ironstone Sand: fine with medium and coarse, quartz Fines: greyish brown	0.6	6.4
?Boulder Clay	Clay, brown mottled grey, sandy in parts with trace gravel	2.1	8.5

Glacial Sand and Gravel

b Sandy gravel

2.4 10.9

Gravel: fine with trace of coarse, mostly brown white and grey, angular to subangular flint with limestone and some rounded to subrounded sandstone and traces of quartzite and ironstone
 Sand: medium with coarse and some fine, quartz flint and ironstone
 Fines: greyish brown

?Boulder Clay

Clay, greyish brown, sandy with traces of gravel

0.4 11.3

Oxford Clay

Clay, stiff, grey, silty, traces of belemnite fragments at base

2.0+ 13.3

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
a	23	52	25	5.8-6.4	23	27	15	10	22	3	0
				6.4-8.5	Clay layer						
				8.5-9.5	8	8	34	17	30	3	0
				9.5-10.9	6	7	31	23	28	5	0
b	7	60	33	Mean	7	8	32	20	29	4	0
a+b	10	58	32	Mean	10	11	29	18	28	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
5.8-10.9	33	36	5	11	9	6

TF 20 NE 29 2955 0570

South of English Drove, Earls Fen

Sub-block E₁

Surface level (-0.1 m) -0.5 ft
Water struck at (-4.2 m)
152 mm percussion
January 1976

Overburden 4.0 m
Mineral 2.1 m
Waste 1.4 m
Mineral 2.7 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark greyish brown with traces of peat	0.4	0.4
Barroway Drove Beds	Clay, stiff, grey with ironstaining throughout	1.1	1.5
	Clay, very soft to glutinous, grey, silty, with patches of peat	1.6	3.1
Lower Peat	Peat, dark brown to black with wood and white shell fragments	0.9	4.0
River Terrace Deposits (First Terrace)	'Very clayey' pebbly sand: with clay band containing white shell fragments between 6.0 and 6.1 m Gravel: fine with trace coarse, mainly angular to subangular brown flint with limestone and quartzite Sand: fine and medium with some coarse, quartz Fines: greyish brown	2.1	6.1
	Clay, firm to soft, dark grey slightly mottled orange-brown, silty, sandy in parts with black carbonaceous patches and white shell fragments throughout	1.4	7.5
?River Terrace Deposits (?First Terrace)	Sandy gravel: iron-cemented layer between 7.5 and 7.7 m Gravel: mainly fine with some coarse, angular to subrounded, brown, white and grey flint with limestone and quartzite with some subrounded sandstone and ironstone, occasional concretions of clay and iron-cemented gravel Sand: medium and coarse with some fine, mainly quartz with flint, sandstone and ironstone Fines: greyish brown	2.7	10.2
Oxford Clay	Clay, firm to stiff, grey, trace shell fragments, many flint pebbles with sand in upper 0.2 m	1.2+	11.4

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
a	29	59	12	4.0-5.0	24	39	9	7	18	3	0
				5.0-6.1	32	19	36	9	3	1	0
				Mean	29	28	23	8	10	2	0
				6.1-7.5	Waste						
				7.5-8.5	5	9	29	10	38	9	0
				8.5-9.5	3	5	24	18	40	10	0
				9.5-10.2	3	5	23	21	43	5	0
b	4	48	48	Mean	4	7	25	16	40	8	0
a+b	14	54	32	Mean	14	16	25	13	27	5	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.0-10.2	24	46	2	9	17	2

TF 20 NE 30

2751 0820

Adjacent to Blue Bell Bridge, New South Eau

Sub-block H₁

Surface level c+2 m c+6 ft
Water level not recorded
76 mm Minuteman
May 1978

Overburden 2.2 m
Mineral 2.3 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown with trace amounts of gravel	0.6	0.6
March Gravels	Clay, pale greyish brown, silty in parts	1.6	2.2
	'Clayey' sandy gravel (very poor recovery) Gravel: coarse, flint, ironstone and sandstone Sand: fine to medium Fines: pale yellowish brown	2.3	4.5
Boulder Clay	Clay, firm to stiff, grey, with chalk race	0.5+	5.0

TF 20 SW 129

2024 0443

Gunton's Road, Newborough

Block D

Surface level (+1.2 m) +4 ft
Water struck at (-1.2 m)
152 mm percussion
January 1976

Overburden 2.2 m
Mineral 1.3 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black	0.4	0.4
Nordelph Peat	Peat, dark brown to black, friable	0.3	0.7
Barroway Drove Beds	Clay, soft bluish grey, silty, glutinous with peat layer between 2.0 and 2.1 m	1.5	2.2
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: mainly fine with trace coarse, mainly limestone with subangular to subrounded ironstone, trace amounts of sandstone and quartzite Sand: medium and coarse with trace fine, quartz, flint and ironstone Fines: pale greyish brown	1.3	3.5
Oxford Clay	Clay, stiff, bluish grey becoming dark khaki-brown below 3.8 m, with many shell fragments	0.9+	4.4

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{8}$	$+\frac{1}{8}$ - $\frac{1}{4}$	$+\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	52	42	2.2-3.5	6	6	24	22	39	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.2-3.5	61	17	13	2	3	4

TF 20 SW 130 2060 0387 Near Norwood House, Newborough

Block D

Surface level (+1.2 m) +4 ft
Water level not recorded
152 mm percussion
January 1976

Waste 2.1 m
Bedrock 2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown	0.3	0.3
Nordelph Peat	Peat, orange-brown becoming black, friable	0.3	0.6
Barroway Drove Beds	Clay, pale bluish grey, silty, with streaks of peat	1.5	2.1
Oxford Clay	Clay, firm, variegated greyish blue to khaki, silty, with many corroded selenite crystals and occasional shell fragments	2.4+	4.5

TF 20 SW 131 2034 0265 Leed's Farm, North Peterborough

Block I

Surface level (+12.8 m) +42 ft
Water level not recorded
152 mm percussion
January 1976

Waste 2.2 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown	0.2	0.2
River Terrace Deposits (Third Terrace)	Clay, generally firm to stiff, soft in upper 0.3 m, pale grey mottled pale brown, calcareous pockets, with flint and sandstone gravel	2.0	2.2
Oxford Clay	Clay, pale to dark greyish brown, with shell fragments	1.2+	3.4

TF 20 SW 132 2153 0418 Whitepost Road, Newborough

Block D

Surface level (+1.5 m) +5 ft
Water not struck
152 mm percussion
January 1976

Waste 1.7 m
Bedrock 3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Mixture of soil and brick rubble	0.3	0.3
Nordelph Peat	Peat, dark brown to black	0.7	1.0
Barroway Drove Beds	Clay, soft to firm, fawnish grey becoming bluish grey below 1.3 m, silty	0.5	1.5
Lower Peat	Peat, dark brown to black, friable	0.2	1.7
Oxford Clay	Clay, firm to stiff, weathered in upper 2.4 m - pale grey to khaki-yellow becoming grey to bluish grey below 4.1 m, silty, occasional shell fragments	3.5+	5.2

TF 20 SW 133 2146 0339 Near Whitepost Farm, Newborough

Block D

Surface level (+1.7 m) +5.5 ft
Water not struck
152 mm percussion
January 1976

Waste 2.5 m
Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, peaty	0.2	0.2
Nordelph Peat	Peat, dark brown to dark orange-red	0.5	0.7
Barroway Drove Beds	Clay, firm to stiff, variegated pale grey with khaki and orange-brown, with sandy patches	1.8	2.5
Oxford Clay	Clay, firm to stiff, pale brown mottled grey becoming bluish grey below 3.8 m, patches of selenite crystals and trace shell fragments	1.5+	4.0

TF 20 SW 134 2139 0162 Near Eastwood Farm, Eye Road

Block A

Surface level (+4.5 m) +15 ft
Water not struck
152 mm percussion
January 1976

Waste 1.8 m
Bedrock 2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.3	0.3
Alluvium	Clay, firm, variegated khaki-brown to pale grey, trace flint gravel	1.5	1.8
Oxford Clay	Clay, stiff, weathered in upper 2.0 m becoming dark bluish grey, silty, with shell fragments	2.4+	4.2

TF 20 SW 135 2275 0459 Near Elm Trees Farm, Newborough Sub-block H₁

Surface level (+3.0 m) +10 ft
 Water not struck
 152 mm percussion
 January 1976

Overburden 0.3 m
 Mineral 1.0 m
 Bedrock 2.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown to orange-brown	0.3	0.3
March Gravels	Pebbly sand Gravel: fine with some coarse, angular to subangular flint and limestone with subrounded to rounded quartzite and sandstone, trace amounts of ironstone Sand: mainly fine and medium with some coarse, mainly subrounded quartz Fines: dark orange-brown to brown	1.0	1.3
Oxford Clay	Clay, stiff to firm, weathered in upper 1.4 m, bluish grey, silty, trace belemnite and ammonite fragments	2.7+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
9	69	22	0.3-1.3	9	36	25	8	15	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.3-1.3	31	36	4	12	16	1

TF 20 SW 136 2267 0347 Green Road, Eye Block E

Surface level (+1.3 m) +4.5 ft
 Water not struck
 152 mm percussion
 January 1976

Waste 1.9 m
 Bedrock 2.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.6	0.6
Barroway Drove Beds	Clay, firm to stiff, variegated orange-brown to pale grey and brown, with sandy patches and calcareous material	1.3	1.9
Oxford Clay	Clay, firm to stiff, weathered khaki-grey in upper 2.1 m becoming bluish grey, with trails of selenite crystals in upper 2.1 m, and shell fragments including <i>Gryphaea</i> in lower 0.5 m	2.6+	4.5

TF 20 SW 137 2240 0095 Oxney House, near Peterborough Sub-block G₁

Surface level (+5.8 m) +19 ft
 Water struck at (+4.5 m)
 152 mm percussion
 January 1976

Overburden 0.7 m
 Mineral 2.3 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Clay, brown, sandy with gravel and brick rubble	0.7	0.7
River Terrace Deposits (Second Terrace)	Gravel Gravel: mainly fine with some coarse, mainly shelly limestone and angular to subangular flint with ironstone, quartzite and sandstone Sand: coarse and medium with trace fine, quartz, flint and ironstone Fines: pale brown to pale greyish brown	2.3	3.0
Oxford Clay	Clay, firm to stiff, dark khaki-grey with shell fragments	1.2+	4.2

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	47	47	0.7-1.7	8	7	20	21	36	8	0
			1.7-3.0	4	4	20	22	42	8	0
			Mean	6	5	20	22	39	8	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.7-3.0	45	31	11	5	7	1

TF 20 SW 138 2268 0023 Flag Fen, Peterborough Sub-block D₁

Surface level (+1.2 m) +4 ft
 Water struck at (-1.8 m)
 152 mm percussion
 January 1976

Overburden 2.6 m
 Mineral 3.8 m
 Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.4	0.4
Nordelph Peat	Peat, dark brown to black, friable, clayey at base	2.2	2.6

River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, mainly limestone and white and brown angular to subangular flint with sandstone, ironstone and quartzite Sand: mainly medium with coarse and some fine, quartz with flint and ironstone Fines: greyish brown to yellowish brown	3.8	6.4
Oxford Clay	Clay, with limestone layer in upper 0.2 m, firm dark grey to bluish grey, silty, with shell fragments	2.0+	8.4

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				-1 $\frac{1}{8}$	+1 $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
4	62	34	2.6-3.6	7	11	49	8	23	2	0
			3.6-4.6	3	10	37	17	25	8	0
			4.6-5.6	5	5	28	17	30	15	0
			5.6-6.4	2	13	44	9	26	6	0
			Mean	4	9	40	13	26	8	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.6-6.4	39	33	6	11	6	5

TF 20 SW 139	2370 0412	Northolme Coppice, Eye	Block E
Surface level (+2.5 m) +8 ft Water not struck 152 mm percussion January 1976			Waste 1.0 m Bedrock 1.3 m+
LOG			
Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown with flint gravel	0.3	0.3
Barroway Drove Beds	Clay, stiff, dark orange-brown mottled dark orange red, occasional flint gravel	0.7	1.0
Oxford Clay	Clay, stiff to firm, weathered orange-brown to grey in upper 0.8 m becoming bluish grey with trace shell fragments	1.3+	2.3

TF 20 SW 140	2377 0334	Cranmore Farm, Eye	Block E
Surface level (+3.6 m)+12 ft Water not struck 152 mm percussion January 1976			Waste 1.7 m Bedrock 1.7 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown	0.2	0.2
Barroway Drove Beds	Clay, firm to stiff, pale orange-brown becoming pale grey below 1.0 m, silty, trace flint gravel	1.5	1.7
Oxford Clay	Clay, firm to stiff, weathered pale grey to mottled brown in upper 1.3 m becoming grey to bluish grey, with selenite crystals and traces of fossil fragments	1.7+	3.4

TF 20 SW 141	2336 0070	America Farm, Flag Fen	Sub-block D₁
Surface level (+1.5 m)+5 ft Water struck at (-0.8 m) 152 mm percussion January 1976			Overburden 2.0 m Mineral 1.1 m Bedrock 1.4 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
Made Ground	Brick rubble with peaty soil	0.5	0.5
Nordelph Peat	Peat, dark brown to black, friable	1.3	1.8
Barroway Drove Beds	Silt, soft, pale grey	0.2	2.0
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with some coarse, mainly angular to subangular flint with some limestone, quartzite, ironstone and sandstone Sand: medium and coarse with fine, quartzite, flint and ironstone Fines: greyish brown	1.1	3.1
Oxford Clay	Clay, firm to stiff, khaki-grey, silty, with many shell fragments	1.4+	4.5

GRADING										
Mean for deposit percentages	Depth below surface (m)	percentages								
Fines	Sand	Gravel	Fines		Sand			Gravel		
			-1 $\frac{1}{8}$	+1 $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm	
4	44	52	2.0-3.1	4	4	25	15	40	12	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.0-3.1	24	43	9	8	15	1

TF 20 SW 142 2468 0442 Cat's Water, Little Tower's Fen Block D

Surface level (+1.9 m)+6 ft
 Water not struck
 152 mm percussion
 January 1976

Waste 0.8 m
 Bedrock 3.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty, with flint gravel	0.4	0.4
Barroway Drove Beds	Clay, well indurated, dark orange-brown mottled greyish brown, silty, some sandy patches	0.4	0.8
Oxford Clay	Clay, stiff to indurated, weathered pale khaki brown to grey in upper 1.7 m becoming bluish grey, siltstone nodules in upper 1.7 m, much carbonaceous and pyritic material between 2.9 and 3.3 m, 'trails' of selenite crystals below 2.5 m and traces of shell fragments below 2.9 m	3.5+	4.3

TF 20 SW 143 2448 0336 Near Hayne's Farm, Mill Fen Sub-block F₁

Surface level (+4.2 m)+14 ft
 Water not struck
 152 mm percussion
 January 1976

Overburden 0.7 m
 Mineral 0.5 m
 Waste 0.3 m
 Mineral 0.7 m
 Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown with flint gravel	0.4	0.4
River Terrace Deposits (First Terrace)	Clay, mottled pale grey to pale brown, silty	0.3	0.7
	a 'Very clayey' pebbly sand Gravel: trace amounts of flint, sandstone quartzite, limestone and ironstone Sand: mainly fine with some medium, trace coarse, mainly quartz Fines: orange-brown	0.5	1.2
	Clay, firm to stiff, pale grey to khaki, with many white ? calcareous siltstones	0.3	1.5
	b 'Clayey' sand Gravel: trace amounts only Sand: mainly fine with some medium, trace coarse Fines: orange-brown	0.7	2.2
Oxford Clay	Clay, stiff, weathered grey to khaki with 'trails' of selenite crystals in upper 1.4 m, becoming bluish grey, traces of shell fragments and pyrite	1.8+	4.0

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines	Sand	Gravel				
							- $\frac{1}{2}$	+ $\frac{1}{8}$ - $\frac{3}{4}$	+ $\frac{3}{4}$ -1	+1-4	+4-16
a	23	73	4	0.7-1.2	23	46	25	2	3	1	0
b	19	78	3	1.2-1.5 1.5-2.2	19	48	29	1	2	1	0
a+b	20	76	4	Mean	20	47	27	2	3	1	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.7-2.2	7	56	5	20	10	2

TF 20 SW 144 2417 0221 Tanholt House track, Bar Pastures Sub-block F₁

Surface level (+3.9 m)+13 ft
 Water struck at (+0.7 m)
 152 mm percussion
 January 1976

Overburden 0.6 m
 Mineral 5.1 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, trace gravel	0.3	0.3
River Terrace Deposits (First Terrace)	Clay, orange-brown, sandy with flint gravel	0.3	0.6
	Sandy gravel Gravel: fine with trace coarse, mainly limestone with angular to subangular flint, and some quartzite, ironstone and sandstone Sand: medium and coarse with fine, quartz, ironstone and flint Fines: orange-brown	5.1	5.7
Oxford Clay	Clay, soft and brown in upper 0.2 m becoming firm to stiff bluish grey, silty, with many shell fragments	0.8+	6.5

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines	Sand	Gravel				
							- $\frac{1}{2}$	+ $\frac{1}{8}$ - $\frac{3}{4}$	+ $\frac{3}{4}$ -1	+1-4	+4-16
	6	60	34	0.6-1.6	10	9	24	17	33	7	0
				1.6-2.6	3	6	23	21	39	8	0
				2.6-3.6	5	5	21	21	43	5	0
				3.6-4.6	7	14	34	28	17	0	0
				4.6-5.7	7	14	41	18	14	6	0
				Mean	6	10	29	21	29	5	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.6-5.7	53	27	8	2	9	1

TF 20 SW 145 2424 0156 Willow Hall Farm, Lincoln's Doles Sub-block F₁

Surface level (+3.9 m)+13 ft
 Water struck at (+1.2)
 152 mm percussion
 December 1975

Overburden 0.4 m
 Mineral 3.2 m
 Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, clayey, with flint gravel	0.4	0.4
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine with trace coarse, mainly angular to subrounded flint with quartzite and limestone Sand: medium and coarse with some fine, mainly quartz and ironstone Fines: orange-yellow	3.2	3.6
Oxford Clay	Clay, stiff, bluish green, with gravel in upper 0.1 m, silty patches, shell fragments throughout	0.6+	4.2

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
			- $\frac{1}{2}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm	
13	53	34	0.5-1.5	21	8	24	18	28	1	0
			1.5-2.5	14	8	23	20	29	6	0
			2.5-3.6	3	11	22	26	36	2	0
			Mean	13	9	23	21	31	3	0

TF 20 SW 146 2421 0071 Poplar Farm, Lincoln's Doles Sub-block D₁

Surface level (+1.2 m)+4 ft
 Water struck at (-1.3 m)
 152 mm percussion
 January 1976

Overburden 2.5 m
 Mineral 3.1 m
 Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark grey to black, peaty	0.9	0.9
River Terrace Deposits (First Terrace)	Clay, soft, glutinous, pale grey to bluish grey silty, sandy towards base, with fragments of peat	1.6	2.5
	Sandy gravel Gravel: fine with some coarse, generally subrounded to tabular, oolitic limestone with angular to subangular flint, quartzite and ironstone with trace sandstone Sand: medium with coarse and some fine quartz, flint and ironstone Fines: greyish brown	3.1	5.6
Oxford Clay	Clay, soft in upper 0.2 m becoming firm to stiff, greyish brown, many shell fragments	0.7+	6.3

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
			- $\frac{1}{2}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm	
3	60	37	2.5-3.5	3	5	35	18	30	9	0
			3.5-4.5	3	10	44	13	25	5	0
			4.5-5.6	4	6	29	20	34	7	0
			Mean	3	7	36	17	30	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.5-5.6	41	29	11	3	15	1

TF 20 SW 147 2357 0236 Near Tanholt House, Bar Pastures

Surface level (+3.6 m)+12 ft
 Water not struck
 152 mm percussion
 January 1976

Block E

Waste 1.3 m
 Bedrock 2.7 +

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, clayey	0.3	0.3
?Barroway Drove Beds	Clay, stiff, dark brownish grey mottled orange, trace gravel, becoming silty and sandy towards base	1.0	1.3
Oxford Clay	Clay, weathered dark grey with orange-brown with 'trails' of selenite crystals in upper 1.8 m, becoming grey, silty, shell fragments throughout	2.7+	4.0

TF 20 SW 148 2421 0382 Nipeut Road, near Cat's Water Farm

Surface level (+5.6 m)+18.5 ft
 Water struck at (-2.4 m)
 76 mm Minuteman
 October 1977

Sub-block H₁

Overburden 0.3 m
 Mineral 7.7 m
 Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown, well indurated	0.3	0.3
March Gravels	Sandy gravel Gravel: fine to coarse, rounded to subrounded to tabular, oolitic and shelly limestone with angular to subangular brown and white flint with trace amounts of ironstone, sandstone and quartzite, shell fragments throughout Sand: medium to coarse with fine, quartz, ironstone, flint and limestone, many comminuted shell fragments Fines: yellowish brown to orange-brown	7.7	8.0
Oxford Clay	Clay, stiff to very stiff, bluish grey	1.0+	9.0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.3-8.0	53	36	5	3	1	2

TF 20 SW 149 2406 0308 Hayne's Farm, Mill Fen

Surface level (+6.5 m)+21.5 ft
 Water level not recorded
 76 mm Minuteman
 November 1977

Sub-block H₁

Overburden 0.2 m
 Mineral 2.6 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown	0.2	0.2
March Gravels	'Clayey' sand; becoming sandy below 1.0 m Gravel: Nil Sand: fine to medium, subangular to subrounded quartz Fines: yellowish brown	1.6	1.8
	Sandy gravel Gravel: fine to coarse, mainly brown with some white angular to subangular flint with subrounded to rounded shelly and oolitic limestone and ironstone, traces of belemnite fragments Sand: mainly medium with fine and coarse, quartz with limestone and ironstone, white shell fragments throughout Fines: pale orange-brown	1.0	2.8
Oxford Clay	Clay, firm, pale grey, calcareous	1.2+	4.0

TF 20 SW 150 2426 0422 Nipeut Road, near Cat's Water Farm

Surface level (+5.8 m)+19 ft
 Water struck at (+0.8 m)
 76 mm Minuteman
 November 1977

Sub-block H₁

Overburden 1.0 m
 Mineral 5.0 m
 Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
?Made ground	Soil with limestone and flint hardcore	1.0	1.0
March Gravels	Pebbly sand Gravel: fine with coarse, mainly shelly and oolitic, subrounded to rounded limestone with angular to subangular brown and white flint, some ironstone and sandstone, shell fragments common particularly lamellibranchs Sand: medium with fine and coarse, mainly limestone, flint, ironstone and many shell fragments Fines: orange-brown	5.0	6.0
Oxford Clay	Clay, soft to firm, grey	2.5+	8.5

TF 20 SW 151 2434 0439 The Reaches, near Cat's Water Farm **Sub-block H₁**
 Surface level (+4.2 m)+14 ft
 Water struck at (+3.2 m)
 76 mm Minuteman
 November 1977

Overburden 0.7 m
 Mineral 2.8 m
 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown to dark brown with some sand and flint gravel	0.7	0.7
March Gravels	'Clayey' pebbly sand Gravel: mainly fine, brown flint with rounded to subrounded limestone and ironstone, white shell fragments throughout particularly lamellibranchs Sand: medium with coarse and fine, mostly subrounded to rounded quartz with limestone and ironstone, shell fragments common Fines: brown	2.8	3.5
Oxford Clay	Clay, firm to stiff, bluish grey, calcareous, traces of fossil fragments	0.5	4.0

TF 20 SW 152 2446 0476 Reaches Drove, Cat's Water **Sub-block H₁**
 Surface level (+4.2 m)+14 ft
 Water level not recorded
 76 mm Minuteman
 November 1977

Overburden 1.0 m
 Mineral 1.5 m
 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown to dark brown, sandy	1.0	1.0
March Gravels	'Clayey' sandy gravel; very sandy in upper 0.4 m Gravel: fine to coarse, angular to subangular, mainly brown with some white flint, with limestone and ironstone, occasional belemnite fragments Sand: fine to coarse, flint, ironstone and quartz, white shell fragments common Fines: greyish brown	1.5	2.5
Oxford Clay	Clay, very soft becoming firm below 3.2 m, pale bluish grey, calcareous	1.5+	4.0

TF 20 SW 153 2295 0427 Northolme House, Eye Green **Sub-block H₁**
 Surface level (+4.2 m)+14 ft
 Water struck at (+2.7 m)
 76 mm Minuteman
 November 1977

Overburden 0.5
 Mineral 6.8 m
 Bedrock 2.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown to pale brown with fine quartz sand	0.5	0.5
March Gravels	Sand, fine to medium, mostly rounded to subrounded quartz, with many white shell fragments and very small complete lamellibranchs, silty, orange-brown 'Clayey' pebbly sand Gravel: Mostly fine subrounded shelly limestone with subrounded to rounded ironstone, traces of flint, shell fragments Sand: fine to coarse, mainly subrounded to rounded quartz with limestone and ironstone, shell fragments common Fines: pale to dark greyish brown	2.7 4.1	3.2 7.3
Oxford Clay	Clay, soft to firm, pale bluish grey, calcareous	2.7+	10.0

TF 20 SW 154 2302 0307 Eye brickworks, Eye **Sub-block H₁**
 Surface level (+6.3 m)+20.5 ft
 Water level not recorded
 76 mm Minuteman
 November 1977

Overburden 0.2 m
 Mineral 2.1 m
 Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil with hardcore	0.2	0.2
March Gravels	Sandy gravel; 'Clayey' in upper 1.3 m Gravel: fine to coarse, angular to subangular, brown, grey and some white flint with oolitic and shelly limestone, ironstone and derived Oxford Clay fossil fragments Sand: fine to coarse, mainly quartz with limestone and ironstone Fines: pale yellowish brown	2.1	2.3
Oxford Clay	Clay, firm, bluish grey, calcareous, with many shell fragments	1.7+	4.0

TF 20 SW 155 2124 0216 Eastwood Farm, north Peterborough

Surface level: Not recorded
Water struck at 1.5 m
76 mm Minuteman
May 1978

Block I
Waste 1.8 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, pale brown, sandy, clayey towards base, occasional pebbles of limestone	1.0	1.0
River Terrace Deposits (Third Terrace)	'Clayey' pebbly sand Gravel: trace only, mainly rounded to subrounded quartzite with angular to subangular brown to white flint Sand: fine Fines: pale orange-brown	0.8	1.8
Oxford Clay	Clay, indurated, bluish grey to grey	0.1+	1.9

TF 20 SE 3 2570 0446 Middle Farm West, Great Tower's Fen

Surface level (+1.8 m) +6 ft
Water struck at (+0.1 m)
152 mm percussion
December 1975

Sub-block F₁
Overburden 1.0 m
Mineral 1.2 m
Waste 2.3 m
Mineral 1.1 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.7	0.7
River Terrace Deposits (First Terrace)	Clay, indurated, yellowish brown	0.3	1.0
	a Sandy gravel Gravel: fine with trace coarse, mainly subangular to rounded flint Sand: medium with coarse and some fine Fines: yellowish brown	1.2	2.2
	Clay, very soft, yellowish grey with dark brown organic mottling, traces of gravel	2.3	4.5
	b Gravel Gravel: fine with some coarse, angular to subangular flint, oolitic limestone and sandstone, shell fragments common Sand: coarse with medium and trace fine Fines: greyish yellow	1.1	5.6
Oxford Clay	Clay, stiff, grey, traces of pyrite, selenite crystals and fossil fragments	1.1+	6.7

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Sand		Gravel	
					- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm
a	7	66	27	1.0-1.9	10	6	30	19	30	5	0
				1.9-2.2	3	10	50	17	18	2	0
				Mean	7	8	40	18	24	3	0
				2.2-4.5	Waste						
				4.5-4.6	4	3	22	19	44	8	0
				4.6-5.6	2	1	8	23	60	6	0
b	3	38	59	Mean	3	2	15	21	52	7	0
a+b	5	48	47	Mean	5	4	23	21	42	5	0

TF 20 SE 4 2543 0296 Near Bar Pasture Farm, Mill Fen

Surface level (+2.7 m)+9 ft
Water struck at (+0.5 m)
152 mm percussion
December 1975

Sub-block F₁
Overburden 0.4 m
Mineral 2.0 m
Waste 1.4 m
Mineral 1.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, clayey with some peaty material	0.4	0.4
River Terrace Deposits (First Terrace)	a 'Clayey' sandy gravel Gravel: fine with some coarse, mainly angular to subangular flint with sandstone and quartzite Sand: medium and coarse with some fine Fines: orange-brown	2.0	2.4
	Clay, soft, blue with orange and yellow mottling, silty	1.4	3.8
	b Gravel Gravel: fine with coarse and trace cobble, angular to subangular flint with oolitic and shelly limestone, ironstone and sandstone Sand: medium and coarse with traces of fine Fines: buff-grey	1.8	5.6
Oxford Clay	Clay, stiff, greenish blue, fossiliferous	0.5+	6.1

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines			Sand		Gravel	
					- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm
a	17	46	37	0.4-1.4	24	12	25	12	25	2	0
				1.4-2.4	9	7	21	17	43	3	0
				Mean	17	9	23	14	34	3	0
				2.4-3.8	Waste						
				3.8-4.8	5	4	14	15	34	25	3
				4.8-5.6	3	6	30	16	26	16	3
b	4	43	53	Mean	4	5	22	16	30	20	3
a+b	11	44	45	Mean	11	7	22	15	32	11	2

TF 20 SE 5 2586 0268 East of Bar Pasture Farm, Mile Fen

Sub-block F₁

Surface level (+2.1 m)+7 ft
Water struck at O.D.
152 mm percussion
December 1975

Overburden 1.3 m
Mineral 3.8 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty indurated	0.6	0.6
River Terrace Deposits (First Terrace)	Clay, indurated, mottled orange with dark brown, sandy in upper 0.4 m	0.7	1.3
	Sandy gravel Gravel: fine with trace coarse, cobbles between 4.1 and 5.1 m, subrounded flint, with oolitic limestone, ironstone, sandstone and quartzite Sand: coarse and medium with trace fine, quartzite, sandstone and ironstone Fines: orange-brown	3.8	5.1
Oxford Clay	Clay, stiff, bluish green, fossiliferous	0.8+	5.9

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			-1/8	+1/8 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
5	50	45	13	9	29	19	25	5	0	
			2	3	17	33	41	4	0	
			3	3	26	30	31	7	0	
			2	4	14	16	40	19	5	
			5	5	20	25	35	9	1	

TF 20 SE 6 2527 0169 Willow Hall, The Gores

Sub-block F₁

Surface level (+3.0 m)+10 ft
Water struck at (+0.5 m)
152 mm percussion
December 1975

Overburden 1.5 m
Mineral 3.1 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty, gravelly	0.4	0.4
River Terrace Deposits (First Terrace)	Clay, indurated, iron oxide cemented in parts, mottled orange with dark brown and buff	1.1	1.5
	Sandy gravel Gravel: fine with traces of coarse and cobble, angular to subangular flint with oolitic limestone and some sandstone and ironstone, traces of quartzite and belemnite fragments Sand: medium and coarse with some fine Fines: orange-brown	3.1	4.6
Oxford Clay	Clay, stiff, pale grey to greenish grey	0.6+	5.2

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
			-1/8	+1/8 - 1/4	+1/4 - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
5	49	46	12	20	24	10	25	4	5	
			3	3	16	26	44	4	4	
			1	3	22	24	41	7	2	
			5	8	21	20	37	5	4	

TF 20 SE 7	2653 0479	Great Tower's Fen, Thorney	Sub-block F ₁	
Surface level (+0.9 m)+3 ft Water struck at (-1.1 m) 152 mm percussion December 1975			Overburden	1.2 m
LOG			Mineral	4.1 m
			Bedrock	0.4 m+
Geological classification	Lithology	Thickness m	Depth m	
	Soil, dark brown, peaty, clayey near base	0.9	0.9	
River Terrace Deposits (First Terrace)	Clay, indurated, mottled dark brown with orange, some flint gravel	0.3	1.2	
	Sandy gravel Gravel: fine with trace coarse, mainly angular to subangular flint with ironstone, sandstone, limestone and quartzite Sand: medium and coarse with traces of fine Fines: buff-yellow to orange-brown	4.1	5.3	
Oxford Clay	Clay, stiff, bluish grey, with selenite crystals, fossiliferous, some shell remains pyritised	0.4+	5.7	

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm
4	56	40	1.2-2.2	7	6	32	25	28	2	0
			2.2-3.2	5	7	23	23	35	7	0
			3.2-4.2	3	3	32	26	30	6	0
			4.2-5.2	2	3	20	24	49	2	0
			Mean	4	4	27	25	36	4	0

TF 20 SE 8	2636 0371	Pode Hole Farm, Thorney	Sub-block F ₁	
Surface level (+1.8 m)+6 ft Water struck at O.D. 152 mm percussion December 1975			Overburden	0.9 m
LOG			Mineral	5.5 m
			Bedrock	0.5 m+
Geological classification	Lithology	Thickness m	Depth m	
	Soil, dark brown, peaty	0.5	0.5	
River Terrace Deposits (First Terrace)	Clay, indurated, yellowish brown, sandy in parts, iron-oxide cemented, trace flint gravel	0.4	0.9	
	Sandy gravel Gravel: fine with some coarse, mainly angular to subangular flint with some sandstone and ironstone Sand: medium and coarse, with traces of fine Fines: orange-brown	5.5	6.4	
Oxford Clay	Clay, very stiff, bluish grey, occasional silty layers, traces of shell fragments	0.5+	6.9	

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand	Gravel				
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ -1	+1-4	+4-16	+16-64	+64 mm
3	49	48	1.1-1.8	2	9	32	24	30	3	0
			1.8-2.8	5	4	20	20	44	7	0
			2.8-3.8	2	6	36	15	30	11	0
			3.8-4.8	4	6	27	16	42	5	0
			4.8-5.8	3	5	18	25	41	8	0
			5.8-6.4	3	1	8	24	45	19	0
			Mean	3	5	24	20	39	9	0

TF 20 SE 9	2707 0273	Hill Fen, Thorney	Block E	
Surface level (+2.0 m)+6.5 ft Water not struck 152 mm percussion December 1975			Waste	0.5
LOG			Bedrock	2.0 m+
Geological classification	Lithology	Thickness m	Depth m	
	Soil, dark brown, clayey	0.5	0.5	
Oxford Clay	Clay, stiff, buff to pale grey, mottled orange-yellow in upper 0.2 m, silty, selenite crystals throughout	2.0+	2.5	

TF 20 SE 10	2644 0164	Gores Farm, The Gores	Sub-block F ₁	
Surface level (+2.1 m)+7 ft Water struck at (-0.7 m) 152 mm percussion January 1976			Overburden	0.9 m
LOG			Mineral	3.1 m
			Bedrock	0.5 m+
Geological classification	Lithology	Thickness m	Depth m	
	Soil, dark brown, peaty	0.5	0.5	
River Terrace Deposits (First Terrace)	Clay, mottled orange with brown, sandy, peaty in upper 0.2 m	0.4	0.9	
	Sandy gravel: Gravel: fine with some coarse, angular to subrounded flint with shelly limestone, and trace amounts of ironstone, quartzite and sandstone, occasional shell fragments Sand: medium with coarse and some fine Fines: orange-brown to yellow	3.1	4.0	
Oxford Clay	Clay, stiff, bluish grey, patches of carbonaceous matter, selenite crystals throughout and occasional shell fragments	0.5+	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
9	52	39	0.9-1.9	13	14	38	10	20	5	0
			1.9-2.9	9	10	32	18	24	7	0
			2.9-4.0	5	3	16	16	46	14	0
			Mean	9	9	28	15	30	9	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.9-4.0	39	47	6	3	4	1

TF 20 SE 11 2717 0037 Teakettle Hall Farm, Prior's Fen

Sub-block D₁

Surface level (+0.6 m)+2 ft
Water struck at (-1.6)
152 mm percussion
January 1976

Overburden 1.4 m
Mineral 2.4 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty	0.7	0.7
River Terrace Deposits (First Terrace)	Clay, firm, mottled orange to buff and yellow, sandy with traces of gravel below 1.0 m	0.7	1.4
	Gravel Gravel: Fine with some coarse and trace cobble below 2.0 m to base, subangular to rounded flint, shelly and oolitic limestone, quartzite, ironstone and sandstone, with traces of rounded chalk and belemnite fragments Sand: coarse and medium with trace fine Fines: buff-yellow	2.4	3.8
Oxford Clay	Clay, stiff, greenish grey, silty, with occasional dark grey patches of carbonaceous matter, bivalve shell fragments common	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
3	30	67	1.4-2.0	8	6	26	13	37	10	0
			2.0-3.0	1	1	7	18	61	10	2
			3.0-3.8	2	0	7	19	57	13	2
			Mean	3	2	11	17	54	11	2

TF 20 SE 12 2783 0483

White Hart Bridge Farm, Thorney

Block E

Surface level (+0.3 m)+1 ft
Water struck at (-2.5 m)
152 mm percussion
January 1976

Waste 3.1 m
Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, clayey	0.4	0.4
Barroway Drove Beds	Silt, firm, mottled orange with buff and brown, with some pebbles and shell fragments especially in upper 1.2 m, with medium to coarse sand layer between 2.8 and 3.1 m	2.7	3.1
Oxford Clay	Clay, stiff to very stiff, mottled blue to yellowish buff in upper 1.5 m, becoming predominantly grey, silty, selenite, crystal patches throughout, occasional ? iron-rich nodules and very rare pyritised shell fragments below 4.6 m	1.9+	5.0

TF 20 SE 13 2743 0378

Guy's Fen, Thorney

Block E

Surface level (+1.5 m)+5 ft
Water not struck
152 mm percussion
December 1975

Waste 3.4 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, with shell fragments, clayey	1.3	1.3
Barroway Drove Beds	Clay, soft, yellowish brown mottled with blue, peat layers throughout	2.1	3.4
Oxford Clay	Clay, stiff, mottled pale, grey to yellow in upper 1.0 m becoming grey with many selenite crystals below 4.4 m, silty, with rootlets and calcareous and iron-rich nodules in upper 1.0 m	1.1+	4.5

TF 20 SE 14 2763 0227

Adjacent to the Thorney River, Hill Fen

Block E

Surface level (+0.5 m)+1.5 ft
Water not struck
152 mm percussion
December 1975

Waste 2.5 m
Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.9	0.9
Barroway Drove Beds	Clay, soft, bluish grey, occasional peaty pockets, sandy in lower 0.2 m	1.6	2.5
Oxford Clay	Clay, firm, blue mottled yellow, clusters of selenite crystals throughout, traces of small iron-rich nodules	1.9+	4.4

TF 20 SE 15 2730 0145

Gore's Farm, The Gores

Sub-block F₁

Surface level (+1.2 m)+4 ft
Water struck at (-1.4 m)
152 mm percussion
January 1976

Overburden 2.6 m
Mineral 2.3 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty, clayey	0.8	0.8
?Barroway Drove Beds	Silt, soft, mottled buff to orange becoming blue and grey towards base, with plant remains throughout, micaceous, traces, of sand and gravel at base	1.8	2.6
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with some coarse, mainly angular to subangular flint with subrounded shelly limestone with rounded to subrounded ironstone, sandstone and quartzite Sand: coarse and medium with traces of fine Fines: greyish buff	2.3	4.9
Oxford Clay	Clay, soft to firm, bluish grey, traces of shell fragments with patches of selenite crystals	1.3+	6.2

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	43	51	2.6-3.6	8	4	22	21	39	6	0	
			3.6-4.6	3	2	18	22	46	9	0	
			4.6-4.9	6	2	16	24	44	8	0	
			Mean	6	3	18	22	43	8	0	

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.6-4.9	28	50	10	2	10	0

TF 20 SE 16 2758 0057

Near Stone Bridge, Prior's Fen

Sub-block D₁

Surface level (-0.1 m)-0.4 ft
Water struck at (-1.8 m)
152 mm percussion
January 1976

Overburden 4.8 m
Mineral 3.1 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty clay, passes into peat	0.7	0.7
Barroway Drove Beds	Silt, soft, pale grey, abundant organic remains	1.9	2.6
Lower Peat	Peat, black	1.5	4.1
River Terrace Deposits (First Terrace)	Clay, soft, grey, silty, sandy towards base Gravel Gravel: fine with some coarse, angular to subangular flint with rounded to subrounded shelly and oolitic limestone, and some ironstone, sandstone and fossil fragments, traces of chalk Sand: medium and coarse with traces of fine Fines: buff	0.7 3.1	4.8 7.9
Oxford Clay	Clay, stiff, green, silty, with bivalve shell fragments	0.5+	8.4

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	
4	46	50	4.8-5.8	5	12	27	18	32	6	0
			5.8-6.8	5	5	33	16	30	11	0
			6.8-7.8	1	2	13	13	51	20	0
			Mean	4	6	24	16	38	12	0

TF 20 SE 17 2847 0462 Near railway embankment, Cobbler's Fen, Thorney

Surface level (+0.3 m)+1 ft
 Water Struck at (-3.0 m)
 152 mm percussion
 December 1975

Block E

Waste 3.9 m
 Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, clayey peat	0.4	0.4
Barroway Drove Beds	Clay, very soft, blue, silty, traces of peat and shells	3.5	3.9
Oxford Clay	Clay, stiff, mottled grey and yellow, with pockets of selenite crystals and traces of fossil fragments	1.6+	5.5

TF 20 SE 18 2875 0356 Ashley House, Thorney

Surface level (+2.4 m)+8 ft
 Water not struck
 152 mm percussion
 December 1975

Block E

Waste 0.9 m
 Bedrock 1.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, clayey	0.3	0.3
River Terrace Deposits (First Terrace)	Clay, indurated, mottled dark brown to orange with yellowish grey, sandy, with some flint gravel	0.6	0.9
Oxford Clay	Clay, indurated to well indurated, pale grey mottled yellow becoming grey below 1.4 m, occasional sandy patches, with small iron-rich nodules and selenite crystals throughout, and clusters of bivalve shells including <u>Gryphaea</u>	1.4+	2.3

TF 20 SE 19 2814 0283 Tonceham Farm, Thorney

Surface level (+6.0 m)+19.5 ft
 Water not struck
 152 mm percussion
 December 1975

Block H

Waste 1.4 m
 Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, yellowish brown, clayey, with gravel and peat	0.4	0.4
March Gravels	Clay, indurated, yellowish brown mottled orange and grey in places, silty, sandy	1.0	1.4
Oxford Clay	Clay, stiff, pale bluish grey to grey, with selenite crystals	2.1+	3.5

TF 20 SE 20 2889 0191 Second House Farm, Upper Knarr Fen

Surface level (+1.4 m)+4.5 ft
 Water struck at (-1.0 m)
 152 mm percussion
 January 1976

Sub-block E₁

Overburden 2.4 m
 Mineral 1.9 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground		0.3	0.3
Nordelph Peat	Peat black	0.4	0.7
Barroway Drove Beds	Silt, soft, mottled buff with pale grey and orange, abundant organic material and pockets of peat	1.7	2.4
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with some coarse, subangular to rounded flint, oolitic and shelly limestone, sandstone, ironstone and with some quartzite Sand: coarse and medium with traces of fine Fines: buff-grey	1.9	4.3
Oxford Clay	Clay, stiff, pale greenish grey, with selenite crystals and pockets of carbonaceous matter	0.8+	5.1

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				-½	+½ -¼	+¼ -1	+1 -4	+4 -16	+16 -64	+64 mm
3	38	59	2.4-3.4	3	3	14	20	48	12	0
			3.4-4.3	3	2	17	20	49	9	0
			Mean	3	3	15	20	48	11	0

TF 20 SE 21 2826 0108

Stone Bridge Farm, Thorney Dike

Sub-block E₁

Surface level (-0.1 m)-0.4 ft
Water level not recorded
152 mm percussion
January 1976

Overburden 4.1 m
Mineral 2.9
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty	0.8	0.8
Barroway Drove Beds	Silt, soft, mottled buff with grey	2.5	3.3
?Lower Peat	Peat, dark brown	0.1	3.4
Barroway Drove Beds	Silt, soft, buff to grey, sandy in parts	0.7	4.1
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with some coarse and trace cobble between 6.1 and 7.0m, mainly angular to subangular flint with some shelly limestone and ironstone with traces of sandstone and quartzite, belemnite and bivalve shell fragments throughout Sand: coarse and medium with traces of fine Fines: buff-grey	2.9	7.0
Oxford Clay	Clay, stiff, greenish grey, silty, fossiliferous	0.5+	7.5

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
3	45	52	4.1-5.1	2	2	17	19	36	24	0
			5.1-6.1	3	2	22	26	39	8	0
			6.1-7.0	4	4	20	24	35	7	6
			Mean	3	2	20	23	37	13	2

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone incl. chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.1-7.0	26	58	8	6	2	0

TF 20 SE 22 2875 0022

Green Drove, Bassenhally Moor

Sub-block E₁

Surface level (+0.3 m)+1 ft
Water struck at (-2.7 m)
152 mm percussion
January 1976

Overburden 5.1 m
Mineral 3.3 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty, sandy towards base	0.3	0.3
Nordeph Peat	Peat, dark brown	0.4	0.7
Barroway Drove Beds	Silt, soft to firm, thixotropic and glutinous in parts, mottled bluish yellow to brown in upper 0.4 m becoming dark buff to blue, with much fine sand below 1.4 m to base	3.2	3.9
?Lower Peat	Peat, black	0.5	4.6
?Barroway Drove Beds	Silt, soft, buff-grey, with angular flint gravel at base	0.5	5.1
River Terrace Deposits First Terrace	Sandy gravel Gravel: fine with some coarse and trace cobble between 7.1 and 8.1 m, mainly subangular to subrounded flint with oolitic and shelly limestone, quartzite, sandstone and ironstone, with traces of chalk Sand: medium with coarse and some fine Fines: buff-grey	3.3	8.4
Oxford Clay	Clay, very stiff to indurated, greenish grey silty, with dark grey carbonaceous patches and occasional bivalve shell fragments, selenite crystals throughout, with occasional iron-rich nodules	0.9+	9.3

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
3	51	46	5.1-6.1	6	10	33	18	29	4	0
			6.1-7.1	3	9	28	19	32	9	0
			7.1-8.1	2	4	20	16	38	17	3
			8.1-8.4	4	4	19	23	40	10	0
			Mean	3	7	25	19	35	10	1

TF 20 SE 23 2990 0411 Duke's Head Farm, Ward's Causeway Block E
 Surface level (+1.5 m)+5 ft Waste 6.8 m
 Water level not recorded Bedrock 1.2 m+
 152 mm percussion
 January 1976

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.4	0.4
Nordelph Peat	Peat, firm, sandy, clayey	2.1	2.5
Barroway Drove Beds	Clay, soft to very soft, blue, silty, sandy in parts, with shell fragments	4.3	6.8
Oxford Clay	Clay, stiff, blue	1.2+	8.0

TF 20 SE 24 2955 0313 Park Farm, Thorney Block E
 Surface level (+0.6 m)+2 ft Waste 2.5 m
 Water level not recorded Bedrock 2.0 m+
 152 mm percussion
 December 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.7	0.7
Barroway Drove Beds	Clay, soft to very soft, bluish grey, silty, with patches of peat	1.8	2.5
Oxford Clay	Clay, firm to stiff, weathered pale grey to yellow in upper 1.0 m becoming grey, selenite crystals rare, with shell fragments including <i>Gryphaea</i> and some iron-rich nodules	2.0+	4.5

TF 20 SE 25 2993 0264 Near Crowtree Farm, Upper Knarr Fen Sub-block E₁
 Surface level (+1.1 m)+3.5 ft Waste 3.4 m
 Water struck at (-2.3 m) Mineral 3.1 m
 152 mm percussion Bedrock 1.3 m+
 January 1976

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty, sandy with clay towards base	0.8	0.8
Barroway Drove Beds	Silt, soft, mottled pale buff with orange, sandy in parts Silt, very soft, blue	1.7 0.9	2.5 3.4
River Terrace Deposits (First Terrace)	Gravel Gravel: mainly fine with some coarse and traces of cobble, angular flint with shelly and oolitic limestone, sandstone, ironstone and quartzite Sand: coarse and medium with trace fine Fines: yellow to buff	3.1	6.5
Oxford Clay	Clay, very stiff, bluish green, trace pyrites and occasional small iron-rich nodules	1.3+	7.8

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	39	59	3.4-4.4	2	1	20	18	46	10	3
			4.4-5.4	2	2	15	18	54	9	0
			5.4-6.4	2	3	20	21	42	7	5
			Mean	2	2	18	19	47	9	3

TF 20 SE 26 2999 0159 Crowtree Farm, Upper Knarr Fen Sub-block E₁
 Surface level (-0.1 m)-0.5 ft Waste 5.1 m
 Water level not recorded Bedrock 1.9 m+
 152 mm percussion
 January 1976

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.3	0.3
Barroway Drove Beds	Clay, soft to very soft, mottled yellow to orange and buff, possibly laminated in parts, becomes bluish grey below 2.3 m, silty, with dark, brown peaty patches	2.5	2.8
Lower Peat	Peat, black	0.7	3.5
?River Terrace Deposits (First Terrace)	Clay, very soft becoming firm towards base, yellowish grey, silty, with sandy pockets, gravelly at base	1.6	5.1
Oxford Clay	Clay, firm to stiff, brown to greenish grey, silty in parts	1.9+	7.0

TF 20 SE 27	2981 0053	Green Drove, Bassenhally Moor	Sub-block D ₁	
Surface level (-0.4 m)-1.5 ft Water struck at (-3.9 m) 152 mm percussion January 1975			Overburden	3.5 m
			Mineral	1.3 m
			Waste	0.4 m
			Mineral	1.2 m
			Waste	0.2 m
			Mineral	1.0 m
			Bedrock	1.1 m+

LOG				
Geological classification	Lithology	Thickness m	Depth m	
	Soil, dark brown to black, peaty	0.4	0.4	
Nordelph Peat	Peat, dark brown, silty	0.7	1.1	
Barroway Drove Beds	Clay, soft, blue, with orange sandy patches	1.4	2.5	
Lower Peat	Peat, black	1.0	3.5	
River Terrace Deposits (First Terrace)	a Gravel Gravel: fine with some coarse, trace cobble, angular flint with oolitic limestone, sandstone, ironstone and some chalk Sand: medium and coarse with trace fine Fines: buff-grey	1.3	4.8	
	Clay, alternate layers of firm, yellowish brown, sand with traces of gravel with softer, blue clay; with shell fragments	0.4	5.2	
	b 'Clayey' gravel Gravel: Fine to cobble Sand: medium and coarse with trace fine Fines: yellow	1.2	6.4	
?Boulder Clay	Clay, stiff, mottled grey to dark grey, sandy, traces of flint and chalk gravel	0.2	6.6	
?Glacial Sand and Gravel	c Sandy gravel Gravel: fine to coarse, trace cobble, flint, sandstone and ironstone, with bivalve shells Sand: coarse and medium, trace fine Fines: greyish buff	1.0	7.6	
Oxford Clay	Clay, stiff, greenish blue, silty, selenite crystals throughout, occasional bivalve shell fragments	1.1+	8.7	

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		
a	5	45	50	3.5-4.5	4	5	29	13	33	13	3		
				4.5-4.8	6	3	17	17	39	18	0		
				Mean	5	5	26	14	34	14	2		
				4.8-5.2	Waste								
b	15	34	51	5.2-6.4	15	3	16	15	36	9	6		
				6.4-6.6	Waste								
c	3	65	32	6.6-7.6	3	2	31	32	27	2	3		
a+b+c	6	46	48	Mean	6	3	23	20	34	11	3		

TF 20 SE 28	2574 0100	Near Prior's Farm, Prior's Fen	Sub-block F ₁	
Surface level (+1.8 m)+6 ft Water struck at (-0.4 m) 152 mm percussion April 1976			Overburden	1.5 m
			Mineral	1.9 m
			Bedrock	2.0 m+

LOG											
Geological classification	Lithology	Thickness m	Depth m								
Made ground	Farm track ballast	0.1	0.1								
Nordelph Peat	Peat, dark brown to greyish brown	0.7	0.8								
?Barroway Drove Beds	Clay, firm mottled pale khaki to orange with greyish brown, silty, occasional 'rafts' of peat, some iron-oxide stained patches of fine sand	0.7	1.5								
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine with traces of coarse mainly angular to subangular gray and white flint with ironstone and occasional subrounded quartzite and sandstone, shell fragments below 2.2 m Sand: medium with coarse and fine Fines: greyish brown	1.9	3.4								
Oxford Clay	Clay, firm to stiff, pale grey to grey, rare nodule of ? corroded pyrite	2.0+	5.4								
GRADING											
	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines		Sand		Gravel		
					- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1-4	+4-16	+16-64	+64 mm
	10	59	31	1.5-2.2	17	28	31	7	13	4	0
				2.2-3.4	6	5	28	22	34	5	0
				Mean	10	13	29	17	26	5	0

TL 29 NW 216 2068 9785 North of Stanground, Peterborough

Surface level (+3.5 m) + 11.5 ft
Water struck at (+0.8 m)
152 mm percussion
November 1975

Sub-block A₁

Overburden 2.7 m
Mineral 2.5 m
Waste 0.8 m
Mineral 0.6 m
Waste 0.2 m
Mineral 1.1 m
Bedrock 0.5 m

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.3	0.3
Alluvium	Clay, pale brown, silty	0.7	1.0
Nordelph Peat	Peat, dark brown to black	1.4	2.4
Barroway Drove Beds	Clay, soft to glutinous, bluish grey	0.3	2.7
River Terrace Deposits (First Terrace)	<p>a Gravel Gravel: mainly fine with some coarse and traces of cobble between 2.7 to 4.7 m, mostly angular to subangular white flint with rounded to subrounded quartzite and some shelly limestone and ironstone, traces of sandstone, occasional <i>Gryphaea</i> shells Sand: medium and coarse with a trace of fine, mainly quartz Fines: pale grey</p> <p>Silt, soft, dark brown to black</p> <p>b Pebbly sand Gravel: traces only, mainly fine Sand: medium, traces of fine and coarse Fines: pale greyish yellow</p> <p>Clay, greyish brown with traces of gravel</p> <p>c Gravel Gravel: fine with some coarse and trace cobble, mainly angular to subangular flint with subrounded to rounded quartzites Sand: medium and coarse with trace fine Fines: dark greyish brown</p>	2.5	5.2
		0.8	6.0
		0.6	6.6
		0.2	6.8
		1.1	7.9
Oxford Clay	Clay, very stiff, bluish grey, with pyrite concretions and mudstone pellets throughout, fossiliferous	0.5+	8.4

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		percentages						
					Fines	Sand	Gravel			mm	
			-½	+½ - ¾	+¾ - 1	+1 - 4	+4 - 16	+16 - 64	+64		
a	3	42	55	2.7-3.7	3	3	25	11	35	20	5
				3.7-4.7	2	2	23	20	39	13	1
				4.7-5.2	5	2	19	26	40	9	0
				Mean	3	2	23	17	38	15	2
			5.2-6.0	Waste							
b	7	85	8	6.0-6.6	7	6	73	6	6	2	0
				6.6-6.8	Waste						
c	3	47	50	6.8-7.8	3	3	23	21	31	14	5
a+b+c	4	50	46	Mean	4	3	30	17	31	13	2

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.7-2.8	15	38	8	3	36	0

TL 29 NW 219 2182 9829 Stanground North, Peterborough

Surface level (+2.8 m) + 9 ft
Water struck at (+0.2 m)
52 mm percussion
November 1975

Sub-block A₁

Overburden 2.6 m
Mineral 4.4 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Rubble, passing into orange, iron-stained, well-indurated clay	1.1	1.1
Nordelph Peat	Peat, black, with silty clay layers	1.1	2.2
Barroway Drove Beds	Clay, soft to glutinous, bluish grey	0.4	2.6
River Terrace Deposits (First Terrace)	<p>Sandy gravel Gravel: fine with some coarse and traces of cobble between 5.6 and 7.0 m, mainly angular to subangular white and brown flint with subrounded, generally tabular limestone, subrounded ironstone and quartzite with traces of sandstone Sand: medium and coarse with some fine, quartz, flint and ironstone Fines: greyish brown</p>	4.4	7.0
Oxford Clay	Clay, very stiff, brownish grey in upper 0.2 m becoming dark grey with many white shell fragments	0.5+	7.5

GRADING

Mean for deposit percentages	Depth below surface (m)	percentages								
		Fines			Sand			Gravel		
		-½	+½ - ¾	+¾ - 1	+1 - 4	+4 - 16	+16 - 64	+64		
8	50	42	2.6-3.6	4	5	27	20	38	8	0
			3.6-4.6	4	7	33	19	32	5	0
			4.6-5.6	4	6	28	18	32	12	0
			5.6-6.6	23	10	18	11	28	8	2
			6.6-7.0	4	3	18	22	33	13	7
			Mean	8	7	26	17	32	9	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.6-7.0	20	47	16	2	15	0

TL 29 NW 220 2195 9729 Crick's Farm, Drysides

Sub-block D₂

Surface level (+2.7 m) + 9 ft
Water struck at (-2.0 m)
152 mm percussion
November 1975

Overburden 2.5 m
Mineral 4.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made Ground	Rubble of bricks and soil	0.5	0.5
Nordelph Peat	Peat, firm, brown, partially stained and cemented with iron-oxide, silty and sandy toward base	1.5	2.0
Barroway Drove Beds	Clay, glutinous, greyish blue, silty	0.5	2.5
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse and cobble, mostly angular, white flint with limestone, subrounded quartzite and ironstone with traces of sandstone Sand: medium and coarse with some fine, mainly quartz with some flint and ironstone Fines: greyish brown	4.8	7.3
Oxford Clay	Clay, very stiff, brown in upper 0.3 m becoming bluish grey, with fossil fragments towards base	0.5+	7.8

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
9	61	30	2.4-3.4	12	16	31	20	19	2	0
			3.4-4.4	11	9	40	15	22	4	0
			4.4-5.4	13	5	26	24	29	4	0
			5.4-6.4	5	8	32	22	28	5	0
			6.4-7.3	5	5	38	15	23	11	4
			Mean	9	9	33	19	24	5	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.4-7.3	22	42	16	3	17	0

TL 29 NW 221 2243 9948 Bar Road, Flag Fen

Sub-block D₁

Surface level (+1.9 m) + 6 ft
Water struck at (-0.7 m)
152 mm percussion
October 1975

Overburden 2.6 m
Mineral 5.3 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty	0.5	0.5

Nordelph Peat

Peat, dark brown to black, many root fragments

1.9 2.4

Barroway Drove Beds

Clay, soft to glutinous, bluish grey

0.2 2.6

River Terrace Deposit (First Terrace)

Sandy gravel
Gravel: fine with some coarse, trace cobble between 5.6-6.6 m, mainly angular white and brown flint with subrounded, tabular oolitic limestone and subrounded quartzite, traces of ironstone and sandstone
Sand: medium and coarse with some fine, mainly quartz with flint and ironstone
Fines: brown

5.3 7.9

Oxford Clay

Clay, very stiff, bluish grey, many shell fragments, belemnite

0.3 8.2

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	59	35	2.6-3.6	6	9	17	25	37	5	0
			3.6-4.6	5	20	37	16	21	1	0
			4.6-5.6	6	5	25	29	28	7	0
			5.6-6.6	5	6	26	23	30	8	3
			6.6-7.9	8	15	23	21	24	10	0
			Mean	6	11	25	23	28	6	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.6-7.9	28	50	6	6	8	2

TL 29 NW 222 2251 9860

Near North Bank, Peterborough

Sub-block D₂

Surface level (+1.6 m) + 5 ft
Water struck at (-1.0 m)
152 mm percussion

Overburden 2.3 m
Mineral 4.7 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty	0.6	0.6
Nordelph Peat	Peat, very dark brown to black	1.5	2.1
Barroway Drove Beds	Clay, soft to glutinous, bluish grey	0.2	2.3
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, traces of cobble in upper 3.0 m, mainly angular to subangular brown flint with subrounded limestone and some quartzite and ironstone Sand: medium and coarse with some fine, mainly quartz with flint and ironstone Fines: greyish brown	4.7	7.0
Oxford Clay	Clay, very stiff, brown in upper 0.1 m becoming dark grey with many white shell fragments together with several ammonite impressions	0.5+	7.5

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	57	38	2.3-3.3	7	5	25	18	38	6	1
			3.3-4.3	8	6	28	14	38	7	0
			4.3-5.3	6	10	29	18	28	8	1
			5.3-6.3	0	6	29	30	27	8	0
			6.3-7.0	8	18	38	13	18	4	0
			Mean	6	8	29	19	31	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.3-7.0	25	40	16	0	19	0

TL 29 NW 223 2241 9602 Horsey Grange, Stanground South

Block D

Surface level (+5.4 m) + 17.5 ft
Water not struck
152 mm percussion
November 1975

Waste 0.3 m
Bedrock 4.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, greyish brown with trace gravel	0.3	0.3
Oxford Clay	Clay, stiff, brown to pale brownish grey becoming blue-grey below 4.8 m, traces of gravel in upper layers, abundant selenite crystals throughout, rare fossil fragments	4.9	5.2

TL 29 NW 224 2256 9555 South of Horsey Hill, Stanground South

Block D

Surface level (+2.3 m) + 7.5 ft
Water not struck
152 mm percussion
October 1975

Waste 2.8 m
Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, greyish brown, passes into clay with peat, iron-pan layer near base	1.2	1.2
River Terrace Deposits (First Terrace)	Clay, yellow to orange-brown, with sandy layers and traces of angular flint gravel	1.6	2.8
Oxford Clay	Clay, stiff, bluish-grey, fossiliferous, many selenite crystals	1.9+	4.7

TL 29 NW 225 2341 9958 Northey, Peterborough

Sub-block D₁

Surface level (+1.7 m) + 5.5 ft
Water struck at (-0.4 m)
152 mm percussion
October 1975

Overburden 1.7 m
Mineral 1.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, indurated, dark brown, peaty, with brick rubble	1.0	1.0
Nordelph Peat	Peat, dark brown to black	0.3	1.3
Barroway Drove Beds	Clay, soft, pale grey to greyish green, silty, sandy in parts	0.4	1.7
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine with some coarse, angular flint with subrounded quartzite and limestone with some ironstone and sandstone Sand: medium with fine and coarse, mainly quartz Fines: pale greyish brown	1.8	3.5
Oxford Clay	Clay, stiff, brown in upper 0.1 m becoming bluish grey, fossiliferous	0.5+	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
13	56	31	1.7-3.5	13	13	30	13	24	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.7-3.5	18	44	10	8	19	1

TL 29 NW 226 2336 9867 Mason's Farm, Northey

Sub-block F₁

Surface level (+3.2 m) + 10.5 ft
Water struck at (-0.3 m)
152 mm percussion
November 1975

Overburden 0.6 m
Mineral 3.8 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, black, peaty	0.4	0.4
River Terrace Deposits (First Terrace)	Clay, orange-brown, sandy with some gravel, iron-oxide cemented	0.2	0.6
	'Clayey' sandy gravel, becomes less 'clayey' below 2.5 m Gravel: fine with some coarse and traces of cobble in upper 2.5 m, brown, angular to subrounded flint with shelly limestone and some quartzite and sandstone with traces of ironstone Sand: medium with coarse and fine, quartz, flint and ironstone Fines: dark orange-brown to yellowish brown	3.8	4.4
Oxford Clay	Clay, very stiff, greyish brown becoming dark grey below 4.6 m, fossiliferous	0.6+	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
11	47	42	0.6-1.5	24	22	33	5	9	5	1
			1.5-2.5	10	7	15	12	32	20	4
			2.5-3.5	4	6	17	21	43	10	0
			3.5-4.4	7	10	23	17	32	12	0
			Mean	11	11	22	14	29	12	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.6-4.4	30	42	6	9	11	2

TL 29 NW 227 2311 9763 Bradley Fen, South Bank

Sub-block D₂

Surface level (+1.2 m) + 4 ft
Water struck at (-1.1 m)
152 mm percussion
October 1975

Overburden 1.5 m
Mineral 2.9 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, greyish brown, peaty, passes into peat with silty lenses	1.3	1.3

River Terrace Deposits (First Terrace)

Clay, orange-brown, sandy in parts with some flint gravel

0.2 1.5

Gravel

Gravel: mainly fine with some coarse and trace cobble, angular to subangular flint with rounded to subrounded limestone and some ironstone and quartzite with trace sandstone
Sand: medium and coarse with some fine, mainly quartz
Fines: orange-brown

Oxford Clay

Clay, very stiff, mottled brownish grey in upper 0.2 m becoming greyish blue

0.6+ 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
5	38	57	1.5-2.5	9	15	22	12	33	9	0
			2.5-3.5	2	1	9	22	45	20	1
			3.5-4.4	3	3	16	13	44	19	2
			Mean	5	7	18	13	40	16	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.5-4.4	32	43	11	6	8	0

TL 29 NW 228 2346 9682

Must Farm, Near King's Dike

Sub-block D₂

Surface level (+2.0 m) + 6.5 ft
Water struck at (-3.4 m)
152 mm percussion
November 1975

Overburden 4.5 m
Mineral 2.3 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	1.0	1.0
Nordelph Peat	Peat, dark brown to grey, silty in places	0.6	1.6
Barroway Drove Beds	Clay, soft to glutinous, thixotropic, bluish grey, with occasional peat intercalations	2.9	4.5
River Terrace Deposits (First Terrace)	Sandy gravel; 'clayey' in upper 1.0 m Gravel: fine with traces of coarse and cobble, angular to subangular flint with some limestone, ironstone and quartzite with traces of sandstone Sand: coarse and medium with trace fine, mainly quartz Fines: greyish brown	2.3	6.8
Oxford Clay	Clay, very stiff, grey	0.5+	7.3

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
7	49	44	4.5-5.5	14	9	21	19	34	4	0
			5.5-6.8	2	4	19	26	41	7	1
			Mean	7	6	20	23	38	5	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.5-6.8	23	46	16	1	14	0

TL 29 NW 229 2346 9578 Bunting's Drove, King's Delph

Surface level (+2.0 m) + 6.5 ft
Water not struck
152 mm percussion
November 1975

Block D
Waste 3.0 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Mixture of soil, bricks and peat	0.5	0.5
Nordelph Peat	Peat, dark brown, silty	1.7	2.2
?Barroway Drove Beds	Clay, mottled grey with brown, sandy	0.8	3.0
Oxford Clay	Clay, very stiff, grey mottled with pale khaki, abundant selenite	0.5+	3.5

TL 29 NW 230 2432 9959 Northey Farm, Northey

Surface level (+0.7 m) + 2.5 ft
Water struck at (-2.2 m)
152 mm percussion
October 1975

Sub-block D₁
Overburden 2.8 m
Mineral 0.8 m
Waste 1.2 m
Mineral 1.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty	0.5	0.5
Nordelph Peat	Peat, dark brown to black	0.5	1.0
Barroway Drove Beds	Clay, soft to glutinous, pale bluish grey, silty, sandy towards base	1.8	2.8

River Terrace Deposit (First Terrace)

a 'Clayey' sandy gravel
Gravel: fine with trace coarse, mainly angular to subangular white and brown flint with subrounded ironstone and sandstone
Sand: medium with coarse and fine, mainly quartz
Fines: dark greyish brown

0.8 3.6

Clay, stiff, dark khaki, generally silty, becoming sandy towards base, occasional flint pebbles

1.2 4.8

b Sandy gravel
Gravel: fine with some coarse and traces of cobble, mainly angular to subangular brown and white flint with oolitic and shelly limestone, some ironstone and quartzite and traces of sandstone
Sand: medium with some coarse and fine, quartz, flint and ironstone
Fines: pale orange-brown

1.5 6.3

Oxford Clay

Clay, stiff, greyish khaki, fossiliferous including ammonite impressions

0.5+ 6.8

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	
a	12	59	29	2.8-3.6	12	16	24	19	28	1	0	
				3.6-4.8	Waste							
				4.8-5.8	5	10	36	12	28	8	1	
				5.8-6.3	3	3	14	26	42	9	3	
b	4	53	43	Mean	4	8	29	16	33	9	1	
a+b	7	55	38	Mean	7	11	27	17	31	6	1	

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.8-6.3	24	41	18	5	12	0

TL 29 NW 231 2448 9890 Four Chimney Farm, North Fen

Surface level (+2.0 m) + 6.5 ft
Water struck at (-0.3 m)
152 mm percussion
October 1975

Sub-block F₁
Overburden 0.5 m
Mineral 2.7 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Brick and clay rubble	0.3	0.3
River Terrace Deposits (First Terrace)	Clay, very stiff, variegated dark orange-brown to brown 'Clayey' gravel Gravel: fine with some coarse and trace cobble in lower 0.7 m, angular to subangular brown and white flint, with quartzite, some shelly and oolitic limestone, ironstone and traces of sandstone Sand: coarse and medium with traces of fine, mainly quartz with ironstone Fines: orange-brown becoming dark grey below 1.5 m	0.2	0.5

Oxford Clay Clay, very stiff, khaki-brown in upper 0.2 m, becoming bluish grey, fossiliferous throughout 0.5+ 3.7

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
10	33	57	0.5-1.5	19	6	17	18	36	4	0
			1.5-3.2	4	3	10	17	49	16	2
			Mean	10	4	13	17	44	11	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.5-3.2	16	44	15	6	19	0

TL 29 NW 232 2450 9792 Fen Causeway, Whittlesey Sub-block H₁

Surface level (+5.2 m) + 17 ft Overburden 1.2 m
 Water not struck Mineral 1.1 m
 152 mm percussion Bedrock 0.7 m+
 October 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, indurated, orange-brown, clayey with trace gravel	0.5	0.5
March Gravels	Clay, orange-brown, sandy 'Clayey' gravel Gravel: fine with trace coarse, mainly angular flint with limestone and quartzite and some ironstone, occasional shell fragments Sand: medium and coarse with some fine, quartz Fines: orange-brown	0.7 1.1	1.2 2.3
Oxford Clay	Clay very stiff, brown in upper 0.5 m becoming bluish grey, fossiliferous	0.7+	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
15	41	44	1.2-2.3	15	9	17	15	40	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-2.3	26	40	7	0	26	1

TL 29 NW 233 2460 9647 King's Dike, south of Whittlesey Sub-block D₂

Surface level (+1.1 m) +3.5 ft Overburden 3.9 m
 Water struck at (-2.9 m) Mineral 3.7 m
 152 mm percussion Bedrock 0.5 m+
 November 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, peaty, passes into dark brown peat	1.6	1.6
Barroway Drove Beds	Clay, very soft, glutinous, bluish grey	2.3	3.9
River Terrace Deposits (First Terrace)	Sandy gravel; 'very clayey' in upper 0.4 m Gravel: fine with some coarse, trace cobble between 5.9 and 6.9 m, angular to subangular white and brown flint with oolitic and some subrounded quartzite and ironstone Sand: medium and coarse with trace fine, mainly quartz with ironstone Fines: dark grey	3.7	7.6
Oxford Clay	Clay, brown in upper 0.2 m becoming bluish grey, silty, many shell fragments, occasional well preserved ammonite impression	0.5+	8.1

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
4	52	44	3.9-4.9	6	6	41	14	21	13	0
			4.9-5.9	4	3	23	21	36	14	0
			5.9-6.9	3	4	33	18	30	11	2
			6.9-7.6	3	2	20	24	36	15	0
			Mean	4	4	30	19	30	13	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.9-7.6	30	31	16	0	23	0

TL 29 NW 234 2492 9546

Drake's Farm, King's Delph

Sub-block D₂

Surface level (+0.6 m) + 2 ft
Water struck at (-2.2 m)
152 mm percussion
October 1975

Overburden 2.8 m
Mineral 2.4 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, black, peaty, passes into peat	1.2	1.2
Barroway Drove Beds	Clay, very soft, pale bluish grey, occasional patches of peat	1.3	2.5
Lower Peat	Peat, black, silty, with trace of gravel	0.3	2.8
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with traces of coarse and cobble, mainly angular to subangular brown and white flint with limestone and quartzite and traces of ironstone and sandstone Sand: medium with some fine and coarse Fines: pale greyish brown	2.4	5.2
Oxford Clay	Clay, weathered upper 0.2 m becoming dark bluish grey, fossiliferous	0.2+	5.4

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{4}$	+ $\frac{1}{4}$ - $\frac{1}{2}$	+ $\frac{1}{2}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	62	32	2.8-3.8	5	9	40	10	33	3	0
			3.8-5.2	8	15	37	12	23	5	1
			Mean	7	12	38	11	27	4	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.8-5.2	22	51	5	3	17	2

TL 29 NW 242 2343 9517

Bunting's Drove King's Delph

Sub-block F₂

Surface level: data not available
Water struck
76 mm Minuteman
June 1977

Overburden 1.2 m
Mineral 2.0 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, clayey, with some sand and gravel	1.2	1.2
River Terrace Deposits (First Terrace)	'Clayey' pebbly sand; sandier towards base Gravel: mainly fine, subangular to subrounded limestone with angular to subangular flint and some subrounded ironstone, with traces of sandstone and quartzite Sand: medium with some fine and coarse, mainly quartz with ironstone and limestone Fines: pale khaki	2.0	3.2
Oxford Clay	Clay, stiff, bluish grey, with occasional pebbles	0.8+	4.0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-3.2	51	30	9	3	3	4

TL 29 NW 243 2257 9629

East of Horsey Lock, Stanground South

Block D

Surface level: data not available
Water struck at (1.8 m)
76 mm Minuteman
May 1978

Waste 7.8 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, pale brown, sandy	0.3	0.3
Barroway Drove Beds	Clay, soft to glutinous, pale brown mottled dark orange-brown, silty	1.1	1.5
? Lower Peat	Peat, black, very silty, abundant small white shell fragments, rare complete gastropod	0.5	2.0
Barroway Drove Beds	Silt, soft to glutinous, thixotropic, black to dark grey	3.5	5.5
River Terrace Deposits (First Terrace)	'Very Clayey' pebbly sand (recovery very poor - deposit thought to be non-mineral) Gravel: traces only, fine, angular to subangular flint with some limestone Sand: fine, mostly quartz Fines: (? greater than 40%) pale grey, glutinous	2.3	7.8
? Oxford Clay	Clay, firm, brown, ? traces of shell fragments	0.2+	8.0

TL 29 NE 28 2556 9938 Near Gull Farm, North Fen

Surface level (+1.1 m) +3.5 ft
Water struck at (-2.4 m)
152 mm percussion
July 1975

Sub-block D₁

Overburden 4.1 m
Mineral 2.4 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, overlying rubble of farm track	1.3	1.3
Barroway Drove Beds	Clay, very soft, thixotropic, generally grey, variegated with yellow and buff towards base, silty, with pockets of peat	2.8	4.1
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, mainly angular flint with limestone, ironstone, quartzite and sandstone Sand: medium to coarse with some fine, mainly quartz Fines: pale greyish brown	2.4	6.5
Oxford Clay	Clay, stiff, grey, with shell fragments	0.2+	6.7

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	
7	49	44	4.1-5.1	6	14	22	12	41	5	0
			5.1-6.5	7	8	22	20	34	9	0
			Mean	7	10	22	17	37	7	0

TL 29 NE 29 2576 9857 Near Morton's Leam, Common Wash

Surface level (+1.6 m) +5 ft
Water struck at (-3.5 m)
152 mm percussion
July 1975

Sub-block D₁

Overburden 5.1 m
Mineral 3.9 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, passes into peat	2.1	2.1
Barroway Drove Beds	Clay, soft to glutinous, thixotropic, grey, silty	3.0	5.1
River Terrace Deposits (First Terrace)	Sandy gravel, with silt layer in upper 0.2 m Gravel: fine with some coarse, subangular to subrounded limestone with angular to subangular flint with some subrounded ironstone, traces of sandstone and quartzite Sand: medium and coarse with trace fine, flint, quartz and ironstone Fines: pale greyish brown	3.9	9.0
Oxford Clay	Clay, very stiff, grey, with shell fragments	0.3+	9.3

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	
4	46	50	5.1-6.1	5	9	28	14	33	11	0
			6.1-7.1	3	5	21	21	41	9	0
			7.1-8.1	3	4	19	16	38	20	0
			8.1-9.0	4	6	20	20	34	16	0
			Mean	4	6	22	18	36	14	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
5.1-9.0	41	35	15	6	2	1

TL 29 NE 30 2561 9777 Low Road, Whittlesey

Surface level (+7.7 m) +25.5 ft
Water struck at (+5.3 m)
152 mm percussion
October 1975

Sub-block H₁

Overburden 1.7 m
Mineral 3.3 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown becoming orange-brown, friable	0.6	0.6
March Gravel	Clay, very well indurated, pale orange-brown in part cemented by iron-oxide, sandy, with traces of flint gravel	1.1	1.7
	Sandy gravel Gravel: fine with some coarse, angular to subangular white and brown flint with limestone, and traces of quartzite, ironstone and sandstone Sand: medium with some coarse as a trace of fine, mainly quartz with flint as ironstone Fines: pale brown	3.3	5.0
Oxford Clay	Clay, very stiff, greyish blue, greyish brown in upper 0.1 m, traces of shell fragments at base	0.9+	5.9

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	
9	48	43	1.7-2.7	12	3	26	19	35	5	0
			2.7-3.7	6	9	22	19	38	6	0
			3.7-5.0	8	3	29	13	36	11	0
			Mean	9	5	26	17	36	7	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.7-5.0	38	45	4	1	7	5

TL 29 NE 31 2573 9639 Reach Drove, south of Whittlesey Sub-block D₂

Surface level (+0.7 m) +2.5 ft
 Water struck at (-2.3 m)
 152 mm percussion
 July 1975

Overburden 3.0 m
 Mineral 3.6 m
 Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, brown, passes into dark grey to black peat	2.4	2.4
Barroway Drove Beds	Clay, very soft, thixotropic, grey, silty, with peat pockets throughout	0.6	3.0
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, mainly subrounded, tabular limestone with angular to subangular brown flint with subrounded ironstone and rounded sandstone, and traces of quartzite Sand: coarse and medium with traces of fine Fines: greyish brown	3.6	6.6
Oxford Clay	Clay, very stiff, grey becoming greenish grey below 7.0 m, with small indurated pellets and traces of ?gastropod at 8.0 m	1.5+	8.1

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
			-#	+# - 1/4	+ 1/4 - 1	+ 1 - 4	+ 4 - 16	+ 16 - 64	+ 64 mm	
7	51	42	3.0-6.6	7	5	20	26	36	6	0

Note: much of the finer material was lost during the drilling operations - therefore the above grading was obtained from a composite sample

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.0-6.6	46	22	16	11	5	0

TL 29 NE 32 2587 9551 Two Barns, Cross Drove Sub-block D₂

Surface level (+0.4 m) +1.5 ft
 Water struck at (-4.6 m)
 152 mm percussion
 July 1975

Overburden 5.3 m
 Mineral 2.7 m
 Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty, silty pockets	1.5	1.5
Barroway Drove Beds	Clay, very soft, thixotropic, grey, silty, traces of possible laminations at base	1.5	3.0
Lower Peat	Peat, dark brown to black with occasional wood fragments	1.9	4.9
River Terrace Deposits (First Terrace)	Clay, dark grey to black, silty, with carbonaceous fragments throughout, and pockets of medium to coarse sand with traces of gravel near base	0.4	5.3
	Sandy gravel Gravel: fine with some coarse, angular to subangular flint with limestone, and some quartzite, sandstone and ironstone Sand: medium with some coarse and fine, mainly quartz Fines: dark greyish brown	2.7	8.0
Oxford Clay	Clay, grey, with small mudstone pellets and shell fragments	0.5+	8.5

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
			-#	+# - 1/4	+ 1/4 - 1	+ 1 - 4	+ 4 - 16	+ 16 - 64	+ 64 mm	
4	54	42	5.5-6.5	6	10	41	13	26	4	0
			6.5-7.0	4	28	16	12	36	4	0
			7.0-8.2	3	4	24	15	38	16	0
			Mean	4	11	29	14	33	9	0

TL 29 NE 33 2670 9973 Bank Farm, Levitt's Drove Sub-block F₁

Surface level (+1.3 m) +4.5 ft
 Water struck at (-0.7 m)
 152 mm percussion
 July 1975

Overburden 2.0 m
 Mineral 1.3 m
 Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, brown, mixed with rubble and flint gravel	0.5	0.5
River Terrace Deposits (First Terrace)	Clay, yellowish brown, sandy, with some coarse flint gravel	1.5	2.0
	Sandy gravel Gravel: fine with some coarse, mainly angular to subangular flint with some limestone and sandstone Sand: mainly coarse with some medium and trace fine, flint and quartz Fines: pale brown	1.3	3.3

Oxford Clay Clay, stiff, grey, with small pyritised nodules and occasional shell fragments 1.2+ 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
9	47	44	2.0-3.0	9	7	15	25	33	11	0

TL 29 NE 34 2659 9865 Near Morton's Leam, The Wash Sub-block D₁

Surface level (+1.9 m) +6 ft
Water struck at (-2.7 m)
152 mm percussion
July 1975
Overburden 4.7 m
Mineral 5.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, passes into black peat	2.5	2.5
Barroway Drove Beds	Clay, very soft, thixotropic, grey, with root fragments and pockets of peat especially at 4.6 m	2.2	4.7
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with some coarse, subrounded, tabular limestone, with angular to subangular flint with some quartzite and ironstone and traces of sandstone Sand: medium and coarse and trace of fine, and quartz Fines: pale greyish brown	5.5	10.2
Oxford Clay	Clay, very stiff, grey, with mudstone pellets and shell fragments	0.5+	10.7

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
7	48	45	4.7-8.4	8	6	21	23	33	9	0
			8.4-9.4	4	8	29	11	38	10	0
			9.4-10.2	5	7	20	18	29	21	0
			Mean	7	6	22	20	34	11	0

Note: Much of the finer material was lost between 4.7 and 8.4 m during the drilling operations hence, the grading shown for this interval was obtained from a composite sample

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.7-10.2	40	29	11	4	15	1

TL 29 NE 35 2687 9787 West Delph Road, Whittlesey Sub-block D₁

Surface level (+3.4 m) +11 ft
Water not struck
152 mm percussion
July 1975
Overburden 0.9 m
Mineral 0.7 m
Bedrock 2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, brown, passes into peat	0.9	0.9
River Terrace Deposits (First Terrace)	'Very clayey' sandy gravel Gravel: fine with traces of coarse, limestone with angular to subangular flint and traces of sandstone, ironstone and quartzite Sand: medium and coarse with trace fine Fines: yellowish brown	0.7	1.6
Oxford Clay	Clay, stiff becoming very stiff, pale brown to grey with silty pellets and occasional shell fragments	2.2+	3.8

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ -1	+1 -4	+4 -16	+16 -64	+64 mm
22	46	32	0.9-1.6	22	7	21	18	28	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.9-1.6	40	39	6	8	6	1

TL 29 NE 36 2708 9604 Manor Farm, south of Whittlesey Sub-block D₂

Surface level (-0.5 m) -1.5 ft
Water struck at (-4.1 m)
152 mm percussion
July 1975
Overburden 4.6 m
Mineral 3.9 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, black passes into peat	1.2	1.2
Barroway Drove Beds	Clay, soft, grey, silty, with peat pockets	0.5	1.7
?Lower Peat	Peat, pale brown to dark brown	2.7	4.4
Barroway Drove Beds	Clay, soft, pale grey, silty	0.2	4.6

River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, mainly angular to rounded flint with limestone, sandstone, quartzite and ironstone, with occasional shell fragments Sand: medium and coarse with some fine, mostly quartz Fines: pale to dark grey	3.9	8.5
Oxford Clay	Clay, stiff, grey to greenish grey, shell fragments common	0.7+	9.2

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
7	62	31	4.6-5.6	9	13	21	21	33	3	0
			5.6-6.6	4	4	21	30	24	17	0
			6.6-7.6	5	4	27	32	30	2	0
			7.6-8.5	8	8	43	28	11	2	0
			Mean	7	7	28	27	25	6	0

TL 29 NE 37	2760 9919	Town Fifty, The Wash	Sub-block D₁
Surface level (+1.6 m) +5 ft Water struck at (-3.1 m) 152 mm percussion July 1975			Overburden 4.7 m Mineral 4.7 m Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark peaty, passes into peat	2.7	2.7
Barroway Drove Beds	Clay, soft, pale grey, silty, with pockets of peat at 4.5 m	2.0	4.7
River Terrace Deposits (First Terrace)	Sandy gravel, silty in upper 0.2 m Gravel: fine with some coarse, mainly subrounded, tabular shelly limestone with some angular to subangular black and white flint with rounded to subrounded ironstone and quartzite, traces of sandstone Sand: medium and coarse with trace fine, mainly quartz and flint Fines: pale greyish brown	4.7	9.4
Oxford Clay	Clay, very stiff, grey, with shell fragments	0.6+	10.0

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	54	41	4.7-5.7	9	6	19	26	35	5	0
			5.7-6.7	6	10	36	13	29	6	0
			6.7-7.7	4	5	24	28	31	8	0
			7.7-8.7	3	3	26	22	34	12	0
			8.7-9.4	6	5	22	22	30	15	0
			Mean	5	6	26	22	32	9	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.7-9.4	44	21	18	5	11	1

TL 29 NE 38 2768 9837 Near Little Bridge, Common Wash Sub-block D₁

Surface level (+2.4 m) +8 ft Water not struck 152 mm percussion October 1975	Waste 5.1 m Bedrock 2.9 m+
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LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty	0.1	0.1
Nordelph Peat	Peat, dark brown to black, with root and wood fragments	3.8	3.9
Barroway Drove Beds	Clay, very soft, bluish grey, with occasional peat pockets	1.2	5.1
Oxford Clay	Clay, firm, bluish grey mottled yellowish brown in upper 0.2 m, occasional sandy pockets, abundant selenite crystals throughout and occasional shell fragments	2.9+	8.0

TL 29 NE 39 2788 9672 New Road, Whittlesey Sub-block H₁

Surface level (+6.6 m) + 21.5 ft Water struck at (+3.8 m) 152 mm percussion October 1975	Overburden 0.4 m Mineral 3.5 m Bedrock 0.4 m+
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LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, trace gravel, clayey at base	0.4	0.4
March Gravels	'Clayey' sandy gravel Gravel: fine with trace coarse, mainly angular to subangular, brown and white flint with limestone, some subrounded ironstone and traces of sandstone and quartzite Sand: medium and coarse with some fine, mainly quartz Fines: pale orange-brown	3.5	3.9
Oxford Clay	Clay, bluish grey, with traces of shell fragments	0.4+	4.3

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
14	39	47	0.4-1.4	26	5	18	18	28	5	0
			1.4-2.4	9	8	20	17	41	5	0
			2.4-3.9	8	7	33	18	33	1	0
			Mean	14	7	25	17	34	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.4-3.9	27	56	8	4	5	0

TL 29 NE 40 2714 9555 South of Manor Farm, Whittlesey**Sub-block D₂**

Surface level (-0.4 m) -1.5 ft
Water struck at (-4.5 m)
152 mm percussion
July 1975

Overburden 4.0 m
Mineral 4.8 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, black passes into peat	2.1	2.1
Barroway Drove Beds	Clay, soft, grey, silty	1.2	3.3
Lower Peat	Peat, dark brown	0.7	4.0
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, angular to rounded flint, ironstone, sandstone, quartzite and limestone with some shell fragments Sand: medium and coarse with some fine Fines: 'clayey' in upper 1.0 m	4.8	8.8
Oxford Clay	Clay, stiff, pale grey becoming greenish grey	0.8+	9.6

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
7	67	26	4.0-5.0	11	11	48	20	9	1	0
			5.0-6.0	4	4	27	29	27	9	0
			6.0-7.5	4	3	33	32	24	4	0
			7.5-8.8	9	5	27	30	24	5	0
			Mean	7	6	33	28	21	5	0

TL 29 NE 41 2854 9962 Long Drove, The Wash**Sub-block D₁**

Surface level (+1.8 m) +6 ft
Water struck at (-0.4 m)
152 mm percussion
October 1975

Overburden 2.7 m
Mineral 1.5 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark brown, peaty, passes into black peat	2.1	2.1
Barroway Drove Beds	Clay, soft, grey, silty	0.3	2.4
Lower Peat	Peat, black, 'clayey', with wood fragments	0.3	2.7
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with some coarse, mainly angular to subangular flint with limestone, sandstone and quartzite with some ironstone Sand: medium and coarse with traces of fine Fines: greyish brown	1.5	4.2
Oxford Clay	Clay, very stiff, mottled brownish grey in upper 0.5 m becoming dark grey, with traces of shell fragments and small black nodules near base	0.8+	5.0

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				-½	+½ - ¼	+¼ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
6	41	53	2.7-4.2	6	2	20	19	40	13	0

TL 29 NE 42 2845 9796 Drybread Road, Whittlesey**Sub-block H₁**

Surface level (+5.0 m) +16.5 ft
Water struck at (+3.4 m)
152 mm percussion
October 1975

Overburden 0.2 m
Mineral 2.0 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
March Gravels	Soil, brown, clayey, with some flint gravel 'Clayey' pebbly sand Gravel: fine with traces of coarse, mainly angular flint with sandstones Sand: medium with fine and coarse, mainly quartz Fines: orange-brown	2.0	2.2
Oxford Clay	Clay, very stiff, bluish grey, with shell fragments throughout, and traces of selenite crystals	0.5+	2.7

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
10	68	22	0.6-1.6	9	23	30	22	12	4	0
			1.6-2.2	13	14	29	12	30	2	0
			Mean	10	20	30	18	18	4	0

TL 29 NE 43 2866 9741 Near Eastrea Sub-block H₁

Surface level (+5.3 m) +17.5 ft
 Water not struck
 152 mm percussion
 October 1975

Overburden 0.4 m
 Mineral 1.7 m
 Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, clayey, with flint gravel	0.4	0.4
March Gravels	'Very clayey' sandy gravel Gravel: fine with trace coarse, mainly angular flint with some limestone and quartzite with traces of ironstone, occasional shell fragments Sand: medium and coarse with fine Fines: dark orange-brown	1.7	2.1
Oxford Clay	Clay, brown with bluish grey, many selenite crystals and shell fragments including belemnites	1.3+	3.4

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand			Gravel	
				- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
21	48	31	0.4-1.4	26	10	21	16	23	4	0
			1.4-2.1	13	5	25	19	36	2	0
			Mean	21	8	23	17	28	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.4-2.1	15	70	6	0	9	0

TL 29 NE 44 2803 9550 Alderman's Farm, south of Whittlesey Sub-block D₂

Surface level (+0.4 m) +1.5 ft
 Water struck at (-3.7 m)
 152 mm percussion
 July 1975

Overburden 4.1 m
 Mineral 2.7 m
 Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Brick rubble mixed with peat	0.8	0.8
Nordelph Peat	Peat, dark brown	0.6	1.4
Barroway Drove Beds	Clay, very soft, grey, silty, with much organic material	1.6	1.4
Lower Peat	Peat, dark brown, fragments of wood common	1.1	4.1
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, mainly angular to subangular flint with some limestone, ironstone and sandstone Sand: medium and coarse with some fine Fines: dark grey	2.7	6.8
Oxford Clay	Clay, stiff, blue to greenish grey, fossiliferous	0.8+	7.6

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
6	60	34	4.1-5.1	8	7	31	24	29	1	0
			5.1-6.8	6	7	25	27	31	4	0
			Mean	6	7	27	26	30	4	0

TL 29 NE 45 2890 9543 Kate's Farm, Whittlesey Dike Sub-block D₂

Surface level (+0.3 m) 1 ft
 Water struck at (-4.4 m)
 152 mm percussion
 July 1975

Overburden 4.7 m
 Mineral 3.2 m
 Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, peaty, passes into brown peat	1.6	1.6
Barroway Drove Beds	Clay, soft to glutinous, grey, silty	1.2	2.8
Lower Peat	Peat, with root and wood fragments	1.9	4.7
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, angular to sub angular flint with subrounded to rounded limestone and some ironstone, sandstone and quartzite Sand: coarse and medium with some fine, mainly quartz Fines: dark grey becoming yellowish brown below 7.5 m	3.2	7.9
Oxford Clay	Clay, stiff, grey to greenish grey	1.1+	9.0

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
			- $\frac{1}{8}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm	
8	58	34	4.7-5.7	6	6	20	32	32	4	0
			5.7-6.7	10	9	10	23	36	3	0
			6.7-7.9	8	9	27	29	24	3	0
			Mean	8	8	22	28	30	4	0

TL 29 NE 46

2959 9962

Long Drove, The Wash

Sub-block D₁

Surface level (+1.8 m) +6 ft
Water struck at (-5.3 m)
152 mm percussion
July 1975

Overburden 7.1 m
Mineral 3.9 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, peaty, passes into dark peat	2.5	2.5
Barroway Drove Beds	Clay, soft to glutinous, grey, silty	3.0	5.5
Lower Peat	Peat, dark brown, with silt lenses	1.6	7.1
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: fine with some coarse, mainly angular to subangular flint with tabular, shelly limestone and rounded to subrounded ironstones and quartzites Sand: coarse and medium with trace fine, mainly quartz and flint Fines: pale greyish brown	3.9	11.0
Oxford Clay	Clay, stiff, grey to greenish grey, with occasional nodules, rare shell fragments and pyrite crystals	1.0+	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	
10	45	45	7.8-8.1	17	9	10	17	43	4	0
			8.1-9.1	6	8	23	25	31	7	0
			9.1-10.1	10	5	18	18	33	16	0
			10.1-11.1	5	5	21	26	31	12	0
			Mean	10	6	18	21	35	10	0

TL 29 NE 47

2963 9840

Feldale, Eastrea

Sub-block D₁

Surface level (+0.2 m) +0.5 ft
Water struck at (-4.0 m)
152 mm percussion
October 1975

Overburden 4.2 m
Mineral 1.2 m
Waste 0.1 m
Mineral 2.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty	0.2	0.2
Nordelph Peat	Peat, much organic and woody material	1.4	1.6
Barroway Drove Beds	Clay, very soft to glutinous, pale bluish grey, with pockets of peat	2.1	3.7
Lower Peat	Peat, as above, with large wood fragments	0.5	4.2
River Terrace Deposits (First Terrace)	a Gravel Gravel: fine with trace coarse, mainly flint Sand: coarse and medium with some fine Fines: greyish brown	1.2	5.4
	Clay, greyish brown	0.1	5.5
	b Sandy gravel Gravel: fine with some coarse, mainly angular to subangular, brown flint with rounded to subrounded oolitic limestone with some quartzite and traces of ironstone and sandstone Sand: medium with coarse and some fine Fines: greyish brown	2.5	8.0
Oxford Clay	Clay, mottled brown with dark bluish grey, with pyritised patches and rare fossil fragments	0.5+	8.5

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	
a	9	43	48	4.2-5.4	9	9	14	20	43	5	0
				5.4-5.5	Waste						
				5.5-6.5	5	10	25	19	35	6	0
				6.5-7.5	4	7	29	15	39	6	0
				7.5-8.0	5	16	24	17	32	6	0
b	5	53	42	Mean	5	10	26	17	36	6	0
a+b	6	50	44	Mean	6	10	22	18	38	6	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.2-8.0	26	59	5	2	7	1

TL 29 NE 48 **2951 9748** **Cow Way, Eastrea** **Sub-block H₁**

Surface level (+4.1 m) +13.5 ft
Water not struck
October 1975

Overburden 1.5 m
Mineral 0.5 m
Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, brown, clayey, with some flint gravel	1.5	1.5
March Gravels	Sandy gravel Gravel: fine and coarse, mainly angular to subrounded flint Sand: medium and coarse with trace fine Fines: yellowish brown	0.5	2.0
Oxford Clay	Clay, variegated yellowish brown to pale grey becoming bluish grey, selenite crystals common below 3.0 m, with rare shell fragments	2.1+	4.1

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
7	49	44	1.5-2.0	7	6	27	16	23	21	0

CG

TL 29 NE 49 **2958 9634** **Lattersey Farm, South of Eastrea** **Block D**

Surface level (+0.1 m) +0.5 ft
Water struck at (-3.1 m)
152 mm percussion
October 1975

Waste 2.5 m
Bedrock 3.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, pale brown, passes into peaty clay	1.0	1.0
Barroway Drove Beds	Peat, dark grey to black, abundant seeds and fragments of wood, with occasional clay layers	1.0	2.0
Oxford Clay	Clay, very soft to glutinous, pale grey, silty	0.5	2.5
	Clay, stiff to very stiff, variegated yellowish brown with grey in upper 2.9 m, becoming bluish grey, with small pellets and selenite crystals common throughout, shell fragments common below 5.4 m	3.2+	5.7

TL 29 NE 50 **2991 9524** **North of Micklewaite Farm, Wype Dales** **Sub-block D₂**

Surface level (+0.1 m) + 0.5 ft
Water struck at (-6.2 m)
152 mm percussion
July 1975

Overburden 6.3 m
Mineral 2.5 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Brick and cement rubble	0.9	0.9
Nordelph Peat	Peat, soft, brown	0.5	1.4
Barroway Drove Beds	Clay, soft, glutinous, bluish grey, silty	4.1	5.5
?Lower Peat	Peat, soft, brown	0.5	6.0
Barroway Drove Beds	Clay, soft, glutinous, bluish grey, silty, with occasional black carbonaceous patches	0.3	6.3
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, angular to subangular flint with limestone, ironstone, sandstone and quartzite, with fossils including <i>Gryphaea</i> , and shell fragments throughout Sand: medium and coarse with some fine Fines: dark grey to greenish grey	2.5	8.8
Oxford Clay	Clay, stiff, greyish green	1.2+	10.0

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
6	59	35	6.3-7.3	9	10	33	18	27	3	0
			7.3-8.8	4	5	31	22	33	5	0
			Mean	6	7	32	20	31	4	0

TL 29 NE 51 **2963 9741** **Cow Lane, Eastrea** **Sub-block H₁**

Surface level (+4.8 m) +15.5 ft
Water struck at (+3.2 m)
152 mm percussion
October 1975

Overburden 0.3 m
Mineral 2.7 m
Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
March Gravels	Soil, brown, clayey, with traces of gravel	0.3	0.3
	'Clayey' sandy gravel Gravel: fine with trace coarse, mainly angular to subangular flint with some subrounded limestone and ironstone and traces of quartzite and sandstone Sand: medium with coarse and fine, mainly quartz with flint and ironstone Fines: orange-brown	2.7	3.0

Oxford Clay Clay, very stiff, bluish grey, occasional shell fragments including belemnites 1.9+ 4.9

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{16}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
14	55	31	0.3-1.3	16	20	27	9	23	5	0
			1.3-3.0	12	5	20	27	34	2	0
			Mean	14	14	24	17	27	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.3-3.0	17	65	11	1	6	0

TL 29 NE 52 2862 9878 Bassenhally Farm, South Bank Sub-block H₁

Surface level (+4.1 m)+13.5 ft
Water struck at (+1.7 m)
152 mm percussion
October 1975

Overburden 0.7 m
Mineral 1.0 m
Waste 0.5 m
Mineral 0.8 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, passes into clay with flint gravel	0.7	0.7
March Gravels	a 'Clayey' sandy gravel Gravel: fine with some coarse, mostly angular to subangular flint with some sandstone Sand: medium with some flint and coarse, quartz Fines: orange-brown	1.0	1.7
	Clay, very stiff, orange-brown to pale grey, with occasional silty lenses containing organic matter, occasional ironstone nodules	0.5	2.2
	b 'Clayey' sandy gravel, as above	0.8	3.0
Oxford Clay	Clay, very stiff, brown in upper 0.2 m becoming bluish grey, rare shell fragments	0.5+	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	
a	10	54	36	0.7-1.7	10	17	30	7	23	13	0
				1.7-2.2	Waste						
b	12	46	42	2.2-3.0	12	5	21	20	35	7	0
a+b	11	51	38	Mean	11	12	26	13	28	10	0

TL 29 NE 53 2894 9690 Near Half Acre Drove, Eastrea Block D

Surface level: no data available
Water struck
76 mm Minuteman
October 1977

Waste 5.2 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, soft, fibrous, black, clayey in parts	1.0	1.0
Barroway Drove Beds	Clay, glutinous, thixotropic, pale to dark bluish grey, slightly silty	1.2	2.2
?Barroway Drove Beds (?roddon)	Clay, pale greyish brown, silty in parts, with much fine to very fine subrounded to subangular quartz sand below 3.0 m	3.0	5.2
Oxford Clay	Clay, soft to firm, dark bluish grey	1.8+	7.0

TL 29 NE 54 2912 9631 Near Lattersey Hill, south of Eastrea Block D

Surface level: no data available
Water struck
76 mm Minuteman
October 1977

Waste 7.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Peat, brown, becoming black	1.1	1.1
Barroway Drove Beds	Silt, soft, glutinous, thixotropic, pale greenish grey to dark grey, traces of gravel below 5.0 m	6.4	7.5
Oxford Clay	Clay, firm to stiff, calcareous, occasional selenite crystals	0.5+	8.0

TL 29 SW 3 2110 9208 South of Elm Farm, Yaxley Fen Block D

Surface level (-2.1 m) -7 ft
Water struck at (-6.4 m)
152 mm percussion
October 1975

Waste 4.4 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, peaty	0.6	0.6
Nordelph Peat	Peat, dark brown to black, many root fragments	3.2	3.8
Barroway Drove Beds	Clay, very soft to glutinous, greyish blue	0.2	4.0
Lower Peat	Peat, black	0.3	4.3

River Terrace Deposits (First Terrace)	Pebbly sand Gravel: traces only, mainly fine, oolitic and shelly limestone with brown to white flint, some ironstone and shell fragments Sand: fine to coarse, mainly quartz Fines: orange-brown	0.1	4.4
Oxford Clay	Clay, stiff, brown in upper 0.1 m becoming mottled olive-brown to grey, many shell fragments	0.7+	5.1

TL 28 SW 4	2149 9346	Marshall's Farm, Conquest Drove	Sub-block F₂
Surface level (+3.0 m) +10 ft Water level not recorded 152 mm percussion July 1975			Overburden 0.6 m Mineral 1.6 m Bedrock 2.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown to black, peaty, intermixed with orange-yellow clayey sand below 0.3 m	0.6	0.6
River Terrace Deposits (First Terrace)	'Clayey' pebbly sand Gravel: fine with trace coarse, mostly limestone with angular to subangular flint some sandstone and traces of ironstone and quartzite Sand: medium with coarse and fine, mostly rounded quartz Fines: orange-yellow	1.6	2.2
Oxford Clay	Clay, grey, occasional buff mudstone pellets, shell fragments noted below 4.8 m	2.7+	4.9

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
13	68	19	0.6-1.1	19	28	37	6	8	2	0
			1.1-2.2	11	7	37	22	20	3	0
			Mean	13	14	37	17	16	3	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
0.6-2.2	50	29	5	12	2	2

TL 29 SW 5	2400 9226	Kew Lodge Farm, Straight Drove	Block D
Surface level (+0.5 m) + 1.5 ft Water level not recorded 152 mm percussion July 1975			Waste 3.8 m Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.6	0.6
Nordelph Peat	Peat, black	0.8	1.4
River Terrace Deposits (First Terrace)	Clay, grey becoming pale khaki to blue below 2.0 m	2.4	3.8
Oxford Clay	Clay, grey, with abundant selenite crystals	0.9+	4.7

TL 29 SW 6	2391 9248	Crow Tree Farm, Straight Drove	Sub-block F₂
Surface level (+1.8 m) +6 ft Water level not recorded 152 mm percussion July 1975			Overburden 1.0 m Mineral 0.9 m Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, with some flint gravel	0.5	0.5
River Terrace Deposits (First Terrace)	Clay, stiff, orange-yellow to grey, with much medium-grained quartz sand and occasional carbonaceous fragments	0.5	1.0
	'Very clayey' pebbly sand Gravel: fine with trace coarse, mostly subrounded limestone with angular to subangular flint Sand: medium with coarse and fine, mostly quartz Fines: orange-yellow to greyish brown	0.9	1.9
Oxford Clay	Clay, brownish grey becoming grey, rare shell fragments at base	2.1+	4.0

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines		Sand		Gravel		
				- $\frac{1}{16}$	+ $\frac{1}{8}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
23	49	28	1.0-1.3	26	14	22	12	19	7	0
			1.3-1.9	22	9	25	16	25	3	0
			Mean	23	11	24	15	23	4	0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.0-1.9	57	26	5	7	3	2

TL 29 SW 8 2387 9459 Richer's Drove, King's Delph

Sub-block F₂

Surface level: no data available
Water struck
76 mm Minuteman
June 1977

Overburden 1.3 m
Mineral 2.0 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty	0.6	0.6
River Terrace Deposits (First Terrace)	Clay, orange-brown, sandy, with occasional flint gravel	0.7	1.3
	Gravel	2.0	3.3
	Gravel: fine to coarse, subrounded limestone with angular flint, subrounded ironstone, quartzite and sandstone Sand: mainly coarse with medium and fine, mostly quartz Fines: orange-brown		
?Oxford Clay	Clay - recovery only traces on auger flights	0.5+	3.8

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.3-3.3	47	36	7	4	5	1

TL 29 SW 9 2455 9454 Suet Hills Farm, Suet Hills

Sub-block F₂

Surface level +2.2 m (+7 ft)
Water not struck
76 mm Minuteman
June 1977

Waste 1.0 m
Bedrock 2.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, black, peaty	0.5	0.5
River Terrace Deposits (First Terrace)	Clay, brown, silty, sandy in places, occasional flint gravel	0.5	1.0
Oxford Clay	Clay, variegated khaki-brown with greyish brown in upper 1.5 m becoming grey, fossiliferous, with patches of selenite crystals	2.6+	3.6

TL 29 SW 10 2477 9086 Decrease Drove, The Herne

Block D

Surface level (-0.3 m) 1 ft
Water struck at (-3.3 m)
76 mm Minuteman
June 1977

Waste 7.4 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil brown, sandy, peaty towards base	0.4	0.4
Nordelph Peat	Peat, friable, black with small orange iron-oxide spots, wood fragments	1.4	1.8
Barroway Drove Beds (?roddon)	Silt, very soft, pale khaki, mottled, micaceous, sandy between 3.4 and 3.6 m	2.0	3.8
Barroway Drove Beds	Clay, very soft to glutinous, grey, silty, micaceous	3.6	7.4
Oxford Clay	Clay, stiff, bluish grey	1.6+	9.0

TL 29 SW 11 2497 9214 Low Barn, Farcet

Block D

Surface level: no data available
Water struck
76 mm Minuteman
June 1977

Waste 5.4 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil mixed with rubble	0.2	0.2
Nordelph Peat	Peat, friable, dark brown to black, with wood fragments	0.8	1.0
Barroway Drove Beds	Silt, soft, brown to greyish brown, traces of plant material	4.0	5.0
River Terrace Deposits	Sandy gravel (recovery poor) Gravel: fine, subangular to subrounded shelly and oolitic limestone and angular flint with ironstone, occasional belemnite fragments Sand: fine to coarse, mainly quartz Fines: pale olive-grey	0.4	5.4
Oxford Clay	Clay, stiff, bluish grey	0.2+	5.6

TL 29 SW 12 2397 9148 Bottom Yard Drove, Near Herbert's Bridge

Block D

Surface level: no data available
Water struck
76 mm Minuteman
June 1977

Waste 5.2 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, dark grey to black, peaty	0.6	0.6

Barroway Drove Beds	Silt, soft to firm, grey mottled pale orange-brown, clayey towards base	0.9	1.5
	Silt, bluish grey, clayey, trace fine gravel with some sand below 4.8 m	3.7	5.2
Oxford Clay	Clay, firm to stiff, greyish blue	0.8+	6.0

TL 29 SW 13	2292 9307	Half Mile Drove, Farcet	Sub-block F₂
Surface level (+2.6 m) + 8.5 ft Water struck at (-0.8 m) 76 mm Minuteman June 1977		Overburden 1.0 m Mineral 1.1 m Bedrock 0.3 m+	

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Clay with flint gravel ballast track	0.4	0.4
River Terrace Deposits (First Terrace)	Clay, soft, dark brown becoming grey below 0.8 m, silty, micaceous in parts, with some flint gravel	0.6	1.0
	'Clayey' gravel - 'very clayey' in upper layers Gravel: mainly fine, subangular to angular flint with subangular to subrounded shelly and oolitic limestone Sand: fine to coarse Fines: brown	1.1	2.1
Oxford Clay	Clay, stiff, greenish grey to bluish grey	0.3+	2.4

TL 29 SW 14	2464 9315	Homestead Farm, Milk and Water Drove	Sub-block D₂
Surface level: no data available Water struck 76 mm Minuteman June 1977		Overburden 2.5 m Mineral 0.6 m+	

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, black, peaty	0.7	0.7
Barroway Drove Beds	Silt, soft to firm, pale grey mottled brown in places, micaceous, occasional root fragments	1.3	2.0
Lower Peat	Peat, soft, black, clayey	0.5	2.5
River Terrace Deposits (First Terrace)	'Clayey' sand Gravel: trace only, fine, mainly angular flint Sand: fine to coarse, quartz Fines: pale grey	0.6+	3.1
Note: borehole abandoned as no further progress could be made beyond 3.1 m			

TL 29 SW 15	2407 9339	Milk and Water Drove, Farcet	Sub-block D₂
Surface level (c+1.6 m) c+5 ft Water struck at (c O.D.) 76 mm Minuteman June 1977		Overburden 5.6 m Mineral 2.3 m Bedrock 0.1 +	

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Peat, friable, dark brown to black, clayey near base	1.5	1.5
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: mainly fine, subangular to subrounded limestone with flint, ironstone and sandstone Sand: quartz and ironstone Fines: dark orange-brown	0.3	1.8
	Clay, soft to firm, pale orange-brown, silty, calcareous, throughout, traces of flint, limestone and quartzite gravel, some shell fragments	3.8	5.6
	'Clayey' sandy gravel Gravel: mainly fine, subangular shelly limestone with angular flint, some ironstone and quartzite Sand: mainly medium with fine and coarse, quartz, ironstone and limestone cololiths Fines: dark khaki-brown	2.3	7.9
Oxford Clay	Clay, stiff, bluish- rey	0.1+	8.0

TL 29 SW 16	2067 9414	Conquest Drove, Farcet	Block D
Surface level: no data available Water struck 76 mm Minuteman June 1977		Waste 4.6 m Bedrock 1.4 m+	

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, friable, brown	0.6	0.6
Alluvium	Clay, mottled pale brown to brown	0.4	1.0
Nordelph Peat	Peat, friable, dark brown, wood fragments at base	2.0	3.0
Barroway Drove Beds	Clay, very soft, thixotropic, pale grey, silty	1.6	4.6
Oxford Clay	Clay, stiff, bluish grey, weathered upper layers	1.4+	6.0

TL 29 SW 17 2302 9418 King's Delph Highway, Farcet **Block D**

Surface level (c +0.6 m) c + 2 ft
Water struck at (c -2)m
76 mm Minuteman
June 1977

Waste 6.5 m
Bedrock 1.5 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty	1.0	1.0
Nordelph Peat	Peat, dark reddish brown to black, very clayey towards base, much root and plant material	1.6	2.6
Barroway Drove Beds	Silt, very soft to glutinous, thixotropic, pale greyish brown, with some fine sand in places, becoming clayey towards base	2.9	6.5
Oxford Clay	Clay, firm to stiff, chocolate-brown in upper layers becoming grey	1.5+	8.0

TL 29 SW 18 2188 9484 King's Delph Main Drove, New Meadow **Sub-block D₂**

Surface level (c +2.1 m) c +7 ft
Water struck at (c -0.9 m)
76 mm Minuteman
June 1977

Overburden 4.0 m
Mineral 2.0 m
Bedrock 0.2 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, clayey	0.4	0.4
Nordelph Peat	Peat, friable, black, intermixed with increasing amounts of silt below 1.5 m	3.6	4.0
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: mainly fine, subangular shelly and oolitic limestone with ironstone and angular flint Sand: medium with coarse and fine, mainly quartz with ironstone and black carbonaceous material Fines: dark greyish brown	2.0	6.0
Oxford Clay	Clay, stiff, bluish grey	0.2+	6.2

TL 29 SW 19 2258 9215 Near Frog Hall Bridge, Farcet Fen **Block D**

Surface level: no data available
Water not struck
76 mm Minuteman
June 1977

Waste 0.6 m
Bedrock 1.4 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, peaty	0.3	0.3

Nordelph Peat Peat, friable, dark grey to black 0.3 0.6

Oxford Clay Clay, firm to stiff, pale khaki-grey, calcareous, occasional selenite crystals, fossiliferous 1.4+ 3.0

TL 29 SW 20 2187 9385 Straight Drove, Farcet **Block D**

Surface level (+1.2 m) +4 ft
Water struck at (O.D.)
76 mm Minuteman
June 1977

Waste 2.5 m
Bedrock 0.2 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
	Soil, brown	0.2	0.2
Nordelph Peat	Peat, black, with wood fragments	1.0	1.2
Barroway Drove Beds	Silt, soft to glutinous, thixotropic, mottled bluish grey with green	1.3	2.5
Oxford Clay	Clay, stiff, variegated bluish grey with yellowish brown	0.2+	2.7

TL 29 SE 1 2591 9142 Lethall Farm, near Pondersbridge **Sub-block D₂**

Surface level (-0.1 m) -0.5 ft
Water struck at (-4.5 m)
152 mm percussion
October 1975

Overburden 4.4 m
Mineral 2.0 m
Bedrock 0.6 m+

LOG			
Geological classification	Lithology	Thickness m	Depth m
Made ground	Clay with rubble	0.4	0.4
Nordelph Peat	Peat, dark brown, clayey in places	0.9	1.3
Barroway Drove Beds	Clay, soft, bluish grey	2.3	3.6
Lower Peat	Peat, black, with oak wood fragments, bluish grey silt layer between 4.0 and 4.4 m	0.8	4.4
River Terrace Deposits (First Terrace)	Sandy gravel Gravel: fine with trace coarse, trace cobble between 4.4 and 5.4 m, mostly angular flint with traces of subrounded sandstone, ironstone, quartzite and limestone Sand: medium with coarse and fine, mainly quartz with some ironstone Fines: greyish brown	2.0	6.4
Oxford Clay	Clay, variegated in upper 0.2 m blue with brown becoming bluish grey, occasional shell fragments	0.6+	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	4.4-5.4	4	5	38	16	32	3	2
			5.4-6.4	9	8	25	24	26	9	0
			Mean	7	6	32	20	29	5	1

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
4.4-6.4	2	86	2	7	2	1

TL 29 SE 2 2724 9319 Near Bevill's Leam, Pondersbridge Block E

Surface level (-0.5 m) -1.5 ft Waste 5.9 m
 Water not struck Bedrock 1.6 m+
 152 mm percussion
 Octoner 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, dark brown, peaty, clayey towards base	0.5	0.5
Nordelph Peat	Peat, fibrous, dark brown to black	0.6	1.1
Barroway Drove Beds	Clay, very soft to glutinous, variegated grey with orange-brown in upper 0.6 m, becoming bluish grey	1.4	2.5
?Lower Peat	Peat, dark brown to black	0.8	3.3
Barroway Drove Beds	Clay, soft to glutinous, thixotropic, greyish blue	2.6	5.9
Oxford Clay	Clay, very stiff, mottled greyish brown, with patches of selenite crystals associated with orange-brown ? oxidation colouration in upper 1.1 m, bluish grey with shell fragments below 7.0 m	1.6	7.5

TL 29 SE 3 2864 9444 Boazes Farm, near Chapelbridge Sub-block E₂

Surface level (+0.5 m) +1.5 ft Overburden 3.0 m
 Water struck at (-2.5 m) Mineral 1.1 m
 152 mm percussion Bedrock 0.9 m+
 October 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
Made ground	Soil, brown, clay mixed with brick rubble and sinter	0.4	0.4
Nordelph Peat	Peat, dark brown to black	1.0	1.4

Barroway Drove Beds Clay, soft to glutinous, bluish grey 1.1 2.5

Lower Peat Peat, dark brown 0.5 3.0

River Terrace Deposits (First Terrace) 'Clayey' pebbly sand 1.1 4.1
 Gravel: fine with trace coarse, mainly subangular to subrounded white and brown flint with subrounded sandstone
 Sand: medium and coarse with some fine, mainly quartz
 Fines: dark blue

Oxford Clay Clay, very stiff, variegated greyish blue with pale olive-brown, some fossil fragments including a complete *Gryphaea* 0.9+ 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
17	62	21	3.0-4.1	17	10	26	26	20	1	0

TL 29 SE 4 2805 9154 Cold Harbour Drove, Pondersbridge Block E

Surface level (-0.4 m) -1.5 ft Waste 6.0 m
 Water not struck Bedrock 1.5 m+
 152 mm percussion
 October 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, clayey, peaty in places	0.7	0.7
Barroway Drove Beds	Clay, soft to glutinous, greyish brown, silty	2.8	3.5
?Lower Peat	Peat, brownish grey to black	1.6	5.1
Barroway Drove Beds	Clay, very soft, bluish grey in upper 0.5 m becoming yellowish brown with fine quartz sand	0.9	6.0
Oxford Clay	Clay, stiff, variegated bluish grey with brown in upper 0.5 m becoming bluish grey, many selenite crystals below 6.5 m	1.5+	7.5

TL 29 SE 5 2962 9035 Marriot's Drove, The Hundred Block E

Surface level (-0.8 m) -2.5 ft Waste 8.8 m
 Water struck at (-6.8 m) Bedrock 0.5 m+
 152 mm percussion
 October 1975

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brownish grey, clayey	0.4	0.4

Barroway Drove Beds	Clay, indurated, variegated greyish brown with orange-red	1.1	1.5
	Clay, very soft, bluish grey	0.8	2.3
Lower Peat	Peat, black with wood fragments	1.8	4.1
River Terrace Deposits (First Terrace)	Clay, stiff, greenish grey to bluish grey	4.5	8.6
	Sandy gravel; very well indurated iron oxide cemented upper 0.1 m Gravel: fine with some coarse, mainly angular flint with some subrounded ironstone and sandstone Sand: medium and coarse with trace fine, quartz and flint Fines: greyish brown	0.2	8.8
Oxford Clay	Clay, stiff, variegated in upper 0.2 m, becomes bluish grey	0.5+	9.3

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	
7	50	43	8.6-8.8	7	4	24	22	31	12	0	

TL 29 SE 7	2560 9351	Daw's Drove, Black Bush	Sub-block F₂
Surface level (+1.0 m) +3.5 ft	Water struck at (-0.5 m)	76 mm Minuteman	June 1977
			Overburden 1.2 m Mineral 1.9 m Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, friable, black, peaty, becoming sandy clay towards base	1.2	1.2
River Terrace Deposits (First Terrace)	Gravel Gravel: fine with some coarse, subangular to subrounded shelly limestone with angular flint and traces of ironstone, quartzite and sandstone Sand: coarse and medium with some fine, quartz, ironstone and limestone Fines: dark orange-brown	1.9	3.1
Oxford Clay	Clay, greyish blue	0.1+	3.2

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-3.1	54	33	6	1	2	4

TL 29 SE 8	2563 9319	Blackbush Drain, Black Bush	Sub-block F₂
Surface level (+1.4 m) +4.5 ft	Water not struck	76 mm Minuteman	June 1977
			Overburden 2.8 m Mineral 1.0 m Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty, passes into dark grey to black fibrous peat	1.5	1.5
River Terrace Deposits (First Terrace)	Clay, dark greyish brown, sandy, occasional flint and limestone gravel	1.3	2.8
	'Clayey' sandy gravel Gravel: fine with some coarse, subrounded oolitic and shelly limestone with angular to subangular flint, and some ironstone, sandstone and quartzite, occasional shell fragments Sand: fine to coarse, quartz, ironstone, flint and limestone ooliths Fines: orange-brown	1.0	3.8
Oxford Clay	Clay - traces recovered only	0.2+	4.0

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.8-3.8	43	24	13	9	7	4

TL 29 SE 9	2565 9394	Atkinson's Barn, Black Bush	Sub-block F₂
Surface level (+1.1 m) +3.5 ft	Water struck at (-0.1 m)	76 mm Minuteman	June 1977
			Overburden 1.2 m Mineral 1.9 m Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, black, peaty	0.5	0.5
River Terrace Deposits (First Terrace)	Clay, mottled brown with dark brown, sandy	0.7	1.2
	Gravel; 'clayey' in upper 0.3 m Gravel: fine with some coarse subangular to subrounded limestone with angular flint, and some subrounded ironstone and quartzite with traces of sandstone, occasional shell fragments Sand: coarse and medium with some fine, limestone, quartz, silt and ironstone Fines: dark orange-brown		
Oxford Clay	Clay, stiff, weathered	0.2+	3.3

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-3.1	46	29	0	5	2	2

TL 29 SE 10 2582 9416 Blackbush Drove, Black Bush

Surface level (+1.0 m) +3.5 ft
Water level not recorded
76 mm Minuteman
June 1977

Sub-block F₂

Overburden 1.2 m
Mineral 2.2 m
Bedrock 0.3m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty, fibrous	0.7	0.7
River Terrace Deposits (First Terrace)	Clay, firm to stiff, orange-brown with some pale yellow mottling, silty in places	0.5	1.2
	Sandy gravel Gravel: fine with some coarse, mainly subrounded oolitic and shelly limestone with some angular to subangular flint and traces of ironstone, quartzite and sandstone Sand: coarse to fine, much flint with ironstone, and quartz and some shell fragments Fines: orange-brown to pale brown	2.2	3.4
Oxford Clay	Clay, soft to firm, pale grey	0.3+	3.7

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
1.2-3.4	63	25	6	1	2	3

TL 29 SE 11 2836 9351 Glassmoor House, Glassmoor Bank

Surface level: no data available
Water struck
76 mm Minuteman
June 1977

Sub-block E₂

Overburden 2.2 m
Mineral 1.0 m
Bedrock 0.2+

LOG

Geological classification	Lithology	Thickness m	Depth m
?Nordelph Peat	Soil, friable, black, peaty	0.5	0.5
Barroway Drove Beds	Clay, very soft to glutinous, dark grey to grey, sandy towards base	1.7	2.2
River Terrace Deposits (First Terrace)	'Very clayey' sandy gravel Gravel: mainly fine, subrounded to subangular limestone with angular flint, some ironstone and traces of quartzite and sandstone Sand: fine to coarse, quartz, flint and ironstone Fines: dark olive-grey	1.0	3.2
Oxford Clay	Clay, very stiff, grey	0.2+	3.4

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
2.2-3.2	53	30	8	3	4	2

TL 29 SE 12 2908 9246 Cold Harbour Drove, Glass Moor

Surface level (c+0.6 m) c+2 ft
Water struck at (c-0.9 m)
76 mm Minuteman
June 1977

Block E

Waste 10.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, peaty, passes into black, friable, peat	0.6	0.6
Barroway Drove Beds	Clay, soft to glutinous, thixotropic, grey, micaceous	9.4+	10.0

TL 29 SE 13 2556 9065 Elsie Farm, The Herne

Surface level (+0.2 m) +0.5 ft
Water struck at (-2.8 m)
76 mm Minuteman
June 1977

Sub-block F₂

Overburden 1.2 m
Mineral 2.3 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, peaty	0.8	0.8
River Terrace Deposits (First Terrace)	Silt, soft to firm, orange mottled pale brown, trace gravel 'Clayey' pebbly sand; sandy in upper 0.4 m Gravel: fine, angular to subangular flint with limestone Sand: fine to medium with some coarse, mainly flint and limestone ooliths Fines: pale orange-brown	2.3	3.5
Oxford Clay	Clay, stiff, bluish grey	0.3+	3.8

TL 29 SE 14 2519 9119 Decrease Drove, Near Pondersbridge

Surface level(+0.7 m) +2.5 ft
Water struck at (-3.1 m)
76 mm Minuteman
June 1977

Sub-block F₂

Overburden 2.2 m
Mineral 2.4 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
?Nordelph Peat	Soil, black, peaty, passes into peat	1.8	1.8
?Barroway Drove Beds	Silt, soft, pale grey slightly mottled brown	0.4	2.2
River Terrace Deposits (First Terrace)	a 'Clayey' sand Gravel: traces only, angular flint Sand: rounded to subrounded, quartz and flint Fines: orange-brown	0.8	3.0
	b Sandy gravel Gravel: mainly fine, surrounded oolitic and shelly limestone with some flint and traces of ironstone, quartzite and sandstone Sand: fine to coarse, quartz with limestone ooliths, flint and some shell fragments Fines: orange-brown to pale brown	1.6	4.6
Oxford Clay	Clay, stiff, bluish grey	0.1+	4.7

COMPOSITION

Depth below surface (m)	percentages by weight in gravel fraction					
	Limestone, including chalk	Flint	Ironstone	Sandstone	Quartzite	Others
3.0-4.6	47	34	6	4	5	4

TL 29 SE 15 2663 9216 Near Pondersbridge

Surface level: no data available
Water level not recorded
76 mm Minuteman
June 1977

Block D

Waste 2.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, black, peaty, occasional brick fragment	0.4	0.4
Barroway Drove Beds	Silt, soft, pale greyish brown becoming pale grey, micaceous in lower 0.6 m	1.6	2.0
Lower Peat	Peat, dark grey to black, fibrous	0.5	2.5
Oxford Clay	Clay, soft to firm, bluish grey, rare fossil fragments	0.5+	3.0

TL 29 SE 16 2687 9021 Near Oilmills Road, Pondersbridge

Surface level: n No data available
Water struck
76 mm Minuteman
June 1977

Block D

Waste 6.5 m
Bedrock 1.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, peaty	0.6	0.6
Barroway Drove Beds (?roddon)	Silt, soft to firm, mottled brown to grey	1.7	2.3
Barroway Drove Beds	Clay, very soft, grey to dark grey becoming dark brown associated with 'rafts' of peat, micaceous below 3.0 m	3.2	5.5
River Terrace Deposits (First Terrace)	Clay, sandy with some gravel	1.0	6.5
Oxford Clay	Clay, firm to stiff, dark bluish grey	1.5+	8.0

TL 29 SE 17 2716 9130 Burgiss Farm, near Pondersbridge

Surface level: no data available
Water level not recorded
76 mm Minuteman
June 1977

Block E

Waste 7.1 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
? Nordelph Peat	Soil, peaty	0.7	0.7
Barroway Drove Beds (?roddon)	Silt, firm to soft, thixotropic, pale brown to pale greyish brown, abundant small dark ?carbonaceous specks of material together with mica and shell fragments	6.4	7.1
Oxford Clay	Clay, stiff, bluish grey	0.4+	7.5

TL 29 SE 18 2737 9443 Near Flegcroft, Underwood's Grounds

Surface level: no data available
Water struck
76 mm Minuteman
June 1977

Sub-block D₂

Waste 6.2 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Nordelph Peat	Soil, brown, peaty, with occasional wood fragments	1.1	1.1
Barroway Drove Beds (?roddon)	Silt, soft, in parts glutinous, dark khaki-brown with grey, occasional layers of wood fragments, micaceous below 2.0 m	1.4	2.5

Barroway Drove Beds	Silt, very soft, grey to brown, mottled micaceous	3.5	6.0
Lower Peat	Peat, fibrous, brown	0.2	6.2
Oxford Clay	Clay, stiff, greyish green	1.8+	8.0

TL 29 SE 19 2716 9446 Underwood's Drove, Underwood's Grounds Sub-block D₂
 Surface level: no data available Overburden 3.4 m
 Water level not recorded Mineral 1.2 m
 76 mm Minuteman Bedrock 0.4 m+
 June 1977

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, brown, sandy	1.0	1.0
Nordelph Peat	Peat, dark brown to black	0.4	1.4
Barroway Drove Beds	Silt, soft, glutinous, pale grey to greyish brown micaceous in upper 0.6 m	2.0	3.4
River Terrace Deposits (First Terrace)	'Clayey' sandy gravel Gravel: mainly fine, subangular to subrounded oolitic and shelly limestone with flint, ironstone, and quartzite Sand: fine to coarse, quartz, ironstone and limestone Fines: greyish brown	1.2	4.6
Oxford Clay	Clay, firm to stiff, greyish blue	0.4+	5.0

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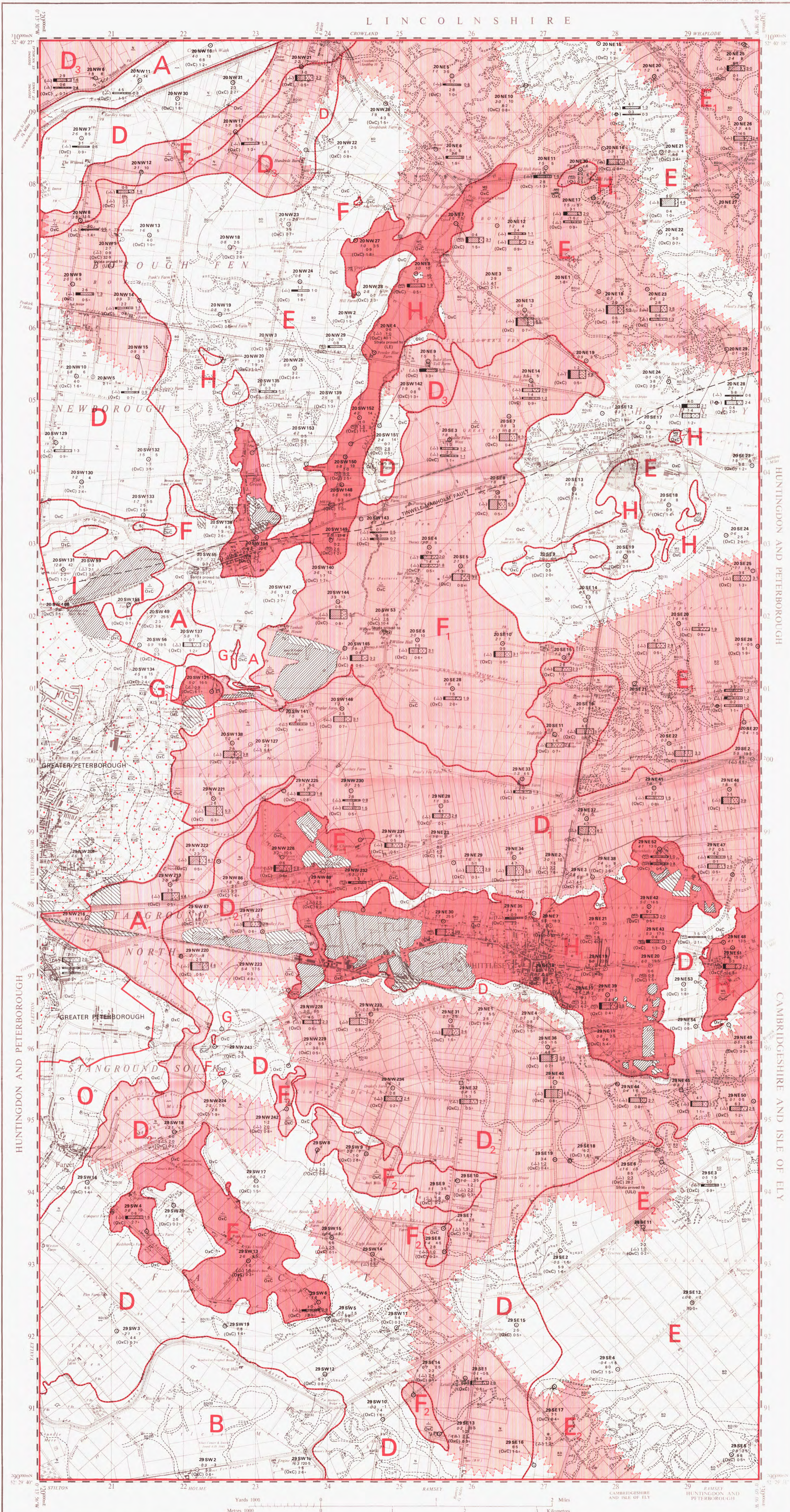
THE SAND AND GRAVEL RESOURCES OF THE COUNTRY AROUND WHITTLESEY, CAMBRIDGESHIRE

93

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

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

ORDNANCE SURVEY
SHEETS TL 29 & TF 20
PROVISIONAL EDITION



EXPLANATION OF SYMBOLS AND ABBREVIATIONS

- DRIFT**
- Alluvium - clays and silts A-21
 - Shell Marl - calcareous silts and clays with aquatic plants and gastropods
 - Northolm Peat - black peat, often incorporated into the soil horizons
 - Lower Peat - mainly soft clays with carbonaceous roots, including mainly soft clays with carbonaceous roots, including
 - Lower Peat - proved only in boreholes
 - First Terrace - fluvial and marine/estuarine sandy gravels with occasional interbedded clay lenses
 - Second Terrace - mainly gravel 2T-25
 - March Gravels - marine/estuarine sandy gravels with occasional sand-filled scour-channels
 - Third Terrace - very clayey sandy gravel 3T-20
- Head-loams, stony clays and unsorted rock debris H-31**
- Boulder Clay - stiff blue clay with pebbles of chalk and flint BC-4**
- Glacial Sand and Gravel - poorly sorted sand and gravel GS-64**
- Glacial Lake Deposits - laminated silts and fine sands CL-8**

- SOLID**
- Cr Corallian - shelly, sandy, fine-grained limestone
 - OxO Oxford Clay - grey-blue, fossiliferous grey clays and mudstones
 - KIS Kellaways Sand - fine-grained, pale grey silty sand
 - KIC Kellaways Clay - dark grey mudstone
 - Cb Cornbrash - indurated, shell-detrital limestone

- Md Made ground MGr-2
- Wd Worked ground WGr-1

- BOUNDARY LINES**
- Geological boundary, Drift.
 - Geological boundary, Solid.
 - Fault at surface, crossmark indicates downthrow side.
 - Resource block and sub-block boundary.
 - Inferred boundary between recognised categories of deposits.
- Broken lines denote uncertainty.

- BOREHOLE DATA**
- SITE LOCATIONS**
- Industrial Minerals Assessment Unit (I.M.A.U.) borehole.
 - Other boreholes.
- I.M.A.U. BOREHOLES**
- Borehole Registration Number - TF 20 SE 27
- Surface level in metres and feet related to O.D. (Newlyn)
- Overburden
- Geological Classification
- Grading diagram

- Note:**
- (1) Thicknesses in metres.
 - (2) The figures in brackets are the conversions to metres of measurements recorded in feet.
 - (3) Figures underlined denote thicknesses used in the assessment of resources.
 - (4) The 'h' sign indicates that the base of the deposit was not reached.
 - (5) The Geological Classification is given only for mineral and bedrock (in I.M.A.U. boreholes).
- Borehole Registration Number**
- Each borehole is identified by a Registration Number e.g. TF 20 SE 27. The first four characters refer to the 1:25 000 sheet, the next two letters refer to the quarter sheet and the figures following to the I.G.S. serial number for that quarter.

- Grading Diagrams**
- Each grading diagram shows the mean particle-size distribution of a distinct deposit of mineral.
-

- OTHER BOREHOLES**
- The layout of information is the same as for I.M.A.U. boreholes, although data available may not be as comprehensive. They are registered in the same series. The final depth of deep boreholes is given in metres above (+) and below (-) O.D. (Newlyn).

- EXPOSURE RECORD**
- Information from the inspection of a temporary exposure (at TL 2709 9066), is shown in the same way as for Other Boreholes. However, it is located by an asterisk, thus *

- CATEGORIES OF DEPOSITS**
- Exposed mineral. CAT-E6
 - Continuous or almost continuous spreads of mineral beneath overburden. CAT-C1
 - Sand and gravel either not potentially workable or absent. CAT-A2
 - Sand and gravel not assessed. CAT-N1

- RESOURCE BLOCKS/SUB-BLOCKS**
- For the purposes of the assessment, the map is divided into Resource Blocks within which sand and gravel, classified as mineral, is distinguished by sub-blocks (see Report p.2). Each block is designated by a letter and sub-blocks by a letter and a subscript number (see Report Table 4).

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

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

The GRID lines on this sheet are at 1 Kilometre interval. Heights are in feet above Mean Sea Level at Newlyn.

Original geological survey on the one-inch scale by J. W. Judd, W. H. Hollings and S. B. J. Skerrett, published on the Old Series Sheet 66 in 1927 (2nd ed.) and 1977 (3rd ed.). The area within grid lines Easting 20 22 and Northing 04 05 surveyed on the one-inch scale by A. Horton, R. G. Lake and B. C. Cousins during 1968. G. A. Kellaways, District Geologist. Re-survey was carried out on the one-inch scale for the reconnaissance level by J. M. Ridgway during 1975-76 under the supervision of A. Horton. Survey completed by R. J. Ward during 1977-78. G. W. Green, District Geologist.

Assessed area falls within the One-Inch New Series Geological Sheets 156 and 172 (both unpublished) and partially within the 1:25 000 Peterborough Geological Sheet.

Worked ground, including sand and gravel shown to June 1978.

Sand and Gravel surveys by S. J. Booth, J. L. Knight and J. B. L. Wild during 1976-78. P. G. Thorne, Head, Industrial Minerals Assessment Unit.

1:25 000 Sand and Gravel Resource Sheet publisher 1982. G. M. Brown, D.Sc., F.R.S., Director, Institute of Geological Sciences, 1982.

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Compiled from 6" sheets last revised 1999-1925. Other partial systematic revision 1938-50 has been incorporated. Some minor roads revised 1971.

Diagram showing the relationship of this sheet to the surrounding sheets. The area shown is the 1:25 000 Sand and Gravel Resource Sheet (unpublished).