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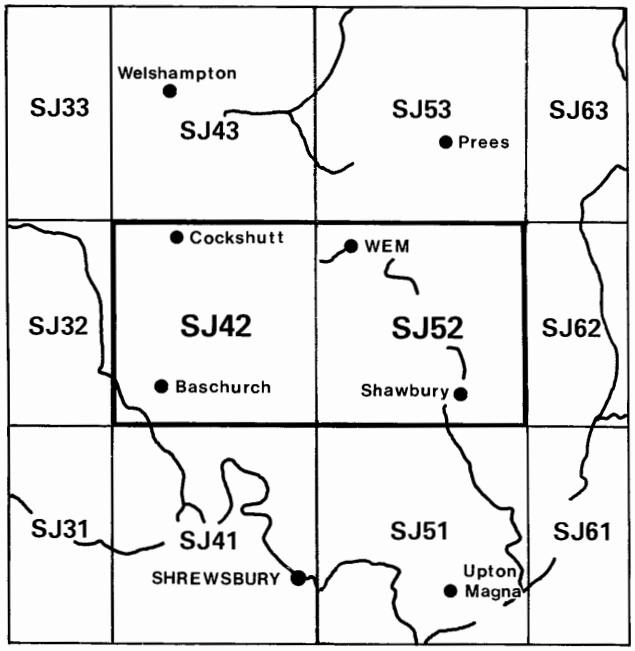

The sand and gravel resources of the country around Wem, Shropshire

Description of 1 : 25 000 resource sheet SJ 42 and SJ 52

B. Cannell and W. J. R. Harries

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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.
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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 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) of the Institute of Geological Sciences began systematic surveys in 1968. The work is now being financed by the Department of the Environment and is being undertaken with the co-operation of the Sand and Gravel Association of Great Britain.

This report describes the resources of sand and gravel of 200 km^2 of the country around Wem, Shropshire, shown on the accompanying resource map. The survey was conducted in 1976–77 by Dr H. C. Squirrell, Dr W. J. R. Harries, Miss M. B. Simmons, Mr B. Cannell, Mr R. G. Crofts and Mr C. I. Jay. Mr Cannell and Dr Harries compiled the report assisted by Mr Jay. The work is based on a geological survey at 1 : 10 560 in 1855–68 by A. R. C. Selwyn, E. Hull and A. C. Ramsay and a re-survey in 1911–22 by R. W. Pocock. Minor amendments were made by Dr Harries, Mr Cannell and Mr Adlam in 1978.

The Property Services Agency and Mr J. D. Burnell, I.S.O., F.R.I.C.S., Chief Land Agent, were responsible for negotiating access to land for drilling. The ready co-operation of landowners and tenants in this work is gratefully acknowledged.

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B. CANNELL and W. J. R. HARRIES

SUMMARY

The assessment of the sand and gravel resources in the Wem area, Shropshire, is based on the geological maps and borehole records of the Institute of Geological Sciences, records made available by the sand and gravel industry, recent field work and one hundred and eighty-two boreholes drilled for the Industrial Minerals Assessment Unit.

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

The area has been divided into six resource blocks each containing between 9.6 and 19.2 km^2 of sand and gravel. For these blocks the geology of the deposits is described and the mineral-bearing area, the mean thickness of overburden and mineral and the mean grading of the mineral are stated. Detailed borehole data are given. The geology, the position of the boreholes and the outlines of the resource blocks are shown on the accompanying map.

Bibliographical reference

CANNELL, B. and HARRIES, W. J. R. 1981. The sand and gravel resources of the country around Wem, Shropshire. Description of 1 : 25 000 sheets SJ 42 and SJ 52. *Miner. Assess. Rep. Inst. Geol. Sci.*, No. 86.

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Note

National Grid references given in this publication lie within 100-kilometre square SJ.

INTRODUCTION

The survey is concerned with the estimation of resources, which include deposits that are not currently exploitable but have a foreseeable use, rather than reserves, which can only be assessed in the light of current, locally prevailing, economic considerations. Clearly, both the economic and the social factors used to decide whether a deposit may be workable in the future cannot be predicted; they are likely to change with time. Deposits not currently economically workable may be exploited as demand increases, as higher grade or alternative materials become scarce, or as improved processing techniques are applied to them. The improved knowledge of the main physical properties of the resource and their variability, which this survey seeks to provide, will add significantly to the factual background against which planning policies can be decided (Archer, 1969; Thurrell, 1971; Harris and others, 1974).

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

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

a The deposit should average at least one metre in thickness.
b The ratio of overburden to sand and gravel should be no more than 3 : 1.
c The proportion of fines (particles passing the No. 240 mesh BS sieve, about $\frac{1}{16}$ mm) should not exceed 40 per cent.
d The deposit must 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 which broadly meets these criteria is regarded as 'potentially workable' and is described and assessed as 'mineral' in this report. As the assessment is at the indicated level, parts of such a deposit may not satisfy all the criteria.

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

gravel grade material, are placed at $\frac{1}{16}$ mm and 4 mm respectively (see Appendix C).

The volume and other characteristics are assessed within resource blocks, each of which, ideally, contains approximately 10 km^2 of sand and gravel. No account is taken of any factors, for example, roads, villages and high agricultural or landscape value, which might stand in the way of sand and gravel being exploited, although towns are excluded. The estimated total volume therefore bears no simple relationship to the amount that could be extracted in practice.

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

Although they may be potentially workable in the terms of the survey (stated above), the sands derived by the weathering of the Permo-Triassic bedrock (Figure 4) have not been assessed in this report. However, it is worth recording that in the south-eastern corner of the district the sandstones are weathered to depths of at least two metres.

DESCRIPTION OF THE DISTRICT

The area assessed on this resource sheet (Figure 1) extends for 200 km^2, of which 86 km^2 is mineral-bearing. Wem, situated in the north of the area, is the principal town with Baschurch, Myddle, Loppington, Cockshutt and Shawbury the more important villages (Figure 2).

The area is given over almost entirely to agriculture with dairying dominant and some arable farming on the lighter sandy soils.

TOPOGRAPHY

The area is dominated by a south-facing Triassic escarpment extending from Marchamley [596 295] in the north-east through Hawkstone Park [580 298] and Pim Hill [487 211] to Myddle Hill [473 240] in the south-west. It reaches an elevation of 208 m at Elysian Hill [579 292]. The remaining area has low relief, is rather featureless, and lies between 72 and 128 metres above Ordnance Datum. The area is drained by eastward-flowing streams, namely the River Roden in the north and the River Perry in the south. Flat, low-lying areas where the drainage is poor, for example at Loppington [471 293], are characterised by the development of peat.

GEOLOGY

The geology of the Wem district has been described by Pocock and Wray (1925). The solid and drift deposits are classified as shown in Table 1. Schematic cross-sections (A–A′, B–B′ on the map) showing the generalised drift geology are depicted at the foot of the map (in pocket).

The solid rocks are exposed along the escarpment from Marchamley to Myddle [470 239] and near Plattmill [407 223]. Elsewhere, they are concealed beneath varied thicknesses of drift, comprising Glacial Sand and Gravel, Boulder Clay, Alluvium and Peat.

SOLID

Bridgnorth Sandstone Poorly exposed Bridgenorth Sandstone occupies the south-eastern part of the district. It consists of friable, bright red, commonly mottled sandstone. Cross-bedded sandstone is well exposed in a road cutting [541 252] at Rock Hall, Preston Brockhurst.

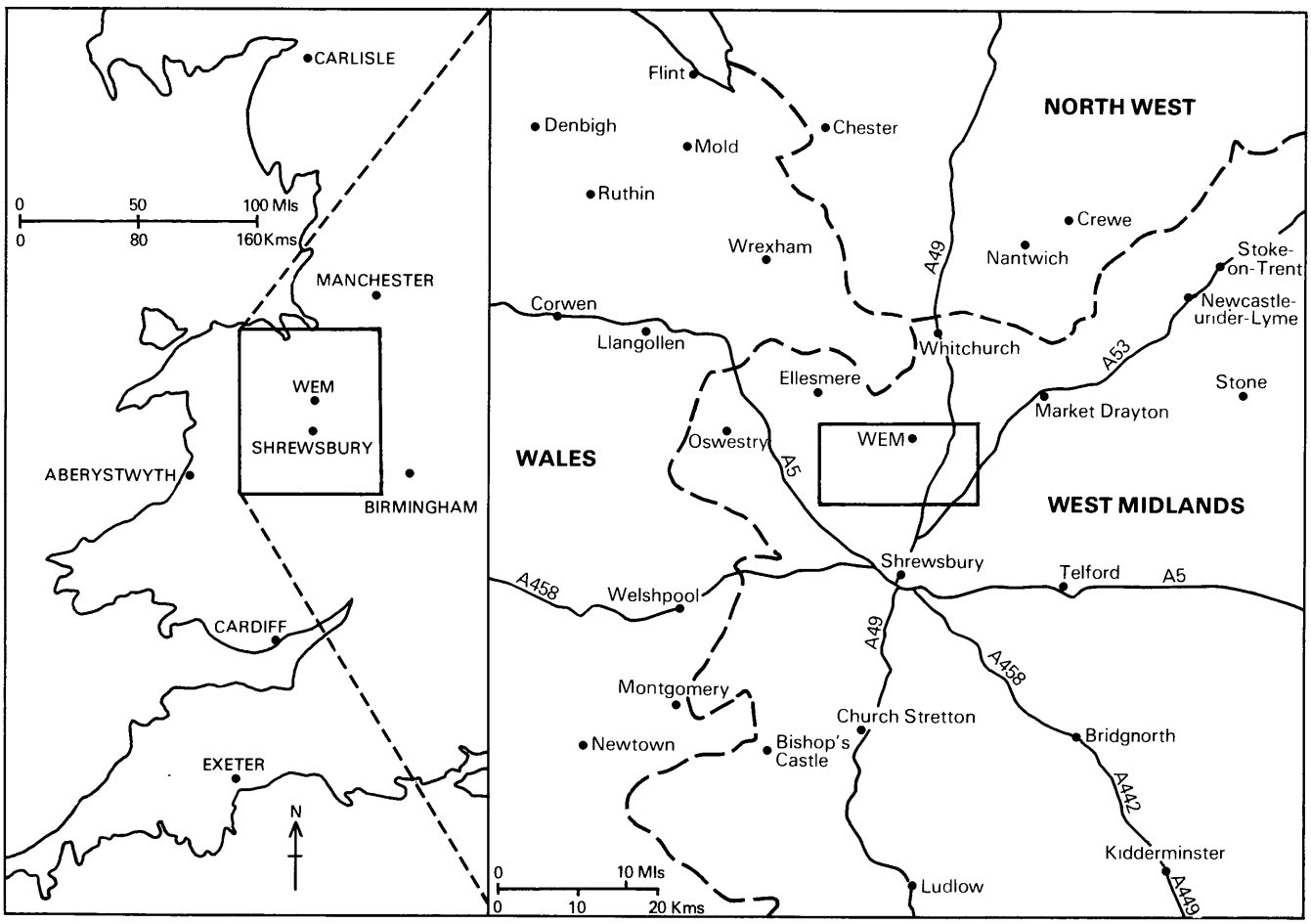


Figure 1 Location of the resource sheet area. The boundaries of the Economic Planning Regions are shown on the right-hand map.

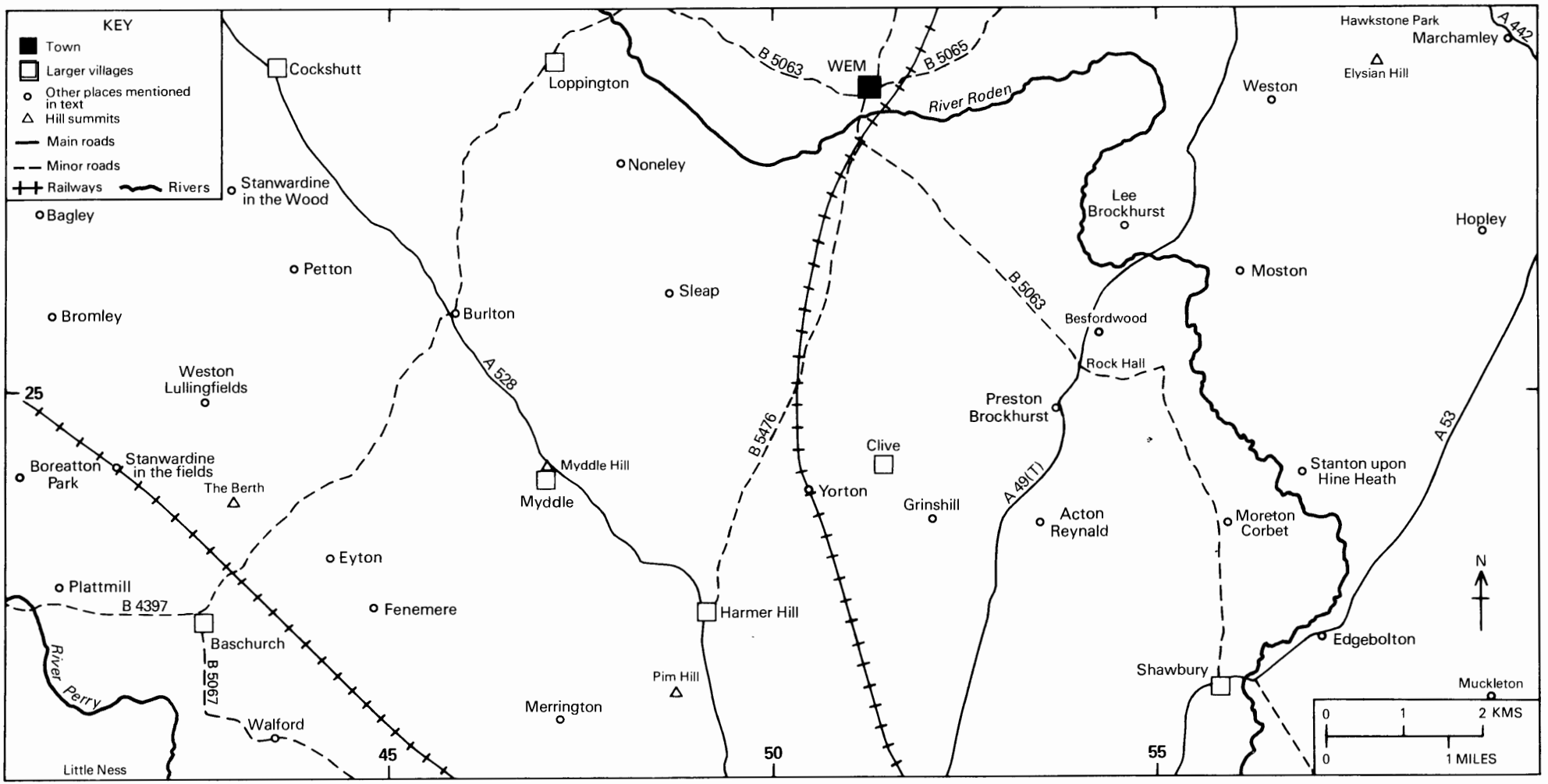


Figure 2 Locality map.

Table 1 Classification of the solid and drift deposits

DRIFT
Recent and **Pleistocene**
Peat
Alluvium
Glacial Sand and Gravel
Boulder Clay
Glacial Lake Deposits
SOLID
Triassic
Mercia Mudstone Group (formerly Keuper Marl and Waterstones)
Sherwood Sandstone Group
Bromsgrove Sandstone (formerly Ruyton and Grinshill Sandstones)
Wildmoor Sandstone (formerly Upper Mottled Sandstone)
Kidderminster Conglomerate (formerly Bunter Pebble Beds)
—— *Unconformity* ——
Permian
Bridgnorth Sandstone (formerly Lower Mottled Sandstone)

Sherwood Sandstone Group

The *Kidderminster Conglomerate* is exposed only at Bessfordwood [546 258], Stanton upon Hine Heath [569 240] and Acton Reynald [535 233]; it consists of brown, red and yellow compact sandstones, containing small pebbles, principally of quartzite. The base of the formation is more pebbly with most of the clasts being of igneous rock.

Wildmoor Sandstone forms most of the scarp-ridges and underlies the area around Weston-under-Redcastle [571 283]. The beds are composed of red sandstone.

The boundary between the Sherwood Sandstone Group and the Mercia Mudstone Group is indistinct. The *Bromsgrove Sandstone* is red and yellow in colour and is transitional between the two groups. It is exposed at Plattmill, Myddle Hill, Yorton [504 236], Grinshill and Hawkstone Park.

Mercia Mudstone Group

Sandstones at the base of the Group are exposed in the north-east of the district where they form a broad belt extending from Hawkstone Park in the west to Marchamley in the east. Elsewhere, smaller outcrops occur south of Plattmill, east of Myddle Hill, Pim Hill, Yorton and Clive [514 242].

Red marl with sporadic green mottling crops out immediately north of the prominent scarp-ridges around Plattmill, Myddle, Pim Hill and Grinshill. Elsewhere, in the west and north-west, over 70 km^2 of marl is concealed beneath extensive drift deposits. Throughout the outcrop thin sandstones (termed skerries) are present.

DRIFT

Deposition of the drift appears to have been associated with two ice sheets, one of 'Irish Sea' type and the other of Welsh origin. The former, which was generated in Scotland and the Lake District, advanced southwards across the Irish Sea into the Cheshire Basin and Shropshire. Valley glaciers, originating in the Welsh massif, coalesced to form a Welsh ice sheet, which moved eastwards into the Vale of Clwyd and Shropshire.

The drift deposits to the north and west of the Triassic escarpment (Figure 3) are locally over 60 m in thickness, whereas to the south-east they are less than 15 m thick. Poole and Whiteman (1961) recognised a tripartite sequence (Lower Boulder Clay, Middle Sands and Upper Boulder Clay), in the Wem area, however a more complex interpretation can be inferred from the variety and vertical arrangement of the deposits within boreholes. Lateral variations between boreholes result from interdigitation and lensing out of the different drift deposits (see cross-sections A–A′, B–B′, at foot of the resource map). Two or more sand and gravel layers, commonly separated by a till sheet, have been proved in several boreholes. Other boreholes have proved a varied sequence of finer deposits ranging from pebbly to silty clay, silt and laminated clay. South-east of the escarpment, however, the stratigraphy appears to be less complex in that a till sheet which lies on bedrock is usually overlain by sand and gravel.

Glacial Sand and Gravel Glacial Sand and Gravel deposits are extensive in the north, west and south-east of the area. They have been outlined in three main areas, around Wem, Baschurch and Shawbury.

The sands and gravels of the *Wem* outwash deposit have a bilobate outcrop and were laid down in front of an ice sheet which was situated to the north. The deposit covers an area of 23.5 km^2 extending from Cockshutt in the west through Burlton [458 260] to Wem in the east. The proven thickness of sand and gravel decreases eastwards from over 10 m between Cockshutt and Burlton to around 4 m near Wem.

The sands and gravels of the *Baschurch* area are probably outwash deposits also, but some debris may have been laid down in a glacial overflow channel (west of Baschurch). They cover an area of approximately 14 km^2 extending from Weston Lullingfields [427 248] in the north to Little Ness [408 196] in the south and to Fenemere [449 227] in the east. The proven thickness of sand and gravel decreases eastwards from 12.0 m near the supposed western source area to around 2.0 m in the east.

When the drainage west of the escarpment was obstructed by ice, southward-flowing channels were cut across the escarpment at Yorton and Lee Brockhurst [546 271]. South of this elevated tract sands and gravels were deposited as the streams debouched onto the lower ground. The deposits cover an area of about 20 km^2, extending from Lee Brockhurst and Hopley [591 270] in the north to *Shawbury* in the south. The mean proven thickness of sand and gravel is 3.0 m.

Throughout the Wem district the gravels consist of quartz, quartzite, sandstone, limestone, argillaceous and igneous rock clasts set in a matrix of fine to coarse-grained

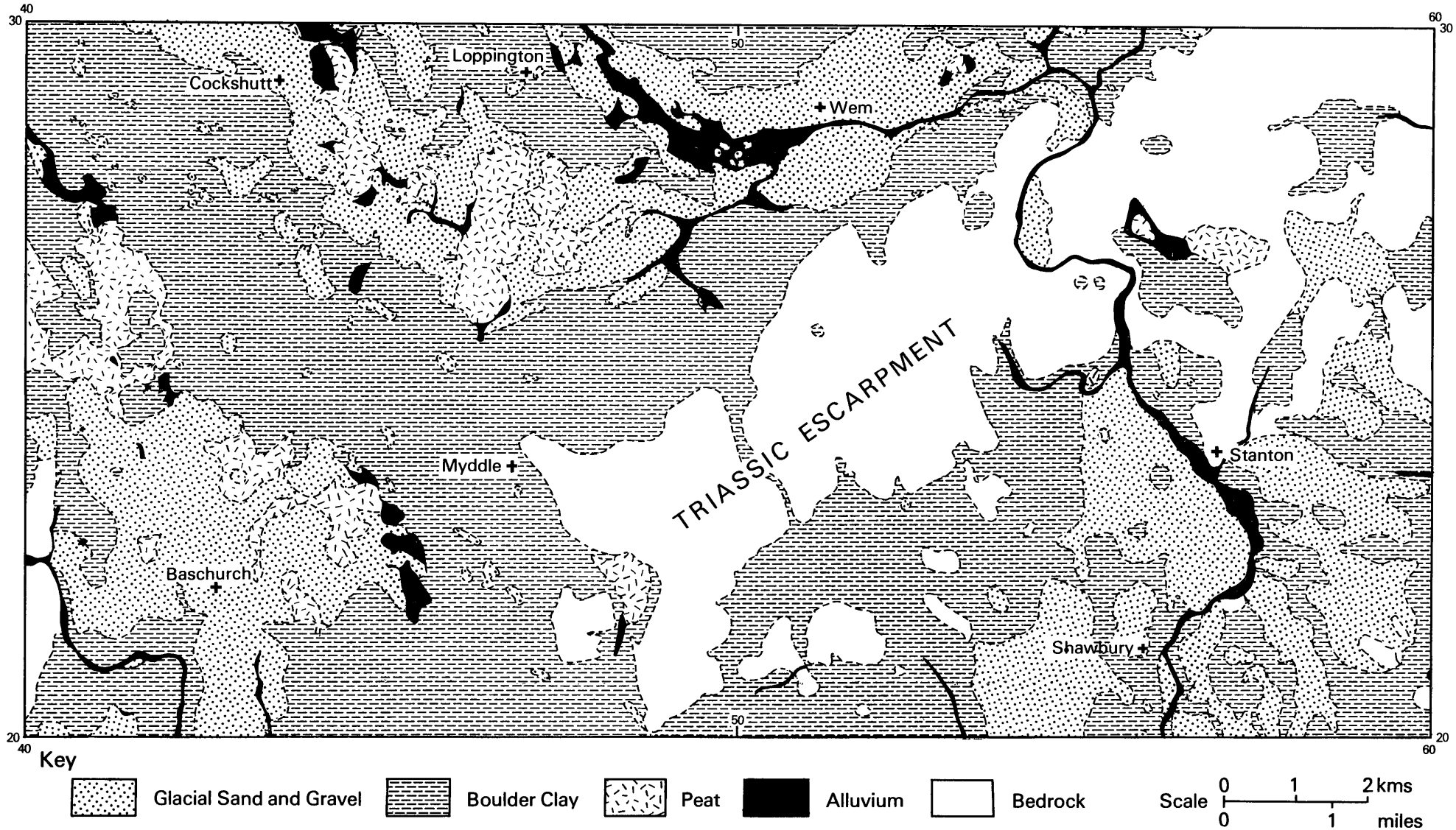


Figure 3 Drift geology map.

sand. Granite pebbles were found in some boreholes. It is possible that groundwater leaching may have modified the distribution pattern of the limestone component; nevertheless this lithology has proved a useful guide to provenance.

The sands have the same lithological constituents as the gravels with the more resistant types (e.g. quartz and quartzite) forming the dominant fraction. Most of the medium and fine sand grains are coated with iron oxides which impart a reddish or yellowish colour to the deposits. The coarser grains are more rounded than the medium-sized grains.

Minor amounts of silt and clay are intercalated with the sands and gravels and probably reflect depostion in quiet water away from the main channel areas.

Boulder Clay Boulder Clay covers extensive areas of the map (Figure 4), separating the major Glacial Sand and Gravel deposits from each other and from areas of bedrock. The Boulder Clay has been subdivided into two main types: pebbly clay and silty clay.

Pebbly clay forms extensive till sheets, particularly in the west of the district, where they are over 18 m thick; elsewhere they are thicker than 25 m though south of the escarpment they are generally between 10 m and 20 m thick. The pebbly clay is sandy and can be divided into a hard, reddish brown type and a greyish brown type: both are believed to be lodgement till. The sand fraction is generally fine to medium-grained and the gravel fraction has a composition similar to the outwash gravels. It seems that the reddish brown till was the product of an Irish Sea Ice Sheet, whereas, the greyish brown till was derived from mid-Wales.

Silty clay has been proved in a few boreholes associated with sand and gravel layers and pebbly clay (e.g. boreholes 42 NW 19, SE 27 and 30). It is a soft, brown, silty clay with scattered pebbles of subangular to rounded quartz, quartzite, sandstone and igneous rock and may be a flow till.

The clay matrices of the pebbly and silty clays are commonly calcareous, a feature which has probably been inherited from the erosion of Carboniferous Limestone bedrock to the north.

Glacial Lake Deposits These deposits comprise laminated clays and silts.

The distribution of the *laminated clays*, which are soft, brown and pebble-free, is shown in Figure 4. Laminated clays usually indicate a lacustrine environment. It is postulated that, during the Late Devensian, ice sheets (to the north and west) obstructed the northward drainage of the area, resulting in the formation of a series of lakes, or perhaps a single extensive lake (Lake Lapworth), in which laminated clays were deposited. The total thickness of the laminated clays has not been proved, but it is at least 15 m in some boreholes. Influxes of sand and silt have been proved in the Merrington area [472 208]. Pebbly clays overlie the laminated clays in some boreholes, thus indicating the presence of a later till sheet, but elsewhere the lacustrine deposits are overlain by outwash sequences. South of the escarpment localised ponding by ice has produced a thin (about 5 m) sequence of laminated clays.

Soft, yellowish brown, pebble-free *silts* have been proved in the south-west of the district, around Bromley [406 260], Myddle and Merrington, ranging in thickness from 3.0 m to 16.0 m. The silts were probably deposited near the lake margins; alternating sand and silt partings, usually about 10 mm thick, may indicate seasonal variations in flow conditions.

Alluvium Alluvium occurs as a continuous deposit on the floor of the present-day river valleys. It consists of gravels, sands, humic silts and clays. The sluggish nature of the drainage over large areas has permitted the accumulation of peat. The thickness of the alluvium ranges up to 2.0 m.

Peat Peat-flats are common throughout the area (Figure 3). These occur on the sites of former lakes which were formed during the retreat of the last ice-sheet. Parts of these lakes still remain at Berth [429 236] and Eyton [442 228].

COMPOSITION OF THE SAND AND GRAVEL

The potentially workable deposits are found in the Glacial Sand and Gravel (Resource Blocks A to F) which occur in three main areas, namely Baschurch (Block A), Wem (Blocks C and D) and Shawbury (Blocks E and F). Block B trends north-west from Merrington. The mean grading and pebble composition for these deposits are summarized in Table 2. The highest proportion of gravel is found in the Baschurch area, whereas the lowest proportion of gravel (22 per cent) occurs in the Shawbury area. The fines content for all the deposits is below 12 per cent.

The Glacial Sand and Gravel is characterised by a variation in grading from 'clayey' pebbly sand to 'clayey' sandy gravel and sandy gravel. The deposits exhibit a marked lateral variation between boreholes.

The variation in particle size distribution of the sand and gravel in the resource blocks is shown in Figure 5. The cumulative frequency curves all exhibit a similar pattern except in the south-east (Block F) where there is a slightly higher sand content.

The compositional variations in the gravels (Table 2) reflect derivation from two distinct source areas. In the west, the Baschurch gravels are dominated by argillaceous rock clasts which have been derived ultimately (perhaps via a Welsh till) from the Lower Palaeozoic strata of mid-Wales. This component is far less prominent in the Wem and Shawbury gravels, in which quartzite, igneous rock, locally derived limestone (Carboniferous of North Wales) and sandstone (predominantly from the Triassic escarpment) clasts are common. In all three areas, the sands and gravels contain trace amounts of coal, flint and chert.

THE MAP

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

Geological data

The geological boundary lines are taken from the geological map of this district, which was surveyed at the scale of 1 : 10 560. Borehole data, which include the stratigraphic relations and mean particle size distribution of the sand and gravel samples collected during the assessment survey, are also shown.

The geological boundaries represent the best available information at the time of the survey. However, it is inevitable, particularly with drift deposits which vary

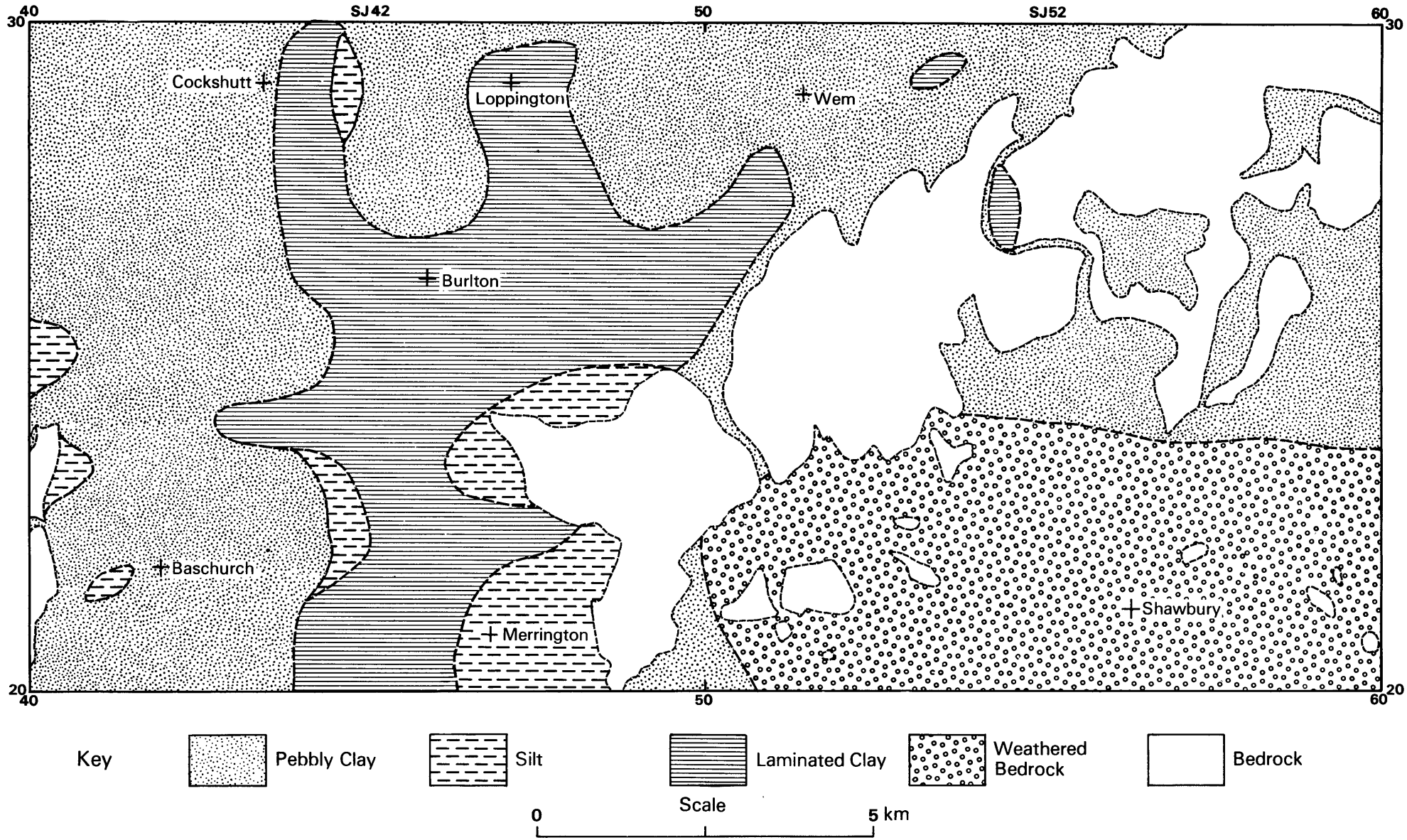


Figure 4 Sketch map showing the relationship between the major clay deposits and weathered bedrock, with the surface sand and gravel removed.

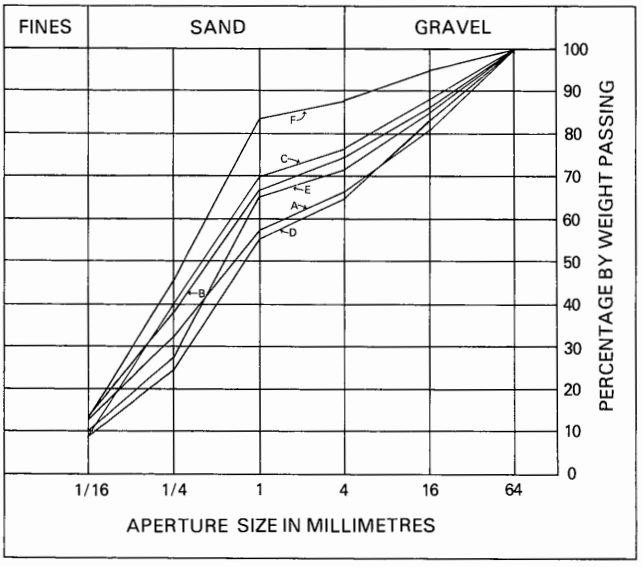
Table 2 Mean grading and composition of the Glacial Sand and Gravel deposits, based on IMAU borehole samples

GRADING

Deposit area	Percentages by weight		
	Fines $-\frac{1}{16}$ mm	Sand $+\frac{1}{16}-4$ mm	Gravel $+4$ mm
Wem	9	63	28
Baschurch	12	54	34
Shawbury	11	67	22

COMPOSITION

Deposit area	Percentages by weight in the gravel (+4 mm) fraction							
	Quartz-ite	Argill-aceous	Igneous	Sand-stone	Lime-stone	Quartz	Pelitic	Others
Wem	35	21	22	6	11	3	1	1
Baschurch	23	46	14	7	6	3	1	Trace
Shawbury	42	14	19	12	3	7	1	2



BLOCK	PERCENTAGE BY WEIGHT PASSING				
	1/16mm	1/4mm	1mm	4mm	16mm
A	12	32	57	66	81
B	13	37	66	74	86
C	9	40	69	76	88
D	9	24	55	65	83
E	10	27	65	72	85
F	12	45	84	88	95

Figure 5 Particle size distribution for the assessed thickness of mineral in resource blocks A to F.

vertically and laterally, that local discrepancies may occur.

Mineral resource information

The mineral-bearing ground is subdivided into resource blocks (see Appendix A). The mineral is identified as 'exposed' where the thickness of overburden, commonly consisting only of soil and subsoil, averages not more than 1.0 m.

Areas where bedrock crops out are uncoloured on the map. Areas of unassessed sand and gravel, for example, in built-up areas, are indicated by a red stipple.

The area of the exposed sand and gravel is measured from the mapped geological boundary lines. The whole of this area is considered as mineral, although it may include small areas where sand and gravel is not present or is not potentially workable.

RESULTS

The statistical results are summarised in Table 3. More complete grading particulars are shown in Figure 5.

Accuracy of the results

For the six resource blocks containing Glacial Sand and Gravel deposits the accuracy of the results varies between 22 and 47 per cent at the symmetrical 95 per cent probability level (that is, it is probable that 19 times out of 20 the true volume present lies within these limits). However, the true values are more likely to be nearer the figures estimated than the limits. Moreover, it is probable that in each block roughly 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, 10 boreholes) were used in the calculation. Thus, if closer limits are needed for the quotation of reserves of part of a block, it can be expected that data from more than 10 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 on this sheet. The volume (395.6 million m^3) can be estimated to limits of ± 16 per cent at the 95 per cent probability level

Table 3 The sand and gravel resources of the Wem district: summary of statistical results

Resource block	Area		Mean thickness		Volume of mineral			Mean grading percentage		
	Block	Mineral	Overburden	Mineral		Limits at the 95% confidence level		Fines $-\frac{1}{16}$ mm	Sand $+\frac{1}{16}$ -4 mm	Gravel $+4$ mm
	km^2	km^2	m	m	$m^3 \times 10^6$	±%	$\pm m^3 \times 10^6$			
A	20.3	19.2	1.1	4.9	94.1	37	34.8	12	54	34
B	42.2	12.8	4.3	6.5	83.2	47	39.1	13	61	26
C	15.4	15.3	1.1	7.9	120.9	22	26.6	9	67	24
D	19.4	18.0	1.0	3.4	61.2	32	19.6	9	56	35
E	14.6	9.6	0.5	4.0	38.4	36	13.8	10	62	28
F	20.9	11.1	0.5	2.1	23.3	46	10.7	12	76	12
A to F	132.8	86.0	1.3	4.6	395.6	16	63.3	11	61	28

(Table 3), by a calculation based on the data from 182 sample points spread across the six resource blocks.

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

NOTES ON THE RESOURCE BLOCKS

The area is divided into six resource blocks in which the area of mineral varies from 9.6 km^2 to 19.2 km^2 (Table 3). As far as possible, the block boundaries are determined by geological considerations. The blocks comprise, in the main, the major areas of 'exposed' sand and gravel, except for Block B which contains areas of concealed mineral and small discontinuous patches of sand and gravel. The mineral of Blocks A, C and D, which extends over 52.5 km^2 (61 per cent of the mineral outlined), has a mean thickness of 5.4 m and represents 65 per cent of the resource by volume. The mineral of Block B has a mean thickness of 6.5 m and that of Blocks E and F, 3.1 m.

Block A

Block A comprises 19.2 km^2 of mineral. Sand and gravel has been worked in this area but only on a small scale for local use.

The assessment is based on 18 Industrial Minerals Assessment Unit (IMAU) boreholes (Table 4) and 6 other boreholes. The mean thickness is 4.9 m; the range is from 1.0 m to 12.4 m. The estimated volume of mineral is 94.1 million $m^3 \pm 37$ per cent. The overburden, which usually consists of gravelly soil and sandy clay, ranges in thickness from 0.1 m to 3.0 m and has a mean of 1.1 m.

The grading results are also shown in Figure 6 and Table 4. The fines content commonly varies between 2 and 20 per cent but reaches a maximum of 32 per cent in borehole 42 SW 30. The sand content varies from 21 per cent to 74 per cent, the fine and medium-grained fractions predominating. The gravel content commonly varies between 25 and 76 per cent, but is as low as 8 per cent in borehole 42 SW 26. The mean grading for the block is fines 12 per cent, sand 54 per cent and gravel 34 per cent.

Block B

Block B extends over an area of 42.2 km^2; however, only 12.8 km^2 of mineral is present. Sand and gravel has been worked locally on a small scale.

Table 4 Data from IMAU boreholes: Block A

Borehole No.	Recorded thickness		Mean grading percentage					
	Mineral	Overburden	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}-1$ mm	$+1-4$ mm	$+4-16$ mm	$+16$ mm
SJ 42								
SW 26	11.8	0.2	18	38	29	7	6	2
SW 27	10.7	3.0	27	30	28	3	5	7
SW 28	6.7	0.3	20	20	19	9	14	18
SW 29	7.0	1.0	12	11	21	14	19	23
SW 30	1.7	1.6	32	20	24	9	11	4
SW 31	3.2	0.3	2	4	11	14	31	38
SW 32	11.7	1.3	5	25	31	8	13	18
SW 33	11.4	0.3	12	27	26	7	12	16
SW 34	2.1	0.3	29	12	18	16	23	2
SW 36	10.8	2.0	7	9	33	11	16	24
SW 37	12.4	0.1	7	16	25	10	18	24
SW 38	3.2	0.5	14	7	16	13	22	28
SW 39	1.7	1.0	4	2	12	19	36	27
SW 40	2.6	1.4	3	2	9	10	30	46
SW 41	4.2	0.7	9	7	27	10	22	25
SW 44	4.7	0.3	8	19	26	7	17	23
SE 16	absent							
SE 30	1.0	1.3	3	4	9	8	36	40

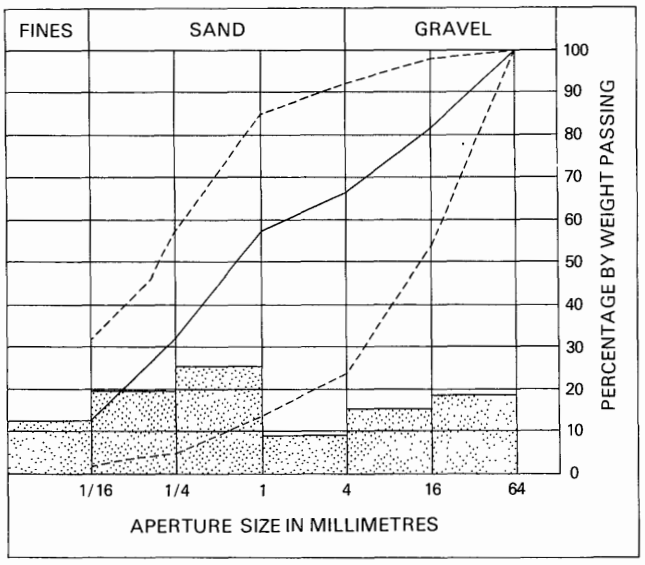


Figure 6 Grading characteristics of the mineral in Block A. The continuous line is the cumulative frequency curve of the mean grading of the block as a whole; the broken lines delimit the envelope within which the mean grading curves for individual boreholes fall. The mean grading of the block is also shown as a histogram.

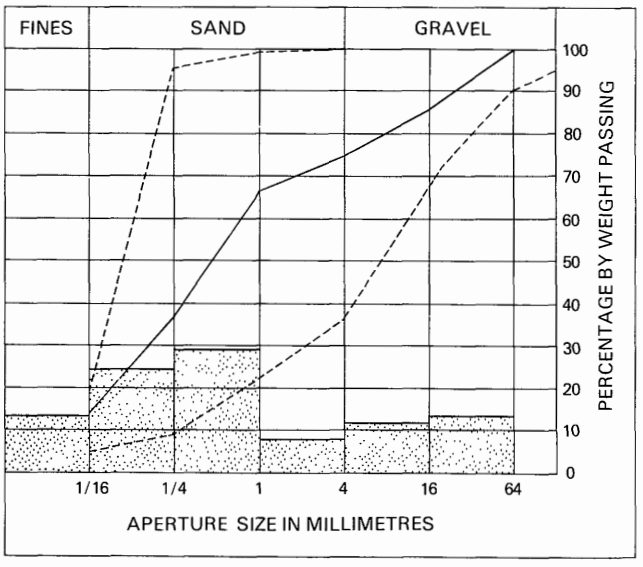


Figure 7 Grading characteristics of the mineral in BlockB. For explanation, see Figure 6.

The assessment is based on 9 IMAU boreholes and 6 other boreholes. The mean thickness is 6.5 m; the range is from 2.2 m to over 22.2 m. The estimated volume of mineral is 83.2 million $m^3 \pm 47$ per cent. The overburden, usually soil and sandy clay, ranges in thickness from 0.2 m to 14.0 m and has a mean of 4.3 m.

The grading results are shown in Figure 7 and Table 5. The fines content varies between 5 and 20 per cent, except in borehole 42 NW 19, where it reaches 27 per cent. The sand content varies from 31 per cent to 79 per cent; the fine and medium fractions predominate. The gravel content varies from 23 per cent to 64 per cent, although in borehole 42 NW 18 it is as low as 7 per cent. There was no gravel in borehole 42 NW 19. The mean grading for the block is fines 13 per cent, sand 61 per cent and gravel 26 per cent.

Block C

Block C extends over an area of 15.4 km^2 of which 15.3 km^2 is mineral-bearing. There are no mineral workings in the area.

The assessment is based on 18 IMAU boreholes and 3 other boreholes. The mean thickness of mineral is 7.9 m; the range is from 2.6 m to over 16.0 m. The estimated volume of mineral is 120.9 million $m^3 \pm 22$ per cent. The overburden, which consists of sandy soil and sandy clay, ranges in thickness from 0.1 m to 5.5 m and has a mean of 1.1 m.

The grading results are shown in Figure 8 and Table 6. The fines content varies from 2 per cent to 18 per cent. The sand content (which is dominantly fine and medium-grained) usually exceeds 50 per cent and reaches a maximum of 89 per cent in borehole 42 NW 24, but can be as low as 37 per cent. The gravel content commonly varies between 14 and 40 per cent although in several boreholes it is less than 3 per cent. The highest gravel content, of 61 per cent, occurs in borehole 42 NW 30. The mean grading for the block is fines 9 per cent, sand 67 per cent and gravel 24 per cent.

Block D

Block D extends over an area of 19.4 km^2 of which 18.0 km^2 is mineral-bearing. There are no mineral workings in the area.

The assessment is based on 22 IMAU boreholes and 7 other boreholes. The mean thickness of mineral is 3.4 m;

Table 5 Data from IMAU boreholes: Block B

Borehole No.	Recorded thickness		Mean grading percentage					
	Mineral	Overburden	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}-1$ mm	$+1-4$ mm	$+4-16$ mm	$+16$ mm
SJ 42								
NW 16	5.0	2.0	20	16	13	7	13	21
NW 17	11.0	6.0	10	33	28	6	13	10
NW 18	22.2+*	0.3	14	24	48	7	4	3
NW 19	5.0	6.0	27	68	4	1	0	0
NW 26	4.3	0.2	6	9	23	15	15	32
NW 32	4.0	0.2	18	14	24	6	18	20
NW 37	8.8+	2.2	5	9	8	14	31	33
SW 35	excessive overburden							
SE 26	3.6	1.3	9	14	17	12	19	29

* The plus sign indicates that the base of the deposit was not reached.

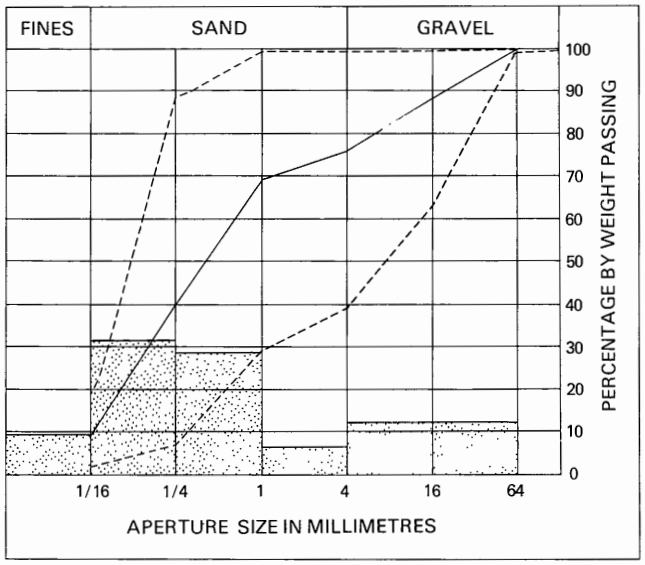


Figure 8 Grading characteristics of the mineral in Block C. For explanation, see Figure 6.

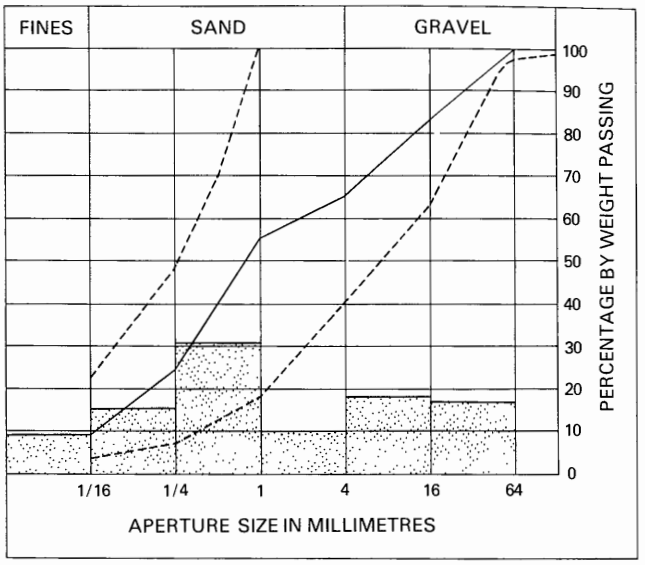


Figure 9 Grading characteristics of the mineral in Block D. For explanation, see Figure 6.

the range is from 1.0 m to 11.3 m. The estimated volume of mineral is 61.2 million $m^3 \pm 32$ per cent. The overburden ranges in thickness from 0.2 m to 5.8 m and has a mean of 1.0 m. It usually consists of soil and silty or sandy clay.

The grading results are shown in Figure 9 and Table 7. The fines content commonly varies between 5 and 20 per cent. The sand content varies from 36 to 86 per cent; the fine and medium-grained fractions predominating. The gravel content varies from 18 to 60 per cent but was absent in borehole 42 NE 29. The mean grading for the resource block is fines 9 per cent, sand 56 per cent and gravel 35 per cent.

Block E

This block extends over an area of 14.6 km^2 of which 9.6 km^2 is mineral-bearing. There are no mineral workings in the area.

The assessment is based on 14 IMAU boreholes and 4 other boreholes. The mean thickness of mineral is 4.0 m; the range is from 1.0 m to 9.3 m. The estimated volume of mineral is 38.4 million $m^3 \pm 36$ per cent. The overburden which is a sandy soil ranges in thickness from 0.3 m to 1.1 m and has a mean of 0.5 m.

The grading results are shown in Figure 10 and Table 8. The fines content commonly ranges between 4 and 13 per cent but reaches a maximum of 20 per cent in borehole 52 SW 33. The sand content varies from 27 to 79 per cent and is dominantly medium-grained. The gravel content commonly varies from 13 per cent to 49 per cent reaching 69 per cent in borehole 52 SE 38. The mean grading for the resource block is fines 10 per cent, sand 62 per cent and gravel 28 per cent.

Table 6 Data from IMAU boreholes: Block C

Borehole No.	Recorded thickness		Mean grading percentage					
	Mineral	Overburden	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}-1$ mm	$+1-4$ mm	$+4-16$ mm	$+16$ mm
SJ 42								
NW 24	14.0+*	0.5	8	55	32	2	2	1
NW 29	10.9	0.1	16	72	8	2	1	1
NW 30	5.0	1.5	2	5	22	10	24	37
NW 33	3.5	4.6	6	12	30	13	20	19
NW 34	8.0+	0.2	7	17	22	14	25	15
NW 35	9.5+	5.5	3	11	34	11	19	21
NW 36	13.1	0.5	7	18	28	11	18	18
NE 17	16.0+	0.6	18	44	21	3	7	7
NE 18	12.6	0.2	13	74	12	0	0	1
NE 19	7.6	0.4	11	10	52	7	10	10
NE 20	10.2+	1.3	11	12	40	3	15	19
NE 22	2.6	0.4	13	22	30	5	13	17
NE 23	4.6	3.2	5	33	35	4	8	15
NE 24	9.2+	0.3	8	19	26	11	20	16
NE 25	9.1	0.3	4	22	42	6	12	14
NE 30	7.5	0.9	7	16	34	14	15	14
NE 33	4.8	0.2	8	15	38	9	11	19
NE 34	3.1	0.1	9	9	45	8	15	14

* The plus sign indicates that the base of the deposit was not reached.

Table 7 Data from IMAU boreholes: Block D

Borehole No.	Recorded thickness		Mean grading percentage					
	Mineral	Overburden	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}-1$ mm	$+1-4$ mm	$+4-16$ mm	$+16$ mm
SJ 42								
NE 21	absent							
NE 28	6.0	1.6	7	11	37	5	19	21
NE 29	2.2	5.8	14	33	53	0	0	0
NE 31	2.8	0.2	23	25	42	3	3	4
NE 32	*							
NE 36	absent							
NE 37	1.2	1.0	4	3	11	22	22	38
NE 38	†							
SJ 52								
NW 10	3.2	4.3	5	38	30	7	14	6
NW 11	11.3	0.3	10	18	28	10	15	19
NW 12	3.8	1.2	6	14	58	4	7	11
NW 13	5.6	0.8	7	19	32	8	19	15
NW 16	9.9	0.3	6	8	26	16	27	17
NW 17	3.1	0.4	8	15	17	5	19	36
NW 18	5.7	0.6	6	13	23	11	30	17
NW 19	4.0	0.3	6	5	16	15	30	28
NW 20	3.2	0.3	6	18	34	4	12	26
NW 22	4.2	0.3	7	7	37	9	18	22
NW 23	2.0	0.3	15	10	44	7	19	5
NW 27	1.0	0.3	15	14	23	9	18	21
NW 28	7.3	0.3	20	15	26	13	15	11
NE 26	1.0	0.3	8	32	49	2	7	2

* 0.6 m of sand proved beneath 0.2 m of overburden.
† 0.6 m of sand proved beneath 0.4 m of overburden.

Block F

Block F extends over an area of 20.9 km^2 of which 11.1 km^2 is mineral-bearing. There are no mineral workings in the area.

The assessment is based on 17 IMAU boreholes and 5 other boreholes. The mean thickness of mineral is 2.1 m; the range is from 1.0 m to 8.1 m. The estimated volume of mineral is 23.3 million m^3 ± 46 per cent. The overburden, which is usually a sandy soil, ranges in thickness from 0.2 m to 1.8 m and has a mean of 0.5 m.

The grading results are shown in Figure 11 and Table 9. The fines content commonly varies between 3 and 20 per cent. The sand content usually exceeds 60 per cent and can be as high as 94 per cent, but is as low as 37 per cent in borehole 52 SE 42. The sand is predominantly fine and medium-grained. The gravel content is very variable

Table 8 Data from IMAU boreholes: Block E

Borehole No.	Recorded thickness		Mean grading percentage					
	Mineral	Overburden	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}-1$ mm	$+1-4$ mm	$+4-16$ mm	$+16$ mm
SJ 52								
NE 30	8.9+*	0.4	13	29	40	4	7	7
NE 35	3.3	0.4	13	27	48	4	5	3
SW 33	1.8	0.4	20	47	27	2	1	3
SW 37	4.5	0.4	5	11	37	8	16	23
SW 40	1.0	0.7	9	14	38	10	10	19
SW 41	9.3	0.3	12	11	58	5	10	4
SE 31	1.7	0.3	18	8	16	9	18	31
SE 32	6.2	0.3	7	6	29	11	21	26
SE 34	1.7	0.6	9	19	51	6	8	7
SE 35	2.0	0.6	10	16	54	7	8	5
SE 38	2.4	1.1	4	3	12	12	24	45
SE 39	3.0	0.3	11	10	31	6	20	22
SE 40	5.5	0.6	9	23	27	5	12	24
SE 45	3.3	0.6	4	11	32	11	21	21

* The plus sign indicates that the base of the deposit was not reached.

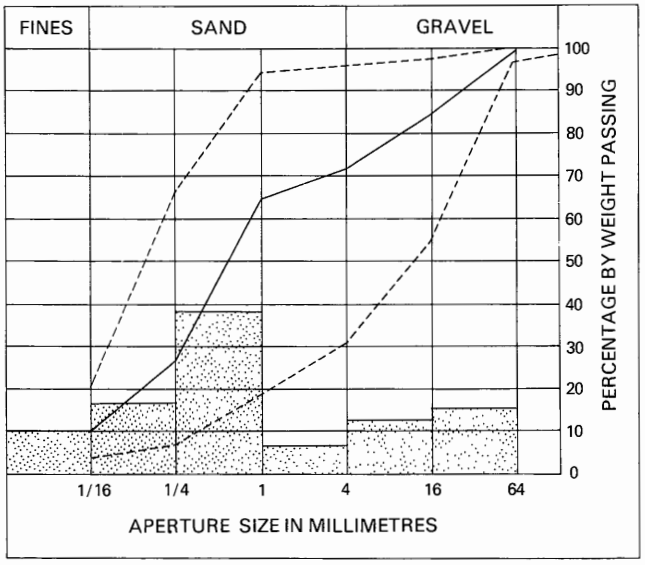


Figure 10 Grading characteristics of the mineral in Block E. For explanation, see Figure 6.

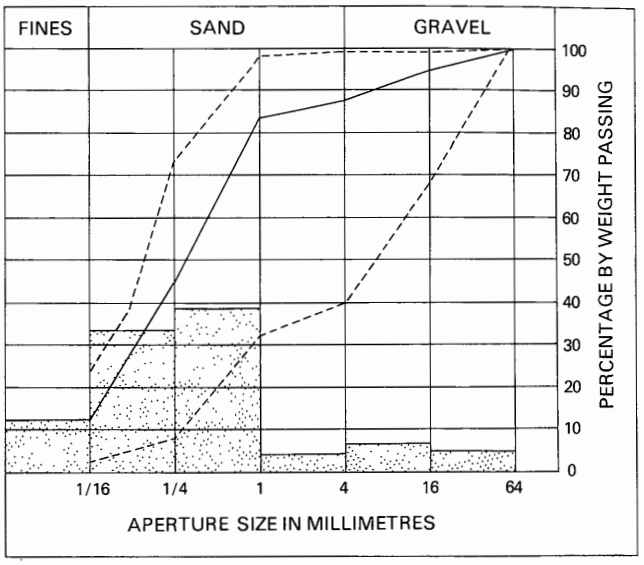


Figure 11 Grading characteristics of the mineral in Block F. For explanation, see Figure 6.

Table 9 Data from IMAU boreholes: Block F

Borehole No.	Recorded thickness		Mean grading percentage					
	Mineral	Overburden	Fines	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel
	m	m	$-\frac{1}{16}$ mm	$+\frac{1}{16}-\frac{1}{4}$ mm	$+\frac{1}{4}-1$ mm	$+1-4$ mm	$+4-16$ mm	$+16$ mm
SJ 52								
NE 42	1.7	0.3	9	64	24	1	1	1
NE 43	1.0	0.2	8	63	25	1	2	1
NE 44	absent							
NE 48	*							
SE 41	2.0	0.2	24	31	37	5	2	1
SE 42	1.2	1.8	3	5	24	8	28	32
SE 44	2.7	0.3	4	44	49	1	2	0
SE 46	8.1	0.5	9	35	31	7	12	6
SE 48	absent							
SE 49	2.1	0.2	13	12	63	2	6	4
SE 50	1.0	0.5	18	39	20	3	11	9
SE 51	1.4	0.5	5	15	69	5	5	1
SE 52	†							
SE 53	2.2	0.7	8	30	57	2	1	2
SE 54	7.1	0.3	20	28	36	4	6	6
SE 56	1.0	0.3	11	56	31	1	0	1
SE 57	‡							

* 0.4 m of sand proved beneath 0.3 m of overburden.
† 0.4 m of sand proved beneath 0.3 m of overburden.
‡ 0.5 m of sand proved beneath 0.3 m of overburden.

but is normally between 1 and 20 per cent, although it is as high as 60 per cent in borehole 52 SE 42. The mean grading for the resource block is fines 12 per cent, sand 76 per cent and gravel 12 per cent.

APPENDIX A

FIELD AND LABORATORY PROCEDURES

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

The mineral shown on each 1 : 25 000 sheet is divided into resource blocks. The arbitrary size selected, 10 km^2, is a compromise to meet the aims of the survey by providing sufficient sample points in each block. As far as possible the block boundaries are determined by geological boundaries so that, for example, glacial and river terrace gravels are separated. Otherwise division is by arbitrary lines, which may bear no relationship to the geology. The blocks are drawn provisionally before drilling begins.

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

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

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

A continuous series of bulk samples is taken throughout the sand and gravel. Ideally samples are composed exclusively of the whole of the material encountered in the borehole between stated depths. However, care is taken to discard, as far as possible, material which has caved or has been pumped from the bottom of the hole. A new sample is commenced whenever there is an appreciable lithological change within the sand and gravel, or at every 1 m depth. The samples, each weighing between 25 and 45 kg, are despatched in heavy duty polythene bags to a laboratory for grading. The grading procedure is based on British Standard 1377 (1967). Random checks on the accuracy of the grading are made in the Institute's laboratories.

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

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

APPENDIX B

STATISTICAL PROCEDURE

Statistical assessment

1 A statistical assessment is made of an area of mineral greater than 2 km^2, if there is a minimum of five evenly spaced boreholes in the resource block (for smaller areas see paragraph 12 below).

2 The simple methods used in the calculations are consistent with the amount of data provided by the survey. Conventional symmetrical confidence limits are calculated for the 95 per cent probability level, that is, there is a 5 per cent or one in twenty chance of a result falling outside the stated limits.

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

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

4 The above relationship may be transposed such that

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

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

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

5 Given that the number of approximately evenly spaced sample points in the sampled area is n with mineral thickness measurements $l_{m_1}, l_{m_2}, \ldots, l_{m_n}$, then the best estimate of mean thickness, $\bar{l}_m$, is given by

$$\Sigma(l_{m_1} + l_{m_2} \ldots l_{m_n})/n \quad .$$

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

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

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

6 The sampled area in each resource block is coloured pink on the map. Wherever possible, calculations relate to the mineral within mapped geological boundaries (which may not necessarily correspond to the limits of deposit). Where the area is not defined by a mapped boundary, that is, where the boundary is inferred, a distinctive symbol is used. Experience suggests that the errors in determining area are small relative to those in thickness. The relationship $S_A/S_{\bar{l}_m} \leqslant \frac{1}{3}$ is assumed in all cases. It follows from equation [2] that

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

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

Block calculation 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 l_o	Overburden wl_o	Mineral l_m	Mineral wl_m	Remarks
SE 14	1	1.5	1.5	9.4	9.4	IMAU boreholes
SE 18	1	3.3	3.3	5.8	5.8	
SE 20	1	nil	–	6.9	6.9	
SE 22	1	0.7	0.7	6.4	6.4	
SE 23	1	6.2	6.2	4.1	4.1	
SE 24	1	4.3	4.3	6.4	6.4	
SE 17	½	1.2	1.6	9.8	7.2	Hydrogeology Unit record
123/45	½	2.0		4.6		
1	¼	2.7	2.6	7.3	5.8	Close group of four boreholes (commercial)
2	¼	4.5		3.2		
3	¼	0.4		6.8		
4	¼	2.8		5.9		
Totals	$\Sigma w = 8$	$\Sigma wl_o = 20.2$		$\Sigma wl_m = 52.0$		
Means		$\overline{wl_o} = 2.5$		$\overline{wl_m} = 6.5$		

Calculation of confidence limits

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

$\Sigma(wl_m - \overline{wl_m})^2 = 15.82$
$n = 8$
t = 2.365

L_V is calculated as

$t/w\bar{L}_m$:

$1.05\,(t/\overline{wl_m})\sqrt{[\Sigma(wl_m - \overline{wl_m})^2/n(n-1)]} \times 100$
$= 1.05 \times (2.365/6.5)\sqrt{[15.82/(8 \times 7)]} \times 100$
$= 20.3$
$\simeq 20$ per cent

Figure 12 Example of resource block assessment: calculation and results.

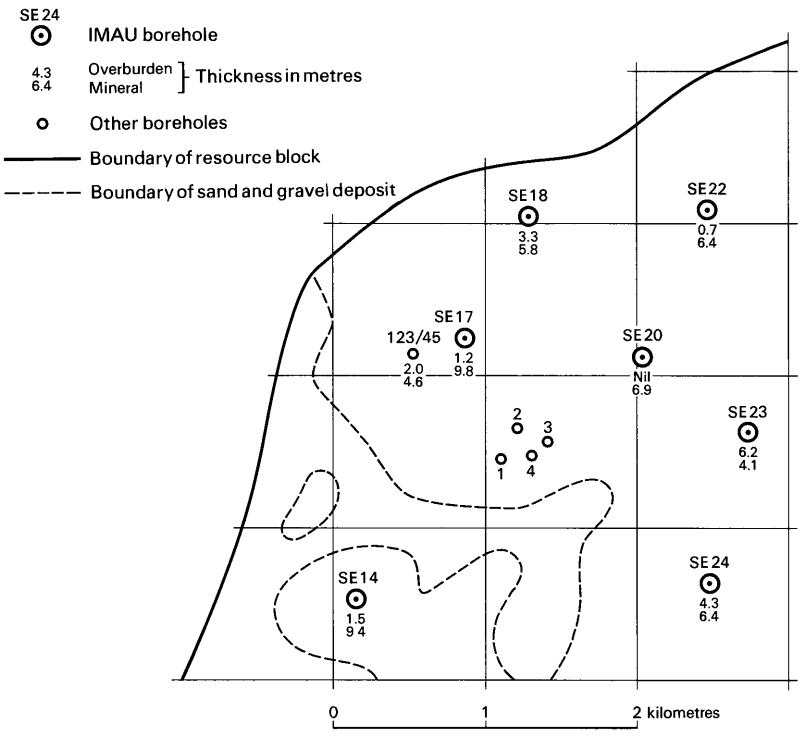


Figure 13 Example of resource block assessment: map of a fictitious block.

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

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

(from Table 12, Biometrika Tables for Statisticians, 1962). When n is greater than 20, 1.96 is used (the value of t when n is infinity).

9 In calculating confidence limits for volume, L_V, the following inequality corresponding to equation [3] is applied: $L_{\bar{l}_m} \leqslant L_V \leqslant 1.05\, L_{\bar{l}_m}$.

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

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

and when n is greater than 20, as

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

(weighting factors may be included: see paragraph 15).

11 The application of this procedure to a fictitious area is illustrated in Figures 12 and 13.

Inferred assessment

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

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

14 No assessment is attempted for an isolated area of mineral less than 0.25 km^2.

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

APPENDIX C

CLASSIFICATION AND DESCRIPTION OF SAND AND GRAVEL

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

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

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

The term 'clay' (as written, with single quote marks) is used to describe all material passing $\frac{1}{16}$ 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 Figure 14). The procedure is as follows:

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

For example, a deposit grading 11 per cent gravel, 70 per cent sand and 19 per cent fines is classified as 'clayey' pebbly sand. This short description is included in the borehole log (see Note 9, Appendix D).

Many differing proposals exist for the classification of the grain size of sediments (Atterberg, 1905; Udden, 1914; Wentworth, 1922; Wentworth, 1935; Allen, 1936; Twenhofel, 1937; Lane and others, 1947). As Archer (1970a, b) has emphasised, there is a pressing need for a simple metric scale acceptable to both scientific and engineering interests, for which the class limit sizes correspond closely with certain marked changes in the natural properties of mineral particles. For example, there is an important change in the degree of cohesion between particles at about the $\frac{1}{16}$-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 (Table 10), which is used in this Report.

The fairly wide intervals in the scale are consistent with the general level of accuracy of the qualitative assessments of the resource blocks. Three sizes of sand are recognised, fine ($+\frac{1}{16} - \frac{1}{4}$ 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

Standard 1377: 1967). In this report the grading is tabulated on the borehole record sheets (Appendix F), the intercepts corresponding with the simple geometric scale $\frac{1}{16}$ mm, $\frac{1}{4}$ mm, 1 mm, 4 mm, 16 mm and so on as required. Original sample grading curves are available for reference at the appropriate office of the Institute.

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

The relative proportions of the rock types present in the gravel fraction are indicated by the use of the words 'and' or 'with'. For example, 'flint and quartz' indicates very approximate equal proportions with neither constituent accounting for less than about 25 per cent of the whole; 'flint with quartz' indicates that flint is dominant and quartz, the principal accessory rock 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: no original faces, edges or corners left. The entire surface consists of broad curves; flat areas are absent. The original shape is suggested by the present form of the grain.

Table 10 Classification of gravel, sand and fines

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

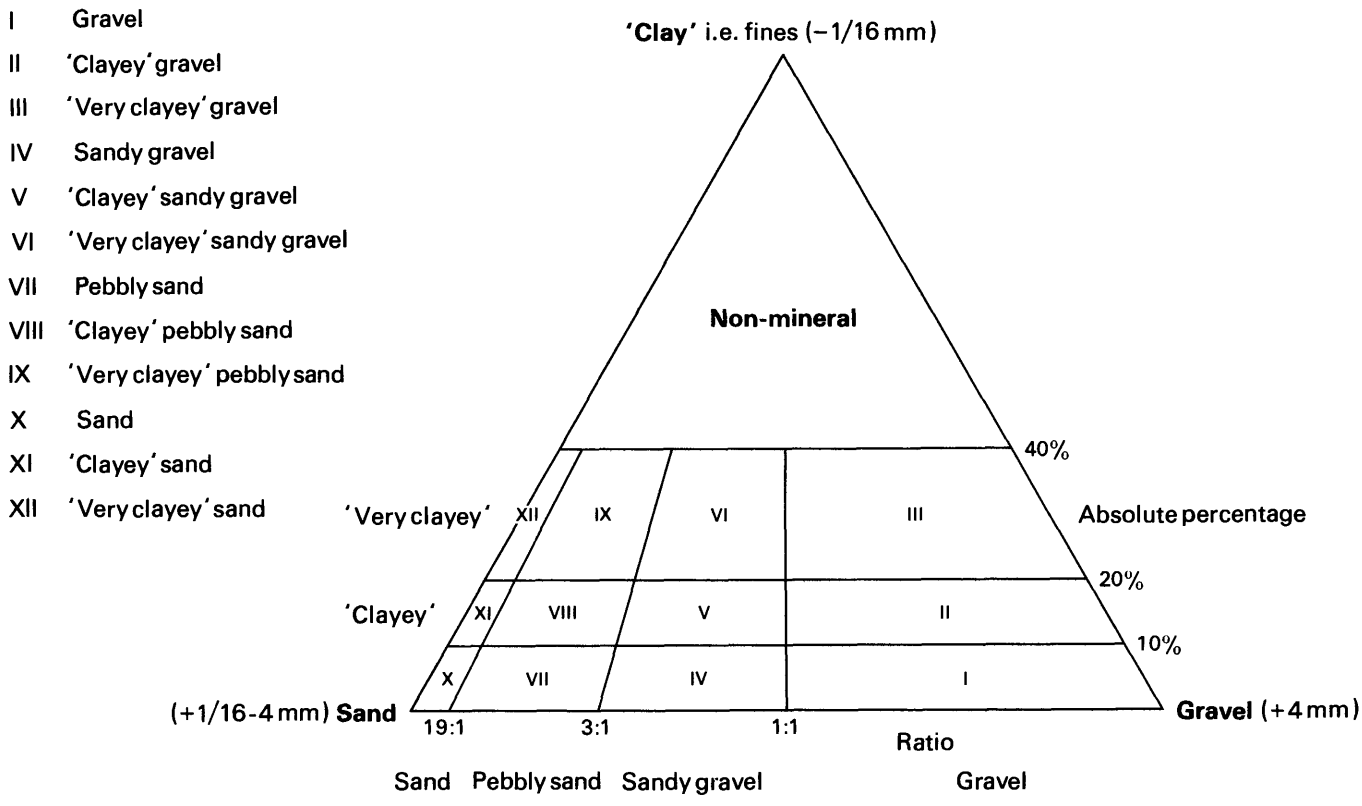


Figure 14 Diagram showing the descriptive categories used in the classification of sand and gravel.

APPENDIX D

EXPLANATION OF THE BOREHOLE RECORDS

Annotated example

SJ 52 SW 41[1] **5454 2011**[2] **Shawbury Heath, Shawbury**[3] **Block E**

Surface level +70.7 m[4]
Water struck at +68.2 m[5]
203 mm shell and auger[6]
July 1976

Overburden[7] 0.3 m
Mineral 2.2 m
Waste 6.7 m
Mineral 7.1 m
Bedrock 0.2 m+[8]

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand[9] and Gravel	**a** 'Clayey' pebbly sand Gravel: Fine, subrounded Sand: mainly medium	2.2	2.5
Glacial Lake Deposits	Clay, laminated, greyish brown	2.8	5.3
Till	Clay, reddish brown; scattered subangular sandstone pebbles	3.9	9.2
Glacial Sand and Gravel	**b** 'Clayey' pebbly sand Gravel: mainly fine, subangular to subrounded Sand: mainly medium	7.1	16.3
Bridgnorth Sandstone	Sandstone, reddish brown	0.2+	16.5

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*					
	Fines	Sand	Gravel[12]		Fines	Sand			Gravel	
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64[11]
a	15	79	6[10]	0.3–1.3	17	19	57	3	4	0
				1.3–2.5	13	10	59	10	7	1
				Mean	15	14	58	7	6	0
b	11	72	17	9.2–10.2	13	12	55	5	9	6
				10.2–12.2	16	12	65	4	2	1
				12.2–13.5	4	8	48	13	26	1
				13.5–14.5	5	7	81	3	2	2
				14.5–15.5	16	10	42	2	18	12
				15.5–16.3	9	6	48	3	14	20
				Mean	11	9	58	5	11	6
a+b	12	74	14	Mean	12	11	58	5	10	4

COMPOSITION[13]

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*								
		Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock	Flint and Chert	Others
a	0.3–1.3	16	54	3	trace	2	17	–	1	7
	1.3–2.5	14	46	10	–	4	16	3	–	7
b	10.2–12.2	6	52	12	–	7	14	trace	trace	9
	12,2–13.5	9	27	25	19	4	5	–	–	11
	14.5–15.5	9	31	35	13	9	3	–	–	–

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

1 Borehole registration number
Each Industrial Minerals Assessment Unit (IMUA) borehole is identified by a registration number. This consists of two statements.

1 The number of the 1 : 25 000 sheet on which the borehole lies, for example, SJ 52.

2 The quarter of the 1 : 25 000 sheet on which the borehole lies and its number in a series for that quarter, for example SW 41.

Thus, the full registration number is SJ 52 SW 41. Usually this is abbreviated to 52 SW 41 in the text.

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

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

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

5 Groundwater conditions
Four kinds of entry are made: the record indicates the level at which groundwater stood on completion of drilling (in metres above or below Ordnance Datum); or that water was encountered but its level not recorded; or that water was not encountered; or that no note of groundwater conditions was made.

6 Type of drill and date of drilling
Modified shell and auger rigs were used in this survey. The type of machine, the external diameter of the casing used, and the month and year of the completion of the borehole are stated.

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

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

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

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

11 Grading results
The limits are as follows: gravel, $+4$ mm; sand $-4+\frac{1}{16}$ mm; fines, $-\frac{1}{16}$ mm.

12 Mean grading
The grading of the full thickness of the mineral horizon identified in the log is the mean of the individual sample gradings weighted by the thicknesses represented, if these vary. The classification used is shown in Table 10. Fully representative sampling of sand and gravel is difficult to achieve particularly where groundwater levels are high. Comparison between boreholes and adjacent exposures suggests that in borehole samples the proportion of sand may be higher and the proportions of fines and coarse gravel ($+16$ mm) may be lower.

13 Composition
A selection of gravel samples was analysed. The categories recognised were:

Quartzite (and sandstone) Durable, recrystallised or granular in texture, varying in colour from buff to dark grey. This category includes quartzose rocks derived from Lower Palaeozic, Carboniferous and Bunter outcrops (recycled).

Igneous rock Two main components:

a Volcanic—Dark grey tuffs, miscellaneous lava types with some fine-grained basalts; probably mixed Lake District and north Wales material.

b Intrusive—dark grey intermediate to basic rocks, mainly dolerites, slightly porphyritic; and light-coloured, coarse-grained, porphyritic granites. The granitic rocks are probably derived from Scotland and the Lake District, but some of the others are possibly of Welsh origin.

Argillaceous rock Mudstones, siltstones and shales, all are mechanically weak and dark grey or green in colour. Most types are of Lower Palaeozoic aspect, probably derived from mid-Wales.

Quartz A durable but subordinate component, usually found in the fine gravel fraction.

Sandstone Medium-grained, poorly cemented, mostly Triassic sandstone.

Limestone Mostly Carboniferous, varying from pure, pale coloured to dark muddy limestones, commonly fossiliferous.

Pelitic rock Minor amounts of slate and phyllite, probably derived from the Lower Palaeozoic outcrop of mid-Wales.

Flint and Chert Durable trace components; the flint is Cretaceous.

Minerals Ironstone nodules, a trace component.

Others Trace amounts of coal and undifferentiated pebbles which were too small to be identified.

'Trace' means less than 0.5 per cent (0.5 and above, rounds up to 1).

APPENDIX E

LIST OF BOREHOLES USED IN THE ASSESSMENT OF RESOURCES

Borehole*	Grid reference
1 INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLES	
SJ 42 NW	
15	4076 2951
16	4091 2846
17	4111 2745
18	4072 2626
19	4047 2560
20	4138 2938
21	4152 2838
22	4185 2737
23	4180 2672
24	4228 2978
25	4231 2854
26	4296 2767
27	4301 2644
28	4252 2532
29	4346 2958
30	4395 2830
31	4351 2700
32	4415 2621
33	4403 2985
34	4467 2894
35	4464 2814
36	4494 2719
37	4467 2609
SJ 42 NE	
17	4535 2943
18	4536 2857
19	4586 2734
20	4589 2665
21	4641 2953
22	4642 2856
23	4654 2757
24	4709 2692
25	4701 2614
26	4724 2557
27	4621 2536
28	4735 2966
29	4738 2843
30	4774 2758
31	4857 2948
32	4823 2837
33	4860 2766
34	4861 2628
35	4765 2543
36	4974 2933
37	4962 2826
38	4980 2748
39	4970 2670
40	4924 2568
SJ 42 SW	
26	4097 2469
27	4101 2363
28	4067 2238
29	4137 2149
30	4075 2050
31	4216 2458
32	4162 2379
33	4191 2216
34	4150 2018
35	4323 2443
36	4280 2331
37	4228 2278
38	4272 2136
39	4262 2068
40	4389 2373
41	4359 2253
42	4331 2146
43	4471 2434
44	4492 2238
45	4471 2156
46	4417 2037
SJ 42 SE	
14	4571 2461
15	4577 2374
16	4524 2250
17	4550 2134
18	4563 2094
19	4659 2494
20	4648 2348
21	4634 2240
22	4662 2136
23	4659 2083
24	4785 2466
25	4741 2241
26	4771 2179
27	4765 2062
28	4844 2460
29	4927 2023
30	4512 2290
SJ 52 NW	
10	5076 2960
11	5060 2871
12	5034 2828
13	5057 2784
14	5028 2698
15	5032 2612
16	5174 2981
17	5162 2841
18	5162 2780
19	5246 2915
20	5218 2830
21	5222 2756
22	5348 2940
23	5368 2879
24	5350 2808
25	5356 2741
26	5452 2965
27	5464 2846
28	5444 2705
29	5396 2521
SJ 52 NE	
25	5529 2975
26	5533 2915
27	5570 2781
28	5536 2713
29	5551 2568
30	5512 2518
31	5603 2833
32	5654 2722
33	5625 2700
34	5609 2646
35	5615 2552
36	5658 2982
37	5730 2708
38	5681 2620
39	5781 2709
40	5767 2534
41	5888 2824
42	5866 2707
43	5824 2662
44	5855 2533
45	5920 2886
46	5950 2675
47	5923 2582
48	5914 2507
SJ 52 SW	
18	5012 2488
19	5049 2197
20	5034 2032
21	5088 2260
22	5140 2243
23	5178 2088
24	5092 2012
25	5168 2309
26	5222 2271
27	5238 2168
28	5288 2118
29	5236 2047
30	5297 2314
31	5359 2254
32	5342 2178
33	5346 2079
34	5392 2440
35	5414 2349
36	5402 2206
37	5423 2107
38	5447 2416
39	5452 2288
40	5467 2166
41	5454 2011
SJ 52 SE	
31	5519 2438
32	5558 2377
33	5578 2300
34	5563 2144
35	5519 2093
36	5540 2027
37	5633 2478
38	5652 2402
39	5613 2328
40	5667 2284
41	5648 2125
42	5698 2018
43	5770 2483
44	5755 2366
45	5715 2296
46	5758 2198

* Borehole number by sheet quadrant.

Borehole*	Grid reference
47	5734 2166
48	5782 2112
49	5755 2060
50	5866 2465
51	5851 2332
52	5845 2239
53	5860 2172
54	5837 2048
55	5982 2424
56	5936 2342
57	5948 2219
58	5992 2126
59	5951 2029

* Borehole number by sheet quadrant.

2 OTHER BOREHOLES

Many records, which are held in confidence, were made available by the industry for the purposes of this assessment.

APPENDIX F

INDUSTRIAL MINERALS ASSESSMENT UNIT BOREHOLE RECORDS

SJ 42 NW 15 4076 2951 Kenwick Park, Cockshutt **Block B**

Surface level + 112.9 m
Water level not recorded
203 mm shell and auger
May 1977

Waste 18.0 m +

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, reddish brown with blue-grey gleying; scattered subangular to rounded quartzite, sandstone and argillaceous pebbles	3.9	4.0
	Clay, sandy, grey; scattered angular to subangular limestone and igneous pebbles	4.0	8.0
Glacial Lake Deposits	Clay, laminated calcareous above 12.0 m, brown; scattered angular to subrounded quartzite and igneous pebbles. Sand lens with cobbles between 12.0 and 12.5 m	10.0+	18.0

SJ 42 NW 16 4091 2846 Whinnett Hill, Cockshutt **Block B**

Surface level + 91.9 m
Water struck at + 89.6 m
203 mm shell and auger
May 1977

Overburden 2.0 m
Mineral 5.0 m
Waste 3.0 m +

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, sandy, reddish brown; scattered subrounded to rounded quartzite pebbles	1.9	2.0
Glacial Sand and Gravel	'Very Clayey' gravel Gravel: fine and coarse with cobbles, angular to rounded Sand: Fine and medium, angular to rounded Clay lens between 2.0 and 3.0 m	5.0	7.0
Till	Clay, sand lenses, brown to grey between 8.1 and 9.0 m; scattered angular to subangular quartzite, sandstone and limestone clasts	3.0+	10.0
	Hole abandoned due to rock obstruction		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
20	36	44	2.0–3.0	16	14	15	9	13	33	0
			3.0–4.0	14	13	13	6	14	40	0
			4.0–5.5	24	15	11	8	15	14	13
			5.5–7.0	24	19	12	6	11	7	21
			Mean	20	16	13	7	13	21	10

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
2.0–3.0	2	11	18	53	9	7
5.5–7.0	trace	72	8	4	7	9

SJ 42 NW 17 4111 2745 Shade Oak, Cockshutt **Block B**

Surface level +78.1 m
Water struck at +72.1 m
203 mm shell and auger
May 1977

Overburden 6.0 m
Mineral 11.0 m
Waste 4.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sandy, silty below 3.0 m, calcareous, reddish brown to brown; scattered angular to rounded quartzite and igneous pebbles	5.8	6.0
Glacial Sand and Gravel	Sandy gravel, part sand and 'clayey' sand Gravel: fine and coarse, subangular to subrounded Sand: fine and medium Clay and silt lenses present	11.0	17.0
Till	Clay, calcareous, brown; scattered subangular to subrounded mainly quartzite and igneous pebbles	4.5+	21.5

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
10	67	23	6.0–7.0	2	6	7	17	38	30	0
			7.0–8.0	10	22	44	4	6	14	0
			8.0–9.3	5	9	14	16	35	21	0
			9.3–10.2	5	25	12	10	31	17	0
			10.2–11.2	8	25	22	9	17	19	0
			11.2–12.3	6	50	43	1	0	0	0
			12.3–13.3	1	41	57	1	0	0	0
			13.3–14.0	20	67	11	1	1	0	0
			14.0–15.5	20	26	48	2	3	1	0
			15.5–17.0	18	64	16	1	0	1	0
			Mean	10	33	28	6	13	10	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
6.0–7.0	1	17	5	7	52	17	1
12.3–13.3	–	–	–	22	45	33	–
14.0–15.5	–	26	3	4	51	16	–

SJ 42 NW 18 4072 2626 Bromley, Hordley **Block B**

Surface level +82.5 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 0.3 m
Mineral 22.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, angular to subrounded Sand: mainly medium	22.2+	22.5
	Hole abandoned due to rising sand		

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
14	79	7	0.3–1.3	16	17	62	2	2	1	0
			1.3–3.5	17	45	37	1	0	0	0
			3.5–4.5	12	22	25	19	16	6	0
			4.5–5.5	5	2	16	36	25	16	0
			5.5–6.5	9	2	18	24	23	24	0
			6.5–7.5	19	2	55	8	7	9	0
			7.5–8.5	6	6	78	6	3	1	0
			8.5–9.5	23	10	49	9	8	1	0
			9.5–11.5	25	28	40	5	1	1	0
			11.5–13.5	26	58	11	5	0	0	0
			13.5–15.5	10	18	69	2	1	0	0
			15.5–17.5	3	34	57	6	0	0	0
			17.5–20.0	5	23	68	4	0	0	0
			20.0–22.5	15	18	59	5	3	0	0
			Mean	14	24	48	7	4	3	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Coal
3.5–4.5	trace	45	3	14	14	24	–
6.5–7.5	1	38	8	8	24	21	–
20.0–22.5	5	53	2	1	10	19	10

SJ 42 NW 19 4047 2560 Bromley Hall, Hordley **Block B**

Surface level +83.5 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 6.0 m
Mineral 2.0 m
Waste 5.5 m
Mineral 3.0 m
Waste 8.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, silty, more sandy at depth, brown	5.8	6.0
Glacial Sand and Gravel	**a** 'Clayey' sand, silt lenses, brown; fine	2.0	8.0
	Silt, sandy, brown	5.5	13.5
	b 'Very clayey' sand, silt lenses, brown, fine	3.0	16.5
	Silt, sandy, brown	8.5+	25.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	17	83	0	6.0–8.0	17	76	6	1	0	0	0
b	34	66	0	13.5–16.5	34	63	2	1	0	0	0
a+b	27	73	0	Mean	27	68	4	1	0	0	0

SJ 42 NW 20 4138 2938 Kenwick Park, Cockshutt **Block B**

Surface level +122.1 m
Water not encountered
203 mm shell and auger
May 1977

Waste 19.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, calcareous, reddish brown with blue-grey gleying in upper part; scattered subangular to rounded quartzite, sandstone and igneous pebbles	18.7+	19.0

SJ 42 NW 21 4152 2838 Ferney Hough, Cockshutt **Block B**

Surface level +91.9 m
Water level not recorded
203 mm shell and auger
May 1977

Waste 18.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, sandy, calcareous, grey-brown; scattered angular to subrounded quartzite, sandstone, limestone, igneous rock and argillaceous clasts	18.4+	18.5

SJ 42 NW 22 4185 2737 Wycherley Hall, Cockshutt **Block B**

Surface level +87.7 m
Water struck at +81.1 m
152 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.8	0.8
Till	Clay, sandy, calcareous, brown; scattered angular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	17.2+	18.0

SJ 42 NW 23 4180 2672 Nilgreen, Baschurch **Block B**

Surface level +81.1 m
Water level not recorded
152 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.9	0.9
Till	Clay, sandy, calcareous, brown: scattered angular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	17.1+	18.0

SJ 42 NW 24 4228 2978 Cockshutt **Block C**

Surface level +109.5 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 0.5 m
Mineral 5.0 m
Waste 1.5 m
Mineral 9.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground and soil	0.5	0.5
Glacial Sand and Gravel	**a** 'Clayey' pebbly sand Gravel: mainly fine, angular to subrounded Sand: mainly fine	5.0	5.5
	Clay, sand lenses, reddish brown; scattered angular to rounded mainly sandstone pebbles	1.5	7.0
	b Sand, reddish brown; mainly fine	9.0+	16.0
	Hole abandoned due to rising sand		

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
a	13	78	9	0.5–1.5	21	32	14	10	16	7	0
				1.5–2.5	23	41	16	6	10	4	0
				2.5–4.0	4	79	14	1	1	1	0
				4.0–5.5	11	58	28	2	1	0	0
				Mean	13	56	18	4	6	3	0
b	5	95	0	7.0–11.0	12	56	31	1	0	0	0
				11.0–16.0	0	53	46	1	0	0	0
				Mean	5	54	40	1	0	0	0
a+b	8	89	3	Mean	8	55	32	2	2	1	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
		Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
a	0.5–1.5	2	36	1	36	25
	4.0–5.5	7	34	2	30	27

SJ 42 NW 25 4231 2854 Kenwick Lodge, Cockshutt **Block B**

Surface level +112.8 m
Water not encountered
203 mm shell and auger
May 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.8	0.8
Till	Clay, silty, bluish grey; scattered subrounded sandstone pebbles	1.7	2.5
	Clay, calcareous, brown; scattered angular to rounded mainly quartzite and sandstone pebbles	15.5+	18.0

SJ 42 NW 26 4296 2767 Stanwardine-in-the-Wood, Baschurch **Block B**

Surface level +107.1 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 0.2 m
Mineral 4.3 m
Waste 15.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	Gravel Gravel: mainly coarse, angular to rounded Sand: mainly medium	4.3	4.5
Till	Clay, calcareous, brown; scattered angular to subrounded quartzite and sandstone pebbles	15.5+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
6	47	47	0.2–1.2	9	17	50	7	10	7	0
			1.2–2.2	8	6	14	17	26	29	0
			2.2–3.2	4	7	15	19	18	37	0
			3.2–4.5	3	5	15	18	9	50	0
			Mean	6	9	23	15	15	32	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
0.2–1.2	1	43	9	–	44	3
3.2–4.5	–	3	1	90	4	2

SJ 42 NW 27 4301 2644 Westoncommon, Baschurch **Block B**

Surface level +106.6 m
Water level not recorded
152 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.8	0.8
Till	Clay, brown with blue-grey gleying to 4.2 m; scattered subrounded mainly quartzite and argillaceous pebbles	17.2+	18.0

SJ 42 NW 28 4252 2532 Claypit Hall, Baschurch **Block B**

Surface level +96.3 m
Water not encountered
203 mm shell and auger
June 1977

Waste 18.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, calcareous, reddish brown; scattered angular to rounded mainly sandstone and igneous clasts	18.3+	18.5

SJ 42 NW 29 4346 2958 Cockshutt **Block C**

Surface level +94.1 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 0.1 m
Mineral 10.9 m
Waste 10.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Glacial Sand and Gravel	'Clayey' sand, part 'clayey' pebbly sand Gravel: fine and coarse, subangular to subrounded Sand: fine, subangular to subrounded	10.9	11.0
Till	Clay, sandy to 14.0 m, calcareous, brown; scattered angular to rounded quartzite, sandstone and igneous pebbles	10.5+	21.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
16	82	2	0.1–1.1	11	38	26	10	6	9	0
			1.1–2.1	15	68	12	3	2	0	0
			2.1–3.1	16	79	3	1	0	1	0
			3.1–5.1	13	85	1	1	0	0	0
			5.1–7.6	24	74	1	1	0	0	0
			7.6–10.1	10	78	11	1	0	0	0
			10.1–11.0	31	58	10	1	0	0	0
			Mean	16	72	8	2	1	1	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.1–1.1	2	67	11	6	14

SJ 42 NW 30 4395 2830 Cockshutt **Block C**

Surface level +91.0 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 1.5 m
Mineral 5.0 m
Waste 14.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	Clay, sandy, reddish brown	1.3	1.5
	Gravel Gravel: fine and coarse, angular to subrounded Sand: mainly medium, subangular to subrounded	5.0	6.5
Glacial Lake Deposits	Clay, laminated, calcareous, brown; scattered angular to subrounded quartzite and sandstone pebbles	14.5+	21.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
2	37	61	1.5–2.5	3	8	19	9	22	39	0
			2.5–3.5	0	1	3	5	22	69	0
			3.5–4.5	3	5	15	10	32	35	0
			4.5–5.5	2	4	35	15	23	21	0
			5.5–6.5	3	5	39	13	20	20	0
			Mean	2	5	22	10	24	37	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.5–2.5	2	39	7	–	26	24	2
5.5–6.5	trace	25	22	12	31	10	–

SJ 42 NW 31 4351 2700 Petton Grange, Petton **Block B**

Surface level +113.7 m
Water level not recorded
203 mm shell and auger
July 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, greyish brown	17.7+	18.0

SJ 42 NW 32 4415 2621 Petton Park, Petton **Block B**

Surface level +110.4 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 0.2 m
Mineral 2.0 m
Waste 1.8 m
Mineral 2.0 m
Waste 15.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	**a** 'Very clayey' sandy gravel Gravel: fine and coarse, subangular to subrounded Sand: fine and medium, angular to subrounded	2.0	2.2
	Clay, reddish brown; scattered subrounded quartzite and sandstone pebbles	1.8	4.0
	b 'Clayey' gravel Gravel: fine and coarse, angular to subrounded Sand: medium, angular to subrounded	2.0	6.0
Till	Clay, sandy, calcareous below 6.6 m, reddish brown; scattered angular to rounded mainly quartzite pebbles	15.0+	21.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	25	48	27	0.2–1.2	26	21	21	8	13	11	0
				1.2–2.2	23	25	18	4	13	17	0
				Mean	25	23	19	6	13	14	0
b	11	40	49	4.0–5.0	21	7	50	13	9	0	0
				5.0–6.0	1	1	8	1	38	51	0
				Mean	11	4	29	7	23	26	0
a+b	18	44	38	Mean	18	14	24	6	18	20	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	0.2–1.2	5	33	8	–	24	30
b	5.0–6.0	2	24	5	20	13	36

SJ 42 NW 33 4403 2985 Crosemere, Cockshutt Block C

Surface level +90.6 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 4.6 m
Mineral 3.5 m
Waste 6.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Alluvium	Clay, sandy, brown; scattered subangular to subrounded mainly quartzite and sandstone pebbles	4.4	4.6
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium, angular to subrounded	3.5	8.1
Till	Clay, reddish brown becoming brown below 12.6 m; scattered angular to subrounded quartzite, sandstone and igneous clasts. Gravel lenses present between 12.0 and 12.6 m and 13.5 and 14.5 m	6.9+	15.0
	Hole abandoned due to rock obstruction		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
6	55	39	4.5–5.6	8	6	27	19	25	15	0
			5.6–6.6	5	12	29	13	22	19	0
			6.6–7.6	3	12	21	12	20	32	0
			7.6–8.1	6	27	58	3	4	2	0
			Mean	6	12	30	13	20	19	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
4.6–5.6	4	27	20	12	10	26	1
6.6–7.6	3	37	3	7	17	32	1

SJ 42 NW 34 **4467 2894** **East of Cockshutt** **Block C**

Surface level +92.1 m
Water level not recorded
203 mm shell and auger
August 1977

Overburden 0.2 m
Mineral 5.2 m
Waste 6.3 m
Mineral 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	**a** Gravel Gravel: fine and coarse, angular to rounded Sand: fine and medium, subangular to rounded	5.2	5.4
	Silt, brown	6.3	11.7
	b Sandy gravel Gravel: fine, angular to subangular Sand: medium and coarse, angular to subangular Clay lenses present	2.8+	14.5
	Hole abandoned due to rising sand		

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	8	46	46	0.2–1.2	15	24	17	7	19	18	0
				1.2–2.2	12	31	23	6	12	16	0
				2.2–3.2	7	13	29	9	26	16	0
				3.2–4.2	4	14	9	10	32	31	0
				4.2–5.4	4	10	17	11	38	20	0
				Mean	8	18	19	9	26	20	0
b	5	67	28	11.7–14.5	5	14	28	25	23	5	0
a+b	7	53	40	Mean	7	17	22	14	25	15	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Others
a	0.2–1.2	1	37	6	–	36	16	4
b	11.7–14.5	4	27	1	3	54	11	–

SJ 42 NW 35 4464 2814 Wackley Lodge, Cockshutt Block C

Surface level +88.0 m
Water level not recorded
203 mm shell and auger
July 1977

Overburden 5.5 m
Mineral 9.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, brownish black	1.5	1.5
Alluvium	Clay, peaty, sulphurous, greenish grey to yellow-brown	4.0	5.5
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse with cobbles, angular to rounded Sand: mainly medium, angular to rounded	9.5+	15.0
	Hole abandoned due to rising sand		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
3	56	41	5.5–6.5	5	21	36	11	24	3	0
			6.5–7.5	4	18	46	4	12	16	0
			7.5–8.5	1	11	38	11	12	16	11
			8.5–9.5	4	11	49	14	14	8	0
			9.5–10.5	6	9	18	8	22	37	0
			10.5–11.5	1	4	7	8	21	59	0
			11.5–12.5	0	11	37	15	19	18	0
			12.5–13.5	3	3	32	16	18	28	0
			13.5–15.0	3	9	41	12	23	12	0
			Mean	3	11	34	11	19	21	1

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
5.5–6.5	6	47	6	14	7	20
9.5–10.5	3	65	1	8	13	10
13.5–15.0	4	36	4	10	20	26

SJ 42 NW 36 4494 2719 Wackley, Petton **Block C**

Surface level +89.8 m
Water struck at +86.8 m
203 mm shell and Auger
August 1977

Overburden 0.5 m
Mineral 7.1 m
Waste 4.4 m
Mineral 6.0 m
Waste 6.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Glacial Sand and Gravel	**a** Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium, subangular to rounded	7.1	7.6
Till	Clay, sandy, reddish brown to brown; scattered subangular to subrounded pebbles	4.4	12.0
Glacial Sand and Gravel	**b** Sandy gravel Gravel: fine and coarse, angular to rounded Sand: fine and medium, angular to rounded Silt and clay lenses present	6.0	18.0
Till	Clay, silty, grey	3.2	21.2
	Clay, brown	2.8+	24.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	7	56	37	0.5–1.5	4	9	25	11	29	22	0
				1.5–2.5	4	16	41	6	15	18	0
				2.5–3.5	17	45	22	3	9	4	0
				3.5–4.5	5	18	52	5	11	9	0
				4.5–5.5	10	9	30	7	16	28	0
				5.5–6.5	3	7	30	10	22	28	0
				6.5–7.6	3	3	26	18	25	25	0
				Mean	7	15	32	9	18	19	0
b	7	59	34	12.0–13.0	1	8	11	27	31	32	0
				13.0–14.0	6	12	17	12	20	33	0
				14.0–15.0	7	6	38	21	20	8	0
				15.0–15.8 15.8–16.9	No grading data available for these samples						
				16.9–18.0	13	60	24	2	1	0	0
				Mean	7	22	22	15	17	17	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	3.5–4.5	3	45	2	–	43	7
b	12.0–13.0	3	38	1	7	26	25
	14.0–15.0	4	23	11	4	22	36
	16.9–18.0	–	32	2	10	18	38

SJ 42 NW 37 **4467 2609** **Pickhill, Petton** **Block B**

Surface level +95.3 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 2.2 m
Mineral 8.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Till	Clay, sandy, reddish brown; scattered angular to subrounded quartzite, sandstone and igneous pebbles	1.7	2.2
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly coarse	8.8+	11.0
	Hole abandoned—no penetration through coarse gravel		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
5	31	64	2.2–3.2	19	71	5	1	3	1	0
			3.2–4.2	2	1	7	22	23	45	0
			4.2–5.2	2	2	10	13	39	34	0
			5.2–6.2	7	2	11	19	44	17	0
			6.2–7.2	2	1	5	22	36	34	0
			7.2–8.2	6	0	4	24	35	31	0
			8.2–9.3	2	1	8	14	46	29	0
			9.3–11.0	1	3	12	6	23	55	0
			Mean	5	9	8	14	31	33	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*							
	Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock	Others
3.2–4.2	10	36	6	–	15	29	2	2
9.3–11.0	2	27	3	10	28	25	5	–

SJ 42 NE 17 4535 2943 English Frankton, Cockshutt **Block C**

Surface level +110.1 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 0.6 m
Mineral 10.0 m
Waste 1.4 m
Mineral 6.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Glacial Sand and Gravel	**a** 'Very clayey' sandy gravel Gravel: fine and coarse, angular to subrounded Sand: mainly fine Clay lenses present	10.0	10.6
	Clay, calcareous, brown; scattered angular to subrounded sandstone, quartzite and igneous pebbles	1.4	12.0
	b 'Clayey' sand with a few pebbles, reddish brown; fine and medium	6.0+	18.0
	Hole abandoned due to rising sand		

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	21	57	22	0.6–1.6	31	55	12	2	0	0	0
				1.6–2.6	27	55	17	1	0	0	0
				2.6–3.6	19	50	30	1	0	0	0
				3.6–4.5	35	45	19	1	0	0	0
				4.5–6.5	34	58	7	1	0	0	0
				6.5–7.6	30	63	6	1	0	0	0
				7.6–8.6	3	13	15	15	36	18	0
				8.6–9.6	2	5	6	12	46	29	0
				9.6–10.6	1	3	4	6	26	60	0
				Mean	21	41	12	4	11	11	0
b	11	87	2	12.0–13.0	7	53	35	3	2	0	0
				13.0–14.0	8	53	34	2	2	1	0
				14.0–15.0	30	41	21	1	4	3	0
				15.0–16.0	9	53	36	0	1	1	0
				16.0–17.0	4	43	52	1	0	0	0
				17.0–18.0	5	51	43	1	0	0	0
				Mean	11	49	37	1	1	1	0
a+b	18	68	14	Mean	18	44	21	3	7	7	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight +8 mm fraction*							
		Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock	Flint and Chert
a	7.6–8.6	6	54	6	–	18	15	1	trace
	8.6–9.6	4	53	3	–	21	19	–	–
	9.6–10.6	3	52	7	–	19	18	–	1
b	12.0–13.0	5	35	27	–	25	8	–	–
	15.0–16.0	2	31	–	1	38	28	–	–
	16.0–17.0	13	50	–	–	34	3	–	–

SJ 42 NE 18 4536 2857 The Wood, Loppington **Block C**

Surface level +101.1 m
Water level not recorded
203 mm shell and auger
February 1977

Overburden 0.2 m
Mineral 12.6 m
Waste 5.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	'Clayey' sand, reddish brown; fine, rare subrounded mainly quartzite and sandstone pebbles	12.6	12.8
Till	Clay, calcareous, brown; scattered angular to subrounded quartzite, sandstone and igneous pebbles	5.2+	18.0
	Hole abandoned—no penetration through stiff clay		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
13	86	1	0.2–1.2	15	73	12	0	0	0	0
			1.2–2.2	14	79	5	2	0	0	0
			2.2–3.2	11	37	52	0	0	0	0
			3.2–4.2	10	65	24	1	0	0	0
			4.2–5.2	10	75	14	1	0	0	0
			5.2–6.2	9	73	13	0	1	4	0
			6.2–7.2	12	74	13	1	0	0	0
			7.2–9.2	12	84	3	0	0	1	0
			9.2–11.0	11	86	3	0	0	0	0
			11.0–12.8	24	71	4	0	1	0	0
			Mean	13	74	12	0	0	1	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
5.2–9.2	–	89	–	9	–	2
11.0–12.8	6	6	63	8	4	13

SJ 42 NE 19 4586 2734 Burlton Grange, Loppington **Block C**

Surface level +87.3 m
Water level not recorded
203 mm shell and auger
February 1977

Overburden 0.4 m
Mineral 7.6 m
Waste 5.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, angular to subrounded Sand: mainly medium	7.6	8.0
Glacial Lake Deposits	Clay, laminated, calcareous, brown	2.0	10.0
Till	Clay, sandy, calcareous, reddish brown; scattered subrounded mainly quartzite and sandstone pebbles	3.5+	13.5
	Hole abandoned—no penetration through clay		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
11	69	20	0.4–1.4	14	8	19	6	16	37	0
			1.4–2.4	3	4	93	0	0	0	0
			2.4–3.4	9	32	51	0	3	5	0
			3.4–4.4	11	12	58	3	9	7	0
			4.4–5.4	16	9	71	1	1	2	0
			5.4–6.4	18	5	67	3	5	2	0
			6.4–8.0	7	4	21	26	28	14	0
			Mean	11	10	52	7	10	10	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
0.4–1.4	2	51	1	–	18	28
3.4–4.4	18	39	trace	–	20	23
6.4–8.0	11	35	1	5	21	27

SJ 42 NE 20 4589 2665 Brook House, Loppington **Block C**

Surface level +86.5 m
Water level not recorded
203 mm shell and auger
February 1977

Overburden 1.3 m
Mineral 10.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Till	Clay, sandy, reddish brown; scattered subrounded quartzite, sandstone and igneous pebbles	0.9	1.3
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, angular to subrounded Sand: mainly medium Igneous rock and limestone cobbles at base	10.2+	11.5
	Hole abandoned due to rising sand		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
11	55	34	1.3–2.3	8	5	38	3	14	32	0
			2.3–4.0	4	3	24	12	43	14	0
			4.0–5.5	9	8	56	2	9	16	0
			5.5–6.5	18	8	57	1	9	7	0
			6.5–7.5	15	32	52	0	1	0	0
			7.5–8.5	9	35	55	0	1	0	0
			8.5–9.5	33	18	34	2	5	8	0
			9.5–10.5	7	4	49	4	3	33	0
			10.5–11.5	0	1	1	1	34	63	0
			Mean	11	12	40	3	15	19	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous Rock	Igneous Rock	Flint and Chert
1.3–2.3	2	26	1	–	15	56	–
10.5–11.5	5	33	trace	12	10	39	1

SJ 42 NE 21 4641 2953 Brownheath, Loppington **Block D**

Surface level +97.3 m
Water not encountered
152 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silty to 2.0 m, grey	14.2	14.5
Glacial Lake Deposits	Clay, laminated, sand and silt partings, greyish brown	3.5+	18.0

SJ 42 NE 22 4642 2856 Woodgate, Loppington **Block C**

Surface level +85.8 m
Water level not recorded
203 mm shell and auger
February 1977

Overburden 0.4 m
Mineral 2.6 m
Waste 16.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, subangular to subrounded Sand: fine and medium, subangular to subrounded	2.6	3.0
Glacial Lake Deposits	Clay, laminated, calcareous, brown	16.5+	19.5

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
13	57	30	0.4–1.4	16	9	21	5	18	31	0
			1.4–2.4	13	27	35	5	11	9	0
			2.4–3.0	8	36	37	4	6	9	0
			Mean	13	22	30	5	13	17	0

COMPOSITION

Depth below surface (m)	*Percentage by weight +8 mm fraction*					
	Quartz	Quartzite	Sand-stone	Argillaceous rock	Igneous rock	Flint and Chert
0.4–1.4	13	37	1	20	29	trace
2.4–3.0	9	14	–	16	61	trace

SJ 42 NE 23 4654 2757 Moor House, Loppington **Block C**

Surface level +83.0 m
Water struck at +82.0 m
203 mm shell and auger
August 1977

Overburden 3.2 m
Mineral 4.6 m
Waste 5.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Peat	Peat, organic fragments, black becoming greyish	2.0	2.0
Alluvium	Clay, silty, black	1.2	3.2
Glacial Sand and Gravel	Pebbly sand Gravel: mainly coarse, subangular to rounded Sand: fine and medium, angular to subrounded	4.6	7.8
Till	Clay, sandy, brown; scattered subrounded sandstone pebbles Hole abandoned—no penetration through clay	5.2+	13.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
5	72	23	3.2–4.2	5	9	52	4	12	18	0
			4.2–5.2	2	6	26	9	20	37	0
			5.2–6.2	6	44	35	4	5	6	0
			6.2–7.2	5	67	26	1	1	0	0
			7.2–7.8	11	42	34	1	2	10	0
			Mean	5	33	35	4	8	15	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
3.2–4.2	2	17	1	40	12	28
7.2–7.8	4	54	trace	3	19	20

SJ 42 NE 24 4709 2692 North of Brandwood, Myddle **Block C**

Surface level +87.6 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 0.3 m
Mineral 9.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, angular to subrounded Sand: mainly fine and medium, angular to subrounded	9.2+	9.5
	Hole abandoned due to rising sand		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
8	56	36	0.3–1.3	13	13	30	10	13	21	0
			1.3–2.3	11	13	38	18	19	1	0
			2.3–3.3	10	40	29	3	10	8	0
			3.3–4.3	4	35	10	11	15	25	0
			4.3–5.3	1	17	43	13	13	13	0
			5.3–6.3	11	3	7	13	41	25	0
			6.3–7.3	3	31	28	5	17	16	0
			7.3–8.3	3	16	16	7	35	23	0
			8.3–9.5	12	9	29	19	18	13	0
			Mean	8	19	26	11	20	16	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sand-stone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.3	6	36	3	29	25	1
8.3–9.5	3	43	9	18	27	–

SJ 42 NE 25 4701 2614 Brandwood, Myddle **Block C**

Surface level + 83.6 m
Water struck at + 82.1 m
203 mm shell and auger
March 1977

Overburden 0.3 m
Mineral 9.1 m
Waste 12.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subrounded to rounded Sand: mainly medium Clay lenses towards base	9.1	9.4
Glacial Lake Deposits	Clay, laminated, calcareous, brown; scattered subrounded quartzite and sandstone pebbles	4.6	14.0
Till	Clay, sandy to 1.6 m, calcareous, reddish brown to brown; scattered subangular to subrounded quartzite, sandstone and igneous pebbles	8.0+	22.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
4	70	26	0.3–1.5	11	38	43	6	1	1	0
			1.5–2.5	4	20	51	7	9	9	0
			2.5–3.0	7	25	58	2	4	4	0
			3.0–4.0	2	8	26	11	25	28	0
			4.0–5.0	1	4	21	7	24	43	0
			5.0–5.6	2	10	30	4	17	37	0
			5.6–6.6	4	24	59	3	2	8	0
			6.6–7.6	5	42	50	2	1	0	0
			7.6–8.4	3	27	62	3	2	3	0
			8.4–9.4	4	12	30	7	34	13	0
			Mean	4	22	42	6	12	14	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
0.3–1.5	3	10	2	–	6	79
3.0–4.0	6	21	3	7	33	30
5.6–6.6	–	29	4	32	17	18
7.6–8.4	–	12	–	–	43	45

SJ 42 NE 26 4724 2557 Brandwood House, Myddle **Block**

Surface level +85.3 m
Water struck at +69.3 m
203 mm shell and auger
March 1977

Waste 19.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sandy, calcareous, reddish brown with bluish grey gleying in upper part; scattered angular to subrounded quartzite, sandstone and igneous pebbles	5.6	5.8
Glacial Lake Deposits	Clay, laminated, sandy, calcareous, greyish brown; scattered subrounded quartzite and sandstone pebbles	13.2+	19.0

SJ 42 NE 27 4621 2536 Burltonlane Farm, Mydd!e **Block B**

Surface level +84.4 m
Water not encountered
203 mm shell and auger
February 1977

Waste 18.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, calcareous, brown with bluish grey gleying; scattered subrounded sandstone pebbles	3.8	4.0
Glacial Lake Deposits	Clay, laminated, calcareous, brown becoming reddish brown below 10.0 m; scattered subangular to subrounded quartzite, sandstone and igneous pebbles	9.0	13.0
Till	Clay, brown	5.5+	18.5

SJ 42 NE 28 4735 2966 Loppington **Block D**

Surface level +83.3 m
Water level not recorded
203 mm shell and auger
March 1977

Overburden 1.6 m
Mineral 6.0 m
Waste 13.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Alluvium	Clay, sandy, mottled grey-green to reddish brown; scattered sandstone and igneous pebbles	1.6	1.6
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, angular to subrounded Sand: mainly medium	6.0	7.6
Till	Clay, sandy, calcareous, reddish brown; scattered subangular to subrounded quartzite, sandstone and igneous pebbles	4.2	11.8
Glacial Lake Deposits	Clay, laminated, calcareous, brown	9.2+	21.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
7	53	40	1.6–2.6	29	29	27	4	5	6	0
			2.6–3.6	1	4	4	4	26	61	0
			3.6–4.6	3	14	38	3	18	24	0
			4.6–5.6	4	10	43	7	19	17	0
			5.6–6.6	4	4	71	4	12	5	0
			6.6–7.6	3	7	36	8	31	15	0
			Mean	7	11	37	5	19	21	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
2.6–3.6	1	30	3	3	15	48
6.6–7.6	7	26	3	–	24	40

SJ 42 NE 29 4738 2843 The Shaws, Loppington **Block D**

Surface level +86.0 m
Water struck at +81.4 m
203 mm shell and auger
September 1977

Overburden 5.8 m
Mineral 2.2 m
Waste 13.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, reddish brown with bluish grey gleying below 2.0 m; scattered subrounded mainly quartzite and sandstone pebbles	5.7	5.8
Glacial Sand and Gravel	'Clayey' sand, reddish brown; fine and medium	2.2	8.0
Till	Clay, brown; scattered subangular to subrounded mainly sandstone pebbles	13.0+	21.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
14	86	0	5.8–6.8	14	33	53	0	0	0	0
			6.8–8.0	13	34	53	0	0	0	0
			Mean	14	33	53	0	0	0	0

SJ 42 NE 30 4774 2758 Noneley, Loppington **Block C**

Surface level +85.4 m
Water level not recorded
203 mm shell and auger
January 1977

Overburden 0.9 m
Mineral 7.5 m
Waste 13.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.9	0.9
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly medium, angular to rounded	7.5	8.4
Till	Clay, calcareous, brown; scattered subangular to rounded sandstone and quartzite pebbles	13.7+	22.1

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
7	64	29	0.9–1.9	13	15	50	9	7	6	0
			1.9–2.9	9	17	47	5	10	12	0
			2.9–3.9	3	2	19	24	21	31	0
			3.9–4.9	6	4	28	28	20	14	0
			4.9–5.9	7	13	42	7	18	13	0
			5.9–6.9	6	15	27	13	23	16	0
			6.9–7.9	6	41	23	11	10	9	0
			7.9–8.4	10	26	31	13	9	11	0
			Mean	7	16	34	14	15	14	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock
0.9–1.9	1	39	4	trace	34	22	–
3.9–4.9	4	41	3	12	17	22	1
7.9–8.4	2	18	9	2	6	63	–

SJ 42 NE 31 4857 2948 Horton Hall, Wem Rural **Block D**

Surface level +80.0 m
Water struck at +77.6 m
203 mm shell and auger
August 1977

Overburden 0.2 m
Mineral 2.8 m
Waste 17.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	'Very clayey' pebbly sand, part gravel Gravel: fine and coarse, subrounded to rounded Sand: mainly medium	2.8	3.0
Till	Clay, calcareous, brown to greyish brown; scattered subangular to subrounded quartzite and sandstone pebbles	6.0	9.0
Glacial Lake Deposits	Clay, laminated, calcareous, greyish brown	6.0	15.0
Till	Clay, calcareous, brown; scattered subangular to subrounded quartzite, sandstone and igneous pebbles	5.5+	20.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
23	70	7	0.2–1.3	27	20	43	6	3	1	0
			1.3–2.7	23	23	43	1	0	0	0
			2.7–3.0	7	8	34	4	12	35	0
			Mean	23	25	42	3	3	4	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
0.2–1.3	21	21	9	–	3	45	1
2.7–3.0	1	21	trace	19	21	38	–

SJ 42 NE 32 4823 2837 The Shays, Loppington **Block D**

Surface level +83.8 m
Water level not recorded
203 mm shell and auger
January 1977

Waste 18.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Sand, reddish brown; fine and medium	0.6	0.8
	Clay, sandy, calcareous, reddish brown with bluish grey gleying; scattered subrounded mainly quartzite and igneous pebbles	5.0	5.8
Glacial Lake Deposits	Clay, laminated, calcareous below 7.1 m, brown; sandy clay lens between 6.5–7.1 m	11.8	17.6
Till	Clay, sandy, calcareous, reddish brown; scattered angular to subrounded mainly quartzite, sandstone and igneous pebbles	1.0+	18.6

SJ 42 NE 33 4860 2766 Sleap Bridge, Loppington **Block C**

Surface level +82.9 m
Water struck at +78.4 m
203 mm shell and auger
January 1977

Overburden 0.2 m
Mineral 4.8 m
Waste 13.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, angular to rounded Sand: mainly medium, subrounded to rounded	4.8	5.0
Till	Clay, sandy and silty below 9.0 m, calcareous, brown; scattered subrounded mainly quartzite, sandstone and igneous pebbles	13.5+	18.5

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
8	62	30	0.2–1.4	11	30	52	2	2	3	0
			1.4–2.4	10	17	66	2	2	3	0
			2.4–3.4	4	8	27	25	25	11	0
			3.4–5.0	7	7	16	8	16	46	0
			Mean	8	15	38	9	11	19	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Flint and Chert
0.2–1.4	2	46	28	6	15	3
1.4–2.4	8	66	4	13	9	–
3.4–5.0	3	46	3	12	36	–

SJ 42 NE 34 4861 2628 Sleap Hall, Myddle **Block C**

Surface level +83.0 m
Water struck at +82.6 m
203 mm shell and auger
March 1977

Overburden 0.1 m
Mineral 3.1 m
Waste 16.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subrounded to rounded Sand: medium, subangular to subrounded	3.1	3.2
Till	Clay, sand lenses, calcareous, brown; scattered subangular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	1.1	4.3
Glacial Lake Deposits	Clay, laminated, sand lenses, calcareous, brown; scattered subrounded quartzite pebbles	13.5	17.8
Till	Clay, sand lenses, calcareous, reddish brown; scattered subangular to rounded quartzite and argillaceous pebbles	1.7+	19.5

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
9	62	29	0.1–1.1	14	13	57	5	7	4	0
			1.1–1.8	4	15	80	0	1	0	0
			1.8–3.2	8	4	18	15	27	28	0
			Mean	9	9	45	8	15	14	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock	Flint and Chert
0.1–1.1	4	35	1	30	30	–	–
1.8–3.2	4	38	1	23	24	trace	trace

SJ 42 NE 35 4765 2543 Houlston, Myddle

Surface level +82.0 m
Water level not recorded
203 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy below 1.7 m, calcareous, brown with blue-grey gleying	4.2	4.5
Glacial Lake Deposits	Clay, laminated, silty lenses, greyish brown	13.5+	18.0

SJ 42 NE 36 4974 2933 The Ditches, Wem Rural **Block D**

Surface level +94.6 m
Water level not recorded
203 mm shell and auger
August 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, sandy to 6.0 m, calcareous, brown with blue-grey gleying to 2.0 m; scattered subangular to rounded quartzite, sandstone and igneous pebbles	17.9+	18.0

SJ 42 NE 37 4962 2826 River Roden, Wem Rural **Block D**

Surface level +73.8 m
Water level not recorded
203 mm shell and auger
August 1977

Overburden 1.0 m
Mineral 1.2 m
Waste 16.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Alluvium	Clay, silty, mottled brown to bluish-grey	0.6	1.0
Glacial Sand and Gravel	Gravel Gravel: mainly coarse, subangular to rounded Sand: mainly coarse, subangular to rounded	1.2	2.2
Till	Clay, brown; scattered angular to subangular mainly sandstone pebbles	16.8+	19.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
4	36	60	1.0–2.2	4	3	11	22	22	38	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
1.0–2.2	6	33	19	10	11	21

SJ 42 NE 38 4980 2748 Ruewood, Loppington **Block D**

Surface level +78.8 m
Water level not recorded
203 mm shell and auger
September 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	Sand with a few pebbles, clay lenses; mainly medium and coarse	0.6	1.0
Till	Clay, grey; scattered subangular to rounded pebbles	17.0+	18.0

SJ 42 NE 39 4970 2670 Tilley Park, Wem Rural **Block D**

Surface level +82.7 m
Water not encountered
203 mm shell and auger
August 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, brown with blue-grey gleying to 2.0 m; scattered angular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	17.9+	18.0

SJ 42 NE 40 4924 2568 Bilmarsh, Myddle

Surface level +85.3 m
Water struck at +83.2 m
203 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, brown with bluish grey gleying	6.3	6.5
Glacial Lake Deposits	Clay, laminated, sandy lenses, calcareous, brown; scattered subrounded quartzite and igneous pebbles	8.3	14.8
Till	Clay, sandy, calcareous, reddish brown; scattered subangular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	3.2+	18.0

SJ 42 SW 26 4097 2469 Limpit Hill, Baschurch **Block A**

Surface level +80.5 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 0.2 m
Mineral 5.8 m
Waste 2.0 m
Mineral 6.0 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	**a** 'Very clayey' pebbly sand Gravel: mainly fine, angular to subrounded Sand: fine and medium, angular to subrounded	5.8	6.0
Till	Clay, sandy, brown	2.0	8.0
Glacial Sand and Gravel	**b** 'Clayey' pebbly sand Gravel: mainly fine, angular to subrounded Sand: mainly fine, angular to subrounded	6.0	14.0
Mercia Mudstone Group	Sandstone, reddish brown	0.3+	14.3

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	20	72	8	0.2–1.2	23	28	19	12	13	5	0
				1.2–2.2	27	22	24	16	8	3	0
				2.2–3.2	20	25	26	22	6	1	0
				3.2–4.2	35	25	26	7	6	1	0
				4.2–6.0	7	49	43	1	0	0	0
				Mean	20	32	30	10	6	2	0
b	16	75	9	8.0–11.0	15	52	29	2	2	0	0
				11.0–14.0	16	36	26	6	12	4	0
				Mean	16	44	27	4	7	2	0
a+b	18	74	8	Mean	18	38	29	7	6	2	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	0.2–1.2	–	15	7	–	66	12
b	11.0–14.0	trace	21	3	20	46	10

SJ 42 SW 27 4101 2363 Birch Park, Baschurch **Block A**

Surface level +108.4 m
Water level not recorded
203 mm shell and auger
July 1977

Overburden 3.0 m
Mineral 4.5 m
Waste 4.8 m
Mineral 4.2 m
Waste 3.5 m
Mineral 2.0 m
Waste 3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Till	Clay, sandy, yellowish brown; scattered subangular pebbles	2.5	3.0
Glacial Sand and Gravel	**a** 'Very clayey' sandy gravel Gravel: fine and coarse, angular to subrounded Sand: fine and medium, angular to subrounded	4.5	7.5
	Silt, sandy, brown	4.8	12.3
	b 'Very clayey' sand, yellowish brown; fine and medium	4.2	16.5
	Clay, silty, brown	3.5	20.0
	c 'Very clayey' sand; fine and medium	2.0	22.0
	Silt, sandy with clay lenses	3.0+	25.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}$–$\frac{1}{4}$	$+\frac{1}{4}$–1	+1–4	+4–16	+16–64	+64
a	20	50	30	3.0–4.0	31	29	34	2	2	2	0
				4.0–5.0	22	58	12	6	2	0	0
				5.0–6.0	12	8	9	12	20	39	0
				6.0–7.5	17	11	14	11	22	25	0
				Mean	20	25	17	8	13	17	0
b	29	71	0	12.3–13.5	23	31	46	0	0	0	0
				13.5–15.0	28	37	35	0	0	0	0
				15.0–16.5	35	31	34	0	0	0	0
				Mean	29	33	38	0	0	0	0
c	35	65	0	20.0–22.0	35	32	33	0	0	0	0
a–c	27	61	12	Mean	27	30	28	3	5	7	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
		Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
a	3.0–4.0	–	60	6	31	3
	6.0–7.5	trace	12	14	64	10

SJ 42 SW 28 4067 2238 Platmill, Baschurch **Block A**

Surface level +99.7 m
Water not encountered
203 mm shell and auger
May 1977

Overburden 0.3 m
Mineral 6.7 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, angular to subrounded Sand: mainly fine and medium	6.7	7.0
Mercia Mudstone Group	Sandstone, reddish brown	0.3+	7.3

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
20	48	32	0.3–1.3	15	19	30	10	13	13	0
			1.3–2.3	24	28	23	7	11	7	0
			2.3–3.3	22	29	14	15	12	8	0
			3.3–4.3	25	8	12	10	15	30	0
			4.3–5.6	21	20	19	4	18	18	0
			5.6–7.0	13	20	15	10	13	29	0
			Mean	20	20	19	9	14	18	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
0.3–1.3	2	14	3	1	77	3
5.6–7.0	trace	6	4	2	80	8

SJ 42 SW 29 4137 2149 Whitmore Lane, Baschurch **Block A**

Surface level +89.6 m
Water level not recorded
203 mm shell and auger
June 1977

Overburden 1.0 m
Mineral 7.0 m
Waste 13.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, brown	0.7	1.0
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium	7.0	8.0
Glacial Lake Deposits	Clay, laminated, silty, yellowish brown to grey; rare pebbles	13.0+	21.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
12	46	42	1.0–2.0	18	27	38	5	4	8	0
			2.0–3.0	24	8	19	18	15	16	0
			3.0–4.4	7	6	12	16	22	37	0
			4.4–6.0	10	14	24	14	19	19	0
			6.0–7.0	8	10	22	17	23	20	0
			7.0–8.0	5	3	15	11	32	34	0
			Mean	12	11	21	14	19	23	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Flint and Chert
2.0–3.0	3	21	12	trace	46	18	–
4.4–6.0	8	17	4	22	32	16	1
7.0–8.0	1	28	1	2	50	17	trace

SJ 42 SW 30 4075 2050 Foxholes, Little Ness **Block A**

Surface level +95.8 m
Water not encountered
203 mm shell and auger
June 1977

Overburden 1.6 m
Mineral 1.7 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, reddish brown; scattered angular sandstone, igneous rock and limestone clasts	1.3	1.6
Glacial Sand and Gravel	'Very clayey' pebbly sand Gravel: mainly fine Sand: fine and medium	1.7	3.3
Mercia Mudstone Group	Sandstone, reddish brown	0.2+	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
32	53	15	1.6–3.3	32	20	24	9	11	4	0

SJ 42 SW 31 4216 2458 Weston Villa, Baschurch **Block A**

Surface level +98.5 m
Water level not recorded
203 mm shell and auger
July 1977

Overburden 0.3 m
Mineral 3.2 m
Waste 16.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, angular to rounded Sand: medium and coarse, angular to rounded Clay lens 1.0–2.0 m	3.2	3.5
Till	Clay, calcareous, grey becoming brown below 11.0 m; scattered angular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	16.5+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
2	29	69	0.3–3.5	2	4	11	14	31	38	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
2.0–3.5	3	17	2	33	33	8	4

SJ 42 SW 32 4162 2379 **Stanwardine-in-the-Fields, Baschurch** **Block A**

Surface level +87.9 m
Water level not recorded
203 mm shell and auger
July 1977

Overburden 1.3 m
Mineral 11.7 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sandy, pebbly, greyish brown	1.1	1.3
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, angular to rounded Sand: fine and medium	11.7	13.0
Mercia Mudstone Group	Sandstone, red	1.0+	14.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
5	64	31	1.3–2.3	15	34	11	4	11	25	0
			2.3–3.3	16	5	10	10	20	39	0
			3.3–4.3	5	1	8	15	13	58	0
			4.3–5.3	2	3	12	18	29	36	0
			5.3–6.3	2	9	27	11	28	23	0
			6.3–7.3	2	12	39	14	23	10	0
			7.3–8.3	4	18	49	7	8	14	0
			8.3–9.3	2	50	40	2	4	2	0
			9.3–10.3	5	52	40	2	1	0	0
			10.3–11.3	4	67	27	1	1	0	0
			11.3–13.0	3	24	61	7	5	0	0
			Mean	5	25	31	8	13	18	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.3–2.3	1	11	2	–	53	12	21
8.3–9.3	13	20	4	1	41	21	–

SJ 42 SW 33 4191 2216 Baschurch **Block A**

Surface level +89.8 m
Water level not recorded
203 mm shell and auger
June 1977

Overburden 0.3 m
Mineral 7.2 m
Waste 1.0 m
Mineral 4.2 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	**a** Sandy gravel Gravel: fine and coarse, angular to rounded Sand: mainly medium	7.2	7.5
	Clay, silty, sandy, reddish brown	1.0	8.5
	b 'Clayey' sand, reddish brown; fine and medium	4.2	12.7
Mercia Mudstone Group	Sandstone, red	0.3+	13.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	9	48	43	0.3–1.3	27	16	41	5	9	2	0
				1.3–2.3	7	4	11	10	20	48	0
				2.3–3.3	2	2	12	16	41	27	0
				3.3–4.3	3	6	33	12	21	25	0
				4.3–5.3	4	0	11	22	24	39	0
				5.3–6.3	9	7	18	8	16	42	0
				6.3–7.5	8	53	36	2	1	0	0
				Mean	9	14	24	10	18	25	0
b	18	81	1	8.5–9.5	15	48	35	1	1	0	0
				9.5–10.5	13	46	39	1	1	0	0
				10.5–11.5	35	33	29	2	1	0	0
				11.5–12.7	11	65	23	1	0	0	0
				Mean	18	49	31	1	1	0	0
a+b	12	60	28	Mean	12	27	26	7	12	16	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Haematite
a	1.3–2.3	3	36	3	–	41	17	–
	4.3–5.3	2	15	6	11	52	13	1
	6.3–7.5	5	14	8	7	48	18	–
b	8.5–12.7	7	13	–	8	57	15	–

SJ 42 SW 34 4150 2018 Milford House, Little Ness **Block A**

Surface level +85.1 m
Water not encountered
203 mm shell and auger
September 1977

Overburden 0.3 m
Mineral 2.1 m
Waste 16.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Very clayey' sandy gravel Gravel: fine, subangular to rounded Sand: fine to coarse, subangular to rounded	2.1	2.4
Till	Clay, sandy, brown; scattered subangular to subrounded quartzite, sandstone and igneous pebbles	8.1	10.5
	Silt, sandy laminations, calcareous, yellowish brown to grey	4.7	15.2
	Clay, greyish brown; scattered subrounded to rounded limestone and igneous pebbles	3.3+	18.5

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
29	46	25	0.3–2.4	29	12	18	16	23	2	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.3–2.4	1	13	10	68	8

SJ 42 SW 35 4323 2443 Weston Lullingfields, Baschurch **Block B**

Surface level +88.3 m
Water struck at +83.2 m
203 mm shell and auger
March 1977

Waste 18.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.6	0.6
Till	Clay, sandy, calcareous, reddish brown with bluish grey gleying to 6.0 m; scattered angular to subrounded mainly quartzite, sandstone, igneous rock and argillaceous clasts 'Clayey' sandy gravel lens 6.0–6.6 m	11.4	12.0
Glacial Lake Deposits	Clay, laminated, calcareous, brown	2.0	14.0
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, angular to rounded, mainly quartzite, sandstone and igneous rock Sand: mainly medium, angular to rounded	2.2	16.2
Glacial Lake Deposits	Clay, laminated, calcareous, brown with bluish grey gleying	2.3+	18.5

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
14	60	26	14.0–15.0	6	8	33	6	19	27	0
			15.0–16.2	20	17	42	12	7	2	0
			Mean	14	13	38	9	12	14	0

SJ 42 SW 36 4280 2331 Mere House, Baschurch **Block A**

Surface level +81.6 m
Water level not recorded
203 mm shell and auger
June 1977

Overburden 2.0 m
Mineral 10.8 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Peat	Clay, brown becoming grey below 1.5 m	1.5	2.0
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium Clay lenses present towards base	10.8	12.8
Mercia Mudstone Group	Sandstone, reddish brown	0.1+	12.9

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
7	53	40	2.0–3.0	2	2	4	4	20	66	0
			3.0–4.0	2	2	16	18	22	40	0
			4.0–5.0	2	2	16	21	28	31	0
			5.0–6.0	2	7	20	11	21	39	0
			6.0–7.0	2	3	24	15	23	33	0
			7.0–8.0	1	3	15	16	32	33	0
			8.0–9.0	3	5	40	18	24	10	0
			9.0–10.0	4	9	83	3	1	0	0
			10.0–11.7	12	7	68	9	3	1	0
			11.7–12.8	37	45	18	1	0	1	0
			Mean	7	9	33	11	16	24	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
2.0–3.0	5	10	3	27	38	17
10.0–11.7	1	37	41	2	13	6

SJ 42 SW 37 4228 2278 The Mount, Baschurch Block A

Surface level +90.7 m
Water struck at +80.6 m
203 mm shell and auger
June 1977

Overburden 0.1 m
Mineral 12.4 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium, angular to rounded	12.4	12.5
Mercia Mudstone Group	Sandstone, reddish brown	0.5+	13.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
7	51	42	0.1–1.3	4	1	6	8	34	47	0
			1.3–2.3	3	3	11	20	30	33	0
			2.3–3.3	4	3	16	19	23	35	0
			3.3–4.5	3	4	21	11	28	33	0
			4.5–5.5	4	2	12	17	28	37	0
			5.5–6.5	3	2	9	12	25	49	0
			6.5–7.6	4	5	15	17	22	37	0
			7.6–8.7	14	28	35	11	7	5	0
			8.7–9.7	8	37	53	1	1	0	0
			9.7–10.7	18	45	36	1	0	0	0
			10.7–11.7	15	22	53	3	7	0	0
			11.7–12.5	12	46	41	1	0	0	0
			Mean	7	16	25	10	18	24	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
0.1–1.3	1	45	4	1	28	21
3.3–4.5	1	38	1	9	34	17
7.6–8.7	6	20	12	5	46	11
8.7–12.5	4	21	5	6	54	10

SJ 42 SW 38 4272 2136 Prescott, Baschurch **Block A**

Surface level +85.5 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 0.5 m
Mineral 3.2 m
Waste 16.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Glacial Sand and Gravel	'Clayey' gravel Gravel: fine and coarse, subangular to rounded Sand: medium and coarse, angular to rounded	3.2	3.7
Till	Clay, grey; scattered subangular to rounded quartzite and igneous pebbles	16.3+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
14	36	50	0.5–1.5	19	6	17	13	22	23	0
			1.5–2.5	15	5	14	13	24	29	0
			2.5–3.7	8	9	17	12	21	33	0
			Mean	14	7	16	13	22	28	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.5–1.5	2	42	2	42	12
2.5–3.7	1	40	2	33	24

SJ 42 SW 39 4262 2068 South of Prescott, Baschurch Block A

Surface level +82.5 m
Water struck at +77.9 m
203 mm shell and auger
May 1977

Overburden 1.0 m
Mineral 1.7 m
Waste 17.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	1.0	1.0
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to rounded Sand: medium and coarse, subangular to rounded	1.7	2.7
Till	Clay, silty, sand lenses, yellowish brown	4.3	7.0
	Clay, brown; scattered subangular to subrounded pebbles	3.0	10.0
	Clay, silty, grey	8.4	18.4
	Clay, grey; scattered subangular to subrounded pebbles	2.1+	20.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
4	33	63	1.0–2.7	4	2	12	19	36	27	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
1.0–2.7	1	11	25	54	9

SJ 42 SW 40 4389 2373 Martontan House, Myddle **Block A**

Surface level +89.2 m
Water level not recorded
203 mm shell and auger
July 1977

Overburden 1.4 m
Mineral 2.6 m
Waste 7.3 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Till	Clay, sandy, brown; scattered subangular to rounded pebbles	0.9	1.4
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to rounded Sand: medium and coarse	2.6	4.0
Glacial Lake Deposits	Clay, laminated, silty, sandy at base, grey to brown; gravel lens present at 8.8 m–9.8 m	7.3	11.3
Mercia Mudstone Group	Sandstone, red	0.2+	11.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
3	21	76	1.4–2.4	3	2	7	11	31	46	0
			2.4–3.4	3	1	8	10	29	49	0
			3.4–4.0	2	3	15	11	28	41	0
			Mean	3	2	9	10	30	46	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
1.4–2.4	18	30	6	–	33	13
3.4–4.0	2	23	3	5	37	30

SJ 42 SW 41 4359 2253 Eyton Villa, Baschurch **Block A**

Surface level +84.1 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 0.7 m
Mineral 4.2 m
Waste 15.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly medium	4.2	4.9
Till	Clay, silty below 18.5 m, greenish grey becoming reddish brown to grey at base; scattered subangular to subrounded quartzite, sandstone and igneous pebbles	15.1+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
9	44	47	0.7–1.7	11	8	30	11	20	20	0
			1.7–2.7	11	9	20	7	17	36	0
			2.7–3.7	11	6	31	9	23	20	0
			3.7–4.9	4	5	27	14	26	24	0
			Mean	9	7	27	10	22	25	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
0.7–1.7	1	21	6	–	46	24	2
3.7–4.9	6	21	9	5	48	10	1

SJ 42 SW 42 4331 2146 War Brook, Baschurch **Block B**

Surface level +82.2 m
Water not encountered
203 mm shell and auger
May 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, brown becoming grey with depth; scattered subangular to subrounded quartzite, sandstone, limestone and igneous pebbles	17.7+	18.0

SJ 42 SW 43 4471 2434 Marton Grange, Myddle **Block B**

Surface level +92.9 m
Water level not recorded
203 mm shell and auger
July 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sandy, brown; scattered subangular to rounded quartzite, sandstone and igneous pebbles	6.8	7.0
	Clay, brown	3.5	10.5
Glacial Lake Deposits	Clay, laminated, grey	7.5+	18.0

SJ 42 SW 44 4492 2238 Lower Fenemere Farm, Baschurch **Block A**

Surface level +79.8 m
Water struck at +77.8 m
203 mm shell and auger
May 1977

Overburden 0.3 m
Mineral 4.7 m
Waste 16.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: fine and medium Silt lenses present	4.7	5.0
Glacial Lake Deposits	Silt, laminated, grey; scattered gravel and clay lenses	16.0+	21.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
8	52	40	0.3–1.3	12	38	44	1	1	4	0
			1.3–2.5	10	8	13	6	26	37	0
			2.5–3.5	7	22	40	3	16	12	0
			3.5–4.5	5	17	21	8	17	32	0
			4.5–5.0	6	6	10	23	26	29	0
			Mean	8	19	26	7	17	23	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
1.3–2.5	2	30	6	–	41	21
4.5–5.0	1	36	4	18	29	12

SJ 42 SW 45 4471 2156 The Leasows, Baschurch **Block B**

Surface level +79.6 m
Water struck at +74.6 m
203 mm shell and auger
July 1977

Waste 15.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Lake Deposits	Clay, laminated, silty, gravel lenses, brown	10.1	10.4
Till	Clay, sandy, reddish brown; scattered subrounded to rounded clasts	5.1	15.5
Sherwood Sandstone Group	Sandstone, reddish brown	0.5+	16.0

SJ 42 SW 46 4417 2037 Walford Manor, Baschurch **Block B**

Surface level +87.5 m
Water level not recorded
203 mm shell and auger
May 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, yellowish grey to brown; scattered subangular mainly quartzite pebbles	3.4	3.7
	Clay, sandy to 4.9 m, calcareous, brown; scattered subangular to subrounded quartzite, sandstone, limestone and igneous clasts	14.3+	18.0

SJ 42 SE 14 4571 2461 Myddlewood Farm, Myddle **Block B**

Surface level +102.0 m
Water not encountered
203 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, calcareous, brown with bluish grey gleying; scattered subangular to subrounded mainly quartzite pebbles	4.3	4.5
Glacial Lake Deposits	Clay, laminated, calcareous, brown	13.5+	18.0

SJ 42 SE 15 4577 2374 Myddlewood, Myddle **Block B**

Surface level +97.3 m
Water level not recorded
203 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, silty below 8.0 m, calcareous, reddish brown with blue-grey gleying above 8.0 m; scattered angular to rounded quartzite and sandstone pebbles	9.9	10.1
Glacial Lake Deposits	Silt, laminated, calcareous, grey	7.9+	18.0

SJ 42 SE 16 4524 2250 Lower Fenemere Farm, Baschurch **Block A**

Surface level +80.6 m
Water level not recorded
203 mm shell and auger
May 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Till	Clay, sandy, mottled greenish grey to orange-brown; scattered angular to rounded quartzite, sandstone and igneous pebbles	1.0	1.4
Glacial Lake Deposits	Clay, laminated, silty, calcareous, grey	8.8	10.2
Till	Clay, grey; scattered subangular to subrounded sandstone and igneous pebbles	7.8+	18.0

SJ 42 SE 17 4550 2134 The Hayes, Baschurch **Block B**

Surface level +81.7 m
Water not encountered
203 mm shell and auger
May 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, brown becoming grey below 11.8 m; scattered subangular to subrounded sandstone and igneous pebbles	13.0	13.3
Glacial Lake Deposits	Clay, laminated, silt lenses, calcareous, brown	4.7+	18.0

SJ 42 SE 18 4563 2094 Oldwood Coppice, Pimhill **Block B**

Surface level +85.9 m
Water struck at +77.5 m
203 mm shell and auger
May 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Till	Clay, sandy, calcareous, brown; scattered subangular to rounded quartzite, sandstone and igneous pebbles	6.6	7.0
Glacial Lake Deposits	Clay, laminated, calcareous, reddish brown to grey; gravel lenses	11.0+	18.0

SJ 42 SE 19 4659 2494 Burltonlane Farm, Myddle **Block B**

Surface level +89.7 m
Water struck at +88.0 m
203 mm shell and auger
March 1977

Overburden 6.2 m
Mineral 5.3 m
Waste 10.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sand lenses, yellowish brown with blue-grey gleying, brown below 3.2 m; scattered rounded pebbles. "Clayey" sandy gravel lens 2.6–3.2 m	5.9	6.2
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, angular to rounded Sand: mainly medium and coarse, angular to rounded	5.3	11.5
Till	Clay, brown; gravel lens in upper 1.5 m	10.5+	22.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
7	34	59	6.2–7.2	2	7	10	11	32	38	0
			7.2–8.2	6	7	12	16	40	19	0
			8.2–9.2	7	9	11	9	33	31	0
			9.2–10.2	11	7	20	17	30	15	0
			10.2–11.5	9	7	12	18	38	16	0
			Mean	7	7	13	14	35	24	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
6.2–7.2	4	13	2	14	30	36	1
10.2–11.5	1	15	2	16	48	18	–

SJ 42 SE 20 4648 2348 The Grove, Myddle **Block B**

Surface level +104.3 m
Water level not recorded
203 mm shell and auger
March 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Lake Deposits	Clay, laminated, silt partings, brown	2.2	2.5
	Silt, clay partings, sandy, yellow-brown	12.0	14.5
	Clay, calcareous, brown with bluish-grey gleying; scattered rounded mainly quartzite pebbles	3.5+	18.0

SJ 42 SE 21 4634 2240 The Hollins, Myddle **Block B**

Surface level +88.9 m
Water not encountered
203 mm shell and auger
April 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sand lenses, silty between 12.0 and 14.0 m, calcareous, brown; scattered angular to rounded mainly quartzite pebbles	17.8+	18.0

SJ 42 SE 22 4662 2136 Praddoe Coppice, Pimhill **Block B**

Surface level +102.0 m
Water not encountered
203 mm shell and auger
April 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Lake Deposits	Clay, laminated, silty, calcareous, yellowish brown with bluish grey gleying to 3.5 m	12.5	12.7
	Silt, calcareous, yellowish brown	5.3+	18.0

SJ 42 SE 23 4659 2083 Merrington Green, Pimhill **Block B**

Surface level +115.6 m
Water struck at +100.6 m
203 mm shell and auger
April 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Lake Deposits	Silt, laminated, clay lenses, yellowish brown	4.8	5.0
	Clay, laminated, sandy, calcareous, reddish brown; scattered subangular to subrounded quartzite, sandstone and limestone pebbles	1.3	6.3
	Silt, laminated, calcareous, yellowish brown	6.9	13.2
	Clay, laminated, sandy, calcareous, reddish brown; scattered angular to subrounded mainly quartzite and sandstone pebbles	1.6	14.8
	Silt, laminated, calcareous, grey	3.2+	18.0

SJ 42 SE 24 4785 2466 Houlston Farm, Myddle

Surface level +84.4 m
Water struck at +70.2 m
203 mm shell and auger
March 1977

Waste 14.3 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, reddish brown with bluish grey gleying below 1.0 m	4.2	4.5
Glacial Lake Deposits	Clay, laminated, sand lenses, calcareous, brown; scattered rounded sandstone pebbles	7.7	12.2
	Silt, laminated, sandy, clay partings, calcareous, reddish brown; scattered subangular to rounded quartzite and sandstone pebbles	2.1	14.3
Mercia Mudstone Group	Mudstone, sandy, reddish brown	0.2+	14.5

SJ 42 SE 25 4741 2241 Webscott Farm, Myddle **Block B**

Surface level +93.8 m
Water level not recorded
203 mm shell and auger
April 1977

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, calcareous, reddish brown with bluish grey gleying; scattered subangular to rounded quartzite, sandstone and igneous pebbles	3.2	3.5
Glacial Lake Deposits	Clay, laminated, calcareous, brown	14.5+	18.0

SJ 42 SE 26 4771 2179 Merrington Lane Farm, Pimhill **Block B**

Surface level +94.4 m
Water struck at +91.8 m
203 mm shell and auger
April 1977

Overburden 1.3 m
Mineral 3.6 m
Waste 15.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Till	Clay, sandy, yellowish brown; scattered angular to subrounded quartzite, sandstone and argillaceous pebbles	0.9	1.3
Glacial Sand and Gravel	Gravel Gravel: mainly coarse, angular to rounded Sand: fine to coarse, subangular to subrounded Silt and clay lenses present	3.6	4.9
Glacial Lake Deposits	Silt, laminated, sand lenses, calcareous, reddish brown to grey	9.1	14.0
	Clay, laminated, calcareous, grey	6.0+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
9	43	48	1.3–2.3	9	7	10	11	24	39	0
			2.3–3.4	7	6	10	10	23	44	0
			3.4–4.9	11	25	27	14	13	10	0
			Mean	9	14	17	12	19	29	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
1.3–2.3	6	30	9	46	9
2.3–3.4	19	14	4	55	8

SJ 42 SE 27 4765 2062 Merrington, Pimhill **Block B**

Surface level +111.6 m
Water not encountered
203 mm shell and auger
April 1977

Overburden 1.5 m
Mineral 1.3 m
Waste 4.4 m
Mineral 6.2 m
Waste 4.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Till	Clay, sandy, mottled yellowish brown to grey	1.0	1.5
Glacial Sand and Gravel	**a** 'Very clayey' pebbly sand Gravel: mainly coarse, subangular to subrounded Sand: mainly fine, subangular to subrounded Clay lenses present	1.3	2.8
	Silt, sand lenses, yellowish brown	4.4	7.2
	b Gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium and coarse, angular to subrounded Clay lenses present	6.2	13.4
Till	Clay, sandy, calcareous, reddish brown; scattered subangular to rounded quartzite, sandstone and igneous pebbles	4.1+	17.5
	Hole abandoned—no progress through clay		

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
a	23	60	17	1.5–2.8	23	46	13	1	3	14	0
b	6	36	58	7.2–8.2	8	5	12	10	21	44	0
				8.2–9.2	4	6	18	15	27	30	0
				9.2–10.2	5	6	16	16	26	31	0
				10.2–11.2	6	6	11	13	29	35	0
				11.2–12.0	6	5	10	21	33	25	0
				12.0–12.7	10	20	13	19	29	9	0
				12.7–13.4	3	6	12	15	33	31	0
				Mean	6	8	13	15	28	30	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	1.5–2.8	1	1	28	–	68	2
b	7.2–8.2	5	23	4	7	37	24
	12.7–13.4	1	17	4	4	53	21

SJ 42 SE 28 4844 2460 Witterage Green, Myddle

Surface level +86.7 m
Water struck at +84.5 m
203 mm shell and auger
March 1977

Waste 11.5 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	'Very clayey' sand, clay lenses; fine and medium	0.9	1.2
	Clay, sand lenses, reddish brown	0.6	1.8
Glacial Lake Deposits	Silt, laminated, sand lenses, yellowish brown becoming grey below 4.0 m; scattered subrounded mainly quartzite pebbles	2.7	4.5
	Clay, laminated, calcareous, greyish brown becoming reddish brown below 10.3 m Sandy clay lens 6.0–6.3 m	7.0	11.5
Mercia Mudstone Group	Sandstone, reddish brown	0.2+	11.7

SJ 42 SE 29 4927 2023 Shawell Cottage, Pimhill

Surface level +108.3 m
Water not encountered
203 mm shell and auger
April 1977

Waste 12.7 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sand and silt lenses, calcareous, reddish brown with blue-grey gleying to 4.5 m; scattered angular to rounded quartzite, sandstone, igneous rock and argillaceous pebbles	12.5	12.7
Sherwood Sandstone Group	Sandstone, calcareous, reddish brown	0.8+	13.5

SJ 42 SE 30 4512 2290 Marton Pool, Baschurch **Block A**

Surface level +79.2 m
Water level not recorded
203 mm shell and auger
May 1977

Overburden 1.3 m
Mineral 1.0 m
Waste 17.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, pebbly	1.0	1.3
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, angular to rounded Sand: mainly medium and coarse, angular to rounded	1.0	2.3
Till	Clay, silty, brown	3.1	5.4
Glacial Lake Deposits	Clay, laminated, grey to reddish brown	14.1+	19.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
3	21	76	1.3–2.3	3	4	9	8	36	40	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
1.3–2.3	5	22	3	5	40	25

SJ 52 NW 10 5076 2960 Wem Urban **Block D**

Surface level +82.6 m
Water struck at +78.4 m
203 mm shell and auger
January 1976

Overburden 4.3 m
Mineral 3.2 m
Waste 3.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silty, sandy below 1.3 m, reddish brown; scattered subangular to rounded sandstone, igneous rock and marl pebbles	4.0	4.3
Glacial Sand and Gravel	Pebbly sand Gravel: mainly fine, subangular to rounded Sand: fine and medium, subangular to rounded	3.2	7.5
Till	Clay, silty, yellowish brown; scattered subangular to rounded pebbles	3.9+	11.4
	Hole abandoned—no penetration through stiff clay		

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
5	75	20	4.3–5.3	7	39	37	4	10	3	0
			5.3–6.3	3	17	34	14	24	8	0
			6.3–7.5	5	55	21	4	8	7	0
			Mean	5	38	30	7	14	6	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
4.3–5.3	4	32	8	6	24	25	1
6.3–7.5	3	34	5	21	12	25	–

SJ 52 NW 11 5060 2871 Green Hill, Wem Urban **Block D**

Surface level +77.4 m
Water struck at +76.0 m
203 mm shell and auger
January 1976

Overburden 0.3 m
Mineral 4.2 m
Waste 12.7 m
Mineral 7.1 m
Waste 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	**a** Sandy gravel Gravel: mainly coarse, subangular to rounded Sand: mainly medium, subangular to rounded	4.2	4.5
Till	Clay, silty, sand lenses, yellowish brown; scattered subangular to rounded sandstone and igneous pebbles	12.7	17.2
Glacial Sand and Gravel	**b** 'Clayey' sandy gravel Gravel: fine and coarse, angular to subrounded Sand: mainly medium, angular to subrounded Clay lenses present	7.1	24.3
Till	Clay, silty, yellowish brown; scattered subangular to rounded pebbles	0.7+	25.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	4	52	44	0.3–1.5	9	10	26	7	18	30	0
				1.5–2.5	4	15	30	9	17	25	0
				2.5–3.5	2	24	24	3	11	36	0
				3.5–4.5	1	16	30	12	23	18	0
				Mean	4	16	28	8	17	27	0
b	14	59	27	17.2–18.3	9	19	36	8	13	15	0
				18.3–19.0	No grading data available						
				19.0–20.6	21	17	28	15	11	8	0
				20.6–21.6	17	16	20	8	14	25	0
				21.6–22.3	9	19	22	14	21	15	0
				22.3–23.3	10	14	17	19	26	14	0
				23.3–24.3	11	33	45	6	3	2	0
				Mean	14	19	28	12	14	13	0
a+b	10	56	34	Mean	10	18	28	10	15	19	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*							
		Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock	Others
a	0.3–1.5	8	21	–	–	16	41	–	14
	1.5–2.5	12	23	7	–	22	22	1	13
	2.5–3.5	18	18	2	–	5	51	–	6
	3.5–4.5	3	20	2	–	56	17	2	–
b	17.2–18.3	7	16	1	13	33	21	–	9
	19.0–20.6	4	6	–	24	24	24	–	18
	20.6–21.6	6	18	trace	12	24	29	–	11
	21.6–22.3	15	9	1	3	36	31	–	5
	22.3–23.3	11	–	4	9	52	24	–	–
	23.3–24.3	1	28	trace	10	48	8	–	5

SJ 52 NW 12 5034 2828 Tilley Bridge, Wem Rural **Block D**

Surface level +76.5 m
Water struck at +75.3 m
203 mm shell and auger
January 1976

Overburden 1.2 m
Mineral 3.8 m
Waste 15.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Alluvium	Silt, sandy, pebbly with depth, brown	0.8	1.2
Glacial Sand and Gravel	Pebbly sand Gravel: fine and coarse, subangular to subrounded Sand: medium Laminated silty clay lens between 4.4–4.7 m	3.8	5.0
Till	Clay, silty, brown with grey banding below 15.0 m; scattered subangular to subrounded pebbles	15.0+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
6	76	18	1.2–2.2	9	19	37	5	11	19	0
			2.2–3.2	4	25	69	0	1	1	0
			3.2–4.4	3	7	89	1	0	0	0
			4.4–5.0	11	3	15	12	26	33	0
			Mean	6	14	58	4	7	11	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.2–2.2	12	26	19	–	14	29	–
4.4–5.0	13	25	6	6	5	43	2

SJ 52 NW 13 5057 2784 Tilley, Wem Rural **Block D**

Surface level +80.0 m
Water struck at +77.5 m
203 mm shell and auger
January 1976

Overburden 0.8 m
Mineral 5.6 m
Waste 14.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.8	0.8
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium Silty clay lenses present	5.6	6.4
Till	Clay, silty, laminated below 13.8 m, yellowish brown; scattered angular to rounded pebbles Gravel lenses present below 16.0 m	14.2+	20.6

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
7	59	34	0.8–1.8	14	64	20	1	1	0	0
			1.8–3.0	8	26	49	5	10	2	0
			3.0–4.0	4	7	37	11	25	16	0
			4.0–4.4	2	2	13	10	32	41	0
			4.4–4.8	2	1	12	7	27	51	0
			4.8–6.0	3	2	33	15	29	18	0
			6.0–6.4	9	4	34	12	30	11	0
			Mean	7	19	32	8	19	15	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.8–3.0	7	46	14	–	10	20	3
6.0–6.4	7	35	15	5	18	17	3

SJ 52 NW 14 5028 2698 Tilley Villa, Wem Rural

Surface level +86.2 m
Water struck at +71.3 m
203 mm shell and auger
February 1976

Waste 16.8 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silty, yellowish brown with blue-grey gleying	14.6	14.9
	'Very clayey' gravel lens	1.9	16.8
Mercia Mudstone Group	Mudstone, silty, red	0.7+	17.5

SJ 52 NW 15 5032 2612 Lyon's Wood, Broughton

Surface level +84.8 m
Water struck at +76.6 m
203 mm shell and auger
February 1976

Waste 8.2 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, silty, pebbly, yellowish brown	8.0	8.2
Mercia Mudstone Group	Mudstone, silty, red	0.3+	8.5

SJ 52 NW 16 5174 2981 Foxley, Wem Urban **Block D**

Surface level +80.8 m
Water struck at +78.5 m
203 mm shell and auger
February 1976

Overburden 0.3 m
Mineral 9.9 m
Waste 11.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly medium and coarse, clay lenses present	9.9	10.2
Till	Clay, silty, yellowish brown	11.9+	22.1

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
6	50	44	0.3–1.6	8	18	33	8	22	11	0
			1.6–2.6	28	8	32	3	15	14	0
			2.6–3.6	5	16	43	8	14	14	0
			3.6–4.6	3	6	19	16	28	28	0
			4.6–5.6	2	5	9	18	40	26	0
			5.6–6.6	2	5	21	14	31	27	0
			6.6–7.6	3	3	22	31	28	13	0
			7.6–8.6	2	3	22	26	33	14	0
			8.6–10.2	2	5	32	20	32	9	0
			Mean	6	8	26	16	27	17	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*							
	Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock	Others
0.3–1.6	3	51	5	–	10	27	–	4
1.6–2.6	19	18	21	–	9	32	1	–
2.6–3.6	8	40	3	–	19	30	–	–
3.6–4.6	8	31	4	–	19	37	1	–
6.6–7.6	14	42	19	5	1	19	trace	–
8.6–10.2	4	45	3	17	12	17	2	–

SJ 52 NW 17 5162 2841 The Larches, Wem Urban **Block D**

Surface level +80.5 m
Water struck at +76.2 m
203 mm shell and auger
February 1976

Overburden 0.4 m
Mineral 2.0 m
Waste 1.3 m
Mineral 1.1 m
Waste 8.8 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	**a** 'Clayey' sandy gravel Gravel: fine and coarse with cobbles, subangular to rounded Sand: fine and medium, subangular to rounded	2.0	2.4
	Clay, sandy, yellowish brown	1.3	3.7
	b Gravel Gravel: fine and coarse, subangular to rounded Sand: mainly coarse, subangular to rounded	1.1	4.8
Till	Clay, silty, pebbly towards base, yellowish brown to reddish brown at base	8.8	13.6
Mercia Mudstone Group	Mudstone, green	0.4+	14.0

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	12	52	36	0.4–1.4	13	13	20	7	17	30	0
				1.4–2.4	10	32	30	2	4	8	14
				Mean	12	22	25	5	10	19	7
b	1	10	89	3.7–4.8	1	1	3	6	33	56	0
a+b	8	37	55	Mean	8	15	17	5	19	32	4

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
		Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
a	0.4–1.4	5	46	5	9	35
b	3.7–4.8	12	40	3	7	38

SJ 52 NW 18 5162 2780 Wood House, Wem Rural **Block D**

Surface level +80.7 m
Water struck at +77.7 m
203 mm shell and auger
February 1976

Overburden 0.6 m
Mineral 3.4 m
Waste 0.6 m
Mineral 2.3 m
Waste 2.9 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Glacial Sand and Gravel	**a** Sandy gravel Gravel: fine and coarse with cobbles, rounded Sand: fine and medium	3.4	4.0
	Clay, reddish brown	0.6	4.6
	b Gravel Gravel: mainly fine, rounded Sand: mainly coarse	2.3	6.9
Till	Clay, reddish brown	2.9	9.8
Mercia Mudstone Group	Mudstone, reddish brown with grey sandy lenses	0.8+	10.6

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	9	62	29	0.6–1.6	7	18	49	5	14	7	0
				1.6–3.0	9	8	33	12	21	17	0
				3.0–4.0	12	39	19	5	7	13	5
				Mean	9	20	34	8	15	13	1
b	1	24	75	4.6–5.6	1	2	7	18	52	20	0
				5.6–6.9	1	1	7	14	54	23	0
				Mean	1	1	7	16	53	22	0
a+b	6	47	47	Mean	6	13	23	11	30	16	1

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	0.6–1.6	8	55	5	–	8	24
b	5.6–6.9	3	53	3	3	19	19

SJ 52 NW 19 5246 2915 Aston Park, Wem Rural **Block D**

Surface level +77.8 m
Water struck at +76.5 m
203 mm shell and auger
February 1976

Overburden 0.3 m
Mineral 4.0 m
Waste 15.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to subrounded Sand: medium and coarse	4.0	4.3
Till	Clay, silty, yellowish brown; scattered angular pebbles	15.7+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
6	36	58	0.3–1.3	6	6	17	16	29	26	0
			1.3–2.3	7	6	17	11	20	39	0
			2.3–3.3	7	5	20	13	31	24	0
			3.3–4.3	3	3	11	20	39	24	0
			Mean	6	5	16	15	30	28	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.3	14	50	4	12	20	–
3.3–4.3	4	42	7	15	26	6

SJ 52 NW 20 5218 2830 Barkersgreen, Wem Rural **Block D**

Surface level +76.4 m
Water struck at +74.8 m
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 3.2 m
Waste 6.5 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sandy gravel Gravel: mainly coarse with cobbles, subangular to rounded Sand: mainly medium	3.2	3.5
Till	Clay, silty, sandy below 6.7 m, yellowish brown becoming reddish brown with depth; scattered subangular clasts	6.5	10.0
Mercia Mudstone Group	Mudstone, micaceous, red	0.5+	10.5

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
6	56	38	0.3–1.3	9	39	46	2	2	2	0
			1.3–2.3	8	10	31	3	14	34	10
			2.3–3.5	2	7	27	6	19	39	0
			Mean	6	18	34	4	12	23	3

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.3–2.3	5	30	5	–	14	46	–
2.3–3.5	5	44	4	trace	8	30	9

SJ 52 NW 21 5222 2756 The Hawthorns, Wem Rural

Surface level +81.4 m
Water struck at +78.4 m
203 mm shell and auger
February 1976

Waste 5.0 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Till	Clay, bluish grey; scattered pebbles, gravel lens at base	2.9	3.6
Glacial Lake Deposits	Clay, laminated, silty at base, reddish brown; scattered pebbles	1.4	5.0
Mercia Mudstone Group	Mudstone, reddish brown	0.2+	5.2

SJ 52 NW 22 5348 2940 Alderley Lane, Wem Rural **Block D**

Surface level +75.5 m
Water struck at +74.2 m
203 mm shell and auger
February 1976

Overburden 0.3 m
Mineral 4.2 m
Waste 15.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: medium	4.2	4.5
Till	Clay, silty, yellowish brown; scattered pebbles	6.8	11.3
Glacial Lake Deposits	Clay, laminated, sand lenses, reddish green	2.2	13.5
Till	Clay, sandy, reddish brown; scattered angular to subangular pebbles	6.7+	20.2

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
7	53	40	0.3–1.3	10	15	60	3	7	5	0
			1.3–2.0	5	9	31	6	19	30	0
			2.0–3.0	6	7	40	6	18	23	0
			3.0–4.5	7	0	22	17	24	30	0
			Mean	7	7	37	9	18	22	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.3	6	47	7	–	19	20	1
3.0–4.5	2	34	12	7	12	30	3

SJ 52 NW 23 5368 2879 Aston Hall, Wem Rural **Block D**

Surface level +77.7 m
Water struck at +75.9 m
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 2.0 m
Waste 2.7 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: mainly fine, subrounded Sand: mainly medium	2.0	2.3
Glacial Lake Deposits	Clay, laminated, reddish brown; scattered pebbles	2.7	5.0
Mercia Mudstone Group	Mudstone, sand lenses, reddish brown to green	0.2+	5.2

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
15	61	24	0.3–1.3	17	13	30	5	26	9	0
			1.3–2.3	13	8	57	9	12	1	0
			Mean	15	10	44	7	19	5	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.3	4	40	3	19	33	1

SJ 52 NW 24 5350 2808 Homedene, Wem Rural

Surface level +85.0 m
Water level not recorded
203 mm shell and auger
March 1976

Overburden 3.0 m
Mineral 3.0 m
Waste 1.7 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, pebbly	2.7	3.0
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium	3.0	6.0
Till	Clay, silty, yellowish brown; scattered subangular pebbles	1.7	7.7
Mercia Mudstone Group	Mudstone, reddish green	1.3+	9.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
11	48	41	3.0–4.0	21	4	21	21	23	10	0
			4.0–5.0	6	4	32	14	22	22	0
			5.0–6.0	6	7	33	9	22	23	0
			Mean	11	5	29	14	22	19	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
3.0–4.0	4	24	3	15	22	32	–
5.0–6.0	–	20	7	–	34	38	1

SJ 52 NW 25 5356 2741 Preston Springs, Moreton Corbet

Surface level +94.9 m
Water level not recorded
203 mm shell and auger
September 1976

Waste 1.2 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, pebbly, reddish brown	1.0	1.2
Mercia Mudstone Group	Mudstone, red and green	0.8+	2.0

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SJ 52 NW 26 5452 2965 Soulton Wood, Wem Rural **Block D**

Surface level +76.4 m
Water not encountered
203 mm shell and auger
March 1976

Waste 3.0 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sand lens, brown becoming grey below 2.2 m; scattered pebbles	2.7	3.0
Mercia Mudstone Group	Mudstone, micaceous, red	0.2+	3.2

SJ 52 NW 27 5464 2846 Brockhurst, Wem Rural Block D

Surface level +76.2 m
Water struck at +74.2 m
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 1.0 m
Waste 2.7 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse with cobbles, subrounded Sand: mainly medium	1.0	1.3
Till	Clay, pebbly, red and green	2.7	4.0
Mercia Mudstone Group	Mudstone, red to green	0.5+	4.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
15	46	39	0.3–1.3	15	14	23	9	18	18	3

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.3–1.3	8	61	2	12	17

SJ 52 NW 28 5444 2705 Lee Farm, Lee Brockhurst **Block D**

Surface level +82.0 m
Water level not recorded
203 mm shell and auger
September 1977

Overburden 0.3 m
Mineral 2.7 m
Waste 2.6 m
Mineral 2.0 m
Waste 2.3 m
Mineral 2.6 m
Waste 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	**a** Sandy gravel Gravel: fine and coarse, angular to subrounded Sand: medium and coarse, angular to subrounded	2.7	3.0
Glacial Lake Deposits	Clay, laminated, silty, reddish brown	2.6	5.6
Glacial Sand and Gravel	**b** 'Very clayey' sand with a few pebbles, reddish brown; mainly medium	2.0	7.6
Glacial Lake Deposits	Clay, laminated, silty, brown	2.3	9.9
Glacial Sand and Gravel	**c** 'Very clayey' sandy gravel Gravel: fine and coarse, angular to subrounded Sand: fine and medium, subrounded	2.6	12.5
Till	Clay, brown; scattered angular to subangular quartz and sandstone pebbles, sand lens between 13.0–13.5 m	2.5+	15.0
	Hole abandoned—no penetration through clay		

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
a	7	48	45	0.3–1.3	5	5	22	16	32	20	0
				1.3–2.3	6	3	17	22	33	19	0
				2.3–3.0	11	6	25	31	13	14	0
				Mean	7	5	21	22	27	18	0
b	38	59	3	5.6–7.6	38	19	32	8	3	0	0
c	21	57	22	9.9–10.9	12	11	8	15	23	31	0
				10.9–12.5	26	30	40	2	2	0	0
				Mean	21	22	28	7	10	12	0
a–c	20	54	26	Mean	20	15	26	13	15	11	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	0.3–1.3	9	35	8	–	27	21
c	9.9–10.9	1	14	12	8	42	23

SJ 52 NW 29 5396 2521 Preston Brockhurst, Moreton Corbet

Surface level +83.8 m
Water level not recorded
203 mm shell and auger
August 1976

Waste 3.8 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, brown; scattered gravel lenses	3.5	3.8
Bridgnorth Sandstone	Sand, fine and medium, red	0.7+	4.5

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SJ 52 NE 25 5529 2975 Massey's Rough, Wem Rural **Block D**

Surface level +80.1 m
Water not encountered
203 mm shell and auger
March 1976

Waste 12.0 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground and soil	0.6	0.6
Till	Clay, silty, pebbly below 6.0 m, yellowish brown	11.4	12.0
Mercia Mudstone Group	Mudstone, red and green	1.0+	13.0

SJ 52 NE 26 5533 2915 Wixhill, Weston-under-Redcastle **Block D**

Surface level +78.2 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 1.0 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Pebbly sand Gravel: mainly fine, subrounded Sand: fine and medium, subrounded	1.0	1.3
Mercia Mudstone Group	Mudstone, red and green	0.7+	2.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
8	83	9	0.3–1.3	8	32	49	2	7	2	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.3	3	32	28	19	16	2

SJ 52 NE 27 5570 2781 Lee Hills, Lee Brockhurst

Surface level +93.3 m
Water not encountered
203 mm shell and auger
March 1976

Waste 0.6 m
Bedrock 4.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Sherwood Sandstone Group	Sand to 5.3 m, red; fine and medium, scattered quartzite and sandstone pebbles. Sandstone below 5.3 m, red	4.9+	5.5

SJ 52 NE 28 5536 2713 Moston Park, Lee Brockhurst

Surface level +82.3 m
Water struck at +79.7 m
203 mm shell and auger
September 1976

Overburden 2.2 m
Mineral 1.3 m
Waste 5.6 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Silt, sandy, reddish brown	1.9	2.2
Glacial Sand and Gravel	Sand, silty, clay lenses, grey; fine and medium	1.3	3.5
Till	Clay, silty and sandy, grey; scattered angular pebbles	1.5	5.0
	Clay, silty, reddish brown	4.1	9.1
Sherwood Sandstone Group	Sandstone, red	0.1+	9.2

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
20	80	0	2.2–3.5	20	45	35	0	0	0	0

SJ 52 NE 29 5551 2568 Papermill Bank, Moreton Corbet

Surface level +66.2 m
Water level not recorded
203 mm shell and auger
July 1976

Waste 3.5 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
Alluvium	Clay, silty, pebbly below 1.0 m, peaty, brown becoming grey with depth	1.9	1.9
Till	Clay, silty, yellowish brown; 'clayey' gravel lens at top	1.6	3.5
Bridgnorth Sandstone	Sandstone, red	0.1+	3.6

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SJ 52 NE 30 5512 2518 Besford, Moreton Corbet **Block E**

Surface level +77.1 m
Water level not recorded
203 mm shell and auger
July 1976

Overburden 0.4 m
Mineral 8.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse with cobbles, subangular to rounded Sand: fine and medium Clay lens between 6.0 and 6.2 m	8.9+	9.3
	Hole abandoned due to rising sand		

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel within their control to be investigated for the purpose of commercial exploitation.

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
13	73	14	0.4–1.4	6	10	42	13	21	8	0
			1.4–2.4	6	25	63	4	2	0	0
			2.4–3.4	5	15	55	3	10	12	0
			3.4–4.4	4	39	55	0	2	0	0
			4.4–5.4	2	65	32	1	0	0	0
			5.4–6.0	6	15	50	5	6	9	9
			6.0–7.2	27	31	27	2	6	7	0
			7.2–8.2	16	30	28	3	7	10	6
			8.2–9.3	34	25	16	5	9	11	0
			Mean	13	29	40	4	7	6	1

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*							
	Quartz	Quartzite	Sand-stone	Lime-stone	Argillaceous rock	Igneous rock	Pelitic rock	Others
0.4–1.4	8	57	2	–	1	16	3	13
1.4–2.4	12	3	–	–	12	35	–	38
2.4–3.4	5	8	–	–	15	53	–	19
3.4–4.4	12	14	–	–	13	21	–	40
4.4–5.4	48	–	–	–	2	24	–	26
6.0–7.2	1	4	26	39	16	6	–	8
7.2–8.2	3	19	43	14	15	5	–	1
8.2–9.3	1	27	19	17	20	14	–	2

SJ 52 NE 31 5603 2833 Wixhill, Weston-under-Redcastle

Surface level + 132.2 m
Water not encountered
203 mm shell and auger
March 1976

Waste 2.0 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, silty, sand lenses, reddish brown	1.9	2.0
Sherwood Sandstone Group	Mudstone, reddish brown	0.2+	2.2

SJ 52 NE 32 5654 2722 New House, Weston-under-Redcastle

Surface level +87.7 m
Water not encountered
203 mm shell and auger
July 1976

Waste 0.4 m
Bedrock 1.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Sherwood Sandstone Group	Sand to 1.9 m, red. Sandstone below 1.9 m, red	1.7+	2.1

SJ 52 NE 33 5625 2700 Moston, Stanton upon Hine Heath

Surface level +83.8 m
Water not encountered
203 mm shell and auger
March 1976

Waste 6.2 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Alluvium?	Sand, yellowish brown; scattered rounded sandstone pebbles	0.5	0.9
	Clay, reddish brown; scattered subrounded quartz and sandstone pebbles	5.3	6.2
Sherwood Sandstone Group	Sandstone, reddish brown with green bands	0.9+	7.1

SJ 52 NE 34 5609 2646 Moston, Stanton upon Hine Heath

Surface level +90.5 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.4 m
Mineral 2.0 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	'Very clayey' pebbly sand Gravel: fine and coarse, subrounded to rounded Sand: mainly fine	2.0	2.4
Sherwood Sandstone Group	Sandstone, reddish brown	0.3+	2.7

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
29	63	8	0.4–1.4	33	37	19	3	3	5	0
			1.4–2.4	25	52	15	1	3	4	0
			Mean	29	44	17	2	3	5	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.4–1.4	2	11	4	79	4

SJ 52 NE 35 5615 2552 Harcourt Park, Stanton upon Hine Heath Block E

Surface level +71.5 m
Water level not recorded
203 mm shell and auger
September 1976

Overburden 0.4 m
Mineral 3.3 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, subangular to subrounded Sand: mainly medium	3.3	3.7
Bridgnorth Sandstone	Sandstone, reddish brown	0.3+	4.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
13	79	8	0.4–1.4	27	18	38	5	6	6	0
			1.4–2.4	6	17	66	5	4	2	0
			2.4–3.7	7	42	42	3	4	2	0
			Mean	13	27	48	4	5	3	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Flint and Chert
0.4–1.4	13	36	4	22	25	–
2.4–3.7	trace	23	49	13	14	1

SJ 52 NE 36 5658 2982 Hawkstone Park, Weston-under-Redcastle Block D

Surface level +90.2 m
Water struck at +83.5 m
203 mm shell and auger
March 1976

Waste 6.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy at top, yellowish brown; scattered pebbles	6.5	6.8
Mercia Mudstone Group	Mudstone, red-green	1.2+	8.0

SJ 52 NE 37 5730 2708 Bury Walls, Weston-under-Redcastle

Surface level +86.4 m
Water not encountered
203 mm shell and auger
March 1976

Waste 0.2 m
Bedrock 6.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Sherwood Sandstone Group	Sand to 5.5 m, red; fine and medium. Sandstone below 5.5 m, reddish brown	6.1+	6.3

SJ 52 NE 38 5681 2620 Booleybank, Stanton upon Hine Heath

Surface level +95.6 m
Water level not recorded
203 mm shell and auger
August 1976

Waste 3.2 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, silty below 2.5 m, reddish brown; scattered subrounded igneous pebbles	3.0	3.2
Sherwood Sandstone Group	Sandstone, reddish brown	0.3+	3.5

SJ 52 NE 39 5781 2709 The Hermitage, Weston-under-Redcastle

Surface level +93.0 m
Water not encountered
203 mm shell and auger
July 1976

Waste 0.6 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Sherwood Sandstone Group	Sand, reddish brown; medium	0.9+	1.5

SJ 52 NE 40 5767 2534 Booley House, Stanton upon Hine Heath Block F

Surface level +81.8 m
Water not encountered
203 mm shell and auger
July 1976

Waste 0.3 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Sherwood Sandstone Group	Sandstone, reddish brown	0.6+	0.9

SJ 52 NE 41 5888 2824 Kerstone, Hodnet

Surface level +144.9 m
Water not encountered
203 mm shell and auger
March 1976

Waste 2.4 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Silt, 'clayey', sandy, pebbly below 1.2 m	1.5	1.7
	Clay, sandy, pebbly, reddish brown	0.7	2.4
Sherwood Sandstone Group	Sand to 3.0 m, reddish brown. Sandstone below 3.0 m, red	0.8+	3.2

SJ 52 NE 42 5866 2707 Hopley Coppice, Hodnet **Block F**

Surface level +103.3 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 1.7 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sand with a few pebbles, brown; mainly fine, subrounded to rounded	1.7	2.0
Sherwood Sandstone Group	Sandstone, reddish brown	0.2+	2.2

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
9	89	2	0.3–1.4	8	70	21	1	0	0	0
			1.4–2.0	12	54	29	2	2	1	0
			Mean	9	64	24	1	1	1	0

SJ 52 NE 43 5824 2662 Morgan's Coppice, Stanton upon Hine Heath **Block F**

Surface level +92.1 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.2 m
Mineral 1.0 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	Sand with a few pebbles; mainly fine, subrounded to rounded	1.0	1.2
Sherwood Sandstone Group	Sand, reddish brown	0.8+	2.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
8	89	3	0.2–1.2	8	63	25	1	2	1	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
0.2–1.2	4	43	5	21	9	18

SJ 52 NE 44 5855 2533 Hine Heath, Stanton upon Hine Heath **Block F**

Surface level +78.9 m
Water not encountered
203 mm shell and auger
March 1976

Waste 0.4 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Sherwood Sandstone Group	Sand, reddish brown	1.3+	1.7

SJ 52 NE 45 5920 2886 Marchamley Hill, Hodnet

Surface level +127.0 m
Water not encountered
203 mm shell and auger
March 1976

Waste 2.3 m
Bedrock 1.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, silty, pebbly, reddish brown	2.2	2.3
Sherwood Sandstone Group	Sand to 2.8 m, reddish brown. Sandstone below 2.8 m, red	1.1+	3.4

SJ 52 NE 46 5950 2674 Hopton, Hodnet **Block F**

Surface level +103.8 m
Water level not recorded
203 mm shell and auger
August 1976

Waste 6.7 m
Bedrock 0.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silty, sandy at top, reddish brown	6.4	6.7
Sherwood Sandstone Group	Sandstone, reddish brown	0.3+	7.0

SJ 52 NE 47 5923 2582 Lodgebank, Stanton upon Hine Heath **Block F**

Surface level +83.5 m
Water level not recorded
203 mm shell and auger
August 1976

Waste 3.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Clay, sandy at top, pebbly, reddish brown	3.6	3.8
Bridgnorth Sandstone	Sand to 4.2 m, red. Sandstone below 4.2 m, red	1.2+	5.0

SJ 52 NE 48 5914 2507 Avenue Cottages, Stanton upon Hine Heath **Block F**

Surface level +77.7 m
Water not encountered
203 mm shell and auger
August 1978

Waste 0.7 m
Bedrock 1.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sand, yellowish brown	0.4	0.7
Bridgnorth Sandstone	Sand to 1.0 m, reddish brown. Sandstone below 1.0 m, reddish brown	1.3+	2.0

SJ 52 SW 18 5012 2488 Yorton, Clive

Surface level +91.3 m
Water not encountered
203 mm shell and auger
April 1976

Waste 2.2 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, reddish brown; scattered subangular to rounded pebbles	1.9	2.2
Mercia Mudstone Group	Mudstone, red	0.2+	2.4

SJ 52 SW 19 5049 2197 Blackbirches, Hadnall

Surface level +84.3 m
Water not encountered
203 mm shell and auger
April 1976

Waste 1.7 m
Bedrock 3.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.4	0.4
Till	Clay, sandy, pebbly, yellowish brown	1.3	1.7
Sherwood Sandstone Group	Sand to 4.2 m; fine and medium. Sandstone below 4.2 m, yellow	3.1+	4.8

SJ 52 SW 20 5034 2032 Plex Coppice, Hadnall

Surface level +91.4 m
Water not encountered
203 mm shell and auger
April 1976

Waste 9.6 m
Bedrock 0.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy lenses below 6.0 m, brown with bluish grey gleying; scattered subangular to rounded pebbles	9.3	9.6
Sherwood Sandstone Group?	Mudstone, brown	0.8+	10.4

SJ 52 SW 21 5088 2260 Sansaw, Clive

Surface level +78.9 m
Water not encountered
203 mm shell and auger
April 1976

Waste 0.5 m
Bedrock 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Silt, clayey, brown	0.2	0.5
Sherwood Sandstone Group	Sand to 3.0 m, red; fine and medium. Sandstone below 3.0 m, red	2.8+	3.3

SJ 52 SW 22 5140 2243 Sansaw Heath, Grinshill

Surface level +80.4 m
Water struck at +77.5 m
203 mm shell and auger
April 1976

Waste 2.7 m
Bedrock 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, reddish brown; scattered subangular to subrounded sandstone pebbles	2.4	2.7
Sherwood Sandstone Group	Sand, red; medium	2.8+	5.5

SJ 52 SW 23 5178 2088 Haston, Hadnall

Surface level +82.6 m
Water not encountered
203 mm shell and auger
April 1976

Waste 0.8 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, brown; scattered pebbles	0.5	0.8
Sherwood Sandstone Group	Sand to 1.9 m, yellow; fine and medium. Sandstone below 1.9 m, red	1.6+	2.4

SJ 52 SW 24 5092 2012 Hastongrove, Hadnall

Surface level +79.8 m
Water not encountered
203 mm shell and auger
April 1976

Overburden 1.4 m
Mineral 1.0 m
Waste 0.6 m
Bedrock 3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silty, sandy lenses, pebbly, brown	1.1	1.4
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: mainly fine Sand: mainly fine	1.0	2.4
Till	Clay, silty, sandy lenses, pebbly, brown with bluish grey gleying	0.6	3.0
Sherwood Sandstone Group	Sand to 5.0 m, red; fine and medium. Sandstone below 5.0 m, red	3.0+	6.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
19	71	10	1.4–2.4	19	45	22	4	8	2	0

SJ 52 SW 25 5168 2309 Grinshill

Surface level +83.3 m
Water not encountered
203 mm shell and auger
April 1976

Waste 4.0 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Silt, 'clayey', sandy	0.5	0.8
	Clay, sandy lenses, pebbly, reddish brown	3.2	4.0
Sherwood Sandstone Group	Sandstone, red	0.2+	4.2

SJ 52 SW 26 5222 2271 Sandy Lane, Grinshill

Surface level +78.9 m
Water not encountered
203 mm shell and auger
April 1976

Waste 0.8 m
Bedrock 3.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Till	Clay, silty, sandy, pebbly	0.7	0.8
Sherwood Sandstone Group	Sand to 3.8 m, pebbly, yellowish red; fine and medium. Sandstone below 3.8 m	3.1+	3.9

SJ 52 SW 27 5238 2168 Painsbrook, Shawbury

Surface level +77.8 m
Water struck at +71.4 m
203 mm shell and auger
April 1976

Waste 6.4 m
Bedrock 0.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Till	Clay, silty, sandy becoming pebbly below 2.5 m	5.9	6.4
Bridgnorth Sandstone	Sand to 6.7 m, pebbly, red. Sandstone below 6.7 m, red	0.4+	6.8

SJ 52 SW 28 5288 2118 Painsbrook, Shawbury

Surface level +74.3 m
Water struck at +69.1 m
203 mm shell and auger
April 1976

Waste 5.2 m
Bedrock 3.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Silty sand lens	0.9	1.2
	Clay, sandy, pebbly, reddish brown	4.0	5.2
Bridgnorth Sandstone	Sand to 7.8 m, red; fine and medium. Sandstone below 7.8 m, red	3.0+	8.2

SJ 52 SW 29 5236 2047 Hadnall

Surface level +79.0 m
Water level not recorded
203 mm shell and auger
November 1976

Waste 6.4 m
Bedrock 1.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silty, sandy, reddish brown; scattered subangular to subrounded mainly sandstone and igneous pebbles	2.9	3.2
Glacial Lake Deposits	Clay, laminated, silty, sandy, greyish brown	1.7	4.9
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly medium	1.5	6.4
Bridgnorth Sandstone	Sand to 7.9 m, red; fine and medium. Sandstone below 7.9 m, red	1.6+	8.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
15	56	29	4.9–6.4	15	18	32	6	16	13	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Haematite
4.9–6.4	4	49	7	14	23	3

SJ 52 SW 30 5297 2314 Woodstile, Shawbury

Surface level +99.4 m
Water level not recorded
203 mm shell and auger
July 1976

Waste 1.8 m
Bedrock 2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Till	Clay, sandy, reddish brown; scattered subangular sandstone pebbles	1.2	1.8
Bridgnorth Sandstone	Sand to 4.0 m, red; fine and medium. Sandstone below 4.0 m, red	2.4+	4.2

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel within their control to be investigated for the purpose of commercial exploitation

SJ 52 SW 31 5359 2254 Boarpit Rough, Shawbury

Surface level +82.3 m
Water level not recorded
203 mm shell and auger
July 1976

Waste 1.5 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Till	Sand, silty, yellowish brown	0.4	0.6
	Clay, reddish brown; scattered subrounded pebbles	0.9	1.5
Bridgnorth Sandstone	Sand to 3.0 m, red. Sandstone below 3.0 m, red	2.0+	3.5

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel within their control to be investigated for the purpose of commercial exploitation

SJ 52 SW 32 5342 2178 New House, Shawbury

Surface level +78.6 m
Water not encountered
203 mm shell and auger
April 1976

Waste 0.2 m
Bedrock 3.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Bridgnorth Sandstone	Sand to 3.1 m, red; fine and medium. Sandstone below 3.1 m, red	3.1+	3.3

SJ 52 SW 33 5346 2079 Shawbury Heath Farm, Shawbury **Block E**

Surface level +73.5 m
Water struck at +71.5 m
203 mm shell and auger
April 1976

Overburden 0.4 m
Mineral 1.8 m
Waste 4.8 m
Bedrock 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: mainly coarse, subangular to rounded Sand: mainly fine	1.8	2.2
Glacial Lake Deposits	Clay, laminated, silty, bluish brown	1.3	3.5
Till	Clay, sandy, pebbly, brown	3.5	7.0
Bridgnorth Sandstone	Sand to 9.5 m, red; fine and medium. Sandstone below 9.5 m, red	2.8+	9.8

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
20	76	4	0.4–1.2	20	36	34	2	3	5	0
			1.2–2.2	20	56	22	1	0	1	0
			Mean	20	47	27	2	1	3	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.4–1.2	5	49	17	7	22

SJ 52 SW 34 5392 2440 Preston Brockhurst, Moreton Corbet

Surface level +88.1 m
Water level not recorded
203 mm shell and auger
July 1976

Waste 2.0 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Till	Clay, sandy, silty towards base, yellowish brown; scattered subrounded sandstone pebbles	1.6	2.0
Bridgnorth Sandstone	Sand to 2.5 m, red. Sandstone below 2.5 m, red	1.0+	3.0

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel within their control to be investigated for the purpose of commercial exploitation.

SJ 52 SW 35 5414 2349 Actonlea Coppice, Shawbury

Surface level +98.7 m
Water level not recorded
203 mm shell and auger
July 1976

Waste 9.3 m
Bedrock 8.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.6	0.6
Till	Clay, sandy below 5.5 m, pebbly, brown	7.4	8.0
Glacial Lake Deposits	Clay, laminated, brown	1.3	9.3
Bridgnorth Sandstone	Sand, reddish brown; fine and medium	8.7+	18.0

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources they will not allow sand and gravel within their control to be investigated for the purpose of commercial exploitation.

SJ 52 SW 36 5402 2206 The Ships, Shawbury **Block E**

Surface level +78.8 m
Water not encountered
203 mm shell and auger
April 1976

Waste 2.0 m
Bedrock 2.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Till	Clay, silt lenses, reddish brown; scattered subrounded pebbles	1.6	2.0
Bridgnorth Sandstone	Sand, red; fine and medium	2.8+	4.8

SJ 52 SW 37 5423 2107 Mathew's Coppice, Shawbury **Block E**

Surface level +74.0 m
Water struck at +71.5 m
203 mm shell and auger
April 1976

Overburden 0.4 m
Mineral 2.2 m
Waste 3.2 m
Mineral 2.3 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Sand and Gravel	**a** Pebbly sand Gravel: fine and coarse, subangular to rounded Sand: mainly medium	2.2	2.6
Till	Clay, sandy below 4.4 m, pebbly, reddish brown	3.2	5.8
Glacial Sand and Gravel	**b** Gravel Gravel: fine and coarse, subangular to rounded Sand: medium and coarse	2.3	8.1
Bridgnorth Sandstone	Sand to 8.6 m, red. Sandstone below 8.6 m, red	0.6+	8.7

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	6	79	15	0.4–1.4	8	22	61	3	4	2	0
				1.4–2.6	5	14	55	4	11	11	0
				Mean	6	17	58	4	8	7	0
b	4	33	63	5.8–6.8	5	5	23	14	26	27	0
				6.8–8.1	3	4	12	10	22	49	0
				Mean	4	4	17	12	24	39	0
a+b	5	56	39	Mean	5	11	37	8	16	23	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
a	0.4–1.4	12	34	6	6	31	10	1
b	6.8–8.1	7	32	8	–	16	37	–

SJ 52 SW 38 5447 2416 Prestonlea Coppice, Moreton Corbet

Surface level +90.0 m
Water level not recorded
203 mm shell and auger
July 1976

Waste 9.3 m
Bedrock 1.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, reddish brown; scattered subrounded sandstone pebbles	9.0	9.3
Bridgnorth Sandstone	Sand to 9.9 m, silty, red. Sandstone below 9.9 m, red	1.0+	10.3

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel deposits within their control to be investigated for commercial exploitation.

SJ 52 SW 39 5452 2288 Actonlea Farm, Shawbury **Block E**

Surface level +79.5 m
Water not encountered
203 mm shell and auger
April 1976

Waste 2.8 m
Bedrock 2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, brown; scattered pebbles	2.5	2.8
Bridgnorth Sandstone	Sand to 5.1 m, silty, red. Sandstone below 5.1 m, red	2.4+	5.2

SJ 52 SW 40 5467 2166 Carradine, Shawbury **Block E**

Surface level +74.2 m
Water not encountered
203 mm shell and auger
April 1976

Overburden 0.7 m
Mineral 1.0 m
Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Glacial Sand and Gravel	Sandy gravel Gravel: mainly coarse, subangular to subrounded Sand: mainly medium	1.0	1.7
Bridgnorth Sandstone	Sand to 3.0 m, red; fine and medium. Sandstone below 3.0 m, red	2.3+	4.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
9	62	29	0.7–1.7	9	14	38	10	10	19	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock
0.7–1.7	7	26	20	14	30	3

SJ 52 SW 41 5454 2011 Shawbury Heath, Shawbury **Block E**

Surface level +70.7 m
Water struck at +68.2 m
203 mm shell and auger
July 1976

Overburden 0.3 m
Mineral 2.2 m
Waste 6.7 m
Mineral 7.1 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	**a** 'Clayey' pebbly sand Gravel: fine, subrounded Sand: mainly medium	2.2	2.5
Glacial Lake Deposits	Clay, laminated, greyish brown	2.8	5.3
Till	Clay, reddish brown; scattered subangular sandstone pebbles	3.9	9.2
Glacial Sand and Gravel	**b** 'Clayey' pebbly sand Gravel: mainly fine, subangular to subrounded Sand: mainly medium	7.1	16.3
Bridgnorth Sandstone	Sandstone, reddish brown	0.2+	16.5

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
a	15	79	6	0.3–1.3	17	19	57	3	4	0	0
				1.3–2.5	13	10	59	10	7	1	0
				Mean	15	14	58	7	6	0	0
b	11	72	17	9.2–10.2	13	12	55	5	9	6	0
				10.2–12.2	16	12	65	4	2	1	0
				12.2–13.5	4	8	48	13	26	1	0
				13.5–14.5	5	7	81	3	2	2	0
				14.5–15.5	16	10	42	2	18	12	0
				15.5–16.3	9	6	48	3	14	20	0
				Mean	11	9	58	5	11	6	0
a+b	12	74	14	Mean	12	11	58	5	10	4	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*								
		Quartz	Quartzite	Sand-stone	Lime-stone	Argill-aceous rock	Igneous rock	Pelitic rock	Flint and Chert	Others
a	0.3–1.3	16	54	3	trace	2	17	–	1	7
	1.3–2.5	14	46	10	–	4	16	3	–	7
b	10.2–12.2	6	52	12	–	7	14	trace	trace	9
	12.2–13.5	9	27	25	19	4	5	–	–	11
	14.5–15.5	9	31	35	13	9	3	–	–	–

SJ 52 SE 31 **5519 2483** **Besford, Moreton Corbet** **Block E**

Surface level +72.5 m
Water struck at +62.5 m
203 mm shell and auger
July 1976

Overburden 0.3 m
Mineral 1.7 m
Waste 9.3 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' gravel Gravel: mainly coarse, subrounded Sand: mainly medium	1.7	2.0
Till	Clay, sandy, reddish brown; scattered subangular sandstone pebbles	4.0	6.0
	Clay, silty, greyish brown becoming reddish brown below 7.5 m; scattered subangular to subrounded pebbles Sandy gravel lens at base	5.3	11.3
Bridgnorth Sandstone	Sandstone, reddish brown	0.2+	11.5

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel deposits within their control to be investigated for the purpose of commercial exploitation.

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
18	33	49	0.3–1.3	21	9	18	8	15	29	0
			1.3–2.0	14	7	12	11	21	35	0
			Mean	18	8	16	9	18	31	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.3	9	41	12	11	21	6

SJ 52 SE 32 5558 2377 Moreton Corbet **Block E**

Surface level +71.4 m
Water struck at +68.3 m
203 mm shell and auger
September 1976

Overburden 0.3 m
Mineral 6.2 m
Waste 3.9 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly medium	6.2	6.5
Till	Clay, reddish brown; scattered subangular to subrounded sandstone pebbles. Sandy gravel lens at base	3.9	10.4
Bridgnorth Sandstone	Sandstone, reddish brown	0.1+	10.5

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel deposits within their control to be investigated for the purpose of commercial exploitation.

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
7	46	47	0.3–1.5	6	19	70	3	1	1	0
			1.5–2.5	7	6	38	9	16	24	0
			2.5–3.5	12	4	19	11	16	38	0
			3.5–4.5	8	1	15	18	32	26	0
			4.5–5.5	3	4	15	15	34	29	0
			5.5–6.5	4	1	12	11	32	40	0
			Mean	7	6	29	11	21	26	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.5–2.5	3	46	8	2	13	26	2
5.5–6.5	8	35	3	11	25	17	1

SJ 52 SE 33 5578 2300 Roman Road, Moreton Corbet **Block E**

Surface level +68.6 m
Water struck at +65.8 m
203 mm shell and auger
March 1976

Waste 3.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.6	0.6
Till	Clay, sandy, reddish brown with bluish grey gleying at top	3.2	3.8
Bridgnorth Sandstone	Sandstone, reddish brown	1.2+	5.0

SJ 52 SE 34 5563 2144 Shawbury **Block E**

Surface level +71.5 m
Water struck at +70.1 m
203 mm shell and auger
April 1976

Overburden 0.6 m
Mineral 1.7 m
Waste 1.1 m
Bedrock 2.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.6	0.6
Glacial Sand and Gravel	Pebbly sand Gravel: fine and coarse, subangular to rounded Sand: mainly medium	1.7	2.3
Till	Clay, brown; gravel lens at base	1.1	3.4
Bridgnorth Sandstone	Sandstone, reddish purple	2.1+	5.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
9	76	15	0.6–1.4	9	9	56	6	8	12	0
			1.4–2.3	10	28	46	5	8	3	0
			Mean	9	19	51	6	8	7	0

SJ 52 SE 35 5519 2093 Shawbury **Block E**

Surface level +72.0 m
Water struck at +70.9 m
203 mm shell and auger
April 1976

Overburden 0.6 m
Mineral 2.0 m
Waste 2.9 m
Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground and soil	0.6	0.6
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: mainly fine, subangular to rounded Sand: mainly medium	2.0	2.6
Till	Clay, sand, pebbly, yellowish brown becoming reddish brown below 4.3 m	2.9	5.5
Bridgnorth Sandstone	Sand to 7.7 m, red; fine and medium. Sandstone below 7.7 m, red	2.5+	8.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
10	77	13	0.6–2.6	10	16	54	7	8	5	0

SJ 52 SE 36 5540 2027 Shawbury Park, Shawbury **Block E**

Surface level +66.7 m
Water struck at +61.5 m
203 mm shell and auger
November 1976

Waste 5.2 m
Bedrock 0.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, brown with bluish grey gleying; scattered angular sandstone and quartz pebbles	1.1	1.4
Glacial Lake Deposits	Clay, laminated, brown with bluish grey gleying at top	2.6	4.0
Till	Clay, reddish brown; scattered angular to rounded quartz and sandstone pebbles	1.2	5.2
Bridgnorth Sandstone	Sand to 6.0 m, pebbly, red; fine and medium. Sandstone below 6.0 m, red	0.9+	6.1

SJ 52 SE 37 5633 2478 Harcourt Mill, Stanton upon Hine Heath **Block F**

Surface level +70.2 m
Water struck at +68.7 m
203 mm shell and auger
March 1976

Waste 7.2 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, sandy, pebbly, yellowish brown	6.9	7.2
Bridgnorth Sandstone	Sand to 7.3 m, pebbly. Sandstone below 7.3 m, reddish brown	1.8+	9.0

SJ 52 SE 38 5652 2402 Stanton Mill, Stanton upon Hine Heath **Block E**

Surface level +63.2 m
Water struck at +57.2 m
203 mm shell and auger
March 1976

Overburden 1.1 m
Mineral 2.4 m
Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.1	0.1
Alluvium	Clay, sandy, greyish brown	1.0	1.1
Glacial Sand and Gravel	Gravel Gravel: mainly coarse with cobbles, subangular to rounded Sand: medium and coarse Clay lens at base	2.4	3.5
Bridgnorth Sandstone	Sand to 5.8 m, pebbly, greyish yellow; fine and medium. Sandstone below 5.8 m, greyish yellow	2.5+	6.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
4	27	69	1.1–2.1	4	2	13	14	26	41	0
			2.1–3.1	3	5	12	10	22	42	6
			Mean	4	3	12	12	24	42	3

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
2.1–3.1	3	46	3	9	12	27

SJ 52 SE 39 5613 2328 Moreton Corbet **Block E**

Surface level +67.0 m
Water level not recorded
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 3.0 m
Waste 7.5 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' sandy gravel Gravel: fine and coarse, subangular to subrounded Sand: mainly medium	3.0	3.3
Glacial Lake Deposits	Clay, laminated, silty, grey	2.9	6.2
Till	Clay, reddish brown; scattered subangular to subrounded sandstone pebbles	4.6	10.8
	Sandy gravel lens 7.8–8.5 m		
Bridgnorth Sandstone	Sand to 11.4 m, red. Sandstone below 11.4, red	1.2+	12.0

The Trustees of the Acton Reynald Estate wish it to be known that whilst they are not opposed to this survey of resources, they will not allow sand and gravel deposits within their control to be investigated for the purpose of commercial exploitation.

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
11	47	42	0.3–1.2	22	19	48	3	4	4	0
			1.2–2.2	8	6	24	12	25	25	0
			2.2–3.3	4	5	23	4	30	34	0
			Mean	11	10	31	6	20	22	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
0.3–1.2	40	33	8	–	–	19	–
2.2–3.3	5	41	3	6	14	30	1

SJ 52 SE 40 5667 2284 Dawson's Rough, Shawbury **Block E**

Surface level +65.2 m
Water struck at +62.4 m
203 mm shell and auger
March 1976

Overburden 0.6 m
Mineral 3.3 m
Waste 5.9 m
Mineral 2.2 m
Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.6	0.6
Glacial Sand and Gravel	**a** Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: fine and medium	3.3	3.9
Till	Clay, pebbly	5.9	9.8
Glacial Sand and Gravel	**b** Gravel Gravel: mainly coarse, angular to rounded Sand: fine and medium	2.2	12.0
Sherwood Sandstone Group	Sand to 14.2 m; fine and medium. Sandstone below 14.2 m, red	2.3+	14.3

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	9	63	28	0.6–1.4	24	22	28	8	13	5	0
				1.4–2.8	4	47	46	1	1	1	0
				2.8–3.9	3	6	15	9	19	48	0
				Mean	9	27	31	5	10	18	0
b	10	41	49	9.8–11.0	10	21	13	4	14	38	0
				11.0–12.0	9	10	31	4	17	29	0
				Mean	10	16	21	4	15	34	0
a+b	9	55	36	Mean	9	23	27	5	12	24	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock
a	0.6–1.4	–	37	1	–	58	4
	1.4–2.8	–	53	3	–	39	5
b	11.0–12.0	3	20	36	12	10	19

SJ 52 SE 41 5648 2125 The Grove, Shawbury **Block F**

Surface level +63.0 m
Water struck at +61.8 m
203 mm shell and auger
March 1976

Overburden 0.2 m
Mineral 2.0 m
Waste 13.3 m
Bedrock 4.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	**a** 'Very clayey' sand with a few pebbles; fine and medium	2.0	2.2
Till	Clay, silty at top, greyish brown	5.8	8.0
	Clay, sandy, pebbly, reddish brown	5.0	13.0
Glacial Sand and Gravel	**b** Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: fine and medium Clay lenses present	2.5	15.5
Bridgnorth Sandstone	Sand to 19.1m, reddish brown; fine and medium Sandstone below 19.1 m, reddish brown	4.8+	20.3

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	24	73	3	0.2–1.2	33	20	36	7	2	2	0
				1.2–2.2	15	42	38	3	1	1	0
				Mean	24	31	37	5	2	1	0
b	6	68	26	13.0–14.5	5	17	36	9	16	17	0
				14.5–15.5	8	40	31	5	9	7	0
				Mean	6	26	34	8	13	13	0
a+b	14	70	16	Mean	14	28	35	7	8	8	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
a	0.2–1.2	1	36	4	–	5	38	16
b	14.5–15.5	6	25	28	3	18	20	–

SJ 52 SE 42 5698 2018 Wytheford Heath, Shawbury **Block F**

Surface level +63.0 m
Water struck at +61.2 m
203 mm shell and auger
March 1976

Overburden 1.8 m
Mineral 1.2 m
Waste 11.0 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground and soil	1.8	1.8
Glacial Sand and Gravel	Gravel Gravel: fine and coarse, subangular to rounded Sand: medium	1.2	3.0
Glacial Lake Deposits	Clay, laminated, pebbly, greyish brown	5.0	8.0
Till	Clay, sandy, pebbly, reddish brown	3.5	11.5
	'Very clayey' pebbly sand lens	2.5	14.0
Bridgnorth Sandstone	Sandstone, reddish brown	0.5+	14.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
3	37	60	1.8–3.0	3	5	24	8	28	32	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.8–3.0	18	34	3	3	18	23	1

SJ 52 SE 43 5770 2483 Blakeley Hill, Stanton upon Hine Heath **Block F**

Surface level +82.3 m
Water level not recorded
203 mm shell and auger
September 1976

Waste 6.6 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Till	Clay, silty, sandy below 3.8 m, reddish brown; scattered subrounded quartz and sandstone pebbles	6.1	6.6
Sherwood Sandstone Group	Sandstone, reddish brown	0.2+	6.8

SJ 52 SE 44 5755 2366 Sowbach, Stanton upon Hine Heath **Block F**

Surface level +73.9 m
Water struck at +72.4 m
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 2.7 m
Waste 4.8 m
Bedrock 0.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sand with a few pebbles, orange-red; fine and medium	2.7	3.0
Till	Clay, silty to 4.0 m, pebbly, grey becoming reddish brown	4.8	7.8
Sherwood Sandstone Group	Sandstone, red	0.2+	8.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
4	94	2	0.3–3.0	4	44	49	1	2	0	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.3–3.0	2	46	7	26	19

SJ 52 SE 45 5715 2296 Forge Coppice, Shawbury **Block E**

Surface level +64.5 m
Water struck at +61.5 m
203 mm shell and auger
March 1976

Overburden 0.6 m
Mineral 3.3 m
Waste 5.4 m
Bedrock 2.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground and soil	0.6	0.6
Glacial Sand and Gravel	Sandy gravel Gravel: fine and coarse, subangular to rounded Sand: mainly medium	3.3	3.9
Till	Clay, silty, pebbly	5.4	9.3
Sherwood Sandstone Group	Sand to 11.3 m. Sandstone below 11.3, purplish brown	2.3+	11.6

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
4	54	42	0.6–1.6	5	20	24	4	16	31	0
			1.6–3.6	3	8	30	16	25	18	0
			3.6–3.9	5	5	68	7	10	5	0
			Mean	4	11	32	11	21	21	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
1.6–3.6	11	43	5	10	16	12	3

SJ 52 SE 46 5758 2198 Moretonmill, Shawbury **Block F**

Surface level +67.9 m
Water level not recorded
203 mm shell and auger
October 1976

Overburden 0.5 m
Mineral 8.1 m
Bedrock 4.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Glacial Sand and Gravel	Pebbly sand Gravel: mainly fine, subangular to rounded Sand: fine and medium	8.1	8.6
Bridgnorth Sandstone	Sand to 12.7 m, reddish brown; fine and medium. Sandstone below 12.7 m, red	4.4+	13.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
9	73	18	0.5–1.5	14	24	58	1	2	1	0
			1.5–2.5	15	61	23	1	0	0	0
			2.5–3.5	8	47	45	0	0	0	0
			3.5–4.5	10	53	37	0	0	0	0
			4.5–5.6	5	58	36	0	1	0	0
			5.6–6.6	6	10	32	17	21	14	0
			6.6–7.6	4	3	12	23	44	14	0
			7.6–8.6	8	22	8	16	27	19	0
			Mean	9	35	31	7	12	6	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Flint and Chert
0.5–1.5	1	49	3	26	21	–
7.6–8.6	4	52	6	14	23	1

SJ 52 SE 47 5734 2166 Edgebolton, Shawbury **Block F**

Surface level +70.4 m
Water not encountered
203 mm shell and auger
March 1976

Waste 3.0 m
Bedrock 3.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground	0.5	0.5
Till	Clay, sandy, reddish brown; scattered subangular sandstone and igneous pebbles	2.5	3.0
Bridgnorth Sandstone	Sand to 6.0 m, pebbly, reddish brown; fine and medium. Sandstone below 6.0 m, reddish brown	3.3+	6.3

SJ 52 SE 48 5782 2112 Hoarheath Coppice, Shawbury **Block F**

Surface level +66.3 m
Water struck at +64.7 m
203 mm shell and auger
March 1976

Waste 5.6 m
Bedrock 7.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Made ground and soil	1.3	1.3
Till	Clay, silty, sandy below 4.6 m, pebbly, yellowish brown	4.3	5.6
Bridgnorth Sandstone	Sand, reddish brown; fine and medium	7.4+	13.0

SJ 52 SE 49 5755 2060 Wytheford Wood, Shawbury **Block F**

Surface level +65.4 m
Water struck at +53.4 m
203 mm shell and auger
August 1976

Overburden 0.2 m
Mineral 2.1 m
Waste 17.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.2	0.2
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, subangular to subrounded Sand: medium	2.1	2.3
Glacial Lake Deposits	Clay, laminated, grey	7.7	10.0
Till	Clay, silty, reddish brown; scattered subangular snadstone pebbles	10.0+	20.0

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
13	77	10	0.2–1.4	17	6	63	2	7	5	0
			1.4–2.3	8	19	63	2	6	2	0
			Mean	13	12	63	2	6	4	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.2–1.4	3	74	17	4	2

SJ 52 SE 50 5866 2465 Stanton upon Hine Heath **Block F**

Surface level +80.9 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.5 m
Mineral 1.0 m
Bedrock 3.3 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, rounded Sand: fine and medium	1.0	1.5
Bridgnorth Sandstone	Sand to 4.0 m, pebbly, reddish brown; fine and medium. Sandstone below 4.0 m, reddish brown	3.3+	4.8

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
18	62	20	0.5–1.5	18	39	20	3	11	9	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*					
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock	Pelitic rock
0.5–1.5	4	20	51	15	10	trace

SJ 52 SE 51 5851 2332 Butlersbank, Stanton upon Hine Heath Block F

Surface level +74.0 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.5 m
Mineral 1.4 m
Bedrock 1.8 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.5	0.5
Glacial Sand and Gravel	Pebbly sand Gravel: fine, rounded mainly sandstone Sand: mainly medium	1.4	1.9
Bridgnorth Sandstone	Sand to 3.6 m, red; fine and medium. Sandstone below 3.6 m, red	1.8+	3.7

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
5	89	6	0.5–1.5	5	13	70	6	5	1	0
			1.5–1.9	6	20	66	1	5	2	0
			Mean	5	15	69	5	5	1	0

SJ 52 SE 52 5845 2239 Pool House, Shawbury **Block F**

Surface level +69.0 m
Water struck at +68.3 m
203 mm shell and auger
March 1976

Waste 11.0 m
Bedrock 2.4 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Sand, yellow	0.4	0.7
	Clay, sandy below 3.7 m, bluish grey	10.3	11.0
Bridgnorth Sandstone	Sand, red; fine and medium	2.4+	13.4

SJ 52 SE 53 5860 2172 Muckleton, Shawbury **Block F**

Surface level +71.5 m
Water struck at +69.1 m
203 mm shell and auger
March 1976

Overburden 0.7 m
Mineral 2.2 m
Waste 6.1 m
Bedrock 2.5 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Glacial Sand and Gravel	Sand with a few pebbles, yellowish brown; mainly medium	2.2	2.9
Till	Clay, pebbly, reddish brown	6.1	9.0
Bridgnorth Sandstone	Sand to 11.0 m, red; fine and medium. Sandstone below 11.0 m, red	2.5+	11.5

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
8	89	3	0.7–2.9	8	30	57	2	1	2	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*				
	Quartz	Quartzite	Sandstone	Argillaceous rock	Igneous rock
0.7–2.9	5	67	2	10	16

SJ 52 SE 54 5837 2048 East of Wytheford Wood, Shawbury Block F

Surface level +65.1 m
Water struck at +63.3 m
203 mm shell and auger
October 1976

Overburden 0.3 m
Mineral 2.2 m
Waste 4.1 m
Mineral 4.9 m
Bedrock 0.1 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	**a** 'Clayey' pebbly sand Gravel: fine and coarse, subangular to rounded Sand: mainly medium	2.2	2.5
Glacial Lake Deposits	Clay, laminated, pebbly, reddish brown	1.8	4.3
Till	Clay, silty, sandier with depth, reddish brown; scattered subangular to subrounded quartz and sandstone pebbles	2.3	6.6
Glacial Sand and Gravel	**b** 'Very clayey' pebbly sand Gravel: fine and coarse, angular to rounded Sand: fine and medium	4.9	11.5
Bridgnorth Sandstone	Sandstone, red	0.1+	11.6

GRADING

	Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
a	13	70	17	0.3–1.3	14	24	46	6	5	5	0
				1.3–2.5	13	16	37	11	15	8	0
				Mean	13	20	41	9	10	7	0
b	23	67	10	6.6–8.1	29	34	29	2	5	1	0
				8.1–9.0	23	24	49	1	2	1	0
				9.0–10.8	21	34	34	1	3	7	0
				10.8–11.5	14	36	22	2	11	15	0
				Mean	23	32	34	1	5	5	0
a+b	20	68	12	Mean	20	28	36	4	6	6	0

COMPOSITION

	Depth below surface (m)	*Percentage by weight in +8 mm fraction*									
		Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock	Flint and Chert	Haematite	Others
a	0.3–1.3	14	8	2	–	25	14	–	–	–	37
	1.3–2.5	18	20	4	–	15	19	–	–	–	24
	Mean	17	17	3	–	18	18	–	–	–	27
b	6.6–8.1	1	30	21	13	8	16	2	–	2	7
	8.1–9.0	2	36	30	15	4	3	1	2	–	7
	9.0–10.8	5	15	9	6	35	18	–	–	8	4
	10.8–11.5	5	16	10	17	25	25	–	–	trace	2
	Mean	4	19	13	12	24	20	1	trace	4	3

SJ 52 SE 55 5982 2424 Heath House, Stanton upon Hine Heath **Block F**

Surface level +74.1 m
Water not encountered
203 mm shell and auger
April 1976

Waste 2.3 m
Bedrock 0.7 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, silt and sand lenses, reddish brown; scattered rounded sandstone pebbles	2.0	2.3
Bridgnorth Sandstone	Sandstone, red	0.7+	3.0

SJ 52 SE 56 5936 2342 The Hazles, Stanton upon Hine Heath **Block F**

Surface level +72.4 m
Water not encountered
203 mm shell and auger
March 1976

Overburden 0.3 m
Mineral 1.0 m
Bedrock 1.9 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	'Clayey' sand with a few pebbles, yellowish red; mainly fine	1.0	1.3
Bridgnorth Sandstone	Sand to 3.1 m, red; fine and medium. Sandstone below 3.1 m, red	1.9+	3.2

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1–4	+4–16	+16–64	+64
11	88	1	0.3–1.3	11	56	31	1	0	1	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*			
	Quartz	Qaurtzite	Argillaceous rock	Igneous rock
0.3–1.3	7	82	6	5

SJ 52 SE 57 5948 2219 Muckleton Moss, Shawbury **Block F**

Surface level +67.5 m
Water struck at +59.5 m
203 mm shell and auger
March 1976

Waste 13.0 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Glacial Sand and Gravel	Sand, yellowish red	0.5	0.8
Till	Clay, sandy below 6.4 m, bluish grey becoming reddish brown: scattered rounded quartzite pebbles	12.2	13.0
Bridgnorth Sandstone	Sandstone, red	1.2+	14.2

SJ 52 SE 58 5992 2126 Muckleton, Shawbury **Block F**

Surface level +66.6 m
Water struck at +64.9 m
203 mm shell and auger
September 1976

Overburden 3.6 m
Mineral 4.5 m
Bedrock 0.6 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.4	0.4
Glacial Lake Deposits	Clay, laminated, sand lenses, silty and pebbly towards base, reddish brown	3.2	3.6
Glacial Sand and Gravel	'Clayey' pebbly sand Gravel: fine and coarse, subangular to subrounded Sand: mainly medium	4.5	8.1
Bridgnorth Sandstone	Sand, reddish brown	0.6+	8.7

GRADING

Mean for deposit *percentages*			Depth below surface (m)	*percentages*						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	$+1-4$	$+4-16$	$+16-64$	$+64$
13	70	17	3.6–4.6	9	30	55	1	3	2	0
			4.6–5.6	24	28	38	2	5	3	0
			5.6–7.1	18	15	42	2	15	8	0
			7.1–8.1	1	1	41	28	7	22	0
			Mean	13	18	44	8	8	9	0

COMPOSITION

Depth below surface (m)	*Percentage by weight in +8 mm fraction*						
	Quartz	Quartzite	Sandstone	Limestone	Argillaceous rock	Igneous rock	Pelitic rock
3.6–4.6	1	33	37	1	15	12	1
7.1–8.1	5	26	18	1	26	24	–

SJ 52 SE 59 5951 2029 Muckleton, Shawbury **Block F**

Surface level +61.2 m
Water struck at +55.2 m
203 mm shell and auger
April 1976

Waste 9.0 m
Bedrock 2.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.3	0.3
Till	Clay, bluish grey	2.2	2.5
Glacial Lake Deposits	Clay, laminated, greyish brown	6.5	9.0
Bridgnorth Sandstone	Sand, reddish brown	2.0+	11.0

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INSTITUTE OF GEOLOGICAL SCIENCES

INDUSTRIAL MINERALS ASSESSMENT UNIT

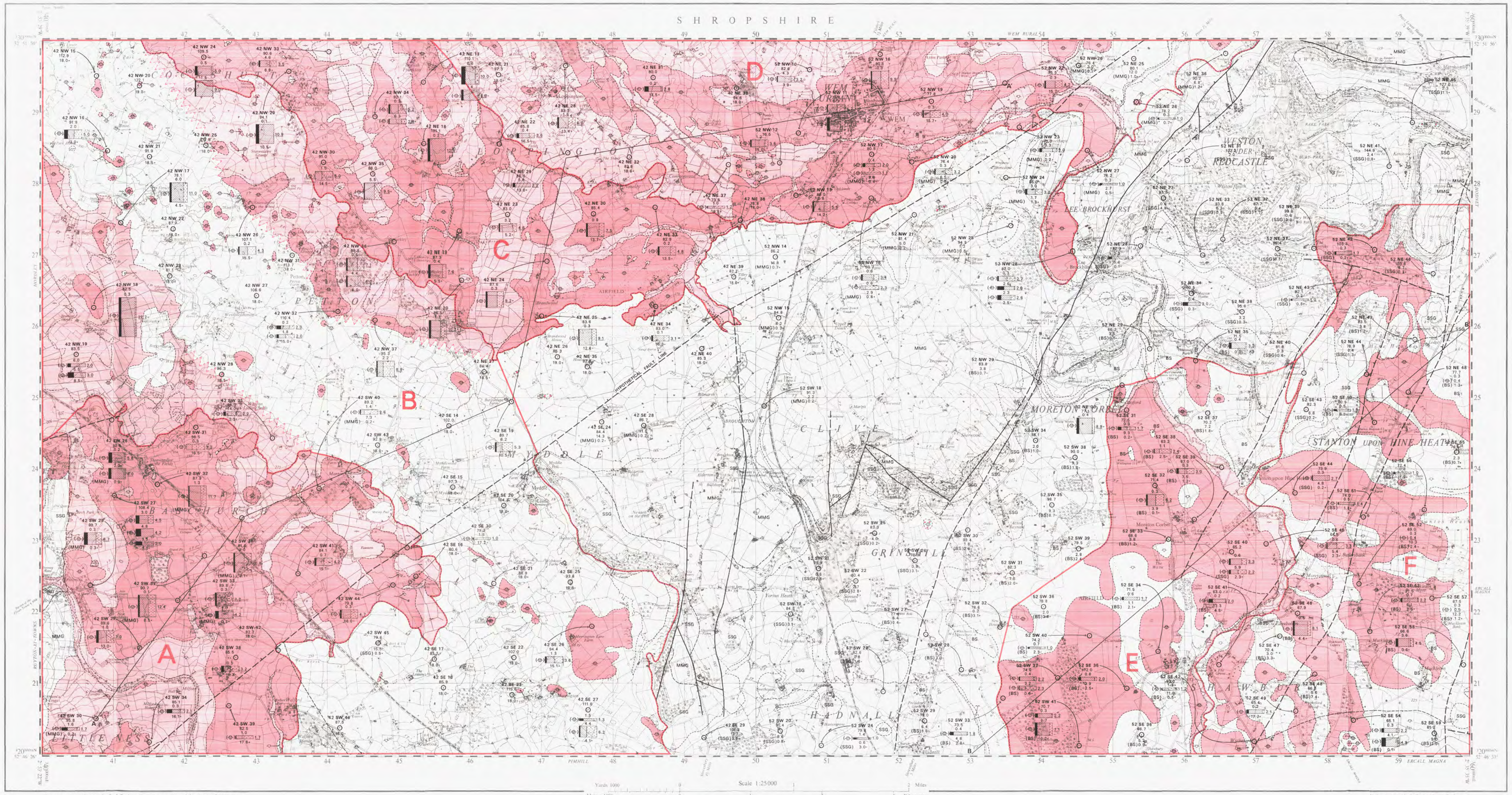
THE SAND AND GRAVEL RESOURCES OF SHEETS SJ 42 AND SJ 52 (WEM, SHROPSHIRE)

THE SAND AND GRAVEL RESOURCES OF SHEETS SJ 42 AND SJ 52 (WEM, SHROPSHIRE)

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

ORDNANCE SURVEY
SHEET SJ42 & SJ52
PROVISIONAL EDITION

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



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

Scale 1:25 000

Yards 1000 — 0 — 1 — 2 Miles

Metres 1000 — 0 — 1 — 2 — 3 Kilometres

The GRID lines on this sheet are at 1 Kilometre interval. Heights are in feet above Mean Sea Level at Newlyn.

Compiled from 6" sheets last fully revised 1900-24. Other partial systematic revision 1949 has been incorporated. Some major roads revised 1965.

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EXPLANATION OF SYMBOLS AND ABBREVIATIONS

DRIFT (RECENT AND PLEISTOCENE)

- **Peat** P-1
- **Alluvium** - humic silts and clays, sands and gravels. A-57
- **Glacial Sand and Gravel** GS-17
- **Boulder Clay** BC-11
- **Glacial Lake Deposits** GL-4

SOLID

Symbol	Formation		Group	Period
MMG			Mercia Mudstone Group	TRIASSIC
SSG	**Bromsgrove Sandstone**	undifferentiated	Sherwood Sandstone Group	TRIASSIC
	Wildmoor Sandstone			
	Kidderminster Conglomerate			
BS	**Bridgnorth Sandstone**			PERMIAN

BOUNDARY LINES

- Geological boundary, Drift
- Geological boundary, Solid
- Fault, crossmark indicates downthrow side
- Inferred boundary between recognised categories of deposits
- Resource Block boundary

Broken lines denote uncertainty

BOREHOLE DATA

SITE LOCATIONS

⊙ Industrial Minerals Assessment Unit (I.M.A.U.) Boreholes

I.M.A.U. BOREHOLES

Borehole Registration Number → 52 SW 41; 70.7 ← Surface level in metres above O.D.; Borehole Site → ⊙; 0.3 ← Overburden; (⊙) 2.2 ← Mineral (Sand and Gravel); Waste → 6.7; (⊙) 7.1 ← Mineral (Sand and Gravel); Geological Classification → (BS) 0.2+ ← Bedrock; Grading Diagram; Thicknesses in metres

Note:
(i) Figures underlined denote thicknesses used in the assessment of resources
(ii) The + sign indicates that the base of the deposit was not reached
(iii) The Geological Classification is given only for mineral and bedrock

Borehole Registration Number

Each I.M.A.U. borehole is identified by a Registration Number, e.g. 52 SW 41. The first number and letters refer to the quarter sheet and the second number to the I.G.S. serial number for that quarter. The unique designation for borehole 52 SW 41 is SJ 52 SW 41.

Grading Diagrams

Each grading diagram shows the mean particle size distribution of a distinct deposit of mineral.

Sand (+ 1/16 -4mm); Fines (-1/16 mm); Gravel (+ 4 mm)

The height of the diagram is proportional to the mineral thickness

The widths of the divisions show the proportions of **Fines**, **Sand** and **Gravel**, but small amounts of **Gravel** may be omitted or exaggerated.

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 (see Report) or absent.** CAT-A2
- **Sand and gravel not assessed.** CAT-N1

RESOURCE BLOCKS

For the purpose of assessment, the mineral is divided into Resource Blocks (see Report). Each is designated by a letter, (ie. A to F).

Horizontal sections showing the general relations of the drift deposits along the lines indicated, are shown at the base of the map.

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

Geological lines from six-inch surveys by R.W. Pocock, D.A. Wray, T.C. Cantrill (District Geologist), C.E.N. Bromehead, B. Smith and L.J. Wills in 1911-22, and from one-inch surveys published in 1855 and 1868. Minor amendments by W.J.R. Harries, B. Cannell and K. Adlam in 1978.

Sand and Gravel survey by W.J.R. Harries, M.B. Simmons, B. Cannell, R.G. Crofts and C.I. Jay in 1975-77.

R.G. Thurrell, Head, Industrial Minerals Assessment Unit.

1 : 25,000 Sand and Gravel Resource Sheet published in 1981. G.M. Brown, D.Sc., F.R.S., Director Institute of Geological Sciences, London.

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

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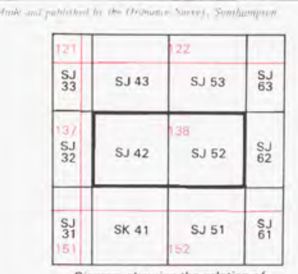

Diagram showing the relation of the National Grid 1 : 25,000 sheets with the One-inch Geological Sheets 121,122,137,138,151 and 152.