

**British Geological Survey**  
NATURAL ENVIRONMENT RESEARCH COUNCIL

**Office of the Deputy Prime Minister**  
Creating sustainable communities

# CAMBRIDGESHIRE

(comprising Cambridgeshire and City of Peterborough)

Mineral Resource Information in Support of National, Regional and Local Planning

## Mineral Resources

Scale 1:100 000

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Project Leader: D.E. Highley.  
Digital cartography by N.A. Spencer, British Geological Survey, Publication 2003.

This map comprises part of a summary of the 'Mineral Resources of the East of England Region'. For further information see [www.bgs.gov.uk](http://www.bgs.gov.uk)

**BIBLIOGRAPHIC REFERENCE**  
Harrison, D. J. and 6 others 2003. Mineral Resource Information in Support of National, Regional and Local Planning: Cambridgeshire, Cambridgeshire and City of Peterborough. British Geological Survey Commissioned Report CR0302/1216.

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**SAND & GRAVEL**

**Superficial deposits**

- Sub-alluvial: Inferred resources
- Sub-alluvial: Indicated resources (only in area assessed by BGS)
- River Terrace deposits
- Glaciofluvial sand and gravel
- Glaciofluvial sand and gravel: Concealed (only in area assessed by BGS)
- Head Gravel

Boundary of area assessed for sand and gravel at the indicated resource level

**Bedrock deposits (sand)**

- Woburn Sands Formation, Lower Greensand Group

**PEAT**

- Peat

**CHALK**

- Chalk: Higher purity (93-98% CaCO<sub>3</sub>)
- White Chalk (Subgroup)
- Chalk: Lower purity (<93% CaCO<sub>3</sub>)
- Grey Chalk (Subgroup)

**LIMESTONE**

- Limestone

**BRICK CLAY**

- Brick Clay

**REFRACTORY CLAY**

- Refractory Formation

**MINERAL PLANNING PERMISSION (as at 01/04/03)**

Source: Mineral Planning Authorities

- Surface planning permission (valid and expired)

**MINERAL WORKINGS**

- Needingworth: Active site
- Godmanchester: Inactive (including sites not yet worked, worked-out and/or restored site)
- Active rail aggregate depot

**Mineral commodity**

Sg	Sand & gravel	Peat	Peat	CR	Crushed Rock
SS	Silica Sand	Ch	Chalk		
Cl	Common & shale	Lst	Limestone		

**ENVIRONMENTAL DESIGNATIONS (as at 30/04/03)**

- National nature conservation designations (SSSIs and NNRS)
- International nature conservation designations (SACs, SPA and Ramsar sites)
- Scheduled Monument

**ADMINISTRATIVE AREAS**

- Mineral Planning Authority
- District

**PLANNING PERMISSIONS FOR MINERAL EXTRACTION**

The extent of all known and former planning permissions for the extraction of minerals is shown on the map. In respect of their current or operational status, the polygons were partly supplied as digital files by Cambridgeshire County Council and also were digitized by BGS from Planning Orders and other documents supplied by Cambridgeshire County Council and Peterborough City Council. Any queries regarding the white outline should be directed to these authorities or the address below. The polygons cover active, former and restored mineral workings and concealed deposits.

Planning Permissions represent areas where a mineral consent to work mineral has been deemed successful. A successful application has been made through the process of the Planning Permission legislation and the County Planning legislation and the consent may have been granted to a greater or lesser extent. Current planning status is not qualified on the map but is available in the underlying database.

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Peterborough City Council, Environmental Services, Bridge House, Town Bridge, Peterborough, PE1 1AB. Tel: 01753 963141. Fax: 01753 880434. Website: [www.peterborough.gov.uk](http://www.peterborough.gov.uk)

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Contact address:  
English Nature, Northminster House, Northminster, Peterborough, PE1 1UA. Tel: 01753 450000.  
Fax: 01753 450100. Web page: [www.english-nature.gov.uk](http://www.english-nature.gov.uk)

Position of Scheduled Monuments as 15th August 2003 as supplied by English Heritage.  
The majority of monuments are plotted using a centred NGR symbol. Consequently the actual area and/or length of a monument plotted by the NGR symbol is not necessarily the same as the actual monument. Monuments scheduled since that date are not accounted for. © English Heritage 2003.  
Contact address:  
English Heritage, 25 Savaile Row, London, WC2E 7ET. Tel: 020 7979 3132. Web page: [www.english-heritage.org.uk](http://www.english-heritage.org.uk)

Digital AONB boundaries © Countryside Agency 1986 (see Countryside Agency).  
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**CHALK**

Chalk is a relatively soft, fine-grained, white limestone of Upper Cretaceous age, mostly consisting of the debris from planktonic algae. Parts of the Chalk are characterized by the presence of flints which mostly follow bedding planes. Traces of clay occur throughout the Chalk and at various levels the clay occurs as calcareous mudstone (fines sands and partings). The Chalk occurs extensively in eastern and southern England where it forms an important and thick resource of 'Timberline' raw material.

The Chalk is divided into the Grey Chalk (forming the Lower Chalk) and White Chalk (forming the Middle and Upper Chalk) subgroups. The White Chalk is characterized by a relatively high clay content, particularly towards the base, and is classified as low purity (93% CaCO<sub>3</sub>). The overlying White Chalk has a lower clay content and is of higher purity (95-98% CaCO<sub>3</sub>). Flints are common in the White Chalk subgroups, particularly towards the top, where they occur as nodular bands. The White Chalk is concealed beneath substantial thicknesses of till (boulder clay), notably between new valleys. The concealed White Chalk is not shown on the map.

The extraction of chalk for agricultural lime was formerly widely practiced in the county and the chalk outcrop is marked by numerous well-defined quarries. At Barrington, Grey Chalk is extracted, together with the underlying East Clay, for cement manufacture. The plant has a capacity of 200,000 tonnes of cement clinker. White Chalk is quarried at Staple Morden, Newington, for the production of chalk wiring for use as an insulating material.

**BUILDING STONES**

The Middle Jurassic to Upper Cretaceous rock succession in Cambridgeshire has yielded a variety of building stones. The Middle Jurassic Lincolnshire Limestone Formation was extensively quarried at Barkham, Marchon, Wareson and Whitting. A thin fossiliferous limestone, known as Altonian Marble, was locally important for decorative purposes. The Upper Jurassic Cotswold limestones of Uffington were also quarried in the past. The Lower Jurassic Peterborough Member has yielded no building stone. In the Upper Cretaceous the Grey Chalk was extensively quarried at Barkham, Beach, Burwell and Barrington for block stone or 'quarry'. Flints extracted from the White Chalk across the whole outcrop were widely used in local building. Currently only the Chalk is quarried at Barrington for building stone.

**BEDROCK SAND**

Bedrock sand resources are mostly confined to the Woburn Sands Formation (Lower Greensand) of Cretaceous age. This is a narrow outcrop across the county from Gutteridge to Ely and then north-westwards to a maximum thickness of about 20 m at Gutteridge. Various areas of the outcrop are underlain by fossiliferous sandstone. The Woburn Sands Formation comprises deep-sea to shallow water, locally cemented sandstones and unconformably bedded pebbly sands. The quality and grain size of the sand is variable and is generally poorly sorted.

Sands from this formation have been worked in the past but there is currently no extraction within the county although similar deposits are worked elsewhere. In fact, just over the county boundary in Bedfordshire, these sands are a major source of building and road-making sand. The sands are used for the manufacture of bricks and for the production of concrete. The sands are also used in the manufacture of glass and for the production of paper. The sands are also used in the production of cement and for the production of lime. The sands are also used in the production of aggregate for use in the construction of roads and for the production of concrete.

**BRICK CLAY**

This clay is the term used to describe clay and mudstone used predominantly in the manufacture of bricks and, to a lesser extent, roof tiles and clay pipes. These clays may sometimes be used as a source of construction fill for filling and sealing landfill sites and for cement manufacture. The suitability of a clay for the manufacture of bricks depends primarily on its behaviour during drying, firing and firing. This will dictate the properties of the fired brick such as strength and frost resistance and, importantly, its architectural appearance.

Most firing bricks, engineering bricks and related clay-based building products are manufactured in large automated factories. These require a high quality feedstock and are increasingly dependent, therefore, on raw materials with predictable and consistent fine-grained textures. In order to achieve high yields of suitable products, growing interest exists in more consistent quality and to provide a range of feed colours and textures in an increasingly common feature of the brick industry. Continuity of supply of consistent raw materials is of paramount importance.

The Lower Oxford Clay (Peterborough Member) in the Peterborough area is one of the major sources of brick clay in Britain. Extraction is on a large scale and the resulting voids of regional importance for waste disposal. The Peterborough Member includes brackish lignite, black, argillaceous mudstones which disintegrate from the underlying members of the Oxford Clay, which are dominated by fine to pale grey silty mudstones. Peterborough Member clays offer from the other principal brick clay resources in Britain in their high inherent carbon content (about 5 per cent) which acts as an essential fuel in the firing process, thus reducing the costs of brick production.

The Peterborough Member is about 15-18 m thick at Peterborough and is extremely uniform in character. Nevertheless, the city is divided at the base to ensure consistency and to reduce local variations in clay content. The clay is generally suitable for use in the manufacture of bricks and is used for the production of concrete. The clay is also used in the production of aggregate for use in the construction of roads and for the production of concrete.

**CRUSHED ROCK AGGREGATE**

A variety of hard rocks are suitable for use as aggregates. Their technical suitability for different applications depends on their physical characteristics, such as crushing strength, resistance to impact and abrasion. Higher quality aggregates are required for coating with bitumen in road surfacing, or for paving with concrete to produce pavements. In applications such as construction fill and drainage media, less demanding specifications, lower quality materials are acceptable.

Cambridgeshire has limited resources of rock suitable for crushed rock aggregate.

**Limestone**

The Lincolnshire Limestone Formation of Middle Jurassic age (Lower Oxford) crops out in the north-west of the county, west of Peterborough, where it forms part of a prominent limestone outcrop running north to south through the county. The limestone is of the Lincolnshire Limestone in the west and north-western parts of the county. Overlying sand and gravel deposits are extracted for aggregate in the north-western part of the county, and brown mudstone in the Lincolnshire Limestone. There is currently no extraction within the county, but similar deposits are worked on a relatively small scale just over the county boundary in Northamptonshire and Leicestershire.

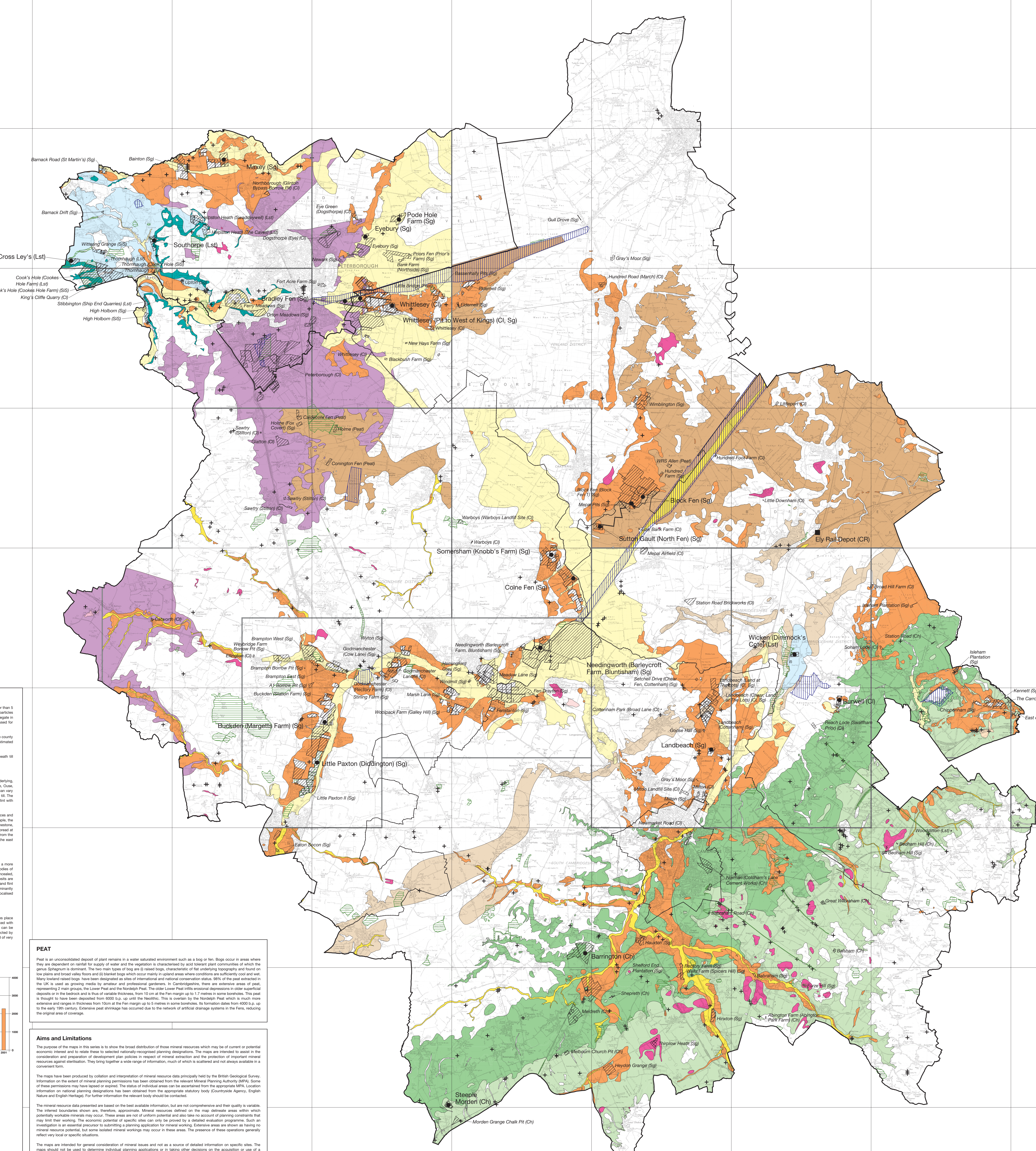
The Gault, which occurs beneath the Grey Chalk, is extracted at Barrington and forms part of the blend, with chalk, for cement manufacture. The Gault has a moderately high silica content and has been considered for use as an additive to fuller's earth, for example, cat litter. It is generally unsuitable for brick manufacture and not shown on the map.

**Sand and gravel**

The Lincolnshire Limestone of Upper Jurassic age is locally developed within Carboniferous rocks north of Cambridge. Here a relatively thin unit (about 10 m thick) of well-sorted, coarse-bedded, coarse-grained, fossiliferous limestone is developed with a sequence of mudstones. It is quarried on a small scale for agricultural lime and asphalt fill.

**Subsurface aggregate potential**

The Carboniferous Limestone lies at relatively shallow depth (under 100 m beneath the Cambridge area) and there has been some interest in exploring for deep-seated limestone aggregates. Although there are no concrete or aggregate for use in underground methods in the UK, this remains an option for the future. The limestone outcrop is defined. Several boreholes have shown the presence of limestone. However, aggregate potential is low since the limited amount of information suggests that the limestones are disintegrated and contain low quality.



**HYDROCARBONS**

**Conventional Oil and Gas**

Cambridgeshire occupies a tract of land beneath which Palaeozoic basement rocks lie at relatively shallow depth. Mesozoic cover rocks are relatively thin, with Jurassic rocks occurring in the east-central part of the county.

Most exploration for oil and gas has been in the north of the county with three hydrocarbon production wells drilled at Gilton, Whitting and Wicken between 1952 and 1971 and a few seismic reflection lines. The boreholes proved that Triassic rocks overlying Palaeozoic and Precambrian rocks. Exploration was probably directed at testing the south-western part of the Lincolnshire Limestone, in particular the Whittington Gull. The wells were plugged and abandoned as dry upon completion. Unit 2002, the only borehole in the county was PFDL3, operated by CANUK, covered the extreme south of the county, extending into Essex and a little way into Hertfordshire in the late July 2002, appeared to have been reworked. At present, therefore, Cambridgeshire appears to offer little or no hydrocarbon potential.

**Coal Mine Methane, Abandoned Mine Methane and Coalbed Methane (CBM) potential**

Strata of Palaeozoic and Precambrian age form the basement to the county of Cambridgeshire. Although boreholes in the south of the county have proved Carboniferous (Oxfordian) limestones, there have to date, been no boreholes drilled in the Lincolnshire Limestone. There have, however, been extensive workings of the Lincolnshire Limestone in the north-west. The Lincolnshire Limestone is a pre-Pennine subsiding being some 20 kilometres to the north-west. Consequently, it is thought that the county covers negligible coal gas drainage, coalmine methane and CBM development potential.

**Lowering**

The Department of Trade and Industry grants licences for exclusive rights to explore for and exploit oil and gas offshore within Great Britain. The rights granted by fractured basins do not include any rights of access, and the licensee must also obtain any current or former legislation including planning permissions. Licensees wishing to enter or drill through coal seams for coalbed methane and abandoned mine methane must also use the permission of the Coal Authority.

**BGS maps covering Cambridgeshire and Peterborough**

144	145
157	158
171	173
186	188
204	205
221	222

1:63 500 and 1:50 000 maps published  
1:25 000 map published (Industrial Minerals Assessment Sand and Gravel Resource Map)  
Current digital availability of these sheets can be found at the British Geological Survey website [www.bgs.ac.uk](http://www.bgs.ac.uk)

**Production of sand and gravel, 1979-2001**

Bar chart showing production of sand and gravel in million tonnes from 1979 to 2001. The chart shows a steady increase in production over the period, with a significant peak in 1999.

**Permitted Reserves of Natural Aggregates**

Bar chart showing permitted reserves of natural aggregates in million tonnes. The chart shows that sand and gravel reserves are significantly higher than limestone reserves.

**PEAT**

Peat is an unconsolidated deposit of plant remains in a water saturated environment such as a bog or fen. Bogs occur in areas where there are deposits on level or gently sloping land and the vegetation is characterized by tall, broad leaved sedge (Carex) and sedge (Sphagnum) plants. The two main types of bog are the raised bog, characteristic of flat underlying topography and found on low plateaus and broad river floors and the blanket bog which is found on upland areas where conditions are unfavourable for sedge and sedge. Many raised bog areas have been designated as sites of international and national conservation status. 90% of the peat extracted in the UK is used for growing media by amateur and professional gardeners. In Cambridgeshire, there are extensive areas of peat, representing 2 main groups, the Lower Peat and the Northampton Peat. The Lower Peat with little residual deposition in older superficial deposits in the Fenlands. The peat is of variable thickness from 10 cm at the Fen margin up to 1.7 metres in some bogs. This peat is thought to have been deposited from 8000 BP up until the Neolithic. This is overlain by the Northampton Peat which is much more extensive and ranges in thickness from 150m at the Fen margin up to 1 metre in some bogs. Its formation dates from 8000 BP up to the early 19th century. Extensive peat drainage has occurred due to the network of artificial drainage systems in the Fen, reducing the original area of coverage.

**Aims and Limitations**

The purpose of this series is to show the broad distribution of these mineral resources which may be of current or potential economic interest and to make these data available to planning authorities. The maps are intended to assist in the consideration and preparation of development plan policies in respect of mineral extraction and the protection of important mineral resources against disturbance. The data together with a wide range of information, much of which is unclassified and not necessarily available in convenient form.

The maps have been produced by collation and interpretation of mineral resource data principally held by the British Geological Survey on the basis of mineral planning permissions has been obtained from the relevant Mineral Planning Authority (MPA). Some of these permissions may have lapsed or expired. The status of individual areas will be ascertained from the appropriate MPA. Location information on national planning designations has been obtained from the appropriate statutory body (Countryside Agency, English Nature and English Heritage). For further information the relevant body should be contacted.

The mineral resource data presented are based on the best available information, but are not comprehensive and their quality is variable. The mineral resources shown are therefore indicative. Mineral resources defined on the map do not necessarily represent potential mineral resources. These areas are not of uniform potential and do not account of planning constraints that may limit their working. The economic potential of specific areas can only be provided as a descriptive evaluation programme. Such an evaluation is a detailed procedure for determining a planning application for mineral extraction. Detailed areas are shown as having no mineral resource potential, but some isolated mineral workings may occur in these areas. The presence of these workings generally reflect very local specific situations.

The maps are intended for general consideration of mineral issues and do not contain detailed information on specific sites. The maps should not be used to determine individual planning applications or in taking other decisions on the acquisition or use of a particular piece of land, although they may give useful background information which sets a specific proposal within context.