

**British Geological Survey**  
**NATURAL ENVIRONMENTAL RESEARCH COUNCIL**

**HAMPSHIRE**  
 (comprising Hampshire, City of Portsmouth  
 and City of Southampton)

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

**Mineral Resources**  
 Scale 1:100 000

Compiled by F.M. McEvoy, A.J. Bloodworth, D.G. Cameron, C. Simpson, G.K. Lot, D.J. Evans and D.E. Highley.  
 Project Leader: D.E. Highley.  
 Digital cartography by N.A. Spencer, British Geological Survey.  
 Published 2003.

This map comprises part of a summary of the 'Mineral Resources of South East England Region'.  
 For further information see www.mineralsuk.com

**BIBLIOGRAPHIC REFERENCE**  
 McEvoy, F.M. and others. 2003. Mineral Resource Information in Support of National, Regional and Local Planning: Hampshire (comprising Hampshire, City of Portsmouth and City of Southampton). British Geological Survey Commissioned Report CR02/03/29.

**Production of this map was commissioned and funded by the Office of the Deputy Prime Minister (Contract MPO677)**

**SAND & GRAVEL**

**Superficial deposits**

- Sub-alluvial: Inferred resources
- Sub-alluvial: Indicated resources (only in areas assessed by BGS)
- River Terrace deposits
- River Terrace deposits: Concealed (only in areas assessed by BGS)
- Storm beach deposits
- Head gravel deposits
- Head gravel deposits: Concealed

**Bedrock deposits (Construction sand)**

- Bracklesham Group: undivided (Poole Formation and Brankstone Sand Formation) (Ringwood area only)
- Whitecliff Sand Member
- Folkstone Formation

**CHALK**

- High purity chalk (93-98% CaCO<sub>3</sub>)
- Low purity chalk (< 93% CaCO<sub>3</sub>)

**BRICK CLAY**

- Reading Formation

**MINERAL PLANNING PERMISSIONS (as at 06.12.02)**  
 Source: Mineral Planning Authorities

- Surface planning permission (valid and expired)

**MINERAL WORKINGS**

- Michelmersham Active site
- Lee-on-Solent Inactive (including yet to be worked), worked-out and/or restored site
- Active marine wharf
- Active rail aggregate depot
- Planning Permission undified

**Mineral commodity**

Sg Sand & gravel CR Crushed Rock CI Clay  
 Cg Construction Sand MSG Marine sand & gravel (wharf) FI Flint  
 Ch Chalk Sst Sandstone Oil Oil

**ENVIRONMENTAL DESIGNATIONS**

- National nature conservation designations (SSSIs and NNRs)
- International nature conservation designations (SACs, SPAs and Ramsar sites)
- National Park New Forest (part) and South Downs (part), Designated but not yet confirmed
- Area of Outstanding Natural Beauty (AONB): South Hampshire Coast and parts of North Wessex Downs, Chichester Harbour, Cranborne Chase and East Hampshire
- Scheduled Monument

**ADMINISTRATIVE AREAS**

- Mineral Planning Authority
- District

**Aims and Limitations**

The purpose of this map is to show the broad distribution of those mineral resources which may be of current or potential economic interest and to relate these to selected nationally recognised planning designations. The maps are intended to assist in the conservation and preparation of development plans in respect of mineral extraction and the management of important mineral resources. They are not intended to provide a detailed assessment of mineral resources, much of which is scattered and not always available in a convenient form.

The maps have been produced by collection and interpretation of mineral resource data primarily held by the British Geological Survey. Information on the extent of mineral planning permissions has been obtained from the relevant Mineral Planning Authorities (MPAs). Some of these permissions may have expired or ceased. The status of individual areas can be ascertained from the appropriate MPA. Location information on national planning designations has been obtained from the appropriate statutory bodies: English Nature and English Heritage. For further information the relevant bodies should be contacted.

The mineral resources listed are based on the best available information, but are not comprehensive and their quality is variable. The mineral resources shown are, therefore, approximate. Mineral resources defined on the map do not necessarily indicate areas in which potentially workable reserves may occur. These areas are not of uniform potential, but they do indicate areas in which they may be found. The economic potential of specific sites can only be proved by a detailed evaluation programme. Such an investigation is an essential precursor to submitting a planning application for mineral working. Extensive areas are shown as having no mineral resource potential, but some isolated mineral workings may occur in these areas. The presence of these operations generally reflect very local specific situations.

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

**PLANNING PERMISSIONS FOR MINERAL EXTRACTION**

The details of mineral extraction and mineral planning permissions for mineral extraction are shown on the map. Information on the extent of mineral planning permissions has been obtained from the relevant Mineral Planning Authorities (MPAs). Some of these permissions may have expired or ceased. The status of individual areas can be ascertained from the appropriate MPA. Location information on national planning designations has been obtained from the appropriate statutory bodies: English Nature and English Heritage. For further information the relevant bodies should be contacted.

Planning Permissions represent areas where a commercial decision to mine mineral has been made, a successful application for mineral extraction has been submitted to the relevant authority and the permitted reserves will have been designated to a greater or lesser extent. Current planning status is not detailed on the map but is available in the accompanying database.

Contact address:  
 Hampshire County Council, Environment Department, The Castle, Winchester SO23 9JG, Tel: 01962 84141, Fax: 01962 847055, web address: www.hants.gov.uk

Portsmouth City Council, Planning Department, Civic Offices, Guildhall Square, Portsmouth PO1 2AA, Tel: 02392 822251, Fax: 02392 834665, web address: www.portsmouth.gov.uk

Southampton City Council, Development Control Services, Local Services Division, Civic Centre, Southampton SO14 2LS, Tel: 02380 228855, Fax: 02380 828207, web address: www.southampton.gov.uk

**SAND AND GRAVEL**

Sand and gravel are defined on the basis of particle size rather than composition. In current usage, the term 'gravel' is used for material that is coarser than 5 mm, with a maximum size of 40 mm, and the term sand for material that is finer, but coarser than 0.075 mm. Most sand and gravel is composed of particles that are not in silica quartz, granite and feldspar, but other rock types may occur locally.

The production of sand and gravel is an energy-intensive process. The main use of gravel is as a drainage aggregate in roads. Crushed sand and gravel can also be used for construction fill and as 'hoggin' for surfacing tracks and earth. Total production of sand and gravel was 4.2 million tonnes in 2001, of which 1.8 million tonnes was made up of mine-washed sand and gravel.

Sand and gravel resources occur in a variety of geological environments. In Hampshire, these resources fall into two main categories:

- superficial or 'soft' deposits, subdivided into river sand and gravel, storm beach gravel and downwash formation.
- bedrock, or 'solid' deposits represented by the Poole and Brankstone Sand formations of the Bracklesham Group, the Whitecliff Sand Member and the Folkestone Formation.

**Superficial deposits**

Parts of the areas assessed for sand and gravel by BGS resource surveys are identified on the map. Resources shown here are taken from these maps where available. In these areas, the possible extent of sand and gravel concealed beneath other materials is shown. These indicated resources were defined by overburden to mineral soils. Outside these areas, available data is more limited. Generally only reported sand and gravel is defined, although sub-alluvial inferred resources of sand and gravel occurring beneath modern river flood plains may be extensive in some places. However, in 2001, sub-alluvial deposits are rarely excluded from the map. Their limited width is likely to preclude economic working of sand and gravel present.

**River terrace deposits**

Terrace deposits occur at several levels in most of the major valleys in the county. These broadly comprise older, raised river terrace sequences (sometimes called 'Plateau Gravels') and younger, flood plain terrace sequences associated with, and underlying, present day alluvium.

Other important terrace occur in the south of the county adjacent to the coast, particularly in the New Forest District and bordering the Solent.

The younger, low-lying terraces are well-developed along the valleys of the rivers Avon, Test, and Beaulieu. The river terraces of the River Beaulieu in the northeast of the county form extensive spreads of sand and gravel composed principally of fine gravels, with minor amounts of sandstone and quartz and quartz rich sands. Low-lying terraces form the main deposits from which sand and gravel are extracted in the county. The coarsest terrace deposits are the Avon valley. They form extensive terrace fans ranging in thickness from 1.5 m to 7.8 m which are coarser than the higher deposits. In the west of the county, extending from Southampton to Basingstoke, the terraces of the River Test, comprising fine gravels with minor amounts of sandstone lie the valley sides up to 15 m above the present valley floor.

The high terraces of the River Avon have proven thicknesses ranging from 0.4 m to 5.3 m and comprise well-bedded gravels with occasional thin bedded sands. In the south of the county, in the vicinity of the New Forest and the Solent, extensive terraces of older river terrace deposits have also been grown. These have been deposited by the 'coldest' Solent flow which flowed across the area during a period of the Quaternary when sea levels were lower than at present. These deposits consist of fine-river gravels with an average thickness of 3.4m. Other flows have a clayey superficial layer.

**Sub-alluvial gravel**

Sub-alluvial gravels are encountered beneath the alluvium of the major valleys throughout the county and are compositionally similar to the river terrace deposits. The deposits rest on an irregular channelled surface and are thus of very variable thickness. These deposits are generally saturated and require wet working.

**Storm beach deposits**

Storm beach gravels occur along from Gosport eastwards to Hayling Island. These deposits consist almost entirely of fine, with a low proportion of sand. The form of these deposits is dictated by the sea-level surge during which gravels are laid down. They are generally made of fine to coarse fine gravels and grade seawards into sands and laminated clay clays. These deposits are not currently worked.

**Bedrock Sands**

**Bracklesham Group (Poole Formation and Brankstone Formation)**

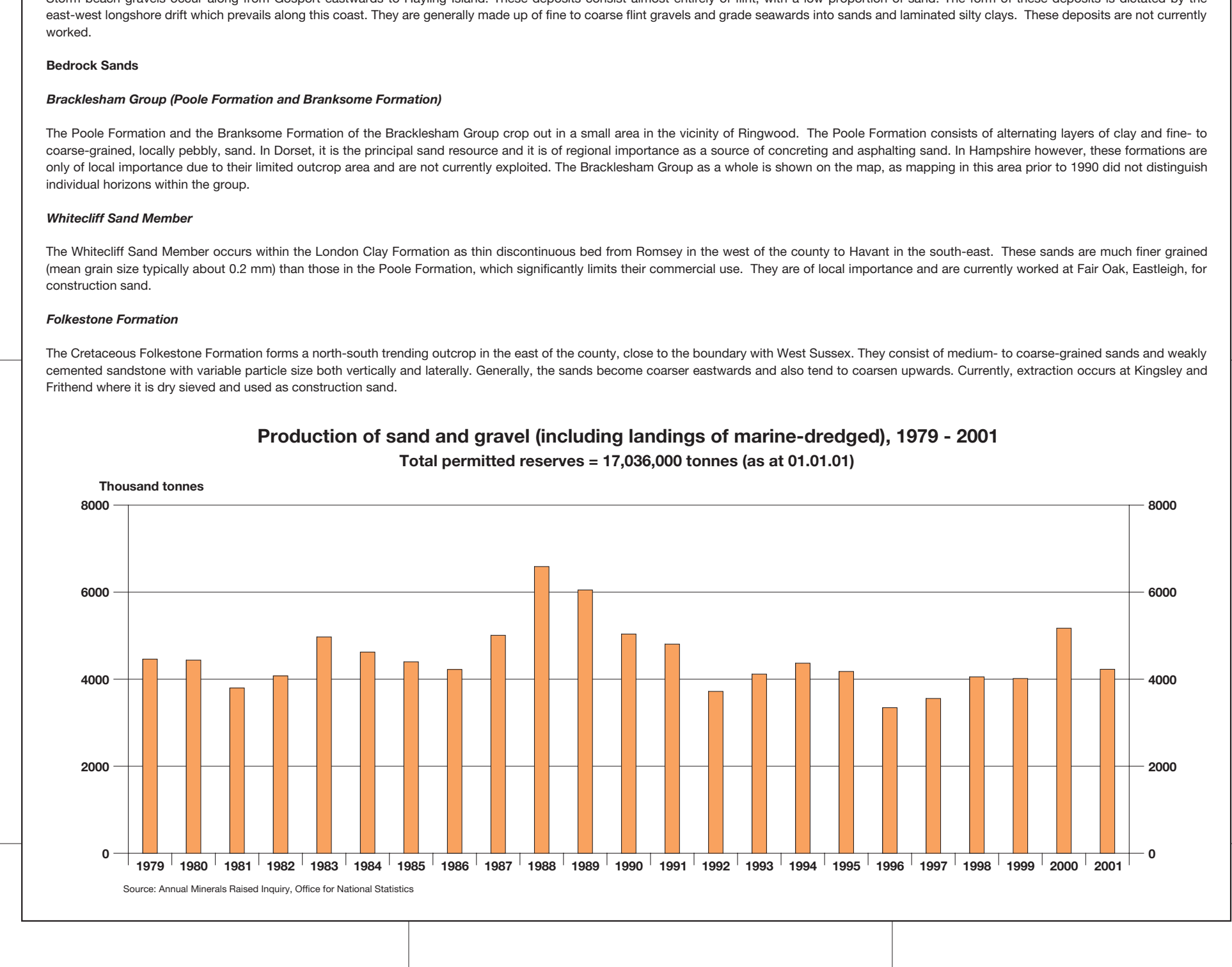
The Poole Formation and the Brankstone Formation of the Bracklesham Group occur only in a small area in the vicinity of Ringwood. The Poole Formation consists of alternating layers of clay and fine- to coarse-grained locally pebbly sand. In Dorset, it is the principal sand resource and is of regional importance as a source of roofing and roofing sand. In Hampshire however, these formations are of local importance due to their bedrock status and are not currently exploited. The Bracklesham Group as a whole is shown on the map, but mapping in the area prior to 1980 did not distinguish individual formations within the group.

**Whitecliff Sand Member**

The Whitecliff Sand Member occurs within the London Clay Formation as thin discontinuous beds from Romsey in the west of the county to Haslemere in the south-east. These sands are much finer grained than the Poole Formation and are typically about 0.2 m thick than those in the Poole Formation, which typically range from 1 m to 2 m. They are of local importance and are currently worked at Fair Oak, Basingstoke, for construction sand.

**Folkestone Formation**

The Folkestone Formation forms a north-south trending strip in the east of the county, close to the boundary with West Sussex. They consist of medium- to coarse-grained sands and weakly cemented sandstone with variable particle size both vertically and laterally. Generally, the sands contain coarse eastwards and also tend to coarsen upwards. Currently, extraction occurs at Kingsley and Fildes where it is dry washed and used as construction sand.



**BRICK CLAY**

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

Most firing bricks, engineering bricks and related industrial building products are manufactured in large automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities.

Most firing bricks, engineering bricks and related industrial building products are manufactured in large automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities.

Brick clay is produced on a relatively small scale in Hampshire. Historically, a variety of clays were extracted for brick making in many places in the county, but the main areas of extraction were in the south of the county, in the vicinity of the New Forest and the Solent, and in the west of the county, in the vicinity of the Whitecliff Sand Member. In 2000, the area used for brick making was limited to planning permission for clay extraction, four of which were within the Whitecliff Sand Member. Two brickworks remain in operation at Motton and Saltham, both with existing extraction sites. At Motton, sand and shales are extracted and mixed with the clay from the Reading Formation to produce hard-firing red and soft-mud pressed facing bricks and fireplace mantels. At Saltham, clay is extracted from the Chalkstone Clay Formation. Both brickworks are important producers of local, high quality, hand-made bricks and tiles, which are available for use where new construction is required to harmonise with other buildings. The Chalkstone Clay Formation is only of local importance and is not shown on the face of the map.

Clay is extracted from the London Clay Formation at Rowlands Castle and from the Haslemere and Osbourne Beds at Lynton for use in walling construction.

Topography reproduced from the OS map by British Geological Survey with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Unauthorised reproduction infringes Crown copyright and may lead to prosecution and civil proceedings. Licence number: G027219/0002.

Administrative boundaries are reproduced with permission from Ordnance Survey Boundary Line. Licence number: G0272671.

Digital SSSI, NNR, SPA, SAC and Marine boundaries © English Nature 2002.  
 English Nature, Northminster House, Northminster, Peterborough, PE1 1UA, Tel: 01733 455000, Fax: 01733 455000, Web page: www.english-nature.org.uk

Locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage.  
 The map shows the locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage. The map shows the locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage. The map shows the locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage.

Digital AONB and National Park boundaries © Countryside Commission 1998 (now Countryside Agency).  
 Countryside Agency, John Dower House, Crescent Place, Cheltenham, Gloucestershire, GL50 9PA, Tel: 01242 513181, Fax: 01242 584270, Web page: www.countryside.gov.uk

Published by the Office of the Deputy Prime Minister © Queen's Printer and Controller of Her Majesty's Stationery Office 2002.

This publication includes copyright material reproduced by change of name for medium for private study or circulation within an organisation. This is subject to it being reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown Copyright and the title of the publication specified.

Applications for reproduction should be made in writing to: The Copyright Unit, Her Majesty's Stationery Office, St Clements House, 1-16 Colindale Avenue, London NW9 1SD, Fax: 01832 733000 or e-mail: copyright@hms.gov.uk

**NEA FARM (Sg)**  
 Blue Haze (Chatsworth) (Sg)  
 Somerley Pit (Ashby) (Sg)  
 Somerley Pit (Ashby) (Sg)  
 Blandford Quarry (Sg)

**BRICK CLAY**

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

Most firing bricks, engineering bricks and related industrial building products are manufactured in large automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities. These represent a high capital investment and are increasingly dependent on reserves on near automated facilities.

Brick clay is produced on a relatively small scale in Hampshire. Historically, a variety of clays were extracted for brick making in many places in the county, but the main areas of extraction were in the south of the county, in the vicinity of the New Forest and the Solent, and in the west of the county, in the vicinity of the Whitecliff Sand Member. In 2000, the area used for brick making was limited to planning permission for clay extraction, four of which were within the Whitecliff Sand Member. Two brickworks remain in operation at Motton and Saltham, both with existing extraction sites. At Motton, sand and shales are extracted and mixed with the clay from the Reading Formation to produce hard-firing red and soft-mud pressed facing bricks and fireplace mantels. At Saltham, clay is extracted from the Chalkstone Clay Formation. Both brickworks are important producers of local, high quality, hand-made bricks and tiles, which are available for use where new construction is required to harmonise with other buildings. The Chalkstone Clay Formation is only of local importance and is not shown on the face of the map.

Clay is extracted from the London Clay Formation at Rowlands Castle and from the Haslemere and Osbourne Beds at Lynton for use in walling construction.

Topography reproduced from the OS map by British Geological Survey with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Unauthorised reproduction infringes Crown copyright and may lead to prosecution and civil proceedings. Licence number: G027219/0002.

Administrative boundaries are reproduced with permission from Ordnance Survey Boundary Line. Licence number: G0272671.

Digital SSSI, NNR, SPA, SAC and Marine boundaries © English Nature 2002.  
 English Nature, Northminster House, Northminster, Peterborough, PE1 1UA, Tel: 01733 455000, Fax: 01733 455000, Web page: www.english-nature.org.uk

Locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage.  
 The map shows the locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage. The map shows the locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage. The map shows the locations of Scheduled Monuments as at 10th August 2001 as supplied by English Heritage.

Digital AONB and National Park boundaries © Countryside Commission 1998 (now Countryside Agency).  
 Countryside Agency, John Dower House, Crescent Place, Cheltenham, Gloucestershire, GL50 9PA, Tel: 01242 513181, Fax: 01242 584270, Web page: www.countryside.gov.uk

Published by the Office of the Deputy Prime Minister © Queen's Printer and Controller of Her Majesty's Stationery Office 2002.

This publication includes copyright material reproduced by change of name for medium for private study or circulation within an organisation. This is subject to it being reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown Copyright and the title of the publication specified.

Applications for reproduction should be made in writing to: The Copyright Unit, Her Majesty's Stationery Office, St Clements House, 1-16 Colindale Avenue, London NW9 1SD, Fax: 01832 733000 or e-mail: copyright@hms.gov.uk

