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ENGLISH HERITAGE

Mineral Extraction and the Historic Environment

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On 27 March 2012, the Government published the [National Planning Policy Framework](#) (NPPF). The NPPF supersedes [Planning Policy Statement 5: Planning for the Historic Environment](#) (PPS5) (which replaced [Planning Policy Guidance 15: Planning and the Historic Environment](#) (PPG15) and [Planning Policy Guidance 16: Archaeology and Planning](#) (PPG16) in 2010); and [Planning Policy Statement 1: Delivering Sustainable Development](#), (PPS1) as Government Policy on the management of change to the Historic Environment in England.

The NPPF also supersedes [Minerals Policy Statement 1: Planning and Minerals](#) (MPS1); [Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England](#) (MPS2); [Minerals Planning Guidance 2: Applications, permissions and conditions](#) (MPG2); [Minerals Planning Guidance 3: Coal Mining and Colliery Spoil Disposal](#) (MPG3); [Minerals Planning Guidance 5: Stability in surface mineral workings and tips](#) (MPG5); [Minerals Planning Guidance 7: Reclamation of minerals workings](#) (MPG7); [Minerals Planning Guidance 10: Provisions of raw material for the cement industry](#) (MPG10); [Minerals Planning Guidance 13: Guidance for peat provision in England](#) (MPG13); and [Minerals Planning Guidance 15: Provision of silica sand in England](#) (MPG15) as Government Policy on Facilitating the Sustainable Use of Minerals.

Whilst some of the references in this document may now be out-of-date, English Heritage believes that it does still contain useful advice, guidance and case studies.

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Mineral Extraction and the Historic Environment



ENGLISH HERITAGE

English Heritage is the government's adviser on the historic environment. Its responsibilities include: archaeology on land and under water; historic buildings, sites and areas; designed landscapes and the historic aspects of the wider landscape. It also manages an estate of more than 400 historic properties open to visitors.

This document sets out the English Heritage position on mineral extraction and the high-level policies that will form the basis for responses and views put forward by English Heritage on any matter relating to the winning, working and safeguarding of minerals. Its principal purpose is to guide the work of English Heritage, but it will also be of interest to the wider historic environment sector, government, local authorities, the minerals industry and other organisations that care for the environment. Before setting out English Heritage's formal policy (pp 16–18) it describes the background to that policy in three sections:

- the economic context and historic significance of mining and quarrying sites and landscapes
- the impacts on the historic environment that can be caused by mineral extraction, together with advice on appropriate mitigation measures and on realising the benefits to the understanding of the historic environment that may be gained through mineral working
- the need for and supply of natural stone and other materials required to conserve the historic environment and maintain local distinctiveness.

MINERALS AND THE HISTORIC ENVIRONMENT

As well as being vital to modern economic life, minerals have played a crucial role in shaping and giving character to England's historic environment.

Background

A mineral is a natural substance, characterised by its distinctive composition, atomic structure and physical and chemical properties. In an economic context, a mineral is any solid or fluid substance that can be extracted from the earth for profit (ODPM/BGS 2005). For the purposes of this statement, the economic definition of minerals is used.

Minerals are all around us in the historic and natural environment, whether on or below the ground or in marine and other submerged contexts. From the stone in Stonehenge to the iron in Ironbridge, the extraction of minerals in prehistory through to the modern era is a story of remarkable human endeavour and ingenuity in sometimes extreme and hazardous environments. Some of our most remarkable and characteristic landscapes have been formed by millennia of mining and quarrying activity and the continued supply of some minerals is fundamental to the upkeep of our locally distinctive built

heritage. Nevertheless, the scale and technical proficiency of the modern extractive industries means that they can have a profound effect on what we value most about the historic environment. About 0.35 per cent of the area of the UK has planning permission for minerals development, including extraction sites, processing plants, minerals waste tips and landscaping schemes. Of this, around 0.12 per cent is specifically associated with aggregates production.

For its size, England is one of the most geologically diverse countries in Europe and is well endowed with many of the naturally occurring raw materials that are required for construction and industry. *Minerals Policy Statement 1* states that 'It is essential that there is an adequate and steady supply of material to provide the infrastructure, buildings and goods that society, industry and the economy needs' (DCLG 2006, para 1). This includes aggregates (mainly sand, gravel and crushed rock), a wide variety of building and roofing stone, different types of clay, energy minerals (mainly coal, oil and natural gas), industrial minerals and metal ores.

Minerals Planning Guidance 13: Guidelines for Peat Provision in England (DoE 1995) provides advice to mineral planning authorities and the peat-extractive industry on the exercise of planning control over the extraction of peat. Specific English Heritage policy on peat is set out in

1 Ironbridge, Shropshire, where the world's first iron bridge was built in 1779. Much of the historic environment is constructed from the products of the extractive industries. Jon Humble © English Heritage

2 The quarrying of aggregates as sand, gravel and crushed rock is by far the most common type of mineral operation in England, both on land and at sea, with most of the output being consumed by the domestic building and construction industry. Jon Humble © English Heritage



Landscape Advice Note 21: Use of Peat (EH 2000) and is referred to in our *Strategy for Wetlands* (EH 2002a).

In 2002 the extractive industries contributed £26 billion to the national economy, with the manufacturing and construction sectors, which are heavily dependent on minerals, contributing a further £100 billion. Currently, the quarrying of aggregates as sand, gravel and crushed rock is by far the most common type of mineral operation in England, both on land and at sea, with most of the output being consumed by the domestic building and construction industry. At approximately 240 million tonnes, the UK's annual consumption of aggregates is equivalent to about 4 tonnes per person. Other sectors, such as coal and industrial minerals, are also vital contributors to the UK economy.

The planning policy framework for mineral extraction

The main policy framework for the mineral planning system is provided by a combination of government guidance set out in the planning policy and minerals planning guidance notes (PPGs/MPGs) and their replacement planning and minerals policy statements (PPSs/MPSs), together with policies in Regional Spatial Strategies (RSSs) and Minerals Development Frameworks (MDFs).

Minerals Policy Statement 1: Planning and Minerals (DCLG 2006) emphasises that the provision of minerals must be undertaken in accord with the principles of sustainable development in terms of minerals supply, together with an integrated policy approach to considering the social, environmental and economic factors. It also states that the aim should be 'to source minerals supply indigenously, to avoid exporting potential environmental damage, whilst recognising the primary role that market conditions play' (DCLG 2006, para 15).

The government's objectives for mineral planning reflect the requirement to contribute to the achievement of sustainable development (DCLG 2006), as required by the Planning and Compulsory Purchase Act 2004. In summary, the objectives are:

- to conserve and safeguard minerals as far as possible while maintaining sufficient supply to meet the anticipated need
- to protect areas of designated landscape or conservation value

- to minimise the production of waste and to encourage efficient use of materials, including appropriate use of high-quality materials, and the use of substitute or recycled materials in place of primary minerals
- to encourage sensitive working practices during mineral extraction and the sustainable transport of minerals, and to ensure high-quality restoration and aftercare after extraction has ceased
- to secure closer integration of mineral planning policy with national policies on construction, waste management and environmental protection.

Minerals Policy Statements set out the government's national planning policies for mineral planning in England. These complement, but do not replace or overrule, other national planning policies and should be read in conjunction with other relevant statements of national planning policy (DCLG 2006, para 2), and government has confirmed that some of the Minerals Planning Guidance notes will continue in operation for the foreseeable future.

The Minerals Development Framework together with the Regional Spatial Strategy provides the policy context for mineral planning in a local authority area. These plans must also have regard to the government's planning policies for the historic environment, which are set out in *Planning Policy Guidance Note 15: Planning and the Historic Environment* (DoE/DNH 1994), and in *Planning Policy Guidance Note 16: Archaeology and Planning* (DoE 1990).

The historic influence and modern development of mineral extraction

Mineral extraction is sometimes referred to as the 'oldest industry' and certainly has been a major social and economic force throughout history. Some extraction during prehistory, for example the systematic mining of flint during the later Neolithic period (c 3000–2000 BC) at sites such as Grimes Graves in Norfolk, was already on what might be considered an 'industrial' scale (Barber *et al* 1999).

During later prehistory, the use of mineral resources (eg stone, clay and metals) for tools, weapons and ornaments increasingly supplemented, and in some circumstances superseded, the use of organic materials such as wood and bone (Peacock 1998). Furthermore, the use of stone as a durable building material also became more commonplace (Stanier 2000). The writings of several classical authors, such as the reference of

KEY STATEMENTS ON THE HISTORIC ENVIRONMENT IN NATIONAL PLANNING GUIDANCE AND POLICY

PPG 16 (DoE 1990), para 8: 'Where nationally important archaeological remains, whether scheduled or not, and their settings, are affected by proposed development there should be a presumption in favour of their physical preservation. Cases involving archaeological remains of lesser importance will not always be so clear cut and planning authorities will need to weigh the relative importance of archaeology against other factors including the need for the proposed development.'

PPG 15 (DoE/DNH 1994), para 2.4: '... authorities should have special regard to the desirability of preserving any listed building or its setting, or any features of special architectural or historic interest which it possesses, and should pay special attention to the desirability of preserving or enhancing the character or appearance of any conservation area ...'

PPG 15 (DoE/DNH 1994), para 3.3: 'There should be a general presumption in favour of the preservation of listed buildings, except where a convincing case can be made out, against the criteria set out in this section, for alteration or demolition.'

PPS 1 (DCLG 2005), para 17: 'The government is committed to protecting and enhancing the quality of the natural and historic environment, in both rural and urban areas. Planning policies should seek to protect and enhance the quality, character and amenity value of the countryside and urban areas as a whole. A high level of protection should be given to most valued townscapes and landscapes, wildlife habitats and natural resources. Those with national and international designations should receive the highest level of protection.'

MPS 1 (DCLG 2006), para 14: 'Adopt a presumption in favour of the preservation of listed buildings, nationally important archaeological remains (including scheduled monuments) *in situ* and their settings, if mineral proposals would cause damage or have a significant impact on them, unless there are overriding reasons of national importance for the development to proceed.'

3 Prehistoric flint-mining at Grimes Graves, Norfolk: the organised extraction of mineral resources began in the Neolithic period, c 4200–2000 BC. *English Heritage*
© Crown copyright



4 *Coalbrookdale by Night* – the Industrial Revolution led to an enormous increase in the extraction and processing of minerals. This painting by Philippe Jacques de Loutherbourg depicts an ironworks, the Bedlam Furnaces, on the banks of the River Severn in 1801. *Source: Science Museum, London*



Strabo in around 7 BC to the tin and lead of the 'Cassiterides' (the British Isles), indicate that the control of mineral wealth may have been a significant motive for the Roman conquest of Britain in AD 43. For tin, lead and silver, production was at its greatest during the medieval and post-medieval periods, and it is in these periods that some of England's most spectacular extractive landscapes have their origins.

The exploitation of mineral resources and allied technological innovation were fundamental to the early development of Britain's manufacturing industry during the Industrial Revolution. This transformation significantly influenced the developing relationship between town and country. Mining and quarrying were carried out either in the countryside or on the urban fringe, and the most lucrative markets developed within the nation's towns and cities. The widespread use of stone, brick and other materials for building at a time of prosperity and population growth made a major contribution to the character and local distinctiveness of the historic environment as we recognise it today. Minerals also played an important part in expanding overseas trade: during the 18th century, lead vied with iron for second place behind wool as England's major export (Barnatt and Penny 2004). The iron, steel and coal industries reached their zenith during the 19th and early 20th centuries, and at its peak in 1913, the coal industry employed one in ten of the working population (Freese 2006).

The ebb and flow of the extractive industries has always been closely linked with market forces and the balance between imports and exports. These considerations continue to influence our relationship with other countries, within an increasingly globalised and competitive market. The domestic industries have responded to these challenges with changes to working practices, such as the recent trend away from the deep mining of coal to open-cast working. Marine-dredged sand and gravel is also now an important component of domestic supply and it is government policy to continue to encourage the winning of marine aggregates, within the principles of sustainable development (DCLG 2006).

In recent years there have been considerable changes in government policy affecting the extractive industries, including the need to ensure that mineral extraction is undertaken with appropriate environmental safeguards. The recycling of waste materials is increasingly encouraged by fiscal measures such as the Aggregates Levy, which taxes the use of primary aggregates, and by

the Landfill Tax, which promotes the recycling of waste by making land filling more expensive. Significant changes in the domestic production of energy minerals (coal, oil and gas) have also occurred or are planned in relation to other forms of energy production and the impacts of climate change.

The legacy of past mining and quarrying

Past mining and quarrying activity has created a widespread and, in some areas (especially the uplands), a fundamental social, economic and environmental legacy. Its physical remains therefore form a significant part of today's historic environment. Every generation has placed its own values on this legacy with attitudes changing radically over time and continuing to change. What were initially perceived as derelict structures and land may eventually become highly valued as historic remains, particularly as the pool of surviving examples declines over time. For example, many historic structures and landscapes in areas of former lead mining are now recognised for their archaeological, ecological, geological, social and educational value, and for the contribution they make to landscape character and local distinctiveness (Barnatt and Penny 2004). By contrast, with the exception of a small number of structures that have been given statutory protection, within many of England's former coalfield areas there has been an almost wholesale eradication of the industrial buildings and landscapes associated with the coal-mining industry.

In recent years our understanding of historic mining and quarrying sites, landscapes and their associated infrastructure has developed rapidly, as part of the growing interest in the archaeology of industry. The contribution of voluntary-sector special-interest groups has been an important factor in this development. Frequently these groups have developed as a response to community associations with the mining and quarrying industries that have developed over many generations and become imbued with a strong sense of local identity and heritage.

As government's adviser on the historic environment and as a statutory consultee to local planning authorities and mineral planning authorities, English Heritage provides advice on the significance, designation and management of historic remains relating to the minerals industry.

To inform this work, English Heritage has undertaken and facilitated many research and conservation projects on mining and quarrying sites and landscapes, particularly since 2002 when it became a distributor body for the

5 Alderley Edge, Cheshire: mining for copper ore took place over a period spanning more than 3,500 years – the archaeological evidence occurs in surface and underground contexts. *Jon Humble © English Heritage*

6 Coal mining in the 1970s at Chatterley Whitfield, Staffordshire. 60 years earlier, one in ten of England's population worked in the mines. © *Sadie Bryson*

7 Caphouse Colliery, Yorkshire: formerly a working colliery, now the National Coal Mining Museum attracting 130,000 visitors per year. *Jon Humble © English Heritage.*



8 Botallack, Cornwall. The outstanding universal value of the Cornish and West Devon mining industry is recognised by its inscription as a World Heritage Site. *Jon Humble © English Heritage.*

9 Magpie Mine, Derbyshire, a 19th-century lead mine with rare, lead-tolerant mountain pansies in the foreground. In addition to their archaeological and historical

significance, mining landscapes may retain many other environmental, social and economic values. *Jon Humble © English Heritage*

10 Exhausted, yet exhilarated schoolchildren from Bonsall, Derbyshire after exploring an 18th-century mine. *Jon Humble © English Heritage*



Aggregates Levy Sustainability Fund, administered by Defra. This has provided new opportunities for carrying out research and conservation, for promoting public appreciation and enjoyment of the historic environment, and for developing good-practice guidance.

The designation of historic sites is an important factor in securing their conservation. For historic industrial remains, English Heritage's approach has normally been to select representative samples of the most important historic buildings, monuments and areas for designation on the basis of industry-specific reviews. There are, however, many nationally important sites that have yet to be designated, either because reviews have yet to be undertaken, because they have only recently become eligible for designation, or because they are very extensive and are not well suited to the detailed controls resulting from designation. In addition, designation tends to be directed towards remains surviving at ground level, rather than the still-accessible subterranean remains of mining activity, which may be of comparable national importance. Alongside nationally important remains, whether designated or undesignated, there are many locally or regionally significant historic sites and landscapes related to the extractive industries that do not meet the current criteria for national importance but which, nevertheless, are worthy of conservation.

English Heritage considers that further work is required to raise general awareness of the extent, significance and cultural value of former mining and quarrying remains if the legacy of the extractive industries is to be safeguarded. Although government policy requires the active remediation of modern, often large-scale mineral workings (DoE 1996), due consideration should be given to historic extraction sites that are a significant aspect of landscape character: English Heritage recognises that these historic remains are often also significant in terms of geological and nature conservation, requiring close co-operation with other environmental bodies. Effective conservation management also requires close collaboration with landowners, farmers and local communities, as well as the minerals industry who may have operational interests in residual mineral resources.

English Heritage recognises that the physical legacy of the extractive industries is not always environmentally benign and the retention of any historic features resulting from mining and quarrying activities should always take account of public safety considerations. In some circumstances, sites may be subject to *The Contaminated*

Land (England) Regulations (DETR 2000), or other environmental controls. Elsewhere, historic mine shafts can be a significant hazard, which needs to be addressed in conservation strategies. For example, within Derbyshire it is estimated that there are at least 50,000 shafts and the appropriate treatment of open shafts is an important issue (Entec 2007).

A proper understanding of the historic resource is a key step, and there is a need for a national research framework for the extractive industries, including recommendations for promoting their conservation, public appreciation and considerable potential as an educational resource.

IMPACTS OF EXTRACTION ON THE HISTORIC ENVIRONMENT

Like minerals, historic sites are also a vulnerable and non-renewable resource – losses cannot be re-created.

Identifying the impacts

It is a key principle of mineral planning that extraction, unlike other forms of development such as housing, roads and commercial premises, is a temporary use of land and can occur only where the minerals are found (DCLG 2006).

The Monuments at Risk Survey of England 1995 (Darvill and Fulton 1998) provided the most comprehensive data yet available on the national resource of archaeological monuments. The survey demonstrated that between 1945 and 1995, largely before the introduction of planning guidance on the historic environment, mineral extraction had a significant impact on archaeological monuments, with 12 per cent of observed cases of wholesale loss and 3 per cent of piecemeal loss of sites attributable to the extractive industries. The figures tend to underplay the fact that although modern mineral extraction is a highly regulated industry, many earlier workings were very extensive and led to the loss of archaeological sites on a landscape scale, especially as a result of sand and gravel quarrying in the river valleys of central, southern and eastern England. A significant loss of ancient monuments has also resulted from the quarrying of dimensional stone for building, open-cast coal mining and the extraction of vein minerals and various specialised deposits, for example china clay on Dartmoor. As a consequence of their geology, a tradition of mineral working is a significant feature of large areas of designated countryside, most notably

11a+11b Two views: since the 19th century, quarrying for aggregates at Breedon on the Hill, Leicestershire, has partly removed a scheduled Iron Age hillfort, and has had a significant impact on the setting of the Grade I listed church on the hilltop. The scar on the side of the hill, however, is now cherished as a local landmark. © *English Heritage*

12 China clay extraction, Cornwall: the impact of the extractive industries upon the landscape can be profound. © *Cornwall County Council Historic Environment Service*

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11b



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13 Archaeological excavation in advance of gravel extraction has revolutionised our understanding of the past. © Trent & Peak Archaeology



14 Lyndford, Norfolk: excavation in advance of gravel extraction revealed that c 50,000 years ago a mammoth (tusk in foreground) was butchered here with stone tools. © Norfolk Archaeological Unit



Areas of Outstanding Natural Beauty and National Parks.

In addition to impacts within the footprint of extraction, the surface disposal of mineral-working waste deposits can prevent (or reduce) appreciation of historic sites. The inappropriate restoration of former extraction sites can disfigure the historic character of the landscape and compromise the setting of ancient monuments and other historic places – for example important historic parks and gardens. Noise, dust and the vibration caused by the regular passage of minerals-related heavy traffic may damage the fabric of historic buildings, monuments and areas and reduce opportunities for their enjoyment and appreciation. Nevertheless, there may also be opportunities for safeguarding, investigating, maintaining or enhancing the historic environment. In accord with relevant policies, it is the role of the mineral planning authority to weigh the negative impacts against the potential benefits.

Approaches to mitigation

Where there have been unavoidable impacts on archaeological remains and the historic environment resulting from extraction, the minerals industry has a long history of responsible environmental management and enabling and supporting mitigation measures. Archaeological survey and excavation on extraction sites has made a fundamental contribution towards revolutionising our understanding of the pre-industrial and industrial past.

Close working between archaeologists, mineral planning authorities and the minerals industry has been promoted by the publication in 1982 (revised 1991) of the CBI's *Archaeological Investigations: Code of Practice for Mineral Operators*, and particularly by *Planning Policy Guidance Note 16: Archaeology and Planning* (DoE 1990). The staged approach to evaluation and archaeological impact assessment required by PPG 16 and the presumption in favour of the preservation *in situ* of nationally important remains and their settings, have provided a generally effective framework for mitigating the impacts of mineral extraction on archaeological remains. Approaches to mitigation include preservation *in situ*, archaeological supervision and control during the extraction programme (a 'watching brief'), sample excavation and recording, and the full archaeological excavation and recording of all deposits in advance of extraction. Identifying appropriate measures and resources for the assessment, analysis, publication and archiving of the results of these activities are related and necessary considerations.

Planning Policy Guidance Note 15: Planning and the Historic Environment (DoE/DNH 1994) has performed an important parallel role in ensuring consideration of the impacts of development proposals on listed buildings, conservation areas and registered parks, gardens and battlefields, as well as the implementation of mitigation measures designed to conserve the significance of historic places and ensure effective investigation and recording of unavoidably threatened historic places.

The most common irreversible impact on the historic environment *within* an area proposed for extraction is upon archaeological remains. These may include, where present, Palaeolithic archaeological remains in the body of sand and gravel deposits and industrial archaeological remains from earlier mineral workings. The most common off-site impacts are upon the setting and character of historic assets. Nevertheless, to ensure that properly informed decisions can be made on applications for planning permission and any other consents that may be required, it is essential that *all* potential impacts and their cumulative effects are comprehensively scoped and assessed – alongside the opportunities for mitigation. The requirements of the European Commission Directive (EC 1985, updated

1997) and the Environmental Impact Assessment Regulations (DETR 1999) provide a robust framework for the scoping and assessment of impacts and effects. Mineral extraction should not normally take place if it would result in the destruction of or damage to a nationally important historic site or building (whether designated or not), or where it would have an adverse effect on its setting. In other cases, adverse impacts should be reduced to a minimum. Opportunities that may arise from developments for safeguarding, investigating, maintaining or enhancing the historic environment should be identified as part of the assessment and decision-making processes that underpin strategic planning and the consideration of planning applications and any other consents that may be required.

More effective approaches to the investigation of historic sites and landscapes are continuously being developed. Dialogue between heritage professionals, mineral planners and the minerals industry is needed to ensure mitigation meets appropriate standards, as well as the test of 'reasonableness' required by the planning process. It is also important that developer-funded investigations have clearly defined objectives and are carried out within the context of national and regional historic-environment research frameworks (Olivier 1996). Jointly developed strategic approaches to understanding the significance and distribution of historic sites and landscapes will be the most effective means of identifying significant sites as early as possible in the planning process, leading to enhanced protection and the facilitation of the most cost-effective deployment of resources by the industry.

POTENTIAL IMPACTS OF MINERAL EXTRACTION ON THE HISTORIC ENVIRONMENT

- the mineral extraction area
- waste heaps
- ancillary works such as haul roads, bunds, processing plants, etc
- vibration damage and noise
- impacts on buried remains caused by mitigation planting of trees
- reduction in landscape legibility
- dewatering of surrounding landscape, with potential impacts on archaeological remains (including palaeoenvironmental deposits) and historic buildings
- subsidence
- dust and airborne pollution
- movements of heavy traffic
- long-term effects on setting, landscape character and, where present, the industrial archaeological remains of earlier workings
- compound effects, for example dewatering in conjunction with farming and irrigation

Restoration, aftercare and after-use of extraction sites

Mitigation of the impacts of mineral extraction on the historic environment has usually tended to focus on the extraction programme itself. In addition to these impacts, inappropriate restoration, aftercare and after-use can have major adverse impacts on the setting of historic assets and may significantly reduce the 'legibility' of the landscape and its historic character. By their nature, these highly visible, yet in some circumstances potentially reversible, alterations to the character, significance and value of places can often be more readily apparent and tangible than the irreversible removal of buried archaeological deposits. *Minerals Planning Guidance Note 7: The Reclamation of Mineral Workings* states that 'Restoration and aftercare should provide the means to maintain or, in some circumstances, even enhance the long-term quality of land and landscapes taken for mineral extraction' (DoE 1996, para 7). Returning the

15 Eden Project, Cornwall: the imaginative re-use of former quarries can add diversity to the landscape. © Cornwall County Council Historic Environment Service



16 Marine aggregates dredging: 21 per cent of aggregates extraction in England and Wales is from the sea bed. © BMAPA



17 Marine aggregates dredging for beach replenishment at Folkestone, Kent. © BMAPA



land to agricultural use, or creating or enhancing sites for nature conservation (EN/QPA/SAMSA 1999 and 2003) and recreational use are typical objectives, but it is important that the setting of historic assets, the historic character of landscape and the archaeology of the former extraction site itself are also given due consideration. In some circumstances, conservation objectives may require that mineral resources within previously quarried areas are safeguarded from other forms of development (DCLG 2006, Annex 3).

In order to assist decision-making by mineral planning authorities and the minerals industry in formulating its proposals, English Heritage believes that good-practice guidance needs to be developed by the heritage sector with other stakeholders for the restoration and after-use of former mineral extraction sites that takes account of the historic environment. Guidance should adopt an integrated approach to the consideration of other economic, recreational and conservation opportunities, in conjunction with the safeguards for 'nationally important monuments, and their settings' required by the planning process (DoE 1990, para 8). In this context, landscape characterisation techniques (Historic Landscape Characterisation and Landscape Character Assessment) can inform decision-making and enable appropriate restoration that reflects or harmonises with the character of the surrounding landscape. English Heritage also believes that the results of archaeological investigation, in advance of and during extraction programmes, can provide evidence of past land use that can help to inform decisions on appropriate future land use.

Marine aggregates

A substantial proportion of the UK's need for aggregates is currently provided from the seabed, and it is government policy to encourage the supply of marine-dredged sand and gravel from environmentally acceptable sources, within the principles of sustainable development (DCLG 2006). About 21 per cent of the sand and gravel used in England and Wales is supplied by the marine aggregates industry. The industry provides the only source of material for large-scale beach replenishment: during the 1990s, more than 20 million tonnes of marine aggregates were used for this purpose. Marine aggregates from English coastal waters are also exported to the near continent.

The National Heritage Act 2002 extended the statutory duties of English Heritage to include maritime archaeology in English coastal waters. This includes

prehistoric sites that were once land, submerged palaeoenvironmental deposits, coastal features such as early fish-traps, submerged structures built to defend our coast in the two world wars and shipwrecks from all ages.

In partnership with the British Marine Aggregate Producers Association, English Heritage has developed good-practice guidance (BMAPA/EH 2003) and a protocol (BMAPA/EH 2005) for identifying and understanding the archaeological issues when developing areas for aggregates dredging, and for reporting on unexpected discoveries. The environmental impact assessment of development proposals, in keeping with English Heritage guidance set out in *England's Coastal Heritage* (EH 1996) and government policy in *Marine Minerals Guidance 1* (ODPM 2002), together with effective measures for mitigation and monitoring regimes, has extended the principles of PPG 16 to the treatment of sub-tidal archaeological remains. The broader policy context for marine archaeology is set out in *Taking to the Water: English Heritage's Initial Policy for the Management of Maritime Archaeology in England* (EH 2002b).

Reducing the impact of mineral extraction on the marine historic environment can be achieved either by reducing the demand for primary aggregates, or by developing the capacity to manage the extraction process – in the majority of cases, restoration is not an option. The development of new and improved techniques for environmental impact assessment and mitigation are of particular importance.

The Aggregates Levy Sustainability Fund

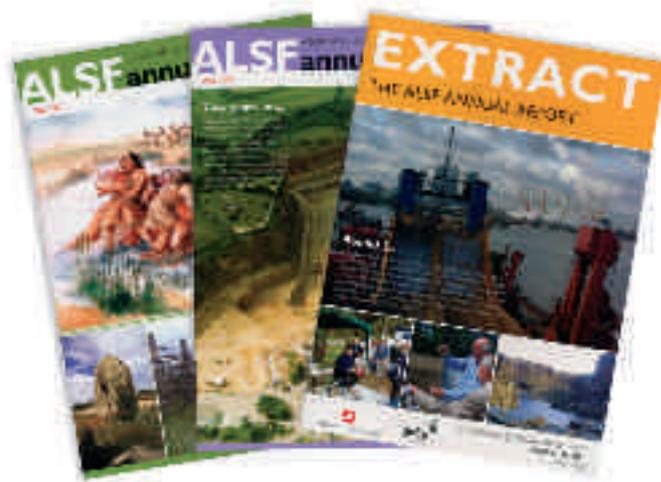
The introduction in 2002 of the Aggregates Levy Sustainability Fund (ALSF) was an important catalyst and focus for cross-sectoral dialogue. English Heritage's function as a major distributor of the ALSF has created many opportunities for closer collaborative working with the minerals industry, and for developing strategic initiatives and site-specific projects for reducing the impacts of past, current and future aggregates extraction on the historic environment.

English Heritage distributes the historic-environment funding stream of the ALSF on behalf of Defra. During the first five years of the scheme, around 200 projects were undertaken (EH 2003–2006). English Heritage has commissioned projects that assess and define the potential impact of extraction on the historic environment, both on land and at sea. These projects have significantly enhanced the availability of data to

18 Since 2002, English Heritage has funded more than 200 projects through the Aggregates Levy Sustainability Fund grant scheme.

19 Old mineral permissions: English Heritage remains concerned by the number of pre-PPG 16 permissions for extraction that do not have appropriate planning conditions for mitigating the impacts on the historic environment.
Jon Humble © English Heritage

18



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mineral planners, archaeologists and the minerals industry, and have developed and promoted new techniques and good practice for assessment and mitigation. English Heritage has also developed partnerships with local communities to conserve monuments and landscapes associated with or damaged by extraction.

Strategic planning considerations

The requirements for Strategic Environmental Assessments (SEA) and Sustainability Appraisals (SA) of development frameworks should assist with the delivery of the key policy objectives set out in PPG 15, 'to have regard to environmental considerations in preparing plan policies and proposals. The protection of the historic environment ... is a key aspect of these wider environmental responsibilities, and will need to be taken fully into account both in the formulation of authorities planning policies and in development control' (DoE/DNH 1994, para 2.1).

English Heritage, however, is concerned that better information on the implications for the historic environment needs to be fed into minerals strategic planning, SEAs and SAs. Unless this is done, the landbank approach to forward planning (ie creating a stock of planning permissions, also known as 'permitted reserves', for the extraction of minerals), could increase pressures on the historic environment as the environmentally acceptable sources of minerals reduce over time.

Wherever it is practicable, strategic archaeological-resource assessments of areas that are or may be proposed for extraction should be encouraged and used to enhance local historic environment records.

Old mineral permissions

Mineral permissions that pre-date PPGs 15 and 16 and that do not benefit consistently from appropriate planning conditions are a significant issue for English Heritage and the historic environment sector. The Planning and Compensation Act 1991 and the Environment Act 1995 require all mineral planning authorities to review and update mineral permissions granted since 1943 and to continue to review them at 15-year intervals. The objectives of the Review of Old Mineral Permissions (commonly referred to as ROMPS) are to update conditions to modern standards of environmental protection and planning control. They also aim to impose modern restoration and aftercare conditions. Although English Heritage welcomes these aims in principle, in practice the implementation of the

Act has been called into question. First, many of the old permissions, even with the most stringent of conditions, would be likely to be refused outright today on the grounds that they cannot satisfy current planning criteria. Secondly, if mineral planning authorities impose conditions that prejudice to an unreasonable degree the economic viability of the operations or asset value of the site, the quarry operator may be entitled to pursue a claim for compensation. Updated requirements for the essential mitigation of the impacts on the historic environment, either by preservation or recording through excavation, may have cost implications that could lead to claims for substantial compensation. The issue is particularly acute where old permissions pre-date the designation of nationally important assets including scheduled monuments. Mineral planning authorities do have powers to make orders which modify or revoke existing permissions, but because a permission is regarded as a property right, compensation is payable. Where a quarry has been inactive for two years or more, and it seems to the mineral planning authority that operators are unlikely to resume work, the authority may make a prohibition order to extinguish the permission. If the Secretary of State confirms the order, compensation is minimal.

MINERALS AND CONSERVATION

Traditional building materials are vital for repairing historic buildings and maintaining local character.

Maintaining historic fabric and local distinctiveness

England has been a major producer and consumer of building and roofing stone for at least 2,000 years. The diversity of local stone sources, often coupled with local masons employing their own styles, has made a fundamental contribution to England's highly variable and locally distinctive built heritage over many centuries. The use of local materials for building is recognised, particularly in rural areas, as the most effective means for achieving a visual harmony with the characteristics of the local geology and environment, and for maintaining local and regional distinctiveness. Certain stones have traditionally been exported within England for prestigious building work (for example Portland and Burlington), and there is a need to maintain their production if the requisite materials and skills are to be sustained. These factors have led to an increase in the demand for building stone, and a growing recognition and appreciation of the value of England's

stone resources. Government's national planning policy on the safeguarding and supply of stone is set out in Annex 3: Natural Building and Roofing Stone Provision in England, of *Minerals Policy Statement 1: Planning and Minerals* (DCLG 2006).

In order to conserve historic buildings and structures it is often necessary to replace some of the materials that have decayed, or been damaged or lost, while normally seeking to retain as much of the original fabric as possible. Technically suitable and compatible materials should be used – stone that closely replicates the original in its appearance, chemical, physical and mineralogical properties, strength and durability. English Heritage has published detailed technical guidance, *Identifying and Sourcing Stone for Historic Building Repair* (EH 2006a), which provides advice to architects, surveyors, engineers, building managers, contractors, conservation officers and owners on the best means of identifying and sourcing stone for the repair of historic buildings and monuments (including conservation policy on the acceptable re-use or 'salvage' of materials). The advice note stresses the importance of sampling and analysing the extant historic fabric to ensure that the type and source of stone are identified and acceptable replacements obtained; to understand the manner in which a stone is weathering or decaying; and to identify any contaminants and their possible effects on the surrounding building fabric.

These repair principles apply to the stone in the foundations, flooring, walls, roofs and architectural detail of historic buildings, the consolidation and repair of significant ruinous structures, stone sculpture, and garden and civic monuments. It is also important that the conservation and maintenance of other historic stone structures, such as the stone field walls, gateposts and stiles in rural areas, and street furniture such as cobbles, paving flags and kerbs, are carried out with due attention to the identification and sourcing of historically appropriate stone. English Heritage also supports the use of other traditional materials for new building stock, for example distinctive brickclays, where this contributes to local character and distinctiveness.

Meeting future conservation needs

This local character and distinctiveness is, however, at risk from a reduction in the number and variety of accessible building and roofing stone sources and from the loss of traditional craft skills. The qualities of colour, texture and mass that stone brings to the built environment of our towns and countryside are in danger of being significantly reduced as alternative materials are used. The cycle of

substitution with cheaper alternatives leading to declining production and increasing costs has been an issue since the 19th century. Improvements in the transport infrastructure have facilitated the importation of cheaper products from other parts of the country and beyond. When local products disappear, however, so can the local traditions and the local character of the built environment. The use of mass-produced products increases the likelihood of standardised building styles and detailing, and the transport of stone over long distances can be inconsistent with sustainability principles.

If the erosion of local and regional identity is to be arrested, measures need to be taken to ensure that local materials are both made available for use in the present and safeguarded for use in the future. Clearly there is a need for the provision of strategic and sustainable sources of stone for the conservation, repair, maintenance and improvement of historic buildings, and English Heritage working with its partners to ensure that the environmental impact of necessary quarrying is minimised. Furthermore, there is a need to ensure that appropriate training in the necessary stone-working skills is available.

Occasional conflicts can arise between conserving the historic and natural environment, perhaps most acutely in designated areas such as Areas of Outstanding Natural Beauty and the National Parks, where geological diversity has contributed to the attractiveness of the landscape and to distinctive styles of traditional architecture. *Minerals Policy Statement 1: Planning and Minerals*, Annex 3: Natural Building and Roofing Stone Provision in England (DCLG 2006) provides the national planning policy framework for assessing, 'the need for small-scale extraction of quantities of stone for the conservation and preservation of historic buildings, monuments and areas' (para 2.2) and for reconciling potentially competing conservation interests, both in the preparation of Local Development Documents and in assessing applications for permissions as part of the planning process. *Minerals Policy Statement 1 Annex 3* is also intended to assist in delivering the objectives of *Planning Policy Guidance Note 15: Planning and the Historic Environment*, Annex C (DoE/DNH 1994), which states that 'the use of appropriate local materials is very desirable. Local planning authorities should encourage their production, and may wish to build up banks of materials to assist appropriate alteration and repair.' English Heritage is required to provide specialist advice on stone sources for the conservation of the historic environment. It is, therefore, working with the British

20 The extension to this early 19th-century cottage in Derbyshire has been built from the same local materials as the original fabric.
Jon Humble © English Heritage



21 The restoration of a Collyweston slate roof during major conservation works to Apethorpe Hall, Northamptonshire.
Pat Payne © English Heritage



22 Gunnerside Bottoms, Swaledale: dry-stone walls and traditional farm buildings are invariably built from locally available natural stone.
Rob White © Yorkshire Dales National Park Authority



ROOFS OF ENGLAND: SAVE OUR STONE SLATE ROOFS

‘The decline of the stone slate industry in England means that the fundamental visual character of whole regions is at risk. For example, the unique Pennine landscapes formed by the drystone walls and stone cottages of the villages and towns with their sturdy stone roofs, achieves a visual harmony with the rocky crags of the hills. This special character is gradually being eroded by the use of unsatisfactory substitute roofing material, or different stone from other regions.’ (EH/DCC 1998.)

English Heritage and its partners are seeking to revive the stone slate industry to fulfil conservation goals at the same time as stimulating employment and local rural economies. Stone slate extraction is a low-energy industry producing a long-lasting quality product, thus meeting today’s requirements for the use of environmentally friendly materials and sustainable development. The technical advice note, *Stone Slate Roofing* (EH 2006b), provides guidance for architects, surveyors, and building owners on the repair and re-roofing of traditional stone slate roofs in England.

Geological Survey and local partners to develop a national database of stone sources that are required for the conservation of the historic environment. A proper appreciation of the key stone sources and the alternative, compatible sources that are appropriate for conservation needs is important. In practice, however, to be able to quarry a stone it must be suitable and present in sufficient quantity; acceptable to a local authority; accessible and economically viable; and found on land with a willing owner, and there needs to be an entrepreneur willing to take the commercial risk. This can be a rare combination of circumstances, so the real opportunities for securing heritage conservation may unfortunately be significantly fewer than the total number of sources of compatible stone might suggest.

In recent decades the extractive industries have become overly associated in the public mind with large-scale, long-term, highly mechanised operations, sometimes serving distant markets. Mineral extraction, however, can also be a modest activity with a small environmental footprint that serves local needs. The planning process needs to take into account that practical and viable arrangements may require either the short-term opening of small quarries or delves to provide building stone for particular restoration projects or new building in order to maintain local distinctiveness, or the intermittent extraction of stone with long periods of dormancy.

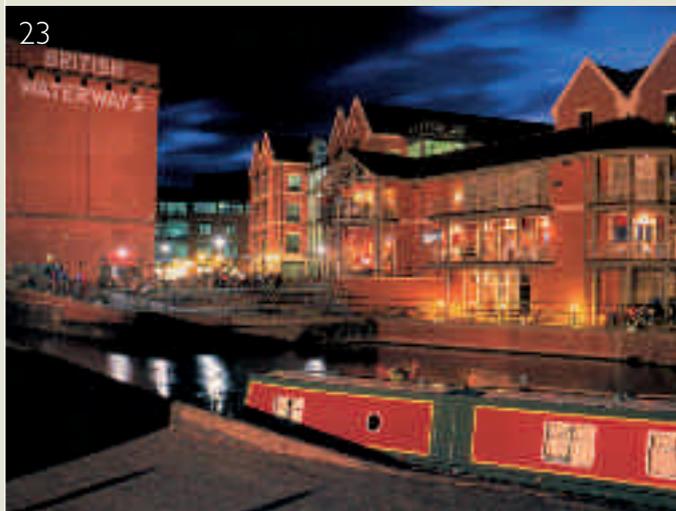
If the unique character of many of our landscapes and townscapes is to be maintained, we will have to foster a wider acceptance that mineral extraction is fundamental to making distinctive and attractive places in which to live and work.

23 Nottingham, a historic and modern urban landscape, both in brick. In addition to stone, other materials are important for maintaining local distinctiveness. © Martine Hamilton Knight

24 The extraction of Forest Marble tilestone in the Cotswolds. Delves for natural stone are typically small with low, reversible and short-lived environmental

impacts. The preparation of natural stone products helps to maintain traditional craft skills. Chris Harris © Cotswold Stone Tile Company

25 The Jerwood Centre, Grasmere, Cumbria built with random slate rubble walling. Local character and distinctiveness are enhanced by the use of traditional local materials for new buildings. Andy Love © Lake District National Park Authority



ENGLISH HERITAGE POLICY ON MINERAL EXTRACTION AND USE

This section sets out English Heritage's preliminary policy framework on the extraction and use of minerals. English Heritage will continue to develop its policy through dialogue with government, the industry and other stakeholders, keeping it under review and providing more detailed guidance where appropriate.

Sustainability and supply

Mineral resources are fundamental to the local distinctiveness and character of our historic cities, towns and landscapes, both through their use as building materials, and through a rich legacy of historic remains of mining and quarrying. English Heritage therefore supports the government's aim of maintaining the historic character of the countryside and urban areas by ensuring the supply of historically and technically appropriate building stone.

Nevertheless, mineral extraction, particularly on an extensive scale, can have adverse effects on the landscape and on historic assets situated on land and at sea. English Heritage therefore also supports the government's broad aims of securing a more sustainable use of indigenous minerals by society, without slowing economic growth. This can be achieved by greater efficiency of extraction and use and, where appropriate, the increased use of alternative materials. In this context, English Heritage believes that the conservation of the historic building stock is inherently sustainable, making an important contribution to minimising land take for minerals and landfill by reducing the demand for new building materials and disposal of demolition waste. It also supports government policy to minimise and mitigate the impacts of mineral extraction on the environment through fiscal measures such as the Aggregates Levy and the Landfill Tax.

The planning system plays a key role in balancing the needs for mineral extraction and all its environmental impacts. English Heritage believes that, in addition to national minerals planning guidance, all Minerals Development Frameworks should have regard both to the need to reduce the impact of mineral extraction on the historic environment, and the need to ensure the continued supply and use of appropriate local building stone.

English Heritage will not normally oppose mineral-related development proposals that are consistent with national, regional and local planning policies on the historic environment, and its own advice in *Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment* (EH 2008).

Safeguarding the industry's heritage

The extractive industries have played a major role in forging the character of communities, settlements and landscapes in many parts of England. The physical remains of more than 6,000 years of mineral exploitation therefore represent a significant part of England's historic environment. This significance should be recognised in the development of historic environment and minerals policy.

Important archaeological remains, historic buildings, sites and landscapes relating to the extractive industries, whether designated or not, should be protected and conserved wherever practicable, through land-management plans and initiatives and through the planning system and other regulatory systems, such as contaminated land procedures. The subterranean elements of extractive sites and mining waste should not be neglected in these considerations.

The historic remains of the extractive industries often have high nature and geological conservation value. These multiple values should be taken into account when making decisions about the restoration, conservation management and after-use of buildings, sites, species, habitats and landscapes.

Work should continue to enhance research, build capacity, develop practice guidance and promote public appreciation and enjoyment of the historic legacy of the extractive industries through a variety of funding streams, including the Aggregates Levy Sustainability Fund.

Impacts and mitigation of current and future extraction

Mineral extraction should not normally take place if it would result in the loss of or damage to a nationally important historic or archaeological site (whether designated or not) or listed building, or where it would have a significant adverse effect on its setting. In other cases, planning authorities are required to consider carefully mineral proposals within or likely to affect regional and local sites of landscape, historical and

cultural heritage importance. This should include an assessment of their relative significance, their setting and their relationship with other sites and landscapes. Any unavoidable adverse impacts should be reduced to a minimum by mitigation.

Pre-determination appraisal of the impacts of development proposals upon the historic environment, with consideration of the options and recommendations for appropriate mitigation measures, is essential to enable informed decisions on applications for planning permission and other consents. This may include Environmental Impact Assessment and an incremental approach to the undertaking of documentary research, non-intrusive and intrusive field evaluation. Such evaluation will vary from case to case depending on the nature and period of the archaeological or other remains present, the local geological conditions and past and current land use.

Planning decisions should take account of the impact of extraction on the natural and historic environment; the need for minerals and the likelihood and practicality of winning comparable materials from less-damaging locations; and the significance of environmental assets likely to be affected, the extent to which they will be affected and the reversibility of those effects. The overall footprint, scale, duration and cumulative impact of such effects are important considerations.

Where permissions for the winning of minerals are granted, mineral planning authorities should ensure that provision is made by the minerals operator to mitigate environmental impacts since the environmental footprint of mineral extraction may extend significantly beyond areas of extraction and processing. In the case of historic assets this should include mitigation of the impacts on their significance, their fabric, their setting, their amenity value and the arrangements for reinstatement. Wherever possible, opportunities should be sought to maintain or enhance the historic environment. Measures for mitigation and enhancement should be secured through planning conditions and/or Section 106 planning agreements.

Although formulated originally for the terrestrial archaeological resource, the principles of *Planning Policy Guidance Note 16: Archaeology and Planning* are also relevant and transferable to the marine environment, as reflected in the protocol and good-practice guidance developed jointly by English Heritage and the British

Marine Aggregates Producers Association.

All old mineral planning permissions as defined by the Environment Act 1995 should be reviewed (where appropriate, English Heritage is a statutory consultee in the review process) and modern conditions should be applied, where necessary, to ensure compliance with current environmental good practice and particularly Planning Policy Guidance Notes 15 and 16:

- guidelines and mechanisms should be developed for extinguishing those old permissions defined by the 1995 Act as dormant, or which have simply been inactive for a period of time, which if recommenced would have an unacceptably adverse impact on historic sites that have been designated under national and international criteria. The use of prohibition orders should play an important role in this.
- all mineral planning permissions that pre-date *Planning Policy Guidance Note 16* must be periodically reviewed by mineral planning authorities, as provided for by the 1995 Act. English Heritage believes that this process should ensure their compliance with current good practice in historic environment conservation.

Wherever possible, the transport of minerals should be managed to minimise the impact of vehicle movements upon the historic environment. In some circumstances, transport by rail and water may have a lower environmental impact than transport by road. *Transport and the Historic Environment* (EH 2004) sets out the broad principles of English Heritage's vision for a long-term national transport policy.

The restoration of former mineral-extraction sites should maintain or enhance the quality of the environment. Consideration should always be given to reinstating the historic character of the landscape and the setting of historic sites, wherever practicable. In some circumstances, however, it may be of greater public benefit to conserve a former extraction site for its historic interest.

Working in partnership with local planning authorities, the historic environment sector has a duty to provide clear information, where available, on the location and national, regional and local significance of historic assets. It also has a responsibility to ensure that investigations and mitigation measures are focused on

clearly articulated objectives and appropriate research frameworks, and are conducted in accordance with relevant professional standards and guidance. In collaboration with the minerals industry and other stakeholders, English Heritage will develop good-practice guidance relevant to the strategic planning process and the consideration of individual planning applications that may affect archaeological remains and the historic environment.

Maintaining historic fabric and local distinctiveness

Minerals make an essential contribution to the historic environment and are particularly important in defining the character and diversity of the local built environment. English Heritage supports the continued winning of certain minerals to maintain and repair significant aspects of the built heritage, and to provide materials for development that are in keeping with local character in order to conserve and enhance local distinctiveness and diversity. Importantly, this requires the maintenance of traditional craft skills and may include the controlled re-opening of historic quarries.

The conservation, maintenance and enhancement of English Heritage's own estate of historic properties will use mineral products that comply with this policy

statement and its *Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment* (EH 2008).

In accordance with *Minerals Policy Statement 1: Planning and Minerals* and particularly Annex 3, there is a need to identify Mineral Safeguarding Areas and to protect and facilitate supplies of historically and technically appropriate materials for a wide variety of landscape and townscape features, such as walling and street furniture, as well as for buildings.

Minerals Policy Statement 1 Annex 3 requires English Heritage to provide specialist advice on stone sources for the conservation of the historic environment. In doing so, English Heritage will endeavour to reconcile any potentially competing conservation interests with its partners, before judgements have to be made by local and mineral planning authorities. In cases where it believes that mineral extraction will benefit one aspect of the historic environment (such as the supply of historically authentic building materials) to the detriment of another (such as the conservation of important archaeological remains), English Heritage will provide local and mineral planning authorities with clear and transparent advice on the range of issues raised and its view on the overall merits of the application.



26 Creswell Crags, Nottinghamshire/Derbyshire: major group of archaeological caves (A) located within a former rural coalfield and adjacent to a working limestone quarry (B). Many of the coal tips are now landscaped, and the colliery 'model village' (C) and the Crags are making a major contribution to the historic environment-led economic regeneration of the area. © English Heritage

REFERENCES

- Barber, M, Field, D and Topping, P 1999. *The Neolithic Flint Mines of England*. London: English Heritage
- Barnatt, J and Penny, R 2004. *The Lead Legacy: The Prospects for the Peak District Lead Mining Heritage*. Bakewell: Peak District National Park Authority
- BMAPA/EH 2003. *Marine Aggregate Dredging and the Historic Environment: Assessing, Evaluating, Mitigating and Monitoring the Archaeological Effects of Marine Aggregate Dredging*. London: British Marine Aggregate Producers Association and English Heritage
- BMAPA/EH 2005. *Protocol for Reporting Finds of Archaeological Interest*. London: British Marine Aggregate Producers Association and English Heritage
- CBI 1982. *Archaeological Investigations: Code of Practice for Mineral Operators*. Revised 1991. London: Confederation of British Industry.
- Darvill, T and Fulton, A 1998. *The Monuments at Risk Survey of England 1995*. London: Bournemouth University and English Heritage
- DCLG 2005. *Planning Policy Statement 1: Delivering Sustainable Development*. London: Communities and Local Government
- DCLG 2006. *Minerals Policy Statement 1: Planning and Minerals*. London: Communities and Local Government
- DETR 1999. *Town and Country Planning (Environmental Impact Assessment)(England and Wales) Regulations*. London: Department of the Environment, Transport and the Regions
- DETR 2000. *Contaminated Land (England) Regulations*. London: Department of the Environment, Transport and the Regions
- DoE 1990. *Planning Policy Guidance Note 16: Archaeology and Planning*. London: Department of the Environment
- DoE 1995. *Minerals Planning Guidance Note 13: Guidelines for Peat Provision in England*. London: Department of the Environment
- DoE 1996. *Minerals Planning Guidance Note 7: The Reclamation of Mineral Workings*. London: Department of the Environment
- DoE/DNH 1994. *Planning Policy Guidance Note 15: Planning and the Historic Environment*. London: Department of the Environment and the Department for National Heritage
- EC 1985. *Directive 85/337/EC: The Assessment of the Effects of Certain Public and Private Projects on the Environment*. Brussels: European Commission
- EC 1997. *Directive 97/11/EC: Amendments to Directive 85/337/EC on the Assessment of the Effects of Certain Public and Private Projects on the Environment*. Brussels: European Commission
- EH 1996. *England's Coastal Heritage*. London: English Heritage and The Royal Commission on the Historical Monuments of England
- EH 2000. *Landscape Advice Note 21: Use of Peat*. London: English Heritage
- EH 2002a. *Strategy for Wetlands*. London: English Heritage
- EH 2002b. *Taking to the Water: English Heritage's Initial Policy for the Management of Maritime Archaeology in England*. London: English Heritage
- EH 2003–6. *Aggregates Levy Sustainability Fund Annual Reports 2002–3, 2003–4, 2004–5, 2005–6*. London: English Heritage
- EH 2004. *Transport and the Historic Environment*. London: English Heritage
- EH 2006a. *Identifying and Sourcing Stone for Historic Building Repair*. London: English Heritage
- EH 2006b. *Stone Slate Roofing Technical Advice Note*. London: English Heritage
- EH 2008. *Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment*. London: English Heritage
- EH/DCC 1998. *Stone Roofs of England*. London: English Heritage and Derbyshire County Council
- EN/QPA/SAMSA 1999. *Biodiversity and Minerals – Extracting the Benefits for Wildlife*. Peterborough: English Nature,
- EN/QPA/SAMSA 2003. *Geodiversity and the Minerals Industry – Conserving our Geological Heritage*. Peterborough: English Nature, Quarry Products Association and Silica and Moulding Sands Association
- Entec 2007. *Treatment of Disused Lead Mine Shafts: A Good Practice Guide*. Entec on behalf of Derbyshire County Council, English Heritage, Natural England, Peak District National Park Authority and Derbyshire Caving Association.
- Freese, B 2006. *Coal: A Human History*. London: Arrow
- ODPM 2002. *Marine Minerals Guidance 1: Extraction by Dredging from the English Seabed*. London: Office of the Deputy Prime Minister
- ODPM/BGS 2005. *Minerals – Earth's Natural Resources, Mineral Matters 10*. London: Office of the Deputy Prime Minister & British Geological Survey
- Olivier, A 1996. *Frameworks for the Past: A Review of Research Frameworks, Strategies and Perspectives*. London: English Heritage
- Peacock, D 1998. *The Archaeology of Stone*. London: English Heritage
- Stanier, P 2000. *Stone Quarry Landscapes: The Industrial Archaeology of Quarrying*. Stroud: Tempus

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