



Leicestershire
County Council



Leicestershire Minerals Development Framework

Core Strategy and
Development Control Policies

Background Paper

June 2008

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1. Introduction

- 1.1 This background paper presents technical and other data in support of the preparation of the Leicestershire Minerals Development Framework (LMDF). In particular, it presents an overview of more strategic considerations as part of the evidence base to the Core Strategy. It is also intended, in part, to signpost to other relevant documents published regionally and nationally that have been relied on in preparing the Core Strategy.

2. National and Regional Policy Framework

National Policy

- 2.1 National policy for minerals extraction is contained in a series of specific guidance and policy statements. These Mineral Planning Guidance (MPG) notes or Mineral Policy Statements (MPS) provide more detailed advice, although Planning Policy Guidance (PPG) notes or Planning Policy Statements (PPS) are also applicable. This chapter highlights several of the more relevant MPGs and MPSs.

[Mineral Planning Statement \(MPS\) 1: Planning and Minerals](#)

- 2.2 MPS1 is the overarching planning policy document for all minerals development in England. It provides advice and guidance to planning authorities and the minerals industry. It also aims to ensure that the needs of society and the economy for minerals is managed in an integrated way against its impact on the environment and communities. Its annexes provide more detailed guidance in relation to aggregates, brick clay, natural building and roofing stone, on-shore oil and gas, and underground storage of natural gas. It is accompanied by a practice guide that sets out how the policies in the statement might best be implemented.
- 2.3 MPS1 replaces Minerals Planning Guidance (MPG1) Note 1: General Considerations and the Development Plan System (published in 1996) and completes the replacement of Minerals Planning Guidance (MPG6) Note 6: Guidelines for Aggregates Provision in England (published in 1994).

[Mineral Planning Statement \(MPS\) 2: Controlling and Mitigating the Environmental Effects of Mineral Extraction in England](#)

- 2.4 Published in its final form in March 2005, MPS2 sets out the policies and considerations in relation to the environmental effects of minerals extraction that the Government expects Mineral Planning Authorities to consider when preparing Development Plan Documents.

Minerals Planning Guidance (MPG) Note 3: Coal Mining and Colliery Spoil Disposal

- 2.5 MPG3 provides a policy framework for Mineral Planning Authorities and the coal industry in England to ensure that the extraction of coal and disposal of colliery spoil only takes place at the best balance of community, social, environmental and economic interests, consistent with the principles of sustainable development.

Minerals Planning Guidance (MPG) Note 7: The Reclamation of Mineral Workings

- 2.6 This MPG deals with policies, consultations and conditions which are relevant to achieving effective reclamation of mineral workings. It should be read in conjunction with the general guidance in other guidance notes/statements.
- 2.7 MPG 7 sets out the contribution which reclaimed mineral sites can make to the Government's policies for sustainable development and mineral working, and for land use and other policies in the wider countryside. It advises on the scope of information which should be provided with applications for new mineral developments, to enable relevant planning conditions to be drawn up and resulting site reclamation to be achieved. It provides advice on preparation of schemes of conditions for restoration, aftercare and after-use that owners/operators of older mineral sites may need to draw up for future reviews of such sites. It emphasises the importance of the roles played by the management of site activities by mineral operators and by development control monitoring and enforcement by local authorities, in achieving successful site reclamation; advises on financial provision in relation to securing restoration of mineral workings; and contains more detailed advice, in Annexes, on soils, reclamation, aftercare and after-use.

Regional Policy

- 2.8 The Regional Spatial Strategy (RSS) forms part of the development plan and sets out a broad development strategy for the East Midlands, to which the LMDF must conform. The Regional Spatial Strategy for the East Midlands (RSS8) was published in March 2005. Policy 37 of RSS8 covers Regional Priorities for Non-energy Minerals. RSS8 also includes the East Midlands sub-regional apportionments for aggregates for the period 2001-2016. RSS8 is currently under review. A draft RRS was published in September 2006 and an Examination in Public held in May 2007. The Panel's Report was published in November 2007.

3. Minerals within Leicestershire

- 3.1 The County of Leicestershire contains extensive mineral resources, some of national importance and others of significance regionally, or locally. The County is one of the principal producers of minerals in the country. The largest extractive operations are now based around construction materials – igneous rock and limestone for crushed rock aggregates, sand and gravel, and materials for the manufacture of bricks, pipes, tiles and plasters. Table 1 below contains a list of current mineral sites within the County.
- 3.2 For the purposes of the LMDF, the minerals within the County have been grouped into categories associated with their main uses. These are aggregate minerals (crushed rock and sand and gravel), other construction minerals (include brickclay, fireclay, gypsum and building stone) and energy minerals (coal and oil/gas).

Table 1: LIST OF CURRENT MINERAL SITES, 2008

Site	District	Mineral
Croft Quarry	Blaby	Igneous Rock
Barrow	Charnwood	Gypsum
Fosse Way, Syston	Charnwood	Sand and Gravel
Mountsorrel Quarry	Charnwood	Igneous Rock
Shepshed	Charnwood	Brickclay
Husbands Bosworth Quarry	Harborough	Sand and Gravel
Shawell Quarry	Harborough	Sand and Gravel
Slip Inn Quarry, Ashby Parva	Harborough	Sand and Gravel
Cadeby Quarry	Hinckley	Sand and Gravel
Cliffe Hill Quarry	Hinckley	Igneous Rock
Desford Brickworks	Hinckley	Brickclay
Brooksby Quarry	Melton	Sand and Gravel
Long Clawson A	Melton	Oil
Long Clawson C	Melton	Oil
Bardon Quarry	North West Leicestershire	Igneous Rock
Breedon Quarry	North West Leicestershire	Limestone
Cloud Hill Quarry	North West Leicestershire	Limestone
Donington Claystocking Site	North West Leicestershire	Fireclay
Ellistown Brickworks	North West Leicestershire	Brickclay
Heather Brickworks	North West Leicestershire	Brickclay
Ibstock Brickworks	North West Leicestershire	Brickclay
Lockington Quarry	North West Leicestershire	Sand and Gravel
Longmoor Opencast Site	North West Leicestershire	Coal
Measham Brickworks	North West Leicestershire	Brickclay

Mineral Extraction in an Economic Context

- 3.3 Minerals are an important element both in the national economy and that of the County. Their exploitation can make a significant contribution to economic prosperity and quality of life. Mining and quarrying has historically played an important role in economic development but nationally, the sector has experienced severe job losses over the past couple of decades. This has been mainly due to the curtailing of the deep coal mining industry together with substantial gains in productivity through increased mechanisation and automation.
- 3.4 The Business Monitor PA1007, covering Mineral Extraction in Great Britain, indicates that 1,381 jobs were involved with mineral extraction in Leicestershire in 2006 (see Table 2 below). Of these, 56% were directly employed, 10% were contractors and 34% were drivers. The County's igneous rock quarries were the most significant employers with 60% of total employees. These figures will increase considerably if all the associated industrial suppliers, contractors and service sector jobs that are associated with the minerals industry are taken into account.

Table 2: EMPLOYMENT AT MINERAL SITES IN LEICESTERSHIRE (2006)

	ALL	Direct	Contractors	Drivers
Sand and gravel	144	82	29	33
Igneous rock	825	479	84	262
Limestone and dolomite	119	53	8	57
Clay & shale	25	8	5	12
Fireclay	38	4	4	30
Ore & other minerals	230	149	10	71
TOTAL	1381	776	140	465

Source: Business Monitor PA1007

Aggregates

Production and Consumption of Aggregate Minerals

- 3.5 Production and Sales data for aggregate minerals is collected on an annual basis, through an aggregate survey undertaken on behalf of the Regional Aggregates Working Party (RAWP). Annually published RAWP reports present annual data on production and reserves for the County back to the early 1990s. The most recent Aggregates Monitoring (AM) report published in 2008 presented data for 2006. Its data is presented in Table 3 below.

Table 3: SALES OF AGGREGATE MINERALS IN EAST MIDLANDS, 2002 – 2006

million tonnes

	2002	2003	2004	2005	2006
CRUSHED ROCK					
Limestone/Dolomite					
Derbyshire	7.210	6.122	6.945	6.886	7.511
PDNP	4.468	4.678	4.581	4.846	4.364
Leicestershire/Rutland	1.665	1.596	1.617	1.576	1.698
Lincolnshire	1.158	1.114	0.959	0.709	0.810
Northamptonshire	0.444	0.454	0.425	0.386	0.318
Nottinghamshire	0.160	0.149	0.166	0.142	0.142
TOTAL	15.105	14.112	14.693	14.545	14.843
Igneous Rock/Sandstone					
Derbyshire	0.152	0.175 (a)	0.158	0.230	0.096
PDNP	0.002	(a)	©	©	©
Leicestershire	14.256	14.071	13.017	13.912	14.519
Northamptonshire	-	-	-	-	-
TOTAL	14.409	14.246	13.176	14.142	14.615
Chalk					
Lincolnshire	0.292	0.215	0.277	0.102	0.233
TOTAL	0.292	0.215	0.277	0.102	0.233
TOTAL ROCK	29.806	28.574	28.145	28.687	29.691
SAND & GRAVEL					
Derbyshire	1.538	1.484	1.367	1.336	1.194
PDNP	-	-	-	-	-
Leicestershire	1.529	1.492	1.422	1.360	1.267
Lincolnshire	3.248	3.158	2.995	3.196	3.371
Northamptonshire	0.905	0.691	0.618	0.581	0.425
Nottinghamshire	3.504	3.942	3.886	3.598	3.653
TOTAL SAND & GRAVEL	10.725	10.766	10.287	10.071	9.910
TOTAL AGGREGATES	40.531	39.34	38.432	37.865	39.601

(a) PDNP combined with Derbyshire

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- 3.6 The following comparison of production and consumption of aggregate minerals in the County relies on data published in 2005, as part of the national 4-yearly survey. This 4-yearly survey includes analysis of the movements (imports and exports) of aggregate minerals.
- 3.7 In 2005, the East Midlands continued to be by far the largest producing region at 38.8 Mt, equivalent to 25% of total primary land-won aggregate sales in England and Wales. The East Midlands accounted for the largest volume of crushed rock aggregate sales (29%).
- 3.8 Inter-regional flows of crushed rock are significantly larger than for sand and gravel. The East Midlands was the largest exporter of crushed rock, representing 56% (16.1 Mt) of its respective total crushed rock sales. Exports of sand and gravel from the region were 2.3 Mt.

- 3.9 The South West at 23 Mt was the largest consuming region, with the East Midlands (22.3 Mt), the South East (21.2 Mt) and the North West (20.2 Mt) all very close behind.

Future Demand for Aggregates Minerals

- 3.10 The Government publishes national and regional guidelines for aggregate production in England. These figures are then broken down to Mineral Planning Authority areas by the Regional Aggregates Working Party. The latest guidelines, published in June 2003, cover the 16-year period 2001-2016 inclusive. These require the East Midlands to provide 523 million tonnes of crushed rock and 165 million tonnes of sand and gravel between 2001 and 2016.
- 3.11 In February 2004, the East Midlands Regional Assembly approved sub-regional apportionments for each of the Mineral Planning Authorities across the region. These figures have subsequently been included within the draft RSS. The sub-regional apportionment of the aggregate guidelines for the County is 262.5 million tonnes of crushed rock and 20 million tonnes of sand and gravel, a yearly average of 16.4 million tonnes and 1.25 million tonnes respectively. A comparison with the production figures presented in Table 3 above shows that annual production of crushed rock has been marginally lower than the annualised apportionment and that of sand and gravel slightly higher.
- 3.12 Annex1 of MPS1 states that, in preparing their Local Development Documents (LDDs), MPAs should make provision for the sub-regional apportionment of the current National and Regional Guidelines for land-won aggregate in the approved RSS. It goes on to say however that the sub-regional apportionments should not be regarded as inflexible and that the preparation of LDDs provides an important opportunity to test the practicality and environmental acceptability of policy proposals at the local level.
- 3.13 At the end of 2006, the landbank in the County for limestone and igneous rock, the two rock types in the Plan area that supply crushed rock, stood at around 25 years, based on a combined permitted reserve of almost 397 million tonnes. For sand and gravel, the landbank stood at about 6 years, based on a reported permitted reserve of 7.6 million tonnes.

Table 4: LANDBANKS FOR AGGREGATES Leicestershire 2006

	2006 Aggregate Sales (Million Tonnes)	Permitted Reserves at 31/12/06 (Million Tonnes)	Average Annual Sales 2004-2006 (Million Tonnes)	Landbank as at 31/12/06 (years)	2001-2016 Apportionment Figures (Million Tonnes)	Landbank based on Apportionment (years)
LIMESTONE/DOLOMITE	1.698	43.610	1.63	26.8	1.6	27.3
IGNEOUS ROCK	14.519	353.35	13.89	25.4	14.8	24
SAND AND GRAVEL	1.267	7.608	1.35	5.64	1.25	6.1

- 3.14 Boxes 1 and 2 of the Core Strategy calculate what additional requirements for extraction of crushed rock and sand and gravel will arise in the Plan period. The calculations assume that requirements after 2016 continue at the same annual average rate to 2021. This assumption is based on advice received from DCLG in October 2005. This indicated that the demand estimates on which the June 2003 guidelines are based were taken at constant value per annum from 2011 onwards. It advised that the only available option for harmonising estimates with plan periods is to extend the present figure forward at constant value to the end of the period.
- 3.15 Given the total size and range of Leicestershire's mineral resources, including the potential contribution from secondary and recycled materials, it is considered that, in principle, land provision could be made to meet the total estimated future requirements for minerals, which are established for the County in the Regional Spatial Strategy.

Crushed Rock

- 3.16 In England, rock resources suitable for road making and building purposes are generally absent south of a line between the Humber and Exe estuaries. Rock reserves within Leicestershire are the nearest to the major market in the South-East of England which means that they are of significant importance. This is reflected in the approved sub-regional aggregate apportionment which requires Leicestershire (with Rutland) to provide 262.5 million tonnes of crushed rock between 2001 and 2016. It is calculated that there is more than enough permitted rock reserves to meet requirements over the period to 2021 (see Box 1, Core Strategy), amounting to an excess of 151.5Mt.

Igneous rock

- 3.17 The oldest rocks in Leicestershire, dating from the pre-Cambrian/Cambrian periods, occur around the centre of Charnwood Forest. The bulk of these have little economic importance however as they are heterogeneous and prone to fragmentation. To the west, pre-Cambrian lavas occur in exposed masses around High Sharpley and Pedlar Tor and are worked around Bardon Hill.
- 3.18 Later folding and uplifting movement of this stratum was accompanied by the injection of masses of fluid magma which exploited fractures around the flanks of Charnwood Forest and to the south-west of Leicester. These intrusions include granodiorites and diorites of economic importance that have been extensively worked, for example, around Mountsorrel. The Charnwood Forest intrusions form two main groups: the southern group around Markfield, Bradgate and Groby which are green and pink in colour; and, the grey more basic northern group, which extends towards Shepshed. To the south-west of Leicester, isolated intrusions of granodiorite occur at a number of locations where working has taken place in the past, these include, Enderby, Earl Shilton, Huncote, Stoney Stanton and Sapcote.

- 3.19 Leicestershire's hard rock has been a source of construction material for many centuries. The Romans used it to build the Fosse Way but it was not until the beginning of major road construction that extensive quarrying began. By the end of the 19th Century all the present major igneous rock quarries except Buddon Wood, Mountsorrel were in operation.
- 3.20 Several significant developments affected the provision of igneous rock in Leicestershire during the 1990s. The formation of Midland Quarry Products Ltd., by ARC Ltd. and Tarmac plc in 1996, followed shortly afterwards by Camas Aggregates and Bardon Ltd. forming Aggregate Industries, affected the number and status of operating units, with extraction being concentrated at 4 main sites: Bardon; Cliffe Hill; Croft; and, Mountsorrel. Whitwick and Groby quarries are inactive although coating and concrete plants are maintained. Extraction at Charnwood Quarry has now ceased.
- 3.21 In view of their considerable economic importance, these rocks are worked beneath substantial thicknesses of overburden and also have extensive associated infrastructure, including rail links.
- 3.22 The quarries whilst declining in number have expanded in size considerably, and aided by rail links have become a nationally important source of crushed rock aggregate, making Leicestershire the largest producing county. Recent sales figures are detailed in Table 5.

Table 5: Igneous Rock Sales				
Year	England* (Mt)	Leicestershire (Mt)	Leicestershire as % of England Igneous Rock	Leicestershire as % of Total Regional Crushed Rock
1997	20.34	13.94	68.53	44.29
1998	17.23	13.83	80.26	44.74
1999	20.80	13.61	65.41	44.79
2000	20.44	13.70	67.02	46.57
2001	21.80	14.36	65.85	45.94
2002	21.89	14.26	65.14	48.18
2003	21.88	14.07	64.30	49.47
2004	20.17	13.02	64.55	45.77
2005	20.58	13.91	67.59	48.49
2006	22.08	14.52	65.76	48.89

Source: EMRAWP Surveys /* Business Monitor PA 1007

Limestone

- 3.23 Carboniferous limestone appears at the surface in several small isolated inliers in north-west Leicestershire near to the Leicestershire/Derbyshire border. These form locally prominent hills above the Triassic marl deposits, which increase rapidly beyond the outcrops, thus determining the limit of quarrying. At present, two of the limestone inliers are worked within Leicestershire, at Breedon Hill and Cloud Hill.
- 3.24 The Carboniferous limestone outcrops at these quarries have been worked for over a hundred years. Initially the majority of the stone was probably used for local building purposes and in lime burning for agricultural uses. A range of aggregate products for a variety of constructional end-uses has now become the main focus. Recent limestone aggregate sales figures are detailed in Table 6.

Table 6 Limestone Aggregate Sales			
Year	England* (Mt)	East Midlands (Mt)	Leicestershire** (Mt)
1997	79.34	16.52	1.20
1998	79.78	16.30	1.57
1999	75.82	16.44	1.57
2000	74.95	15.58	1.43
2001	64.79	16.35	1.75
2002	59.24	15.1	1.66
2003	55.62	14.11	1.60
2004	58.85	14.69	1.62
2005	56.64	14.54	1.58
2006	59.00	14.84	1.7

Source: EMRAWP Surveys /*Business Monitor PA1007

** with Rutland for confidentiality reasons

- 3.25 Limestone resources of Jurassic age also occur in East Leicestershire associated with deposits of ironstone. The ironstones are not considered to have any future economic significance as a source of iron, but the Jurassic deposits could be worked as a source of building stone or low quality aggregate.

Distribution of Crushed Rock

- 3.26 The 2005 AM survey indicated that 74% of Leicestershire's **crushed rock** sales were exported from the County. The amount of igneous rock transported by rail was 33%, around 4.5Mt. The main destinations beyond the East Midlands are East of England; West Midlands; London and the South East.

Table 7: Distribution of Crushed Rock sales from Leicestershire (2005)	
DESTINATION	(tonnes)
Derbyshire & PDNP	187239
Notts and Lincs	435402
Leics and Rutland	3891076
Northants	1212852
Unknown in E. Midlands	450000
Total East Midlands	6176569
North West	23315
Yorks & Humber	128057
West Midlands	2801126
East of England	3451788
London	1583640
South East	799171
South West	14297
Wales	2037
Unknown in UK	195582
Total outside E Midlands	8999013
Total Rock	15175582

Permitted Reserves of Crushed Rock

- 3.27 The 2001 AM survey indicated that as at the end of December 2001, Leicestershire had 438,920,000 tonnes of permitted reserves, which when combined with the sales figure for 2001, of 14,356,933 tonnes, made a total of 453,276,933 tonnes at the commencement of the MDF period. The MLP Monitoring Report and Key Issues consultation undertaken in May 2003, and subsequent information provided by the minerals industry, has refined this figure slightly to 449,548,246 tonnes.
- 3.28 The latest AM survey (2006) indicated that as at the end of December 2006, Leicestershire had 353.35M tonnes of permitted reserves, 264.55mt at active and 88.9MT at inactive sites. This would be sufficient for 25 years based on average sales over the 3-year period 2004-06; and 24 years based on the average annual apportionment. Although the estimated reserves at permitted sites in the County are sufficient in overall terms to meet the sub regional apportionment and landbank requirements, individual sites themselves may not be able to maintain production over the plan period without the release of additional reserves.
- 3.29 Given the level of permitted reserves in relation to the future requirements, and the ability of the existing sites to attain the required level of output, together with the objective of protecting the natural environment, it is not considered necessary to make specific provision in this LMDF for future crushed rock extraction. Extensions to existing quarries may nevertheless be appropriate for operational reasons or as an appropriate means of addressing any unforeseen circumstances affecting the landbank provision or production capacity, provided that the effects of the proposed development on the

environment and residential amenity can be made acceptable. Existing quarries are shown on the Key Diagram.

- 3.30 Quarries producing rock aggregates generally will require a longer security of reserves to justify capital investment in, for example, crushing equipment. This factor coupled with the geological limitations mean that it is not considered appropriate at the current time to contemplate any new greenfield sites for rock extraction, given the potential impact that such large scale development would involve, particularly within attractive areas of the County where development is being strictly controlled.

Sand and Gravel

Geology

- 3.31 Sand and gravel are formed by the past erosion of existing rock and the subsequent transportation and deposition of the resultant sediment either by the sea, or by water, or ice in old or existing riverbeds and floodplains. In the County, sand and gravel for aggregate use has usually been obtained from two distinct types of deposit: sub-alluvial and river terrace; and glaciofluvial.
- 3.32 The sub-alluvial and river terrace deposits of Quaternary and Recent age represent an important source of sand and gravel in Leicestershire due to their consistent grading, uniformity and lower percentage of fines. They mark an abandoned valley floor of a recent or existing river and are often arranged in a series of well-defined steps. Within Leicestershire they occur most notably in the valleys of the Rivers Trent, Soar and Wreake where historically working has taken place and still continues today.
- 3.33 Glaciofluvial deposits are the products of glacial melt waters that escaped from the ice margins. These occur in a complex series of isolated deposits in areas to the south and west of Leicester, representing sheet or delta-like formations above boulder clays, or irregular deposits within the clay series. These deposits have tended to be worked more modestly, due to their irregularity and general lower quality. The full extent of this resource is unknown due to the extensive boulder clay and other drift deposits which cover central and eastern parts of Leicestershire concealing potential deposits.
- 3.34 Deposits of solid sand and gravel sources in the form of the Triassic Bunter Pebble Beds occur in two areas in the north-west of Leicestershire, around Measham and Castle Donington. Historic low key working of these resources has taken place when economic conditions allowed. Blown sand deposits resulting from aeolian reworking of river and glacial deposits and bare Triassic bedrock occur in the Vale of Belvoir, where small-scale working has also taken place in the past.

History

- 3.35 National sand and gravel production increased dramatically during the last century, in response to an expansion in demand for its use primarily as a concreting aggregate. Prior to 1919, it was mainly used as a road metal and in traditional building practices, supplied by small, widely dispersed pits. From about 1930 onwards, pits were opened in the Trent Valley to serve local markets and by 1938 national production had increased tenfold.
- 3.36 The rise in demand led to improved plant and methods of extraction, and the development of larger units requiring higher levels of investment. This trend is evidenced by the changes that occurred from the mid 1950s to the late 1960s, when the number of pits fell nationally by 15% but their average output increased by 80%. National production peaked in 1973 with 114Mt, although this was matched more recently in 1989.
- 3.37 Major changes in the control of the industry also occurred with ownership passing from local concerns to major national and now international companies. This is reflected locally, with major companies now operating all of the sites in Leicestershire.

Recent Sales

- 3.38 Recent sales figures are detailed in Table 8.

Table 8 Sand and Gravel Sales				
Year	England* (Mt)	East Midlands Region (Mt)	Leicestershire (Mt)	Leicestershire as % of Regional Sales
1997	63.01	11.31	1.67	14.77
1998	61.24	10.00	1.03	10.30
1999	62.95	10.37	0.91	8.78
2000	63.20	10.09	1.26	12.49
2001	62.68	10.15	1.40	13.79
2002	71.32	10.72	1.53	14.27
2003	69.38	10.77	1.49	15.14
2004	74.48	10.29	1.42	13.8
2005	70.84	10.07	1.36	13.5
2006	69.03	9.91	1.27	12.82

Source: EMRAWP Surveys & AM 2001/*Business Monitor PA1007

- 3.39 As at 31/12/2007, there were 7 permitted sites in Leicestershire, of which 1 is yet to commence extraction - Syston (Fosse Way), whilst no extraction has taken place recently at Slip Inn Quarry. Ongoing operations are at Brooksby, Cadeby, Husbands Bosworth, Lockington, and Shawell. Three of these sites

- involve the working of alluvial and river terrace deposits, while the remainder work glacial deposits.
- 3.40 All of the existing operations are located in close proximity to the County's lorry route network; and the road traffic generated generally avoids residential areas and minor roads.
- 3.41 These sites are well located in proximity to Principal Urban Areas and proposed urban growth areas, in particular those at Loughborough, Coalville, north-east Leicester and Hinckley. and represent a good distribution throughout the County, with Lockington to the north west; Cadeby to the west; Shawell to the south; Husbands Bosworth to the south east; and Brooksby to the north east of Leicester. The currently inactive Slip Inn Quarry lies to the south of Leicester, between Leicester, Hinckley and Lutterworth.
- 3.42 Brooksby is the site closest to the Leicester Urban area. Workings have historically been closer in the Soar valley north to Sileby and the Wreake valley towards Melton. This area has been largely worked out. A planning permission immediately south of Leicester was abandoned in the 1990s due to the nature/variability of reserves. Brooksby was effectively allocated in the Minerals Local Plan (1995) as replacement for exhausted operations to the north of the city. The lack of sites to the east of the City and the north east of the County reflect the general paucity of potential reserves and the low demand in these predominantly rural areas.
- 3.43 Sand and gravel operations within Leicestershire tend to serve local markets, largely within the County, although some material travels to neighbouring counties and regions from sites located close to the County boundary. All material is transported by road.
- 3.44 The 2005 AM survey indicated that the destination of 63.5% of Leicestershire's sand and gravel sales was unknown. Of the known destinations, 68.4% of sales were within Leicestershire/Rutland. The main destinations for material exported beyond the County were adjoining areas, namely the West Midlands (18.9%), Derbyshire (6.6%) and Northamptonshire (5.2%). The AM 2001 survey had indicated that 17.9% of Leicestershire's sand and gravel was exported to the West Midlands, with the remainder of the material used in the East Midlands.

Table 9: Distribution of Sand and Gravel from Leicestershire (2005)	
DESTINATION	(tonnes)
Derbyshire & PDNP	32596
Notts and Lincs	1088
Leics and Rutland	339878
Northants	25617
Unknown in E. Midlands	862989
Total East Midlands	1262168
Yorks & Humber	3218

West Midlands	94049
South East	41
Total outside E Midlands	97308
Total Sand & Gravel	1359476

Productive Capacity

- 3.45 Based on average sales (2001-2005), existing sites (excluding Brooksby which has only recently become operational) would be capable of producing the required sub-regional apportionment production of 1.25Mt per annum. It is anticipated that the Brooksby site could produce 300,000 tonnes p.a. in addition to this. If future extraction is concentrated at these main sand and gravel sites, then all of Leicestershire's sand and gravel needs in the immediate future could be met without releasing any additional land for the establishment of new sand and gravel operations.
- 3.46 Table 10 below indicates the potential production capacity of each site based on information submitted with recent planning applications. This suggests that these sites have a total potential capacity of between 1.5 and 1.7 million tonnes. This compares with the current sub-regional apportionment figure of 1.25 million tonnes per annum.

Table 10: Potential Sales Output

Site	Tonnage*
Cadeby	250-300,000
Husbands Bosworth	150,000
Lockington	300,000
Shawell	400-500,000
Slip Inn	120,000
Brooksby	300,000
Total	1.52 – 1.67 Mt

*from recent planning applications

- 3.47 The 2006 AM survey indicated that Leicestershire had 7,608,000 tonnes of permitted reserves as at the end of December 2006, 3,521,000 at active sites and 4,087,000 at inactive sites. This would be sufficient for 5.6 years based on average sales over the 3-year period 2004-06; and 6.1 years based on the average annual apportionment.
- 3.48 Table 11 below compares the annual production required to deliver the apportionment with potential annual production from individual sites. Potential annual production and remaining permitted reserves for each site have been based on information provided in recent planning applications adjusted to provide a 'best fit' to the required annual apportionment. No contribution is included from the currently inactive operation at Slip Inn Quarry.
- 3.49 The relatively quick rate at which sand and gravel is extracted results in sites becoming exhausted and replacement ones coming forward more frequently than in the case of hard rock operations. Existing sites would not be able to meet the County's future requirements without the benefit of extensions to

their currently permitted operations. The Table indicates that, unless additional reserves are released, there will be a potential shortfall in annual output from 2011.

Table 11: Potential production 2007-2021

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cadeby	200	200	200	200	200	200	200	200	200	200	200	XX			
Hus.Bos.	80	80	100	100	100	100	100	100	100	XX					
Lockington	250	250	250	250	XX										
Shawell	450	450	450	450	450	450	450	450	450	450	XX				
Slip Inn															
Brooksby	180	170	250	250	250	250	250	250	250	250	250	250	250	XX	
Fosse Way	90	100													
TOTAL	1.25	1.25	1.25	1.25	1.0	1.0	1.0	1.0	1.0	0.9	0.45	0.25	0.25	0	0

3.50 The minerals industry has identified potential extensions to sand and gravel extraction operations at all 5 of the existing sites referred to above, together with extensions to the inactive site at Slip Inn Quarry and the recently exhausted operation at Huncote Quarry. In total, the amount of sand and gravel reserve associated with these potential extensions total some 14Mt, which significantly exceeds the identified shortfall over the MDF period.

3.51 An initial assessment of these potential extensions suggests that not all the sites would be environmentally acceptable, so that a strategy of providing further land in the form of acceptable extensions would involve the probable closure of some sites. It is nevertheless anticipated that more than sufficient sand and gravel reserves could be released through site extensions to meet requirements over the MDF period.

3.52 Potential additional reserves have been identified as extensions to operations at Cadeby, Husbands Bosworth, Lockington, Shawell and Brooksby. The quantities involved are as follows:

- Brooksby 1,600,000 tonnes
- Cadeby 1,150,000 tonnes
- Husbands Bosworth 1,380,000 tonnes
- Shawell 1,380,000 tonnes
- Lockington 3,900,000 tonnes

3.53 Table 12 illustrates the potential effect of releasing these reserves. Whilst this suggests that that may still be a shortfall towards the end of the Framework period, there would still be some unworked reserves at four of the sites as at 2021. In addition, no provision is included from Slip Inn Quarry. Work carried out by BGS to assess mineral deposits of economic importance in the County also suggests that further potential resources exist in vicinity of existing sites.

Table 12: Potential production with release of additional reserves 2007-2021

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cadeby	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200+
Hus.Bos.	80	80	100	100	100	100	100	100	100	100	100	100	100	100	100+
Lockington	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250+
Shawell	450	450	450	450	450	450	450	450	450	450	450	450	450		
Slip Inn															
Brooksby	180	170	250	250	250	250	250	250	250	250	250	250	250	250	250+
Fosse	90	100													
TOTAL	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	0.85	0.85

Potential additional reserves shown in **bold**
+additional reserves remain to be worked.

Alternative Sources of Aggregate Minerals

- 3.54 It is Government policy to encourage the greatest possible use of alternative (secondary and recycled) materials so as to reduce the amount of primary aggregate extracted. The National and Regional Guidelines for Aggregates Provision in England (June 2003) take into account the proportion of aggregates which will be derived from secondary and recycled sources and sets targets for the use of these materials. The forecast assumed that alternative aggregates would meet, but not exceed, a target for England of 60mt per annum by 2011. The East Midlands Region is expected to provide 95mt of alternative materials of the period 2001 – 2016. No apportionment is made of this amount to sub-regional areas.

Other Construction Minerals

Brick Clay

- 3.55 The majority of clay used for brickmaking in Leicestershire is derived from Keuper Marl, a widespread series of fine deposits laid down in shallow ephemeral lakes within an enclosed desert basin during the late Triassic period some 150 million years ago. The Keuper Marl often lies directly upon Coal Measures and much older rocks, as these were uplifted and folded during a mountain building period and then deeply eroded before being covered by the younger rocks. The Keuper deposits have suffered little folding and are generally regular, their thickness varies (up to 180 metres) and extends to form a vast resource.
- 3.56 Bricks have been made in Leicestershire for over 500 years and both Kirby Muxloe Castle and Bradgate House are late 15th Century examples of the use of local products. By the 17th Century, brick was commonly being used as a replacement for timber and stone, especially in the western part of the County where the Keuper Marls were readily available. 19th Century industrialisation and expansion of the railways opened up distant markets, leading to the establishment of a brick-making industry in a zone fringing the Leicestershire Coalfield. Brickworks became established at colliery sites, taking advantage

of the plentiful coal supplies to fire the kilns and were operated by the Colliery Companies for many decades.

- 3.57 Over the past 30 years a major rationalisation of the brick industry has seen the number of clay pits and brickworks decline. Advances in brickmaking technology have allowed larger, fully mechanised works to take advantage of economies of scale and serve widespread markets. In Leicestershire at the beginning of the 20th century more than 25 brickworks existed. Presently there are 6, all with adjacent clay pits, operated by 3 different companies.
- 3.58 Most of the clay pits worked in Leicestershire occur where the Keuper Marl overlies productive Coal Measures. The industry usually works several horizons in combination and favours the lower part of the Group, blending clays to achieve improved durability and to produce a wider range of colours and textures. The behaviour of clay during manufacture is key in determining its suitability for brick use, as this will dictate properties including strength, frost resistance and architectural appearance.
- 3.59 Nationally, over 90% of clays extracted are used in brick-making although clays are also used in the manufacture of pipes and tiles, and in the engineering of landfill sites, flood defences and as a general bulk fill material. There are no national guidelines to indicate future demand for brick clay and therefore, recent levels of production are the best indicator of demand. Recent sales figures are detailed in Table 13. This shows that since 1998 sales have been relatively stable, with total production in the County generally between 600,000 and 700,000 tonnes per annum. The market is nevertheless still sensitive to the cyclic demands of the construction industry.

Table 13 Clay and Shale Sales for Bricks, Pipes & Tiles			
Year	England (000t)	East Midlands Region (000t)	Leicestershire (000t)
1998	7,888	1,273	589
1999	7,801	1,472	637*
2000	7,207	1,365	610*
2001	7,055	1,412	634*
2002	6,579	1,368	683*
2003	6,717	1,335	^
2004	7,303	1,298	^
2005	7,393	1,353**	730
2006	6,515	1,340	680

Source: Business Monitor PA1007 & * from LCC Clay Survey 2004.

^ withheld to avoid disclosure

** with construction uses

- 3.60 National planning policy for brick clays has been published in the form of Annex 2 to MPS1. This confirms the need to provide site specific landbanks equivalent to 25 years of production to support investment in new or existing manufacturing plant. The 6 current brick manufacturing works in Leicestershire are listed in table 14 below. The table also indicates the actual landbank of clay supply for each works as at 2003 and 2008. This shows that not all of the works are currently supported by a 25 year landbank of permitted reserves of clay.
- 3.61 The increase in reserves at Measham between 2003 and 2008 is as a result a planning permission granted in July 2007 for the extraction of an additional 3.4 million cubic metres of clay. The decrease at Desford and Heather reflects the number of intervening years, while the significant decline at Shepshed is as a result of a reassessment of reserves. The permitted reserves at Shepshed do not take into account all of the land allocated for extraction in the Minerals Local Plan (1995). The remaining allocated land contains some 127,000 cubic metres of clay (215,000 tonnes), which would provide approximately 20 years' supply for the works at recent production levels.

Table 14: Brickclay Operations within Leicestershire

Site	Operator	Reserves @1.1.03 (No. of Years)	Reserves @1.1.08 (No. of Years)
Desford	Hanson	25	19
Ellistown	Ibstock Brick	85	
Heather	Hanson	23	19
Ibstock	Ibstock Brick	35	
Measham	Hanson (formerly Redbank)	20	24
Shepshed	Charnwood Brick	35	12

- 3.62 In October 2006, Hanson Building Products stopped production at Heather Brickworks due to market forces and general overproduction of the product range within which the brickworks operated. The Company has indicated that the brickworks are not closed permanently, but have been 'mothballed' as a temporary closure with a view to reopening when the market position improves. In the meantime, the Company proposes to export clay to other brickworks (including Desford) for blending purposes.
- 3.63 As part of a survey carried by the County Council in 2004, clay operators were requested to provide information regarding potential additional reserves. Potential reserves were identified adjacent to Measham Brickworks, the extraction of which has subsequently been permitted. Potential reserves also exist in the vicinity of Ibstock and Shepshed Brickworks but were not specifically identified as the operator did not own or have options to work them. No potential reserves were identified in respect of the other works.

Fireclay

- 3.64 Fireclays are formed from the fossil soils underlying coal seams (seatearths). Most are relatively thin and would not be economic to extract on their own. Surface coal mining sites are therefore the main source of supply nationally. A sequence of quality pottery, pipe and refractory clays occurs within the upper seams of the Middle Coal Measures of North West Leicestershire. Although restricted to a relatively small basin between Swadlincote and Moira, the fireclay deposits have been recognised as an important national source.
- 3.65 Fireclays are used principally in the production of buff and pale-bodied engineering and building bricks / pavements, clay pipes and ceramics. Approximately 20% of the bricks manufactured in the UK contain fireclay which enables the bricks to meet high specifications for water absorption and frost resistance. Fireclay is mixed with clays/shales to manufacture clay pipes, where it adds plasticity and widens the vitrification range. The high alumina and low alkali content of some fireclays also makes them suited for the production of refractory ceramics. Different fireclay seams can be characterised by a high degree of variability. It is therefore necessary to blend clays to achieve a consistent mix for firing in order to enable brick/ceramic manufacturers to supply a consistent market product.
- 3.66 National planning guidance for fire clay is provided in Annex 2 to MPS1, in association with guidance about brick clay. MPS1 stresses the importance of safeguarding and where necessary stockpiling supplies of clays, especially specific “premium” brickclays such as fireclay. Government guidance on opencast coal in MPG3 also emphasises the importance of fireclay and urges that every opportunity is taken to recover it from a proposed site.
- 3.67 Fireclay resources were initially used in a domestic pottery industry, which can be traced back to the 13th Century, when numerous family based potteries worked clays in the South Derbyshire Coalfield. The fireclay industry did not develop on a large scale until the 19th Century, its expansion taking advantage of increased usage in the emerging range of clay products – notably the manufacture of sanitary ware and salt-glazed pipes. Railways improved transportation of products to new markets as the abundant supplies of raw materials were exploited. Salt-glazed pipes were eventually replaced by vitrified clay pipes, which continue to be an important product to the area, being manufactured at the Donington works in Blackfordby.
- 3.68 Uses for the refractory qualities of fireclays were found in the expanding iron and steel industry, and as the process of smelting changed from the use of fireclay crucibles to large furnaces, so the demand rose for furnace and ladle linings. Local firms expanded accordingly, particularly to meet the wartime demands. The domestic refractory market expanded and diversified during the inter-war years, producing fire backs, stove linings etc. In the post war

years, refractory production declined in Leicestershire and is no longer undertaken today.

- 3.69 Methods of extraction changed considerably in the post war years, as modern excavating machinery became more proficient. Until 1945 most of the clay was deep mined and extracted by hand. More recently, large quantities of fireclay reserves have been exploited by opencast methods in conjunction with coal extraction schemes. This method has released larger volumes of fireclays of differing qualities than are immediately required, which have then stockpiled on site or remotely.
- 3.70 The principal source of these fireclays in the County has been the Donington Island site. Originally some 7 million tonnes of fireclay were stocked, although about 2 million tonnes of poor quality clay was subsequently used for restoration. This site is now the only significant clay stocking facility within the County. The site contained around 1.7 million tonnes of clay at the end of 2006. Blending takes place on site to supply various works in the area and beyond. The facility currently has a planning permission until the end of 2012.
- 3.71 Company amalgamations and rationalisation has resulted in significant changes to the local industry. The Donington stockpiles are owned by a consortium of companies, the most important suppliers from the site being Hepworth Building Products and Ibstock Brick. Redbank Manufacturing Co Ltd is also supplied with clay from the site.
- 3.72 Leicestershire has dominated fireclay supply in England for many years and in 2005 the county accounted for about 31% of total sales in England. Recent sales figures are detailed in Table 15. Sales during some years may have been higher than those normally expected due to the influence of clays released from opencast coaling at Hicks Lodge and Albion.

Table 15 Fireclay Sales			
Year	England (000t)	East Midlands Region (000t)	Leicestershire (000t)
1998	575	^	
1999	545	414	31*
2000	547	^	193*
2001	419	253	112*
2002	449	^	89*
2003	483	274	274
2004	338	^	^
2005	346	108	108
2006	213	46	46

Source: Business Monitor PA1007 & * from LCC Clay Survey 2004
^ withheld to avoid disclosure

- 3.73 A substantial amount of fireclays are exported out of the County to regional and national markets, and do not only support local works. With the reduction in national levels of opencast coal extraction, high quality fireclays are becoming increasingly scarce. Stricter husbandry of existing reserves at Donington Island would therefore be beneficial.

Gypsum

- 3.74 UK consumption of gypsum is derived from three sources: the production of natural gypsum, mainly by underground mining, but with some surface extraction in Nottinghamshire; recovery of synthetic gypsum; and imports of both natural and synthetic gypsum.
- 3.75 Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and anhydrite (CaSO_4) are, respectively, the hydrated and anhydrous forms of calcium sulphate. The main deposits of Gypsum derive from the Permian and Triassic periods when the arid climate was favourable to the evaporation of sea waters, resulting in pockets of gypsum being formed amongst sedimentary rocks. Gypsum occurs therefore as a bed or seam varying in thickness and continuity. Subsequent earth movements have caused faulting, breaking the seams and causing lateral and vertical displacement. Anhydrite is a harder form of calcium sulphate and generally occurs in nodular masses, being formed at a greater depth than gypsum.
- 3.76 Calcium sulphate is also derived as a synthetic by-product of certain industrial processes. The most important is flue gas desulphurisation (FGD), a process that removes sulphur dioxide from the flue gases at coal-fired power stations. The product, known as desulphogypsum, is now an important supplement to the supply of natural gypsum, both in the UK and elsewhere.
- 3.77 Natural gypsum, of which British Gypsum Ltd is the sole producer, is extracted in Leicestershire, Nottinghamshire, Staffordshire, Cumbria and East Sussex. BPB, which owns British Gypsum and is the world's largest producer of gypsum building products, was taken over by the French company Saint-Gobain in November 2005.
- 3.78 Gypsum occurs in the Triassic Mercia Mudstone Group in north Leicestershire. It is extracted in an area to the east of Loughborough towards the County boundary with Nottinghamshire from an underground mine at Barrow upon Soar. The Mine drifts to intercept the Gypsum seam were completed in 1988. The Tutbury Gypsum seam varies between depths of 60 and 150m and is overlain by Jurassic limestones. Continuous electric cutting machines work the seam in a traditional pillar and stall mining method, exploiting in the region of 75% of the workable mineral. The existing planning permission at Barrow effectively defines the viable deposit. Outside this area, the bed thickness/grade declines or there are difficult geological conditions which would preclude mining. A fault effectively demarks the southern limit of

the deposit while extensive faulting near the Nottinghamshire border similarly marks the northern limit of the mine within Leicestershire.

- 3.79 An associated manufacturing plant at the same site produces a range of bagged plasters for the construction industry. This plant serves much of the Midlands, Wales and Southern England. Production capacity at the Barrow works has been in the order of 650,000 tonnes per annum, although recent planning approvals have increased potential capacity to 900,000 tonnes per annum. This allows for flexibility in meeting increased demands and seasonal variations, and to provide additional production capacity for future needs. In the region of 90% of the gypsum consumed at the Barrow works is sourced from the Barrow Mine, with around 10%, up to 90,000tpa, being imported for blending purposes. The imported gypsum is of higher purity than that sourced at the mine, and consists of both natural gypsum and desulphogypsum (around 96% gypsum content). Some 18Mt of permitted reserves remained to be worked at the Barrow site, representing a life of around 22 years, at the current rate of production.
- 3.80 An outcrop of the Tutbury Gypsum horizon has been inferred to the south of the Barrow Mine based on recent mapping. Very limited borehole evidence indicated that the down dip extension of the Tutbury Gypsum has potential for gypsum mining, but there was much less confidence about the potential resource area compared with the Barrow Mine. Further exploratory work has indicated that the potential resource in this area is low. Potential does however exist for future extensions of the Nottinghamshire Marblaegis Mine into Leicestershire, to the north of Wymeswold.
- 3.81 Total gypsum output in England is about 1.7 million tonnes per year. Recent gypsum production in England (estimated due to confidentiality) is detailed in Table 16. In 2005 imports of crude gypsum were 627 595 tonnes and imports of calcined gypsum, i.e. plasters, were 133 522 tonnes.

Table 16 Gypsum Production	
Year	England* (000t)
1998	2000
1999	1800
2000	1500
2001	1700
2002	1700
2003	1700
2004	1686
2005	1700

Source: UK Minerals Yearbook.

- 3.82 Gypsum and anhydrite derived as by-products from flue gas desulphurisation plants at coal-fired power stations has led to a decline in the amount of

natural gypsum extracted nationally in recent years, but its limited workability restricts applications in respect of replacing bagged plasters. In 2004, synthetic gypsum (mainly desulphogypsum) accounted for 36% of the total UK consumption of gypsum.

- 3.83 The amount of desulphogypsum produced at FGD plants is dependent on two main factors: the electricity output of the station and the amount of sulphur in the coal. About 0.7 tonnes of high purity limestone are required for each tonne of desulphogypsum produced. The output of desulphogypsum in recent years is shown in table 17.

Table 17: Output of Desulphogypsum

	Drax	Ratcliffe-on-Soar	West Burton	Total
1996	510	300		810
1997	549	296		845
1998	323	278		510
1999	483	220		703
2000	565	260		825
2001	506	291		797
2002	485	358		843
2003	699	384		1083
2004	653	350	274	1228
2005	565	235	335	1135
2006	610	206	289	1105

Source: UK Yearbook

- 3.84 FGD capacity has also been fitted at the Eggborough in North Yorkshire and the Cottam station in Nottinghamshire. Additional FGD plants are planned or under construction for several other coal-fired power stations in the UK including Ferrybridge, Fiddlers Ferry, Rugeley and Longannet.
- 3.85 Synthetic gypsum is also produced by the neutralisation of acid effluent from the manufacture of titanium dioxide by the sulphate process at Huntsman Tioxide Ltd's plant at Grimsby. Production of white titanogypsum is used by Knauf for the manufacture of plasterboard at their Immingham plant. UK titanogypsum production reduced by half in 2004 (to approximately 100 000 tonnes per year) due to a reduction in plant capacity.

Building and Roofing Stone

- 3.86 Two major groups of resources dominate the supply of building stone in Great Britain: the various Jurassic limestones in the Midlands and South of England and Carboniferous sandstones in West Yorkshire, Derbyshire, the Peak District and the North West.
- 3.87 Historically a wide range of indigenous stone has been used for building purposes in Leicestershire as evidenced by the many local buildings, including churches, farms and dwellings that date back hundreds of years. The majority of the most important rock types found in the County have been

used, including igneous rocks of the Charnwood area; metamorphic slates from Swithland; Carboniferous limestones and sandstones from north-west Leicestershire; and ironstones from east and north-east Leicestershire. None of these sources are currently exploited solely for building stone. Only a very small amount of the igneous rock and limestone worked at local quarries is sold as building stone. This reflects the national picture where over the last 50 years or so there has been a substantial closure of many traditional building and roofing stone quarries.

- 3.88 It is not possible to estimate future requirements for building stone during the LMDF period. The demand for natural stone products comprises two principal markets, namely new buildings and the repair of historic buildings. The market for stone for new building is small and specialised but relatively buoyant, whilst the conservation market is of increasing importance. The area and likely level of demand for some stones is likely to be only extremely local. Future demand and supply requirements are not prescribed by National and Regional planning policy as is the case for aggregate production.
- 3.89 According to the British Geological Survey in their Mineral Planning Fact sheet '[Building and roofing stone](#)' (Updated Mar 2007), the industry is still capable, with a few notable exceptions, of meeting current demand for natural stone. It does not specifically identify any shortage of stone derived from Leicestershire.
- 3.90 It is therefore anticipated that future demands for building stone from within the County are likely to remain at a low level that will enable existing aggregate quarries to satisfy requirements. If the situation changes and further proven need is demonstrated, then consideration of dedicated building stone operations may be appropriate.

Energy Minerals

Coal

- 3.91 The Coal measures of the Carboniferous strata provide the coal-bearing rocks, the main developments of which occur in north-west Leicestershire where they both crop out at the surface and are concealed beneath Triassic rocks, and in north-east Leicestershire where they are entirely concealed.
- 3.92 In north-west Leicestershire the coal deposits are divided by an up-lift of older strata – the Ashby Anticline upon which the town of Ashby de la Zouch is situated. The resources to the east are recognised as the Leicestershire Coalfield and those to the west as the South Derbyshire Coalfield. Both coalfields formerly supported deep mining but all the collieries have now closed. The exposed parts of the coalfields, generally those areas adjacent to the outcrop on either side of the anticline, have supported extensive opencast mining operations, particularly to the west where important fireclays

have also been worked. The overlying depths of overburden limit the southern extent of working in the Leicestershire Coalfield.

- 3.93 The Leicestershire and South Derbyshire Coalfields are among the smallest in the UK but are two of the most ancient as finds from medieval times have shown. The historic development of Leicestershire's deep mining reflects the national picture, as industrialisation saw a steady expansion occur until the First World War. A period of closure and mergers of the smaller collieries followed in the inter-war years, before the demands of the Second World War placed further pressures on an already weary and under resourced industry.
- 3.94 The formation of the National Coal Board in 1947 and the immediate post war years saw a policy of "coal at any price", and a large capital investment programme saw production peak in 1956, although closures were to take place at local pits a decade later. Underground amalgamations preceded the final closures, which took place during the mid-late 1980s at the Bagworth/Ellistown and Rawdon/Donisthorpe complexes. Coal recovery from tip washing operations followed the closures until 1994, when it finished at the Desford Colliery site.
- 3.95 Large-scale opencast coalmining started in 1941 when emergency legislation was introduced to enable sites to be brought forward to meet wartime needs. Opencasting continued after the war years and by 1960, over 30 sites had operated within the County. A subsequent downturn then saw production cease within Leicestershire during the early 1960s, although by the 1970s, National Coal Board led schemes brought about an upturn in production levels. This trend continued with British Coal operations until the privatisation of the coal industry, and subsequently local production has tended to be limited to a few small-scale operations. Notwithstanding this, transportation of coal by rail directly to generators and to deep-mines or specific blending facilities has been successful at opencast sites. Low chlorine coals typical of opencast production have been imported to the UK for over 30 years. The level of imports increased significantly during the mid-1980s however, and now accounts for over 50% of total UK coal consumption.
- 3.96 The exposed coalfield in Leicestershire has seen extensive opencast coal mining activity over the last 50 years. However, production and the number of extraction sites have reduced in recent years in line with the situation nationally. Recent coal production figures are detailed in Table 18. Between 1999 and 2004, production of opencast coal was in the order of 0.5Mt. This output generally resulted from 2 main sites at Hicks Lodge and New Albion, supplemented by various other smaller sites, including Rawdon, Towpath and Wood Farm. By the beginning of 2006, both Hicks Lodge and New Albion had ceased coaling. There is currently one opencast operation in the County at Longmoor, between Ravenstone and Normanton-le-Heath, which commenced in 2007.

Table 18 Coal Production				
Year	UK Deep-mined[^] (000t)	UK Opencast[^] (000t)	Imports[^] (000t)	Leicestershire Opencast Coal Production* (000t)
1999	20,888	15,275	20,293	504
2000	17,187	13,412	23,446	492
2001	17,347	14,166	35,542	360
2002	16,391	13,148	28,687	536
2003	15,633	12,126	31,891	586
2004	12,542	11,993	36,153	412
2005	9,563	10,445	43,968	95
2006	9,444	8,635	50,456	34

Source: [^]dti Digest of United Kingdom Energy Statistics, *MPA/POS Surveys.

- 3.97 Opencast coal sites have also released valuable fireclays through joint working practices, which has enabled local stockpiles to be replenished and brickworks to build stocks for the manufacture of buff coloured products. Coal sites have also contributed to the clearance of despoiled land, predominantly, the legacy of previous mineral activities. Most of the coal has been despatched by rail either to blending facilities or direct to the power generating companies.
- 3.98 The North-East Leicestershire Coalfield is an eastward extension of the Nottinghamshire Coalfield lying between Nottingham, Grantham and Melton Mowbray. Approximately 74% of the coalfield lies within Leicestershire but working has been restricted to a short period from the Asfordby mine near Melton Mowbray which closed in 1997, due to complex geological problems being encountered.
- 3.99 The MPA does not have the technical or commercial information relating to the quality and extent of reserves, to the degree that more specific areas of search for future working can be defined with sufficient certainty. The former Conditional Licences for opencast coal, which formed part of the portfolio of sites distributed at the time of coal privatisation, represent sites where coal has been essentially proved with some confidence. There are two such sites in Leicestershire (Coalfield West and Sweptstone Lane).
- 3.100 MPG3 states that the extent to which it will be possible to identify particular areas where extraction may be acceptable will depend upon local circumstances and the level of knowledge about the resource. The County Council has been advised by UK Coal about two sites within Leicestershire which have been sufficiently assessed as to suggest that a proposal for extraction could be made. These correspond to the former Conditional

Licence sites mentioned above. The sites put forward are Longmoor, which has now been permitted on appeal, and Minorca, which was refused planning permission in July 1996. UK Coal has not provided any information to suggest that the original reasons for refusal at Minorca can be overcome. No other coal operators have put forward any sites.

- 3.101 Table 19 below listed opencast coal planning applications considered by the County Council over the last 10 years. Six of the 11 opencast coal applications submitted to the County Council have been permitted. The 5 refusals related to 4 sites, one of which subsequently obtained approval from the County Council (New Albion) while another (Longmoor/Thorntree) obtained approval on appeal.

Table 19: Opencast Coal Applications in Leicestershire 1996-2006

Year	Site Name	Decision	Tonnage	
			Permitted	Refused
1996/7	Odd House	Permitted	30,000	
1996/7	New Albion	Refused		1,500,000
1996/7	Minorca	Refused		750,000
1997/8	Rawdon	Permitted	85,000	
1997/8	Thorntree	Refused		5,300,000
1998/9	New Albion	Permitted	1,700,000	
1998/9	Towpath	Permitted	120,000	
1999/0	Hicks Lodge	Permitted	900,000	
2000/1	Willesley Woodside	Refused		67,000
2003/4	Longmoor	Refused		725,000
2005/6	Swainspark	Permitted	40,000	
TOTAL			2,865,000	8,340,000

Oil and Gas

- 3.102 The alternating sandstones and shales of the Lower Coal Measures in the East Midlands provide ideal conditions for the accumulation of oil and gas. However, limited folding of these strata produced relatively small traps for the accumulations. Nevertheless, since the 1930s, the northern part of Leicestershire has been intensively explored for oil and gas, and this has led to a number of discovery wells and the development of two producing oilfields at Plungar and Long Clawson. Elsewhere, exploration has met with limited success, with the exception of the Belvoir No. 1 discovery in 1986.
- 3.103 The North Leicestershire (Plungar) Oilfield was discovered in 1953. Eleven wells were subsequently completed for production, and a peak output in 1956 of 4,970 tonnes was achieved. A rapid decline in all but one of the horizons saw only one well remain by the mid-1960s, although production continued until 1980, by which time total production had reached 43,788 tonnes.
- 3.104 The Long Clawson Oilfield was discovered in 1986, and production started at the end of 1990. Following rationalisation of the drill sites through the early

1990s, production has continued at Long Clawson A and C wells. Recent oil production figures are detailed in Table 20.

- 3.105 Some 10 Petroleum Exploration and Development Licences have been granted covering a large part of north Leicestershire. Over recent times, 2 proposals for exploration wells have been approved from within these licensed areas.

Table 20 Crude Oil Production('000 Tonnes)			
Year	UK Offshore	UK Landward	Long Clawson Oilfield
1998	119,049	5,166	8.6
1999	124,886	4,277	10.1
2000	114,830	3,245	8.7
2001	106,547	2,948	8.3
2002	105,603	2,661	8.8
2003	96,868	2,194	8.9
2004	86,906	1,929	9.0
2005	77,180	1,642	9.0
2006	70,073	1,359	7.5
2007	57,851	1,017	6.4
Cumulative Total			146

Source: BERR http://www.og.berr.gov.uk/pprs/full_production.htm

New energy production technologies

- 3.106 Annex 4 of MPS1 includes guidance on new coal technologies and underground gas storage. It indicates that there are 3 main ways of recovering gas from coal to provide energy, namely extraction of coalbed methane, extraction of methane from coal mines and underground coal gasification.
- 3.107 The report 'UK Coal Resource for New Exploitation Technologies' (BGS/DTI, November 2004) examines the UK coal resources available for exploitation by the new technologies of Underground Coal Gasification (UCG), Coalbed Methane (CBM) production and Carbon Dioxide Sequestration. Carbon Dioxide Sequestration is a technology that is at a very early stage of development. Because of the major uncertainties surrounding this technology, no areas specifically suitable for it have been identified in the report.
- 3.108 As the Leicestershire and South Derbyshire Coalfields have no working mines, there is no Coal Mine Methane potential in these areas. The prospects for Abandoned Mine Methane and Coal Bed Methane in these Coalfields are also considered to be very poor. The outcropping coalfield areas are not considered to form a UCG resource due to the extensive nature

of former underground and the need to stand off from these workings, both vertically and horizontally.

- 3.109 The north-east Leicestershire Coalfield is not considered to have potential for CBM production. There are large areas in Eastern England that meet the criteria for UCG. The best areas occur mainly between Newark and East Retford and extend to the north west of Gainsborough. Further south, good potential exists but tends to be patchy and isolated, surrounded by areas of poor potential. There are also large areas where the UCG potential is unverifiable, particularly to the south-east of Nottingham, between Newark, Sleaford and Lincoln. UCG resources may therefore be present in this area and warrant further investigation.
- 3.110 DTI has examined the opportunities for UCG and its potential contribution to the future UK energy supply. If this source of energy is to be exploited then an experimental UCG development would need to be undertaken. UCG development presents a number of actual and potential impacts that need to be addressed and mitigated. Many of these are common to other types of mineral and industrial operations.