

DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

TOWARDS A SPATIAL PORTRAIT: AN OVERVIEW OF DERBYSHIRE AND DERBY

JANUARY 2015

This paper has two elements. Firstly, it provides an overview of Derbyshire and Derby in terms of its population, transport system, economy, environment etc. Secondly, it sets out the background information regarding minerals in the Plan area. This information provides the foundation for developing the vision and objectives of the Plan.

It has been developed since the preparation of the Minerals Plan began in 2009. Comments from the stakeholder workshop were instrumental in developing the first draft of the Portrait. This was published in the Issues and Options Paper for consultation in 2010.

There were sixteen comments made in respect of this element of the Plan, all suggesting amendments or additions to the Portrait.

Summary of responses

- There needs to be fuller reference to the Landscape Character Assessment of Derbyshire.
- The benefits of restoration to provide priority habitats should be clearer.
- Reference should be made to the Creswell Crags World Heritage Site.
- The Natural Heritage section should be rewritten.

The remainder suggested minor wording changes or points of clarification.

These comments and suggestions for improvements have been used in the redrafting of the Portrait.

The Portrait has also been updated on an on-going basis since the Issues and Options stage to take account of new or revised information as this has become available. This includes for example, the results of the 2011 Census, ONS 2012 population and

household projections, the 2013 Oxford Economics Study and the Quarterly Economic Updates regarding employment statistics for the Plan area. The on-going engagement process has also led to comments being received, which have informed the evolution and development of the Portrait.

Contents

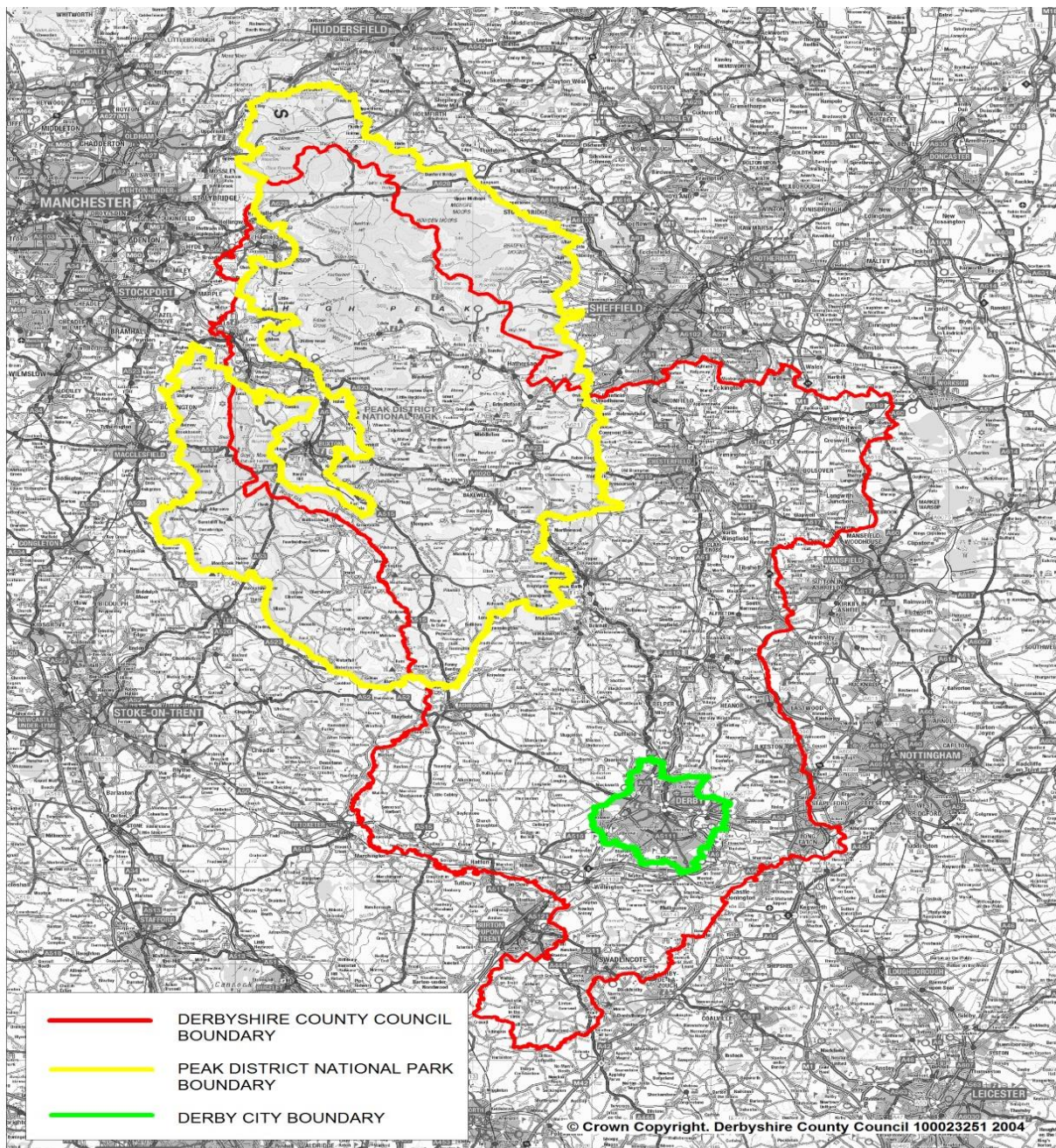
	Page
1 A General Portrait	1
2 A Profile of Minerals in Derbyshire	12
3 Appendix 1 – Key to Mineral Sites	25

1 A General Portrait

1.1 Introduction

Derbyshire is renowned for its stunning and diverse landscapes, which underpin a valuable leisure and tourism industry. It is a national leader in minerals production, exhibiting a wealth and diversity of important mineral resources, which bring significant benefits to the county in terms of jobs and economic prosperity and also from the environmental value of restored sites. Mineral development can also bring negative impacts, particularly in terms of the social and environmental impact of extracting the minerals.

Diagram 1: The Plan area



Reproduced from the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office. (C) Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.

Derbyshire and Derby (the Plan area) are situated in the central part of England, within the East Midlands Region.

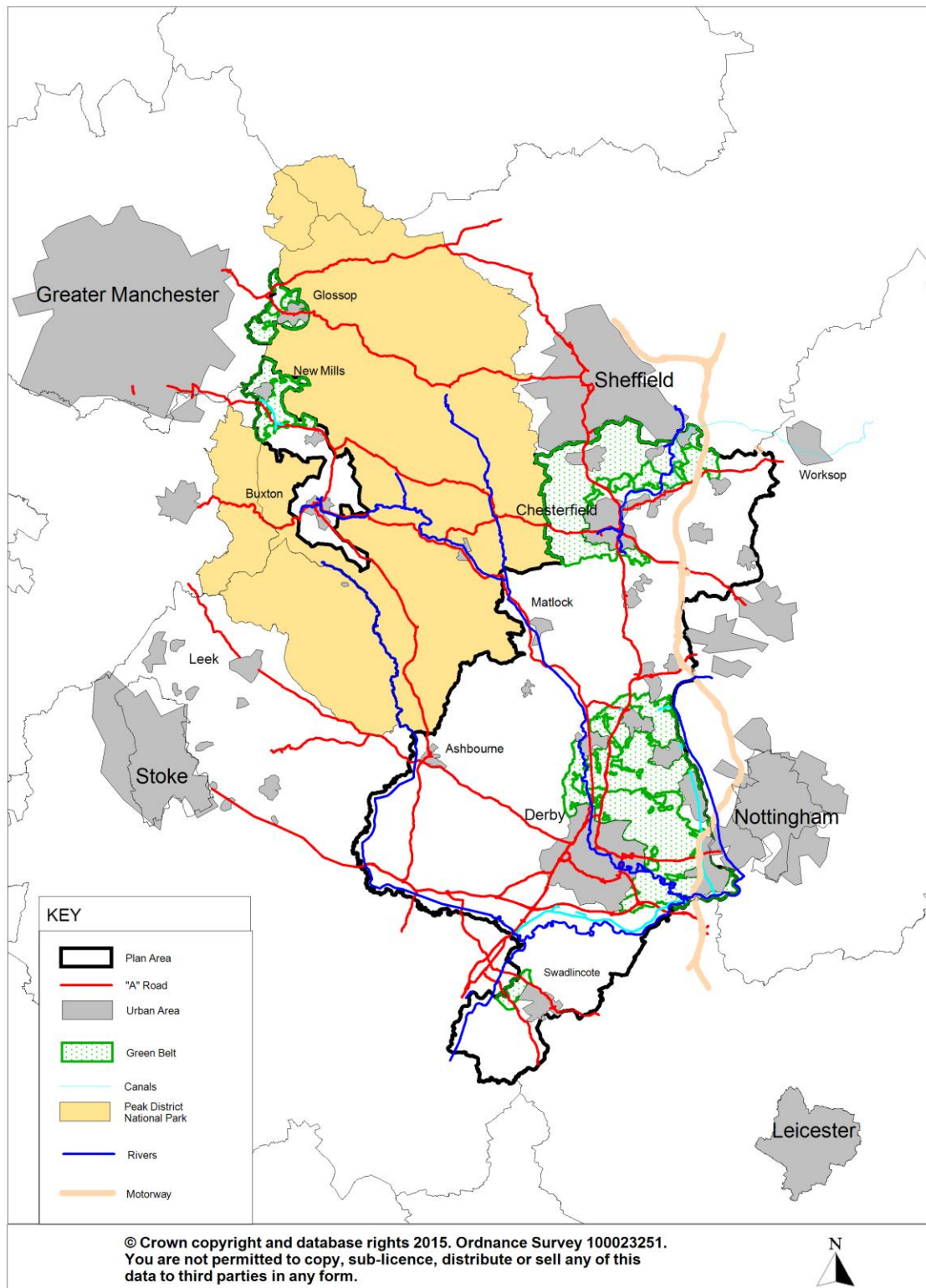
Derbyshire and Derby cover a total area of 983 square miles (including the area of the Peak District National Park (PDNP) which lies within Derbyshire). The Plan area (as shown on Diagram 1 above) does not include the PDNP which covers much of the

north west of the county. Within the county of Derbyshire, there are eight district councils; Amber Valley Borough, Bolsover District, Chesterfield Borough, Derbyshire Dales District, Erewash Borough, High Peak District, North East Derbyshire District and South Derbyshire District. Derby City is a unitary authority, situated in the southern part of the Plan area.

Diagram 2 gives a broad picture of the geography of Derbyshire and Derby. It shows the National Park, a largely upland area which makes road transport difficult, and it shows the main roads and railways, river valleys, towns and other features. Also, it shows the major cities, such as Sheffield, Nottingham and Manchester, which are outside the Plan area but are important markets for some of its minerals.

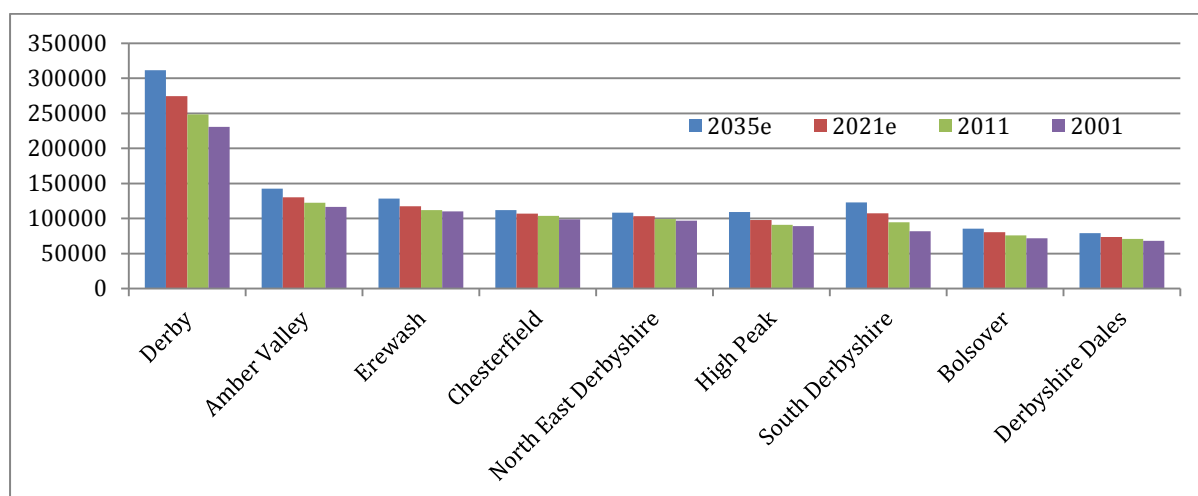
There are a number of market towns, including Glossop and Buxton in the north west of the Plan area, Chesterfield and Bolsover in the north east of the area, Matlock and Alfreton in the central part of the area and Ashbourne and Swadlincote in the more southern part of the Plan area. These urban areas are separated by large rural areas, particularly in the north-west, central and southern parts of the Plan area. The eastern part of the Plan area is, in general terms, of a more urban nature than the other parts of the Plan area.

Diagram 2: Derbyshire and Derby



1.2 Population

At the 2011 Census, Derbyshire had a population of around 769,700 and Derby City had a population of 248,700¹, accounting for about 22% of the total population of the region. The majority of the population of Derbyshire lives in urban areas, with around three quarters of the population living in settlements in the eastern half of the county. By 2035, Derbyshire and Derby is expected to have a population of approximately 1,110,000 people, an increase of about 8% on the figure for 2011². This is shown by district in the graph below.



This population growth is supported by a combination of natural change (+45,000) and net in-migration (+40,000).³

The City of Derby, with a population of some 250,000, is the largest settlement and lies in the south of the county. Chesterfield, in the north east of the county, is the other major town, having a population of around 100,000⁴.

In 2011, there were about 435,000 households in Derbyshire. By 2021 this is expected to have risen to about 474,000 households, or by about 9%.⁵ In terms of construction of new dwellings, the most recent figures provided by the individual local authorities

¹ ONS, 2012, Population and Household Estimates for England and Wales.

² Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p14.

³ Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p14.

⁴ Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, accompanying tables.

⁵ Household Interim Figures, x

suggest an annual increase in homes of about 3,500 per annum.⁶ Much of this will be in Derby and parts of southern Derbyshire which lie within the Three Cities National Growth Area

1.3 Economic and Social Conditions

Derbyshire and Derby has a diverse and thriving economy. The economy began its recovery in 2013 and this growth continued throughout 2014. This will help to ensure that the demand for minerals continues. It is a county of great variety, much of it rural in character, but it also contains a number of urban areas, which are based historically on coal mining and other heavy industries. Some of the older urban areas also contain significantly deprived populations, especially in Derby and within the former coalfield areas. Within these areas, there are thirty seven Super Output Areas⁷ which are amongst the 10% most deprived areas in the country.⁸

As in all areas, there are strong correlations between health and deprivation, so the most deprived areas of the county, in terms of health, are in areas within Bolsover, Chesterfield and North East Derbyshire Districts. Overall, the general health of residents is worse than the national and regional averages, with 6.1% of people suffering 'bad' general health compared to 5.5% in England and 5.6% in the East Midlands.⁹

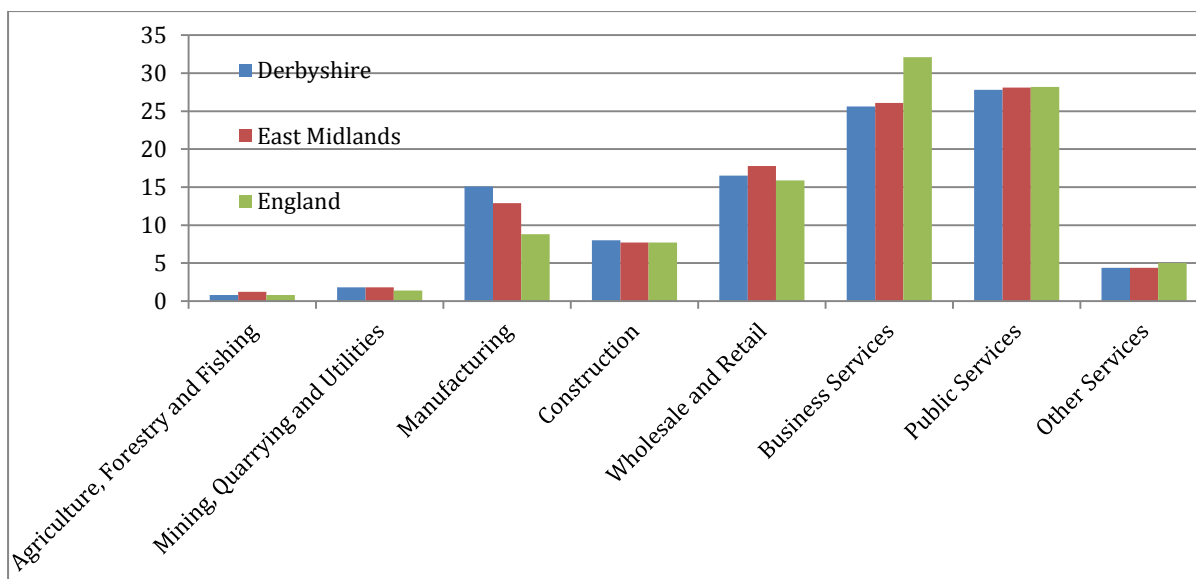
⁶ Figures compiled from most recent district council consultation papers, April 2013.

⁷ Super output areas (SOAs) were designed to improve the reporting of small area statistics and are built up from groups of output areas.

⁸ English Indices of Deprivation, 2010,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6872/1871524.xls accessed 23/05/2013.

⁹ 2011 Census.



Employment is dominated by the service industries (>70%). Employment in manufacturing industries ($\approx 15\%$) is high compared to the national average ($\approx 8\%$). In 2011, around 1.8% of people aged 16-74 were employed directly in the mining and quarrying and utilities industrial sector¹⁰, which was the same as the regional figure and higher than the national average (1.4%). Related transport and support services also provide some employment. The largest proportions of workers from this sector are found in the limestone quarrying areas of Buxton and Wirksworth. Despite there having been a very significant decline in employment levels in the mining and quarrying sector over the last three decades, especially as a result of the decline of the coal industry, Derbyshire has maintained its position as a national leader in minerals production.

The Oxford Economics Report states that the economy of Derbyshire and Derby “enjoyed a period of strong, if uneven, employment growth through much of the early to mid 2000s”¹¹. Between 2000 and the end of 2007, employment in the county rose by 43,000, however, from the beginning of 2008 until 2010 the county lost 18,000 jobs. Since 2010 employment in the county has been recovering, and is now back to the pre-recession peak.¹² Employment is currently at 79.3%, higher than the national

¹⁰ 2011 Census.

¹¹ Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p1.

¹² Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p16.

rate of 77.5%¹³. Employment is forecast to grow by 0.4% in 2014 and then by 0.4% per year for the rest of the decade and remaining relatively flat from then onwards.¹⁴ The Report states that, “employment in Derbyshire is more heavily concentrated in sectors that are expected to show weak or no employment growth in the future (such as manufacturing), and the county has less exposure to job creating private sector services.”¹⁵

The Report¹⁶ also states that in 2012, 425,300 people were employed in 471,100 jobs (some people have more than one job) in Derbyshire, with a total of 492,100 Derbyshire residents being in employment, signifying net-out commuting from the county.

In July 2014, the unemployment rate in Derbyshire (1.8%) and Derby (2.3%) is broadly in line with the national average (2.1%). Youth unemployment (3.2%) is marginally higher than the national average (3%)¹⁷. It should be noted that the average rate masks significant variations between different parts of the county, with some areas, such as parts of inner Derby or the former coalfield areas around Chesterfield having significantly higher levels of unemployment.¹⁸

The Local Enterprise Partnership¹⁹ seeks to reduce these economic variations in the creation of a more prosperous, connected and increasingly resilient economy.

1.4 Transport

The Plan area generally has a good quality road transport network, which provides excellent links to other regions, particularly to the north and the south via the M1, the A38 and the A61. The A50 provides an important link to the M6 to the west. It is easily accessible, therefore, to and from a number of large neighbouring conurbations,

¹³ Derbyshire Economic Review September 2014.

¹⁴ Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p17.

¹⁵ Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p17.

¹⁶ Oxford Economics, 2013, Derbyshire County Council Employment Forecast Report, p15.

¹⁷ Derbyshire Economic Review September 2014 and Derby City Economic Briefing Dec 2014.

¹⁸ 2011 Census.

¹⁹ D2N2 LEP for Derby, Derbyshire, Nottingham and Nottinghamshire.

including Manchester, Sheffield, Leeds and Nottingham. In line with the rest of the country, traffic levels have increased significantly throughout the Plan area over the last few decades, but at a slightly slower rate than the regional average.

A significant issue in the Plan area in relation to transport is the impact of heavy lorries, including mining and quarrying traffic, on local communities and other road users. In some areas, heavy goods vehicles can account for up to 25% of traffic²⁰. The Derbyshire Community Strategy seeks to reduce congestion on roads and to limit the environmental impacts of transport. These aims are reflected in the priorities of the latest Derbyshire Local Transport Plan and the Derby Local Transport Plan, which both cover the period 2011-2026.

There is a somewhat fragmented railway system in the county with five separate operators. Only one freight operator (EWS), however, transports minerals in Derbyshire.

There is some potential for the transportation of minerals on inland waterways i.e. rivers and canals, but this form of transport is not currently used for mineral transportation in the Plan area.

In terms of air quality, a number of areas suffer from air pollution, mainly associated with traffic, and within the Plan area, seven areas are covered by Air Quality Management Areas (AQMAs). These are in Derby (2), Erewash (2) and Bolsover (3). A further one is proposed for the A61, A617 and A619 corridors through Chesterfield.

1.5 Natural and Historic Environment

The geology of a landscape is a key determinant of landscape character, its habitats and the historic evolution of an area; at the same time it is inextricably linked to the mineral resource.

²⁰ Derbyshire Local Transport Plan 2011-2026.

The county exhibits areas of landscape of ecological and historic importance, from the upland limestone plateau and gritstone moorlands in the north of the county adjacent to the Peak District National Park, through the rolling pasturelands in central Derbyshire to the broad river valleys in the south. Many parts of the county exhibit the legacy of large-scale mineral extraction from the limestone quarries in the north and west of the county to the former coal mining areas in the east of the county.

The landscape of Derbyshire attracts significant numbers of tourists and day visitors, who provide important economic benefit to the county.

The Landscape Character Assessment of Derbyshire assesses and categorises each landscape type, helping the assessment of proposals for development in terms of their impact on the landscape. This work has also been used to identify those areas of landscape considered to be of multiple environmental sensitivity relating to ecology, historic environment and landscape attributes.

The Lowland Derbyshire Biodiversity Action Plan covers the area of Derbyshire outside the Peak District National Park. It describes the distribution of habitats and species across the county and also establishes the priorities for their action and protection.

Much of the county is worked as farmland, almost all of which is classified under the Agricultural Land Classification (ALC) as grade 3 and 4, with a small amount of grade 2 land to the south of Ashbourne.

Ancient Woodland has been assessed by Natural England, and suggests that Derbyshire contains one of the five biggest areas of interconnected ancient woodland in the country. This is focused within the Peak Fringe and the Lower Derwent Valley.

The three main rivers in the county are the Trent, the Derwent and the Dove. All the rivers have important flood defence regimes, including functional flood plains, which need protecting, especially with the additional stress put on them from the potential effects of climate change. Mineral extraction presents the opportunity to restore and

improve the quality of many stretches of heavily modified rivers, through the redesign of floodplains during restoration.

There are significant areas of ecological importance in the Plan area, which support valuable populations of national and local Biodiversity Action Plan (BAP) priority species. Changes in farming practices and other factors over the past 50 years have, however, resulted in the loss of hedgerows, wetlands, floodplains and other habitats.

Special Areas of Conservation (SACs) are designated under the EC Habitats Directive and form part of the Natura 2000 Network of internationally important wildlife sites. Special Protection Areas (SPAs) are areas of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within European Union countries. They are European designated sites, classified under the 'Birds Directive 1979'. SACs and SPAs in Derbyshire, outside the Peak District National Park, are:

- Bees Nest and Green Clay Pits on the south eastern edge of the Peak District;
- Gang Mine; also on the south eastern edge of the Peak District; and
- River Mease on the border of South Derbyshire and Leicestershire
- South Pennine Moors SAC (Goyt Valley, west of Burbage and Darley Forest, north of Darley Dale). Also designated as the Peak District Moors SPA
- Peak District Dales SAC (Wye Valley near Buxton, small area outside the PDNPA), Matlock Woods SSSI and Via Gellia Woods SSSI).

In terms of other designations for biodiversity, there are 87 Sites of Special Scientific Interest (SSSIs); 1 National Nature Reserve (at Calke Abbey, 12 km south of Derby, managed by the National Trust); and around 1200 local wildlife sites and 101 Regionally Important Geological Sites, half of which lie within the Derbyshire Dales area.

The Plan area has a wealth of archaeological and historic features and sites, with 9,500 entries on the Sites and Monuments Record; 476 Scheduled Monuments; 5,941 Listed

Buildings and 486 Conservation Areas. Registered Historic Parks and Gardens include Sudbury, Calke, Hardwick and Kedleston, and there is also a wealth of other very high quality mansion houses and their associated estates, such as Melbourne Hall. The Derwent Valley Mills World Heritage Site, lying between Matlock Bath and Derby, is of international importance and is also a significant tourist attraction. Creswell Crags in the north east of the county is a candidate World Heritage Site, in part because it is the location of the only Upper Palaeolithic cave art so far discovered in Britain.

The nature of the archaeological heritage of the county is very dependent on the underlying geology, which influences both the character and type of the surviving remains and nature of their survival.

2 A Profile of Minerals in Derbyshire and Derby

2.1 There were twenty seven comments made in respect of the Minerals Portrait at the Issues and Options stage, all suggesting amendments or additions.

2.2 Summary of responses

- The benefits of restoration schemes should be made clearer.
- It should refer to the restoration of quarries to either nature or agriculture as a preference over leisure.
- More positive reference should be made to the mineral industry.
- The historic and educational significance (e.g. lead rakes) of mineral workings should be recognised.
- The national importance of coal should be recognised.
- Clean coal technologies should be referred to.

The remainder suggested minor wording changes or points of clarification.

These comments have been used in the re-drafting of this element of the Portrait.

2.3 Geology

The underlying geology has shaped the landscape of the Plan area, giving rise to its diverse and contrasting characteristics. The limestones, sandstones and coal measures, which are today exploited commercially, were formed during the Carboniferous, Permian and Triassic Periods, which covered the time between 354 and 200 million years ago. The river valley sand and gravels were laid down much more recently, during the last ice age (around 14,000 years ago). Rocks were eroded by the glacial melt waters and deposited as sand, gravel and silt materials in wide tracts alongside the major rivers.

2.4 Mineral resources

The majority of mineral resources²¹ in the Plan area are in Derbyshire. There are only limited resources of sand and gravel in Derby City and these are not currently worked.

In terms of quantity, by far the most significant mineral extracted in Derbyshire is limestone, accounting for over 80% of all minerals produced (by weight) in the county. The next most significant mineral produced in Derbyshire is sand and gravel (about 9%).

Minerals extracted in smaller amounts include coal (about 5%), vein minerals (mainly fluor spar & barytes), gas, sandstone, silica sand & clay and shale (unknown quantities, but likely to each be less than 1% of the total county production by weight). Although the tonnage of these minerals extracted is low compared to that of limestone and sand and gravel, their higher value per tonne often makes them very significant in economic terms. They are used by several nationally important industries, such as brick making, electricity generation and steel making.

The Minerals Local Plan notes that Derbyshire's other minerals, namely gypsum, ironstone, ganister and peat have been worked in the past. However, in view of their limited occurrence in Derbyshire, they are unlikely to be worked in this county again in

²¹ Figures used in this section come from the 2013 Derby & Derbyshire Aggregates Survey, the 2010 Coal Authority Returns and the 2010 Minerals Year Book.

the foreseeable future. In some cases (for example, ganister) their use has largely been superseded by other minerals or by changes in process technology.

Derbyshire's production of limestone is highly significant in national terms, providing about 20% of England's production of limestone. Minerals such as sand and gravel provide a smaller proportion of England's mineral production (sand and gravel about 2% and coal about 6%), but are still important both in local and regional terms.

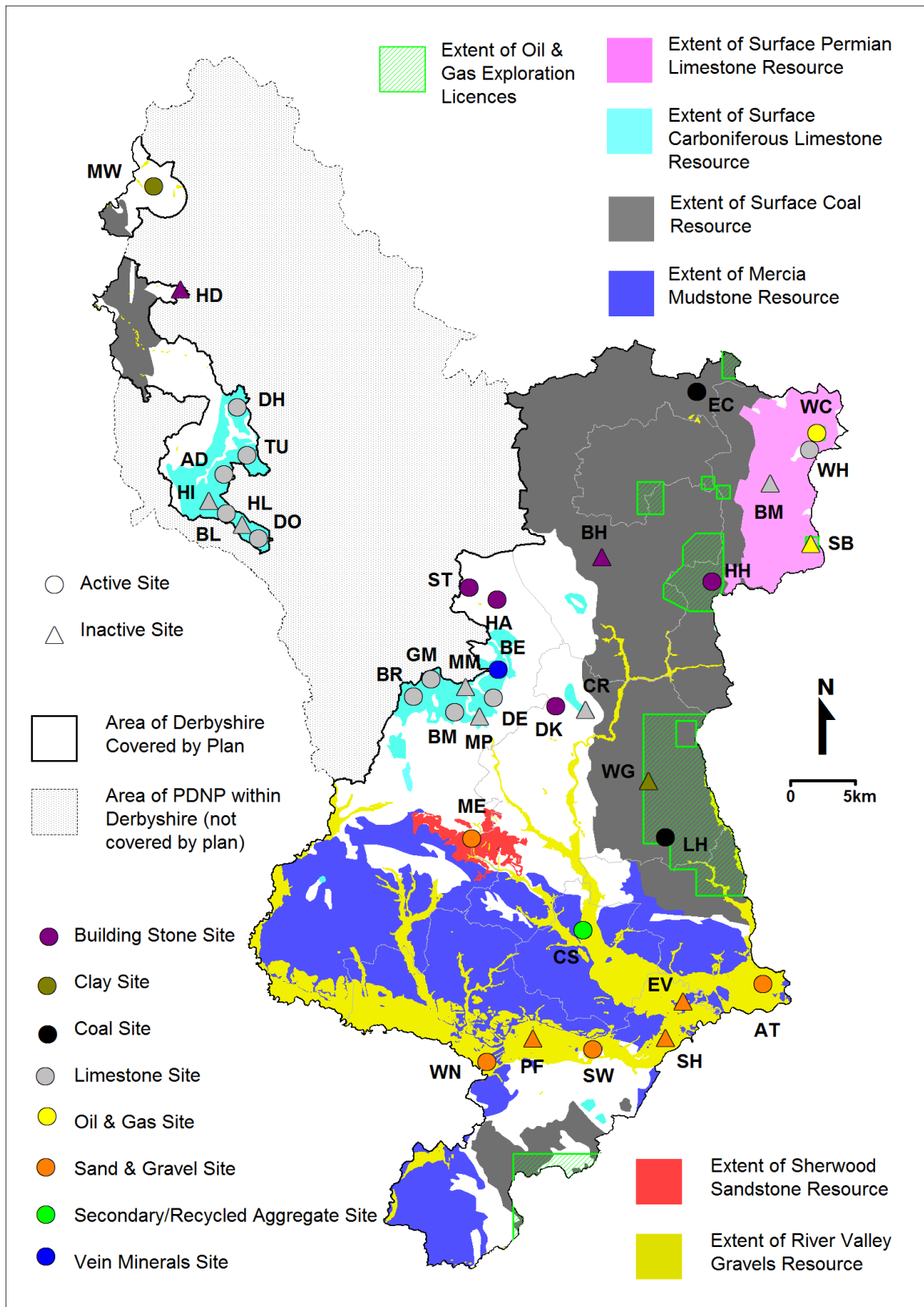


Diagram 3: Significant mineral resources and permitted sites in 2013 (locations indicative).

2.5 Distribution of Mineral Resources

As shown by Diagram 3 above; large areas of the Plan area have some potential for the extraction of a wide variety of valuable mineral resources.

Limestone resources, whether of aggregates or industrial quality, are located mainly in the north west of the county (Carboniferous), in the Matlock/Wirksworth area (Carboniferous) and in the north east area of the county, east of Bolsover (Permian). In 2013, there were a total of ten active quarries within Derbyshire extracting limestone, of which nine were exploiting the Carboniferous resource and one exploiting the Permian resources.

Sand and gravel resources are concentrated along the river valleys, the most important being the Trent Valley to the south of Derby, as well as the adjoining river valleys of the Lower Derwent and Dove. In 2013, there were three active operations spread along the Trent Valley.

There is a less widespread sand and gravel deposit in the hard rock formation of the Sherwood Sandstones (whilst these are called sandstones they are poorly consolidated and are used in the same way as traditional sands and gravels). It is found in a small area around Mercaston, between Ashbourne and Belper. This resource is currently worked in one quarry at Mercaston.

There remain substantial resources of coal in the exposed coalfield, particularly in the east of the county in the North Derbyshire Coalfield, despite the cessation of large scale coal production in the 1990s. Whilst some surface coal resources remain in South Derbyshire, this coalfield is of a limited size and is now largely exhausted by previous surface mining operations.

Additionally, there is a potential resource of deep coal in north east Derbyshire contiguous with the surface coal resource shown on the map, and dipping beneath the Permian Limestone to the east. However, development of a new deep mine or the re-opening of a closed deep mine seems unlikely due to very high costs. It is unlikely also

that this resource would be suitable for coal bed methane extraction as a result of the low methane content and uncertainty over the permeability of the coals.

The most important economic resources of clay and shales are of Carboniferous age and are associated with the Millstone Grit and the coal measures, the latter being also a potential source of fireclays. The Mercia Mudstones are found in a band in the south of the county, as shown on Figure 3 but currently are not of economic importance.

In the UK, workable deposits of vein minerals, such as Fluorspar and Barytes are found exclusively in mineralised veins and related deposits in the Carboniferous Limestone. Fluorspar occurs in only two areas in the UK – the Northern Pennines and the Southern Pennines. Production in the northern area (Durham) ceased in 1999, leaving the Peak District area as the remaining potential source. However, production of these minerals in the Plan area is limited, with extraction opportunities arising from the quarrying of limestone. The majority of national supply comes from sites within the Peak District National Park.

Building stone (mostly sandstone and gritstone, but including some limestone) is produced mainly from small quarries in the central part of Derbyshire around Matlock and Darley Dale, but also from the north west of the county around Hayfield and Glossop.

There is some potential for finding conventional oil and gas deposits in Derbyshire, particularly to the east of Calow, Hardstoft and Ironville on the western margin of the East Midlands oil province. The area to the west has less potential because the main East Midlands reservoir sands, which hold the oil deposit, are absent or only shallow here. One site within Derbyshire currently produces methane from an abandoned coal mine.

There are very limited natural deposits of Silica Sand in Derbyshire and these lie near Brassington. They have been worked to some extent in the past, with little likelihood of being worked in the foreseeable future.

In terms of recycled aggregates, there was, in 2013, one active permanent site at Chaddesden Sidings in Derby. There are also a number of temporary mobile recycling operations within the county.

2.6 Mineral Reserves

At 31st December 2013, current reserves (i.e. that part of the overall mineral resource that has planning permission to be worked) of limestone for aggregate uses totalled some 785 million tonnes, enough to last for over 100 years at Derbyshire's current level of annual apportionment. Reserves of industrial limestone are estimated to be around 308 million tonnes.

Reserves of sand and gravel are significantly lower, standing at 9.4 million tonnes at the end of 2013. Based on Derbyshire's current level of apportionment, it is likely that these reserves will last for around 8-9 years.

At the end of 2012, permitted reserves of coal in Derbyshire were about 1 million tonnes, distributed between three sites. The majority of reserves are at Lodge House, Smalley and Eckington Drift Mine, with smaller reserves at the Engine Reclamation Site, nr Bolsover, George Farm, Smalley and Langley Marina.

Current reserves of sandstone (at operational sites) stand at around 500,000 tonnes. In 2012, production from these sites was negligible.

There is currently one site in Derbyshire producing gas (abandoned mine methane) at the former Whitwell Colliery.

2.7 Usage & Markets

Limestone

After extraction, limestone is crushed mechanically to varying sizes and its end use depends either on its physical properties (used as aggregate) or its chemical properties (industrial limestone). A single bed of limestone can provide rock for both purposes

and many of Derbyshire's quarries produce both industrial limestone and aggregate limestone.

Aggregate Limestone is important mainly for its physical properties. It is used mainly as fill material, roadstone and in the manufacture of concrete. Around 67% of Derbyshire's limestone aggregates production is sold outside the county. The largest share of these exports is to the North West Region (22% of total production). 14% of total production is sold to other counties within the East Midlands and 24% to other regions, notably Yorkshire & Humberside, the West Midlands and the East of England regions²².

Industrial Limestone is used for a great variety of generally high value industrial processes (such as agricultural and steel industries, sugar refining and glass making and as filler in products such as paints, plastics & rubbers). Markets are national and, in some cases, international. Tunstead, Whitwell, Longcliffe, Dowlow and Grangemill Quarries are the main producers of high value industrial limestone in Derbyshire. A more local use is for cement manufacture and in this case, cement works tend to be located very close to quarrying operations. The cement works at Tunstead uses large quantities of limestone from the quarry in which it is situated.

Sand and Gravel

This is used primarily in the manufacture of ready mixed concrete, pre cast concrete products and as a bulk filling material. In Derbyshire, a high percentage of sand and gravel is used in the manufacture of concrete. Most of the active pits in Derbyshire have ready mixed concrete plants on site, producing concrete for the pre-cast concrete plants within the county. These serve a national and regional market for products such as blocks, floors, pipes, kerbs and street furniture. Sand is used mainly in the production of mortars and asphalt, or as building sand.

²² 2009 EMAWP Annual Report.

Most sand and gravel originating in Derbyshire is used within 10 – 15 miles of where it is quarried, mainly because of the high cost of transporting the material, but also because of competition from other sources of aggregate in the area. In 2009, 47% of total sand and gravel output from Derbyshire was used within the county, with 46% being exported to elsewhere in the East Midlands and most of the remaining 7% used within the West Midlands Region²³.

Coal

Coal is an important energy mineral in national terms. Derbyshire coal is of a quality suitable for use by the electricity industry in power generation. The nearest coal fired power station is at Ratcliffe-on-Soar in Nottinghamshire. Over the longer term there is likely to be increasing pressure on coal resources as additional technologies to extract coal become economic, such as underground gasification. Clean coal technologies are being developed to remove or reduce pollutant emissions to the atmosphere. New uses for coal, such as substituting for chemical uses where oil and/or gas are currently used, may also become economic.

Clay

Brick clay is the term used to describe clay, shale and mudstone that is used in the manufacture of structural clay products. The largest use (90%)²⁴ is for facing bricks, followed by pavers, engineering bricks, clay tiles and clay pipes. Fireclays are used in the manufacture of refractory products, i.e. furnace linings, and are also an important raw material for the manufacture of engineering bricks. Cream and buff coloured bricks are manufactured from fireclay as it has low iron content.

Whilst in the past, brick clay and fireclay were consumed locally; today increasing tonnages are transported to large scale automated brickworks for blending purposes and to serve plants with no clay reserves. Clay is generally transported to the plant by road and the finished product is usually delivered to the market by road. Brick clay is a high weight and low value commodity and as such transportation affects costs

²³ 2009 EMAWP Annual Report.

²⁴ Brick Clay Factsheet, BGS 2007.

significantly. Fireclay has a slightly higher value than brick clay and which means that longer journeys are more feasible in economic terms.

Vein minerals

There are two vein minerals which are significant in Derbyshire; Fluorspar and Barytes. The main use for Fluorspar has traditionally been as a flux in the manufacture of steel. The decline in the British steel industry and new technology has reduced this requirement significantly. All Fluorspar mined in Britain, therefore, is now processed to produce Hydrofluoric acid, which is used in a variety of industrial processes. Barytes is produced in small amounts in Derbyshire. Due to its relatively high density, it is used mainly as a weighting agent in drilling mud in the offshore oil and gas industries. It is also used as filler in paper, textile, rubber, plastics, oilcloth and linoleum manufacturing and as a pigment in paint.

Oil & gas

Both are internationally traded commodities with a wide variety of uses. Gas can be used either close to its point of extraction or can be transported by road or fed into the national grid.

Sandstone (for building stone)

The market for traditional building stone is small and is mainly concerned with the restoration of historic buildings or with the repair/extension of existing properties or new build properties in areas of high environmental value. The specific properties and value of the stone mean that it is often economically viable to transport it substantial distances.

Recycled & secondary aggregates

Recycled Aggregates & Secondary Aggregates materials replace the use of primary aggregate by providing bulk fill for construction projects, in concrete manufacture, road surfacing and for the manufacture of light weight aggregate blocks. Their increased use should be encouraged to help further reduce the use of primary resources.

2.8 Contribution to the Local Economy

Derbyshire is a national leader in the provision of minerals. As a result, the minerals industry plays an important and positive role in benefitting the economy of Derbyshire. In 2010, 1,739 people were employed by the mining and quarrying industry in Derbyshire (incl. the Peak District National Park), 642 of these in direct employment and 1097 employed by related contractors and as drivers²⁵. We estimate that up to 50 million pounds is paid annually in salaries to employees in the minerals industries in Derbyshire, with many of these jobs located in rural areas where employment can be scarce.

The minerals industry in Derbyshire also supports a network of production and processing facilities, such as the cement works at Tunstead. In turn, these industries supply the raw materials for other essential industries, such as construction.

2.9 Transportation

Most of the minerals produced in Derbyshire are transported by road. Generally, rail links are only viable at high volume, long life quarries where the significant capital costs can be recovered, although smaller operations can sometimes access the rail network when opportunities arise. In 2013, there were three active rail facilities in Derbyshire; at Tunstead Quarry, Dowlow Quarry and Doveholes Quarry and two inactive rail facilities at Whitwell Quarry and Hindlow Quarry (which is used for imports from Tunstead). There may be potential for mineral transportation using the inland waterways but currently they are not used for mineral transportation in Derbyshire.

2.10 Reclamation and Restoration

Generally, mineral extraction by its nature is a temporary use of land, but one which has a permanent impact on the area. Once extraction has ceased, the site must be restored to its former use or to another suitable and beneficial new use, such as agricultural, wildlife, leisure uses or some form of built development or a mixture of

²⁵ Annual Mineral Raised Inquiry Survey 2010.

these. Well designed and implemented restoration schemes can result in significant benefits to wildlife and people, whilst contributing to local and national BAP targets for priority habitats and creating green Infrastructure for local communities to enjoy. The type of restoration possible will be affected by site specific issues and the type of quarry that existed; for example, it would not be possible for the large limestone quarries to be restored to their original ground levels, although they can often be reclaimed for agricultural use within a changed landscape setting, a good example being Bolsover Moor Quarry. In contrast, sites for surface coal mining can often be restored back to original ground levels without the need for the importation of fill material.

In the Plan area, many of the currently operational quarries have conditions requiring their restoration to agriculture and/or amenity uses. Some quarries currently have no agreed restoration scheme, an issue which the councils as the mineral planning authority will need to work positively with the mineral operators concerned.

Although in the past, most of the permitted sand and gravel workings in Derbyshire have conditions requiring their restoration to agriculture, restoration to water uses is becoming more common as inert infill material becomes increasingly scarce. Where sites are close to airports, this has to be balanced against the need for restoration schemes to take into account and mitigate the risk of birdstrike.

2.11 Legacy of Mineral Extraction

Former mineral workings can provide opportunities for development which help to deliver economic growth, for example the former Markham Colliery in north Derbyshire has been restored to provide an important strategic site for new economic development opportunities.

Whilst there are many former quarries in Derbyshire, the majority are small and, have often blended into the landscape over time. Indeed, many are now considered to be of positive value, particularly in historic, ecological, geological and environmental terms. Many former mineral workings can also provide benefits in terms of their

educational value, providing opportunities for schools, colleges and universities to study the geology of the area.

Although underground mining is no longer so significant, potential public safety and stability problems can still be triggered and uncovered by development activities. Such problems can include the collapse of mine entries and shallow mine workings, emissions from mine gases and spontaneous combustion and the discharge of mine water from abandoned coal mines.

Within the Derbyshire area, there are approximately 9,800 recorded mine workings and large areas of shallow mine workings. To date, around 185 hazards related to coal mining have been recorded. To address this issue; the Coal Authority, along with North East Derbyshire, Chesterfield & Bolsover District Councils, are working on a map to help identify areas where issues (e.g. ground instability) resulting from the legacy of coal mining in Derbyshire need to be considered when determining planning applications.

Appendix 1

Key to mineral sites in Diagram 3

Code	Name	Main mineral
AD	Ashwood Dale	Industrial limestone
AT	Attenborough	Sand & gravel
BE	Ball Eye	Vein minerals
BH	Bolehill	Sandstone
BL	Brierlow	Aggregate limestone
BM	Bolsover Moor	Aggregate limestone
BO	Bone Mill	Aggregate limestone
BR	Brassington Moor	Industrial limestone
CS	Chaddesden Sidings	Recycled aggregates
DE	Dene	Aggregate limestone
DH	Dove Holes	Aggregate limestone
DK	Dukes	Sandstone
DO	Dowlow	Aggregate limestone
EC	Eckington	Coal
EV	Elvaston	Sand & gravel
GM	Grange Mill	Industrial limestone
HA	Hall Dale	Sandstone
HD	Hayfield	Sandstone
HG	Hoe Grange	Aggregate limestone
HH	Hardwick Hall	Sandstone
HI	Hillhead	Limestone
HL	Hindlow	Limestone
LH	Lodge House	Coal
ME	Mercaston	Sand & gravel
MM	Middleton Mine	Industrial limestone
MP	Middle Peak	Aggregate limestone
MW	Mouselow	Clay
PF	Potlocks Farm	Sand & gravel

Code	Name	Main mineral
SB	Shirebrook	Gas
SH	Shardlow	Sand & gravel
SL	Slinter Top	Vein minerals
ST	Stancliffe	Sandstone
SW	Swarkestone	Sand & gravel
TU	Tunstead	Industrial limestone
WC	Whitwell Colliery	Gas
WG	Waingroves	Clay & shale
WH	Whitwell	Industrial limestone
WN	Willington	Sand & gravel