

LANCASHIRE MINERALS: A WHISTLE STOP TOUR OF PAST AND PRESENT WORKINGS AND RESTORATIONS

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ABSTRACT

The county of Lancashire is nationally important for minerals being the North West's largest producer of aggregate minerals. Sand, gravel, gritstone and limestone have played a significant role in the development of Lancashire and more recently there has been an active interest in other minerals including oil, gas, and salt.

Lancashire has been fortunate to influence the subject of the restoration of worked sites in a positive and proactive way and examples of success stories are provided here.

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INTRODUCTION

The author is a Planning Officer based at Lancashire County Council (Figure 1) and this paper focuses briefly upon the geology of Lancashire, considers the current situation for mineral extraction and provides, by way of a couple of detailed examples, a flavour of the type of restoration proposals that have been approved and implemented in the county.

Unfortunately Dr. Thomas and Dr. Thompson were not able to submit a paper to support their EIG presentation entitled 'The Geology and Mineral Resources of North West England.' For the purposes of completeness and to 'set the scene' to this paper, their abstract is included as it provides detailed information of the geology of mineral resources within the northwest region.

Abstract from 'The Geology and Mineral Resources of North West England'

North West England, extending from Cumbria and the Isle of Man in the North to the Cheshire Basin in the south, contains a wide variety of commercial mineral resources.

The oldest rocks are those of Ordovician and Silurian age within the Lake District. These include the granites, volcanic rocks and metamorphosed sediments within the National Park, some of which are still worked for roofing slates, together with a similar range of rocks outside the National Park, some of which provide important sources of construction aggregate. The latter include a small area of the Borrowdale Volcanic Group rocks around Millom and more extensive turbidite sediments in south east Cumbria which both form important sources of High Specification (skid-resistant) aggregates for use in road construction.

Carboniferous limestone, which almost encircles the National Park is extensively worked for crushed rock aggregates and more locally as a source of high purity lime for the steel industry (at Shap Fell) or for building stone. Further south, around Clitheroe in Lancashire, the limestones and associated shales are exploited for cement manufacture. Carboniferous sandstone outcrops within the eastern parts of Lancashire, Greater Manchester and Cheshire are traditional sources of building and roofing stone as well as lower-grade aggregates; whilst the Permo-Triassic sandstones of Cumbria are also important sources of distinctive red building stone.

Carboniferous coal measures occur extensively at shallow depth within north-west Cumbria, southern Lancashire, much of Greater Manchester, and the eastern parts of Merseyside and Cheshire, but are not currently worked on any significant scale. In all of these areas, there are associated fireclay deposits which are locally utilised for brick making. Deeper coal deposits extend beyond these areas, throughout the rest of the Cheshire basin and in the north of Cumbria, but again are not currently worked.

Permian gypsum deposits within the shales beneath the Eden Valley are worked by underground mining methods at Kirkby Thore, near Penrith; and Triassic salt within the Mercia Mudstone Group underlies much of the Cheshire Basin, where it continues to be worked by controlled brine pumping and rock salt mining. In the past, 'wild' brine pumping has given rise to spectacular subsidence, though this is now controlled far more effectively.

Quaternary glacial sands and gravels occur extensively within Cheshire and Greater Manchester. The deposits are worked for construction aggregates, especially in the Delamere Forest area, but elsewhere, around Chelford, they are important sources of high

purity silica sands, which continue to be used for glass-making in St Helens. More recent superficial deposits include the river terrace and sub-alluvial sands and gravels of the major river valleys, exploited for construction aggregates; the wind-blown Shirdley Hill

sand deposits of east Lancashire, which were the original source of silica sand for the glass industry in St Helens; and the inter-tidal sediments of the Ribble, Mersey and Dee Estuaries, which have been exploited at times as a source of building sand (Thomas and Thompson, 2012).

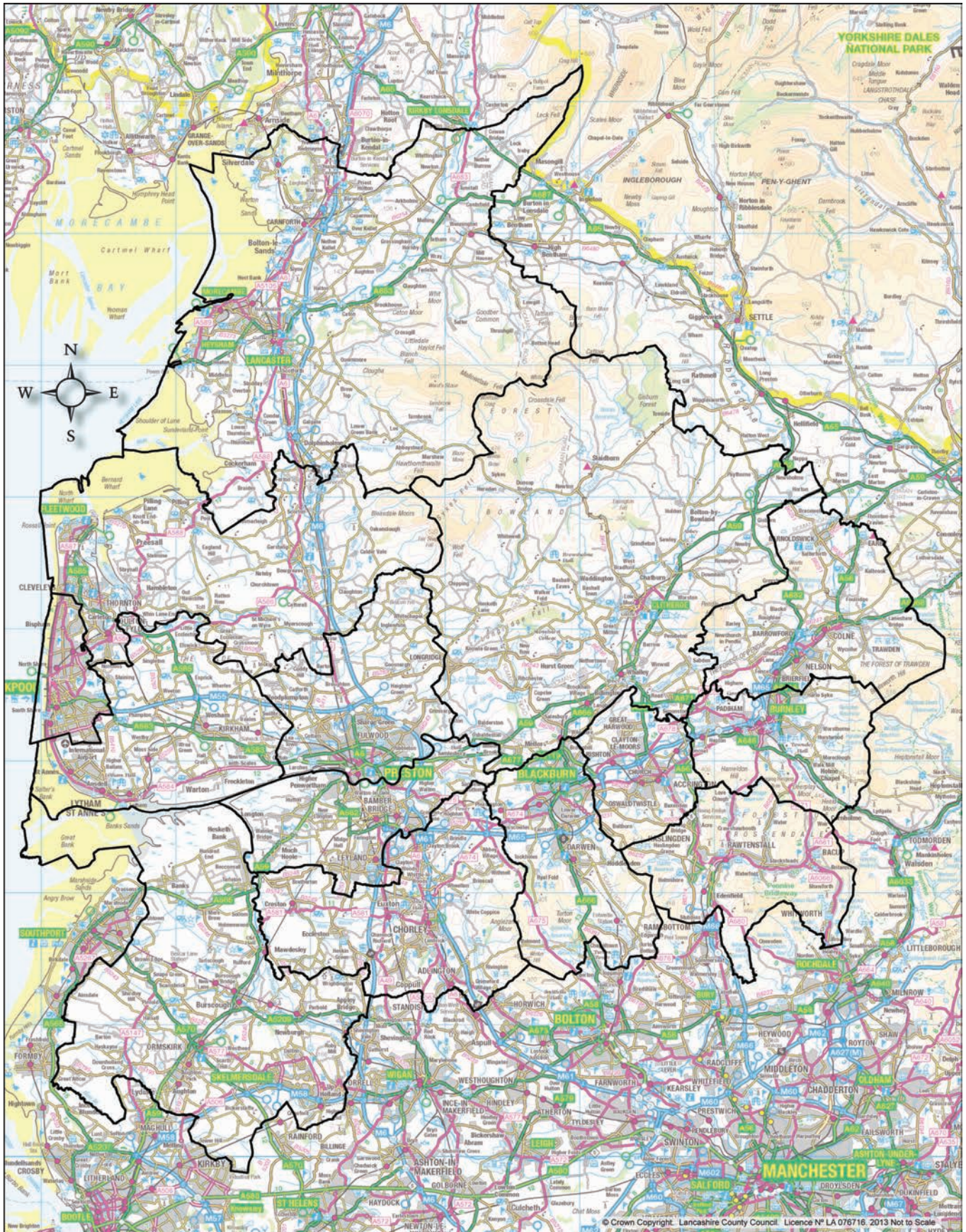


Figure 1. Map showing the extent of the County of Lancashire, as served by Lancashire County Council.

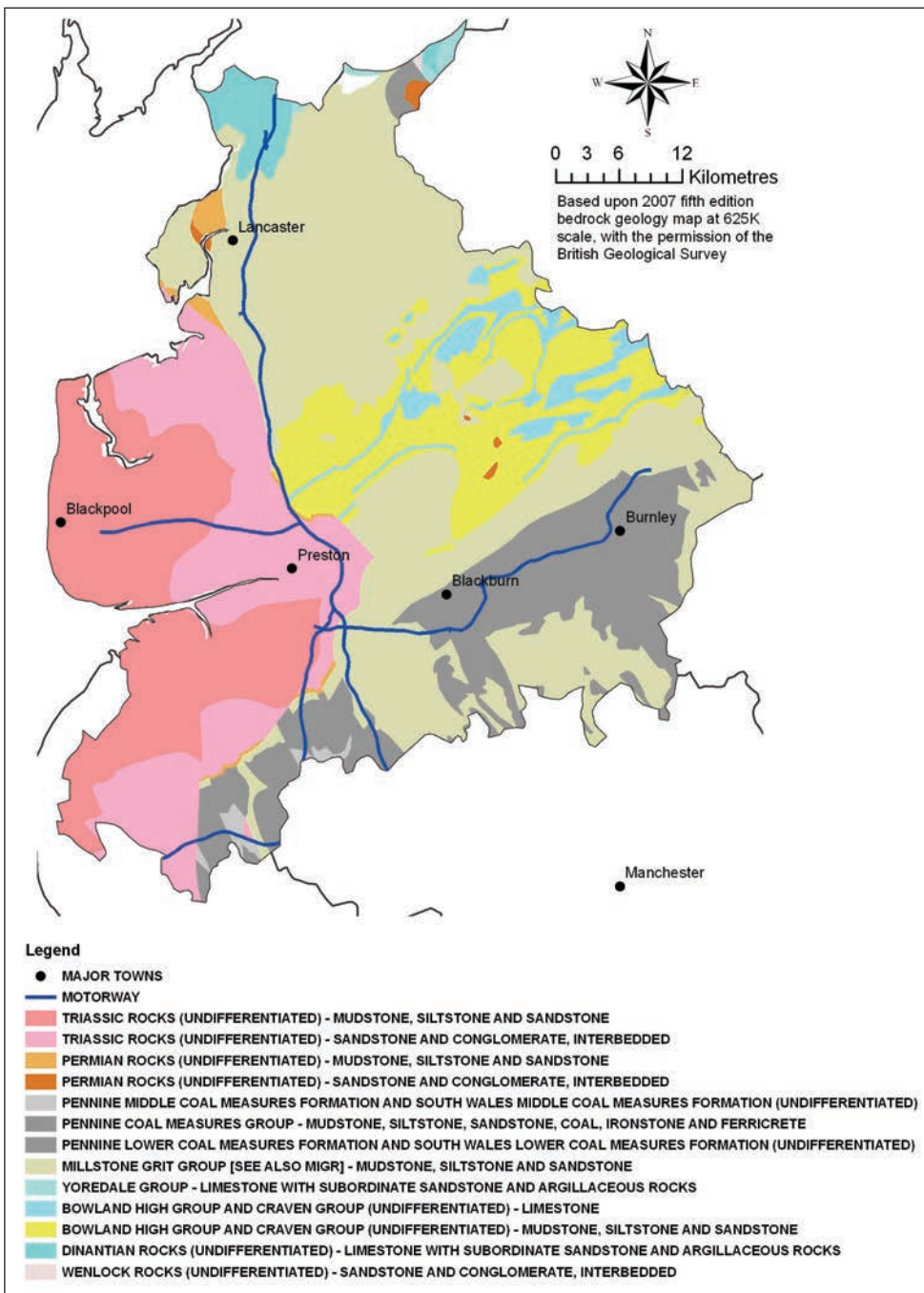
LANCASHIRE COUNTY: GEOLOGY AND MINERAL RESOURCES

Following on from the abstract submitted by Geoff Thomas and Alan Thompson, the geology of Lancashire is dominated by sandstones of Carboniferous and, to a lesser extent, Permo-Triassic age, and Limestones, as shown on Figure 2. The geology of Lancashire is best described in a useful document published by English Heritage in 2011 entitled 'Strategic Stone Study- a building stone atlas of Lancashire' (Geldard, et al, 2011).

The fine to very coarse-grained sandstones of mainly Carboniferous age are located to the east of the County (for example, near Rossendale) with bands buried under glacial till (Quaternary) in the lowlands of the west of the County (for example, near Ormskirk). There are two distinct limestone areas within the County, one known as

North Lancashire, and the second is a small pocket around Clitheroe, known as the Craven Basin. This outcrop has more recently been important in the production of lime and the processing of cement.

The geology of the County has influenced the varied building styles found in the area, with many quarries worked to provide local building materials. To the east of the County much development was constructed using sandstone, for example the Haslingden rock. This particular sandstone was also widely exported to other areas of Britain, in particular London, and also abroad for use as a paving stone due to its strength and durability. In contrast many buildings in Preston were constructed utilising bricks from the Accrington Brickworks, which has recently closed. These bricks, with the infamous 'Nori' imprinted on each one (which reads iron backwards), were most widely used due to their strength.



Figures 2. The bedrock geology of Lancashire extracted from the 625,000 scale geological map of Great Britain, with permission from the British Geological Survey.

Historically there are known to have been in the region of 1,549 quarries in Lancashire (as we now know it). Interestingly it is known that there were also; 5 copper mines, 9 mines for iron ore, 67 lead mines and 797 coal mines.

Currently, there are approximately 60 permitted mineral sites in Lancashire. These include sand and gravel extractions to the south of Chorley, near Preston and on the Fylde coast, sandstone and gritstone to the south and east and limestone to the north and north east of the County. There is now only one small independent coal mine on the eastern County boundary near Bacup.

Proposed sites under consideration include applications for gas extraction (fracking) on the Fylde coast and the underground storage of gas in the defunct salt stores near Fleetwood.

RESTORATION SCHEMES

Restoration is an important aspect of the mineral extraction process in Lancashire. Examples of how quarries have been used and restored within the north-west include the following.

- Martinmere, (Burscough, Ormskirk) – Wetland reserve
- Warton Cragg, (Carnforth) – Nature reserve
- Trowbarrow Quarry (Silverdale) – Climbing / ecology / geology
- Capernwray Quarry (Carnforth) – Diving centre
- Borwick (Carnforth) – Fishing lakes
- Dockacres (Carnforth) – Accommodation lodges and recreation
- Cox Green Quarry (Bolton) where Ned Kelly was filmed
- Montcliffe Quarry (Horwich) – an episode of BBC series 'Accused' was filmed to portray the Iraq war.

Two additional sites merit further attention, namely Brockholes Nature Reserve, near Preston and Lee Quarry near Bacup, East Lancashire.

Brockholes Nature Reserve

Brockholes Nature Reserve is a recently restored former sand and gravel quarry approximately 4 km east of Preston (Figure 3). Planning permission for sand and



Figure 3. Aerial view of Brockholes Quarry near Preston, 2002.

gravel extraction at the site was granted on appeal in 1992. The approval for the quarrying activities was subject to a legal agreement that required the site to be restored to a low profile amenity after use such as nature conservation. The site is in the Green Belt and the quarry itself is designated a Biological Heritage Site.

Full planning permission was granted in 2011 for the development of a visitors centre at the site including a cafe unit, retail conference and exhibition spaces. The location and design of the centre was the result of an architectural competition run by Royal Institute of British Architects (RIBA). The concept for the design 'A Floating World' is based upon a cluster of buildings to resemble an ancient marshland village and which are constructed on a floating pontoon on the edge of one of the lakes (Figure 4). The scheme also involves the restoration of the wetlands, and ancient reed bed habitats, the creation of ponds, seeding of meadows, planting new hedgerows and trees, making access paths and building proper bird watching hides. The project has been made possible through a variety of funding measures including an £8.6 million regeneration grant from the North West Regional Development Agency and Natural England and Department for Environment Food and Rural Affairs' (DEFRA) Aggregates Levy Sustainability Fund which awarded around £300,000. The scheme since its opening has scooped several awards including, Sustainable Project of the Year in the 2012 Building Awards.



Figure 4. Photograph of the Brockholes Visitor Centre, Preston in 2012. The design of the buildings is based upon the concept of a marshland village and was the winning entry of a competition. Printed with kind permission from Lancashire Wildlife Trust.

Lee quarry

The second restoration scheme relates to Lee quarry, a former gritstone quarry to the east of the County near Bacup, Rossendale (Figure 5). Disused since the 1970s planning permission was granted for the partial reclamation of the quarry for public amenity use in April 1999. Lee quarry is designated as a Biological Heritage Site and a Site of Special Scientific Interest.

A development of the mountain bike trails was established within the quarry and this forms part of the 'Adrenaline Gateway', a network of accessible and interconnected lifestyle or adrenaline based sports and activities across Rossendale and Pennine Lancashire.



Figure 5. Aerial view of Lee Quarry, near Bacup, Rossendale, 2002 .

Utilising experts in the design of the mountain bike trails the quarry includes 8km of tough technical mountain bike trails.

Many leading bike magazines hold photo shoots at the quarry and the Great Britain Olympic cycling team regularly uses the site. An example of an article from ‘Single Track’ a cycle magazine is reproduced as Figure 6. The site is popular and used by both walkers and mountain bikers and includes pedestrian and mountain bike circulation routes, and interpretation boards. The

‘Valley of Stone’ project which explores the history of local quarries and the legacy left behind, has commissioned sculptures to be constructed within the quarry thereby celebrating the quarrying and stone working heritage of Rossendale.

CONCLUSION

The rich and diverse mineral wealth of Lancashire has been historically important at different times across the region. The mineral industry continues to play a major role in the economic life of Lancashire and the ability through planning to influence restoration schemes is vital for the future of the County.

REFERENCES

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Figure 6. Article from Mountain Bike Magazine showing the restoration of Lee Quarry, Bacup. Printed with kind permission from the magazine ‘Single Track’.