

NORTHUMBERLAND AND TYNE & WEAR

(comprising Northumberland, Northumberland National Park, North Tyneside, Gateshead, South Tyneside, Newcastle - upon - Tyne and Sunderland)

A Summary of Mineral Resource Information for Development Plans

Mineral Resources (North)

Scale 1:100 000
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- ### SAND & GRAVEL
- #### Superficial deposits
- River sand & gravel resources
 - Concealed river sand & gravel resources in assessed areas
 - Glacial sand & gravel resources
 - Concealed glacial sand & gravel resources in assessed areas
 - Marine & estuarine sand & gravel resources
 - Blown sand and raised beach deposits
- Boundaries of areas assessed for sand and gravel at the indicated resource level
- #### Bedrock deposits
- Outcrop of Basal Sands

- ### PEAT
- Peat

- ### LIMESTONE
- #### Dolomite
- Upper Magnesian Limestone
 - Middle Magnesian Limestone
 - Lower Magnesian Limestone

- #### Limestone
- Limestone

- ### IGNEOUS ROCK (Intrusive)
- Dolerite (including Great Whin Sill)
 - Felsite

- ### COAL
- #### Areas of shallow coal
- Principal resource area - thick, closely spaced coals
 - Subsidiary resource area - widely spaced coals
 - Opencast coal: Worked area

- #### COAL LICENCE AREAS (as at 01.08.00)
- Source: The Coal Authority
- Opencast coal site
 - Deep mine

- #### MINERAL PLANNING PERMISSIONS (as at 01.01.00)
- Source: Mineral Planning Authorities
- Surface planning permission (valid and expired)
 - Underground planning permission other than coal (valid and expired)
 - Planning permission undefined

- #### MINERAL WORKINGS
- Blaxter Active site
 - Brunton Inactive, worked-out and/or restored site
 - Active underground mine
 - Active secondary aggregate producer
 - Active wharf

- #### Mineral commodity
- | | | | | | |
|----|---------------------|------|----------------------|-----|---|
| Cl | Common clay & shale | Lst | Limestone | Sg | Sand & gravel |
| Co | Coal | MSg | Marine sand & gravel | Sst | Sandstone |
| Fr | Freyclay | P | Peat | Vm | Vain minerals (Lead, Fluorspar, Withertite) |
| Ig | Igneous rocks | Sagg | Secondary aggregates | | |

- #### ENVIRONMENTAL DESIGNATIONS
- Northumberland National Park
 - Area of Outstanding Natural Beauty: Northumberland Coast, North Pennines (part)
 - Site of Special Scientific Interest
 - National Nature Reserve
 - Scheduled Monument

- #### ADMINISTRATIVE AREAS
- Mineral Planning Authority
 - District

SAND & GRAVEL

Two main categories of sand & gravel resources are defined:
(1) Superficial (Sg) deposits, further subdivided into (a) river sand & gravel (Rg), (b) glacial sand & gravel, (c) marine and estuarine sand & gravel and (d) blown and raised beach deposits.
(2) Bedrock (bed) deposits represented here by the Permian Basal Sands.

River sand & gravel

Most gravel river terrace and alluvial deposits are developed along the major river valleys such as the Broomish, Tyne, Coquet and Till. Fluvio-glacial sands and gravels may also occur beneath these deposits, and quarry operations generally extend down to these deposits.

River gravels are generally well sorted, well rounded and of a high commercial quality. In the Broomish, Coquet and Woadle Water valleys, pink sand & gravel derived from the Cheviot complex is regarded as a first class concreting aggregate. These deposits are generally well-sorted and fairly well graded with a moderate fines content. Narrow beds of fine sand gravel are also common in valleys.

Fluvio-glacial sands and gravels, generally thicker deposits than river alluvium, have been partially, but imperfectly, sorted by streams issuing from the melting glaciers. The largest extent of such deposits is in the north-east England near Woadle, where extensive terraces of sand & gravel up to 9 m in thickness occur. Terraces are also present along the River Tyne and its tributaries. The deposits tend to be regular in depth and composition, and contain a high proportion of gravel, much of the finer material having been washed out. The terrace gravels consist mainly of Carboniferous sandstones with some Lower Magnesian greywackes, shales and igneous rocks.

Glacial sand & gravel

The largest group of sands and gravels in north-west England are on-contact sediments laid down by streams flowing on the top of, within and beneath ice sheets. These deposits commonly occur as terraces either within, or beneath the Boulder clay. The composition and thickness of these deposits is highly variable, although characteristically sandy, except in the Tyne Valley where gravels predominate. They may also grade into alluvium as they contact increases. Important glacial beds may reach a thickness of up to 30 m in the Tyne Valley.

Parts of the area assessed for sand & gravel by the BGS are identified on the map. Within these areas, the extent of sand & gravel, including the possible extent of glacial sand & gravel beneath till, is shown. Outside resource assessment areas, data are more limited and only general sand & gravel at outcrop is shown. Resources concealed beneath till may be extensive in some areas.

Marine and estuarine sand & gravel

Within the Morpeth area, these resources are shown in the estuaries of the Blyth and Wansbeck, where they consist of silt, peaty clay and sand & gravel.

Blown and raised sand

Beach deposits are found along the length of the Northumberland coast, often backed by sand dunes. They are generally clean fine- to medium-grained sands of uniform grading, used for concreting and building sand. No beach deposits are currently worked. Blown or dune sand areas of variable thickness and consist of unconsolidated fine- to medium-grained sands. Dunes are rarely worked because of conservation considerations.

Bedrock deposits

The Permian Basal Sands have a small outcrop in the extreme south-east of the area, where they crop out intensively along the base of the Permian Magnesian Limestone escarpment and dip to the east beneath the limestone. They are currently unworked, unlike in neighbouring Durham, where they form an important source of building sand.

BUILDING STONE

Sandstones of Carboniferous age, primarily sandstones of the Carboniferous Limestone (Durian, Stannemore Group Millstone Grit - Namurian) and the Coal Measures (Wearhead) are the principal building stone resources in Northumberland and the Tyne & Wear areas. They satisfy the accepted criteria for building stone in such as strength and tool resistance (see criteria), durability and weathered well coloured and resistant mineral framework, size of block, based on thickness of the bed, and aesthetic qualities such as colour and texture.

Demand for stone is currently concentrated on sandstones of uniform colour (buff, pale yellow and grey) and fine- to medium- grain-size. Coarser grained and pebbly sandstones or granites which were widely used are now generally less commonly worked. As the stone quarries are often small, the extent of the resource is not shown on the map. Despite this, the quarries are commercially important and their products are widely used in the north-east, and also in the towns of the Borders and southern Scotland. Quarrying of sandstone has been carried out since at least Roman times and blocks can be seen in Hadrian's Wall. Production reached a peak in the 19th to the early part of the 20th centuries, with many quarries operating in and around Newcastle and Gateshead, of which only Spangwath remains in production. Demand is rising as natural stone is specified, mainly on aesthetic grounds, for new buildings in the area. Sandstones from quarries in the Stannemore Group such as Cullery, Bloor and Grange, Doddington in the Lower Limestone Group and Spangwath in the Coal Measures are important sources of building stone. A laminated sandstone is worked for roofing and flooring slabs at Lathwicks.

PEAT

Two types of peat bog are found in Northumberland, raised bogs, characteristic of flat underlying topography and found mainly on low plains or broad level floors, and blanket bogs in upland areas, where the accumulation of peat on all but the steepest slopes. These can, however, contain areas of raised mire and higher areas known as valley or basin mire. Horticultural peat is produced from lowland bogs, extracted by mechanical means from workings in Northumberland, peat bogs cut in summer and transported in winter. Kemping Moss, near Lanchester, is a raised mire and Dryburn Farm, near Bedburn, works a lowland peat bog. A third area, Belling Wood, near Wink Forest in the National Park, is an area of upland raised bog.

IGNEOUS ROCK

The most important source of igneous rock for crushed rock aggregate is the Whin Sill, a tabular, sheet like, intrusive body of quartz diorite, locally known as 'labradorite'. The sill may be up to 70 m thick in places and underlies most of the Carboniferous rocks of northern Northumberland. It is worked at the prominent outcrop formed where the sill is exposed from the Tyne Valley to the coast at Belford. The Whin Sill is remarkably consistent in composition throughout its outcrop, though its thickness varies considerably. It is primarily used for metalling.

An igneous complex of Devonian age, comprising an extensive suite of lavas intruded by a central granite, occurs in the Cheviot Hills. The complex is deeply weathered and, except for small intrusions of felsite, has been little worked. A felsite at Howden, near Rothbury, is quarried for the production of a range of aggregate products which are valued for their red colour. The granite and basalt have been excluded from the map.

AIMS AND LIMITATIONS

The purpose of the maps and associated reports in this series is to show the broad distribution of those minerals which may be of current or potential economic interest and to refer these to selected nationally recognised planning designations. The maps are intended to assist in the consideration and preparation of development plan policies in respect of mineral extraction and the protection of important mineral resources against disturbance. They bring together a wide range of information, much of which is outdated and not always available in a convenient form. The mineral resource data presented are based on the best available information, but are not comprehensive and their quality is variable. The mineral boundaries shown are, therefore, approximate. Mineral resources defined on the map delineate areas within which potentially suitable resources may occur. These areas are not of uniform potential and also take no account of planning constraints that may limit their working. The economic potential of specific sites can only be proved by a detailed evaluation programme. Such an investigation is an essential precursor to submitting a planning application for mineral working. Delineated areas are shown as having no mineral resource potential, but some isolated mineral outcrops may occur in these areas. The presence of these outcrops generally reflect very local or specific situations which are referred to in the accompanying report.

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

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Positions of Scheduled Monuments at 1st April 1999 as supplied by English Heritage. The majority of monuments are protected by a central pillar system. Consequently the actual area and/or length of a monument protected by the legal constraints of scheduling cannot be represented here. Monuments scheduled since that date are not accounted for.

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CLAY AND SHALE, INCLUDING FIRECLAY

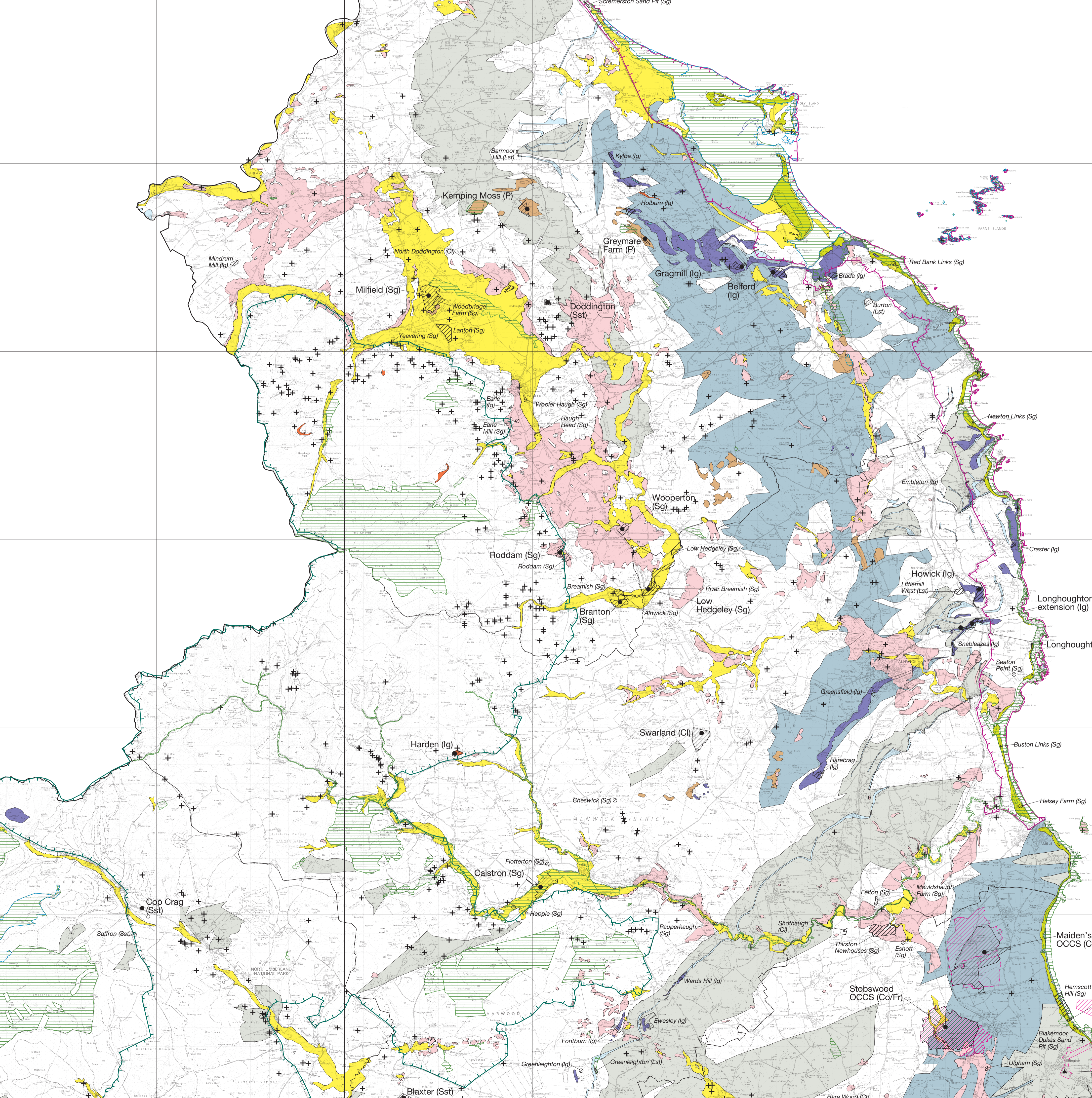
Coal Measures mudstone and fireclay are the principal brick clay resources in the area and their extent is largely coincident with opencast coal resources. Coal Measures mudstone is produced at Red Bank Quarry in South Tyneside to supply the Throckley plant, west of Newcastle, with red-firing clays for facing brick manufacture. A small brick plant at Seaton, near Rothbury, also producing red-firing bricks is based on locally produced glacial clay.

Fireclays typically occur beneath coal seams and resources are, therefore, confined to coal-bearing strata. Originally fireclays were valued as refractory raw materials but only small amounts of fireclay are now used for refractory applications. Some fireclays have relatively low iron contents compared with other brickmaking clays and they are valued for the production of buff-coloured bricks and gears. They are often blended with red-firing clays to give a range of colours. The close association of fireclay and coal means that opencast coal sites are one of the few viable sources of fireclay. Fireclay resources are thus closely associated with opencast coal resources, although because of quality considerations, mainly levels of carbon, sulphur and iron, only a small number of fireclay seams are usually workable. The Northumberland coalfield is an important source of fireclay, which is used mainly in built brick manufacture and on modest scale for refractory applications.

LIMESTONE

Carboniferous limestones occur in a cyclical sequence of limestone, mudstone and sandstone beds the so-called 'fordale facies'. The limestones are usually less than 10 m thick and, therefore, are too thin to support a modern quarrying operation. Consequently they have mostly been excluded from the map. However, they may be worked where closely associated with the Whin Sill. The main exception is the Great Limestone which is sufficiently thick up to 20 m, extensive and consistent in quality to form a workable resource. It is worked at two sites in the southern part of the county for crushed rock aggregate.

Dolomites, dolomitic limestones and limestones of Permian age the Magnesian Limestone occur in the south-west corner of the area. The Magnesian Limestone is highly variable in its physical, mechanical and chemical properties. It is inferior to Carboniferous limestones as a source of aggregate, because of its variable character, lower strength and higher porosity and is generally used for sub-base material and fill. Magnesian Silt forms an important aggregate resource. The Upper Magnesian Limestone is worked at Marsden Quarry, in South Shields, for roadstone, fill and agricultural use.



COALBED METHANE

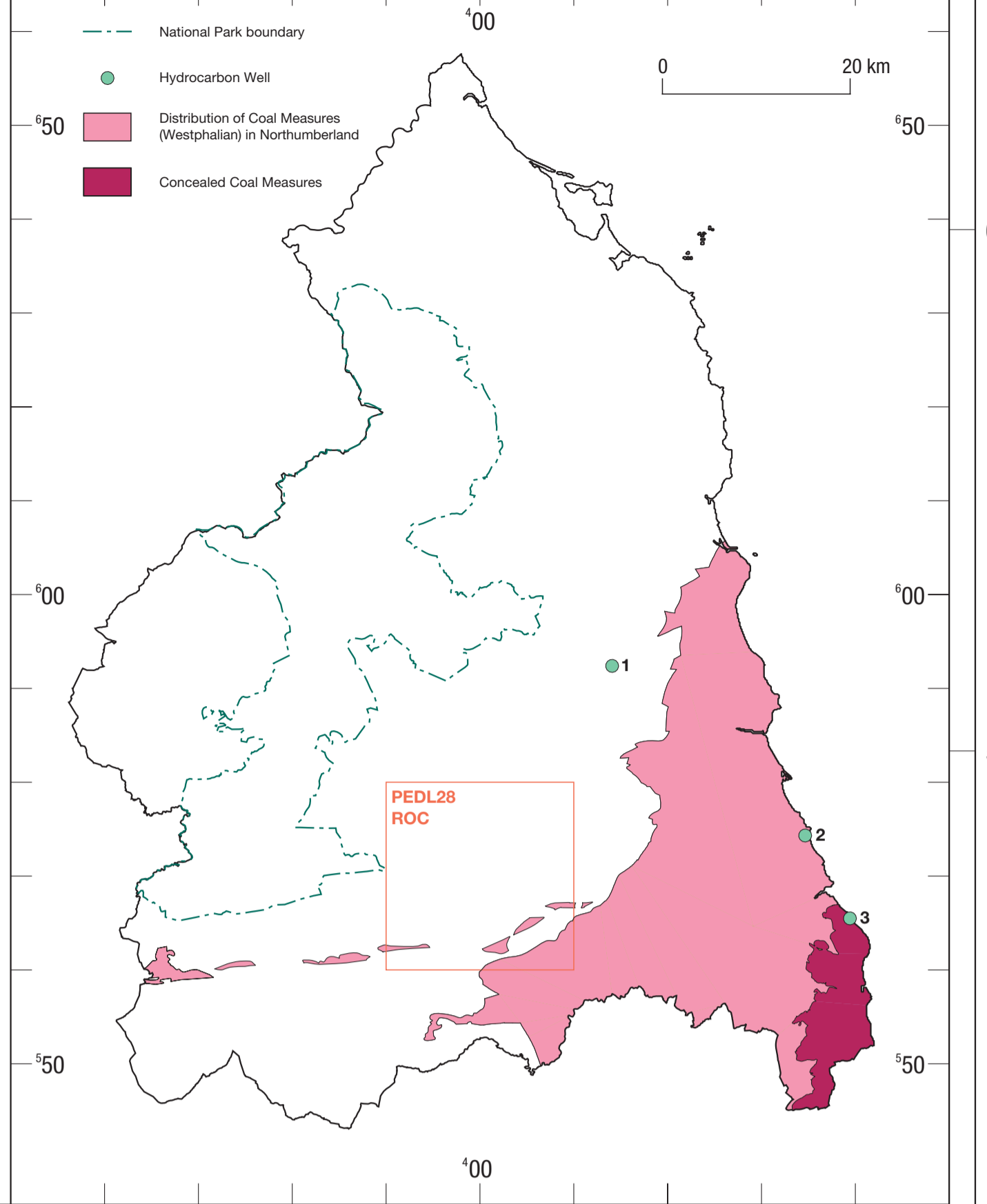
Methane contained within coal seams is known as coalbed methane and is a potential source of energy. However, the gas content of the coals in Northumbria are too low for commercial coalbed methane production.

CONVENTIONAL HYDROCARBONS

The Carboniferous Northumberland Trough has gas-generating potential but oil-generating potential has not been proven. Much of any oil or gas, which may have been generated, may have already been lost and, with a lack of good reservoir rocks, the prospects are not encouraging.

HYDROCARBON WELLS OF NORTHUMBERLAND

- | | |
|--|---|
| 1 LONG HORSELEY 1
Operator: Carbonia Resources
Status: 10.07.1988
Tended: Stannemore Group
Limestone Group, Limestone Group
Scremerston Coal Group
Total depth: 1128 m
Test results: where produced from 3 sandstone reservoirs
Status: Plugged and abandoned | 3 HARTON DOME 1
Operator: Jiffy
Status: 15.01.1960
Tended: Coal Measures, Stannemore Group, Limestone Group
Total depth: 1128 m
Test results: where produced from 3 sandstone reservoirs
Status: Plugged and abandoned |
|--|---|

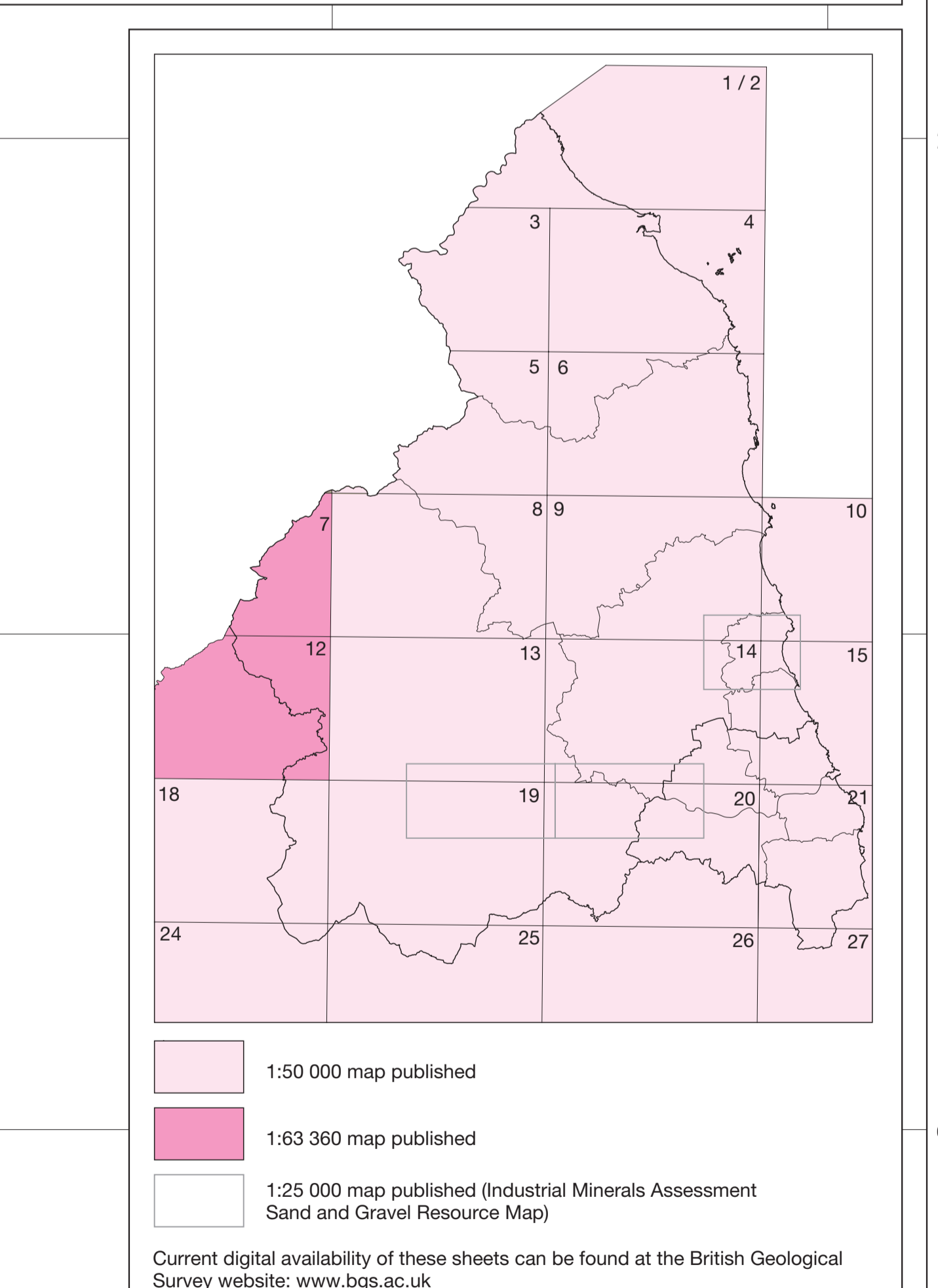
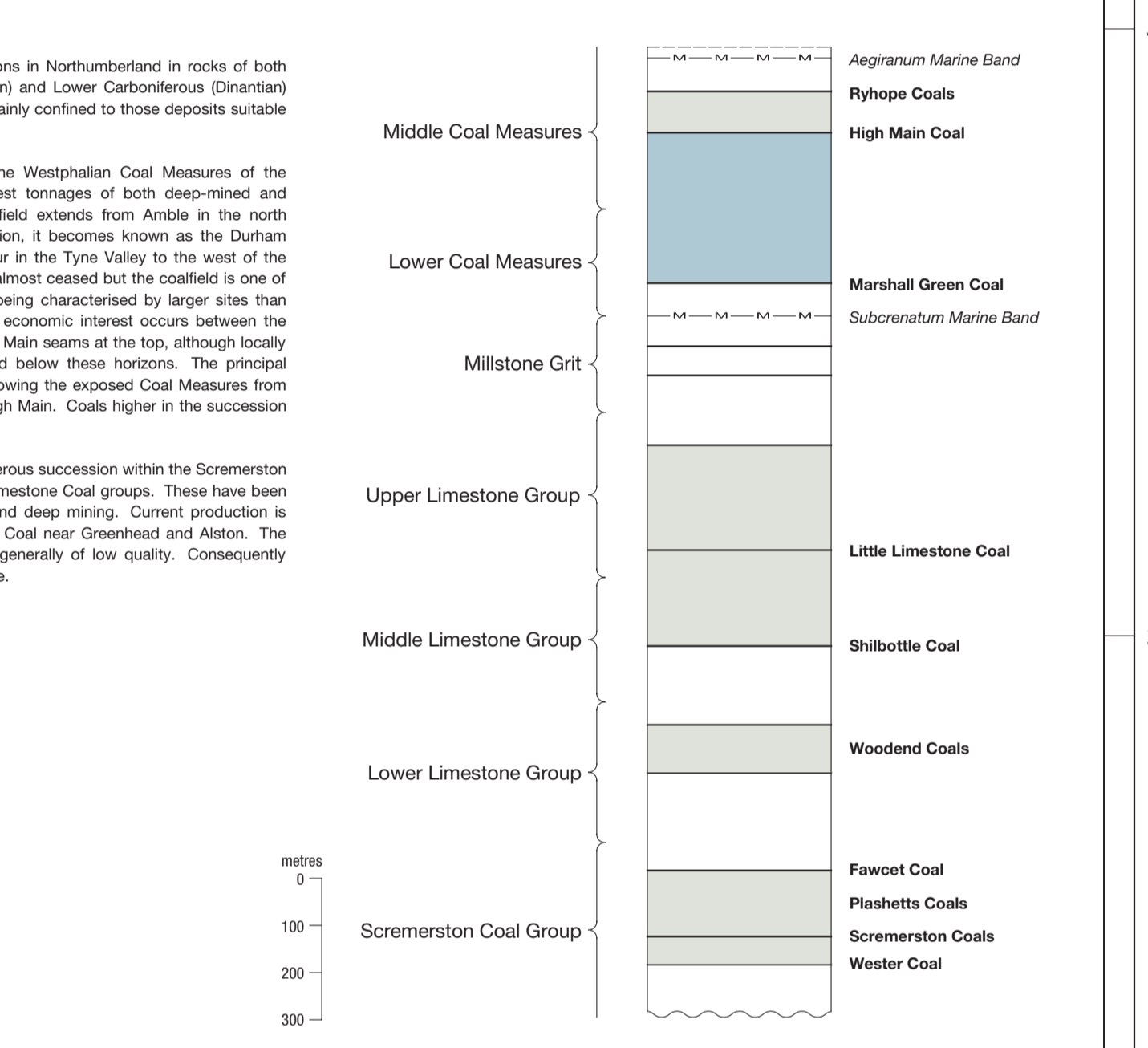


COAL

Coal bearing strata occur at a number of horizons in Northumberland in rocks of both Upper Carboniferous (Namurian and Wearhead) and Lower Carboniferous (Durian) age. Future commercial interest is likely to be mainly confined to those deposits suitable for opencast extraction.

Economically by far the most important are the Wearhead Coal Measure of the Northumberland Coalfield from which the largest volumes of both deep-mine and opencast coal have been extracted. The coalfield extends from Ankle in the north northwards to the Tyne Valley where, by tradition, it becomes known as the Durham Coalfield. These outcrops of Coal Measures occur in the Tyne Valley to the west of the main coalfield. Extensive deep mining has now almost ceased but the coalfield is still the major source of opencast coal in Britain, being characterised by larger sites than elsewhere. The main concentration of coals of economic interest occurs between the Bottom Marshall Green at the base and the High Main seams at the top, although locally some coals have been worked both above and below these horizons. The precise opencast coal resource has been defined by showing the exposed Coal Measures from the Bottom Marshall Green to the end of the High Main. Coals higher in the succession have been classified as a subsidiary resource.

Widely spaced coals occur lower in the Carboniferous succession within the Scremerston Coal Group and the Lower, Middle and Upper Limestone Coal groups. These have been worked on a modest scale by both opencast and deep mining. Current production is confined to slow mining of the Little Limestone Coal near Howden and Axton. The coals are widely spaced, laterally variable and generally of low quality. Consequently they have been classified as a subsidiary resource.



Current digital availability of these sheets can be found at the British Geological Survey website: www.bgs.ac.uk