

# Minerals and Waste Joint Plan Evidence Paper 2: Minerals Specific Evidence (non- aggregate minerals)

**North Yorkshire County Council**

**March 2017**

**Minerals and Waste Joint Plan**  
**Evidence Base 2017 update**

**Minerals Specific Evidence (non-aggregate minerals) for North Yorkshire**  
**County Council**

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# 1. Introduction

This document is part of the background evidence supporting the preparation of the Minerals and Waste Joint Plan.

The National Planning Policy Framework (NPPF), which was published in March 2012 and replaces a wide range of national planning policy, requires Local Plans to be justified and 'based on proportionate evidence'<sup>1</sup>. Some National Planning Policy Guidance (NPPG) was also published on the web in March 2014 to support the NPPF. In addition the NPPF also requires Local Plans to be based on 'adequate, up-to-date and relevant evidence'<sup>2</sup>.

North Yorkshire County Council is the Minerals and Waste Planning Authority for those parts of the County outside the Yorkshire Dales and North York Moors National Parks, as shown on Figure 1 below.

Please note that the data provided in this document commonly applies to the administrative boundary for the whole of North Yorkshire, i.e. including the National Parks. Data only applies to the area outside the National Parks where this is specifically stated. The reason for this is the availability of specific data at varying levels. Parts of the eastern and western boundaries of the Plan area are defined by the National Parks. However, these boundaries do not follow ward boundaries, which are often the lowest spatial level of data, especially economic, provided by the Office of National Statistics. Therefore, so as not to provide data which excludes wards which cross the national park boundaries data is shown, unless otherwise stated, for the whole of the County, including the National Parks.

In 2013 it was agreed that North Yorkshire County Council, City of York Council and the North York Moors National Park would produce a Minerals and Waste Joint Plan which would cover the three administrative areas. The City of York Council and North York Moors National Park Authority have produced separate evidence base papers for minerals and waste which are available to view at [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence). The content of this report is derived primarily from factual sources, and is an 'evolving document' which will be updated as more contemporary evidence becomes available.

With effect from 22 February 2013 the Government formally revoked the Regional Strategy for the Yorkshire and Humber Region (RSS), with the exception of Green Belt policies relevant to York. From the 22 February 2013 development plans across the former government office region, with the exception of York, comprised the relevant local plan, and where they exist, neighbourhood plans. In York, the development plan will continue to include the Regional Strategy's Green Belt policies.

The main focus of this document is on non-aggregate minerals. More detailed information about aggregates (ie sand and gravel and crushed rock used for construction purposes, as well as secondary and recycled aggregate and marine dredged aggregate) can be found in the North Yorkshire Sub-Regional Local Aggregates Assessment, which is available on the Joint Plan website via the following link: [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence) .

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<sup>1</sup> CLG, National Planning Policy Framework, March 2012 (para 182)

<sup>2</sup> Ibid (para 158)



Figure 1: North Yorkshire County Council planning authority area

## 2. North Yorkshire's Geology

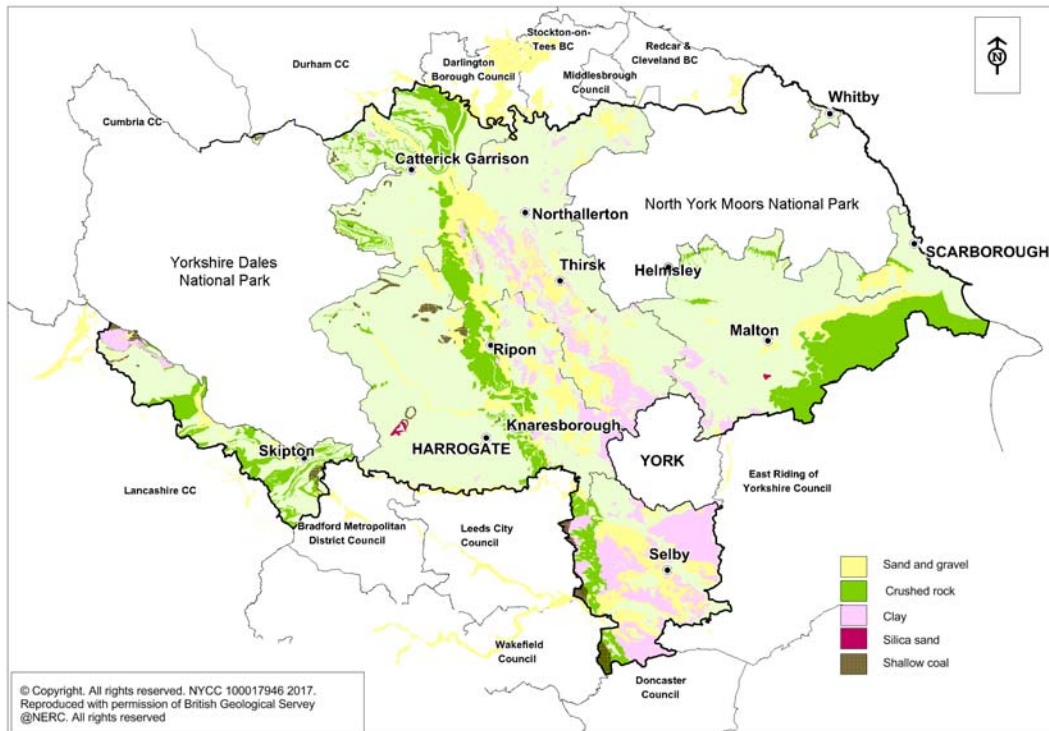


Figure 2: Surface mineral resources in North Yorkshire County Council Plan area.

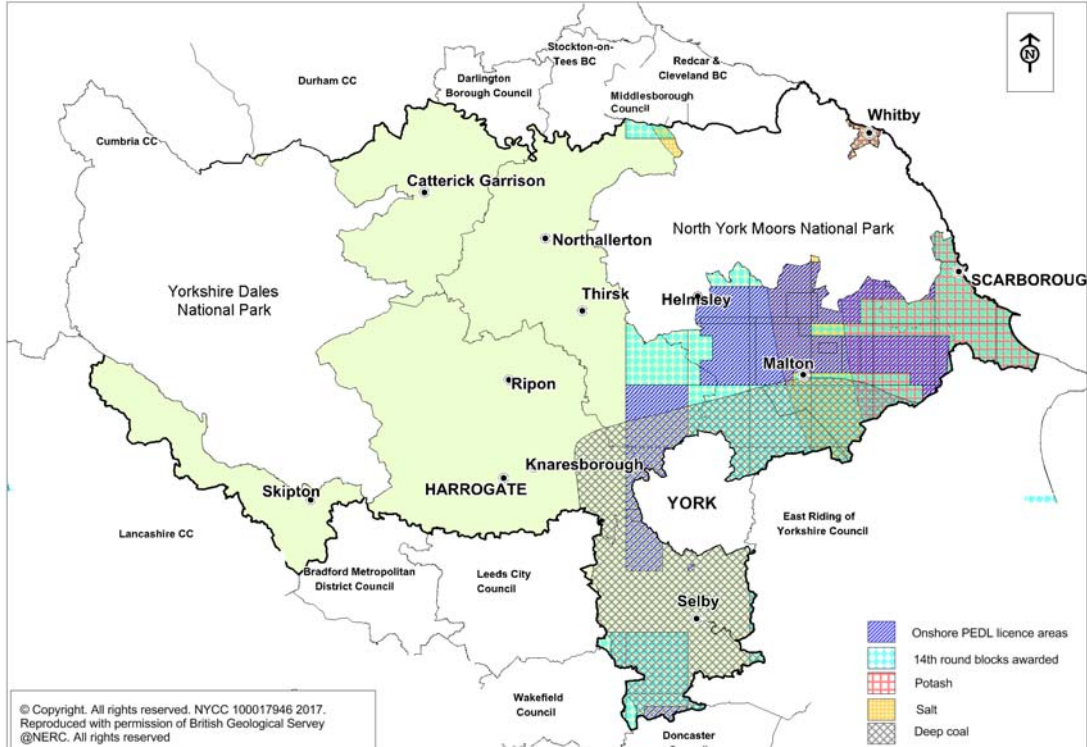


Figure 3: Deep mineral resources in North Yorkshire County Council Plan area.

North Yorkshire has a varied geology comprising a range of rock types of differing economic potential. The rocks generally get younger towards the east and a number of geological periods are represented, including limestones, mudstones and

sandstones of Carboniferous age, Permian limestones (including the economically important Magnesian Limestone), Triassic sandstones and a range of deposits of Jurassic age, including limestones and sandstones. Chalk of Cretaceous age is also represented in the eastern part of the County. More recent, superficial, deposits are also present, including sands, gravel, clay and silt arising from glacial and fluvio-glacial deposition processes as well as river deposits. The superficial deposits in North Yorkshire are an important source of sand and gravel aggregate as well as limestone for crushed rock aggregate. More information on the specific rock types and minerals of potential economic importance, other than aggregates, in North Yorkshire are provided in the following sections.

## 3. North Yorkshire's Non-aggregate Minerals

### A. Industrial minerals

#### 3.1 Clay

##### 3.1.1 What is clay?

Clay is very fine grained sedimentary rock, often associated with other types of deposits such as shale and sandstone. Both bedrock and superficial deposits may be used for brick clay purposes. Clay extracted in North Yorkshire is used mainly in the manufacture of bricks, tiles, pipes and decorative pottery. It is also used in the manufacture of lightweight clay aggregate for block manufacture. The suitability of clay for its intended afteruse depends on its physical and chemical properties, which determine how it responds to firing and drying.

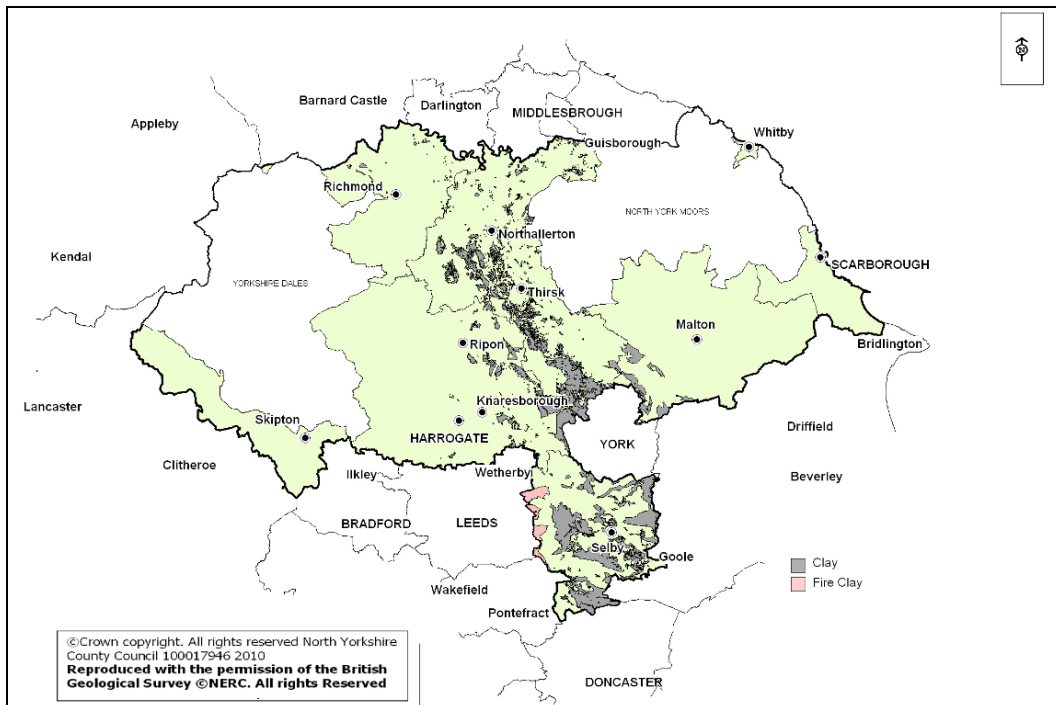


Figure 4: Deposits of clay in North Yorkshire<sup>3</sup>

##### 3.1.2 Where does it occur?

In North Yorkshire, clay workings are mainly associated with superficial laminated glacial lake deposits within the Vale of York. Current extraction sites are located in Hambleton District, Harrogate Borough and Selby District but the resource map suggests that other resources of clay may exist in the Plan area. Resources of fire clay may exist on the western most fringe of the County in Selby District, in association with relatively shallow coal resources, but to date these have not been subject of any commercial interest.

##### 3.1.3 Key data for clay

<sup>3</sup> British Geological Survey, 2010

The majority of production is concentrated at a small number of sites: Hemingbrough clay pit, in Selby District (which produces clay for use within a lightweight block manufacturing plant, also located within Selby District) and Alne Brickworks, in Hambleton District, which produces clay for use in an on site specialist brick and tile works. Extraction has taken place at a third site, at Escrick in Selby District, but permitted reserves no longer remain. Very small scale clay extraction takes place at Littlethorpe, near Ripon, where it is used to make pottery. A dormant site is located at the former Grange Brickworks in Harrogate Borough. This site has been dormant for in excess of 20 years and there are no known proposals to reactivate it.

No published data is available on reserves of clay in the County. It is likely that the large majority of clay extracted within the County is used at manufacturing facilities within North Yorkshire and therefore only relatively small amounts of raw material are exported from the area.

A small number of crushed rock sites in the County produce clay as a secondary product, which has to be segregated from the primary mineral. Secondary clay is generally produced in small quantities only at these sites but specific figures are not available.

#### **3.1.4 Safeguarding**

British Geological Survey was commissioned by the Council to delineate Minerals Safeguarding Areas for the Plan area. The approach taken was in accordance with the methodology outlined in 'Mineral safeguarding in England: good practice advice' 2011. Only the first three stages of the methodology were carried out, which identified and consulted upon which minerals resources to safeguard and the physical extent of the minerals safeguarding areas. The minerals industry have been involved by helping to identify the most economically viable potential resources, even if it is not intended to be extracted in the near future. Brick clay resources have been identified for safeguarding.

The BGS report Mineral Safeguarding Areas for North Yorkshire County Council 2011, which includes draft safeguarding maps, is available in the Council's web pages at [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence). The safeguarding of clay is being finalised through the progression of the Minerals and Waste Joint Plan. The final safeguarded clay resource and buffer will be displayed on the Policies Map produced in conjunction with the Plan. The latest versions of the documents are available at [www.northyorks.gov.uk/mwjjointplan](http://www.northyorks.gov.uk/mwjjointplan).

#### **3.1.5 Local, Regional and National Policy**

Minerals Policy Statement 1 (MPS1): Planning and Minerals 2006 Annex 2 has been replaced by the NPPF (2012). The NPPF identifies brickclay and ball clay as minerals of national and local importance because they are necessary to meet society's needs. As such MPAs must identify and include policies for its extraction and define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of the resource are not needlessly sterilised by non-mineral development, whilst not creating a presumption that the resources defined will be works. Defined Minerals Consultation Areas should be based on these Mineral Safeguarding Areas.

The NPPF states that MPAs should plan for a steady and adequate supply of industrial minerals by:





			Dormant Clay Sites
<b>Harrogate Borough</b>	CL3 - Littlethorpe Potteries	<b>Harrogate Borough</b>	CL5(d) - Grange Brickworks
<b>Hambleton District</b>	CL1 - Alne Brickworks		
<b>Selby</b>	CL2 - Hemingbrough Clay Pit		

Table 1: Clay sites by district

Littlethorpe Potteries – this site is located at Littlethorpe village, near Ripon and covers an area of just over 23 hectares. It is worked at a very low rate (2 tonnes in 2009), via hand digging. The clay extracted is used for the small scale manufacture of pottery on site. The permission is valid to February 2042.

Alne Brickworks – the current site area is between 7 and 8 hectares and is near Alne, near Easingwold in Hambleton District. The clay extracted is used by the adjacent brickworks to produce up to 5 million handmade bricks per year. The life of the current permission for extraction runs until 2020 but it is not anticipated that any further clay will be produced from the current permitted area, with supply being maintained from stockpile. An application has been granted for a new extraction site adjacent to the processing site, covering 8.7ha and containing a reserve of 615,000 tonnes. The permission is for 23 years from the date of commencement.

Hemingbrough Clay Pit – the site is northwest of Hemingbrough village in the eastern part of Selby district and has a permission which runs until 2023. Recently an extension has been granted which adds 20.81ha to the existing site containing an estimated reserve of 1.3mt in the extension area, the new permission runs until 2035. The clay has a low silt content and is used to produce lightweight expanded clay blocks at a manufacturing site at Heck, which is also in Selby district. The block making process can use Furnace Bottom Ash FBA as a substitute for clay, so this may impact upon the level of demand from Hemingbrough.

### 3.1.9 Ancillary Development

The operational clay sites in North Yorkshire are all linked to individual processing operations such as brick or expanded block production. Littlethorpe Potteries and Alne Brickworks have the manufacturing sites directly adjacent to the clay extraction site. Clay from Hemingbrough Clay Pit is transported to associated manufacturing facilities at Great Heck, also in Selby District, by road.

### 3.1.10 Transportation

All transport of clay raw material within North Yorkshire is by road, although block products manufactured at a block making facility at Great Heck, using clay extracted in North Yorkshire, are transported from the facility by rail.

### 3.1.11 Restoration

The three active clay sites in North Yorkshire all have different restoration proposals which include woodland and scrub, agriculture, wetland and recreational uses.

## **3.2 Silica Sand**

### **3.2.1 What is silica sand?**

Silica sand contains a high proportion of silica in the form of quartz and relatively low levels of impurities compared with sands used as construction aggregates. It is used mainly as raw material for the glass and foundry casting industries but can have a wide range of other uses, including ceramics and chemicals manufacture, firing and drying. Closely defined quality specifications are often required to meet particular end uses and relatively complex processing of the raw material may be required, with an associated high capital investment involved.

### **3.2.2 Where does it occur?**

North Yorkshire has relatively limited resources of silica sand. Two widely separated sites currently have the benefit of planning permission; one located within Carboniferous sandstone deposits in the Nidderdale Area of Outstanding Natural Beauty in Harrogate Borough (Blubberhouses Quarry) and the other within Jurassic sandstone near Malton, in Ryedale District (Burythorpe Quarry).

### **3.2.3 Key data for silica sand**

Published data for the Yorkshire and Humber region in the United Kingdom Minerals Yearbook 2008 indicate that, during 2007, 0.075mt of silica sand was produced in the Region of which 0.061mt was used for agricultural, horticultural and leisure uses and 0.014mt used for other industrial uses. The 2009 Minerals Yearbook indicates that 0.014mt was produced for other industrial uses and there is nothing recorded against the other categories of use. Production took place from sites within North Yorkshire, South Yorkshire and Humberside. Of the two permitted sites in North Yorkshire one, Blubberhouses Quarry, has been mothballed since 1991. During the period this site was active it produced sand for glass manufacture. The permission was due to expire in 2011 and an application for an extension of time submitted in December 2011. The application is currently undetermined. The remaining site, Burythorpe Quarry, is relatively small. Minerals Resource Information published by British Geological Survey in 2006 indicates that production at this site was around 0.030mtpa and is used for producing resin coated foundry sand, washed sand, washed and dried sand, 1:30 sand and sand for equestrian and agricultural uses. The current permission expires in 2042. Burythorpe has a coating plant on site which produces resin coated sand ready for use in industry.

More recent information provided by the operator indicate that, on average, approximately 30,000 tonnes of silica sand per annum is sold from Burythorpe Quarry and there were approximately half a million tonnes remaining at the end of 2016. The operator has indicated that there are unconsented reserves next to the existing site which could be extracted once planning permission is obtained.

There is a large glass manufacturing plant based at Eggborough near Selby which imports silica sand from Norfolk as this silica sand has the correct properties for producing float glass.

Early in 2016 a review of silica sand cross boundary supply issues was carried out, details of which can be found in Appendix 1 of this document. The review focuses on high quality silica sand which had the qualities to produce glass. The summary concluded that in the short term there appears to be an adequate supply of high quality silica sand available for the manufacture of glass in the Yorkshire and Humber

Region, but this will reduce in the medium to long term, so further sources of supply are likely to be needed.

### 3.2.4 Safeguarding

The NPPF has replaced Minerals Planning Guidance 15: Provision of silica sand in England (2006) and includes silica sand within the group of minerals of local and national importance that are necessary to meet society's needs. Hence policies for extraction of the resource should be identified and included and Minerals Safeguarding Areas defined with appropriate policies in order that known locations of the resource are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked. Minerals Consultation Area should be defined based on the Minerals Safeguarding Areas.

British Geological Survey was commissioned by the Council to delineate Minerals Safeguarding Areas for the Plan area. The approach taken was in accordance with the methodology outlined in 'Mineral safeguarding in England: good practice advice' 2011. Only the first three stages of the methodology were carried out which identified and consulted upon which minerals resources to safeguard and the physical extent of the minerals safeguarding areas. The minerals industry was involved by helping to identify the most economically viable potential resources, even if it is not intended to be extracted in the near future. Silica sand resources have been identified in the vicinity of the two existing sites in North Yorkshire.

The Mineral Safeguarding Areas for North Yorkshire County Council 2011 document, which includes draft safeguarding maps, is available in the Council's web pages at [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence). The safeguarding of silica sand is being finalised through the progression of the Minerals and Waste Joint Plan. The final safeguarded silica sand resource and buffer will be displayed on the Policies Map produced in conjunction with the Plan. The latest version of the document is available at [www.northyorks.gov.uk/mwjointplan](http://www.northyorks.gov.uk/mwjointplan)

### 3.2.5 Local, Regional and National Policy

The NPPF states that MPAs should plan for a steady and adequate supply of industrial minerals by:

- co-operating with neighbouring and more distant authorities to co-ordinate the planning of industrial minerals to ensure adequate provision is made to support the use in industrial and manufacturing processes
- encouraging safeguarding or stockpiling so that the minerals remain available for use
- providing a stock of permitted reserves to support the level of actual and proposed investment required for new or existing plant and the maintenance and improvement of existing plant and equipment of at least 10 years for individual silica sand sites and at least 15 years for silica sand sites where significant new capital is required.

There are no specific national or regional targets for anticipated levels of production of silica sand. At a local level mineral planning is currently covered by the saved policies of the Minerals Local Plan which was originally adopted in 1997, but there are no specific silica sand policies.

### 3.2.6 Production

There is only one active silica sand site in North Yorkshire (Burythorpe Quarry near Malton). In the past reserves and production figures have been produced on a confidential basis and so could not be published. The United Kingdom Minerals Yearbook 2008 states that in 2007 75,000 tonnes of silica sand was extracted in the Yorkshire and Humber region and of this 61,000 tonnes was used for agricultural, horticultural and leisure uses and the remaining 14,000 tonnes was used for other industrial uses. The 2009 Minerals Yearbook indicates that 14,000 tonnes was produced for other industrial uses and there is nothing recorded against the other categories of use. The 2010 Minerals Yearbook does not break down silica sand to regional or sub regional figures apart from stating that there are 2 silica sand sites in the Yorkshire and Humber Region. Information published by the British Geological Survey Minerals Resource Report in 2006<sup>5</sup> indicates that production at this site was around 0.03mt per annum. The response to direct survey by North Yorkshire County Council indicates that 0.027mt was extracted in 2013, rising to 0.034mt in 2014.

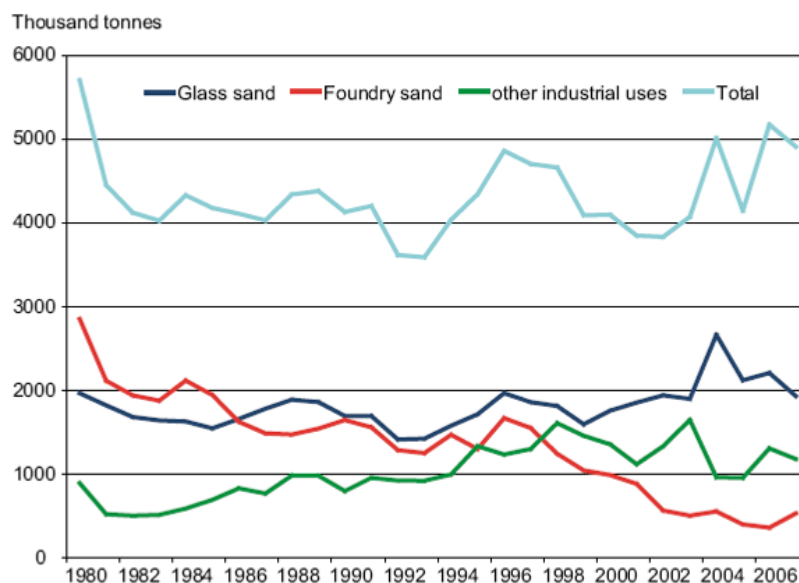


Figure 6: UK silica sand production 1980 - 2007<sup>6</sup>

### 3.2.7 Discussion of Major sites (Active & Dormant)

There are only two silica sand sites in North Yorkshire. One is active and one is dormant. The active site is Burythorpe Quarry, which has a permitted life until 2042 and which extracts silica sand for a variety of markets but mainly for industrial and equestrian uses. On site there are ancillary activities which include a silt lagoon for disposal of impurities and a mobile processing plant for the production of resin coated sand. Information published by the British Geological Survey Minerals Resource Report in 2006<sup>7</sup> indicates that production at this site was around 0.03mt per annum. This is supported by more recent mineral survey returns from the

<sup>5</sup> BGS Mineral Resource Information in Support of National, Regional and Local Planning: North Yorkshire (comprising North Yorkshire, Yorkshire Dales and North York Moors National Parks and City of York 2006).

<sup>6</sup> BGS, Silica sand fact sheet

<sup>7</sup> BGS Mineral Resource Information in Support of National, Regional and Local Planning: North Yorkshire (comprising North Yorkshire, Yorkshire Dales and North York Moors National Parks and City of York 2006).

operator. According to the minerals survey carried out by the Council in 2012, over 80% of the silica sand is exported outside the County.

The Blubberhouses site is located entirely within the Nidderdale AONB and has been mothballed since 1991. There is still a reserve of over 4mt at the site but the permission for extraction was due to expire at the end of 2011. There is currently an application to extend the permission end period by 25 years to enable the operator to extract from the site in the future. The silica sand at Blubberhouses has properties suitable for high quality glass manufacture and so would cater for a different market to the silica sand produced at Burythorpe Quarry.

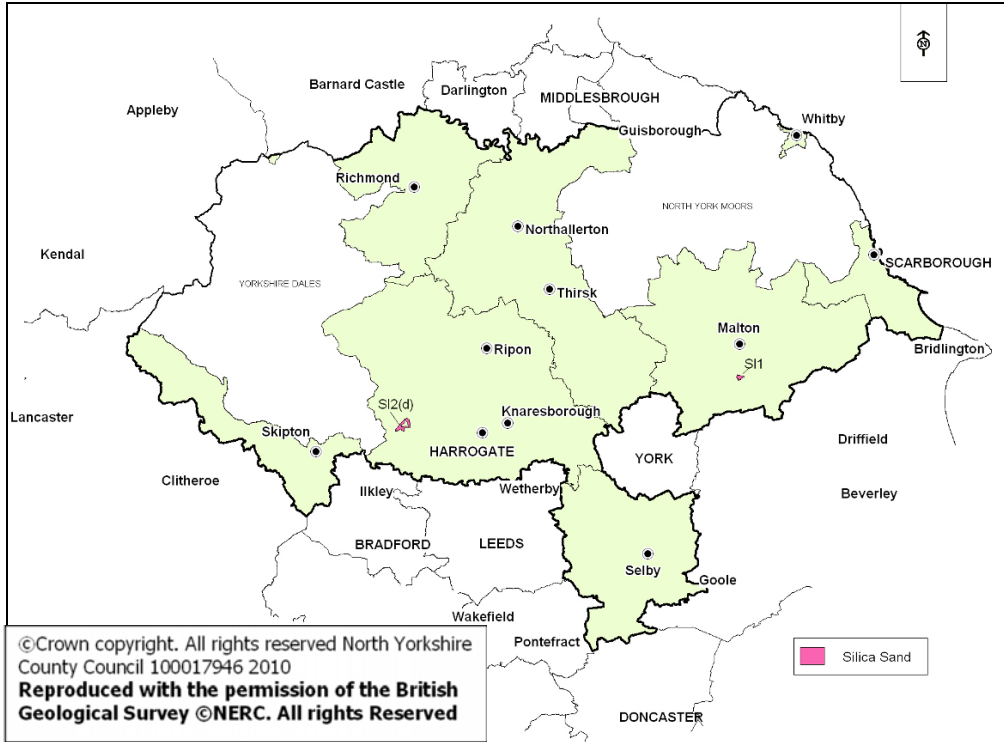


Figure 7: Active and dormant sites for silica sand<sup>8</sup>

Active Silica Sand Sites		Dormant Silica Sand Sites	
<b>Ryedale District</b>	SI1- Burythorpe Quarry	<b>Harrogate Borough</b>	SI2(d)- Blubberhouses Quarry

Table 17: Silica sand sites by district

### 3.2.8 Transportation

Silica sand worked in North Yorkshire is transported by road.

### 3.2.9 Restoration

Working of silica sand sites tends to take place over a long period of time. In some cases progressive working and restoration cannot be achieved as different grades of sand are worked from different areas and levels in a single quarry. The demand for

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differing sands may vary and this will add to the problems of progressive restoration. More complex working schemes may be needed than for construction sand quarries.

The only active silica sand site in North Yorkshire has a progressive restoration scheme in place to restore the site to agriculture with enhanced nature conservation interest.

### **3.3 Potash and Salt**

#### **3.3.1 What are potash and salt?**

Potash and salt are types of evaporite minerals, formed during the evaporation of seawater. Potash comprises a range of potassium-bearing minerals of which a mineral called Sylvinite has historically been the most important. It is likely that over the Plan period the Polyhalite form of Potash will become increasingly more important than Sylvinite given the Dove's Nest Farm permission is to only mine for Polyhalite and a recent press release by Boulby Mine says their renewal is likely to be based on Polyhalite and not Sylvinite

Salt, a sodium bearing mineral, occurs as rock salt (Halite) formed in a similar way to potash. The principle use of potash is as a fertiliser, with minor uses in the chemical and pharmaceutical industries. Rock salt is used mainly for de-icing roads. .

#### **3.3.2 Where do they occur?**

During the Permian geological period, arid conditions prevailed in the North and East Yorkshire area and led to the formation of a number of evaporite deposits. The principal deposits of commercial significance comprise the Boulby Potash, which averages around 7m in thickness and which underlies eastern parts of North Yorkshire at a depth of more than 800 metres below ground level and the Boulby Halite, which is up to around 40m thick and which underlies substantial parts of north and east Yorkshire at depths similar to the Boulby Potash. There are two Polyhalite seams which vary in thickness up to 85m and lie below the Sylvinite and Halite seams. Boulby Potash Mine first started producing Sylvinite potash in 1973 and Polyhalite in 2011..

In October 2015 permission was granted by the North York Moors National Park Planning Authority for a new Polyhalite mine at Doves Nest Farm near Whitby. The mineral will be transported via a tunnel which will be used to convey the material to handling and port facilities at Teesside. Commencement of the construction is due to begin in the first half of 2017.

Neither of these sites crosses the boundary into the North Yorkshire County Council's administrative area.

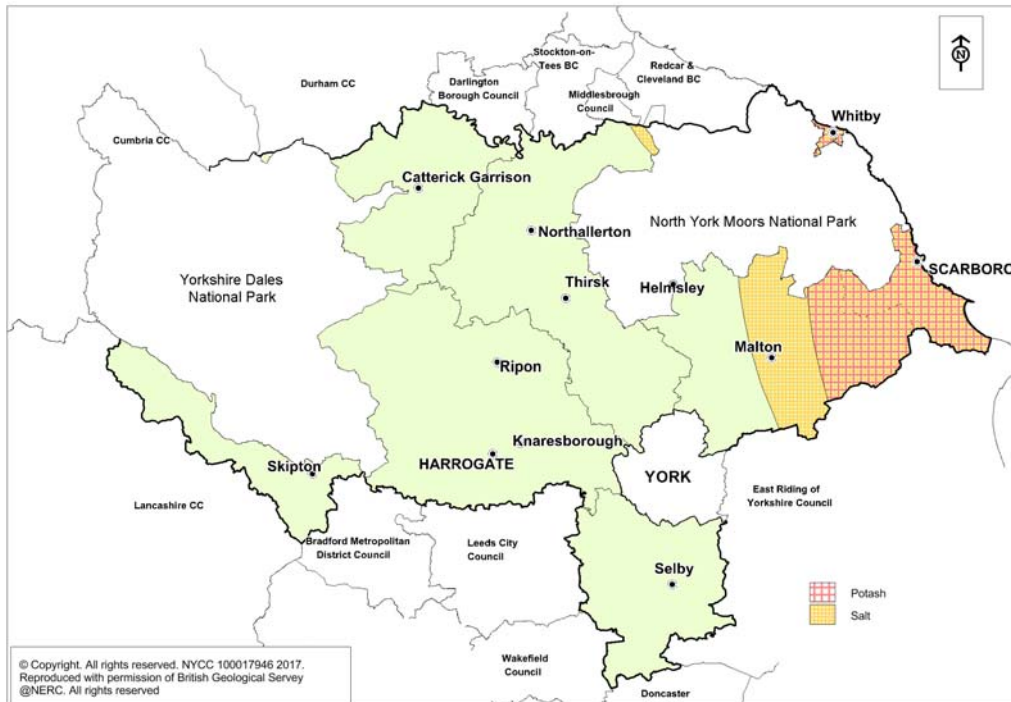


Figure 8: Extent of Potash and Salt deposits within the plan area.

### 3.3.3 Key data for potash and salt

The data in this section is taken from the British Geological Survey Minerals Planning Factsheet for potash (BGS April 2011).

Boulby Mine is currently the only site producing potash in the UK located near Loftus in the North York Moors National Park, close to the border with Redcar and Cleveland Borough Council. The site also produces rock salt as a by-product. Much of the output from the mine is transported by rail to a specific potash and rock salt terminal at Teesport. Full production commenced in 1976, with a peak production level of over 1 million tonnes in 2005. Although specific figures are not available, BGS estimate that about half of the UK production is exported via Teesport, mainly to Western Europe. Total sales in 2009 were estimated to be £170 million (including the by-product rock salt), making the site the most important non-hydrocarbon mineral operation in Britain. It previously employed around 1,000 people and exports are valued at about £50 million.

The BGS Factsheet notes that UK consumption of potash declined from 834,000 tonnes in 2004 to about 535,000 tonnes in 2009 which is in part due to the collapse of the global demand for potash in 2009.

The mine works potash and salt under the North York Moors National Park, parts of Redcar and Cleveland and also under the adjacent North Sea. There is no information about remaining reserves within the mine however permission was granted in 2014 for a new building to house a Polyhalite crushing and screening plant together with pipe conveyor. The existing permission to mine will expire in 2023 and in November 2016 Boulby mine issued a press statement announcing an intention to apply for a new planning permission to go beyond its current 2023 permission expiry. In the 1960's two other proposals to mine potash in North Yorkshire were granted but never implemented and these permissions have now lapsed.



### **3.3.4 Safeguarding**

British Geological Survey was commissioned by the Council to delineate Minerals Safeguarding Areas for the Plan area. The approach taken was in accordance with the methodology outlined in 'Mineral safeguarding in England: good practice advice' 2011. Only the first three stages of the methodology were carried out which identified and consulted upon which minerals resources to safeguard and the physical extent of the minerals safeguarding areas. Safeguarding areas for potash/polyhalite have been identified given the strategic significance of this resource.

The draft safeguarding maps are available via the Council's web pages at [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence). The BGS work on safeguarding of potash is being progressed in the Minerals and Waste Joint Plan which is currently being developed. The latest version of the document is available at [www.northyorks.gov.uk/mwjointplan](http://www.northyorks.gov.uk/mwjointplan)

### **3.3.5 Local, Regional and National Policy**

Potash is identified in the NPPF as being of local and national importance. The NPPF states that local planning authorities should define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of specific minerals resources of local and national importance are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked; and define Minerals Consultation Areas based on these Minerals Safeguarding Areas. The NPPF also requires that authorities should include in their local plans policies for extraction of mineral resource of local and national importance, which therefore includes potash.

The adopted North York Moors Core Strategy (now under review) states that continued extraction of potash at Boulby will be permitted provided that any detrimental effect on the environment, landscape or residential amenity is not unacceptable in the context of any overriding need for the development.

### **3.3.6 Current active sites**

Boulby Mine - Neither the surface mine site nor the underground working areas are located within the North Yorkshire County Council Plan area although the site lies in relatively close proximity to the North Yorkshire County Council area in the vicinity of Whitby.

### **3.3.7 Ancillary development**

Substantial post-extraction processing of potash takes place at the Boulby Mine prior to sale. This includes primary crushing underground, followed by further crushing, dewatering, drying and screening. Main processing of mineral from the proposed new mine would take place at Teesside.

### **3.3.8 Future developments**

Given the recent approval of the new potash mine in the North York Moors National Park it is not anticipated that there will be any new proposals coming forward for the development of potash or salt resources in North Yorkshire, other than at the Boulby or Doves Nest Farm sites. It is expected that an application will be submitted in the coming years by Boulby to extend its mining permission beyond 2023 and the

commencement of work at Doves Nest Farm is due to start in early 2017 with the construction of the mine and the underground mineral transport system, although actual production is not planned until 2021.

## **3.4 Gypsum**

### **3.4.1 What is gypsum?**

Gypsum is a major rock forming mineral that produces massive beds, usually from precipitation out of highly saline waters. Its chemical name is Calcium Sulphate Dihydrate.

Calcium sulphate can also be obtained from desulphogypsum (DSG) which is produced as a commercial grade by-product from the flue gas desulphurisation (FGD) processes<sup>9</sup> at Drax power station.

### **3.4.2 Where does it occur?**

Underground gypsum deposits occur within Selby District and were formerly mined at Sherburn-in-Elmet for use in plasterboard manufacture. The mine was sunk in the 1960s, but flooded in 1988 leading to the closure of the mine. There is no other production in the area and the manufacturing plant at Sherburn-in-Elmet now imports its raw material from other sources.

A property of gypsum is that it is soluble in water and it often dissolves at outcrop which means the physical occurrence of gypsum is unpredictable. BGS has not shown the gypsum resource on the minerals resource maps, because of its' association in North Yorkshire with water bearing strata<sup>10</sup>. Hence there is no current information on the thickness and quality of any potential gypsum resource in North Yorkshire.

DSG can also be used in the manufacture of plasterboard and as well as being produced at Drax power station it is also produced just across the county border at Ferrybridge power station, which supplies a plasterboard manufacturing plant adjacent to the power station. DSG is produced as a result of using coal to fuel the power stations; the higher the sulphur content the more DSG will be produced. Imported coal tends to have less sulphur than indigenous coal. Therefore an implication of a need to rely on imported coal following the closure of local sources of supply is that it is likely that less DSG will be produced. The supply of indigenous coal ceased at the end of 2015 so all coal is now imported.

Ferrybridge coal fired power station closed in March 2016 and Drax has 3 of its towers now using biomass instead of coal for fuel, so the amount of DSG being produced will be less. Eggborough Power Station is also expected to close in 2017.

### **3.4.3 Key data for gypsum**

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<sup>9</sup> FGD is a process that removes sulphur dioxide from the flue gases at coal-fired power stations and the DSG is an important supplement to the supply of natural gypsum.

<sup>10</sup> Source: British Geological Survey 'mineral Resource Information in Support of National, Regional and Local Planning: North Yorkshire (comprising North Yorkshire, Yorkshire Dales and North York Moors National Parks and City of York)' 2006

There are currently no active sites within the Plan area for the extraction of gypsum and none have been active since the mine at Sherburn-in-Elmet closed in 1989 following flooding in the mine.

Figures are available for the production of DSG from Drax and Eggborough Power Stations.

	Drax Power Station tonnes	Eggborough Power Station tonnes
2005	565,000	31,000
2006	610,000	46,000
2007	645,000	36,000
2008	744,000	66,000
2009	646,000	-
2010	719,000	40,000
2011	692,000	44,000
2012	779,000	112,000
2013	627,000	108,000
2014		96,000

Table 2: DSG produced by power stations in North Yorkshire<sup>11</sup>

#### 3.4.4 Safeguarding

BGS have not identified any specific resource area in the safeguarding report produced for the Council, but the safeguarding of gypsum is being reconsidered in the Minerals and Waste Joint Plan which is under development. The latest version of the documents is available at [www.northyorks.gov.uk/mwjointplan](http://www.northyorks.gov.uk/mwjointplan)

#### 3.4.5 Local, Regional and National policy

The NPPF identifies gypsum as a locally or nationally important mineral and so advises that policies should be included for safeguarding and extraction.

#### 3.4.6 Current sites

Underground gypsum deposits occur within Selby District and were formerly mined at Sherburn-in-Elmet for use in plasterboard manufacture. The mine was sunk in the 1960s, but flooded in 1988 leading to the closure of the mine. There is no other production in the area and the manufacturing plant at Sherburn-in-Elmet now imports its raw material from other sources.

#### 3.4.7 Ancillary Development

Calcium sulphate can also be obtained from desulphogypsum (DSG) which is produced as a commercial grade by-product from the flue gas desulphurisation (FGD) processes<sup>12</sup> at Drax and Eggborough power stations. The calcium sulphate can be used as a substitute for mined gypsum in the manufacture of plasterboard. The nearest plasterboard manufacturing sites are at Sherburn-in-Elmet and Ferrybridge power station.

<sup>11</sup> United Kingdom Minerals Yearbook 2014 & Drax Environmental Performance Review 2013

<sup>12</sup> FGD is a process that removes sulphur dioxide from the flue gases at coal-fired power stations and the DSG is an important supplement to the supply of natural gypsum.

## **3.5 Vein Minerals**

### **3.5.1 What are vein minerals?**

Vein minerals include minerals such as fluorspar, barytes and lead, which occur in localised settings within other geological deposits.

### **3.5.2 Where do vein minerals occur?**

Fluorspar, barytes and lead mineralisation occur within parts of Craven District, Richmondshire District and Harrogate Borough as part of the Northern Pennine orefield. Many historic workings were in what is now the Yorkshire Dales National Park, such as those near Grassington and in Upper Swaledale. The Greenhow Hill area near Pateley Bridge in Harrogate Borough is an area which has been intensively worked in the past but there is no recent history of vein mineral extraction in the Plan area. Some of this former working was surface extraction, but in places it has also involved underground working.

### **3.5.3 Key data for vein minerals**

There has been little activity in terms of vein in the Plan area for at least 15 years. Planning permissions for vein mineral extraction still remain in the vicinity of Greenhow Hill in Harrogate Borough and at Cononley in Craven District, but these cannot be reactivated until new working and restoration conditions have been agreed, as the permissions are classified as dormant.

### **3.5.4 Safeguarding**

BGS have not identified any specific resource area in the safeguarding report produced for the Council, but the safeguarding of vein minerals is being reconsidered in the Minerals and Waste Joint Plan which is under development. The latest version of the documents is available at [www.northyorks.gov.uk/mwjointplan](http://www.northyorks.gov.uk/mwjointplan)

### **3.5.5 Local, Regional and National policy**

The NPPF requires that local planning authorities should identify and include policies for extraction of mineral resources of local and national importance in their area but does not specifically mention vein minerals other than fluorspar.

### **3.5.6 Current sites**

There are currently no active sites within the Plan area and none have been active since 1982 at the latest. There are no known proposals to reopen the dormant surface or underground workings in the Plan area, although planning permissions for the extraction of the minerals remain extant and in theory could be re-opened subject to the determination of new planning conditions.

## **B. Energy minerals**

### **3.6 Oil and Gas**

#### **3.6.1 What is oil and gas?**

Oil and gas includes naturally occurring hydrocarbons in liquid and gaseous forms respectively. They are derived from the breakdown of organic matter and tend to occur underground in accumulations (reservoirs) or within other specific geological settings. The NPPF deals with four forms of oil and/or gas development. Conventional on-shore oil and gas (COG) development involves the extraction of petroleum or hydrocarbon oils and gases by drilling and, if necessary, pumping from land based sites. Coalbed methane is extracted by drilling into unmined coal seams to release the gas. Methane capture takes place from active and abandoned coal mines can take place where the methane has accumulated in, and may be freely venting from, mine voids. The fourth form is underground coal gasification, which involves drilling into and subsequent controlled gasification of pressurised coal seams and the recovery and use of the resulting gases.

#### **3.6.2 Key data for oil and gas**

The Oil and Gas Authority (OGA) regulates oil and gas exploration and extraction operations by operating a licensing system. Once a licence has been granted, planning permission must be obtained before the OGA will give consent to drill a well, or to develop an oil or gas field or coalbed or coalmine methane resources.

Since 1995 a single licence, called the Petroleum Exploration and Development Licence (PEDL), has been issued to cover the three main stages of petroleum activity which are exploration, appraisal and development. The licence enables the holder to undertake seismic investigations, drill wells and develop discoveries. The PEDL also covers gas extraction. In July 2014 the 14<sup>th</sup> Onshore Oil and Gas Licencing Round was launched, inviting interest from operators. In August 2015 it was announced that 27 blocks would be formally offered to companies. A second group of 132 blocks were subject to further assessment under the Conservation of Habitats and Species Regulations 2010. Offers for the second group of licence block were made in December 2015. Figure 9 illustrates the location of PEDL licences, including licence areas proposed to be awarded as part of the 14<sup>th</sup> round.

According to the Department of Business, Energy and Industrial Strategy (DBEIS, formerly DECC), there are currently 5 active onshore gas fields in North Yorkshire outside the National Parks. There are currently 2 active sites for coal mine methane extraction in the area, one at Kellingley colliery and one at the former Stillingfleet mine.

The main onshore gas fields in North Yorkshire are in the Vale of Pickering. Gas in the conventional reservoirs in the Vale is trapped within two types of rocks at different levels. The majority of the gas lies in Permian limestone, at a depth of between 1200 and 1500 metres, while the remainder is in carboniferous sandstone at around 1500 metres. Gas from the limestone contains a small amount of hydrogen sulphide and is termed “sour”, while the gas from the sandstone does not and is known as “sweet”. Sour gas cannot be used directly by customers but can be burned to generate electricity, or it can be processed (known as sweetening) and distributed via the national gas transmission system. Hydraulic fracturing or fracking is another method

of extracting oil or gas from rock of low permeability. Fracking involves pumping water, gas and chemicals into the rock at high pressure to fracture rocks and release oil or gas. An application for fracking was granted for an existing well at Kirby Misperton in North Yorkshire in April 2016 but is currently subject to judicial review. Any gas produced would be piped to existing power generation facilities at the nearby Knapton generating station, which currently serves a number of conventional gas wells in the area.

Permission has been granted on appeal for a gas processing facility at Thornton le Dale near Pickering, which would process gas prior to distribution via the national transmission system. The permission has not yet been implemented and expires in June 2017. According to the planning application, normal production would be 15 million standard cubic feet per day (mmscfd) and the maximum capacity would be 40 mmscfd. The site would be linked directly to a gas well at Ebberston, within the adjoining North York Moors National Park authority area. A planning application has recently been granted for production of gas from an existing well at Ebberston South to supply the Knapton generating station via a new pipeline. The permission is accompanied by a legal agreement which, if the permission is implemented would, in effect, prevent the development of the currently permitted pipeline from Ebberston to the recently permitted processing facility at Thornton-le-Dale

In the year September 2015 until August 2016, 1,660<sup>13</sup> tonnes of conventional gas was produced from wells in the North Yorkshire sub-region, which is about 3.7% of UK production. According to survey returns for the calendar year 2016 over 1,400,000m<sup>3</sup> of gas was extracted in North Yorkshire.

A recent review of current geological information relating to shale gas potential, published by the British Geological Survey on behalf of DECC (now DBEIS)<sup>14</sup> in June 2013, suggests that there is potential for substantial quantities of shale gas to occur within Carboniferous strata at depth below substantial parts of the eastern part of the Plan area, much of which is already licensed for gas exploration and development, or would be subject of new licences proposed to be awarded through the 14<sup>th</sup> onshore licensing round.

The table below provides information about the existing or permitted future gas operations in North Yorkshire.

Site	Location	Type of Gas	Capacity	End uses
<b>Knapton Generating Station</b> , gas provided by Kirby Misperton wellsite, Marishes wellsite, Malton wellsite, Pickering wellsite	Ryedale District, near Malton	Onshore gas	Has capacity to use 9mmscf/d gas, and has a 41 megawatt turbine to produce electricity	Electricity produced feeds into the National Grid, has capacity to supply up to 40,000 homes

<sup>13</sup> Source <https://www.ogauthority.co.uk/data-centre/data-downloads-and-publications/production-data/>

<sup>14</sup> DBEIS stands for Department of Business, Energy and Industrial Strategy.

<b>Stillingfleet Mine Generating Station</b>	Selby Coal Field	Coal Mine Methane	3 generators which can produce up to 10.5 megawatts electricity	Electricity produced feeds into the National Grid.
<b>Kellingley Coal Mine</b>	Selby Coal Field	Coal Mine Methane	3 generators and a flare, can produce 21,000 megawatt hours/annum.	Electricity used on colliery site.
<b>Wood Farm, Shipton</b>	Shipton by Beningbrough, near York	Coal Bed Methane	Not operational	Exploratory drilling took place but has not gone into production.
<b>Ebberston South well and pipeline to Knapton Generating Station</b>	Ryedale District, near Malton	Onshore gas	Not operational	Permission granted for production and construction of a new pipeline to transport gas to Knapton Generating Station
<b>KM8 well site, Kirby Misperton</b>	Ryedale District, near Malton	Shale gas	Not operational	Permission granted in 2016 (subject to Judicial Review) for hydraulic fracturing of an existing well
<b>Proposed Ryedale Gas Project</b>	Thornton le Dale near Pickering	Onshore gas	Potential capacity of 40mmscf/d	Would feed into the National Transmission System. Permission for the Thornton le Dale processing facility expires on 28 June 2017. The permission is currently unimplemented.

Table 3: Gas operations in North Yorkshire

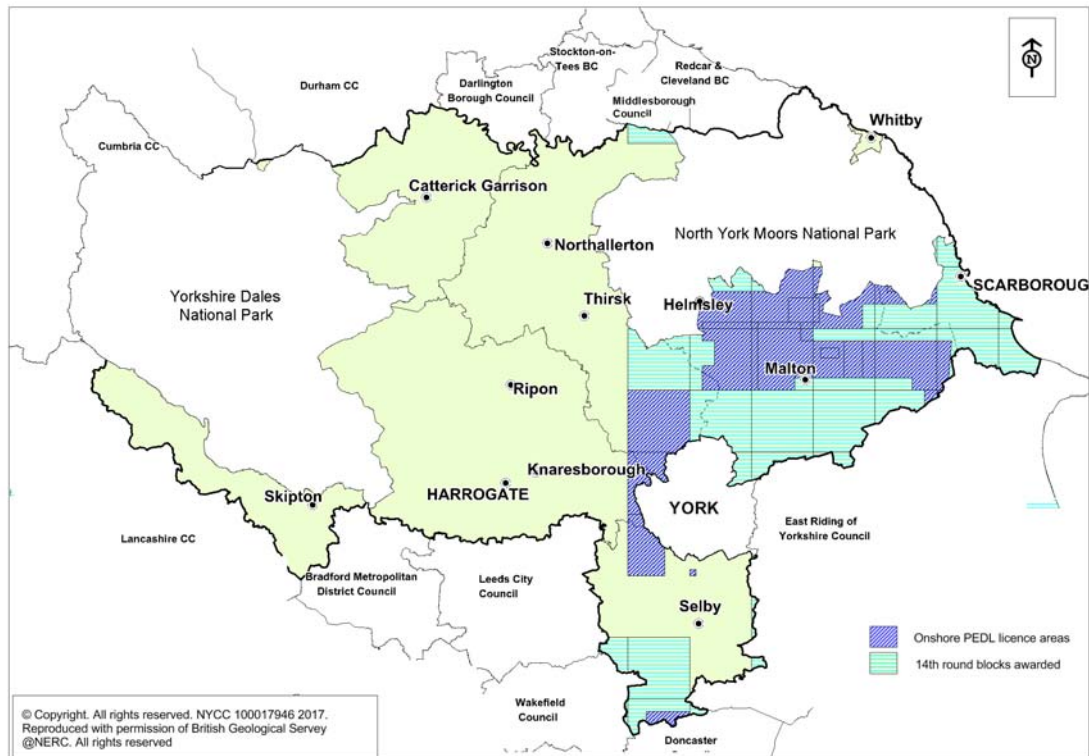


Figure 9: Petroleum Exploration and Development Licence (PEDL) licensed areas in North Yorkshire (as at December 2015)<sup>15</sup>

### 3.6.3 Local and National Policy

The Petroleum Act 1998 vests ownership of the petroleum resources of Great Britain and the United Kingdom territorial sea in the Crown and allows DECC (formerly DECC) to grant licences to persons to 'search and bore and get' those resources. The NPPF contains national planning policy relating to on-shore oil and gas and underground storage of natural gas. The Government has not set targets for the share of total energy or electricity supply to be met from different fuels. The Guidance states that the Government's short to medium term aims is to maximise the potential of the UK's conventional oil and gas reserves in an environmentally acceptable manner; encourage the development of clean coal technologies and encourage the capture of methane from coal mines where environmentally acceptable.

The NPPF indicates that, when planning for oil and gas development, including unconventional hydrocarbons, mineral planning authorities should distinguish, in their policies, between the three main phases of development (i.e. exploration, appraisal and production) and address constraints on production and processing within licensed areas.

The NPPF makes no specific mention of coal bed methane or Underground Coal Gasification but with regard to coal mine and abandoned mine methane, Mineral Planning Authorities are advised to develop policies which encourage its capture and use. A further ministerial statement has stated that there is a national need to explore and develop shale gas in a safe, sustainable and timely way.

<sup>15</sup> OGA, 2015



Planning Practice guidance indicates that local plans should include Petroleum Licence Areas on their proposals maps and contain criteria-based policies for each of the exploration, appraisal and production phases of hydrocarbon extraction and that these policies should set clear guidance and criteria for the location and assessment of hydrocarbon extraction within licence areas. Local plans should identify existing hydrocarbon extraction sites and MPAs may include specific locations for development should the onshore oil and gas industry wish to promote specific sites. The Guidance also indicates that there is normally no need to create mineral safeguarding areas for hydrocarbons, given the depth of the resource, the ability to use directional drilling and the small surface area requirements of well sites.

The Government has also introduced, via amendments to the Infrastructure Act, a ban on associated hydraulic fracturing in National Parks, AONBs, SACs, SPAs and SSSIs at depths of less than 1200 metres. The Government has also consulted recently on proposed further environmental protections<sup>16</sup>. These would be implemented through the PEDL system and would prevent hydraulic fracturing from wells drilled at the surface within National Parks, AONBs, SSSIs, Natura 2000 sites, Ramsar sites, World Heritage Sites and within Groundwater Source Protection Zone 1.

Changes to the Town and Country Planning (General Permitted Development) (England) Order 2015 now means that much of the early exploration work for new hydrocarbon developments in locations outside designated areas can take place without the requirement for planning permission under permitted development.

At a local level mineral planning is covered by the saved policies of the Minerals Local Plan which was originally adopted in 1997. The saved policies were agreed in September 2007 including policy 7/2 Exploration Boreholes, 7/3 Identifying of Geological Structure, 7/4 Appraisal Boreholes, 7/5 Production Wells, 7/6 Development Scheme, 7/7 Development of New Reserves, 7/8 Gathering Stations, 7/10 Restoration, 7/11 Retention of Features and 7/12 Pipelines. The Minerals Local Plan saved policies will stay in force until Minerals and Waste Joint Plan is adopted.

### 3.6.4 Transportation

Natural gas is transported by underground pipeline. Gas pipelines can be divided into two categories which are high-pressure, larger diameter transmission pipelines and lower-pressure distribution mains. The high pressure transmission pipelines transport gas from import terminals to major towns, cities and some large industrial users. These pipelines are known as the National Transmission System (NTS). There is a high-pressure pipeline which runs through the Ryedale and Scarborough Districts. The lower-pressure distribution pipeline network takes gas from the National Transmission System and delivers it to homes and businesses. The proposed Thornton-le-Dale gas processing plant, which is part of the Ryedale Gas project, would feed into the National Transmission System.

National Grid own, maintain and operate the high-voltage electricity transmission system in England and Wales. Electricity generated by the coal power stations at Drax, Eggborough and Knapton Generating Station is fed into the National Grid through regional distribution networks.

<sup>16</sup> Consultation on proposed restrictions through the Petroleum Exploration and Development Licence (November 2015)

## 3.7 Coal

### 3.7.1 What is coal?

Coal is one of a number of energy minerals and is formed through the decomposition and lithification of plant material. Coal seams can vary significantly in terms of their lateral extent and thickness, as well as in terms of their calorific value and levels of impurities such as sulphur and ash; with high calorific value and low levels of impurities representing higher quality coals. Coal mined in North Yorkshire is used for power generation. Colliery spoil produced during mining, as well as ash by-products from coal burning are important sources of secondary aggregate materials and both are produced in North Yorkshire.

### 3.7.2 Where does it occur?

North Yorkshire includes part of the concealed East Pennine Coalfield, comprising Lower and Middle Coal Measures strata. These rocks underlie the south and southeast of the County at depths between 50m and 1200m below the surface, with depths generally increasing to the east. Isolated and small resources of coal are also located in parts of western and northern North Yorkshire. A number of seams have been worked by underground methods, including the Barnsley Seam (within the Selby Coalfield) and the Beeston and Silkstone Seams (Kellingley Colliery). Following the closure of the Selby Coalfield in 2004, Kellingley Colliery, near Knottingley, was the only active mine in the County and worked permitted reserves in the eastern part of Selby District. The colliery closed at the end of 2015 and the mine was sealed. Until 2002 coal within North Yorkshire was also mined from the now closed Prince of Wales Colliery, which was located outside the County boundary. Information published by the British Geological Survey in Mineral Resource Information in Support of National, Regional and Local Planning: North Yorkshire 2006 suggests that some shallow coal occurs in the Plan area although there is no recent history of opencast coal working.

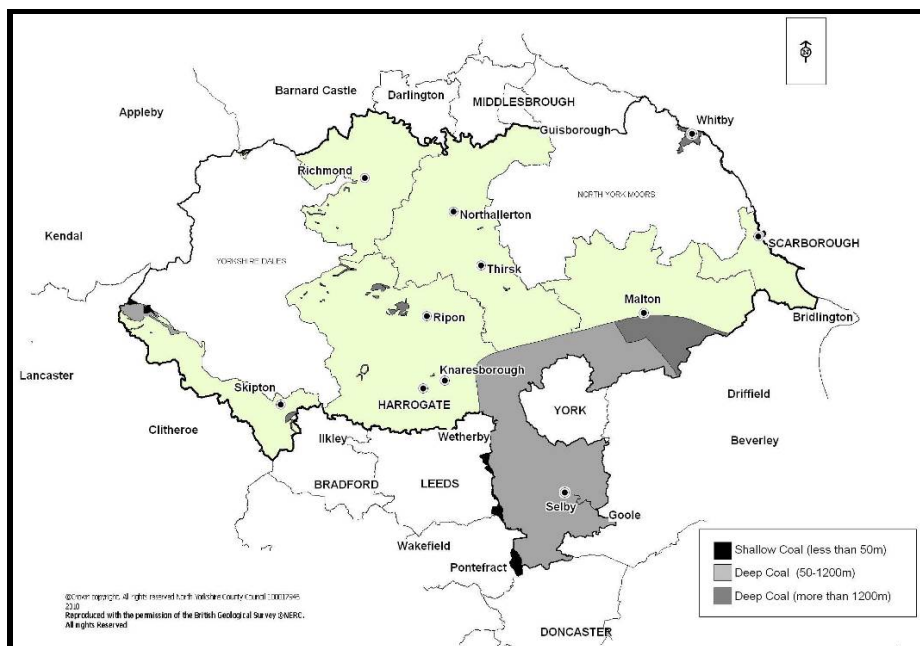


Figure 10: Map showing coal resources

The map illustrates the differing depths of coal in the County. Shallow coal seams exist along the western edge of the Selby District, in parts of the lower parts of some of the Dales and near Ingleton, shown on the map in black.

### **3.7.3 Key data for coal**

According to UK Coal's Annual Report 2011 the total permitted reserves for 2011 at its active deep mines in the UK was 201.5 million tonnes. Of this 65, million tonnes was at Kellingley Colliery which, following closure of the Selby Coalfield in 2004, was the only active deep mine in North Yorkshire. A report published by British Geological Survey in 2006 stated that Kellingley Colliery had proven reserves of 50mt. An extension to underground reserves was permitted in August 2007 and that permission was due to expire on 31 December 2018 but the colliery closed early, at the end of 2015. The reserves covered by this permission totalled 5 million tonnes. The permission for the Kellingley 'take' area overall extends up to 2042 but there are currently no plans to work this resource in the future.

According to the 2013 minerals survey carried out by the County Council, 95% of the coal mined in North Yorkshire went to the power stations, with the remaining 5% sold into the country-wide domestic coal market.

Kellingley Colliery produced substantial amounts of colliery spoil as a by-product, with some sold for use as secondary aggregate, ranging between 0.01 and 0.05mt per annum for the years 2011 to 2014. Spoil not reused was mainly disposed of at the nearby colliery spoil disposal facility at the former Womersley Quarry, in Selby district, to which it was transported by lorry. Previously, some spoil was also been disposed of at the nearby Gale Common power station ash disposal facility, where it was used for construction of lagoon embankments. The Womersley spoil disposal facility has limited capacity but, following closure of the Colliery at the end of 2015, is now being completed and restored using remaining spoil stockpiled at the Colliery.

### **3.7.4 Safeguarding**

The BGS document 'Summary of information on coal for land-use planning purposes' (2004) states that since coal has been mined extensively in Great Britain for the past 160 years, the resources readily accessible to conventional underground mining have been heavily depleted so it is unlikely that any new deep mines for working virgin resources would be economically viable in the foreseeable future, although access to these resources from existing mines is a possibility. There is still the possibility of accessing coal by drift mining and so future interest in coal extraction is likely to be mainly confined to shallow coal resources that can be worked by surface mining methods, or extensions to existing deep mine operations.

Shallow coal resources are easily sterilised by other forms of non-mineral development and yet these are seen as a valuable and readily accessible energy resource that could be worked reasonably rapidly. Shallow coal resources which could be worked by surface mining should be identified and safeguarded against future sterilisation by non-mineral development. As indicated by the map earlier there are limited resources of shallow coal in North Yorkshire, and there is currently no known intent to work them.

British Geological Survey was commissioned by the Council to delineate Minerals Safeguarding Areas for the Plan area. The approach taken was in accordance with

the methodology outlined in 'Mineral safeguarding in England: good practice advice' 2011. Only the first three stages of the methodology were carried out which identified and consulted upon which minerals resources to safeguard and the physical extent of the minerals safeguarding areas. The minerals industry have been involved by helping to identify the most economically viable potential resources, even if it is not intended to be extracted in the near future. Deep and shallow coal resources were identified as requiring consideration in relation to safeguarding.

The Mineral Safeguarding Areas for North Yorkshire County Council 2011 report produced by BGS, which includes draft safeguarding maps, is available in the Council's web pages at [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence).

Following the closure of Kellingley Colliery the need to safeguard deep coal in the County was reviewed as part of the progress on the Minerals and Waste Joint Plan.

### 3.7.5 Local, Regional and National Policy

Minerals Planning Guidance 3: Coal Mining and Colliery Spoil (MPG3) 1999 was replaced by the NPPF (2012). The NPPF identifies coal as a mineral of national and local importance because it is necessary to meet society's needs. As such MPAs must identify and include policies for its extraction (identifying areas where extraction would be acceptable) and define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of the resource are not needlessly sterilised by non-mineral development, whilst not creating a presumption that the resources defined will be works. Defined Minerals Consultation Areas should be based on the Mineral Safeguarding Areas.

The Department of Trade and Industry report *Meeting the Energy Challenge 2007* states that in England, Scotland and Wales substantial remaining coal reserves have the potential not only to help meet our national demand for coal and to reduce our dependence on imported primary fuels, but also to contribute to the economic vitality and skills base of the regions where they are found.

The NPPF also states that for the extraction of coal there should be a presumption against development unless the proposal is or can be made environmentally acceptable, or, it provides national, local or community benefits which clearly outweigh the likely impacts to justify the grant of planning permission.

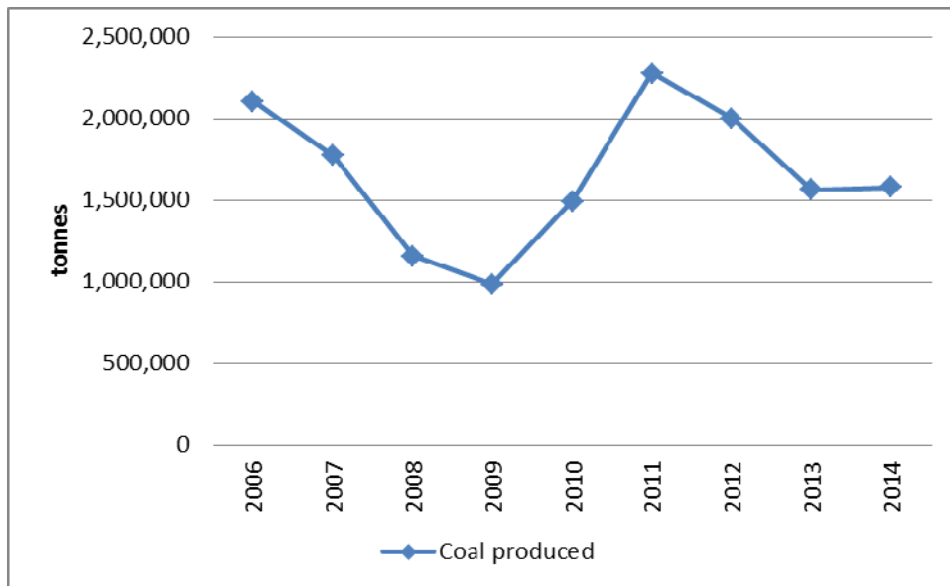
At a local level mineral planning is covered by the saved policies of the Minerals Local Plan which was originally adopted in 1997. The saved policies were agreed in September 2007 including policy 6/2 Deep Mining of Coal, 6/3 Evaluative Framework Technique, 6/4 Colliery Spoil Disposal and 6/5 Colliery waste tips. The Minerals Local Plan will stay in force until a Minerals and Waste Joint Plan is adopted.

### 3.7.6 Production

The production at Kellingley over the last 9 years is detailed below.

Year	Tonnes
2006	2,104,521
2007	1,771,522
2008	1,154,778

2009	984,736
2010	1,490,000
2011	2,276,000
2012	2,000,438
2013	1,561,963
2014	1,579,000

Table 4: Production of coal from Kellingley Colliery between 2005 and 2014<sup>17</sup>Figure 11: Coal production 2006 and 2014<sup>18</sup>

The decline in production in 2008 and 2009 is understood to relate primarily to geological issues.

### 3.7.7 Current active sites

There are currently no active deep mined coal sites in the County as Kellingley Colliery in Selby district closed at the end of 2015. There are no current open cast coal sites and no recent history of working coal by this method.

Mining within the Selby Coalfield ceased in 2004, although at one of the surface sites (the former Stillingfleet mine) gas engines have been installed to utilise coal mine methane to generate electricity. The Kellingley Colliery site has 4 generators on site utilising coal mine methane.

### 3.7.8 Colliery spoil

Colliery spoil is a by-product of the deep mining of coal. Some spoil previously produced through coal mining in North Yorkshire was used as secondary aggregate, including use for lagoon embankment construction at Gale Common Ash Disposal

<sup>17</sup> UK Coal, 2009/2012

<sup>18</sup> UK Coal, Annual Reports 2010 to 2014

Site. The remainder was disposed of at Womersley Quarry colliery spoil disposal site, where it was used to fill a former quarry void. Further information on sales and use of colliery spoil is contained in the section on secondary and recycled aggregate. Further information about utilisation of colliery soil is provided in the North Yorkshire Local Aggregates Assessment and in a supplementary paper on aggregates.

### 3.7.9 Former mine workings

The Coal Authority has a strategic objective to manage the legacy of coal mining activities arising from the UK coal mining industry. There are potentially some serious public safety hazards and risks associated with former mining activities. One of their aims is to raise awareness of historic sites which may cause potential problems such as subsidence, and there are currently 13,500 sites recorded in North Yorkshire, with the potential for more. Mine entries have the potential to collapse causing surface instability, but there is a further risk that mine entries provide a potential pathway to the surface for mine gas and mine water. The Coal Authority has produced a map which identifies the most at risk areas to make developers and planning authorities aware of the potential risks of using old coal sites. Proposals to develop land within a Coal Mining Development Referral Area, also known as a Development High Risk Area, will need to submit a Coal Mining Risk Assessment with any planning application (unless for a householder development)

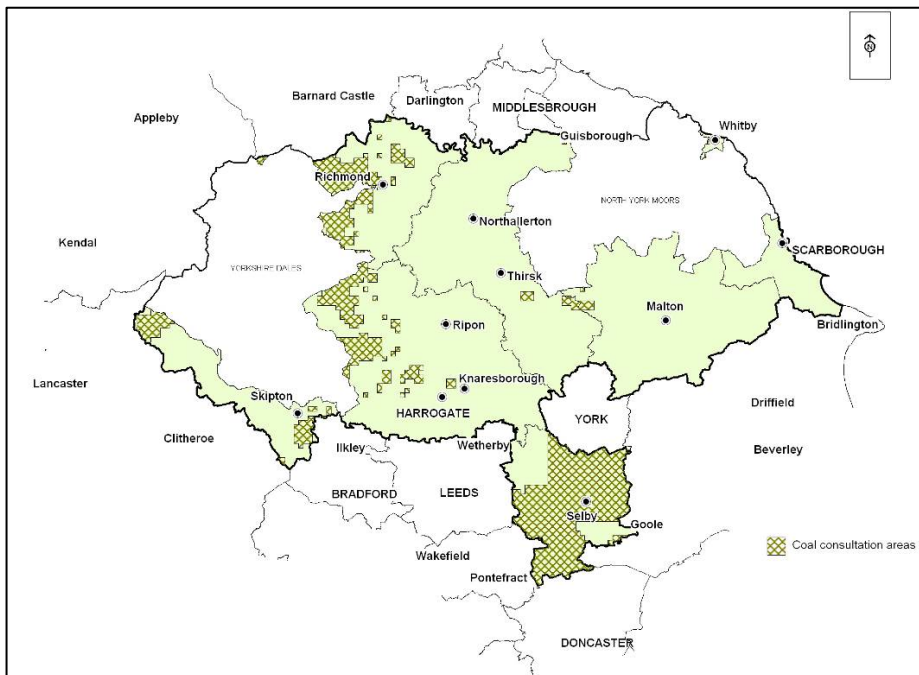


Figure 12: Coal mining referral areas in North Yorkshire<sup>19</sup>

The above map displays the Coal Mining Development Referral Areas for North Yorkshire. The plan shows the areas where specific mining issues are likely to be greatest and there is degree of risk from the legacy of coal mining operations.

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The Coal Authority has issued Standing Advice which can act as a 'deemed' consultation response to Local Planning Authorities. It is intended to give general information to applicants and developers about the potential hazards relating to coal mining and direction as to where further information can be found.

## C. Other non-aggregate minerals

### 3.8 Building Stone

#### 3.8.1 What is Building Stone?

Unlike aggregates, which are used in the construction industry in particulate form, certain rock types may be suitable for use directly for construction in the form of walling, roofing, flagstones or for ornamental purposes. They are frequently used for local building purposes but may sometimes be transported substantial distances in order to meet particular requirements. In North Yorkshire the principle rock types used as building stone include Carboniferous sandstones, Permian dolomitic limestones and Jurassic limestones and sandstones.

#### 3.8.2 Where does it occur?

Potentially suitable rock types for building stone are relatively widespread in North Yorkshire, including the eastern fringes of the Yorkshire Dales, the Magnesian Limestone outcrop running north-south through the central part of the County and Jurassic rocks occurring in the eastern part of the County in Scarborough and Ryedale Districts. Despite this relatively widespread occurrence, working of building stone only takes place at a relatively small number of sites, although historically a large number of very small scale building stone quarries have been utilised.

#### 3.8.3 Key data for building stone

No published data for building stone production in North Yorkshire is available. Production currently takes place mainly at a small number of low output sites specialising in building stone, including sites in Richmondshire District (working Carboniferous sandstone) and Selby District (Magnesian Limestone). Planning permission was granted in 2009 to re-open an old Jurassic sandstone building stone quarry (Brows Quarry) near Malton in Ryedale District but extraction has yet to commence and the permission has now expired. The Yorkshire and Humber Regional Aggregates Working Party Annual Report for 2009 indicates that 111kt of material from crushed rock quarries was sold for non-aggregate purposes in North Yorkshire, and it is known through discussion with operators that some crushed rock quarries sell small amounts of building stone in association with production of aggregates. No published data is available on reserves of building stone in the County. It is also known that some building stone worked in North Yorkshire is used outside the County, for example some stone from Gatherley Moor Quarry in Richmondshire District is processed at facilities in Cumbria and South Yorkshire for onward sale to relatively widespread locations including Scotland. No information is available on imports of building stone into the County.

In 2012 English Heritage and British Geological Survey completed a Strategic Stone Study (SSS). The study identified significant building stone types used in historic buildings and then traced the original and potential alternative sources of the stone used in the buildings. The SSS identifies the location of all known building stone quarries, both active and disused, and the type of stone they in order to help with the locating of suitable sources of stone for repair or restoration of historic buildings. The SSS aims to make sure that quarries which contain stone used in historic buildings are identified and encourages MPAs to safeguard the stone supply so it will not be sterilised by other forms of development.



The SSS has identified all known building stone quarries in North Yorkshire and includes an interactive map and data base, which is available at [maps.bgs.ac.uk/BuildingStone/default.aspx](http://maps.bgs.ac.uk/BuildingStone/default.aspx). Many of the building stone quarries in North Yorkshire which have been identified by the SSS are very old and have not been worked for many years. If any of these sites are identified as containing a specific type of stone which is required for restoration or repair of a historic building then a new planning permission or, if the site is classed as a dormant site, new working and restoration conditions, will be required before extraction can take place.

### **3.8.4 Safeguarding**

British Geological Survey was commissioned by the Council to delineate Minerals Safeguarding Areas for the Plan area. The approach taken was in accordance with the methodology outlined in 'Mineral safeguarding in England: good practice advice' 2011. Only the first three stages of the methodology were carried out which identified and consulted upon which minerals resources to safeguard and the physical extent of the minerals safeguarding areas. The minerals industry have been involved by helping to identify the most economically viable potential resources, even if it is not intended to be extracted in the near future. Building stone has two principal markets which are new buildings and the repair of historic buildings. The approach to safeguarding of building stone sites is detailed in the Mineral Safeguarding Areas for North Yorkshire County Council 2011. The safeguarding document, which includes safeguarding maps, is available in the Council's web pages at [www.northyorks.gov.uk/mwevidence](http://www.northyorks.gov.uk/mwevidence). The BGS work on safeguarding of building stone is being progressed through the Minerals and Waste Joint Plan which is currently being developed, the latest version of the documents is available at [www.northyorks.gov.uk/mwjointplan](http://www.northyorks.gov.uk/mwjointplan).

### **3.8.5 Local, Regional and National Policy**

National Policy relating to building stone is contained in the NPPF (2012). MPAs should consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites and recognising the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the potentially long duration of planning permissions that reflects the intermittent or low rate of working at many sites. There are no specific national targets for anticipated levels of production of building stone.

### **3.8.6 Demand**

The former MPS1 Planning and Minerals Practice Guide (now cancelled) stated that, historically, England has had a wide variety of natural building and roofing stone resources. Peak extraction took place during the second half of the 19<sup>th</sup> century but since then levels of production have fallen due to competition from cheaper man made materials, increased labour costs, and imports of inexpensive stone from elsewhere in the world. Many traditional mines and quarries closed and this reduced the range of types of stone that were readily available but in recent times many building and roofing stone quarry operators have reported a steady increase in demand over the past decade.

Building stone is usually only required for local purposes but may be transported some distances for specific orders. The importance of building stone is in helping to maintain or enhance the quality of the built environment, for example by matching

stone used for repair and renovation with existing materials. It may also be important for the stone to match to help prevent damage to the original stone where it is in contact with the replacement material.

Further work on building stone undertaken during preparation of the Joint Plan sought information from relevant stakeholders on potential factors expected to influence demand for building stone. This suggested that localised factors influencing demand are likely to remain of most significance, with no expectation of significantly increased pressure on resources within the Plan area as a result of demand factors arising outside it.

### 3.8.7 Production

The only current published data available specific to the Yorkshire and Humber area is in the BGS United Kingdom Minerals Yearbook 2009, which states that 0.141 million tonnes were produced in the Yorkshire and Humber Region in 2008. The minerals survey undertaken by the County Council in 2017 indicates that over 20,000 tonnes of building stone was sold from quarries in North Yorkshire in 2016.

The ODPM report Planning for the Supply of Natural Building Stone in England and Wales 2004 states that the trend in England is for 90% of building stone quarries to be small scale and produce less than 2,000 m<sup>3</sup> (4,000 to 5,200 tonnes) per annum, with only one or two employees. The remaining 10% are larger sites and produce on average 20,000m<sup>3</sup> per annum and so account for 70% of the total annual production of about 650,000 tonnes for England. The larger quarries may market stone on a regional, national and even international scale. There are no large scale building stone quarries in North Yorkshire.

A review of existing active building stone sites has been undertaken and a minerals site operator survey undertaken by the Council in from 2010 onwards on an annual basis. All of the sites which produced building stone in 2009 are small scale operations. The largest output was estimated to be in the region of 8,000 tonnes per year. From the survey returns three quarries identified the destination of sales of building stone and this information is represented in the following diagram.

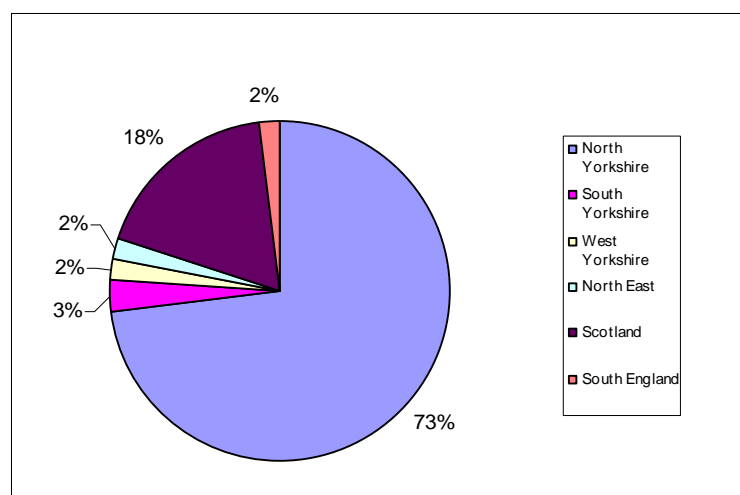


Figure 13: Destinations for building stone sales from North Yorkshire 2009<sup>20</sup>

<sup>20</sup> NYCC Minerals Survey Data, 2010

The diagram reinforces the fact that the majority of building stone produced is used locally.

There is no published reserves data for building stone in North Yorkshire.

### 3.8.8 Current active building stone sites

The map below shows active building stone quarry sites (including aggregates quarries producing building stone as an additional product) in the North Yorkshire County Council area

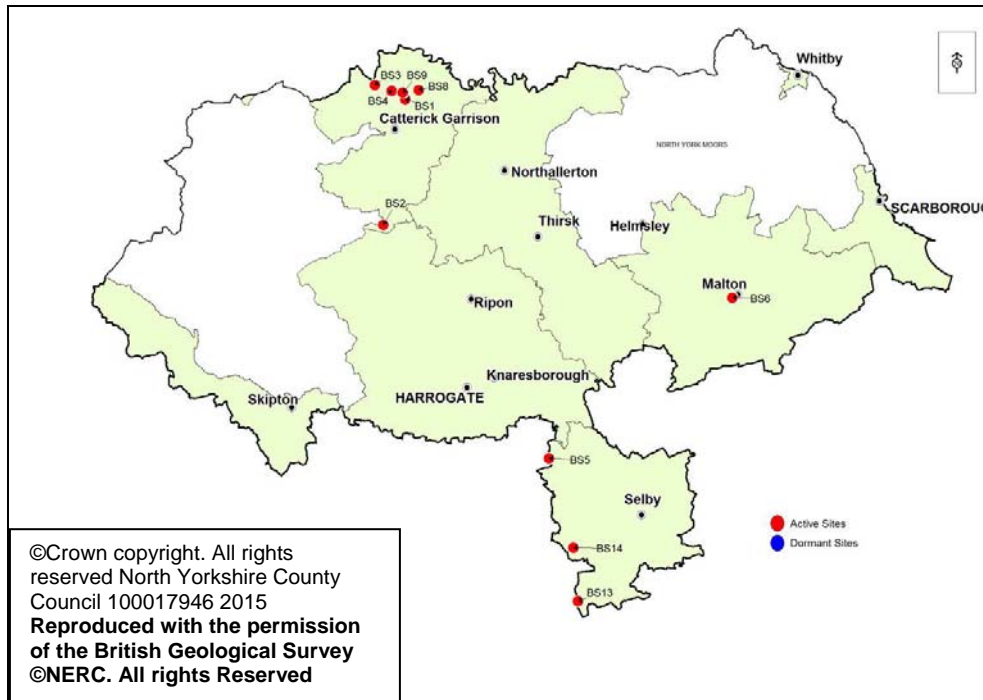


Figure 14: Building stone sites in North Yorkshire

Building Stone Sites		Aggregate Quarries which also produce Building stone	
<b>Ryedale District</b>	BS6 - Brows Quarry	<b>Richmondshire District</b>	BS9 - Low Grange
<b>Richmondshire District</b>	BS1 - Gatherley Moor Quarry BS2 - Grey Yaud Quarry BS3 - Greenbank Farm (restored to agriculture) BS4 - Carkin Moor Quarry BS8 - Melsonby Quarry	<b>Selby District</b>	BS13 - Went Edge BS14 - Brotherton Quarry
<b>Selby District</b>	BS5 - High Moor Quarry		

Table 5: Building stone sites by district

Brows Quarry – The site is a former quarry of just over 0.5ha area and is located near Malton. Permission for extraction was granted in 2009. Work on site did not start within the requisite 3 years so the planning permission has now lapsed and a new permission would need to be approved before any extraction could take place.

Gatherley Moor Quarry – The site is located within Richmondshire district and is just under 6ha in area. It produces building stone and has permission up to 2020. The stone can be cut on site. According to the Council's minerals survey carried out in 2013 about half of the stone was used in Yorkshire and half was used in Scotland, the 2016 survey indicated that just 5% was used in North Yorkshire and 95% elsewhere including Derbyshire and Scotland. The quarry is worked intermittently either to produce stone to order or to replenish stocks. The operator has existing stone yards in Cumbria and South Yorkshire where the stone can be processed.

Grey Yaud Quarry – This site is located between East Witton and Ellingstring in the Nidderdale AONB. Permission has been granted for an extension of 3.4 ha, which has extended the permitted operational life to December 2036. The total area of the site is now 6.9ha. The stone can be cut at the processing site near Leyburn before being delivered; the stone is used for either new build or restoration.

Greenbank Farm – The site is approximately 1 km north of Ravensworth in Richmondshire, and there has been small scale extraction in the past but no activity for over a year. The site has now been returned to agriculture. The permission runs to 2030.

Carkin Moor Quarry – the site is located south of East Layton in Richmondshire and covers just over 3ha. Permission has been granted up until August 2036. The stone is to be processed on site to produce block stone, walling stone, crazy paving and garden stone. The site is expected to have a life of 20 years once excavation starts.

Melsonby Quarry – this site is located to the north east of Richmond and covers an area of just over 3ha. The permission expires in 2017 and the site produces facing stone, dimension stone and dressed building stone, but over recent times has only been worked intermittently.

High Moor Quarry – the site covers more than 3ha and is near Tadcaster and has permission for working to July 2021. Part of the site lies within the Leeds City Council area. The site produces building stone from Magnesian limestone, which is sawn on site.

The Strategic Stone Study undertaken by English Heritage and British Geological Survey has identified many more former building stone quarries.

### **3.8.9 Ancillary Development**

Ancillary activity at building stone sites may typically include dressing or sawing to produce products such as block stone, building and walling stone, crazy paving, garden stone, sills and head stones before it is removed from site.

### **3.8.10 Transportation**

All building stone worked in North Yorkshire is transported by road.

### **3.8.11 Restoration**

The NPPF identifies need for a flexible approach to the potentially long duration of planning permissions that reflects the intermittent or low rate of working at many building stone sites. Other issues can be the limited availability of fill material and/or availability of soil, as well as possible physical constraints such as the level of the water table, the amount of and access to level floor areas in dry quarries and sidewall stability.

The majority of the dedicated building stone sites in North Yorkshire are expected to be restored to either agriculture or woodland/forestry.

### 3.9 Peat

#### 3.9.1 What is peat?

Peat is an accumulation of partially decayed plant material. It forms in waterlogged conditions, usually in marshy conditions where plant material is unable to completely decay due to the lack of oxygen. The size of a peat bed will depend on the level of water logging, the wetter the conditions the faster peat will form. Peat will gradually develop over thousands of years.

#### 3.9.2 Where does it occur?

Peat deposits within North Yorkshire are principally located as blanket bogs within some of the upland areas of the Yorkshire Dales (for example, near Malham Tarn and the SSSI at Austwick Moss) and in the North York Moors National Park. There are also some small deposits in Craven District and some isolated fen deposits in the Selby District. The map below illustrates the distribution of peat throughout England.

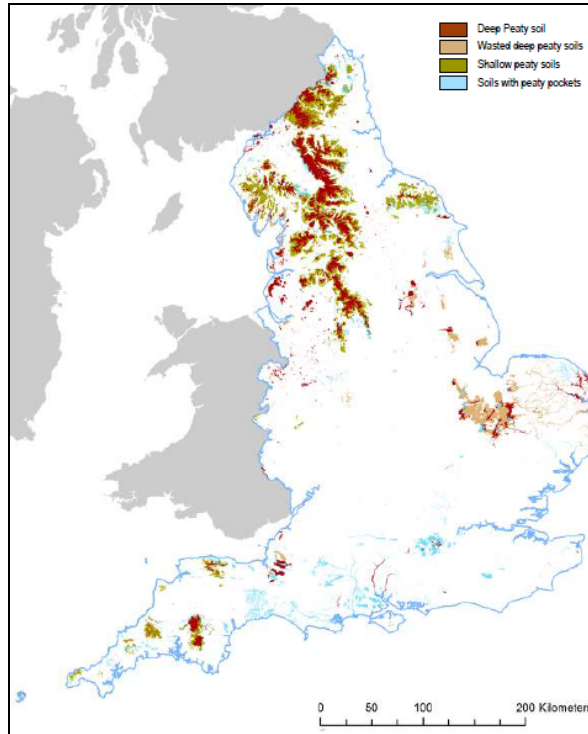


Figure 15: Map of peat locations in England<sup>21</sup>

<sup>21</sup> Joint Nature Conservation Committee: Towards an assessment of the state of UK peatlands. April 2011. Source: Mapping derived from 1:50,000 scale, BGS digital data (Licence 2006/072, British Geological Survey © NERC). National Soils map ©

### **3.9.3 Key data for peat**

There is no known economic peat resource in the Plan area and none have been proposed since the 1980's when a site near Cowling was refused planning permission. An earlier planning application near Burton in Lonsdale in the 1970's was also refused.

### **3.9.4 Safeguarding**

The Peat Partnership Project was established by Defra, the Welsh Assembly Government, the Environment Agency, the Forestry Commission, Natural England, the Countryside Commission for Wales and the Northern Ireland Environment Agency in late 2007. The aim of the project was to co-ordinate work on the protection of peatlands and promote their importance to a range of policy areas which include climate change, biodiversity, water quality and flood risk.

The Site of Special Scientific Interest (SSSI) framework gives legal protection to extensive areas of peat habitats, in recognition of their biodiversity and ecosystem value.

The UK Biodiversity Action Plan (UK BAP) also provides a framework for the protection of peat and contains many targets on the protection and restoration of peat habitats. These complement targets for SSSI condition but also include a commitment to increase the areas of peat-forming habitats and improve condition of undesignated peatland habitats.

### **3.9.5 Local, Regional and National policy**

The NPPF specifically states that in preparing local plans local planning authorities should not identify new sites or extensions to existing sites for peat extraction.

### **3.9.6 Current sites**

There are no known economic peat resources within the area.

## Appendix 1

### Review of silica sand cross-boundary supply issues

#### Background

Blubberhouses Quarry, in Harrogate Borough, is capable of providing high quality silica sand which could be used in the glass production industry. The site has been operational in the past but has been mothballed since 1991. There are several constraints associated with the site, including its location within the Nidderdale AONB and the presence of an adjacent internationally important nature conservation site. The permission for extraction has expired although an application has been submitted seeking permission to retain the site for a further period. The site has also been put forward for allocation in the Joint Plan.

Silica sand is considered a mineral of national significance given its particular properties and the associated end uses it serves, as well as the relative scarcity of silica sand resources suitable for glass manufacture.

To help to establish the national position regarding availability of high quality glass making silica sand, Mineral Planning Authorities with known reserves and active sites were contacted and asked a series of questions. Known glass manufacturers using high quality silica sand in their processes were also contacted to seek their views on the supply situation.

#### Requests for information

The MPAs identified as having active silica sand sites and reserves in their areas were Norfolk County Council, Surrey County Council, East Cheshire Council and Fife Council. The questions asked were:

1. What are your current reserves for glass making silica sand in your Plan area?
2. How many years supply do you expect this to provide?
3. Is there potential for future provision of glass making silica sand in your Plan area beyond the current permitted reserves?
4. Is information available about the main markets for the silica sand provided from your area?
5. Are there any other major known constraints which would be likely to impact on the future supply of glass making silica sand from your area?

Two reminders were sent to the MPAs who had not responded, with responses received from all but one (Cheshire East Council).

Glass manufacturers in Yorkshire and Humber were identified and contacted. These included: Saint-Gobain, Allied Glass Containers Ltd, Dual Seal Glass, Ardagh Group, Beatson Clarke Plc, G B Cullet, Guardian Industries UK Ltd, Stolze Flaconnage Ltd, SGP, Saverglass, Tecoglas Ltd, Vitritech Ltd and Guardian Industries UK. Only three responded. The questions asked were:

1. Are you concerned about the future availability of sources of supply of the right quality and quantity to meet expected future requirements?
2. Which geographical areas do you currently source supply from and do you expect this to change in the foreseeable future?
3. Would it be possible to provide an estimate of the quantity of silica sand your facility would use in a typical year?

## Responses

### Norfolk County Council

Norfolk County Council supply silica sand to the Saint Gobain float glass facility near Eggborough in Selby District. At present there is approximately 3.5 years of silica sand supply left in current permissions. The adopted Norfolk Minerals and Waste Core Strategy contains a site allocation which would provide a further 4 years supply, thus facilitating supply of silica sand resource up to 2023/24. To help address the position beyond that date the Council are carrying out a Single Issue Silica Sand Review. A call for sites was issued but only one site was submitted. If this site was allocated it would provide a further 18 months' supply. To deal with the remaining shortfall the Council has identified 6 potential Areas of Search from which a future application for silica sand extraction could come forward. There is less certainty of supply levels with Areas of Search than with site allocations. The process of reviewing the Strategy is not yet concluded.

The majority of high quality silica sand extracted from Norfolk is transported to glassworks in the north of England, including North Yorkshire. All of the silica sand extracted in Norfolk is for specialist end uses.

There is a large resource of silica sand in Norfolk but there are significant constraints to extraction. These include Natura 2000 sites, Area of Outstanding Natural Beauty and water dependant Sites of Special Scientific Importance. Some areas of silica sand are impacted by the setting of listed buildings, scheduled monuments and Registered Historic Parks and Gardens.

### Surrey County Council

There are 2 active silica sand sites in Surrey, with a landbank currently of between 5 and 10 years. A specific figure could not be provided due to commercial confidentiality issues, as there is only a single operator. Not all of the silica sand extracted is suitable for glass manufacture.

North Park Quarry is partly in an Area of Great Landscape Value and partly in an AONB. There has been a recent extension into a similar area and this is connected to the main North Park site by a conveyor. Permission was granted on the basis that any harm to the landscape was outweighed by the nature and benefits of the scheme in national and local terms, in respect of the provision of the mineral.

One new site and two Areas of Search are allocated in the Surrey Minerals Plan Core Strategy. The allocated site contains 6.3 million tonnes of silica sand, of which 1 million tonnes may be suitable for glass manufacture.

Some of the high quality silica sand extracted was sent to Cheshire for glass manufacture. A main constraint will be the ability of the mineral operator to obtain additional land for extraction of silica sand.

Surrey County Council and Kent County Council produced a Silica Sand Study in March 2010 which provides an overview of the national situation in relation to high quality silica sand used for glass manufacturing. The report states that there only a few quarries in the UK which extract silica sand used in glass manufacturing, and these are mainly run by one mineral operator. Surrey and Norfolk are the main suppliers of glass silica sand in England, with the glass industry in Scotland supplied by sites in Fife.



## **Cheshire East Council**

Note - no specific response was received from Cheshire East Council. The following information is derived from the site operator and a review of information available via the internet.

The single silica sand quarry in the Cheshire East area (Dingle bank Quarry) has less than 3 years of reserve left, but glass sand production will cease at the end of 2016 as the remaining sand will not meet the strict specification required for glass manufacture. There is no proposed extension to the site and no other silica sand resource identified in the area.

Further note - additional information has become available regarding the situation in Cheshire East. An application to extend the permitted extraction life at Dingle Bank Quarry to 30 June 2019 was granted in September 2016, although the operator has indicated that mineral quality issues mean that the rate of output over the remaining life of the quarry is expected to reduce. In October 2016 a planning application was submitted for a new silica sand quarry, straddling the boundary between Cheshire East and Cheshire West Council areas. The application is for extraction of approximately 3.5mt over a 12 year period.

## **Fife Council**

There are two silica sand quarries in the Fife area, with over 16 years permitted supply remaining in these quarries. There are further resources in the area if required in the future. The sites in Fife mainly supply the glass manufacturers in Scotland.

## **Glass manufacturers in Yorkshire and Humber Region**

Only two glass manufacturers and a trade federation who were contacted responded. They expressed concern about the future supply of silica sand. The two responding manufacturers currently receive silica sand from Norfolk, with one also receiving a supply from Fife. The trade federation identified 6 glass manufacturers who operate over 9 sites in the Yorkshire and Humber Region and state that these manufacturers use approximately 1.2 million tonnes per annum of high quality glass making silica sand.

## **Other information**

Sibelco are the main silica sand quarry operator in England. The company provided a response to the Minerals and Waste Joint Plan Preferred Options consultation which took place between November 2015 and January 2016. In this response they state that a significant proportion of UK glass manufacturing industry falls in the Yorkshire and Humber area. All of the silica sand to these glass manufacturing plants is imported from outside Yorkshire and Humber. Few of the active silica sand sites in England have the requisite minimum of 10 years stock of permitted reserves.

The response also provided information about sites in Cheshire, Norfolk and Surrey and this information has been incorporated into the MPA sections above where relevant.

The response states that silica sand from Blubberhouses meets the strict chemical and physical characteristics to produce a clear glass product. Only three active sites

in England are known to meet this specification, Dingle Bank Quarry in Cheshire, Lezaita Quarry in Norfolk and North Park Quarry in Surrey.

### **Summary**

There are three MPAs with sites in England which produce silica sand of a quality suitable for the manufacture of clear glass. One of these has limited reserves left with a planning application for a new site under consideration; another has a landbank of between 5 and 10 years but has some additional provision available when this supply becomes depleted. The third has limited reserves but is seeking to make provision for further supply.

Fife in Scotland has substantial resources of silica sand, some of which is imported into the Yorkshire and Humber region already, which could therefore be available as an alternative source of supply if required.

Overall, in the short term, there appears to be an adequate supply of high quality silica sand available for the glass manufacturers in the Yorkshire and Humber Region, but the availability of suitable high quality silica sand will reduce in the medium to long term and will also be dependent on the outcome of current planning applications and local plan reviews. If further provision from the current MPAs with active or proposed high quality silica sand sites is not forthcoming to maintain the required level of glass manufacture in the longer term, the national and local 'need' for high quality silica sand from Blubberhouses Quarry will increase.

## Contact us

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