

Core Strategy

Minerals Evidence Base Report



CONTENTS

SECTION 1 – INTRODUCTION	3
SECTION 2 – POLICY CONTEXT	4
SECTION 3 – EVIDENCE BASE – AGGREGATES	8
SECTION 4 – EVIDENCE BASE – SANDSTONE (BUILDING, ROOFING AND PAVING STONE)	15
SECTION 5 – EVIDENCE BASE – COAL AND CLAY	20
SECTION 6 – CURRENT MINERALS SUPPLY CONTEXT WITHIN BRADFORD	26

1.0 INTRODUCTION

- 1.1 This document is intended to support the development of the Minerals elements within the Local Plan for the Bradford District – Core Strategy Development Plan Document, by providing a summary of the evidence which has been used to inform the development of the minerals policies. The document should be read in conjunction with Section 5.5 of the Local Plan for the Bradford District – Core Strategy Development Plan Document.

- 1.2 The report is set out in sections summarising the evidence which has been considered in respect of the relevant national planning policies, evidence of the spatial distribution of the resources within the District, the economic demand for those resources, feedback from consultation, consideration of cross-boundary issues and an assessment of the current context of minerals development within the District.

2.0 POLICY CONTEXT

2.1 National Minerals Policies

- 2.1.1 National minerals planning policy is set out in Section 13 of the National Planning Policy Framework. Supplementary guidance is provided in the relevant section of the Planning Practice Guidance website within the section entitled 'Guidance on the planning for mineral extraction in plan making and the application process'.
- 2.1.2 The overarching rationale behind the government's approach to minerals planning is set out in the introductory paragraph to Section 13, which confirms the government's view that:

Minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs. However, since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them to secure their long-term conservation.

- 2.1.3 Guidance on the weight MPAs should attach to varying factors when assessing planning applications is set out in paragraph 144 of the NPPF. In this paragraph the government confirms that Planning Authorities should *give great weight to the benefits of the mineral extraction, including to the economy.*
- 2.1.4 The key considerations in terms of the preparation of Local Plans set out at paragraph 143 are:
- Identify and include policies for extraction of mineral resource of local and national importance in their area, but should not identify new sites or extensions to existing sites for peat extraction;
 - So far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;
 - 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;
 - Safeguard:
 - existing, planned and potential rail heads, rail links to quarries, wharfage and associated storage, handling and processing facilities for the bulk transport by rail, sea or inland waterways of minerals, including recycled, secondary and marine-dredged materials; and
 - existing, planned and potential sites for concrete batching, the manufacture of coated materials, other concrete products and

the handling, processing and distribution of substitute, recycled and secondary aggregate material.

- Set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non mineral development to take place;
- Set out environmental criteria, in line with the policies in this Framework, against which planning applications will be assessed so as to ensure that permitted operations do not have unacceptable adverse impacts on the natural and historic environment or human health, including from noise, dust, visual intrusion, traffic, tip- and quarry-slope stability, differential settlement of quarry backfill, mining subsidence, increased flood risk, impacts on the flow and quantity of surface and groundwater and migration of contamination from the site; and take into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;
- When developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction; and
- Put in place policies to ensure worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place, including for agriculture (safeguarding the long term potential of best and most versatile agricultural land and conserving soil resources), geodiversity, biodiversity, native woodland, the historic environment and recreation.

2.2 National Aggregates Policy

2.2.1 Paragraph 145 of the NPPF sets out national planning policy on the provision of aggregates. The principle tool which Minerals Planning Authorities (MPAs) are advised to use to plan for future aggregate provision is the preparation of a Local Aggregates Assessment (LAA), based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine dredged, secondary and recycled sources. MPAs are also advised to participate in the operation of an Aggregate Working Party (AWP), comprised of both Regulatory and Industry representatives, and take the advice of the AWP into account during the preparation of the LAA.

2.2.2 The system described above replaces the previous government's more hierarchically based managed aggregates supply system whereby MPAs had to make provision for a sub-regional apportionment of the aggregate demand figures set out in the National and Regional Guidelines for land-won aggregate provision¹. These Sub-regional apportionments were made by the Regional Planning Body through the Regional Spatial Strategy (RSS) informed by the advice of a Regional Aggregates Working Party (RAWP). However this regional level

¹ Department for Communities and Local Government, 2009. *National and regional guidelines for aggregates provision in England 2005-2020*.

managed aggregate provision framework no longer exists as a consequence of the current government's planning reforms.

- 2.2.3 The new LAA based aggregate supply management system allows for more local flexibility in terms of the factors which inform the derivation of future aggregate provision targets. However the NPPF does maintain a reference to the National guideline figures, stating that MPAs should take account of 'published National and Sub National Guidelines on future provision which should be used as a guideline when planning for the future demand for and supply of aggregates'.
- 2.2.4 The spatial coverage of LAAs is also more flexible, with the NPPF advising that LAAs may be prepared 'either individually or jointly by agreement with another or other mineral planning authorities'. MPAs are advised make provision for the aggregate supply targets set out in adopted LAAs by allocating specific sites, preferred areas, areas of search, and/ or locational criteria within Local Plans/ Minerals Plans, as appropriate.
- 2.2.5 The NPPF advises that mineral landbanks should continue to be used as an indicator of the security of aggregate minerals supplies and to indicate where additional provision is required, with the objective being to maintain a landbank amounting to at least 7 years supply for sand and gravel and at least 10 years supply for crushed rock. However MPAs are cautioned not to stifle competition by suppressing further minerals development in situations where landbanks are bound up in very few sites.

2.3 National Building Stone Policy

- 2.3.1 The last two paragraphs of paragraph 144 of the NPPF sets out national planning policy on the provision of natural building and roofing stone advising MPAs to:
- 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
 - recognise 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 reflecting the intermittent or low rate of working at many sites.

2.4 National Fireclay Policy

- 2.4.1 Although there is no specific national policy guidance on fireclay, paragraph 147 of the NPPF advises that MPAs should provide for coal producers to extract separately, and if necessary stockpile, fireclay so that it remains available for use.

2.5 National Coal Policy

- 2.5.1 Previously Minerals Planning Guidance 3: Coal mining and colliery spoil disposal (MPG3), published in 1999, set out in significant detail national policy advice on Coal Mining. MPG3 indicated that the

planning system should not seek to predetermine the appropriate levels of coal to be produced by underground or opencast mining but that instead MPAs should determine the acceptability of individual projects in accordance with the principles of the planning system.

2.5.2 The NPPF has not carried through much of the detailed text contained in MPG3 however the principles remain similar, with paragraph 149 confirming that permission should not be given for the extraction of coal unless the proposal is environmentally acceptable, or can be made so by planning conditions or obligations; or if not, it provides national, local or community benefits which clearly outweigh the likely impacts to justify the grant of planning permission.

2.5.3 The main difference between this current national planning policy position on coal set out in NPPF paragraph 149 and the previous position articulated through MPG3 is that Planning Authorities are now advised to take both *national*, local and community benefits into account. Previously only community benefits were permitted to be taken into account in terms of weighing up whether the benefits of the development outweigh the development's likely impacts.

3.0 EVIDENCE BASE – AGGREGATES

- 3.0.1 The five West Yorkshire authorities have jointly prepared a Local Aggregates Assessment² which was formally ratified by Leeds City Region Portfolio Holders on 05 December 2014. The LAA includes a full review of evidence in relation to the supply of and demand for crushed rock aggregates and sand and gravel within West Yorkshire. On the basis of this information the LAA sets future aggregate provision targets for the West Yorkshire sub-region. The findings of the LAA, have informed the Minerals Policies set out in Section 5.5 of the Local Plan for the Bradford District – Core Strategy Development Plan Document.
- 3.0.2 The content of the LAA will not be repeated within this evidence base report and instead information is set out below which is useful in providing an understanding of the background behind the aggregates supply and demand situation within West Yorkshire and issues specifically relevant to the Bradford District.

3.1 Regional Sand and Gravel Issues

- 3.1.1 The Regional Planning Body (RPB) (now abolished) previously estimated that there was a 32 million tonne shortfall in the permitted reserves of sand and gravel in the Yorkshire and Humber Region to meet the apportionments likely to be set by the government up to 2021³. The RPB commissioned a series of reports to inform their policy response to this shortfall. The British Geological Society (BGS) published a phase 1 study in 2004⁴. This first phase helped to identify the extent of sand and gravel resources within the Region and how these relate to environmental constraints. Sand and gravel deposits were identified within the Bradford District within the flood plains of the rivers Aire and Wharfe.
- 3.1.2 Following on from the BGS study, a phase 2 study was published in late 2007⁵. The phase 2 study developed and appraised spatial options for revised sub-regional apportionments of sand and gravel to address the shortfall in permitted reserves. The recommendation of the phase 2 study was that the proportion of sand and gravel supply met by sand and gravel resources located within South and West Yorkshire should be substantially increased, with a 3 fold increase in the West Yorkshire sub-regional apportionment.
- 3.1.3 A number of local authorities including Bradford Council raised concerns about the viability of increasing sand and gravel extraction within West Yorkshire to the levels recommended in the phase 2

² Local Aggregate Assessment for West Yorkshire 2012

³ British Geological Survey, 2004. *Yorkshire and Humber Regional Aggregates Working Party: Sand and Gravel Study*.

⁴ *Ibid*

⁵ Land Use Consultant, 2007. *Phase 2 Sand and Gravel Study for Yorkshire and Humber Appraisal of Apportionment Options*.

report. In response to this the RPB commissioned BGS to carry out a consultation exercise with the sand and gravel extraction industry. A report collating the views expressed by representatives of the 4 largest companies operating sand and gravel extraction sites within the Region was published in June 2009⁶.

3.1.4 In summary the findings of the report were:

- The industry estimate that the amount of potentially viable sand and gravel within West Yorkshire, is between 90 – 96% lower than was estimated in the phase II study.
- Only sites containing 1-1.5 million tonnes of sand and gravel (taking up 10-25ha of land) would be likely to be economically viable. Much of the potentially viable sand and gravel resource within West Yorkshire is divided by rivers, canals, railways and roads therefore there are only likely to be a very small number of viable sites.
- The Wharfe Valley is considered to have some of the largest areas of unworked high quality sand and gravel in the region; however the industry regard it as unviable for new extraction sites due to the proximity of landscape/ environmental designations coupled with the potential for relatively strong opposition from local communities.
- The industry have identified 5-10 potential sites for sand and gravel extraction within West Yorkshire; however issues relating to access, environmental, hydrological, and/or planning restrictions are considered too problematic relative to the volumes and quality of reserves to merit developing any of them.

3.1.5 A final recommendation on possible revisions to the sub-regional sand and gravel allocations was to be considered by the RPB and taken forward in the development of an Integrated Regional Strategy. However subsequent to the change in national government, the abolition of the RPBs, the revocation of the Regional Spatial Strategy and the introduction of the NPPF, this process has been abandoned, effectively removing the strategic regional element of minerals planning. MPAs must now determine their own approach to future aggregate supplies through the preparation of an LAA and their own Local Plans, albeit acting under the duty to cooperate.

3.2 Historic Evidence of Sand and Gravel Extraction

3.2.1 BGS data and historical records indicate that commercial sand and gravel extraction last took place within the Bradford District in the 1950s at two sites: Ben Rhydding, adjacent the River Wharfe east of Ilkley, and Goose Eye, adjacent to Dean Beck/ North Beck west of Keighley. However following the closure and restoration of these sites in the 1960s the planning authority have no further records of any commercial scale extraction of sand and gravel taking place within the District.

⁶ British Geological Survey, 2009. *West Yorkshire sand and gravel resources: Investigating the potential for an increased sub-regional apportionment.*

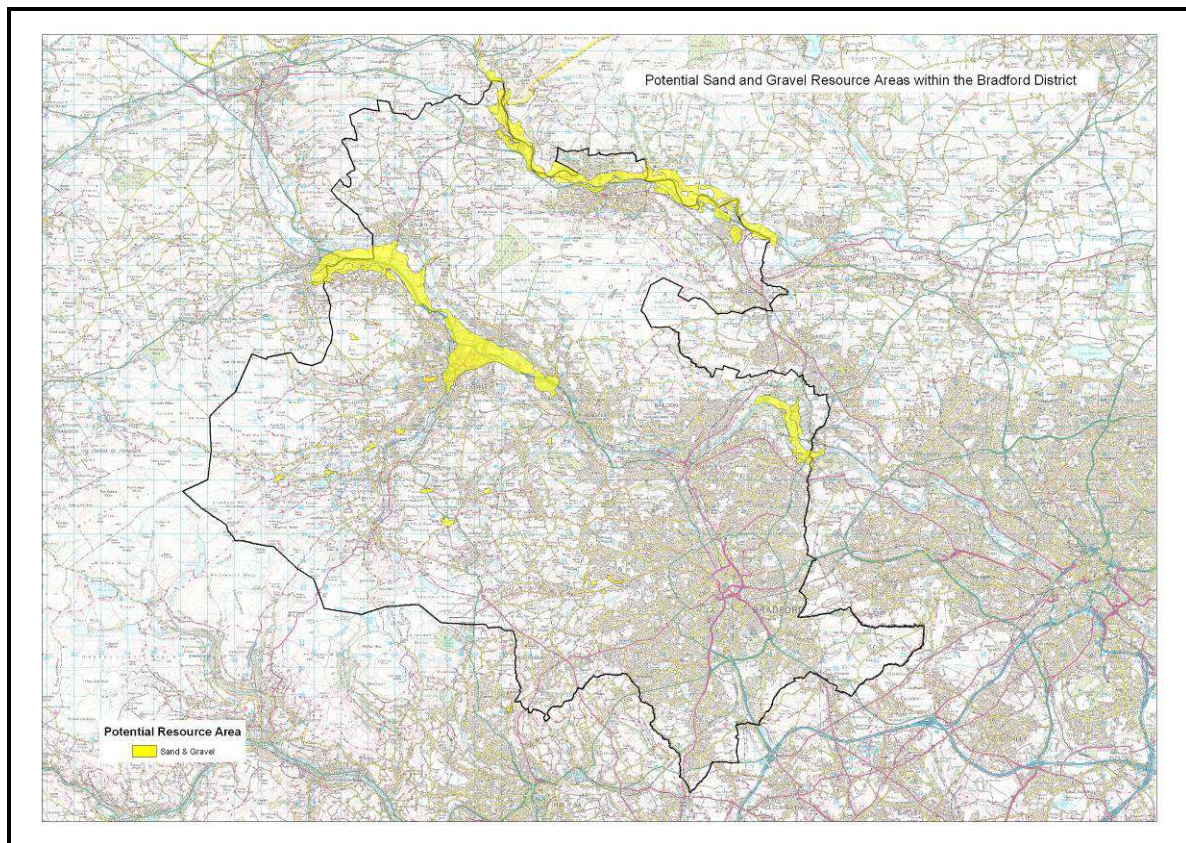
3.3 Evidence of the Location of Potential Sand and Gravel Resources

- 3.3.1 Data on potential sand and gravel resources within the Region is provided by the British Geological Survey (BGS) through their 1:100,000 scale digital mineral resource maps⁷. The resource areas shown on these maps have generally been inferred from available geological information and have not been evaluated by drilling or other sampling methods. The boundaries of the inferred resources are therefore approximate and the economic viability of the resources is unproven and variable. Figure 1 overleaf shows the areas of potential sand and gravel resources within the District mapped by BGS.
- 3.3.2 The largest potential sand and gravel resource shown within the District is an area of inferred sub-alluvial river terrace deposits located adjacent to the western stretch of the river Aire between Steeton and Crossflats and adjacent to the northernmost stretch of the river Worth at its confluence with the river Aire. However a large proportion of this potential resource appears to be heavily constrained by urban development in and around Keighley. River terrace deposits, both exposed and sub-alluvial, are also mapped adjacent to the river Aire in the area east of Esholt; this potential resource area appears to be predominantly located within the site of the Esholt Waste Water Treatment Works and therefore is potentially less constrained by other forms of development.
- 3.3.3 Inferred sub-alluvial and exposed river terrace sand and gravel deposits are also mapped by the BGS adjacent to the river Wharfe between Addingham and Burley in Wharfedale. Previous working of sand and gravel resources in this part of the Wharfe Valley has been recorded both at the Ben Rhydding gravel pits, east of Ilkley, and a site at West Hall east of Addingham (outside of the District). The resources adjacent to the Wharfe appear to be constrained by urban development at Ilkley and Addingham. The 2009 BGS industry consultation⁸ exercise found that the sand and gravel industry view the prospect of opening new extraction sites within the Wharfe Valley as being problematic, due to both the proximity of landscape/ environmental designations and the potential for relatively strong opposition from local communities.

⁷ British Geological Survey, 2009. Mineral Resource Data for City of Bradford MDC 1:100,000 scale (DiGMapGB-100) data [CD-Rom], Version 1_0

⁸ British Geological Survey, 2009. *West Yorkshire sand and gravel resources: Investigating the potential for an increased sub-regional apportionment.*

Figure 1



(Plan produced by CBMDC; resource area derived from British Geological Survey data)

3.4 Evidence of the Economic Value of Crushed Rock Aggregate Resources within the District

3.4.1 Crushed rock aggregates are essential for a wide range of construction activities. Statistics quoted in the British Geological Society (BGS) Minerals Yearbook 2009 (see table 1 below), indicate that the primary economic use for crushed rock aggregate produced in England during 2008 was for road surfacing and concrete production, with a significant proportion also being used for unstipulated lower specification uses such as engineering fill. Both concrete and roadstone applications require aggregates which conform to certain specifications in relation to water absorption, resistance to abrasion (AAV) and resistance to polishing (PSV).

Table 1 – End-Uses for Crushed Rock Produced in England in 2008

End-Use	Roadstone	Railway Ballast	Concrete	Other (including fill)	Armorstone & Gabion Walling	Total
Thousands of Tonnes	30,628	2,248	16,928	24,923	450	75,177
Percentage	41%	3%	23%	33%	1%	100%

(source: British Geological Survey, 2010. United Kingdom Minerals Yearbook 2009)

3.4.2 The BGS Minerals Planning Factsheet for Construction Aggregates (2007) indicates that a reasonable gauge of the suitability of a rock for use as a construction aggregate is its water absorption characteristics;

with good quality aggregates generally requiring water absorption of less than 2% and concrete grade aggregate requiring less than 1%. The properties of the principle sandstone units within the District were assessed in a study reported within a 1996 BGS Technical Guide to Ground Conditions⁹ and technical data on several of the worked sandstone resources within the District is also available on the Building Research Establishment British Stone List¹⁰. These data indicate that sandstone resources within the district have water absorption values significantly in excess of 2% which would imply they are unsuitable for higher specification uses.

- 3.4.3 The assumption that the sandstones within the District are of low economic value is substantiated by comments made in the 1996 BGS Technical Report which stated that “In general, the Carboniferous sandstones in Yorkshire are too weak and porous and susceptible to frost damage for them to be used for good quality roadstone or concrete aggregate”¹¹. This is further corroborated by a government commissioned 2004 report on high specification aggregates which states that, “most Upper Carboniferous formations tend to possess very limited resistance to impact, crushing, abrasion and weathering, and therefore do not meet HSA [High Specification Aggregates] requirements”¹².
- 3.4.5 Therefore the evidence indicates that in general, the relatively coarse grained Upper Carboniferous sandstones, which represent the majority of the resource within the District, whilst highly suited to producing strong, durable building and paving stones, are generally unsuitable for high specification aggregate applications such as road construction and concrete manufacture. The main exception to this generalised assessment is building sand derived from crushed sandstones suitable for use both in mortar and the production of artificial stone products.
- 3.4.6 The version of the Sandstone Supply policy included in the Further Engagement Draft of the Core Strategy expressly required that aggregate production at new or extended building stone quarries be limited to the minimum level necessary to make the quarrying operation practicably and economically viable. The policy was informed by the relatively gross level of the West Yorkshire crushed rock aggregate landbank level report in the LAA and motivated by a concern that an oversupply of low specification crushed rock aggregates could suppress the market for Recycled and Secondary Aggregates.

⁹ British Geological Survey, 1996. *A geological Background for Planning and Development in the City of Bradford Metropolitan District, Volume 2: A Technical Guide to Ground Conditions*. BGS: Nottingham.

¹⁰ Available online at <http://projects.bre.co.uk/ConDiv/stonelist/stonelist.html>

¹¹ British Geological Survey, 1996. *A geological Background for Planning and Development in the City of Bradford Metropolitan District, Volume 2: A Technical Guide to Ground Conditions*. BGS: Nottingham, page 37.

¹² Capita Symonds, 2004. *The Sustainable Use of High Specification Aggregates for Skid-Resistant Road Surfacing in England*. Capita Symonds: East Grinstead, page 4.

- 3.4.7 During the technical event held to discuss the FE Draft minerals policies in November 2011 a number of minerals industry stakeholders expressed concerns that limiting aggregate production at building stone quarries would harm their economic viability. Both during and after the technical event a number of quarry operators also explained that they considered that the aggregates produced at building stone quarries generally didn't compete in the same market as RSA, e.g. building sand or rural public footpath surfacing materials. Furthermore one operator claimed that the sand produced from crushed rock at his quarry was a good quality building sand which was a valuable alternative to the building sand produced at sand and gravel extraction sites outside of the District.
- 3.4.8 In their representation on the Further Engagement Draft Core Strategy the Minerals Products Association also expressed the opinion that any economic restriction imposed on the dimension stone industry is likely to have an adverse effect on its development. They further explained their view that aggregates production in particular provides vital cash flow that smoothes over variations in income from sporadic dimension stone contracts, allowing the workforce to be kept in employment and continued investment to be made in equipment, environmental protection and marketing. The Minerals Products Association suggest that any restriction on aggregates production at building stone quarries should be on the basis of adverse impact on restoration, not on a supposed over-supply of aggregates or impact on recycled materials
- 3.4.9 The revisions to the sandstone supply policy (EN10) set out in the final submission version of Section 5.5 of the Local Plan for the Bradford District – Core Strategy Development Plan Document responds to the concerns expressed by the minerals industry by removing the requirement to minimise aggregate production, providing certain criteria are met. However the criteria in the revised policy still ensure that aggregate production would not be permitted at a level which would prejudice the achievement of the policy objectives of safeguarding building stone reserves, protecting markets for RSA and ensuring appropriate site restoration.

3.5 Evidence of the Location of Potential Crushed Rock Resources

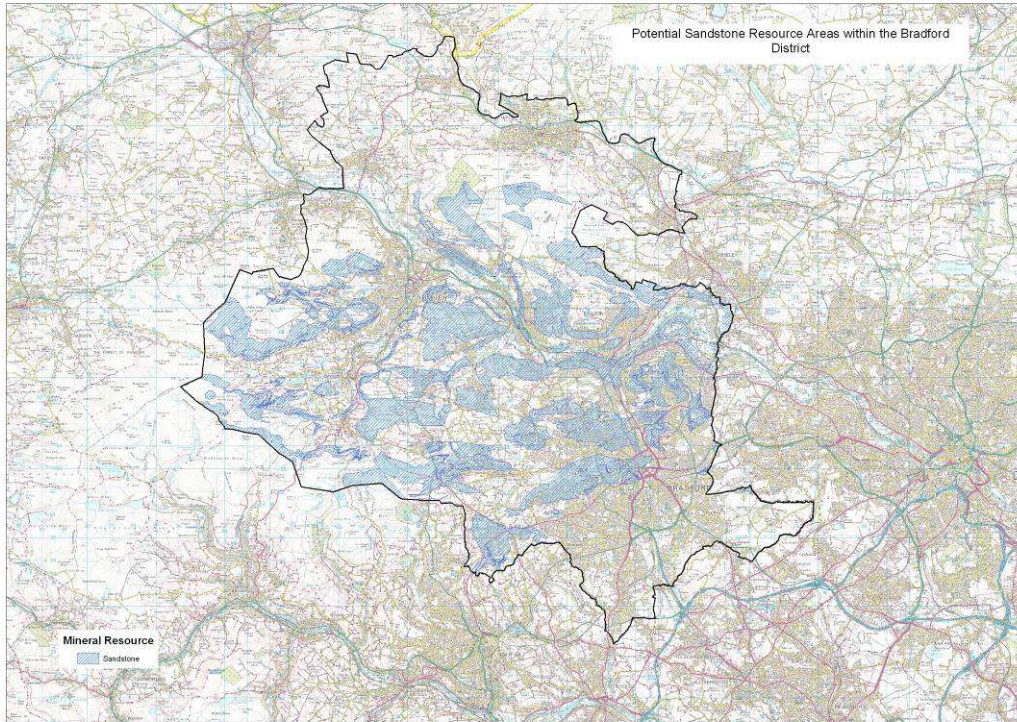
- 3.5.1 Data on sandstone resources within the region potentially viable for aggregate production are provided by the BGS through their 1:100,000 scale digital mineral resource maps¹³. The BGS data show extensive potential sandstone resources located in numerous distinct pockets in a central band across the District; see figure 2 below. The central band of sandstone resources extends north from Queensbury and Bradford City Centre up to Morton Moor, to the north of Riddlesden/ East Morton. The only parts of the District shown not to contain any pockets

¹³ British Geological Survey, 2009. Mineral Resource Data for City of Bradford MDC 1:100,000 scale (DiGMapGB-100) data [CD-Rom], Version 1_0

of sandstone resources are the south-eastern corner and the far rural north of the District.

Figure 2

(Plan produced by CBMDC; resource area derived from British Geological Survey data)



4.0 EVIDENCE BASE – SANDSTONE (BUILDING, ROOFING AND PAVING STONE)

4.1 The Symonds Report

- 4.1.1 In March 2004 the government published a report by the Symonds Group on the planning issues relevant to the supply of natural stone building materials, a document which became known as the Symonds Report¹⁴. The report was the culmination of a research project, utilising survey work, analysis of published statistics and case studies, which looked into the issues affecting the supply of building and roofing stone in England and Wales. Demand was discussed but not quantified, due to the variability and unpredictability of building stone markets.
- 4.1.2 The Symonds Report found that the majority of quarries are relatively small scale, under 3 hectares in area, with relatively low output, producing less than 2,000m³ of building stone products per annum, and are often only worked intermittently. However the majority of production is concentrated within a small number of larger and more intensive operations.
- 4.1.3 The report highlighted the significance of carboniferous sandstones in terms of building and roofing stone production, which account for both the largest number of individual quarries and the highest level of output. The importance of Yorkshire, in terms of the supply of carboniferous sandstones, commonly known as Yorkstone, is particularly noted.
- 4.1.4 The supply data analysis indicated that there was a generally slowly rising trend in building and roofing stone production in England and Wales in the period from 1992 to 2001. Subsequent BGS Minerals Yearbooks appear to indicate that this general rise in building and roofing stone production continued until 2005; however production fell in 2006 and 2007, with output in 2007 returning to similar levels to 2003¹⁵.
- 4.1.5 The Symonds Report notes that most successful building stone quarries tend to concentrate on the production of blockstone and/ or naturally riven flagstones, and that roofing stone production appears to have declined as a consequence of a number of factors including:
- the bedding characteristics of the resources which continue to be worked;
 - the incompatibility of roofing stone production with modern quarrying techniques;
 - the relatively low and unsteady demand for roofing stone.

¹⁴ Symonds Group, 2004. *Planning for the Supply of Natural Building and Roofing Stone in England and Wales*

¹⁵ British Geological Society, 2009. *United Kingdom Minerals Yearbook 2008*

- 4.1.6 The report highlighted that the proportion of building and roofing stone demand being met by imports increased dramatically over the period between 1992 and 2001; with imports being 14% greater than domestic production in 1992 but 200% greater by 2001. Imports are stated to be the perceived biggest threat to the UK building stone industry. In particular sandstone from India and China is noted to be competing directly with materials such as Yorkstone paving at less than half the price.
- 4.1.7 However the data for building and roofing stone imports quoted in the Symonds Report should be treated with caution. The BGS Minerals Yearbook 2008 indicates that the disproportionately high figure quoted for unworked granite imports prior to 2006 (which accounted for 74% of total imports) may have been due to a reporting error. The most recent BGS Minerals Data indicates that a total of 1,459,000 tonnes of worked and unworked building and dimension stone were imported into the UK in 2007, including 323,000 tonnes of unworked sandstone and 297,000 tonnes of worked paving and flagstones. The figure for the domestic production of sandstone building and dimension stone within Great Britain in 2007 was 419,000 tonnes, with total building and dimension stone production from all types of minerals at 790,000 tonnes¹⁶.
- 4.1.8 Because the figures for imports include Northern Ireland and the production figures only account for Great Britain they are not directly comparable, however it is clear that imports substantially exceed domestic production. In terms of sandstone an unrecorded proportion of the worked flag and paving stones imported into the UK are composed of sandstone. If half of the worked paving and flag stone is assumed to be sandstone (148,500) and Northern Ireland is assumed to account for 20% of UK imports then the total figure for sandstone imports to Great Britain would be 377,000 tonnes, which was 90% of domestic production in 2007.
- 4.1.9 The Symonds Report concludes that the widespread use of artificial and imported materials, where local sources of building or roofing stones are either no longer available or unable to win competitive contracts, provides evidence that demand for building and roofing stone in England and Wales is “potentially somewhat greater than the current supply from indigenous sources”¹⁷. However it is acknowledged that the ‘unfulfilled’ element of demand cannot easily be quantified.

4.2 Local Distinctiveness and Protection of Heritage

- 4.2.1 The need for materials for the repair, alteration or extension of historic and culturally important buildings within the district, such as listed buildings and many buildings within Conservation Areas, is less significant than new build in terms of sales but of key importance in

¹⁶ British Geological Society, 2009. *United Kingdom Minerals Yearbook 2008*

¹⁷ Symonds Group, 2004. *Planning for the Supply of Natural Building and Roofing Stone in England and Wales*. p.54.

terms of the maintenance of the character of the traditional built environment of Bradford.

4.2.2 To inform the development of minerals policies the Council's Design and Conservation Team have produced a report discussing the relationship between the built heritage of the district and the availability of minerals resources¹⁸. The report notes that the character of the settlements within Bradford and the 'sense of place' of the inhabitants is primarily derived from the use of local building stone materials and that the use of artificial stone, brick or contrasting materials can dilute local character and result in the loss of a sense of place.

4.2.3 The report goes on to note that there are only a limited number of operational quarries supplying building stone with appropriate aesthetic characteristics for use within the District. The scarcity of supply of coarse grained 'gritstone' walling, suitable for use in settlements to the north of the district, and stone slate roofing are particularly highlighted. Concerns are raised that the natural stone materials currently imported from outside the district can have subtly different aesthetic characteristics to local stone, in terms of colour, texture and course thickness. The report concludes that there is a clear need for greater availability of local stone for local use, and that particular emphasis should be placed on increasing supplies of roofing stone.

4.3 Historic Buildings and Monuments

4.3.1 Enquiries have been made with both English Heritage and the West Yorkshire Archaeological Advisory Service (WYAS) to establish if any records exist of specific quarries within the District which may be important in supplying materials for the repair and maintenance of historic sites and monuments. English Heritage have indicated that they cannot currently provide any assistance in identifying such sites. WYAS likewise indicated that they do not hold any records of sites within Bradford which have provided material for the repair of historic sites or monuments.

4.3.2 The BGS have produced a STRATEGIC STONE STUDY - A Building Stone Atlas of WEST & SOUTH YORKSHIRE funded by English Heritage, published in March 2012¹⁹. This document provides an overview of the historic importance of building stone quarrying for West Yorkshire, the main rock units which have been quarried and the way in which the use of building materials from these specific rock units have helped form the character of the historic built environment within the sub-region. This document helps to highlight the significance of building stone to Bradford's past and the importance of preserving supplies of historically used building materials to allow the quality and

¹⁸ Ackroyd, J. 2008. *Identifying mineral resources in the Bradford District – local distinctiveness and protection of heritage*. (unpublished)

¹⁹ Available online at:

http://www.bgs.ac.uk/mineralsuk/buildingStones/StrategicStoneStudy/EH_atlases.html

character of the District's built heritage to be maintained for future generations.

4.4 Evidence for the Occurrence of Building Stone Resources

4.4.1 The suitability of sandstone deposits for use in the production of building, paving or roofing stones depends on a multitude of factors including the spacing of bedding planes and joints, fracturing, strength, texture and colour²⁰. There can often be significant variation in 1 or more of these factors over relatively short vertical or horizontal distances across a bed of sandstone and therefore predicting the viability of potential sandstone resources for the production of natural stone building materials is problematic²¹. As a consequence of the difficulties of identifying and estimating new reserves there tends to be a strong general preference among the building stone industry to extend existing quarries or re-open disused quarries rather than open new greenfield sites²².

4.4.2 The general sandstone resource areas which have been identified by the British Geological Survey are relatively indiscriminate, accounting for a substantial proportion of the land area of the District, see figure 2 above. It is therefore currently not possible to identify the location of those sandstone resources which have the necessary characteristics to make them suitable for building, proofing or paving stone production, other than through site investigation or reference to existing quarry exposures.

4.5 Evidence of the Spatial Scale of Building Stone Supply

4.5.1 Building stones, and in particular flagstones, produced within the District are thought to be sold both locally and throughout the UK for both new paving and building schemes and projects relating to the restoration or improvement of historic buildings and sites. The only current evidence on the spatial extent of markets for the building stones produced within the District is available from the local stone producers themselves. Quarry operators within the District advertise that their sandstone products have been recently used in projects at nationally significant sites such as Saltaire World Heritage Site, York Minster and Buckingham Palace. Therefore the available evidence indicates the supply of natural stone products from the District has implications of more than local significance.

4.6 Delivery of the Development Plan

4.6.1 The need for natural stone building materials within the district is integrally linked to housing, built heritage and design policy objectives set out elsewhere in the Local Plan. The most significant element of building, roofing and paving stone demand is from new build projects, including new housing developments and public realm projects. The

²⁰ British Geological Survey, 2007. *Minerals Planning Factsheet: Building and Roofing Stone*.

²¹ *Ibid*

²² Symonds Group, 2004. *Planning for the Supply of Natural Building and Roofing Stone in England and Wales*.

LDF will set out targets for housing provision within the Bradford District over the plan period. Depending upon the location of the housing and the design policies adopted by the Council, a certain proportion of the building materials required to construct these new houses will comprise natural sandstone products such as architectural masonry. Likewise design objectives are likely to require natural Elland Flag paving and decorative/ monumental stone for a certain proportion of public realm projects.

- 4.6.2 It is difficult to quantify this need for stone to deliver other policies within the LDF. However it is evident that the sustainable delivery of housing, design and public realm policies is linked to the maintenance of sufficient supplies of local natural stone building materials over the plan period. The consequence of a failure to supply demand for building, roofing and paving stone from local sandstone resources could be the haulage of natural stone building materials over long distances, with a consequent increase in environmental costs, or compromising design objectives through the use of inappropriate materials.

5.0 EVIDENCE BASE – COAL AND CLAY

5.1 Clay

- 5.1.1 The Bradford District has historically been an important supplier of fireclays, which are a type of sedimentary mudstone occurring as seatheaths beneath coal seams. Fireclays were traditionally valued as a raw material for manufacturing refractories for lining furnaces. Nationally demand from refractory manufacturers has diminished and fireclay is now more commonly used for manufacturing high quality buff coloured facing bricks²³. However, until recently demand has continued for the extraction of the fireclay resources located to the west of the City of Bradford and east of Halifax, for the production of specialist refractory products for the glass industry. The fireclay resources suitable for this specialist use are associated with the Halifax Hard Bed coal seam which occurs within the western part of the coal measures resources present within the District²⁴. The particular highly siliceous properties of this fireclay are specifically mentioned within the BGS Minerals Planning Factsheet on Fireclay (2006).
- 5.1.2 In the past fireclay workings were widespread to the south of the District around the settlements of Denholme, Queensbury, Thornton, Tong and the south of the City of Bradford²⁵. However most of these sites appear to have ceased operating by the 1960s/ 1970s and the most recent fireclay production statistics (from 2003) indicate that the total annual output of fireclay across West Yorkshire was only 10,000 tonnes²⁶. A small-scale fireclay extraction site continued to operate within the District until 2006 at a site 2Km east of Denholme, supplying the refractory business referred to above. In April 2011 a dormant fireclay extraction site located within the District was reactivated. However the clays being extracted from this site are being blended with other clays for the production of high specification bricks and are not being used for refractory purposes.
- 5.1.3 There is very little evidence of a current economic demand in for the fireclay resources present within the District. In terms of the specialist demand for the highly siliceous fireclays present within the western part of the District for refractory products, the only refractory business which has utilised these resources in recent times has indicated that they do not intend to open any further sites within the District following the closure of the site east of Denholme. The BGS Minerals Planning Factsheet on fireclay advises that future opportunities for fireclay

²³ British Geological Survey, 2006. *Minerals Planning Factsheet: Fireclay*.

²⁴ British Geological survey, 1996. *Applied Geology of the Bradford Area; Map 2b: Bedrock Geology Map*

²⁵ Historical minerals workings data gathered using British Geological Survey, *Minerals Information Online* (accessed January 2009)

²⁶ British Geological Survey, 2006. *Minerals Resource Information in Support of National, Regional and Local Planning: West Yorkshire*.

recovery is likely to be dependant upon the extraction of other minerals, primarily coal²⁷.

- 5.1.4 In contrast there has recently been renewed extraction of brick clay within the District at a site on Soil Hill, south of Denholme. The Council understands that clays from this site are being used to supply a brickworks in Lancashire for the production of high specification engineering bricks. Another site on Soil Hill has also, until recently, supplied low permeability engineering clays for use in landfill engineering. However, although there is clearly the potential for clays found within the District to be commercially extracted for a variety of purposes, this demand appears to be relatively small scale and sporadic and it is impossible to predict whether any continued industrial demand for clays extracted within the District will be sustained into the future.
- 5.1.5 In terms of evidence of the geographical spread of clay resources within the District, the BGS have not defined any distinct clay resource area. However fireclays only tend to occur as seatearths beneath coal seams and therefore the shallow coal resource areas defined by the BGS can be used as a general indicator of the parts of the District within which fireclays are likely to be located, see figure 3 below. The suitability of a clay for a specific purpose is highly dependant upon the particular fireclay seam's quality, purity and composition and therefore it cannot be assumed that all fireclays within the shallow coal resource area are of economic value. There is no available geological evidence to identify just those parts of the District which contain clays of economic value.

5.2 Coal

- 5.2.1 There has been widespread historic deep mining of coal within the District; however opencast mining has been relatively limited and confined to the far east of the District in the area of open land surrounding Tong. There are currently no active deep or opencast coal mines within the district. Both minerals industry bodies and the Coal Authority were consulted on the previous minerals topic papers; however no evidence has come forward of any current economic interest in the mining of the coal resources present within the District. However a 2006 BGS report on minerals planning within West Yorkshire advised that "prospects for opencast coal remain"²⁸.
- 5.2.2 The District's coal resource comprises the north-westernmost part of the East Pennine Coalfield (the BGS indicate that the calorific value and rank of the coalfield broadly increases eastwards and categorise much of the coal within the District as a secondary rather than primary resource) and it is known that very extensive mining activity has taken

²⁷ See pages 2&3 of the British Geological Survey, 2006. *Minerals Planning Factsheet: Fireclay*

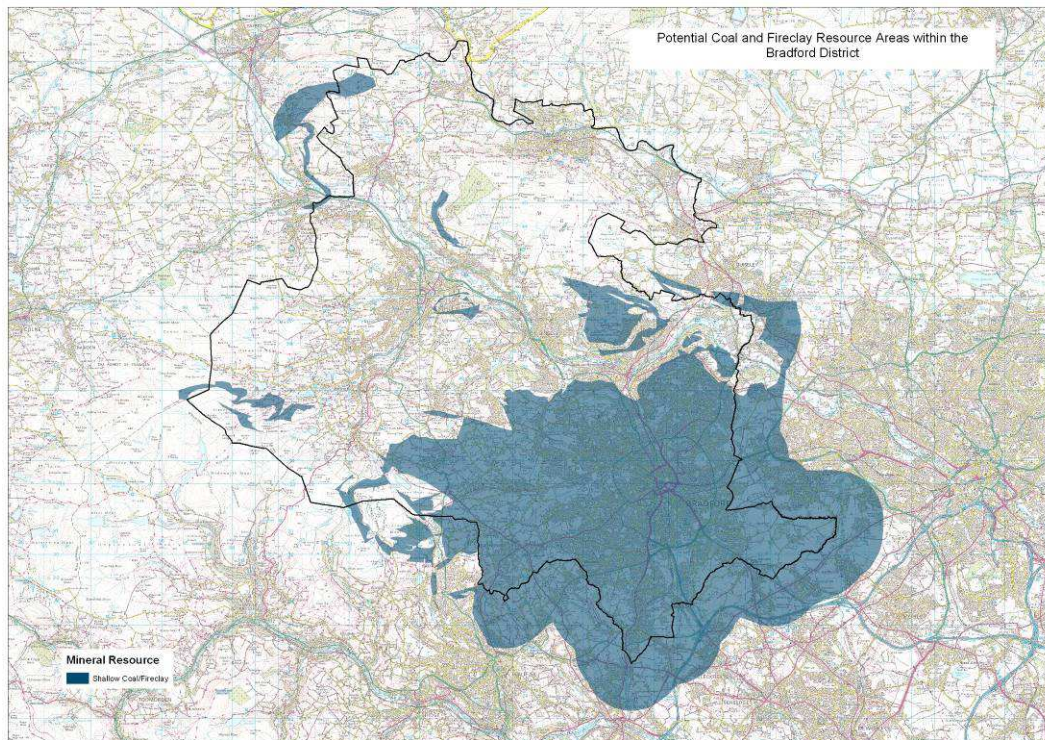
²⁸ British Geological Survey, 2006. *Minerals Resource Information in Support of National, Regional and Local Planning: West Yorkshire*. P. 10.

place within the District over the last two centuries. The methodology report supporting the 2006 BGS coal resource mapping exercise²⁹ identifies primary, secondary and tertiary coal resource areas. Primary areas are stated to constitute the main target for opencast coal extraction, comprising a relatively closely spaced succession of variable but generally thick coals resource areas. Secondary coal resource areas are described as containing coals which are generally thinner and less concentrated in vertical and areal distribution and therefore generally less viable for large scale opencast mining.

- 5.2.3 The 2006 BGS resource appraisal methodology report identifies the base of the primary coal resource within the West Yorkshire Coalfield as being the Better Bed Band Coal with the remainder of the underlying coal measures formation identified as a secondary resource. The BGS bedrock geology map of the District indicates the Better Bed only occurs within the south-eastern part of the Elland Flag series present within the District.
- 5.2.4 The BGS have provided a coal resource map which differentiates between the parts of the coal resource present within the district which are thought to constitute primary, secondary and tertiary coal beds. This map corroborates the assumption that it is primarily only the southern and eastern part of the coalfield identified by the Coal Authority constitutes a primary coal resource, as defined by the BGS. Figure 3 below shows the full extent of the theoretical coalfield within the District undifferentiated according to quality. Figure 4 shows the coal resource differentiated into Primary, Secondary and Tertiary resource areas.

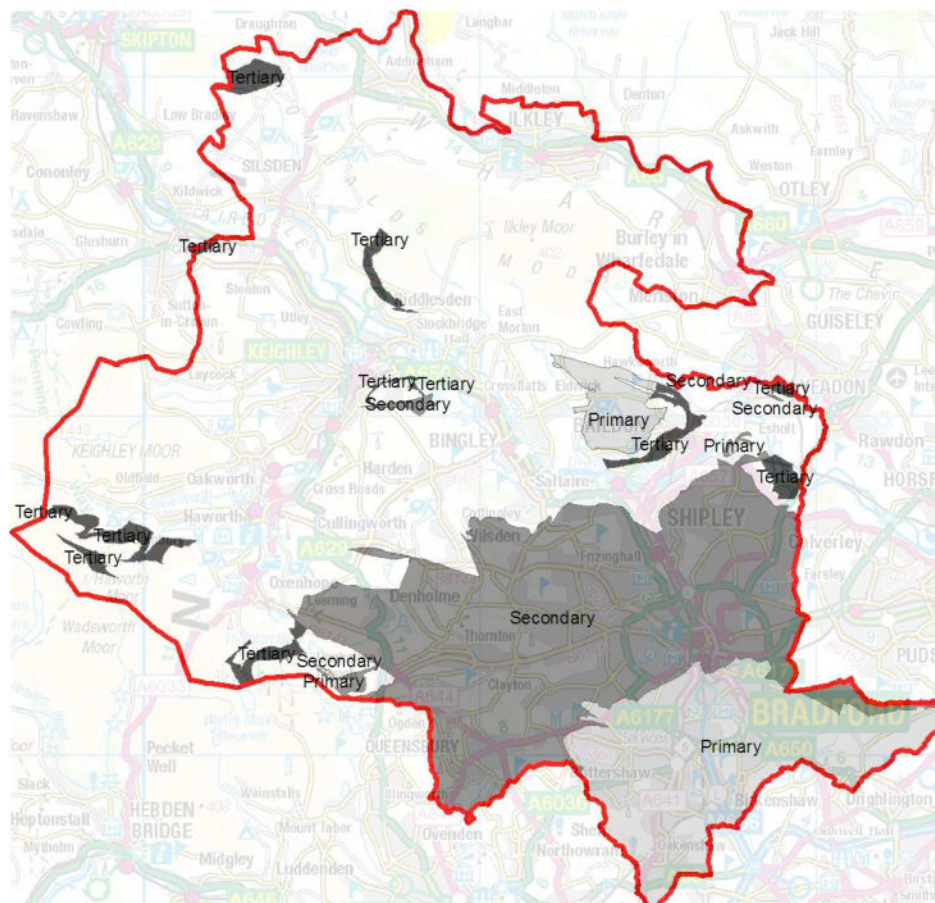
²⁹ British Geological Survey, 2006. *Coal Resource Appraisal Maps: methodology and datasets used*.

Figure 3



(Plan produced by CBMDC; resource area derived from Coal Authority data)

Figure 4



(Plan produced by CBMDC; resource areas derived from British Geological Survey and Coal Authority data)

5.3 Coal – Safeguarding Issues

- 5.3.1 The Coal Authority previously raised concerns in relation to the setting of thresholds for the scale of development for which the coal safeguarding policy proposed in the Local Plan would be applicable (a 1 hectare site threshold was proposed in earlier versions of the safeguarding policy). Their objection was on the grounds that they knew of examples of prior-extraction taking place on sites smaller than 1 hectare. The Coal Authority further explained that they had a preference for the need to consider prior extraction to apply to the major and minor categories of development. However they confirmed that they would be willing to discuss the option of applying the safeguarding policy to major developments only, if evidence could be provided that this would suit the local circumstances.
- 5.3.2 To support their objection to the imposition of the 1 hectare threshold the Coal Authority provided a list of 61 examples of prior extraction of coal which has taken place within urban areas of the UK between 1994 and 2011. An analysis of the first 15 of these examples revealed that, whilst one of the sites was below the 1 hectare threshold, all of the sites met the definition of major development, as defined in the General Development Management Order 2010. Therefore it is considered that, whilst the Coal Authority have demonstrated that it can be viable, under certain circumstances, to undertake the prior extraction of surface coal resources on development sites below 1 hectare, they have not demonstrated that the prior extraction is viable for minor development types.
- 5.3.3 It is not contested that prior extraction of coal may be viable in certain particular circumstances on minor development sites. However the evidence leads to the reasonable conclusion that these circumstances are likely to be relatively limited. Furthermore there are several reasons to suspect that a significant proportion of the extensive coal resource identified by the Coal Authority within the District is unlikely to contain significant quantities, of good quality, accessible coal, including:
- the District's coal resource comprises the north-westernmost part of the East Pennine Coalfield and the BGS indicate that the calorific value and rank of the coalfield broadly increases eastwards;
 - The BGS categorise much of the coal within the District as a secondary rather than primary resource (coal beds which are generally thinner and less concentrated in vertical and areal distribution);
 - It is known that very extensive mining activity took place within the District over the last two centuries resulting in the removal of much of the good quality accessible coal.
- 5.3.4 Therefore it seems reasonable to assume that the relatively rare circumstances under which prior extraction of coal is viable on small

development sites are even less likely to occur within the Bradford District than may be the case in other parts of the coalfield.

- 5.3.5 In their objections to the Council's initial proposed approach of restricting coal safeguarding policies to developments on sites of over 1 hectare the Coal Authority initially indicated that their preference would be for safeguarding policies to apply to all minor and major developments (the Coal Authority have since changed this position subsequent to further negotiation with the Council).
- 5.3.6 In order to inform an understanding of the likely effects of applying the coal safeguarding policy to minor as well as major development types, an analysis was undertaken of all the planning applications received during the 2010/2011 and 2011/2012 accounting periods within the wards which are covered by the coal resource area defined by the BGS. This analysis revealed that an average of approximately 1,000 minor planning applications are received within these wards each year. Therefore the application of the safeguarding policy to all minor, as well as major, development types would result each year in approximately 1,000 planning applications for relatively small scale developments being required to submit additional documentation, i.e. a coal resource appraisal.
- 5.3.7 Given the lack of evidence that prior extraction is likely to be viable for a significant proportion of the minor developments which take place within the District, it was not considered that this additional bureaucratic burden, on a very large number of relatively small developments, where economic viability is likely to be more marginal, was justified.
- 5.3.8 However to respond to the Coal Authority's concerns that opportunities may be missed for prior extraction on minor development sites the minerals safeguarding policy set out in the submission version of the Local Plan Core Strategy includes strong policy support for proposals for the prior extraction of coal. Therefore, if a viable coal resource is discovered on a minor development site during the plan period, there will be a positive policy environment which will allow the developer to extract this coal resource as part of site preparation work. This policy, of encouraging, rather than requiring, minor developers to consider prior extraction, is considered to be proportionate and in line with the government's stated objective of not overburdening investment in business with the combined requirements of planning policy expectations (NPPF paragraph 21)

6.0 CURRENT MINERALS SUPPLY SITUATION WITHIN BRADFORD

6.1 The principal mineral resource commercially extracted within the District is sandstone, the primary use of which is for the production of building, roofing and paving stones. Crushed sandstone aggregates are also produced at many sites utilising either permitted reserves considered to be unsuitable to produce building, roofing or paving stones, or stone wasted during the working and dressing of such products. However no quarries within the District have the primary purpose of commercial aggregate production. A clay deposit, suitable for brick clay purposes, is currently worked at one site to the south of Denholme. Currently no commercial coal or sand and gravel extraction takes place within the District.

Table 2
Active Extraction Sites within the Bradford District (January 2015)

Site	Grid Ref	Mineral	Geological Formation	Site Area (ha)
Bank Top Quarry	SE091374	Sandstone	Millstone Grit - Rough Rock (Yeadonian)	13
Bolton Woods Quarry	SE162364	Sandstone	Coal Measures - Elland Flag (Langsettian)	25
Branshaw Quarry	SE032401	Sandstone	Millstone Grit - Woodhouse Grit (Marsdenian)	5.8
Fagley Quarry	SE187352	Sandstone	Coal Measures - Elland Flag (Langsettian)	4
Hainworth Shaw Quarry	SE067389	Sandstone	Millstone Grit - Rough Rock Flags (Yeadonian)	7.9
Naylor Hill Quarry	SE040364	Sandstone	Millstone Grit - Woodhouse Grit (Marsdenian)	5.4
Rawdon Quarry	SE198391	Sandstone	Millstone Grit - Rough Rock Flags (Yeadonian)	0.17
Ten Yard Lane Quarry	SE081340	Sandstone	Coal Measures - Elland Flag (Langsettian)	5.6
Far Shay Fireclay Pit	SE079316	Brick Clay	Coal Measures - Mudstone & Siltstone with 36 Yard Coal Outcrop	3.9

6.2 Table 2 above identifies the active extraction sites currently located within the District. Currently active sites comprise 8 sandstone quarries and 1 clay extraction site. Four of the sandstone quarries are thought to only be intermittently active with very low output. The 4 quarries with significant output all primarily produce blocks of stone which are sawn into a variety of building stone products including walling stone, lintels, cills, sawn paving and kerb stones.

- 6.3 The production of hand riven flags and stone slate roofing is thought to have declined substantially. Reserves appear to be close to exhaustion at the majority of sites with only one quarry thought to possess remaining reserves of over 1 million tonnes of sandstone.
- 6.4 In addition to the active extraction sites 9 dormant minerals extraction sites are located within the District³⁰, 4 fireclay extraction sites and 5 sandstone quarries; however it appears that a number of these dormant sites may now be unworkable due to subsequent sterilising development. The remaining dormant sites are as set out in table 3 below:

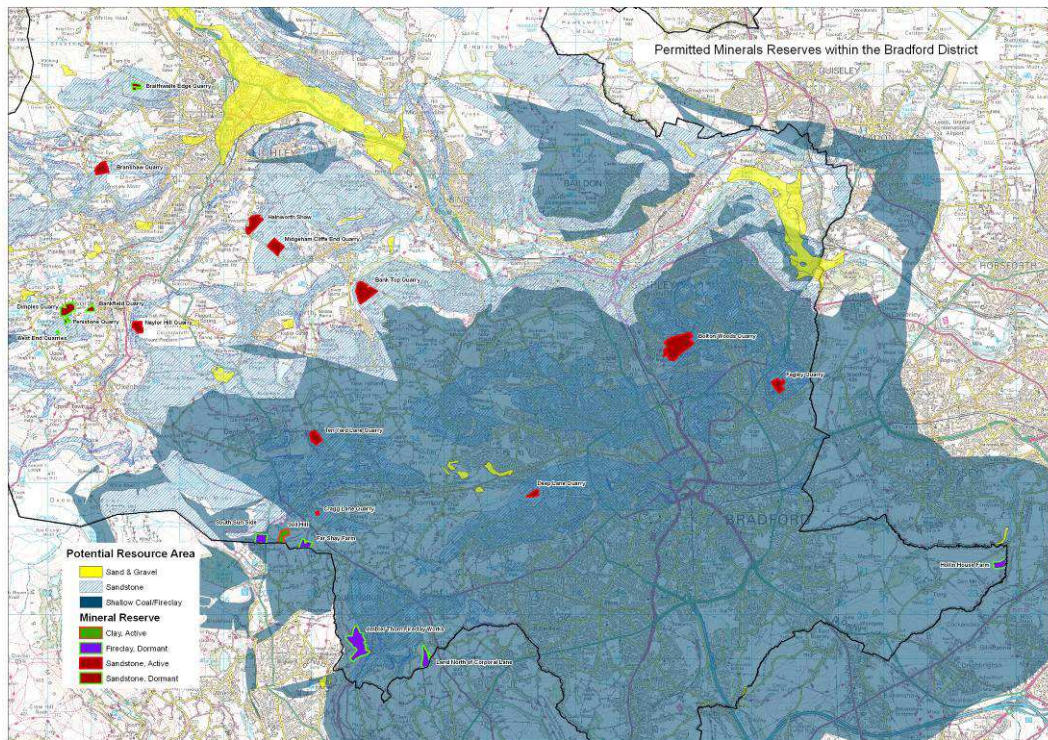
Table 3
Dormant Extraction Sites within the Bradford District (January 2015)

Site	Permission Date	Permission Ref	Grid Ref	Type of Mineral
Ambler Thorn Fireclay Works	09 May 1952	QS/21	SE090293	Not Specified (fireclay opencast & underground)
Bankfield Quarry	23 May 1951	KE/845A	SE030369	Sandstone
Braithwaite Edge Quarry	09 Nov 1954 22 July 1965	KE/1666 KE/5607	SE040420	Stone
Dimples Quarry	11 June 1951	KE/845B	SE025370	Sandstone
Hollin House Farm	04 January 1967	30514	SE236311	Not Specified (fireclay mine)
Land north of Corporal Lane	14 October 1952	QS/198	SE106290	Fireclay (opencast)
Penistone Quarry	20 Sept 1966 10 March 1969	KE/5998 KE/7083	SE024366	Stone flags
South Sun Side	05 February 1970	DH/654/A	SE068317	Fireclay and associated minerals (opencast)
West End Quarries	22 October 1964	KE/5232	SE022364	Not specified (sandstone)

- 6.5 Figure 5 below shows the location of the minerals sites within the district. The majority of sites are located west of the City of Bradford around the settlements of Bingley, Cullingworth, Wilsden, Thornton, Denholme and Oxenhope. However several 'urban quarries' are located within the City of Bradford itself.

³⁰ A dormant site is a minerals extraction site which was registered as dormant under the review of mineral planning permissions brought about by the Environment Act 1995. Dormant sites can not re-open until a modern set of planning conditions has first been approved by the Mineral Planning Authority.

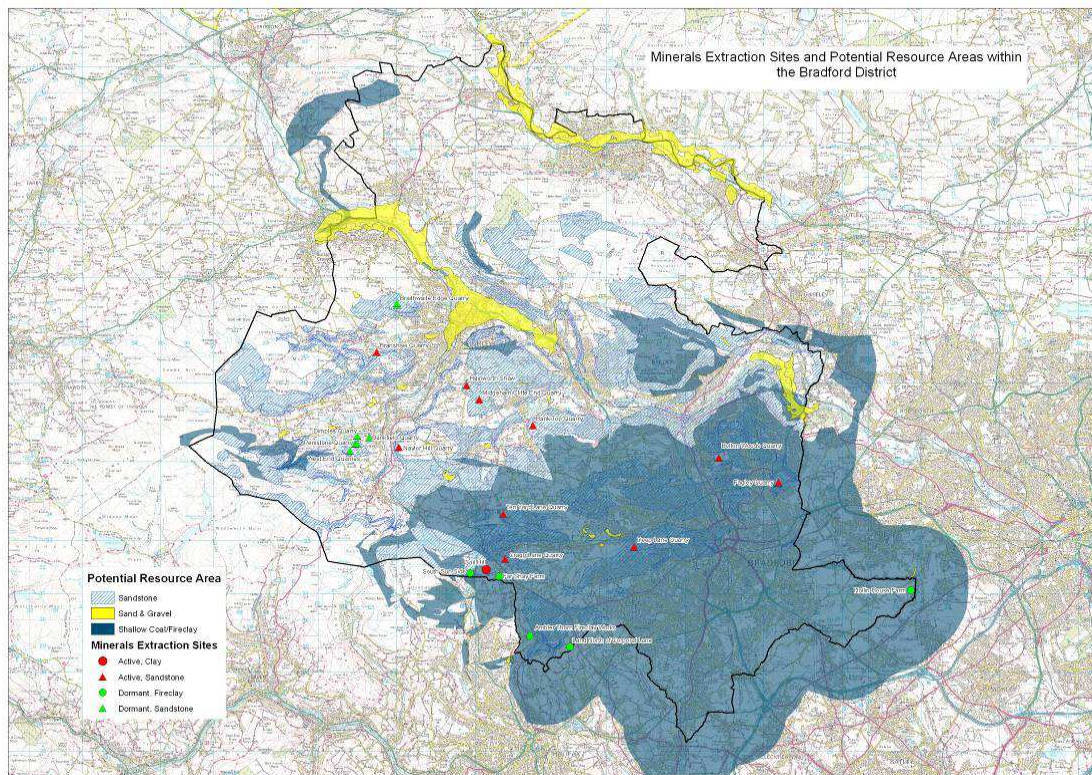
Figure 5



(Plan produced by CBMDC; resource areas derived from British Geological Survey and Coal Authority data)

6.6 Most of the active quarries are long established sites that have provided stone for the construction of buildings within the District for over a century. The landscapes within which the quarries tend to be situated are predominantly either mixed upland pasture areas or gritstone moorland and often the quarries themselves form part of the established character of the landscapes. As can be seen from Figure 6 below certain sandstone rock units no longer contain any active workings, such as the coarser gritstones to the north of the District.

Figure 6



(Plan produced by CBMDC; resource areas derived from British Geological Survey and Coal Authority data)