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Introduction

Background

Why safeguard minerals?

1. Minerals are an important national, regional and local resource. The entire borough is underlain by minerals of varying economic value, for example, below the surface; at varying depths are significant coal and gas resources covering the entire borough, and extending into other parts of the region. Doncaster also has considerable mineral resources within the Magnesian Limestone ridge, between Barnsdale Bar in the north and Stainton in the south. The east of Doncaster between Thorne and Bawtry contains deposits of both alluvial and post glacial sands and gravels as well as soft sand, which is part of the Sherwood sandstone bedrock. These minerals have a fundamental role in underpinning the local economy by providing aggregate for construction, dimension stone for prestige buildings and energy to power homes and industry.

2. Mineral resources are finite; therefore it is essential that a sustainable approach is used to ensure that there is sufficient supply in the future. Safeguarding is the process to ensure this desired outcome by avoiding unnecessary development such as housing, industry or retail.

What are Mineral Safeguarding Areas (MSAs)?

3. MSAs are areas of known mineral resources that are considered to be of sufficient economic or conservation value (such as building stone) to warrant protection for future generations. The level of information used to prove the existence of the mineral resource can vary from geological mapping to more in depth geological investigations.

Planning Context

National Policy

4. Paragraphs 203 and 204 of the 2018 National Planning Policy Framework identifies 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. It goes on to say Local Plans should:

- Safeguard mineral resources by defining Mineral Safeguarding Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral
development where this should be avoided (whilst not creating a presumption that the resources defined will be worked);

- safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material;

Minerals Planning Practice guidance goes on to say: ‘Since minerals are a non-renewable resource, minerals safeguarding is the process of ensuring that non-minerals development does not needlessly prevent the future extraction of mineral resources, of local and national importance.’

Local Policy

5. The statutory development plan for Doncaster currently comprises:

- The Local Development Framework Core Strategy. This Development Plan Document, adopted in May 2012, sets out the overall vision for planning of the borough and the strategic planning policies.
- The Barnsley, Doncaster and Rotherham Joint Waste Plan sets out the overall approach to managing waste across the areas over a 15-year period, up until 2026. It has core strategy status and forms part of each borough’s statutory development plan, this plan was adopted in March 2012.
- The saved policies of the Doncaster Unitary Development Plan (UDP). The UDP was adopted in July 1998 but only some of its policies are still “saved”; these are listed at Appendix 3 of the Core Strategy. These policies were saved by the Direction of the Secretary of State dated 27th September 2007. The UDP Proposals Map still forms part of the statutory development plan.
- Neighbourhood Plans. A number of Neighbourhood Plans are in various stages of preparation; upon adoption, a Neighbourhood Plan will form part of the statutory development plan. Neighbourhood Plans for Armthorpe, Rossington, Tickhill, Thorne/Moorends and Norton are currently in preparation.

6. This document will form part of the evidence base to support a new single Local Plan which is currently in preparation. This will supersede the Core Strategy and the saved policies of the UDP. It will set out both the strategic and local planning policies for the Borough and will include a new Proposals Map. Local planning policies will not be included for those Neighbourhood Planning areas where the Neighbourhood Plan is sufficiently advanced.

Outcomes

7. In line with the British Geological Survey (BGS) good practice advice Minerals Safeguarding in England we will consider strategic options, produce detailed maps and finally develop a draft policy showing how MSAs will be taken into account in respect of planning proposals for non-mineral development.
Key Outcomes will include:

- Assessment of the best geological and resource information available to the authority
- **Deciding which resources to safeguard and identifying draft Mineral Safeguarding Area proposals for consultation**
- Identification of the reasons for the decisions reached on what resources will and will not be included in the safeguarding areas
- **Consult on the draft MSA proposals**
- Production this evidence base document and documenting the methodology used

Further work will include:

- deciding on the approach to safeguarding in the Local Plan
- deciding on the approach to development management policies in the Local Plan

**Limitations and other Constraints**

8. It is essential to note that the identification and delineation of mineral resources is limited by the quality and quantity of available data. Also predicting what minerals may become economically viable in the future is influenced by changing economic, environmental and technical factors and as such it should be noted that the economic potential of minerals may change with time.

**Which document will contain the minerals safeguarding policy?**

9. Doncaster’s Core Strategy currently contains a specific minerals planning policy (Policy 20) and makes reference to Mineral Safeguarding Areas. This document will support the new Local Plan superseding the Core Strategy and the saved policies of the UDP. It will set out both the strategic and local planning policies for the Borough and will include a new Proposals Map.

The Minerals Safeguarding Area will be a allocation which identifies that the mineral may be of future value and strategic importance to the economy and will be taken in to account alongside other policy considerations, when evaluating the facts and making a decision in respect of a planning application.

**Methodology**

10. Doncaster’s MSAs will be defined in accordance with national policy and the British Geological Survey (BGS) Minerals Safeguarding in England: Good Practice Advice (Minerals and Waste Programme, Open Report OR/11/046 (2011)). It will include an evaluation of the associated issues and constraints particular to Doncaster. The following stages will be used as a basis for the project and the development of MSAs.
Stage One
Identifying and assessing the best available geological and mineral resource information available…
Doncaster’s Mineral Resources - Available Information

11. The British Geological Survey (BGS) mineral resource map data set DiGMapGB-100 mineral resource data shows Doncaster has significant mineral resources. These include limestone aggregates, sands and gravels, coal, fire clay & brick clay, peat, (Upper Carboniferous) sandstone and hydrocarbons. The entire borough is underlain by minerals of varying economic value, for example, 50 metres below the surface is a significant deep coal resource covering not only the whole borough, but most of the region. So, although minerals are finite, they are not always scarce. It is, therefore important to define practical safeguarding options to achieve a balance between mineral exploitation and surface development.

12. The BGS resource map provides the best information on broad areas of mineral availability and so provides a starting point for developing the MSAs. Where data is available from the minerals industry or other studies (such as the Phase Two: sand and gravel study for the Yorkshire and Humber) these will be used also. There may also be areas in Doncaster where there is a proven resource, which may or may not be excluded from safeguarding as it has already been developed.

13. A comprehensive mineral profile for each of Doncaster’s mineral resources (as derived from the BGS data set DiGMapGB-100 mineral resource data and The Doncaster Geodiversity Assessment 2007) can be found in appendix 1. The profiles include information on geology type, surface area, what is worked and where, long term prospects and options for safeguarding. Sherwood sandstone (although not identified in the BGS mineral resource data) has also been profiled and discussed alongside the other identified resources.
14. The final profile is conventional and unconventional hydrocarbons and includes information sources and prospects, what is worked and where, long term prospects and future options. Unconventional gas sources such as abandoned mine methane (AMM), coal mine methane (CMM), coal bed methane (CBM), and shale gas will be identified and discussed.

Map One: BGS data set DiGMapGB-100 mineral resource data
Stage Two

Deciding which mineral resources will be safeguarded and the physical extent of the MSAs
15. The BGS mineral resource map (sourced from the British Geological Survey) shown on the previous page identifies the mineral resources found in Doncaster. The resources include Magnesian limestone, various types of sand (soft sand and sharp sand) and gravel, sandstone, coal and clay. These resources, plus hydrocarbons will be assessed and considered for their suitability for safeguarding in the Local Plan.

Issues and Constraints
16. This stage looks at the issues and constraints informing the development and extent of the Mineral Safeguarding Areas to be allocated in the Local Plan and supporting Proposals Maps. Considerations include;
   - Defining and identifying developed areas, existing settlements and the main urban area
   - determining the appropriate size of the safeguarding buffer zone
   - identifying transport and processing infrastructure
   - Identifying new allocation proposals (Housing, Employment, Others?) and impacts on MSA proposals
   - Identifying and excluding areas of existing and exhausted mineral workings
   - Identifying and excluding ‘Areas of Search’ once identified
   - Identifying and excluding new proposals once identified

Defining Development, Settlements and Main Urban Area
17. National Planning Practice guidance says ‘Safeguarding mineral resources should be defined in designated areas and urban areas where necessary to do so’. It goes on to identify that safeguarding of minerals beneath large regeneration projects in brownfield land areas can enable suitable use of the mineral and stabilisation of any potentially unstable land before any non-minerals development takes place. Projects have been undertaken where coal, sand and gravel have been extracted prior to development. With this in mind it is important to identify where development, settlements and the main urban area are located.

18. With the above considerations in mind the Mineral Safeguarding Area Proposals Map will be produced using the latest version of the Ordnance Survey landlines® as the base map. In addition to this an airport shape file (supplied by Peel Holdings) will also be added to identify the extent of the airport and associated development.

19. This approach will identify all safeguarded mineral resources proposals regardless of existing development. A criteria based policy will then be included in the Local Plan. This policy will consider if the mineral can be practicably extracted as part of a regeneration project or new development proposal and take account of:

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1 Paragraph: 004 Reference ID: 27-004-20140306
• The quality and quantity of the mineral
• The economic value of the mineral
• Associated environmental impacts
• The economic importance of the development proposal

20. It is proposed that applications which are identified as domestic, minor or temporary in nature will not require consideration against this policy.

Determining Proximal Buffers for MSAs

21. The identification and use of proximal buffers will help prevent the sterilisation of the mineral resource from other surface development proposals. The application of a buffer may also help to account for potentially anomalous geological boundaries. A MSA may therefore be required to extend beyond the identified BGS mineral resource boundary.

22. The application of a buffer zone around the mineral resource will therefore account for potential anomalies and also safeguard entire mineral resource from proposed nearby development. See diagram below

The Sterilisation of near surface mineral by surface development

![Diagram of mineral resource and buffer zone](image)

23. A meeting was held with industry in March 2015 to discuss Local Development Scheme minerals issues. Minerals safeguarding buffers were discussed and refined. The buffer zones are shown below.

Table of proposed MSA buffers (safeguarding the mineral from development)

<table>
<thead>
<tr>
<th>Mineral Category</th>
<th>Buffer Zone (Metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand and Gravel</td>
<td>250m</td>
</tr>
<tr>
<td>Crushed Rock</td>
<td>250m (up to 500m if blasting is required)</td>
</tr>
<tr>
<td>Building Stone</td>
<td>(as crushed rock)</td>
</tr>
<tr>
<td>Shallow coal</td>
<td>250m</td>
</tr>
</tbody>
</table>

24. **Note**: Where buffer zones cross into an adjacent authority boundaries they
will be clipped to the borough boundary. Where proposals could potentially impact
on adjacent authority, consultation will ensure local plan designations are
considered across borough boundaries.

**Transport and Processing Infrastructure**

25. Government policy requires mineral planning authorities to safeguard existing
or potential infrastructure support facilities used for transport, storage, handling
and processing of minerals. There is currently one working wharf in Doncaster,
which is used on an ad hoc basis for the transport of Magnesian Limestone. This
wharf is located on the navigable section of the river Don at Cadeby Quarry. We
have received no representations for additional canal wharf sites or promotion of
waterborne freight for limestone or sand and gravel aggregate. The use of the
canal and navigable river network for transportation minerals is always a preferred
sustainable option and navigable waterways will be shown on our Local Plan
proposals map.

26. Government policy also states that consideration should be given to sites
which are needed for the processing and re-distribution of recycled / secondary
aggregate and any potential for locating processing plants in sustainable transport
locations should be investigated.

**Table of Summary Responses for Infrastructure Requirements for Mineral Safeguarding**

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Type Of Infrastructure</th>
<th>Existing / Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanson UK</td>
<td>Auckley Rossington</td>
<td>Concrete Production</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete Production</td>
<td></td>
</tr>
<tr>
<td>Marshalls plc</td>
<td>Stainton</td>
<td>Concrete Products, Batching &amp; Processing</td>
<td>Existing</td>
</tr>
<tr>
<td>Tarmac</td>
<td>Kirk Sandall Finningley Finningley</td>
<td>Concrete Batching Handling &amp; Processing</td>
<td>Existing</td>
</tr>
<tr>
<td>Aggregate Industries</td>
<td>Kirk Sandall</td>
<td>Handling &amp; Processing</td>
<td>Existing</td>
</tr>
<tr>
<td>Breedon Aggregates Ltd</td>
<td>None</td>
<td>None</td>
<td>Existing</td>
</tr>
<tr>
<td>Network Rail</td>
<td>Ten Pound Walk, Doncaster</td>
<td>Handling &amp; Processing – recycled rail ballast</td>
<td>Existing</td>
</tr>
</tbody>
</table>

**Building Stone**

27. The National Planning Policy Framework requires MPAs to consider of small
scale building and roofing stone sources, including their need for the repair of
heritage assets. Building stone (dimension stone) is produced as a by-product of
the aggregate industry; however the production of hand-worked quality building
stone is increasingly rare. There are sites in Doncaster that still produce building stone. It is proposed to identify dormant / disused quarries (with extant permission) on the safeguarding Proposals Map. Importantly dormant / disused quarry sites will have historically produced material for use in restoration projects.

28. The British Geological Survey and Historic England (formerly English Heritage) collaborated on The Strategic Stone Study, to identify significant building stone sites in each county across England. The work specifically identifies stone matches for conservation projects. A map from the database (see appendix Three) identifies a number of quarry sites within the Doncaster area. Three of the sites identified in the study have extant permissions (Cadeby Quarry, Hazel Lane Quarry and Park Nook Quarry) it is proposed therefore to identify these sites on the Safeguarding Proposals Map. When additional information comes to light in respect of other sites identified in the study, these will be considered for addition on the Proposals Map.

29. A table identifying transport, processing and mineral recycling infrastructure and building stone safeguarding proposals can be found in appendix three
Stage Three
Mineral Safeguarding Areas Options: Reasons and Justification

30. Issues relating to defining MSAs range from ‘including most if not all of the resource, to restricting MSAs to worked areas and potential extensions, and where known prospects exist. The issue of known prospects is very relevant in the sand and gravel areas in and around Finningley, Blaxton and Branton areas. This is further limited by the uncertainty of the resource information required to clearly define an appropriate MSA. Limiting factors relating to economics and the environment also need to be considered.

31. To determine which areas will be safeguarded six criteria have been used:
   - Known geology (identified by BGS)
   - Which are currently worked, or have been worked (including the main use)
   - Regional / National Status
   - Strategic Importance
   - Long term prospects
   - Consultation with industry

32. The mineral profiles in appendix one take account of the above criteria in some detail and also include safeguarding options which have been taken account of during the recent ‘sites, and selection methodology’ update carried out in November 2015. The table below summarises which minerals identified by the British Geological Survey are proposed for safeguarding in Doncaster. A summary reason and justification is also included.

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Identify MSA</th>
<th>Reason / Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand and Gravel (including lacustrine, river</td>
<td>Yes</td>
<td>BGS mineral resource data shows significant (proven and indicative) sand and gravel deposits in the area. The material has been and is still worked in the area. Mineral companies say it is important to safeguard the resource, however long term prospects are currently limited, due to the resource depletion. There appears to be significant material available, but this is limited by the current working ratios of waste material / soft sand and sharp sand and gravel. The material worked is now predominantly soft sand. It is proposed to identify a safeguarding area around the sharp sand and gravel deposits (which include the soft sand) to account for a potential increase in the value of the mineral and technology improvements make working poorer resources more economically viable. There are also significant resources under the main urban area, and the airport, although effectively sterilised, development proposals within these areas will be required through policy to evaluate the economic and environmental viability of pre-extracting minerals as</td>
</tr>
<tr>
<td>Mineral</td>
<td>Identify MSA</td>
<td>Reason / Justification</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Crushed Rock: Dolomite</td>
<td>Yes</td>
<td>Dolomite is a well known (locally and regionally important) geological resource and is extensively quarried for low grade applications and is the only significant source of crushed rock in Doncaster. A limited amount of this rock may also be of sufficient strength and durability for concreting aggregate and coated road stone. Dolomite has been worked in the area for hundred’s of years and is still worked today. There are also significant resources under the satellite towns around the main urban area, although effectively sterilised, development proposals within these areas will be required through Local Plan policy to evaluate the economic and environmental viability of pre-extracting minerals prior to development.</td>
</tr>
<tr>
<td>Building Stone (Dolomite)</td>
<td>Yes</td>
<td>Building stone (dimension stone) is produced as a by-product of the aggregate industry; however the production of hand-worked quality building stone is increasingly rare. There are sites in Doncaster that still produce building stone and these will be identified on the safeguarding map. Dormant / disused quarries (with extant permission) which have historically produced hand-won material will also be identified for use in restoration projects.</td>
</tr>
<tr>
<td>Industrial Dolomite (Limestone)</td>
<td>Yes</td>
<td>The chemical properties of locally found Dolomite make the mineral significantly important at both a regional and national level. Dolomite with low levels of impurities is relatively scarce in Britain and as such quarries which produce ‘industrial dolomite’ will also be identified on the safeguarding map. Following the site assessment analysis, an additional ‘Area of Search’ will be identified to the west of and immediately adjacent to Warmsworth quarry just off the A630. See ‘Mineral Site Proposals for inclusion within the Local Plan’.</td>
</tr>
<tr>
<td>Gypsum and anhydrite</td>
<td>No</td>
<td>Gypsum (CaSO_4 \cdot 2H_2O) and anhydrite (CaSO_4) are, respectively, the hydrated and anhydrous forms of calcium sulphate. In nature they occur as beds or nodular masses up to a few metres thick and were originally deposited from the evaporation of seawater. Gypsum is not worked in Doncaster but there are some very high purity natural gypsum occurrences in Nottinghamshire.</td>
</tr>
<tr>
<td>Sherwood sandstone</td>
<td>No</td>
<td>The Sherwood sandstone in Doncaster is predominantly over-lain by quaternary deposits of sand and gravel (which have been extensively quarried). The soft sand (from the Sherwood sandstone) has been exploited for asphalt, mortar sand and agricultural sand, but is usually worked alongside the extraction of the quaternary deposits.</td>
</tr>
<tr>
<td>Mineral</td>
<td>Identify MSA</td>
<td>Reason / Justification</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sherwood sandstone</td>
<td>No</td>
<td>BGS have not identified Sherwood sandstone as a mineral resource in Doncaster and Nottinghamshire county also has a significant area of Sherwood sandstone which is also being worked. The Sherwood sandstone also forms Doncaster’s primary drinking water aquifer. It is not proposed to safeguard this mineral</td>
</tr>
<tr>
<td>Upper Carboniferous sandstone</td>
<td>No</td>
<td>Upper Carboniferous Sandstone, although historically quarried for building stone is not now quarried locally. This material is also too weak and friable to be a good source of aggregate, with dolomite being the preferred local option. These sandstones are also inter-bedded with mudstones and coals making them more costly to exploit. It is also not envisaged the sandstones will be quarried locally in the future.</td>
</tr>
<tr>
<td>Brick clay / Fire clay</td>
<td>No</td>
<td>Brick clay and fire clay occurs with the Pennine Coal Measures Group to the west of Doncaster. Doncaster’s brick clay is not identified as part of the locally or nationally important resource. Because this material is contiguous with the coal bearing strata open cast sites would be the main source for clay in this area and there are no open cast sites in Doncaster. It is not proposed to identify a safeguarding area around clay resources.</td>
</tr>
<tr>
<td>Peat</td>
<td>No</td>
<td>Peat is a known geological resource which has been worked historically by hand by local people for fuel (turbary), and more recently by large companies for horticultural uses. Doncaster’s extensive peat bogs occur in the east of the borough at Thorne and Hatfield moors. These areas are now internationally protected as a ‘biological reserve’ so the extraction of peat is unlikely to be environmentally acceptable. As the site is afforded European protection for biodiversity the peat resource will likely remain unaffected by development. Paragraph 204 of the 2019 NPPF states local planning authorities should not identify new sites or extensions to existing sites for peat extraction</td>
</tr>
<tr>
<td>Deep Coal</td>
<td>No</td>
<td>The whole of Doncaster is underlain by a vast resource of deep coal (the Eastern Pennine coalfield), which has been historically worked for approximately 150 years. BGS have stated that ‘it is unlikely that any new deep mines for working virgin coal resources will be economically viable in the foreseeable future’ and that the future interest in coal extraction will be from exploiting shallow coal resources using surface mining methods. The deep coal resource will remain unaffected by surface development; the issue therefore, relates to associated surface development requirements to facilitate deep coal extraction.</td>
</tr>
<tr>
<td>Mineral</td>
<td>Identify MSA</td>
<td>Reason / Justification</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Shallow Coal</td>
<td>Yes</td>
<td>The shallow coal resource is identified by BGS (on behalf of the Coal Authority) as a strategically important energy mineral. Shallow coal resources are also easily sterilised by surface development, and BGS assume the future interest in coal extraction is likely to be from shallow coal resources that can be easily surface mined. There are no open cast coal sites in Doncaster, but the shallow coal resource in the west of the borough cover a surface area of over 120km². As shallow coal resources can be sterilised by surface development it is proposed to identify a mineral safeguarding area around this shallow resource to ensure consideration within the planning system</td>
</tr>
<tr>
<td>Hydrocarbons</td>
<td>No</td>
<td>Conventional hydrocarbons (on-shore oil and gas potential) are identified as to be relatively poor in this area and wells discovered at Hatfield and Trumfleet are now used for gas storage. Unconventional hydrocarbon potential (shale gas) is being explored locally, regionally and nationally. The resource potential for this area is currently unknown. Coal mine methane and abandoned mine methane can be recovered from working mines and abandoned mines respectively and can be extracted if the mines are not flooded. Coal bed methane can be recovered using a process of underground coal gasification. There is no national policy requirement to identify MSAs for hydrocarbons and any associated surface development would be assessed against criteria based polices and the petroleum licence areas will be shown on the Proposals Maps</td>
</tr>
</tbody>
</table>

**Mineral safeguarding proposals for transport, processing infrastructure and building stone**

33. The quarry industry is supported by a variety of infrastructure. A number of screening, production, processing and handling facilities are located in Doncaster. Infrastructure requirements have been identified through consultation with industry carried out in 2015. The identified infrastructure proposed for safeguarding is listed in appendix three.
Stage Four

Approach to safeguarding Within the Local Plan

Following consultation with stakeholders between March and April 2016 the map overleaf illustrates the proposed broad areas of the strategically important minerals to be covered by the safeguarding policy. Exclusions from the safeguarded minerals areas in the Local Plan policy map will include:

- new allocations such as minerals (preferred areas), housing and employment sites
- areas of existing and exhausted mineral workings and ‘areas of search’.

34. The Doncaster Local Plan minerals policies and proposals map will identify and safeguard beyond the plan period the minerals and infrastructure identified and acknowledged in this document.

35. The Local Plan minerals policies will propose that all non-mineral development within MSAs will be required to account for the safeguarded mineral prior to development taking place. It will also ensure the safeguarding of minerals within developed areas to encourage and ensure, the consideration of prior extraction of economically valuable resources prior to non-mineral development taking place.

36. Stages five, six and seven of the MSA methodology, which includes the revision of strategic policies, ensuring the inclusion of ‘Development Management’ policies (and mineral assessment requirements) are included in the ‘Publication version of the Local Plan.’

37. Finally please note at this stage there is no presumption that the extraction of minerals in Mineral Safeguarding Areas is or will be environmentally acceptable now or in the future, but that a potential resource is available and accounted for during and beyond the plan period.
Safeguarding proposals
References


http://www.bgs.ac.uk/mineralsuk/planning/mineralPlanningFactsheets.html

Alternative Fossil Fuels
Brick Clay
Cement Raw Materials
Coal
Construction Aggregates
Gypsum
Fireclay
Industrial Dolomite
Industrial Limestone
Onshore Oil and Gas
Silica Sand
Underground Storage

Mineral resource maps in England and parts of South Wales
http://www.bgs.ac.uk/mineralsUK/planning/resource.html

<table>
<thead>
<tr>
<th>South Yorkshire (comprising Metropolitan Boroughs of Barnsley, Doncaster and Rotherham and City of Sheffield)</th>
<th>Report (1.02 Mb)</th>
<th>Map (4.79 Mb)</th>
<th>2006</th>
<th>CR/04/173N</th>
</tr>
</thead>
</table>

Doncaster Geodiversity Assessment Volume 1 – Report Geology and Landscape South Programme CR/07/025N


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Appendix One:

Mineral Profiles (BGS Minerals Resource Data Licence no. 2008/113)

Sand and Gravel (Aggregates)
Sands and gravels are defined on the basis of particle size rather than composition. In current commercial practice, following the introduction of new European standards from 1 January 2004, the term ‘gravel’ (or more correctly coarse aggregate) is used for general and concrete applications to define particles between 4 and 80 mm, and the term ‘sand’ for material that is finer than 4 mm, but coarser than 0.063 mm. For use in asphalt 2 mm is now the break point between coarse and fine aggregate. Most commercial sand and gravel is composed of particles that are rich in silica (quartz, quartzite and flint).

They can be sub-divided into:

River terrace deposits
Head deposits
Lacustrine deposits
Glacioluvial deposits
Glaciolacustrine deposits
Blown sand

The Doncaster Geodiversity Assessment Volume 1 report CR/07/025N goes into some detail about the nature of the deposits in the borough, identifying ‘possible’ fluvioglacial deposits at Common Lane Quarry (SE 567 962), Hurst Plantation (SK 640 990) Ipswichian old river gravel deposits at Dunsville Quarry (SE 655 075).

In the east of Doncaster the sand and gravel deposits, more commonly referred to as older sands and gravels form extensive ‘flattish’ spreads consisting of lenses, beds and layers of both pebble free sand, and well sorted fine to medium gravel in a sand matrix. Additional sand and gravel deposits can also occur within the Sherwood Sandstone bedrock further complicating the issues of mineral safeguarding. These deposits have generally been worked as a minor component in the floor of sites working overlying superficial sands and gravels.

Aggregates are identified in the NPPF as a mineral of local and national importance as they are required to meet society’s needs.
River Sand and Gravel (terrace and sub alluvial deposits)

Surface area (including sterilised area)
River terrace deposits 4501.19 hectares, River terrace deposits (concealed) 2496.11$^3$ hectares. Sub alluvial indicated resources 267.63 hectares, Sub alluvial inferred resources 2277.73 hectares.

Total (unsterilised) 7846 hectares

Known Geology
Resources occur in both river terraces within modern floodplains and in flood plain terrace deposits underlying present day alluvium.

What is worked and where? Main uses – Aggregate sand and gravel.
A small amount of river gravel is being worked and Dunsville (Lings Farm) along with the Sherwood Sandstone and current consented (but un-worked) areas of river gravels exist at Low Grounds Farm (as a new site) and at Armthorpe Quarry as a small extension. River gravels were historically the focus at Blaxton, Wroot Road, and Austerfield Quarries but these are now depleted and the sites such as Austerfield are now worked purely for Sherwood Sandstone.

Regional / National Status / Strategic Importance
Aggregates are the most commonly used construction minerals in the UK. They are widely distributed with a range of potential sources and, while a low cost product, are used in very large quantities. They are essential for constructing and maintaining what is literally the physical framework of the buildings and infrastructure on which our society depends.
Demand is driven by activity in the construction industry and the economy as a whole. The relationship is not simple and demand forecasting has proved to be difficult.
A wide range of aggregate types contribute to overall supply. There is a significant variation in aggregate resource types across the UK and local resources may have particular properties that affect use. The geological distribution of primary aggregate resources is uneven. Although the implications of this will be understood near the source of supply, it may not be appreciated elsewhere leading to resources being discounted or poorly utilised because of concerns about compliance and also competition from higher quality materials.

Government planning policy on the provision of construction aggregates in England is set out in the National Planning Policy Framework. Additional guidance is provided in guidance on the Managed Aggregate Supply System.

Long term prospects
Long term prospect for river sand and gravel are limited due to the resource nearing exhaustion. The Yorkshire and Humber Region Aggregates Working Party Annual Report for Aggregates Monitoring 2014 identifies a 5.81 million tonne reserve for South and West Yorkshire. The 2018 Local Aggregates Assessment (LAA) (based on 2017 data) identifies a reserve of just above 5.6 million tonnes. The LAA identifies

$^3$ Sand and gravel information limited to boundary of area assessed by BGS
the overall sand and gravel landbank (at 2017) stands at 18.1 years based on average sales data of 0.31 million tonnes (mt) for the previous 10 years. The LAA also identifies that the majority of the sand and gravel reserve in South Yorkshire (read Doncaster) is soft sand.

**Industry Consultation**
No additional comments received post consultation

**Safeguarding**
Subject to Industry consultation it is proposed to identify a safeguarding area around all identified terrace and sub alluvial resources as the areas hold potential for future sand and gravel extraction. (See next page for map showing locations of river terrace deposits)
Sand and Gravel (Glacial deposits)

Surface Area (including sterilised resources)
Glacial deposits 105.59 hectares, Glaciofluvial deposits 2000.98 hectares, Glaciofluvial deposits (concealed) 41.94 hectares, Glaciolacustrine deposits 658.07 hectares.

Total (unsterilised) 2286 hectares

Geology
Glaciofluvial deposition is complex and intricate, with sand and gravel occurring in sheet like layers of till, as elongated irregular lenses or as totally concealed deposits. The deposits rest on the Sherwood sandstone and comprise beds, layers and lenses of pebble free sand and gravel in a sand matrix. Glaciolacustrine deposition associated with the Devensian glaciation is predominantly fine grained sand and laminated clays and occurs around West Moor depression and toward the racecourse around Cantley.

What is worked and where? (Main uses) Aggregate sand
Glacial deposits have been worked around Finningley Park, Rossington (Stripe Road) High Common (near Tickhill), and Hurst Plantation. BGS data also identifies historical workings that coincide with glaciolacustrine deposits at Beech Tree Farm (Cantley).

Regional / National Status / Strategic Importance
Aggregates are the most commonly used construction minerals in the UK. They are widely distributed with a range of potential sources and, while a low cost product, are used in very large quantities. They are essential for constructing and maintaining what is literally the physical framework of the buildings and infrastructure on which our society depends. Demand is driven by activity in the construction industry and the economy as a whole. The relationship is not simple and demand forecasting has proved to be difficult.
A wide range of aggregate types contribute to overall supply. There is a significant variation in aggregate resource types across the UK and local resources may have particular properties that affect use. The geological distribution of primary aggregate resources is uneven. Although the implications of this will be understood near the source of supply, it may not be appreciated elsewhere leading to resources being discounted or poorly utilised because of concerns about compliance and also competition from higher quality materials.

Government planning policy on the provision of construction aggregates in England is set out in the National Planning Policy Framework. Additional guidance is provided in guidance on the Managed Aggregate Supply System.

Long term prospects
Long term prospect appear limited as known glacial deposits have already been worked. There may well be unknown concealed deposits such as those being worked at Fifty Eights Road (Finningley), but borehole data is unavailable and industry representatives say they are now investigating further afield outside the borough boundary. The Yorkshire and Humber Region Aggregates Working Party
Annual Report for Aggregates Monitoring 2014 identifies a 5.81 million tonne reserve for South and West Yorkshire. The 2018 Local Aggregates Assessment (LAA) (based on 2017 data) identifies a reserve of just above 5.6 million tonnes. The LAA identifies the overall sand and gravel landbank (at 2017) stands at 18.1 years based on average sales data of 0.31 million tonnes (mt) for the previous 10 years. The LAA also identifies that the majority of the sand and gravel reserve in South Yorkshire (read Doncaster) is soft sand.

**Industry Consultation**
No additional comments received post consultation

**Safeguarding**
Subject to consultation with industry it is proposed to identify a safeguarding area around all glacial resources as the areas a potential resource for future sand and gravel extraction. Conclusive borehole data on the amount or quality of the resource is limited, however further investigations will be supported in suitable locations.

(See next page for map showing locations of glacial deposits)
Doncaster Main Urban Area

Adwick / Skellow
Duncroft
Thorne
Mexborough
Airport
Bawtry
Tickhill

Legend
- Settlement boundaries
- Sand & Gravel Sites
- Limestone Sites
- Motorways
- Doncaster Boundary
- South Yorkshire navigation
- Blown sand
- Glacial deposits
- Glacifluval deposits
- Glacifluval deposits: concealed
- Glaciolacustrine deposits
- River terrace deposits
- River terrace deposits: concealed
- Sub-alluvial: indicated resources
- Sub-alluvial: inferred resources

Glacial Deposits

2015 Safeguarding Considerations

Completed By:
Helen McCluskie

Reference:
Minerals(LDF).mxd

Date:
13 April 2015

Scale:
1:162,000

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Derived from 1:100,000 BGS digital data under licence 2006/113
British Geological Survey (c) NERC
Sand and Gravel (Blown Sand Deposits)

Surface area
The surface area of the blown sand equates to 278.34 hectares

Geology
Blown sand occurs to the east of the borough, and is largely concealed under peat and alluvium. The map shows the most extensive deposits of blown sand flanking Thorne and Hatfield moors. The deposits are a result of the aeolian reworking of fluvial and glaciofluvial sands during the late Quaternary.

What is worked and where? (Main uses)
A small area of blown sand is located and worked in the vicinity of Wroot Road quarry.

Regional / National Status / Strategic Importance
Sand and sandstone is distributed widely throughout the UK. Only a small proportion of this can be considered a suitable source for silica sand. Doncaster is not one of the strategic resource areas, which occur in Cheshire and central Scotland. Locally the material is used for horticulture.

Long term prospects
A small area of blown sand is located in the vicinity of Wroot Road quarry, given the area is subject to the granting of a planning permission already this represents a commercial decision to work the mineral and not save it beyond the plan period.

Industry Consultation
No additional comments received post consultation

Safeguarding
Subject to consultation with industry it is not proposed to safeguard blown sand.
2015 Safeguarding Considerations

Completed By:
Helen McCluskie

Reference:
Minerals (LOF).mxd

Date:
13 April 2015

Scale:
1:162,000
Limestone Dolomite (including industrial dolomite and building stone)

Surface Area
Dolomite and dolomitic limestone (solid geology) 104 km²

Geology
The Permian Magnesian Limestone ridge outcrops as a narrow belt running for 230km from Newcastle to Nottingham and in some places is 300 metres thick. Dolostones and limestones of the Zechstein Group cover a broad outcrop of easterly dipping strata to the west of Doncaster. Dolomite is a sedimentary carbonate rock consisting mainly of the calcium magnesium carbonate (CaMg(CO₃)₂) and is formed by the introduction of magnesium oxide (at a chemical level) into pre-existing (calcium carbonate) limestone. The dolomitisation process is normally incomplete and as such ‘dolomite’ is usually comprised a combination of limestones, dolomitic limestones and dolomite. Industrial grade dolomite is also sourced from the Magnesian limestone ridge and is important due to its chemical properties and low levels of impurities.

What is worked and where? Main uses
Dolomite is the only significant source of crushed rock in Doncaster and depending on its physical properties it can be used for a variety of purposes, such as construction fill, drainage media, sub bases for roads and for buildings. Dolomite is worked at Cadeby, Stainton, Warmsworth, Hazel Lane and at Barnsdale Bar just outside the borough.

The pale coloured dolostones have historically been quarried for local building stone, which can be seen around Brodsworth, Hampole and Conisbrough, and also in prestige buildings such as Brodsworth Hall and Cusworth Hall. Building stone such as at Cadeby quarry and Hazel Lane quarry is largely produced as a by-product of aggregates and dolostone production, but good quality stone extracted by traditional quarry methods is intermittently available with extant (but currently un-used) planning permission at Parknook quarry (LGS no. 6.18) for ‘hand-worked quality building stone for restoration projects’.

Dolostone is also important in certain industrial applications where its chemical properties are important. Dolostones with sufficiently low levels of impurities to be used in steelmaking and glassmaking are relatively scarce in Britain. The Permian, Cadeby Formation in the Cadeby, Sprotborough and Warmsworth area is, however, of higher purity. Dolostone for industrial purposes is required to be of high chemical purity accounts for a relatively small and decreasing proportion of total dolostone output in Britain. Industrial dolostone is still sourced at Warmsworth quarry. The quality of the stone is variable and selective quarrying of specific horizons and subsequent blending is required to ensure that the stone meets the low iron requirements for glassmaking and filler applications. Please note, industrial dolostone is no longer sourced from Cadeby quarry.

Regional / National Status / Strategic Importance
The Permian Magnesian Limestone ridge is the main source of dolomite in the UK and is a resource of national and regional importance. High purity dolomite and
dolomitic limestones are more scarcely distributed than high purity limestone. The demand for dolomite is however lower.

**Long term prospects**
The ‘British Geological Survey’ (BGS) has placed considerable economic importance on industrial dolomite because of its restricted distribution and go on to say ‘Permian dolomites are the main source of dolomite in the UK and are a resource of national and regional importance’. The Yorkshire and Humber Region Aggregates Working Party Annual Report for Aggregates Monitoring 2014 identifies a 59.5 million tonne reserve for South Yorkshire. The 2018 Local Aggregates Assessment (LAA) (based on 2017 data) identifies a reserve of 51.7 million tonnes. The LAA identifies the limestone landbank (at 2017) at 30.2 years based on average sales data of 1.7 million tonnes (mt) for the previous 10 years. The long term prospects for aggregate dolomite are currently stable.

**Industry Consultation**
No additional comments received post consultation

**Safeguarding**
Dolomite is a nationally and regionally important mineral, it is therefore proposed to:
- Identify a minerals safeguarding area around all the identified crushed rock aggregate resource
- Identify an ‘area of search’ around half the industrial dolomite representation immediately adjacent to Warmsworth quarry and safeguard the remaining area up to the farm house
Identify sites which produce dimension stone, including sites which can produce hand worked quality building stone for restoration projects.

(See next page for map showing location of Limestone Dolomite)
Gypsum and anhydrite

Surface Area
Not applicable

Geology
Gypsum (CaSO$_4$.2H$_2$O) and anhydrite (CaSO$_4$) are, respectively, the hydrated and anhydrous forms of calcium sulphate. In nature they occur as beds or nodular masses up to a few metres thick and were originally deposited from the evaporation of seawater. Borehole records show intermittent occurrences of Billingham Main Anhydrite, Carnallitic Marl and Upper or Sherburn Anhydrite at varying depths and thicknesses around Askern, Austerfield, Rossington, Hatfield and Thorne.

What is worked and where? (Main uses)
Gypsum is not worked in Doncaster.

Regional / National Status / Strategic Importance
Gypsum is widely distributed through rocks of the Permian and Triassic age. It is a relatively low priced mineral and is economically more important than anhydrite. It is used in the manufacture of cement, plaster, plasterboard and plaster of Paris. Small quantities of high-purity gypsum are also used in confectionery food, the brewing industry, pharmaceuticals, in sugar beet refining, as cat litter and as an oil absorbent. There are some very high purity natural gypsum occurrences in Nottinghamshire.

Industry Consultation
No additional comments received post consultation

Long term prospects
Not applicable

Safeguarding
It is not proposed to safeguard Gypsum and anhydrite.

(Please note, resources are inferred therefore no map has been produced)
Sherwood Sandstone

Surface Area
354 km² (including the area covered by quaternary deposits)

Geology
The Sherwood Sandstone group occurs at or near the surface to the east of the A1, with a pronounced scarp slope just east of Tickhill, but it is predominantly overlain by unconsolidated quaternary sediments. Conglomerate horizons of pebbles and cobbles are also occasionally found and worked. The Sherwood Sandstone consists mainly of red-brown fine to medium grained cross bedded consolidated sand. The Triassic Sherwood Sandstone also forms Doncaster’s primary aquifer.

What is worked and where? (Main uses)
Sherwood Sandstone is worked at Austerfield quarry, Lings farm (Dunsville) and Wroot Road. The soft sand is mainly used for asphalt and mortar sand, but Wroot Road used / uses the material for agricultural and horticultural purposes.

Regional / National Status / Strategic Importance
The Aggregates are the most commonly used construction minerals in the UK. They are widely distributed with a range of potential sources and, while a low cost product, are used in very large quantities. They are essential for constructing and maintaining what is literally the physical framework of the buildings and infrastructure on which our society depends.
Demand is driven by activity in the construction industry and the economy as a whole. The relationship is not simple and demand forecasting has proved to be difficult.
A wide range of aggregate types contribute to overall supply. There is a significant variation in aggregate resource types across the UK and local resources may have particular properties that affect use. The geological distribution of primary aggregate resources is uneven. Due to the vast area of mineral available, which extends into Nottingham, long term depletion is not an issue.

Industry Consultation
No additional comments received post consultation

Long term prospects
Due to the vast area of mineral available long term depletion is not an issue

Safeguarding
It is not proposed to safeguard Sherwood Sandstone bedrock as it is not identified by the BGS as a mineral resource. The surface area in Doncaster alone (below the quaternary deposits equates to 354 km² and in the adjacent county of Nottinghamshire also identifies 510 km².

(See next page for map showing location of Sherwood Sandstone)
Sandstone (Upper Carboniferous)

Surface Area
Upper Carboniferous sandstone 110 hectares

Geology
Sandstones form a substantial part of the Upper Carboniferous sequence in Doncaster where they are interbedded with mudstones and coals. Where thick beds of sandstone are developed they have historically been exploited for building stone, and can be seen in buildings to the west of Doncaster around Barnburgh and Mexborough.

What is worked and where? (Main uses)
The sandstones of Pennine Coal Measures Group have (regionally and historically) been a prolific source of building stone. Upper Carboniferous sandstone is not now worked in Doncaster

Regional / National Status / Strategic Importance
The Aggregates are the most commonly used construction minerals in the UK. They are widely distributed with a range of potential sources and, while a low cost product, are used in very large quantities. They are essential for constructing and maintaining what is literally the physical framework of the buildings and infrastructure on which our society depends
Demand is driven by activity in the construction industry and the economy as a whole. The relationship is not simple and demand forecasting has proved to be difficult.
A wide range of aggregate types contribute to overall supply. There is a significant variation in aggregate resource types across the UK and local resources may have particular properties that affect use. Upper Carboniferous sandstone is too weak and friable for good quality aggregate for roadstone or concrete

Industry Consultation
No additional comments received post consultation

Long term prospects
Upper Carboniferous sandstone is too weak and friable for good quality aggregate for roadstone or concrete

Safeguarding
It is not proposed to safeguard sandstones from the Upper Carboniferous sequence because they are very limited in Doncaster and are too weak or porous to be used as good quality aggregate for roadstone or concrete.

(See next page for map showing location of Upper Carboniferous Sandstone)
Fire Clay and Brick Clay

Surface Area
125 km²

Geology
Clay resources in Doncaster occur within the mudstones of the Pennine Coal Measures Group which are interbedded with siltstones, sandstones, coal seams and seat earths. The mudstones are dark grey, with variable carbon content. They are typically up to 5 m thick, but much thicker (20 to 30 m) in places. ‘Brick clay’ is used in the manufacture of bricks, roof tiles, clay pipes and decorative pottery. These clays may sometimes be used in cement manufacture, as a source of constructional fill and for lining and sealing landfill sites. The suitability of clay for the manufacture of bricks depends largely on its behaviour during shaping, drying and firing. This determines the properties of the fired brick, such as strength and frost resistance and, importantly, its architectural appearance.

Fireclays typically occur beneath coal seams and resources are confined to coal-bearing strata. Although originally valued as a refractory raw material, fireclay is now used by the brick industry for its combination of good technical properties allied to its cream-buff-firing characteristics. Not all fireclays are suitable for buff brick production because of the presence of impurities. The close association of fireclay and coal means that opencast coal sites are one of the few viable sources. Resources of fireclay are thus coincident with opencast coal resources and consequently the future supply of fireclay is largely dependent on the future of the opencast coal industry.

What is worked and where? (Main uses)
Although brick clay and fire clay were once sourced locally, products are now manufactured in large automated factories requiring high capital investment nearby raw materials with predictable and consistent firing characteristics. Brick works are located in Barnsley and Derbyshire.

Regional / National Status / Strategic Importance
Doncaster is not a national, regionally important source of clay. The largest brick making regions are the West Midlands, East Midlands, East of England and the South East.

Industry Consultation
No additional comments received post consultation

Long term prospects
Doncaster’s brick and fire clay are not part of the nationally important resource and viability of the resource is dependant on open cast coal mining.

Safeguarding
It is not proposed to safeguard fire clay and brick clay as it is generally worked alongside the extraction of other economically valuable minerals.

(See next page for map showing location of Clay resources)
Peat

Surface Area
3719 hectares

Geology
Peat is an unconsolidated deposit of compressed plant remains formed in a water-saturated environment such as a bog or fen. Bogs occur in areas where inputs of water (almost exclusively from precipitation) have a low nutrient content and where rainfall is sufficient and drainage low enough to maintain the ground surface in a waterlogged condition.

Many lowland raised bogs have been designated as sites of international and national conservation importance. 98% of peat in England is dug almost entirely for horticultural purposes, either as a growing medium, or as a soil improver.

In Doncaster, extensive peat deposits occur in the east of the borough on Hatfield Moors and Thorne Moors. These deposits occur within designated conservation areas (SSSI, SPA and SAC). Natural England now own both Thorne and Hatfield moors and peat extraction has now largely ceased with extraction only occurring as part of the restoration process. Natural England managed restoration programmes are now in place to return the land to its original raised bog status.

What is worked and where? (Main uses) Horticulture
Peat deposits have been exploited for many years and the horticultural industry based on these resources was one of the largest in Great Britain. Peat was also historically cut by locals as fuel. It is not now environmentally acceptable to extract peat on Thorne and Hatfield Moors which are now in the ownership of Natural England, where they are undergoing restoration. Extant planning permission is still in place, but Natural England is managing the sites for their biodiversity value which may include moving peat around the sites for restoration purposes. Two local landowners also have planning permission for peat extraction on their land but the areas are not worked and as yet they have not been compensated.

Regional / National Status / Strategic Importance
The working of peat is no longer ethically or environmentally acceptable. Paragraph 204 of the 2018 National Planning Policy Framework states local planning authorities should not identify new sites or extensions to existing sites for peat extraction.

Industry Consultation
No additional comments received post consultation

Long term prospects
Thorne and Hatfield moors are being restored as active peat bogs and are internationally important sites for biodiversity.

Safeguarding
It is not proposed to safeguard peat

(See next page for map showing location of peat resource)
Deep Coal

Surface Area
460 km²

Geology
Doncaster lies predominantly within the East Pennine Coalfield. The coal-bearing strata of the Pennine Coal Measures Group (Upper Carboniferous) generally dip to the east or south. Coal seams crop out at the surface in the west and become concealed to the east beneath younger rocks, down to depths of 1200 m below OD. Coal seams are numerous in the region. The seams are mainly bituminous with the calorific value of the coal increasing eastwards. Sulphur and chlorine are impurities associated with all Yorkshire coals, with the most easterly parts of the coalfield recorded as ‘moderately high in sulphur’.

What is worked and where? (Main uses) Energy Mineral
Hatfield colliery located in Doncaster is due to close in August 2015. Following the closure of Maltby colliery in 2014, Kellingly and Thoresby at the end of 2015, there are now no deep coal mines in UK.

Regional / National Status / Strategic Importance
Paragraph 211 of the 2018 National Planning Policy Framework states planning permission should not be granted for the extraction of coal unless:
   a) the proposal is environmentally acceptable, or can be made so by planning conditions or obligations; or
   b) if it is not environmentally acceptable, then it provides national, local or community benefits which clearly outweigh its likely impacts (taking all relevant matters into account, including any residual environmental impacts).

Industry Consultation
No additional comments received post consultation

Long term prospects
The vast coal field underlying Doncaster and indeed the region is a nationally significant asset, but BGS assume that the virgin deep coal seams will not be exploited by conventional means in the foreseeable future. Hatfield Colliery is due to cease extracting deep coal by 2015.

Safeguarding
It is not proposed to identify a safeguarding area around deep coal as surface development will have little or no impact on the deep coal reserves. Surface development related to deep coal mining can be covered through criteria based policies relating to surface development. Five year review of the Local Plan period will allow for flexibility.

(See next page for map showing the location of deep coal resources)

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4 See notes on Underground Coal Gasification (UCG) – ‘Local Plan- Hydrocarbons Evidence Base Update’
Shallow Coal

Surface Area
125 km²

Geology
The coal bearing strata of the Pennine Coal Measures Group (Upper Carboniferous) outcrops near the surface in the west of Doncaster, with the coal interbedded with siltstones, seat earths and sandstones. The coal is bituminous, with a high calorific value and a high sulphur content. Coal near the surface could be worked using the 'open cast' methods and possibly worked prior to any development taking place.

What is worked and where? (Main use) Energy mineral
There are no working open cast coal sites in Doncaster.

Regional / National Status / Strategic Importance
Paragraph 211 of the 2018 National Planning Policy Framework states planning permission should not be granted for the extraction of coal unless:
   a) the proposal is environmentally acceptable, or can be made so by planning conditions or obligations; or
   b) if it is not environmentally acceptable, then it provides national, local or community benefits which clearly outweigh its likely impacts (taking all relevant matters into account, including any residual environmental impacts).

Industry Consultation
No additional comments received post consultation

Long term prospects
The East Pennine coal field is a regionally and nationally significant asset that will in the future require consideration as an important energy mineral. With investment in clean coal technology (carbon capture and desulphurisation) reducing the environmental impacts, the future for coal could be quite bright, subject to environmental impacts and productivity.

Coal Authority:
A small area to the west of Doncaster is identified by the Coal Authority as a ‘coal resource area’. Barnsley Metropolitan Borough is 329 km² with the whole area being identified by the as a ‘coal resource area’ and Rotherham Metropolitan Borough is 286 km² and has 80% of its surface area identified as a ‘coal resource area’

Safeguarding
It is proposed to identify a safeguarding area around shallow coal resource deposits as identified in the Coal Authority’s surface coal resource data as supplied by the British Geological Survey

(See next page for map showing location of shallow coal resource)
Hydrocarbons (Oil and Gas)

Introduction
Hydrocarbons are a significant and very valuable energy mineral that can be extracted from conventional and unconventional sources. Conventional gas and oil is found in pockets within the different rock strata, whereas unconventional gas is held within the rock itself in pore spaces or small fractures.

Surface Area
The borough of Doncaster is broken up into hydrocarbon licence areas.

Geology
Doncaster lies towards the north western end of two major Carboniferous basins: the Gainsborough Trough and Edale Gulf. Within these areas source rocks were deposited which have since produced significant quantities of oil and gas, forming a series of important oil and gas fields to the southeast that make up the East Midlands Oil Province. Permian and Triassic strata crop out over the eastern half of the county providing, in addition to Carboniferous sequences, potential reservoir rocks for hydrocarbons generated from the Carboniferous rocks. The Gainsborough Trough is a potential shale gas formation, which runs from South Yorkshire to North Nottinghamshire. The majority of the exploration licences held in the region relate to the extraction of methane.

What is worked and where? (Main uses) Energy Minerals
The British Geological Survey indicates a relatively poor conventional hydrocarbon potential in the area and depleted gas fields are now used for gas storage. Trumfleet 1 was developed in 1998. Hatfield 1 followed in 1981 and was still producing in late 2005. The role of the Hatfield gas fields has changed to gas storage with gas being injected into the reservoir during periods of low demand and then pumped out during peak demand.

Unconventional hydrocarbons include gas recovered from existing operating mines Abandoned Mine Methane (AMM), Coal Mine Methane ((CMM)), and virgin coal seams (Coal Bed Methane (CBM)). Shale gas is recovered from rocks previously considered to impermeable for economic recovery. Unconventional hydrocarbons may provide a limited replacement for declining natural gas production from both offshore and onshore conventional sources. The assessment of shale gas resources in the UK is still in its infancy. The British Geological survey has stated the preliminary estimates for shale gas potential in the UK look promising.

Green Park Energy (Acquired by Alkane Energy in 2012) and Regent Park Energy (also part of the Alkane group) have drilled boreholes and extracted mine gas in the borough with fluctuating amounts of gas production. Alkane Energy also has a licence to extract gas from abandoned mines just outside Doncaster. The company bought the rights to the methane reserves at Maltby Colliery in Rotherham, and announced it plans to start drilling at Markham Main. Issues include flooding from the interconnected mine network which could impact on prospects identified in the region. The gas produced is commonly used on site for power generation or supplied direct to local consumers.
**Long term prospects**
The depleted conventional gas fields at Hatfield and Trumfleet are used for gas storage. The pattern of gas exploration has changed with an increased interest in unconventional hydrocarbon exploration such as shale gas. The potential of shale gas in the region (and nationally) is still being explored. Alkane is exploring opportunities to enter the onshore shale gas sector and the group has commissioned some geological work looking at shale production.

Underground Coal Gasification (UCG) is another potential area for development in coalfield areas. The technology has been around for some time and UCG pilot testing was carried out by the National Coal Board in the 1950’s, but not progressed. Potential limitations and environmental consequences such as geological, hydrological hazards and previous mining activity may be problematic. Historic mining across the region and the depth of the coal seams in and around Doncaster may however make this option unrealistic.

**Regional / National Status / Strategic Importance**
Hydrocarbons are identified as a mineral of local and national importance with conventional and unconventional hydrocarbons being required for energy security in supporting a transition to a low carbon economy. Paragraph 209 of the 2018 National Planning Policy Framework identifies the provision of energy minerals is a strategic priority. Hydrocarbons provide two-thirds of the world's primary energy supply. They are also important for chemical feedstock. Oil and gas have made a significant contribution to the UK economy for over 40 years.

**Industry Consultation**
No additional comments received post consultation

**Licensing**
The Oil and Gas Authority (part of DECC) issue licences for exclusive rights to explore and exploit oil and gas onshore within Great Britain. The rights granted by landward licences do not include rights of access, and the licensees must obtain any consent under current legislation, including planning permission.

Licensees wishing to enter or drill through coal seams for coal bed methane and abandoned mine methane must also seek the permission of the Coal Authority. UCG licenses are also awarded by the Coal Authority. All rights and permissions (including access to land and planning consents) have to be in place prior to the commencement of any operations.

**Safeguarding options**
It is not proposed to safeguard hydrocarbons, but to deal with the development issues associated with hydrocarbon operations through criteria based policies. In line with planning practice guidance it is proposed to show the Petroleum Licence Areas and hydrocarbon extraction sites on the proposals map and include criteria based policies to deal with exploration, appraisal and subsequent development for conventional and unconventional gas and oil (including shale gas). Proposals will be considered in licenced areas only. (See next page for map showing location of hydrocarbon licence areas)
Appendix Two: (Building Stone Sources)

W & S Yorkshire Bedrock Geology

West & South Yorkshire Bedrock Geology

Click on this link to visit West Yorkshire's geology and their contribution to known building stones, stone structures and building stone quarries. (Opens in new window http://maps.bgs.ac.uk/buildingstone/County=West_Yorkshire
http://maps.bgs.ac.uk/buildingstone/County=South_Yorkshire)
## Appendix Three:

**Mineral safeguarding proposals for transport, processing infrastructure and building stone**

### Asphalt Plants

<table>
<thead>
<tr>
<th>Name</th>
<th>Owner / Operator</th>
<th>Location</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Express Asphalt</td>
<td>Aggregate Industries</td>
<td>Doncaster</td>
<td>Active</td>
<td>Asphalt sand sourced from Dunsville Quarry</td>
</tr>
</tbody>
</table>

### Ancillary Minerals Infrastructure

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Type Of Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanson UK</td>
<td>Auckley</td>
<td>Concrete Production</td>
</tr>
<tr>
<td></td>
<td>Rossington</td>
<td>Handling &amp; Processing</td>
</tr>
<tr>
<td>Marshalls plc</td>
<td>Stainton</td>
<td>Concrete Products, Batching &amp; Processing</td>
</tr>
<tr>
<td>Tarmac</td>
<td>Kirk Sandall</td>
<td>Concrete Batching</td>
</tr>
<tr>
<td></td>
<td>Finningley</td>
<td>Handling &amp; Processing</td>
</tr>
<tr>
<td></td>
<td>Finningley</td>
<td>Handling &amp; Processing</td>
</tr>
<tr>
<td></td>
<td>Wath-upon-Dearne</td>
<td>Cement works (Ready Mix)</td>
</tr>
<tr>
<td>Aggregate Industries</td>
<td>Kirk Sandall</td>
<td>Handling &amp; Processing</td>
</tr>
<tr>
<td>Network Rail</td>
<td>Ten Pound Walk</td>
<td>Rail aggregate recycling handling and transport</td>
</tr>
<tr>
<td>Doncaster Council</td>
<td>Carcroft</td>
<td>CDW / aggregate recycling handling and transport</td>
</tr>
<tr>
<td>Breedon Aggregates Ltd</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Network Rail</td>
<td>Black Bank</td>
<td>rail aggregate recycling</td>
</tr>
</tbody>
</table>

### Building Stone

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadeby Stone Products</td>
<td>Cadeby Stone</td>
<td>Building Stone</td>
</tr>
<tr>
<td>Catplant</td>
<td>Hazel Lane Quarry</td>
<td>Building Stone</td>
</tr>
</tbody>
</table>
## Appendix Four: Consultation Comments

2016 MSA Document - Consultation responses (March – April 2016)

<table>
<thead>
<tr>
<th>No.</th>
<th>Respondent</th>
<th>Comment</th>
<th>Response / Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coal Authority</td>
<td><strong>Doncaster Local Plan - Mineral Safeguarding – Stakeholder Consultation Draft</strong>&lt;br&gt;Thank you for your consultation received on the 23 February 2016 in respect of the above.&lt;br&gt;The Coal Authority supports the approach to Mineral Safeguarding Areas as set out in the consultation document.&lt;br&gt;The Coal Authority also wishes to continue to be consulted both informally if required and formally on future stages.&lt;br&gt;Thank you for your attention.&lt;br&gt;<strong>For and on behalf of Miss Rachael A. Bust  B.Sc.(Hons), MA, M.Sc., LL.M., AMIEnvSci., MInstLM, MCM, MRTP</strong>&lt;br&gt;Chief Planner / Principal Manager</td>
<td>No Action Required</td>
</tr>
<tr>
<td></td>
<td>AGGREGATE INDUSTRIES UK LIMITED Geoff Storey</td>
<td>My main concern is the safeguarding of the Aggregate Industries asphalt plant at Kirk Sandall from further constraints from housing. Regards,</td>
<td>Minerals infrastructure is identified and considered within the MSA document and selected transport and processing infrastructure will be identified for safeguarding on the proposals map in the local plan (page 2)</td>
</tr>
<tr>
<td></td>
<td>NYCC Rob Smith Plans and Technical Services Team Leader</td>
<td>Thank you for consulting NYCC on this matter. We are in general agreement with the proposed approach to minerals safeguarding in Doncaster, which is broadly consistent with the approach being developed in North Yorkshire. There are a number of specific differences in the proposed approach, particularly in relation to</td>
<td>No changes proposed to the document. Doncaster council is not proposing to safeguard of deep coal and hydrocarbons.</td>
</tr>
</tbody>
</table>
the safeguarding of deep coal and hydrocarbons, although this is not considered to raise any issues of cross-boundary significance. I should also point out that the minerals industry representatives in North Yorkshire have recently raised the issue of safeguarding of glacial sands and the Sherwood sandstone in North Yorkshire, both of which lie adjacent to the NYCC/Doncaster border. I am expecting to receive further views from the industry on this matter in the near future and will let you know if there is any intention to revise the approach to safeguarding these deposits in North Yorkshire.

Additional response 27/04/2016
In response to your request our policy approach to safeguarding limestone in the North Yorkshire County Council, City of York and North York Moors National Park Plan area is to safeguard all of the magnesian, carboniferous and jurassic limestone resource with a buffer of 500m to take into account any blasting which may be required.

As North Yorkshire County Council is part of a 2 tier structure the Minerals Safeguarded areas translate into Mineral Consultation Areas which the District and Borough Councils are obliged to take note of when considering planning applications.

Some of our limestone resource goes up to the boundary with Doncaster so has cross boundary implications.

In 2014 we consulted on our evidence base paper ‘Minerals Safeguarding, Cross Boundary Issues’ which considered the overlap of minerals between our Plan area and adjacent authorities so we have considered this issue in the past. Doncaster provided a response to this consultation.

I hope this provides the information you require, please get in touch if you need anything else.

MWP – Minerals and Waste Planning
Chris Ballam

I have had a quick scan through and it seems ok to me. No comments therefore.

No Action Required

We are not proposing a buffer of 500m to take into account any blasting.
<table>
<thead>
<tr>
<th>Notts County Council</th>
<th>Steven Osborne-James</th>
<th>In terms of the note contained in the document regarding buffer zones crossing into adjacent authorities. In Nottinghamshire we have taken the same approach as Doncaster i.e. cropping the safeguarding/buffers at the county boundary. Just for note… If you take a look at inset 1 (page 189) of the Submission Draft document, you will notice that the safeguarding area does cross the boundary slightly however this is a mapping anomaly between the two layers as opposed to any policy approach. For most minerals we use a 250m buffer where necessary. We have got a background paper on safeguarding and it can be found on our webpage under the evidence base tab if needed. Address below. Hope that helps Steve</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPA (Minerals Products Association)</td>
<td>Malcolm Ratcliff Senior Planning Advisor</td>
<td>thank you for consulting the MPA on the approach to MSAs in Doncaster. Having read the document, we are content that you have covered the important minerals and have broadly the correct approach. Of course, we shall have to reserve comment on the proposed policies when you go out to formal consultation, but this looks like the right way to go about it. Our principal objectives in safeguarding are to see that NPPF and the BGS guidance is followed as closely as possible since this defines good practice. Therefore, we generally find that we have to make comments on the following to maintain that adherence to national guidance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• buffers around mineral deposits to guard against proximal sterilisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• inclusion of urban areas in MSAs with appropriate exemption criteria</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• inclusion of environmental designations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• separate MSAs for each mineral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• absence of thresholds for consideration of sterilisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• mention of the requirements of mineral assessments to assist developers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• inclusion of safeguarding for infrastructure with buffers and requirements for replacement of lost facilities and sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Action Required</td>
</tr>
</tbody>
</table>
| East Riding CC | The proposed approach to safeguarding mineral resources in Doncaster is consistent with the proposed East Riding safeguarding approach for Minerals that cross the administrative boundaries between the two Authorities apart from in the case of the following:

**Glaciolacustrine Sand and Gravel deposits**

There appears to be an inconsistency between the BGS stance that glaciolacustrine deposits, on a regional scale, do not constitute a sand and gravel resource and has been removed from their mineral resources data (at least for the former Humberside County area), and the proposal to safeguard these deposits within Doncaster’s area. The BGS saw these deposits comprising predominantly laminated clay with only local patches of generally fine sand. On the original resources map they were included as although these deposits are locally worked in specific locations, often coincidentally with clay, they are too fine grained for concreting aggregate and had low resource potential.

Have the BGS changed their stance on glaciolacustrine deposits and re-included them in their resources data or were they never removed from the South Yorkshire version of the resources map? There is a potential inconsistency between the proposed East Riding safeguarding approach which does not safeguard these deposits - see attached draft background paper to the East Riding and Hull Joint Minerals Local Plan, and the proposed approach for Doncaster that does.

**Shallow Coal**

Mapping within the document appears to show a shallow coal resource extending up

---

No Action Required
No changes proposed (response sent)

With regard to the glaciolacustrine deposits they were not removed from our resource map because they have been historically worked in our area. This is the primary reason for leaving them in.

The shallow coal layer is only on the west of the borough adjacent to
to Doncaster’s boundary with the East Riding, which is proposed for safeguarding. Our understanding of the East Riding’s geology is that there are no shallow coal resources as the coal deposit has a relatively thick overburden meaning it is only classed as a deep coal resource. If our understanding is correct, then either the mapping of shallow coal resources in Doncaster is incorrect or the approach to whether or not the resource should be safeguarded requires some reconsideration. At present, we do not propose to safeguard any coal resources through the East Riding and Hull Joint Minerals Local Plan- see attached draft background paper to the East Riding and Hull Joint Minerals Local Plan ...

<table>
<thead>
<tr>
<th>Sibelco Mike Hurley Sustainability Manager</th>
<th>Wakefield, Rotherham and Barnsley. The east of the borough is deep coal and is not proposed for safeguarding.</th>
</tr>
</thead>
</table>

Sibelco Mike Hurley Sustainability Manager

Helen,

Thank you for consulting Sibelco on the stakeholder consultation draft of the Mineral Safeguarding Areas document.

We find the document clear and comprehensive.

We have the following comments:

Under Stage 2 (Issues and Constraints) the considerations include, amongst other things, identifying and excluding existing workings; Areas of Search once identified and new proposals once identified. We are of the view that these areas should be safeguarded especially in the context of the need for buffer zones. This matter is referenced also at the end of Section 3.3 of the consultation document.

Under the section on buffer zones, the consultation document notes that where buffer zones cross into an adjacent authority they will be clipped to the Doncaster boundary. This no doubt has to be so on the maps but what mechanism will ensure that the neighbouring authority (or authorities) have due regard for the adjacent MSA in the Doncaster area?

In Appendix One, under the section on Limestone Dolomite, we support the...
recognition of the high quality dolomites as being of national importance. We are unsure of the context under which the final sentence under “Long Term Prospects” (Industrial limestone needs further consideration) sits under this section.

Under the options being considered for Warmsworth Quarry, we are unsure exactly what area could be considered to be safeguarded for industrial mineral development. Clearly Sibelco will be seeking through appropriate representations to have adjacent areas allocated on the Local Plan proposals map as a site extension to the existing quarry.

Under the Safeguarding section of Limestone Dolomite in Appendix One, why is crushed rock aggregate resource specifically mentioned in bullet point 1? In bullet point 2 under the strategic important of industrial dolomite, why is there a caveat in brackets?

<table>
<thead>
<tr>
<th>Tarmac (Agent David L Walker Ltd)</th>
<th>No response to point 1 to 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.04.22 Ltr H McCluskie Doncaster</td>
<td>In response to point 6. It is proposed not to exclude areas that have been sterilised or affected by development – this will be made clearer in the document</td>
</tr>
<tr>
<td></td>
<td>In response to point 7. The safeguarding maps once complete will be overlaid over the most up-to-date OS land line map.</td>
</tr>
<tr>
<td></td>
<td>In response to point 8. Additional consultation sent to adjacent authorities to confirm consistent cross boundary approaches</td>
</tr>
</tbody>
</table>

This section will be amended following consultation and once final decisions on safeguarding, areas of search and site proposals are confirmed.

The limestone dolomite includes aggregate, industrial and building stone resource.

This section will be amended once final decisions are made.
Noted - points 9 and 10

In response to point 11 and 12
The authority is considering applying safeguarding to the relevant supporting mineral facilities including identifying relevant individual sites

In response to point 13
The information in table 'infrastructure requirements for mineral safeguarding' was derived in consultation with industry.

In response to point 14
The safeguarding maps once complete will be overlaid over the most up-to-date OS land line map showing where the resource affected by the built environment. A specific policy covering these areas is proposed in the Local Plan

In response to point 15 and 16
Our safeguarding proposals reflect the information we have available

In response to point 17 and 18
We are not proposing to safeguard the
entirety of the Sherwood sandstone bedrock area, without additional information from industry we are unable to ascertain specifically where sharp sand and gravel is. All other considerations have been accounted for where relevant.

Rotherham MBC
Ryan Shepherd

Our approach to Mineral safeguarding is set out in our background paper. I have attached it here for info, but broadly we adopted the approach which you previously took (which was broadly agreed with by others when we consulted):

<table>
<thead>
<tr>
<th>Mineral Safeguarding Area</th>
<th>Extent</th>
<th>Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone</td>
<td>Whole resource</td>
<td>500m clipped to borough boundary</td>
</tr>
<tr>
<td>Shallow coal, brick and fire clay</td>
<td>Whole resource</td>
<td>250m clipped to borough boundary</td>
</tr>
<tr>
<td>Sand and gravel</td>
<td>Whole resource</td>
<td>250m clipped to borough boundary</td>
</tr>
</tbody>
</table>

Comments Noted

The mineral resources to be safeguarded are shown on our Publication Sites and Policies: Policies Map 4 – its too large to email but can be downloaded here: http://rotherham.limehouse.co.uk/file/3575884

This map shows the mineral resources for safeguarding including buffers.

The majority of limestone resources to be safeguarded in Rotherham are concentrated in the south-east of Rotherham (Maltby downwards), and in this area the extent of safeguarding extends to the borough boundary within Rotherham, and therefore much of the extent of the joint Rotherham / Doncaster boundary. A smaller area of limestone resource is proposed to be safeguarded close to Conisbrough, and
adjoins part of our joint borough boundary in this area.

We are proposing to safeguard sand and gravel resources which in places extends to our joint borough boundary; this is focused in the area near Mexbrough / Conisbrough, but small extents of the resource are proposed to be safeguarded in the south-east of the borough too.

I would note that in terms of Shallow coal the resource safeguarded in Rotherham mainly follows the borough boundary. For much of the boundary between Rotherham and Doncaster therefore the safeguarded area extends to our borough boundary. There is however an area in the east of Rotherham (around Stainton / Firbeck) where the shallow coal resource does not extend to the Rotherham / Doncaster boundary, and there is essentially a gap between the safeguarded resource and our borough boundary.

I hope this is helpful – if you need anything more from me, please let me know.