Doncaster Local Plan

Local Plan Evidence Base

Hydrocarbons Evidence Base Update

Date: June 2019
1. Introduction and Background

1.1 This purpose of this document is to look at the available information relating to conventional and unconventional hydrocarbons and update the information on hydrocarbon energy minerals contained in the Doncaster Geodiversity Assessment (CR/07/025N), produced in 2007 by British Geological Survey. This additional evidence base will show which hydrocarbons are exploited locally and which have yet to be extracted. This evidence will support the production of the Local Plan.

1.2 The UK’s needs hydrocarbons: The UK has been a net importer of gas since 2004 with 45% of the gas we use today being imported through pipelines from Belgium, Norway, and the Netherlands and by ship as Liquified Natural Gas (LNG). Offshore domestic oil and gas production is declining rapidly but consumption is remaining the same. The government believes we will be importing three quarters of our primary energy need by 2020 and wants to achieve energy diversity and security.


2. National Policy and Legislation

2.1 The National Planning Policy Framework (NPPF) sets out the minerals planning policy for oil, gas and coal exploration and extraction. Mineral Planning Authorities are required to:

- when planning for on-shore oil and gas development, clearly distinguish between, and plan positively for the three phases of development (exploration, appraisal and production), whilst ensuring appropriate monitoring and site restoration is provided for ensure appropriate monitoring and restoration is provided for
- encourage underground gas and carbon storage and associated infrastructure if local geological circumstances indicate its feasibility
- indicate any areas where coal extraction and the disposal of colliery spoil may be acceptable
- encourage the capture and use of methane from coal mines in active and abandoned coalfield areas and provide for coal producers to extract, and if necessary stockpile fireclay.

1 23rd May 2019 update following high court ruling.
2.2 The National Planning Practice Guidance provides additional information and detail, with online information available on the Planning for Hydrocarbon Extraction web page. Further to paragraph 2.1 above a local authority is also expected to identify that hydrocarbon extraction can only take place in areas licenced under the Petroleum Act 1998 (Petroleum Licence). With regard to what should be included in a local plan:

- petroleum licence areas should be shown on ‘policies maps’ and
- criteria-based policies for each of the exploration, appraisal and production phases of hydrocarbon extraction should set clear guidance and criteria
- existing hydrocarbon extraction sites should be identified in local plans
- include specific locations should the onshore oil and gas industry wish to promote specific sites

Guidance is available regarding development phases, the application process, development management procedures, determining applications, Environmental Impact Assessment (EIA), after care and restoration. The guidance also contains a series of additional annexes relating to shale gas, coalbed methane, underground coal gasification, the process for drilling an exploratory well and model planning conditions. Please note there is no need to create mineral safeguarding areas specifically for extraction of hydrocarbons given the depth of the resource.

2.3 The Infrastructure Act received royal ascent on the 12th February 2015 with the main areas of interest in respect of shale gas and hydraulic fracturing are the inclusion of hydraulic fracturing safeguards, such as:

- the local planning authority must consider environmental impacts
- independent well inspections are required
- methane monitoring in groundwater required for 12 months prior to fracturing,
- monitoring emissions to air required
- no fracturing in protected groundwater source areas,
- no fracturing within ‘other protected areas’
- the local planning authority must take into account cumulative effects of the application and related applications,
- substances used in fracturing requires disclosure
- the local planning authority must consider whether to impose a restoration condition
- the local planning authority must consult all the relevant undertakers prior to granting permission
- the local planning authority must confirm the applicant has met the public notification requirements

3. The Role of the Minerals Planning Authority

3.1 With regard to hydrocarbons the role of the Minerals Planning Authority is to assess an application for location of a well or well pad and to make sure the impacts on the land area acceptable. The NPPF identifies the Planning Authority’s role and responsibilities. National Planning Practice Guidance provides more detail on the phases of hydrocarbon extraction and how the Authority should deal with planning applications if submitted.

3.2 The Planning Authority is required to work with all relevant statutory consultees and key regulators for all shale gas related planning applications. These include:
• The Department for Energy and Climate Change who issue hydrocarbon licences,
• The Environment Agency who deal with the protection of water resources, treatment and disposal of mining waste, emissions to air, and;
• The Health and Safety Executive who regulate all aspect of all phases of extraction;
• Coal Authority;
• Natural England;
• British Geological Survey (BGS);
• Hazardous Substances Authorities.

3.3 When updating the Local Plan the Planning Authority is required to identify Petroleum Exploration & Development Licences (PEDL), and existing hydrocarbon extraction sites on the Local Plan policies map, and provide for criteria based policies for each phase of hydrocarbon extraction. There are three phases of onshore hydrocarbon extraction: exploration, testing (appraisal) and production.

3.4 Exploration... This involves acquiring geological data to establish whether hydrocarbons are present. It may involve seismic surveys, exploratory drilling and, in the case of shale gas, hydraulic fracturing. For conventional hydrocarbons, exploration drilling onshore is a short-term, but intensive, activity. Typically, site construction, drilling and site clearance will take between 12 to 25 weeks. For unconventional hydrocarbons exploratory drilling may take considerably longer, especially if there is going to be hydraulic fracturing and, in the case of coalbed methane, removal water from the coal seam.

3.5 Appraisal... This takes place after the exploration phase when the existence of oil or gas has been proved, but the operator needs further information to establish whether the deposit is economically viable. The appraisal phase can take several forms including additional seismic work, longer-term flow tests, or the drilling of further wells. This may involve additional drilling at another site away from the exploration site or additional wells at the original exploration site. For unconventional hydrocarbons it may involve further hydraulic fracturing followed by flow-testing to establish the strength of the resource and its potential productive life. Much will depend on the size and complexity of the hydrocarbon reservoir involved.

3.6 Production... This normally involves the drilling of a number of wells. These may be at sites used at the exploratory and/or appraisal phases of hydrocarbon development, or from a new site(s). Associated equipment such as pipelines, processing facilities and temporary storage tanks are also likely to be required. Production can be up to 20 years or more.

4. Oil and Gas Licences

4.1 The government owns all the mineral rights in the UK. The exploration and extraction of energy minerals is regulated by the Oil and Gas Authority (OGA) created in 2015 it is an executive agency of the Department of Energy and Climate Change (DECC). The OGA grant licences (known as Petroleum Exploration and Development Licence Areas PEDLs) for exclusive rights to explore and exploit onshore oil and gas in Great Britain. The Secretary of State issues the licences under powers granted by the Petroleum Act 1998 giving rights to the holder to
search for, bore for and get hydrocarbons. The licence holder however is still required to:

- obtain access rights from landowners;
- adhere to health and safety regulations and obtain relevant permits, and;
- obtain planning permission from relevant local authorities.

4.2 Further information on licensing guidance can be found here – Oil and Gas: Petroleum licensing guidance. There are a number of granted licences in the Doncaster area, the majority of which relate to the extraction of methane. Please see appendix one for detailed license map of the Doncaster area. Alternatively, the OGA UK interactive on-shore licensing map can be found here.

5. Hydrocarbons in Doncaster

5.1 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 pore spaces or small fractures of the rock itself.

5.2 There are a number of granted applications in the Doncaster area including sites for abandoned mine methane extraction, and gas storage. (See appendix two for a list of granted hydrocarbon applications). It is planned to show the location of these sites on the Local Plan Policies map. Landfill gas extraction sites and electricity generators are also identified, these are however, linked to existing landfill sites covered by the ‘Barnsley, Doncaster & Rotherham Joint Waste Plan’.

6. Conventional Gas and Oil

6.1 Section 4.10.1 (Conventional Oil and Gas) in the Doncaster Geodiversity Assessment (CR/07/025N) is still relevant. Doncaster lies within 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 within and outside the borough that contribute to the East Midlands Oil Province. During the late 1950’s and early 1980’s exploration and drilling took place at Askern, Blaxton Common, Moss, Tickhill and Warmsworth, all of which were plugged and abandoned as dry. Gas was historically extracted at Trumfleet, Hatfield West and Hatfield moors gas fields, with the latter two now being used for gas storage. (see appendix two granted hydrocarbon applications). The Gainsborough Trough runs from South Yorkshire to North Nottinghamshire and is a prospective shale gas formation identified in the DECC/BGS Carboniferous Bowland Shale Study. The Bowland Shale resource runs across the centre of England from Hull in the east to Blackpool in the west. See below.
7. Unconventional (Alternative) Fossil Fuels

7.1 Coal Mine Methane (CMM), Abandoned Mine Methane (AMM) and Coal Bed Methane (CBM)

7.1.1 Methane gas from coal plays a small part in the gas market, less than 0.1% in 2009. Gas can be recovered from working mines (Coal Mine Methane (CMM)), abandoned mines, (Abandoned Mine Methane (AMM)) and untouched coal seams (Coal Bed Methane (CBM)).

7.2 Coal Mine Methane (CMM)

7.2.1 CMM is a mixture of methane & air released during the process of coal mining and must be vented for safety reasons. Methane has significant effects as a greenhouse gas being 21 times higher than that of carbon dioxide, therefore its capture and use has significant environmental benefits. With the decline in working mines in the Doncaster area the recovery of CMM is limited.

7.3 Abandoned Mine Methane (AMM)

7.3.1 Even after coal mines are shut down, coal mine gas continues to be released. There are a number of approved applications in our area with Greenpark Energy and Regent Park Energy exploiting abandoned mine methane at Brodsworth and Hatfield. Alkane Energy now owns the rights to extract gas from Maltby colliery in Rotherham. If this is an indicator for Doncaster the prospects for abandoned mine methane could have high potential.

7.4 Coal Bed Methane (CBM)

7.4.1 Coalbed methane is produced during the process of coal formation. The gas is either adsorbed onto the coal or dispersed into pore spaces within the coal. Coalbed methane can be extracted from coal seams which have not been mined and the exploitation generally involves drilling a network of wells, with the gas normally
extracted via the well through natural pressure release or through the pumping of water from the seam in order to reduce pressure. CBM is usually extracted by either:

- drilling vertically into a coal seam (making use of pre-existing fracture patterns); or
- directional drilling along a coal seam.

7.4.2 In some cases the coal may need to be fractured to improve flow rates; the well is then pumped to remove water and lower the pressure within the seam to allow release of methane. It is worth noting that section 50 of the Infrastructure Act 2015 limits hydraulic fracturing from taking place in land at a depth of less than 1000m.

7.4.3 The potential for Coal Bed Methane also dependent on undisturbed coal areas, these are limited in Doncaster. The Coal Authority has produced an interactive map viewer, which provides information on the location of coalfields throughout England. See also 4.10.2 of the Doncaster Geodiversity Assessment for further information. BGS is investigating the distribution, depth, thickness and gas content of coal seams in the UK to check their suitability for CBM exploitation.

7.5 Under Ground Coal Gasification
Underground Coal Gasification is a process involving controlled combustion of coal seams beneath the ground and the recovery of the resulting gases. The coal can be accessed by directional drilling of several wells penetrating the coal seam for an appropriate distance. The gas contains both methane and hydrogen and can be processed into a high quality diesel fuel. The local authority has not been contacted by any companies expressing an interest in this area of work.

7.6 Shale Gas
7.6.1 What is Shale Gas? Shale gas is the same as the natural gas (methane) obtained from gas fields in the North Sea. Shale gas is obtained direct from the source rock (shale, sandstone, limestone) which has to be micro-fractured to allow the gas to flow.

7.6.2 The British Geological Survey (BGS) has identified a significant (but as yet untested) shale resource in the Carboniferous Bowland-Hodder shale group running across the centre of England from Liverpool to Hull.

7.6.3 These deeply buried shales are seen as the most promising gas prospect in the UK. The study also identifies a wide range of geological formations that could also contain shale gas. This information has been used by the government’s Oil and Gas Authority to market new licence areas around the country. As a result of this exercise the Doncaster borough is now covered by patchwork of pre-existing and new ‘Petroleum’ Licence Areas. (see appendix one)

7.6.4 Shale gas activity in the UK is still in the exploration stage and companies are currently drilling test wells. As yet there are currently no production operations in UK. As of August 2018 there is no shale gas extraction or fracking activity in the Doncaster area and no scoping requests have been received by the Planning Authority. Exploration for shale gas has taken place in Blackpool Lancashire and shale gas (exploration) applications have been approved by North Yorkshire and Nottinghamshire County Councils. Rotherham Council has refused two applications; one of which is currently undergoing an appeal.
7.6.6 As noted earlier in paragraph 7.6.1 methane gas can be sourced from a variety of rock types including shale, sandstone and limestone. The plan below identifies other onshore unconventional hydrocarbon (shale gas) resources being considered by the BGS on behalf of the government.

7.5.7 Shale gas extraction involves vertical and horizontal drilling to reach the shale rock layer. A mixture of water, sand and regulated chemicals is then pumped under high pressure into the bore hole to fracture the rock (a process known as ‘fracking’). The gas trapped in the rock is then released and can be collected.

8. Coal

8.1 Paragraph 4.8 of the Geodiversity Assessment explains that Doncaster lies predominantly within the East Pennine Coalfield. Coal seams are numerous and varied in our area, with shallow coal exposed in the west and deep coal underlying the central and eastern half of the borough.

8.2 Until recently South Yorkshire was an important coal producing area, the last deep mine, Hatfield Colliery, however closed in August 2015. There is no surfaced mined coal and no proposals have been submitted within the Borough. As such we are not proposing to identify any locations for colliery spoil disposal, but we are proposing to produce maps and policies that safeguard the shallow coal located in the western part of the borough around Mexborough.
9. Duty to Cooperate
The duty to cooperate was created in the Localism Act 2011. The duty to cooperate is not a duty to agree. It places a legal duty on the authority to actively engage on ongoing strategic cross boundary issues. We are required to make every effort to secure the necessary cooperation on strategic cross boundary matters before we submit our Local Plan for examination. We will be required to demonstrate how we have complied with the duty at the independent examination of our Local Plan. This evidence base update and subsequent Local Plan policies and proposals will therefore be sent to our immediate neighbours for consideration and comment.

10. Planning Implications and Mitigation
10.1 Planning for all minerals including oil and gas have a number of specialist characteristics not found in other sorts of development for example:

- they can only be worked where they are found occurring naturally, which leads to a limited number of locations where it is both economically viable and environmentally acceptable for extraction;
- working minerals is temporary landuse, although it can take place over a very long period of time;
- working minerals may have adverse effects, but most adverse effects can be mitigated;
- extraction of minerals is a continuous process of development, therefore there is a requirement for routine monitoring, and if necessary, enforcement to ensure conditions that mitigate negative impacts are complied with;
- at the end of extraction the surface land should be restored to a suitable beneficial afteruse.

10.2 For each discrete phases of development; exploration, appraisal and production planning consent will be required. Proposals for gas and oil extraction will include the provision of a detailed scheme of working (and restoration where relevant) where all relevant impacts are identified and mitigated. Examples of such issues to be addressed include visual intrusion, impacts on amenity (noise, dust and fumes), transportation methods, traffic routing, nature conservation and heritage conservation, and numerous others all of which will be covered in the Local Plan policies.

11. Summary / Conclusion
11.1 The policy in the Local Plan, directs applicants to the national policy, guidance and legislation, and relevant policies within the Local Plan. The Local Plan will take account of the relevant hydrocarbons in the area and the ‘Policies Map’ will show the locations of the hydrocarbon licence areas, permitted hydrocarbon sites, gas storage areas and permitted gas fired power stations. The Local Plan includes policies on the economy, environment and social needs, which will allow for a balanced judgment on all hydrocarbon applications prior to any decisions being made.
References and Links


http://www.doncaster.gov.uk/services/planning/doncaster-geodiversity-assessment

British Geological Survey 2006 - South Yorkshire Mineral Resource Information in Support of National, Regional and Local Planning (Minerals Resources Scale 1:100,000 Map


Onshore Oil and Gas Mineral Fact Sheet - http://www.bgs.ac.uk/mineralsuk/planning/mineralPlanningFactsheets.html


Infrastructure Act 2015 -

The Unconventional Hydrocarbon Resources of Britain’s onshore Basins – Shale gas Department of Energy and Climate Change 2010 -

The Unconventional Hydrocarbon Resources of Britain’s Onshore Basins - Coalbed Methane (CBM) department of energy and climate change 2013 -
Appendix One – Hydrocarbon Considerations - (to be shown on Local Plan Policies Map)
Appendix Two
Hydrocarbon Sites Granted Applications (to be shown on Local Plan Policies Map)
<table>
<thead>
<tr>
<th>Site Name</th>
<th>App No.</th>
<th>Applicant</th>
<th>Proposal</th>
<th>Location</th>
<th>Gas Type</th>
<th>Status</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Thorpe Marsh Power Station</td>
<td>14/02534/WCCC</td>
<td>Thorpe Marsh Power Limited</td>
<td>Construction of a gas-fired Combined Cycle Gas Turbine (CCGT) electricity generating</td>
<td>Thorpe Marsh Power Station Marsh Lane Barnby Dun</td>
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<td>Granted (lapsed consent)</td>
<td>For information only</td>
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<td>Garden Lane Cadeby</td>
<td>06/02672/MIN (granted 25yrs) and 12/01679/FULC (granted)</td>
<td>Alkane Energy UK</td>
<td>Proposed borehole, mine gas extraction and electricity generation</td>
<td>Disused Reservoir Garden Lane Cadeby</td>
<td>AMM</td>
<td>operational</td>
<td>12/01679/FULC – additional pumping and cooling equipment to support extraction of mine gas</td>
</tr>
<tr>
<td>Hazel Lane Quarry</td>
<td>09/00057/MIN</td>
<td>Catplant Limited</td>
<td>Installation of landfill gas engines to generate electricity for the national grid, and associated infrastructure including gas flare</td>
<td>Hazel Lane Quarry Wakefield Road Hampole</td>
<td>gas (landfill)</td>
<td>operational</td>
<td>Identify on the policies map as a ‘dot’ and link to the new waste plan</td>
</tr>
<tr>
<td>Hatfield Lane Edenthorpe</td>
<td>13/02622/MIN (15/01223/WCCC)</td>
<td>Regent Park Energy</td>
<td>Application to drill a borehole, the erection of containerised units and other associated plant, equipment and ancillary operations in order to extract mine gas to generate electricity.</td>
<td>Land To The East Of Hatfield Lane Edenthorpe</td>
<td>AMM</td>
<td>operational</td>
<td>Identify on the policies map as a ‘dot’</td>
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<tr>
<td>Brodsworth</td>
<td>04/2394/P 06/01900/MIN 10/01343/WCC</td>
<td>Greenpark Energy</td>
<td>Mine methane for 25 years plus additional borehole in ‘06’</td>
<td>Brodsworth</td>
<td>AMM</td>
<td>Not operational</td>
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<td>Campsall Road Askern</td>
<td>06/01863/MIN 10/01341/WCC</td>
<td>Alkane</td>
<td>Application for mine gas extraction and power generation</td>
<td>Campsall Road Askern Doncaster</td>
<td>AMM</td>
<td>operational</td>
<td>Now use dual fuel gas and diesel engines</td>
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<tr>
<td>Project Name</td>
<td>Reference No.</td>
<td>Company Name</td>
<td>Description</td>
<td>Location according to Planning Permission</td>
<td>Nature of Development</td>
<td>Comment</td>
<td></td>
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<tr>
<td>Croft Farm Landfill Site</td>
<td>99/1816/P 15/01340/WCCC</td>
<td>Veolia ES Landfill</td>
<td>Comprehensive reclamation of colliery spoil heap plus production of energy from landfill gas...</td>
<td>Croft Farm Landfill Site Askern Road Carcroft</td>
<td>gas (landfill)</td>
<td>operational</td>
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<td>Levitt Hagg Quarry Landfill</td>
<td>04/0955/P</td>
<td>WRG</td>
<td>Construction of extension to landfill gas utilisation compound and gas control compound</td>
<td>Levitt Hagg Warmsworth Quarry Sheffield Road</td>
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<td>Identify on the policies map as a ‘dot’ and link to the new waste plan</td>
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<td>Scabba Wood</td>
<td>03/6417/P</td>
<td>WRG</td>
<td>gas utilisation facility and amendments to conditions 7 and 17 of Planning Permission D/84/20/764</td>
<td>Scabba Wood Cadeby Road Sprotbrough</td>
<td>gas (landfill)</td>
<td>Identify on the policies map as a ‘dot’ and link to the new waste plan</td>
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<td>Hatfield Moors 1 And 3 Production Site</td>
<td>98/2734/P</td>
<td>Scottish Power</td>
<td>gas storage facility, continuation of gas production with associated pipelines/access roads and additional equipment and the use of reservoir for gas storage for a period of 25 years</td>
<td>Hatfield Moors 1 And 3 Production Site Lindholme Bank Road Hatfield Woodhouse</td>
<td>gas production and storage</td>
<td>operational</td>
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Identify on the policies map as a ‘dot’
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Reference Numbers</th>
<th>Applicant</th>
<th>Description</th>
<th>Location</th>
<th>Type</th>
<th>Status</th>
<th>Notes</th>
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</thead>
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<tr>
<td>Hatfield Moor Gas Storage facility</td>
<td>09/02333/MINM &amp; 13/00153/MAT</td>
<td>Scottish Power</td>
<td>Continued use of the existing Hatfield Moor reservoir for natural gas (gas) storage and extraction, the retention of the Lindholme gas processing facility (GPF) and retention of all existing infrastructure associated with Hatfield Moor; development of the existing Hatfield west reservoir for the storage and extraction of gas; drilling of an appraisal well and 2 no. production wells…</td>
<td>Land At Moss Croft Lane Hatfield Woodhouse</td>
<td>Gas storage</td>
<td>operational</td>
<td>amendment to previous permission 09/02333/MINM, granted on 07.04.2010, new fuel gas skid and turbine</td>
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