

## **PLANNING FOR SHALE GAS AND OIL – BRIEFING NOTE MARCH 2016**

The exploration of shale gas and oil, and hydraulic fracturing – or ‘fracking’ as it has become commonly known – is a huge issue for local authorities and communities across the country.

This note provides information and advice on shale gas and oil exploration and production and how Mineral Planning Authorities plan for and make planning decisions on these highly contentious applications.

### **SUMMARY**

Shale gas and oil exploration, appraisal and development is relatively new to the UK but is expected to be a major area of growth in the coming years.

The Government considers that shale gas and oil development should be part of the future energy mix, subject to continued environmental assessment and controls. Relatively little exploration and appraisal activity, to assess the commercial viability of shale gas and oil has been undertaken in the UK. Recent Written Ministerial Statements are clear in their support for such exploration to take place in a safe and sustainable manner.

The Government believes that the existing regulatory systems are fit for purpose whilst acknowledging that experience will enable more robust controls to be developed if necessary.

Mineral Planning Authorities are advised to plan positively for shale gas and oil development proposal. Local authorities working alongside other regulatory bodies will need to be equipped to handle the high interest and potential opposition to ‘fracking’ applications by some local communities and anti-fracking groups.

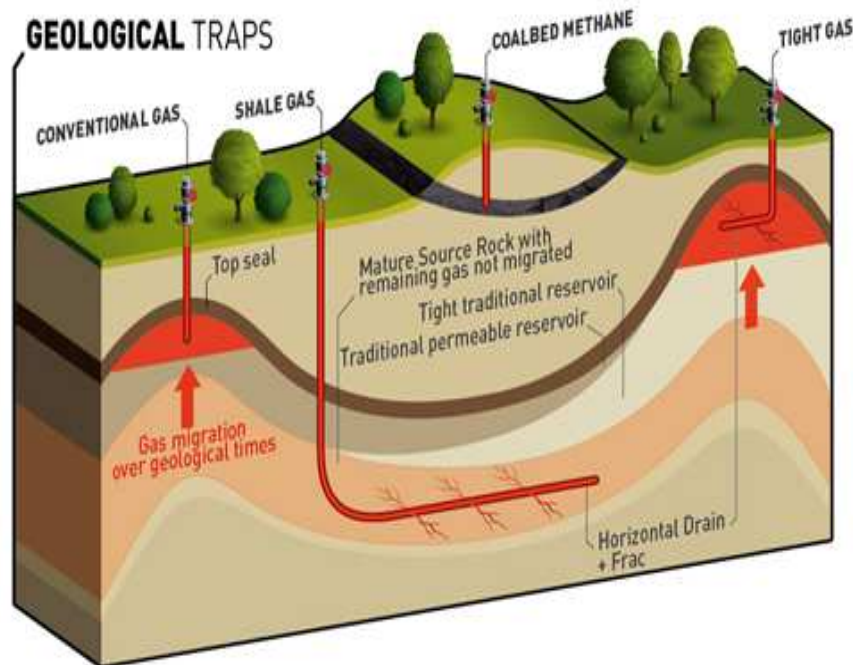
This briefing note aims to provide local authority officers and members with information on shale gas and oil development, government policy, the regulatory controls including the role of the planning system and the environmental and planning considerations that need to be taken into account by decision makers.

A reference list for further reading is included at the back of this guide that includes the key documents used to inform this briefing note as well as additional further reading that might be of interest.

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## CONVENTIONAL AND UNCONVENTIONAL HYDROCARBONS

Conventional hydrocarbons (gas and oil) are hydrocarbons that are trapped in porous reservoirs (e.g. sandstone and limestone) and are relatively easy to extract. Conventional gas and oil has been extracted on-shore in the UK for over 100 years.



Source: DECC

There are currently around 2,100 on-shore conventional oil and gas wells in the UK, some of which have been hydraulically fractured. Current production for onshore oil production is estimated at 20,000 barrels of oil per day.

Unconventional hydrocarbons are hydrocarbons that are trapped in rocks with low permeability and from which gas and oil are difficult to extract. Unconventional reserves include shale gas, shale oil, tight gas and coalbed methane.

Recent developments in drilling and well development technology have made it more economically attractive to extract unconventional gas and oil.

### Shale Gas and Oil

Shale is formed from muddy sediments rich in organic matter deposited in seas millions of years ago. As these sediments were buried, they were heated and turned into rock and the organic matter was converted into gas and oil which is trapped in the rock.

These rocks are often the source rocks for conventional oil and gas fields but have low permeability so it is difficult to extract hydrocarbons from them directly. Shale gas is essentially the same as North Sea gas, i.e. mainly methane.

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## Shale Gas and Oil in the UK

In the UK shales containing gas and oil are present in:

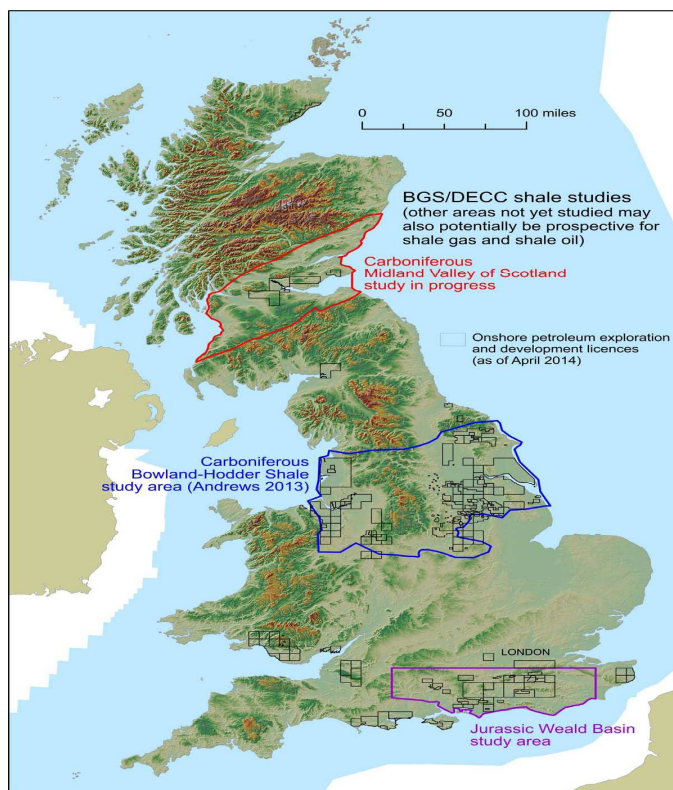
- Northern and Central England
- Southern England (Weald Basin)
- Central Scotland
- South Wales

The British Geological Survey (BGS) in association with the Department of Energy and Climate Change (DECC) has completed shale resource estimates for each of these areas.

An assessment for Northern and Central England was produced by the BGS in 2013 and the other three assessments were produced in 2014.

The assessment for Northern and Central England estimates that there is a median resource of 1,329 trillion cubic feet of shale gas in the area (i.e. the total estimated quantity of gas present). The reserve (the amount of gas which might feasibly be extracted) cannot be estimated at present without further exploration and appraisal but may be up to 10% of the total resource. If this was the case this would be equivalent of approximately 50 years gas supply in the UK (at the current rate of use). However, the recoverable reserve may be much lower than this.

The assessment for the Weald Basin (Southern England) estimates that there is a median resource of between 0.3 and 1.1 billion tonnes of shale oil in the area.



Source: DECC

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## Licensing for Onshore Oil and Gas Exploration

The Oil and Gas Authority (OGA) is responsible for administering the oil and gas licensing system in Great Britain. All rights and ownerships of the hydrocarbon resources of Great Britain (and UK territorial waters) are vested in the Crown by the Petroleum Act 1998. The Secretary of State for Energy and Climate Change periodically offers licences to explore and develop these resources.

Petroleum Exploration and Development Licences (PEDLs) are valid for a sequence of periods, called terms. These are designed to comprise the typical life cycle of a field: exploration, appraisal, and production. Each licence will expire automatically at the end of each term, unless the licensee has completed the working programme agreed with OGA.

The initial term is usually an exploration period. For PEDLs the initial term is set at five years and carries a work programme of exploration activity that OGA and the licensee will have agreed as part of the application process. The second term is intended for appraisal and development and is set at five years. The licence will expire at the end of the second term unless the Secretary of State approves a development plan. The third term is intended for production and is set at 20 years. The Secretary of State has the discretion to extend the term if production is continuing, but OGA reserves the right to reconsider the provisions of the licence before doing so.

Onshore licencing rounds generally take place every other year. On 17 December 2015, OGA announced that a total of 159 blocks were formally offered to successful applicants under the 14<sup>th</sup> Onshore Oil and Gas Licencing Round. This round had been launched on 28 July 2014 and closed on 28 October 2014.

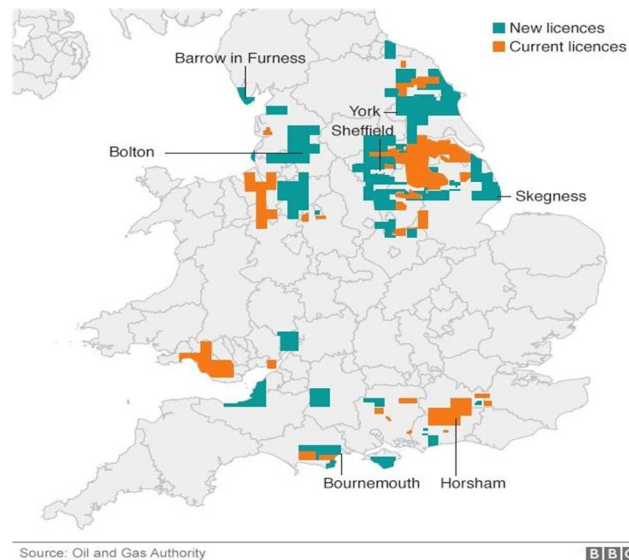
The blocks relate to all onshore oil and gas activities with about 75% being unconventional hydrocarbons.

The area under consideration for licencing had been subject to a Strategic Environmental Assessment in 2013. 132 of the 159 blocks were then subject to further detailed assessment in accordance with the Conservation of Habitats and Species Regulations 2010. In offering the 159 blocks OGA indicated that it was satisfied that there would be no adverse effect on the integrity of any protected European site.

The currently licensed blocks (1 February 2016) can be viewed on the following map and more detail is available on DECCs webpage:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/382805/Landfileds\\_Lics.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382805/Landfileds_Lics.pdf)

The UK Onshore Geophysical Library (UKOGL) have produced a very useful free interactive map containing lots relevant data on licenses in the UK (including the names of license holders), along with local geological and seismic data, present well locations and district and unitary boundaries. <http://www.ukogl.org.uk/map/>



## Shale Gas and Oil Exploitation

The rocks in the UK that contain significant shale gas resources are typically 2,000 metres to 4,000 metres below the ground surface. Rocks containing shale oil in the Weald Basin are typically 1,000 metres to 3,000 metres below the ground surface. Accessing the hydrocarbons requires the use of the following established oil and gas drilling techniques:

**Vertical drilling** – to reach the required depth below the surface.

**Horizontal drilling** – to maximise the amount of shale available for hydraulic fracturing.

**Hydraulic fracturing** – to maximise the amount of gas or oil which can be extracted from the shale.

Whilst none of these techniques are new technological advances, over the past few years they have allowed for increased control and accuracy during drilling to allow exploitation of shale gas and oil reserves

### Hydraulic Fracturing

Hydraulic fracturing is the process of fracturing rocks by the injection of water (98%), sand (1%) and non-hazardous chemical additives (<1%) into the shale rock formation at high pressure. The wells are cased with steel tubes cemented in place. The tubes along the horizontal section of the well within the shale are perforated.

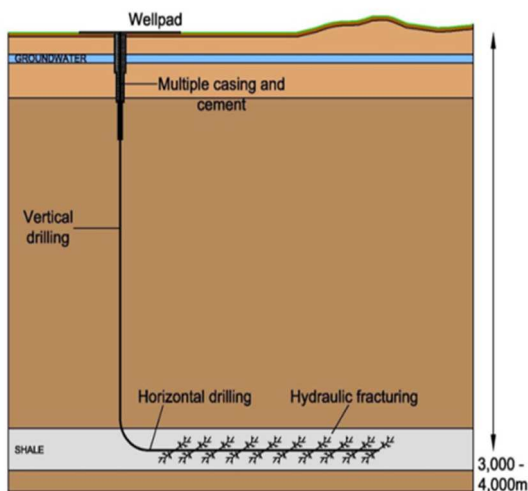
This hydraulic action or fracturing (hence ‘fracking’) opens up fractures in the impermeable shale rock that allow the gas to flow from the rock into the well. Fractures are typically < 350m long.

The process of hydraulic fracturing a horizontal well would typically take a few days.

The presence of the sand in the water acts as a “proppant” that ensures that the fractures stay open to allow the gas or oil to continue to migrate after the initial fracturing is undertaken.

Additives in the water include surfactants to enable the fluid to pass easily through fractures, bactericides and acids to prevent build-up of scale in the well. All chemical additives used in hydraulic fracturing require pre-approval by the Environment Agency and are required to be non-hazardous (non-carcinogenic).

Following fracturing, the gas or oil is allowed to migrate into the well which displaces the water forcing some of it back up the well to the surface. This is referred to as ‘flow back’ fluid.

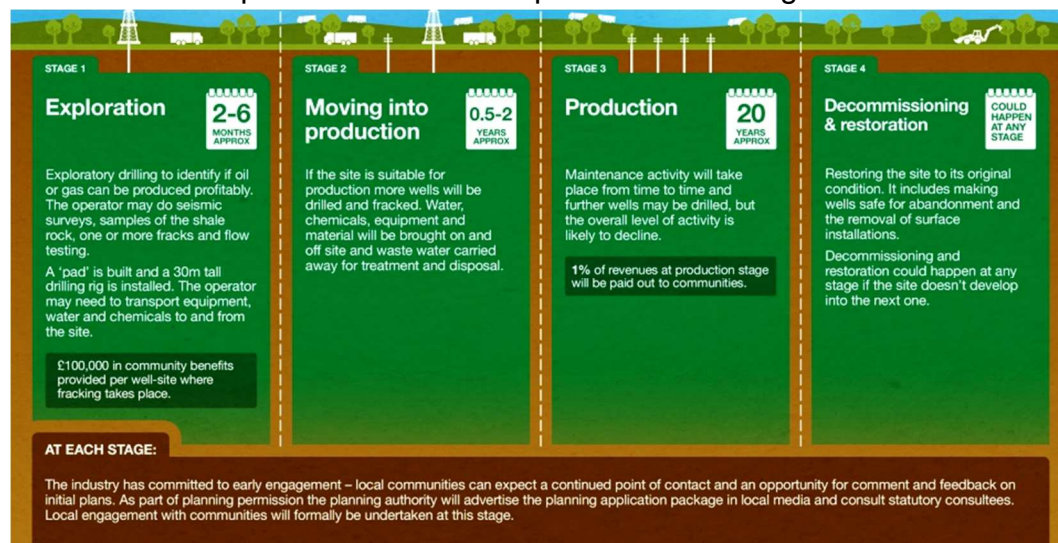


Gas reaching the surface will either be flared (during exploration/appraisal) or piped off site to the gas transmission network (during appraisal/production).

Oil reaching the surface will either be tankered off site (during exploration and appraisal) or piped off-site during production.

## Shale Gas and Oil Development

There are three phases in the development of a shale gas or oil field.



Source: DECC

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## Exploration and Appraisal

The well is situated on a pad – the ‘wellpad’. The amount of land needed for the wellpad for an exploratory or appraisal well will vary depending on how many wells are being drilled. A single well might only require 1-2 hectares but if 4 wells are being drilled up to 6 hectares may be needed. The site must be large enough to accommodate the drilling equipment, any on-site water storage requirements, staff facilities, parking and space for vehicle deliveries and movements.

Within a given licence block there might be a number of exploratory wells but these are likely to be relatively widely spaced over a licence block that could be hundreds of square kilometres in area.

The siting of wellpads will not only have to take into account the best locations in terms of the available knowledge regarding the shale gas or oil potential of a given area but also the land use and environmental constraints that would relate to any development.

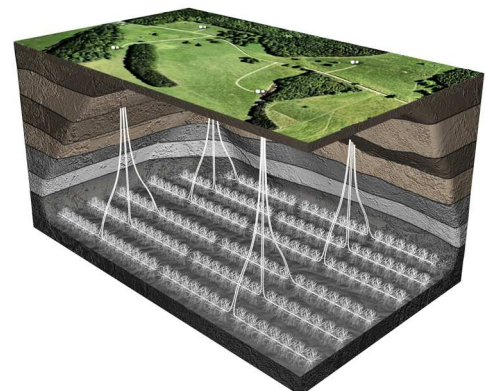
The data gathered from the exploration stage (the establishment of how much shale gas or oil might be present in the source rock) would form the basis for the appraisal stage during which the amount of gas or oil that could be produced will be assessed by undertaking hydraulic fracturing.

For each exploratory well the exploration phase itself is relatively short (2 to 4 months) and therefore some wellpads will represent very short-term development should there be insufficient gas.

When appraisal follows on from exploration the process might also be relatively short term, 4 to 6 months in duration for each well. However, the circumstances will vary for different sites. At the proposed Roseacre Wood and Preston New Road sites in Lancashire, the planning applications included provision for extended flow testing and the total period applied for exploration, appraisal and extended flow testing from 4 wells for each site was 75 months.

## Production

The size of the wellpad required for the production phase will also depend on the number of wells on the site. A single well wellpad could produce gas from an area of 5 to 10 km<sup>2</sup>. A multi-well wellpad could support up to 10 individual wells each with several horizontal wells (“laterals”). A single horizontal lateral could reach up to 2,000 metres from the wellpad.



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The drill rig and associated infrastructure can be removed from the site after the well is fractured, with only the gas / oil production and transmission infrastructure remaining. A single well could be expected to produce gas for up to 20 years.

Off-site infrastructure will be required to service a number of pads to allow the gas or oil to be transported to the national grid or refinery. Connecting pipework is likely to be underground.

All exploration, appraisal and production wells will ultimately be plugged and abandoned with well-heads removed and the sites restored to their original state. OGA requires operators to submit an abandonment plan and obtain consent before operations to abandon a well are commenced. Operators are responsible for wells once abandoned and have an open-ended liability to remediate any ineffective abandonment operations.

## **ENVIRONMENTAL CONSIDERATIONS**

The environmental considerations that will need to be taken into account will generally include the following.

- Water Use
- Waste Management
- Groundwater Contamination
- Surface Contamination
- Aerial Emissions
- Seismicity
- Traffic
- Noise
- Landscape and Visual
- Ecology
- Climate change

### **Water Use**

The hydraulic fracturing of a typical well would require between 10,000 and 20,000 cubic metres of water (the equivalent of 4 to 8 swimming pools of water). Water with additives would be stored on-site in tanks.

During multi-stage fracturing for production the additives added to the water may vary throughout the process. In order to facilitate this, a development site would need to house the necessary storage and mixing equipment.

Sources of water for hydraulic fracturing include mains water, surface water and ground water. The use of mains water would require the agreement of the relevant utilities company whilst the abstraction of surface water or groundwater would require an abstraction licence from the Environment Agency (EA).



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## **Waste Management**

Each stage of shale gas or oil development will produce waste.

Drilling activity of any kind produces drill cuttings (rock fragments and drilling mud). This waste can be disposed of to landfill, as is currently the case for other drilling activities undertaken in the UK.

Flowback water will be collected and contained on-site in closed tanks (open storage ponds are not permitted in the UK.) The water will need to be discharged to sewer or transported to a water treatment works for treatment. Flowback water may contain Naturally Occurring Radioactive Materials (NORM) at low levels. This is also the case in conventional oil and gas extraction and procedures for the effective management of these materials are well established. Flowback water containing NORM is likely to require pre-treatment prior to conventional treatment. These aspects are regulated by the Environment Agency.

Recycling and re-using the flowback water, particularly during the development of multi-well pads, can reduce the overall water consumption of the fracking process.

## **Groundwater Contamination**

Fracturing takes place at 2,000 to 4,000 metres below the surface (gas) or 1,000 to 2,000 metres (oil) and fractures are typically less than 350 metres in length. Freshwater aquifers are at shallow depths (typically within 100 metres of the ground surface). Therefore thousands of metres of rock separate fractures from drinking water supplies (aquifers).

Aquifers are protected from leakages from the well by the use of multiple cemented casing and the contamination of aquifers therefore is very unlikely if best practice is followed during drilling and completion. The Health and Safety Executive regulates the well design and construction.

Monitoring of groundwater quality before during and after development will be essential in assessing the impact of shale gas or oil development on groundwater quality. This is regulated by the Environment Agency.

## **Surface Contamination**

Controls such as impermeable bunded or lined wellpads, effective flowback water containment, good working practices and continual monitoring should all be employed to limit the risk of surface contamination. These will be regulated by the Environment Agency. Baseline monitoring prior to any development is again important in order to compare surface conditions throughout and after development.

## **Aerial Emissions**

Aerial emissions associated with shale development will include:

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- dust – as a result of well pad construction activities;
  - particulates and NOx – as a result of HGV movements and use of on-site generators during drilling and fracking; and
  - fugitive gas from the well and from flaring during appraisal and production.

UK and EU legislation on emissions apply to shale gas and oil development and it is the role of Local Authorities under the Environmental Protection Act 1990 to inspect sites for odour and noise associated with the venting or flaring of gas as well as to monitor emissions to ensure that they do not breach local air quality standards.

Operators should adopt best practice on site as well as undertaking emissions monitoring. Flaring is a method for controlling gaseous emissions that can be employed during development for use when necessary. Venting and flaring of methane and other emissions are controlled through conditions of PEDLs and flares on-site can be enclosed. During production it is not in an operator's interest to flare gas but to capture and maximise gas production/sale from each site.

### **Seismicity**

Earthquakes felt at surface induced by hydraulic fracturing are a very rare occurrence. Of over 35,000 hydraulically fractured wells there have only been three noticeable earthquakes at Oklahoma in 1979, Preese Hall in Lancashire in 2011 and in British Columbia in 2012.

In light of the seismic activity experienced at Preese Hall the Secretary of State for Energy announced the introduction of new regulatory requirements to ensure that seismic risks are effectively mitigated.

The Oil and Gas Authority is responsible for enforcing the controls. Operators will first be required to review the available information on faults in the area of the proposed well to minimise the risk of activating any fault by fracking, and required to monitor background seismicity before operations commence.

Real time seismic monitoring will also continue during operations, with these subject to a "traffic-light" regime, so that operations can be quickly paused and data reviewed if unusual levels of seismic activity are observed.

**GREEN:** Go, injection proceeds as planned

**AMBER:** Injection proceeds with caution, possibly at reduced rates, Monitoring is intensified

**RED:** Injection is suspended immediately

If a magnitude greater than  $M_L$  0.5 is detected operations will stop and the pressure of the fluid will be reduced. A magnitude of  $M_L$  0.5 would only be detectable by sensitive equipment and would not be felt by people at the surface.

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## **Traffic**

Development will result in an increase in HGVs on local roads associated with the delivery of materials for well pad construction and drilling and fracking operations, the importation of water if a local piped supply is not available and the management of wastes, particularly flow back fluid. A traffic impact assessment will therefore normally be required to be submitted with the planning application.

## **Noise**

Noise impacts may occur as a result of construction of the site and well pad, drilling and fracking operations and the transport of materials. As with all new developments, the impact of noise on the local environment will need to be assessed. The applicant should carry out an appropriate assessment having regard to the relevant national and local planning policy and guidance. Drilling and fracking operations may take place 24/7 and in such cases noise impacts during the night will need to be considered.

## **Landscape and visual**

The main impacts on landscape character and visual amenity will take place during the exploration and appraisal stages from the drilling rig(s). The rig may be over 50m high but its use will be temporary and intermittent and painting an appropriate colour may reduce the visual impact. The site will contain storage containers and staff facilities. It is likely to be surrounded by security fencing and landscaping/acoustic soil mounds that will screen some of the structures and activities taking place on the well-pad but will themselves have landscape and visual effects. The impact of lighting will need to be considered particularly night time illumination.

## **Ecology**

Impacts on ecology may include those on protected species and habitats as a result of development sites. Ecological surveys undertaken at the appropriate time of year should identify baseline, potential effects and appropriate mitigation taken wherever possible.

## **Climate Change**

Greenhouse gas emissions from shale gas and oil development are primarily associated with two different elements of the process:

- emissions released by the extraction process; and
- the carbon footprint of shale gas and oil when used commercially

The process of extracting shale gas or oil has the potential to release methane into the atmosphere. During exploration and appraisal gases are released and flaring is employed to minimise emissions of greenhouse gases. 'Green completion

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technologies' will be utilised to allow operators to capture the methane from the flowback fluid for flaring.

DECC recommend that unconventional hydrocarbon exploration and production in the UK should be accompanied by careful monitoring and inspection of greenhouse gas emissions relating to all aspects of exploration, pre-production and production, at least until any particular production technique is well understood and documented in the context of UK usage.

A recent study undertaken by DECC found that the carbon footprint for shale gas is significantly less than that for coal when used for electricity generation and that the majority of carbon emissions will come from its final use as a fuel. The production of shale gas could increase global cumulative greenhouse gas emissions if the fossil fuels displaced by shale gas are used elsewhere. This is not specific to shale gas and would apply to the exploitation of any new fossil fuel reserve.

## **COAL BED METHANE (CBM)**

Coalbed methane is a further unconventional gas resource. Methane is bound within coal by a process known as adsorption, where gas molecules adhere to surfaces or fractures within the coal.

To extract coalbed methane a well is drilled into the coal seam and water is pumped out to lower the pressure in the seam. This allows methane to desorb from the internal surfaces of the coal enabling it to flow, either as free gas or dissolved in water, towards the production well.

The quantity of gas produced from a well increases as the amount of water pumped out decreases.

Permeability is necessary to achieve CBM production. The natural permeability of coal seams can be low, so some CBM wells are stimulated (by hydraulic fracturing) to improve connectivity between the well and the coal.

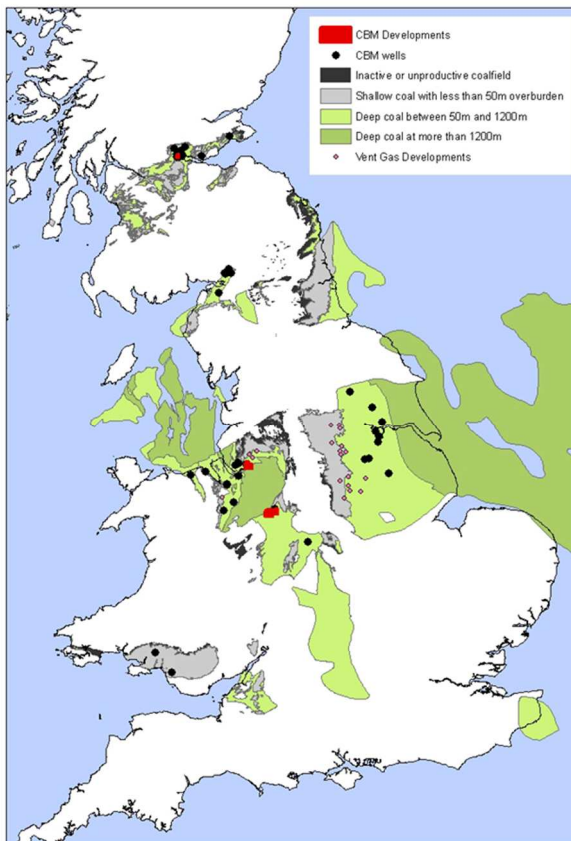
### **Licensing for CBM in the UK**

A Petroleum Exploration and Development Licence (PEDL) allows a company to pursue CBM exploration activities in the same way as for shale gas and oil exploration.

### **CBM in the UK**

The map below shows those areas of the UK where there are deep coal resources and where there are current CBM developments. As at 2012 three CBM development plans had been approved by DECC, but as yet no full scale developments have been constructed. Between 2007 and 2012 over 40 CBM exploration and appraisal wells and 12 pilot production development wells were drilled.

The BGS has estimated that the total CBM resource in the UK is 2,900 billion cubic metres. However a study by the BGS in 2004 estimated that as little as 1% of this resource could be recovered, because of perceived widespread low seam permeability, low gas content, resource density and planning constraints. If 10% of the UK CBM resource potential could be developed, the produced 290 billion cubic metres would correspond to over three years of UK natural gas supply.



DECC 2012

## Drilling for CBM

CBM is present at shallower depths than shale gas - typically from 150 – 1,500 metres deep.

Accessing the gas uses similar oil and gas drilling technologies to shale gas. However, the well configuration is different due to the need to pump groundwater out of the seam (including the need for multiple wells in certain cases).

## Groundwater Contamination

Fracking may be required to extract CBM if seams are insufficiently permeable. Fractures formed by hydraulic fracturing commonly extend beyond the coal seam and may serve as conduits between the coal seam and groundwater aquifers if the coal being targeted is present at shallow depths.

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To prevent contamination, detailed knowledge of coal seam properties (porosity, fluid conductivity, seam thickness, etc.) is required before the decision about the location for a CBM production well that may be hydraulically fractured is made.

### **CBM Regulation**

The majority of the same regulations and controls that apply to shale gas and shale oil also apply to CBM, particularly if hydraulic fracturing is involved. The regulatory controls that apply to CBM development are co-ordinated by the same UK regulators that regulate shale gas and shale oil development including the relevant Minerals Planning Authority (MPA), Environment Agency (EA), Oil and Gas Authority (OGA), the Health & Safety Executive (HSE) and the Coal Authority.

### **ASSESSMENT AND REGULATION**

Planning applications for shale oil and gas developments will require an Environmental Impact Assessment (EIA) where the site is larger than 0.5 ha in size or if the proposed development is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

Developers can submit an EIA voluntarily even where the development may not fall into the scope of the EIA Regulations. As with all EIA development applications the 'scope' of the assessment should be agreed with the MPA.

An EIA requires baseline monitoring to be undertaken for groundwater and surface water, air and noise and seismicity before development commences. The impact assessment identifies mitigation of predicted impacts where necessary and specifies the scope for ongoing monitoring as required. Assessment of the cumulative effects of field development will be very important at the production stage of shale gas and oil development.

### **Infrastructure Act 2015**

The Infrastructure Act 2015 received royal assent on 12<sup>th</sup> February 2015. The Act simplified the procedure for obtaining the right to use underground land 300 metres and below for the purpose of exploiting oil and gas. Most of the provisions came into force on 12 April 2015 and the remaining provisions come into force in April 2016.

Part 6 of the Act introduces a number of 'Onshore hydraulic fracturing safeguards'. In summary, hydraulic fracturing is prohibited from taking place in land at a depth of less than 1000 metres; and associated hydraulic fracturing is prohibited from taking place in land at a depth of 1000 metres or more unless the licensee has the Secretary of State's consent for hydraulic fracturing to take place.

The Secretary of State may not issue a hydraulic fracturing consent unless the operator provides evidence that the following conditions have been met.

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- The environmental impact of the development, which includes the relevant well, has been taken into account by the local planning authority.
  - Appropriate arrangements have been made for the independent inspection of the integrity of the relevant well.
  - The level of methane in groundwater has, or will have, been monitored in the period of 12 months before the associated hydraulic fracturing begins.
  - Appropriate arrangements have been made for the monitoring of emissions of methane into the air.
  - The associated hydraulic fracturing will not take place within protected groundwater source areas.
  - The associated hydraulic fracturing will not take place within other protected areas.
  - In considering an application for the relevant planning permission, the local planning authority has (where material) taken into account the cumulative effects of a) that application; and b) other applications relating to the exploitation of onshore petroleum obtainable by hydraulic fracturing.
  - The substances used, or expected to be used, in associated hydraulic fracturing: a) are approved; or b) are subject to approval, by the relevant environmental regulator
  - In considering an application for the relevant planning permission, the local planning authority has considered whether to impose a restoration condition in relation to that development.
  - The relevant undertaker has been consulted before grant of the relevant planning permission.
  - The public was given notice of the application for the relevant planning permission.

The Act also sets out that the Secretary of State must, by regulations, specify a) the descriptions of the areas which are 'protected groundwater source areas'; and b) the descriptions of areas which are 'other protected areas'. In December 2015 the Government approved the protected areas in which hydraulic fracturing will be prohibited. It cannot therefore take place at depths above 1200 metres in National Parks, the Broads, AONBs and areas that are most vulnerable to groundwater pollution (SPZ1s).

### **Regulatory Controls**

Shale gas and oil development is subject to a range of regulatory controls co-ordinated by different UK regulators including the relevant Minerals Planning Authority (MPA), Environment Agency (EA), the Oil and Gas Authority (OGA), the Health & Safety Executive (HSE) and, if drilling encroaches on coal seams, the Coal Authority.

A number of studies have been undertaken and reports produced with regards to the effectiveness of the current regulatory regimes in the UK to manage shale gas and oil development. Regulators have also produced and are continuing to develop industry specific guidance as to how development will be monitored and managed and also

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how the different regulatory bodies envisage working together going forwards. Key document references are included at the back of this note.

The Royal Society/Royal Academy of Engineering – Shale Gas Extraction in the UK: A Review of Hydraulic Fracturing 2012 report states:

*“Shale gas extraction in the UK is presently at a very small scale. [...] Uncertainties can be addressed through robust monitoring systems and research [...] Co-ordination of the [regulators] must be maintained. Regulatory capacity may need to be increased.”*

Public Health England – Draft Review of Public Health Impacts 2013 states:

*“The currently available evidence indicates that the potential risks to public health from exposure to the emissions associated with shale gas extraction are low if the operations are properly run and regulated.”*

In addition to the guidance provided by statutory regulatory bodies, the United Kingdom Onshore Operators Group (UKOOG) has published their UK Onshore Shale Gas Well Guidelines for the exploration and appraisal phases of development. The document contains details of what is considered to be good industry practice and it references relevant legislation, standards and practices.

Policy makers need to design policies that strike the right balance between the role of the MPA and the other regulatory regimes involved in shale gas and oil development.

Case law has established that impacts regulated under another regime and the existence of that regime, are both material considerations for the planning decision maker. MPAs will therefore need to be satisfied that matters regulated by others have been addressed by the applicant and that the relevant regulatory body recommends that there are no reasons to refuse planning permission due to such impacts.

## **PLANNING FOR SHALE GAS AND OIL DEVELOPMENTS**

### **Planning Application Process**

Planning permission is one of the regulatory approvals required before any activity may start.

A Minerals Planning Authority (MPA) will decide whether the activity is acceptable in planning terms at that particular location, after local communities and other interested people have had the opportunity to set out their views on the benefits and impacts of the proposal through a public consultation process.

The MPA in England will be the county or unitary authority in which the development is proposed.



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Planning permission is required for each stage of the process; exploration, appraisal and production. An applicant may apply for more than one stage in the same application. Most commonly this will be for exploration and appraisal.

The issues for planning consideration for shale gas and oil developments are likely to include the following:

- noise;
- air quality and dust;
- lighting;
- visual impact on the local and wider setting;
- landscape character;
- heritage features;
- traffic and impact on the highways network;
- land contamination;
- soils and impact on agricultural land;
- internationally, nationally and locally designated wildlife sites, protected species and ecological networks;
- nationally protected geological sites and features; and
- site restoration and aftercare.

### **Development Plans**

The Planning and Compulsory Purchase Act 2004 introduced a new plan making system and the procedures were consolidated by the Town and Country Planning (Local Planning) (England) Regulations 2012. Some Local Planning Authorities do not yet have adopted plans prepared under the new system and the development plan may comprise a mix of policies from the old and new systems.

Shale gas and oil development is a recent phenomenon and adopted policies in Development Plans are only likely to exist for conventional (i.e. not involving hydraulic fracturing) hydrocarbon exploration, appraisal and production in areas that have seen this activity in the past. In areas that have not experienced conventional hydrocarbon activities, Development Plan policies are likely to be of a generic nature (e.g. applying to all types of mineral development).

Current development plan policies largely carry forward the approach originally set out in Department of the Environment Circular 2/85 'Planning Control over Oil and Gas Operations':

- encourage exploration and production;
- maximum exploitation consistent with good practice;
- onus on the industry to demonstrate need.

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Existing policies are also typically structured in terms of the 3 phases of development (exploration, appraisal and production) – to reflect:

- different policy considerations at each stage; and
- planning decisions for exploration and appraisal should not pre-empt decisions to be taken later at the production stage.

MPAs which fall in areas that are the subject of PEDLs issued by OGA will need to consider the issues likely to be raised by shale gas and oil development. This includes those MPAs that have up to date policies on conventional hydrocarbon exploration, appraisal and production.

MPAs are presently taking different approaches towards the preparation of Development Plan policies for shale oil and gas. Some authorities intend to rely on the same policy approach for both conventional and unconventional hydrocarbons whereas others are proposing a tailored policy approach that recognises the distinctive features of unconventional hydrocarbons.

Some authorities are preparing Supplementary Planning Documents (SPD) on shale oil and gas that will provide detail to support policies in higher order planning policy documents. Care needs to be taken, however, as SPDs cannot introduce new policy on shale oil and gas.

Until new Development Plan policies are adopted dealing specifically with unconventional hydrocarbons, decisions on individual shale gas proposals will need to have regard to generic policies where they exist as well as other ‘material considerations’ that apply.

### **Material Considerations**

There is no statutory definition of “material considerations”. They have been established through case law and a wide range of policy and evidential documents can also be considered as material.

In the case of shale gas and oil there are two key policy / guidance documents that apply:

- National Planning Policy Framework (DCLG, March 2012); and
- Planning Practice Guidance. Minerals. Planning for Hydrocarbon Extraction. (DCLG, March 2014 and April 2015)

Important evidential material includes governmental statements, professional reports published and studies undertaken regarding shale gas and oil development in the UK (key study references are included at the back of this note). Also relevant are the Ministerial Statements by Amber Rudd (Secretary of State for Energy and Climate Change) made on 16 September and 18 November 2015.

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## **National Planning Policy Framework (NPPF)**

The NPPF was published in March 2012 and sets out the Government's planning policies for England. Key sections of the NPPF relevant to shale oil and gas that should be given weight include:

Paragraph 14 – ‘At the heart of the NPPF is a presumption in favour of sustainable development’

Paragraph 142 - ‘important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs’

Paragraph 144 - ‘When determining planning applications, local planning authorities should... give great weight to the benefits of mineral extraction, including to the economy...(and) ensure...that there are no unacceptable adverse impacts on the natural and historic environment, human health.... ’

Paragraph 147 - ‘MPAs should...when planning for on-shore oil and gas developments, including unconventional hydrocarbons, clearly distinguish between the three phases of development (exploration, appraisal and production) and address constraints on production and processing within areas that are licensed for oil and gas exploration or production.’

In preparing Development Plan policies or assessing planning applications for shale oil and gas MPAs will also need to consider other policies within the NPPF that are material to the circumstances of the case.

### **Planning Practice Guidance**

Accompanying the NPPF the Government has consolidated a number of planning practice guidance notes, circulars and other guidance into a single Planning Practice Guidance suite that is available as an on-line resource. The guidance is intended to be read alongside the NPPF and other planning guidance. Most of the guidance was issued in March 2014 but it is revised and updated as appropriate.

Many parts of the guidance may be relevant to shale oil and gas proposals depending on the circumstances of the case but the following should be given weight.

Section 9 of the guidance on minerals deals with planning for hydrocarbon extraction and was issued on 6 March 2014. Paragraph 91 states: ‘As an emerging form of energy supply, there is a pressing need to establish - through exploratory drilling - to assess whether or not there are sufficient recoverable reserves to allow full scale production on an economically viable scale.’

The guidance also includes information on the phases of hydrocarbon development and the issues raised by such developments including those that are specific to unconventional oil and gas reserves.

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MPAs are encouraged to make appropriate provision for hydrocarbons in mineral local plans. Where they consider it necessary to update their local plans and they are in a PEDL they are expected to include Petroleum Licence areas on policies maps and criteria based policies for each of the three phases of development. Specific locations may be included should the industry wish to promote specific sites. Safeguarding areas are not normally needed (paragraphs 105 and 106).

The guidance notes that 'some issues may be covered by other regulatory regimes but may be relevant to MPAs in specific circumstances' (paragraph 112). The example of risk to groundwater is referred to, where the Environment Agency has responsibility for ensuring the risk is appropriately identified and mitigated, but MPAs have a role in preventing pollution through controlling such aspects as site construction and operation.

Paragraph 112 continues: 'there exist a number of issues which are covered by other regulatory regimes and MPAs should assume that these regimes will operate effectively. Whilst these issues may be put before MPAs, they should not need to carry out their own assessment as they can rely on the assessment of other regulatory bodies. However, before granting planning permission they will need to be satisfied that these issues can or will be adequately addressed by taking the advice from the relevant regulatory body'.

### **Ministerial Statements**

Amber Rudd, Secretary of State for Energy and Climate Change, made a written ministerial statement '*Shale Gas and Oil Policy Statement*' to the House of Commons on 16 September 2015. It states that it should be taken into account in planning decisions and plan making.

The statement sets out the Government's view 'that there is a national need to explore and develop our shale gas and oil resources in a safe, and sustainable and timely way'. It continues 'exploring and developing our shale gas and oil resources could potentially bring substantial benefits and help meet our objectives for secure energy supplies, economic growth and lower carbon emissions'.

The statement lists a number of potential economic benefits of indigenous shale gas production leading it to conclude 'that there is a clear need to seize the opportunity now to explore and test our shale potential'. It states that 'this must be done whilst maintaining the very highest safety and environmental standards'. It continues: 'The Government is confident we have the right protections in place now to explore shale safely.... Planning authorities can also have confidence that the regulators will enforce safety, environmental and seismic regulation effectively'.

The statement also set out a number of expectations for the planning system. 'There is a clear expectation that local planning authorities should ensure that decisions on planning applications are made within statutory timeframes: 16 weeks where an

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application is subject to Environmental Impact Assessment. This should be supported by an upfront timeline agreed with the applicant including the anticipated decision date. To avoid unnecessary work causing delay, when determining planning applications, local planning authorities should carefully consider which issues can be left to other regulatory regimes, taking full account of the Government's planning guidance on this issue.'

The Government provided a £1.2m shale support programme for 2015/16 to assist local planning authorities to determine applications in a timely manner. At the time this note was produced, the Government had not announced whether a similar funding programme would be available for 2016/17.

Amber Rudd also announced that the recovery criteria would be revised to enable the Secretary of State for Communities and Local Government to recover appeals for exploring and developing shale gas, subject to review after two years.

On 18 November 2015 Amber Rudd set out the '*Priorities for UK energy and climate change*' in a further written ministerial statement. This stated: 'New nuclear and gas will be central to our energy secure future and we are encouraging investment in our shale gas exploration so we can add new sources of home-grown supply to our real diversity of imports'.

There has subsequently been some discussion and speculation on the implications for UK energy policy, including shale oil and gas development, of the Paris climate change agreement to cap global warming at 2C. However, to date there has been no further update to Amber Rudd's statement of 18 November 2015.

## **Public Engagement**

As part of the planning process, MPAs will make applications and supporting documents including the Environmental Statement available to local people and will ask for their comments.

These will be considered with the planning application. Other organisations, including statutory consultees such as the Environment Agency, will also be consulted on any application.

Each planning application must be publicised by a display on-site and in local newspapers and information must also be available on the relevant local authority website. This must include a section on how interested people can submit representations about the application.

## **Pre-application Discussions**

It is good practice for the applicant to discuss the proposal with the MPA and other interested parties including local residents before the planning application is submitted. Such engagement can improve the quality of planning applications. The

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approach to pre-application engagement needs to be tailored to the nature of the proposed development. Pre-application discussions are particularly recommended for major planning applications and controversial proposals such as shale gas and oil developments. Increasing numbers of local planning authorities are charging applicants for pre-application advice.

### **Planning Performance Agreements**

A planning performance agreement (PPA) is a project management tool that the MPA and the applicant can use to agree timescales, actions and resources for handling planning applications. It can also involve other interested parties including statutory consultees. The agreement can cover all stages of the process from pre-application discussions through to determination of the planning application. A PPA can be particularly useful in setting out an efficient and transparent process for determining major and complex planning applications, providing increased certainty on timescales and responsibilities for all concerned.

PPAs will not be appropriate for all MPAs or for all applications. However, there could be advantages in using a relatively simple PPA for shale gas and oil proposals but because of their controversial nature there is a need for openness and transparency to avoid any perception that a PPA could be viewed as 'buying a permission'.

Some advantages and barriers to using a PPA for shale gas and oil developments are noted below:

#### *Advantages:*

- Provides a framework for handling pre application discussions and the application in an efficient and effective way.
- Provides an effective project management tool for setting out the timescales and responsibilities.
- Provides additional certainty on the process and timescales to all interested parties.
- As pre-application charging is now the norm, the perception of a 'permission being bought' is reduced.
- Provides funding to offset e.g. the abnormal costs involved in processing representations and security measures.

#### *Barriers:*

- Public perception of 'buying a permission'.
- Mindset that PPAs are a tool for dealing with housing and multi-use applications not minerals applications.

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- Perceived as being too complex and 'legalistic'.
  - Concern that MPA will have difficulties in meeting the agreed timescales because of lack of resources, committee cycles, delays in applicant providing the required information, delays in receiving key consultee responses etc.
  - Lack of understanding on how a PPA can assist the process.
  - Resistance from councillors.

Some of the barriers can be overcome by:

- Giving public clarity on the role of a PPA and that entering into the PPA does not prejudice the decision making process.
- Officer and member training on PPAs.
- Use of a model PPA.
- Highlight the advantages in particular the additional funding obtained to assist in meeting abnormal costs of handling these type of applications.
- Agree with statutory consultees their role or engagement in the PPA process.

PAS has prepared a model template and user guide for a PPA for shale gas and oil developments. The PPA template is available on the PAS web site for MPAs to adapt to their own circumstances and to use.

### **Public Concern**

Shale gas and oil development has attracted a lot of attention from the media and the public. Public concerns include a wide range of matters including groundwater protection and induced seismicity as a result of hydraulic fracturing.

Weight to be given to public concern has been considered by the courts and can be broadly summarised as:

- public safety is capable of being a material consideration;
- public opposition per se is not a material consideration;
- concerns may be a material consideration if they relate to a planning matter, are objectively justified and may have land-use consequences; and
- where public concern is not justified, it cannot be conclusive.

There have been several cases where public concern has resulted in widespread public protests against shale gas and oil proposals. Sometimes demonstrations have been peaceful and well ordered but in some cases this has involved such actions as vandalism and public disorder. This poses additional challenges for local authorities and other agencies including the police.

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## DEALING WITH CONTROVERSIAL APPLICATIONS

Determining applications in a timely and appropriate manner when faced with a large number of representations / enquiries is an issue that MPAs may find challenging in relation to shale gas and oil development applications. Senior planning officers in a number of MPAs that have dealt with planning applications for shale gas/oil developments have commented that:

- the level of media and public interest is unprecedented with thousands of representations being received;
- there is public concern about the capacity of the regulators and lack of understanding of their roles;
- applicants have a responsibility to aspire to and deliver “highest environmental standards”; and
- decisions in this area are subject to highest level of scrutiny.

There are a variety of techniques that local planning authorities can use to help address these issues.

Best practice in engaging with local communities could involve the following:

- Sharing information about shale oil and gas developments through the MPA’s website.
- Links on the MPA website to accredited sources of information on fracking and related issues.
- Encouraging the potential applicant to engage with local communities at an early stage in the pre-application process.
- Encouraging local residents, businesses, Parish Councils etc to work collaboratively highlighting that it is the quality not the quantity of representations that the MPA is seeking.
- Learn lessons from the experiences of other MPAs that have dealt with similar controversial applications.
- Use plain and simple language and avoid emotive terminology such as ‘fracking’ and ‘unconventional’.

The industry can assist in this process by following a number of techniques.

- Early engagement with local communities that will be affected by the proposed development.



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- Provide guidance and good practice on the UKOOG website.
  - Ensuring that all necessary information is provided with the planning application.

Local Planning Authorities can use the following techniques for dealing with large numbers of representations:

- Use of digital tools to group representations that contain similar subject matter.
- State in the Statement of Community Involvement that all representations will be taken into account but they will not receive a response or acknowledgment.
- Encourage the public to submit representations on-line as this makes processing easier.

The following can assist the determination of applications within statutory timescales:

- Use of Planning Performance Agreements to agree timescales and responsibilities.
- Specialist, dedicated teams of planning officers and support staff within MPAs (whilst recognising that resource availability could be an issue).
- Getting the information right when the application is submitted and avoiding the need to seek further information after submission.
- Do not validate the application until all the required information to the required standard has been submitted.
- Good project and programme management.
- Early engagement between applicant and MPA and other interested parties (statutory consultees, local communities etc.) as appropriate at pre-application stage or earlier, with MPA being proactive in contacting companies awarded PEDLs in its area.

The interface between the MPA and the regulators is a key consideration for shale oil and gas developments. The following can assist in ensuring that the MPA and the regulators work effectively together and that the public are aware of their respective roles and responsibilities:

- Good websites with clear information on respective roles and responsibilities
- Effective networking between the MPA and the regulators either through meetings or telephone calls.

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- Greater visibility of regulators including attendance at public engagement events, training events, committee meetings etc.

## **FINANCIAL MATTERS**

The UK Onshore Operators Group (UKOOG) has adopted a “Community Engagement Charter” which includes a commitment to provide:

- £100,000 per well site where hydraulic fracturing takes place; and
- 1% of revenues from production allocated approximately 2/3rd to the local community and 1/3rd at the county level.

In addition to this, the Prime Minister announced on 13 January 2014 that Councils will be able to keep 100 per cent of business rates they collect from shale gas and oil sites. This is double the current 50 per cent figure and DECC has stated that the business rates could be worth up to £1.7 million a year for a typical site.

In January 2015 DCLG published a summary of responses to a consultation on draft regulations to allow the 100% local retention of business rates on shale gas and oil sites. The publication includes the Government’s position on this matter following the consultation and how it intends business rates to be split between two-tier authorities.

In addition Amber Rudd in her ministerial statement in September 2015 stated: ‘we also strongly believe that communities hosting shale gas developments should share in the financial returns they generate. The Government welcomes the shale gas companies’ commitment to make set payments to these communities, which could be worth £5-10m for a typical 10 well site, and we want to go further. As announced by the Chancellor in the 2014 Autumn Statement, and set out in our manifesto, we are determined to ensure that local communities share more of the proceeds and feel more of the benefits, using a proportion of the tax revenues that are recouped from shale gas production, we will present our proposals later this year for how we propose to design the sovereign wealth fund.’

Regulation 122 of the Community Infrastructure Levy Regulations 2010 sets out the limitations which apply to the use of planning obligations. Regulation 122(2) states that: “A planning obligation may only constitute a reason for granting planning permission for the development if the obligation is necessary to make the development acceptable in planning terms; directly related to the development; and fairly and reasonably related to scale and kind to the development.

The type of local community benefits scheme which UKOOG has adopted fails all three of the tests set out in Regulation 122(2). MPAs are therefore likely to be advised that it would be improper to take any account of such financial benefits when determining applications.

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## **FURTHER READING**

### **Key Studies/publications:**

The Unconventional Hydrocarbon resources of Britain's onshore basins – Shale Gas, 2012, Department of Energy & Climate Change

The Unconventional Hydrocarbon resources of Britain's onshore basins – Coalbed Methane (CBM), 2012, Department of Energy & Climate Change

The Carboniferous Bowland Shale gas study: geology and resource estimation, 2013 (Updated March 2015), British Geological Survey, Department of Energy & Climate Change

Shale gas extraction in the UK: a review of hydraulic fracturing, June 2012, The Royal Society and The Royal Academy of Engineering.

Shale gas: challenges and opportunities - A briefing note by the Geological Society of London, Summary of public briefing meeting held in June 2012

Potential groundwater impact from exploitation of shale gas in the UK - Groundwater Science Programme Open Report OR/12/001, British Geological Survey, 2012

Review of the Potential Public Health Impacts of Exposure to Chemical and Radioactive Pollutants as a Result of Shale Gas Extraction, Public Health England, June 2014

### **Industry Guidance**

UK Onshore Shale Gas Well Guidelines, Exploration and appraisal phase: Issue 2 January 2015, United Kingdom Onshore Operators Group.

Community Engagement Charter Oil and Gas from Unconventional Reservoirs, 2013, United Kingdom Onshore Operators Group.

### **Regulatory Guidance**

Onshore oil and gas exploration in the UK: regulation and best practice, England (different versions available for Scotland, Wales and Northern Ireland), December 2015, Department of Energy & Climate Change

Guidance on fracking: developing shale oil and gas in the UK, 6 January 2016, December 2015, Department of Energy & Climate Change

Fracking UK Shale: safety from design to decommissioning, February 2014, Department of Energy & Climate Change.

Onshore oil and gas exploratory operations: technical guidance, Consultation Draft, Environment Agency, August 2013.

Guidance Note: Regulation of exploratory shale gas operations – Environment Agency, November 2012

The Environment Agency and the Health and Safety Executive: Working together to regulate unconventional oil and gas developments, November 2012

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**Other Guidance:**

Fracking UK Shale: Climate change, February 2014, Department of Energy & Climate Change.

Potential Greenhouse Gas Emissions Associated with Shale Gas Extraction and Use, September 2013, Professor David J C MacKay FRS, Dr Timothy J Stone CBE, Department of Energy & Climate Change.

**Recommended Web Sites:**

United Kingdom Onshore Operators' Group: [www.ukoog.org.uk](http://www.ukoog.org.uk)

Oil and Gas Authority: [www.gov.uk/government/organisations/oil-and-gas-authority](http://www.gov.uk/government/organisations/oil-and-gas-authority)

Environment Agency: [www.gov.uk/government/organisations/environment-agency](http://www.gov.uk/government/organisations/environment-agency)

Health and Safety Executive: [www.hse.gov.uk/offshore/unconventional-gas.htm](http://www.hse.gov.uk/offshore/unconventional-gas.htm)

British Geological Society: [www.bgs.ac/shalegas](http://www.bgs.ac/shalegas)

Public Health England: [www.gov.uk/government/organisations/public-health-england](http://www.gov.uk/government/organisations/public-health-england)

Planning Advisory Service: [www.pas.gov.uk](http://www.pas.gov.uk)

The UK Onshore Geophysical Library (UKOGL): <http://ukogl.org.uk/>

**This advice note has been produced by Stephenson Halliday for PAS following the delivery of a programme of workshops for Mineral Planning Authority officers and councillors on Planning for Shale Gas and Oil in March 2016. It builds on a previous advice note PAS produced.**

