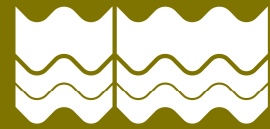


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East Sussex
County Council



SHALE GAS AND HYDRAULIC FRACTURING (FRACKING)

FREQUENTLY ASKED QUESTIONS (FAQs VERSION 3)

AUGUST 2014

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This document has been prepared by East Sussex County Council. It addresses FAQs associated with shale gas and hydraulic fracturing or “fracking” related to the situation in East Sussex.

A: SHALE GAS AND FRACKING

What is shale gas?

Shale gas is a natural gas (largely methane) that is trapped within shale formations. Shales are fine-grained rocks that have been accumulated with mineral and organic particles. They are quite common across the world. There are consequently vast reserves of shale gas worldwide.

Conventional gas is trapped in rock structures as a result of earth folding or faulting. Shale gas is sometimes known as an ‘unconventional’ hydrocarbon as it does not require these geological characteristics. Unconventional gas may be trapped in the original source rock or it has migrated to a rock formation which has since become impermeable. Shale gas is frequently found at great depths - sometimes 2 km and more beneath the surface.

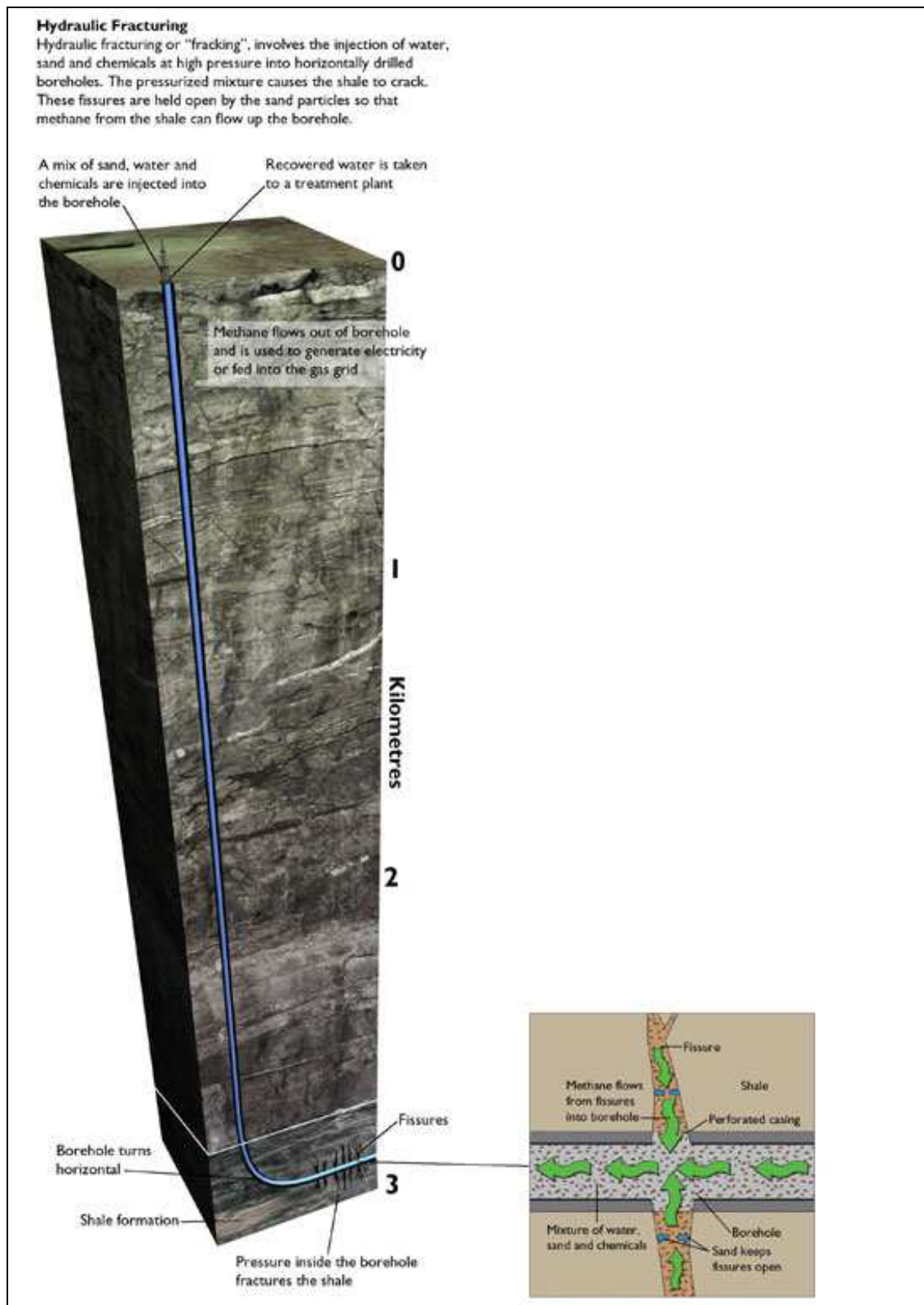
What is fracking?

Shale gas is hard to extract because it is trapped in the rock and does not flow freely when a well is drilled. Gas has to be extracted using a technique known as hydraulic fracturing or, more commonly, as “fracking”.

Fracking uses fluid, usually a mixture of water, sand and chemicals, pumped at high pressure into the rock to create narrow fractures to create paths for the gas to flow to the surface. The principles behind fracking have been used in the oil industry since the mid nineteenth century (in the US) to improve and extend oil production, but using it to extract shale gas is a relatively recent innovation.

The diagram on the following page summarises how shale gas is extracted.

Figure 1: Shale gas extraction



Source: British Geological Survey (www.bgs.ac.uk)

What chemicals are used in the Fracking process?

The chemicals used in fracking fluids have to be assessed by the Environment Agency. The operator has to demonstrate that any chemicals are not hazardous in their application.

Is there shale gas in the UK?

Recent data from the British Geological Survey shows that the UK has more shale gas than previously expected (1,300 trillion cubic feet of shale gas in the north of England and the Midlands). If only 10% of this gas could be extracted this would still be enough to supply the country for at least 43 years.

Is there shale oil and gas in East Sussex?

Actually one of the first UK wells to find shale gas was drilled in the centre of the County in 1875. In 1896, a well at Heathfield produced gas to light the local railway station, providing supplies into the 20th Century.

Geological conditions make the presence of shale gas a probability. However, until exploratory wells are drilled into the shale rock we do not know the amounts for sure.

The Department of Energy and Climate Change has commissioned the British Geological Survey (BGS) to assess the background geological knowledge and resource assessment of the United Kingdom's shale gas basins.

A study on the Weald Basin was published by BGS in May 2014. The assessment is based on detailed seismic mapping and results from existing oil and gas wells. The study suggests the shales organic carbon contents and oil saturation index are relatively low compared to producing areas in North America. However, there are optimum conditions for oil generation within the Basin.

The study suggests there could be total shale oil resources of 4.4 billion barrels of oil (this is a reasonable central estimate of a range, and does not represent how much could actually be extracted).

The BGS's examination of the geological data indicates there is unlikely to be any shale gas potential.

The study provides a view of the potential for shale oil and gas – it does not indicate how and by which process any oil and gas would be commercially exploited.

A link to the study is provided below.

<https://www.gov.uk/government/publications/bgs-weald-basin-jurassic-shale-reports>

Will shale gas be produced in the UK?

Even if significant quantities of shale gas exist in the UK, there will be issues about feasibility and practability of extraction. Some limited fracking has been undertaken in northern England associated with exploratory wells but no shale gas is being produced at present.

Who owns the minerals rights under land?

In many parts, it is fairly common that someone will own the surface of the land but someone else will own the land below the surface. Silver, gold, oil and other petrochemicals are owned by the Crown.

B: NATIONAL AND LOCAL PLANNING POLICY

What is the UK Government's position?

Although the shale gas industry is in its early stages in the UK, the government considers there is great potential for it to increase our energy security, create jobs and generate substantial tax revenue.

A new **Office of Unconventional Gas and Oil (OUGO)** has been established sitting within the Department of Energy & Climate Change (DECC) which aims to promote the safe, responsible, and environmentally sound recovery of the UK's unconventional reserves of gas and oil.

<https://www.gov.uk/government/policy-teams/office-of-unconventional-gas-and-oil-ougo>

The government has recently published information in the form of a synopsis of common questions with government responses: ***Facts about' Fracking'***.

<https://www.gov.uk/government/policies/providing-regulation-and-licensing-of-energy-industries-and-infrastructure/supporting-pages/developing-shale-gas-and-oil-in-the-uk>

The National Planning Policy Framework also refers to the role of mineral planning authorities when planning for onshore oil and gas development.

The Government's Planning Practice Guidance has been updated which incorporates further details on the Government's approach to development for unconventional hydrocarbons in National Parks and Areas of Outstanding Natural Beauty.

<http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/planning-for-hydrocarbon-extraction/determining-the-planning-application>

What is East Sussex's current planning policy on onshore oil and gas?

Whilst we do have policies in our Waste and Minerals Plan relating to hydrocarbon development, there are no specific planning policies which either promote/support or oppose fracking. If a planning application were made, any decision to grant permission would be considered in light of national planning policy as well as local planning policy which is set out in the adopted Waste and Minerals Plan 2013. Policy WMP 16 is particularly relevant and is set out below:

“Policy WMP 16

A) Exploration for Oil and Gas

The Authorities will support proposals for the exploration for oil and gas where it can be demonstrated that there is no less sensitive location that could be utilised and that there is no unacceptable adverse impact on the environment or local amenity.

B) Appraisal for Extraction

Site identification for the extraction of oil or gas should meet the requirements of the policy framework of the Plan, having demonstrated the following sequence:

- i. an area of search, with alternative sites, indicating consideration of sites outside sensitive areas or features including the High Weald AONB and South Downs National Park;*
- ii. avoidance of environmental harm; and*
- iii. mitigation and compensation of environmental harm.*

C) Production

In addition, when considering the merits of any extraction proposal, the Authorities will assess

- i. how the oil and gas will be transported from site; and*
- ii. how additional impacts of production will be avoided, and*
- iii. the potential for acceptable mitigation, where impacts cannot be avoided in addition to other policies within the Plan, including those relating to site restoration and the potential for community benefit.”*

This policy, together with others in the Waste and Minerals Plan, are intended to ensure that development can only take place which avoid unacceptable harm to the environment or communities and that any disturbance caused by operations would be mitigated against.

C: THE REGULATORY FRAMEWORK

Who are the key regulators involved in giving permission for fracking?

- a) **Department of Energy and Climate Change** – issues Petroleum Licences, gives consent to drill under the Licence once other permissions and approvals are in place, and have responsibility for assessing risk of and monitoring seismic activity, as well as granting consent to flaring or venting;

b) **Mineral Planning Authorities** – grant permission for the location of any wells and wellpads, and impose conditions to ensure that the impact on the use of the land is acceptable;

c) **Environment Agency** – protect water resources (including groundwater aquifers), ensure appropriate treatment and disposal of mining waste, emissions to air, and suitable treatment and manage any naturally occurring radioactive materials; and

d) **Health and Safety Executive** - regulates the safety aspects of all phases of extraction, in particular responsibility for ensuring the appropriate design and construction of a well casing for any borehole.

What is the regulatory framework and who determines planning applications?

Before a company can start exploring for conventional or unconventional oil or gas reserves they must:

- Obtain a Petroleum Exploration and Development Licence (PEDL) from DECC – these licences grant exclusivity to operators in the licence area (see link). The licences however do not give consent for drilling or any other operations.

<https://www.gov.uk/government/policies/providing-regulation-and-licensing-of-energy-industries-and-infrastructure/supporting-pages/oil-and-gas-licensing>

- Obtain planning permission from the Minerals Planning Authority, (in a two tier area such as East Sussex this will be the County Council). The County Council will determine whether the planning application needs to be supported by an Environmental Impact Assessment (EIA).

- Gain a 'well consent' for exploration from DECC. At this stage, if the intention is to 'frack', DECC would require a geological assessment, a 'Frack Plan', and the monitoring of seismic activity before, during and after fracking.

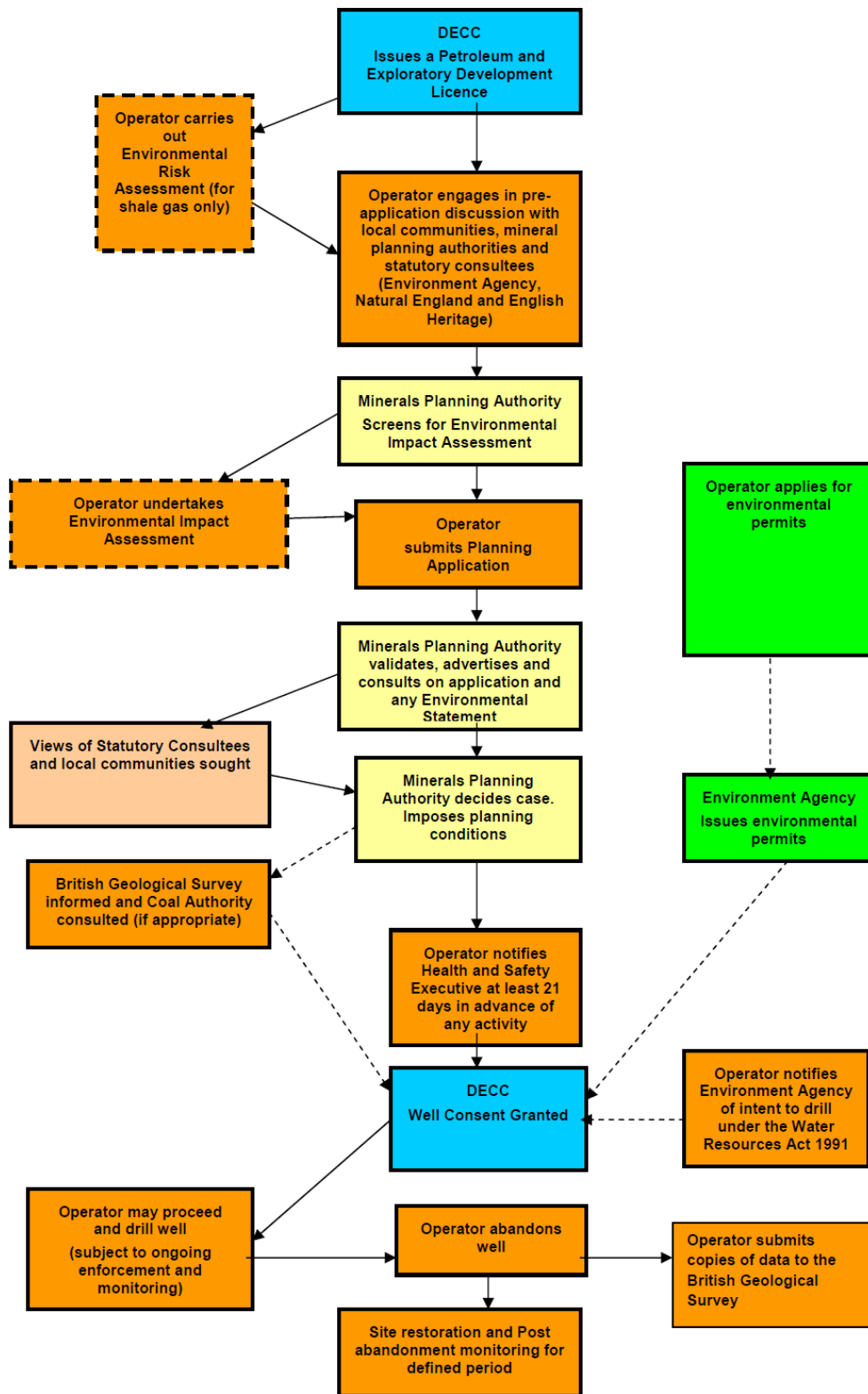
- The Environment Agency may also require an Environmental Permit at the exploration phase, and are likely to require an abstraction licence if more than 20,000 litres of water per day is to be abstracted.

- At least 21 days before drilling is planned, the Health & Safety Executive (HSE) must be notified of the well design and operation plans to ensure that major accident risks are properly controlled,

If the company then wishes to go into production to extract gas, it must gain a new planning permission from the Minerals Planning Authority, a Field Development Consent from the DECC, and an Environmental Permit from the Environment Agency.

A flow chart identifying processes for permissions on exploratory wells is reproduced below from DCLG planning practice guidance.

Annex B: Outline of process for drilling an exploratory well



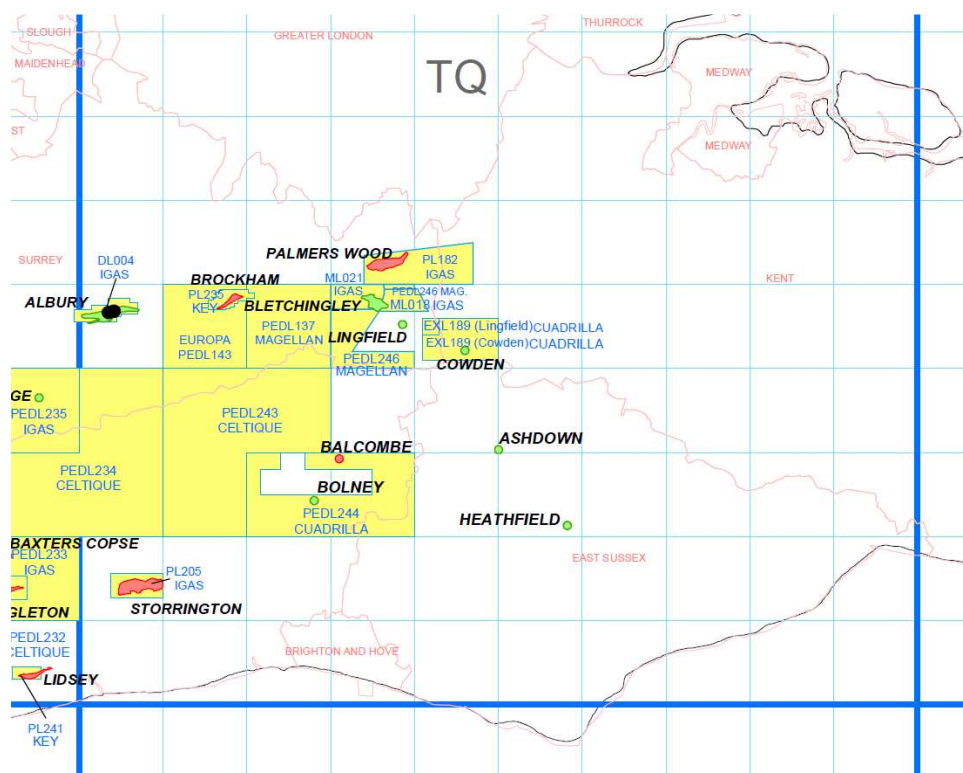
D: THE CURRENT SITUATION IN EAST SUSSEX

What is happening in and around East Sussex?

Planning applications for exploration, appraisal and production of unconventional hydrocarbons (shale gas and oil) would be determined by the County Council. There are no current planning permissions (or applications for planning permission) for oil and gas exploration, including Fracking, in East Sussex.

In addition to planning permission, a Petroleum Exploration and Development Licence (PEDL) is required and these are granted by the Department of Energy and Climate Change (DECC), not East Sussex County Council. A small number of licences were granted by the Government in 2008 (13th Onshore Licensing Round), and a new round of licensing is due in the near future. Some PEDLs have been granted for certain parts of East Sussex, for on-shore drilling and exploration (see map below). These licences do not give permission to drill but gives companies exclusive rights to invest the considerable time and resources needed to explore and appraise the extent of oil and gas reserves, and possibly move on to production. However, they must first obtain all the necessary regulatory approvals. Further information can also be found on the following website: <https://www.gov.uk/oil-and-gas-petroleum-licensing-guidance>.

It should be noted that some 13th Licensing Round Licences have been relinquished in 2014, including PEDL 247 held by Cuadrilla, which covered part of the County. A new round of Licensing has now commenced (see below).



Areas currently under licence

Source: DECC – Oil and Gas: Onshore Maps. <https://www.gov.uk/oil-and-gas-onshore-maps-and-gis-shapefiles>

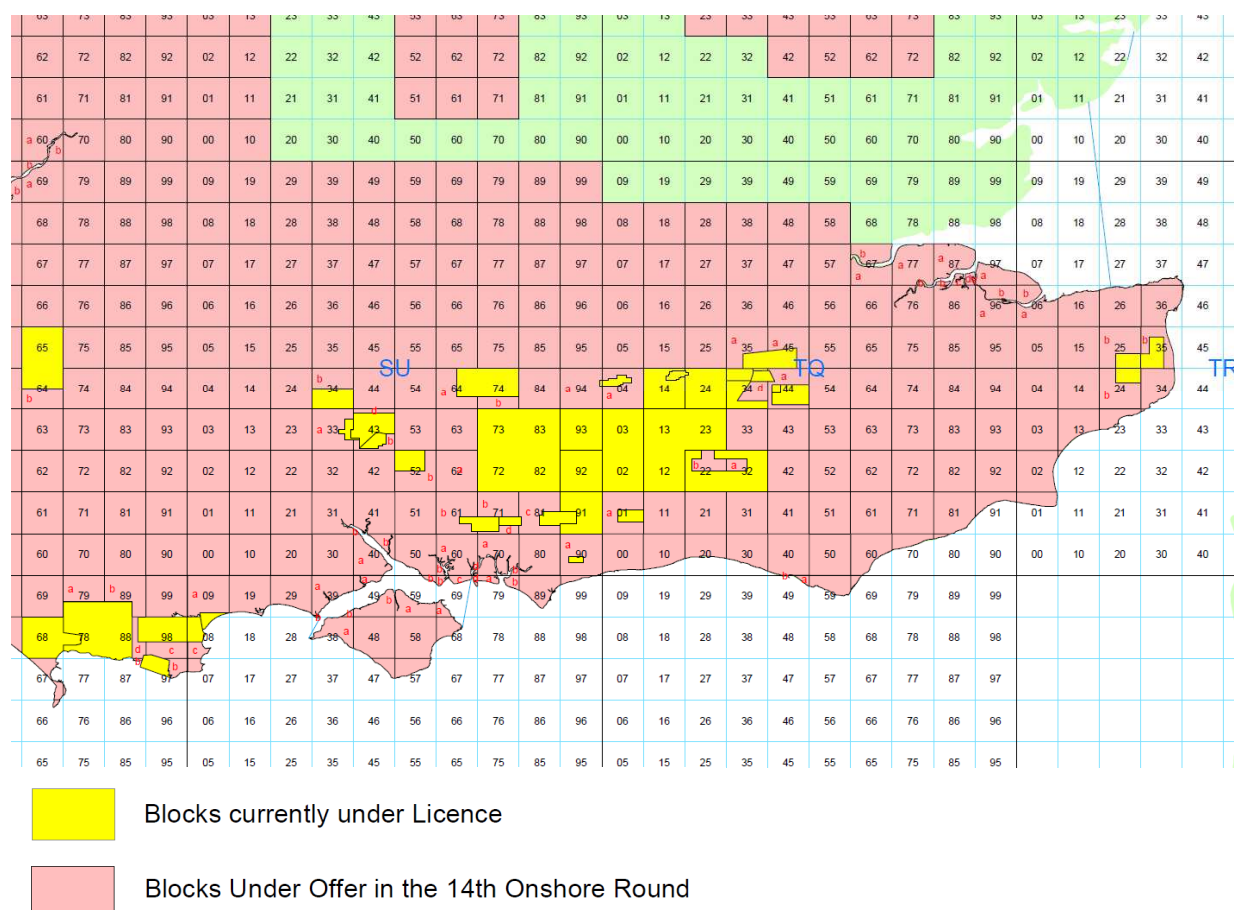
Oil and gas exploration and appraisal has occurred across parts of the south east both historically and recently, although there has not been any exploration in East Sussex since the early 1980s. There are, however, operational sites in West Sussex, Surrey and Hampshire. Further details for these sites should be sought from the relevant County Councils.

E: FUTURE LICENCE AREAS

What are the next steps?

DECC announced on 28th July 2014 the bidding process for the 14th Onshore Licensing Round. Companies have 90 days to submit applications, up to 28th October 2014. The new licensing round is offering for bids the whole of the rest of East Sussex not covered by current licences.

The map below shows the areas the current licensing round is offering for bids.



Source: DECC – Oil and Gas: Onshore Maps.
<https://www.gov.uk/oil-and-gas-onshore-maps-and-gis-shapefiles>

The Government expects applications for new licences to cluster around areas already licensed.

The Government has considered responses to a draft Strategic Environmental Assessment (SEA) which was published for consultation in December 2013. The Environmental Report and Post Adoption Statement are available on the DECC website.

<https://www.gov.uk/government/consultations/environmental-report-for-further-onshore-oil-and-gas-licensing>

A resource study of the potential for shale oil and gas in the Weald Basin has been published (see Section A above)

<https://www.gov.uk/government/publications/bgs-weald-basin-jurassic-shale-reports>

F: ENVIRONMENTAL AND SAFETY CONCERNS

What are the key issues for exploratory boreholes?

Key issues may include:

- Site location
- Water (e.g. run-off from site)
- Traffic volumes
- On-site storage facilities
- Noise
- Groundwater
- Induced seismicity
- Waste
- Site restoration

Why are there environmental concerns?

Shale gas extraction raises a number of environmental concerns in relation to:

- **Climate change** –shale gas is a fossil fuel and although burning relatively cleanly, its use will result in greenhouse gas emissions when the gas is combusted for heating or power generation and with a risk of methane leakages during drilling. There is also concern that investment in shale gas extraction will divert investment away from the development of renewable energy and other sources of gas such as bio gas from household waste. A recent study by DECC has examined potential greenhouse gas emissions from shale gas production and the study considers compatibility with global climate change targets.

<https://www.gov.uk/government/publications/potential-greenhouse-gas-emissions-associated-with-shale-gas-production-and-use>

- **Water consumption** – Large amounts of water are required although no more so than many other agricultural and commercial activities. Water use is at its greatest during the production stage of oil extraction. An operator would have to ensure that there is sufficient water for their operations.
- **Contamination** - the chemicals used in fracking and their subsequent disposal with the possible risk of contaminating groundwater.
- **Land use** - competing land-use requirements in densely populated areas
- **Minor earth tremors**. The physical effects of fracking potentially in the form of increased seismic activity

Where would the mineral planning authority get advice?

The Government has indicated that before granting planning permission, mineral planning authorities should not need to carry out their own assessment for certain requirements but rely on the assessment of other regulatory bodies. These issues might cover:

- Mitigation of seismic risks – DECC is responsible for controls, usually through the licence consent regime, to mitigate seismic risks. Seismic assessment of the geology of the area to establish the geological conditions, risk of seismic activity and mitigation measures to put in place is a requirement by DECC for all fracking processes;
- Well design and construction – the Health and Safety Executive is responsible for enforcement of legislation concerning well design and construction;
- Well integrity during operation – under health and safety legislation the integrity of the well is subject to examination by independent qualified experts throughout its operation, from design through construction and until final plugging at the end of operation;
- Operation of surface equipment on the well pad – The Government considers that whilst planning conditions may be imposed to prevent run-off of any liquid from the pad, and to control any impact on local amenity (such as noise), the actual operation of the site's equipment should not be of concern to mineral planning authorities as these are controlled by the Environment Agency and the Health and Safety Executive;
- Mining waste – the Environment Agency is responsible for requiring that extractive wastes do not harm human health and the environment. An Environmental Permit is required for phases of hydrocarbon extraction.

- Chemical content of hydraulic fracturing fluid – this is covered by the Environmental Permit as developers are obliged to inform the Environment Agency of all chemicals that they may use as part of any fracking process;
- Flaring or venting of any gas produced as part of the exploratory phase will be subject to DECC controls and will be regulated by the Environment Agency. Mineral planning authorities will, however, need to consider how issues of noise and visual impact will be addressed;
- Final off-site disposal of water – Water that comes back to the surface following hydraulic fracturing may contain naturally occurring radioactive materials. Mineral planning authorities will need to consider on-site storage and the traffic impact of any movement of water. The Environment Agency will consider the requirements for final treatment/disposal of the water
- Well decommissioning/abandonment – After the exploratory stage, the well could be mothballed for a period of time. Health and Safety Legislation requires the well to be designed and constructed in a way that, so far as reasonably practicable, there is no unplanned escape of fluids from it. The mineral planning authority will be responsible for ensuring the final abandonment of the well head and that the site is restored.

How are the risks of earth tremors managed?

The operator will have to submit to DECC as part of the permission process, a review of all the information on fault lines in the location of the drilling. Background seismicity is measured before fracking operations commence. In 2012, DECC introduced new measures to control risks. It is proposed that fluid amounts are controlled to levels that are sufficient to allow the gas to flow. Once fracking commences, real time seismic monitoring will be used to operate a “traffic light” warning protocol. Operations have to stop if tremors are detected above a particular range. The magnitude is well below the energy level that could be felt at the surface.

What happens to the liquids that come back up the well?

Some fluids return to the surface. They can under certain circumstances be reused in the process. Any excess liquid would be contained and if necessary removed for treatment at an appropriate facility.

Is Fracking safe?

The Royal Society and Royal Academy of Engineering has carried out an independent review of the major environmental and geological risks associated with fracking in the UK and the extent to which these risks can be effectively managed. The main conclusion of their report is that the risks associated with fracking can be managed effectively in the UK provided that operational best practices are implemented and regulated effectively.

<http://royalsociety.org/policy/projects/shale-gas-extraction/report/>

G: LOCAL COMMUNITY CONSULTATION

How will the community be consulted on any planning application for oil and gas development?

Public consultation is a fundamental part of the planning process. The applicant for any planning application for an oil well will need to serve notice on the relevant landowners. The planning application will be advertised, and the mineral planning authority will ensure that the local community where the proposal is located, will be notified about the proposed development. Further details on the processes that the mineral planning authority would follow are contained in East Sussex County Council's Statement of Community Involvement.

<http://www.eastsussex.gov.uk/environment/planning/development/mineralsandwaste/default.htm>

The UK Onshore Operators Group has a Community Engagement Charter which sets out that communities will be engaged at each of the three stages of operation.

How can an individual get involved?

Details of any applications for oil and gas development will be included on the County Council's website. Any individual can make a representation within the time period prescribed.

What community benefits have the Government announced?

On 13 January 2014, the Government announced that community benefits for local people will be strengthened. Councils will be able to keep 100% of the business rates from shale gas sites. Last year, operators stated that local communities would receive £100,000 in community benefits at exploration phase, per well-site where hydraulic fracturing occurs, and if shale gas is discovered to share 1% of revenues. The industry has confirmed that it will further consult on how this money could be shared.

H: MORE INFORMATION

Where do I look for further information on fracking and shale gas?

There is a vast amount of information published on the subject, including on the Internet. However – the following publications may be of more general interest:

General Government guidance and publications

A regulatory road map for onshore oil and gas exploration in the UK

<https://www.gov.uk/government/publications/regulatory-roadmap-onshore-oil-and-gas-exploration-in-the-uk-regulation-and-best-practice>

Oil & Gas Licencing – Overview

<https://www.gov.uk/oil-and-gas-licensing-rounds>

Developing Onshore Shale Gas and Oil – Facts about ‘Fracking’ December 2013

<https://www.gov.uk/government/policies/providing-regulation-and-licensing-of-energy-industries-and-infrastructure/supporting-pages/developing-shale-gas-and-oil-in-the-uk>

House of Commons Library – Shale Gas and Fracking 13 August 2013

<http://www.parliament.uk/briefing-papers/SN06073>

The Impact of Shale Gas on Energy Markets House of Commons Energy and Climate Change Committee 26 April 2013

<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenergy/785/785.pdf>

More technical advice

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

http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/projects/shale-gas/2012-06-28-Shale-gas.pdf

The planning and regulatory regime

Planning Practice guidance for onshore oil and gas. DCLG July 2013

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224238/Planning_practice_guidance_for_onshore_oil_and_gas.pdf

National Planning Practice Guidance (NPPG) – Updated 2014

<http://planningguidance.planningportal.gov.uk/>

NPPG – Planning for Hydrocarbon Extraction

<http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/planning-for-hydrocarbon-extraction/>

Onshore oil and gas exploration and development integration between regulatory agencies March 2013

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/139624/Onshore_Role_of_Regulatory_Agencies_March_2013_.pdf

The geology of conventional and unconventional gas

A succinct explanation for those interested in the geology can be found here:

http://www.nt.gov.au/d/Minerals_Energy/index.cfm?header=What%20is%20the%20difference%20between%20Conventional%20and%20Unconventional%20Gas?

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