2

Briefing: The Shale Gas Legal Landscape

June 2020

Joanne Hawkins, University of Leeds

Summary of Key Findings

The current presumption against issuing hydraulic fracturing consent (HFC) in effect, imposes a temporary moratorium on future activities. However, this position will be subject to review should new evidence relating to the prediction and management of induced seismicity be provided. As such an examination of the existing regulatory framework is key to understanding the relevant legal landscape in which potential future developments could take place. Should the presumption against issuing HFCs be lifted:

- There is a problematic tension in the planning context between previous national policy support for shale gas and the aims of the Localism Act 2011. This is exacerbated by planning appeal outcomes to date and generates uncertainty for LMPAs and operators involved in shale gas related planning applications.
- Beyond planning, a broad range of well-established regulatory controls are potentially applicable to shale gas developments. Further, numerous regulatory changes have been made since 2010 which work towards building a more certain and coherent framework. Regulatory changes predominantly reflect previous government support for shale gas developments but also reveal responsiveness to NGO and local community concerns.
- However, a number of regulatory areas require further attention (e.g. role of environmental impact assessments, industrial emission permit controls, remediation of land). Ongoing review of applicable controls should be undertaken if the industry develops to ensure the purposes of controls are not undermined when applied in practice.
- Where legal challenges are brought against regulatory decisions, unless there is a procedural failure, the courts are reluctant to interfere in specialised decisions by expert bodies. Given the courts limited role here, it is important that the relevant expert bodies keep the substance of controls, and their co-ordination, under review should development continue.
- With Brexit posing a significant threat of regression to general environmental standards in England, and the overarching regulatory framework within which shale gas developments take place, ongoing review of the regulation is particularly important.

January 2020

The Shale Gas Legal Landscape

Regulation is a governing force of all development. Understanding how the regulatory framework shapes developments is key to a meaningful understanding of the potential for/impact of shale gas developments in England. This briefing paper provides an overview of: the regulatory framework, implemented and proposed changes to this framework post 2010, and relevant legal challenges to the framework. Given the key role that the planning system plays in the regulation of shale gas developments, the paper begins by reviewing these three points in the context of planning before moving on to examine them in relation to other aspects of the regulatory framework.

Table 1.1. Key regulatory steps before shale gas drilling can take place

Key regulatory steps
Obtained PEDL from OGA
Secured a lease from the landowner
Submitted relevant PON notifications to OGA
Secured planning permission from the LMPA
Discharged any relevant conditions placed on the planning permission
Informed the BGS of intention to drill
Completed the necessary consultation processes with all the statutory/relevant consultees
Obtained all the necessary permits from the Environment Agency
Notified the HSE of the intention to drill
Provided HSE with details of the proposed well design examined by an independent and competent well examiner
Agreed data-reporting methods with OGA
Agreed a method for monitoring induced seismicity and fracture growth height with OGA where hydraulic fracturing is planned
Received approval for an outline hydraulic fracturing programme from OGA, where hydraulic fracturing is planned.
Received consent to hydraulically fracture (post November 2019 the Government has issued a presumption against issuing new HFCs)

1. The current presumption against issuing hydraulic fracturing consent (HFC)

Following the Oil and Gas Authority's interim report analysing data from Cuadrilla's operations at Preston New Road (OGA, 2019), the Government announced that from November 2019 there will be an ongoing presumption against issuing any new consents for hydraulic fracturing (HFCs) (BEIS, 2019b). Hydraulic fracturing consent must be obtained before an operator can carry out any associated/relevant hydraulic fracturing (more than 1,000 cubic metres of fluid at each stage, or expected stage, or more than 10,000 cubic metres of fluid in total). This presumption, in effect, imposes a temporary moratorium on future hydraulic fracturing activities (although exploratory drilling activities that do not involve hydraulic fracturing can continue, and the Secretary of State can still consider any HFC application on its own merits despite the presumption). Notably, the general presumption against issuing HFCs could be subject to review should new evidence relating to the prediction and management of induced seismicity be provided. Cuadrilla has already announced their intention to provide the OGA with further detailed data to address the concerns that have prompted the temporary moratorium (Cuadrilla, 2019), and the OGA has stressed the interim nature of their 2019 report. As such an examination of the existing regulatory framework is key to understanding the relevant legal landscape in which potential future developments could take place if, following the availability of new data, the presumption against issuing HFCs is lifted.

2. The planning system

Political support for the shale gas industry in England has, until November 2019, been constant despite the change from Conservative/Liberal Democrat coalition (2010), to Conservative Government (2015). Notably this support stood in contrast to the position on fracking adopted by all the other main opposition parties. Of note too, is the clear divergence in approach to shale gas developments in England and the devolved governments (their administrations holding the relevant licensing powers for oil and gas). Both Welsh and Scottish administrations have planning measures in place which currently create a presumption against shale gas developments. In 2015, prior to the breakdown of the Northern Irish Government, their revised Strategic Planning Policy Statement (SPPS) also indicated that there should be a presumption against unconventional hydrocarbon extraction until there was further evidence on environmental impacts. Despite a legal challenge to the Scottish Administration's position in 2018 (*Ineos Upstream v Lord Advocate*),

the court refused to interfere in an ongoing policy development process, and the Scottish Government confirmed their final policy position of no support in October 2019. Any future challenge to actions taken by devolved administrations, be they policy or legislative, will have to succeed in showing that such action does not fall under devolved powers relating to matters of licensing, environment or planning. Given the approaches of the devolved administrations, and the scope to reverse the presumption against issuing HFCs in England (if new evidence is made available) this paper focusses on the regulatory framework in England that has governed/would govern any future shale gas developments.

2.1 Key reforms to the planning system post 2010

Any shale gas development requires planning permission from the Local Mineral Planning Authority (LMPA) under the Town and Country Planning Act 1990. Planning decisions are focussed around whether development is an acceptable use of land when judged against national and local planning policy (National Planning Policy Framework and Local Development Plans). When making their Local Development Plan, the local planning authority must have regard to national planning policies and advice/guidance issued by the Secretary of State. Any local development plan is subject to independent examination and must be 'sound'. The definition of 'sound' includes a consideration of the extent to which the local plan is consistent with national policy (MHCLG 2018c (NPPF): para 35).

Table 1.2. Key reforms to national planning policy and the national planning system post 2010

Key Change:	Effect:
Planning Practice Guidance – Minerals (revised 2014)	▶ Mineral planning authorities should take account of government energy policy (DECC, 2013) which states that energy supplies should come from a variety of sources including onshore oil and gas. ▶ Applications for the exploratory phase should be considered on their own merits. They should not take account of hypothetical future activities i.e. production.
Planning for Onshore Oil and Gas: Written statement (2015).	▶ Local councils who fail to reach a decision on a shale gas exploration site application within 16 weeks may see their oil/gas applications decided by the Communities Secretary. ▶ Shale gas applications added as a specific criterion for the recovery of appeals.
The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016	▶ Removal of the requirement for planning permission to drill boreholes for the purpose of groundwater and seismic monitoring.
Energy Policy: Written statement (2018)	▶ Emphasises the national importance of shale gas and the benefits of mineral extraction. ▶ Local plans should not set restrictions/thresholds that limit shale development without proper justification. ▶ Proposed launch of a £1.6 million shale support fund to build capacity and capability in local authorities dealing with shale applications. ▶ Proposed launch of a new planning brokerage service for shale applications to provide guidance to developers and local authorities on the planning process (with no role in making planning decisions/commenting on the merits of an application)
Revised National Policy Planning Framework (2018).	▶ Emphasises that 'great weight should be given to the benefits of mineral extraction, including to the economy'. ▶ Paragraph 209(a) and the duty to facilitate 'exploration and extraction' of onshore oil and gas was challenged and found to be unlawful (see discussion in section 2.4)). However, the remainder of the revised NPPF, including chp. 17 on 'facilitating the sustainable use of minerals' is unaffected.

Given the strong support for shale gas in past written ministerial statements and the current NPPF, any deviation from this, such as in the Draft Spatial Framework for Greater Manchester, which states that hydraulic fracturing (fracking) will not be supported, (Greater Manchester Combined Authority, 2019), risks being judged non-compliant should the current presumption against issuing HFCs be lifted.

The Localism Act of 2011 aimed to give local planning authorities greater freedom to develop local plans without undue interference from central government (DCLG, 2011: 14). There is a clear contradiction between the spirit of the Localism Act and the previous Written Ministerial Statements (WMS) on shale gas planning policy/ revised NPPF. This tension is further illustrated by recent refusals of planning permission and LMPA opposition to applications at inquiries for non-determination. For example, despite the fact that Lancashire and Derbyshire both have Conservative majority Councils (reflected in their planning committee membership make up of 7 Conservative, 4 Labour and 1 Independent for Lancashire, and 6 Conservative and 4 Labour for Derbyshire) this has not prevented them from taking positions that diverge from government policy at the time favouring the benefits of shale gas and its role in our energy mix. This suggests that LMPAs are prepared to prioritise concern over local impacts above national policy. However, the success of appeals against LMPA refusal questions the weight that can be given to such concerns in determining applications (for further discussion of planning appeals and the key lessons see section 1.3).

Should the Government lift the presumption against issuing HFCs, uncertainty over the limits of LMPAs' power/discretion in the current planning system risks generating inconsistency in decisions. This in turn renders the identification of potentially suitable sites difficult to predict as well as risking increased financial burdens for both operators and LMPAs.

2.2 Other proposed reforms

The Government conducted consultations on classifying non-fracking shale gas exploration (i.e. exploration activities that do not involve fracking, such as drilling for the purposes of searching for the presence of natural gas) as a permitted development that does not require planning permission (MHCLG, 2018a), and recategorizing shale gas production developments as Nationally Significant Infrastructure Projects (NSIP) so that planning applications are decided by the Secretary of State and not LMPAs (BEIS, 2018). These proposed changes were strongly opposed by the Housing, Communities and Local Government Committee and numerous MPs (Hansard, 2018: vol 646 column 328WH). In November 2019, the Secretary of State for Business, Energy and Industrial Strategy confirmed that the proposed reforms would not be taken forward. Such changes would have further eroded the alleged spirit of Localism in planning that the 2011 Act sought to strengthen. Such a move may have facilitated the speed at which developments could progress, but were likely to come at the cost of further public opposition and distrust. Given that research, and experience on the ground, has shown how damaging public opposition can be, any such reforms which ignore public opinion/perceptions were unlikely to facilitate shale gas developments in the long run (Bradshaw and Waite, 2017).

2.3. Legal challenges in the planning context

To date, there have been a number of legal challenges in the planning context. The mechanisms for bringing such challenges are:

- **Planning appeal** (section 78 of the Town and Country Planning Act 1990) - If an application for planning permission is refused by the LMPA, or if it is granted with conditions, an appeal can be made to the Secretary of State.
- **Statutory Review (s288 of the Town and Country Planning Act)** – If a planning permission has been granted following a successful appeal against a previous refusal of permission, or if permission is granted by the Secretary of State, a statutory review' can be brought.
- **Judicial review** – decisions are open to challenge through judicial review (JR) if the relevant authority is not considered to have acted in accordance with the law when exercising its duties or powers. To bring a claim, the person/persons must have sufficient standing and grounds. A broad approach to standing has been taken in environmental cases and standing has been interpreted to mean those with a sufficient interest in the matter (enabling both individuals and NGOs to establish JR claims). When it comes to grounds, mere disagreement with a decision is insufficient. One of the following restricted grounds must be shown 1) illegality, 2) procedural unfairness, 3) unreasonableness or irrationality, and 4) incompatibility.

2.3.1 Key lessons from legal challenges

A number of key lessons can be drawn from the planning related legal challenges that have been brought to date which are of importance should the Government lift the presumption against issuing HFCs (for a detailed overview of these challenges, outcomes and points of note see table 1.3 in annex 1).

- LMPAs that refuse planning permission contrary to the advice of the local planning officer are likely to struggle in defence of such a position on appeal. The only refusal upheld on appeal to date, at the Roseacre Wood exploration site, was for a site at which the local planning officer and inquiry inspector recommended refusal.
- Where a development may not comply directly with an existing local plan, this does not necessarily justify a refusal. The development can still be granted permission if a development can be read in accordance with the other relevant policies of a development plan, taken as a whole, and the harm is considered minor enough to be outweighed by other material considerations.
- LMPAs should take heed of the 16-week time frame for making decisions. It is clear that non determination risks local authorities losing the power to make decisions over application in their area. Whilst this amendment, and the overturning of LMPAs refusal at the appeal stage by the Secretary of State, or an appointed inspector, has given rise to discussion of the democratic nature of such decision making, it is well established that such a procedure is in fact compliant with Article 6 ECHR (right to have civil rights and obligations determined by an independent and impartial tribunal) (R on the application of Alconbury Developments Limited and Others).
- Whilst the splitting up and segregating of different regulatory tasks and goals e.g. the assumption during planning decisions that all other regulatory systems operate effectively (MHCLG, 2014: para 121), may be necessary to prevent paralysis of development, it is something that regulators, particularly the Shale Environmental Regulator Group (SERG) should constantly review. This review is necessary to ensure that LMPAs can confidently rely on this assumption and to avoid duplication/overlap in regulatory stages. If developments progress, particularly should we move towards production, greater clarity is needed over how LMPAs can deal with cumulative impacts in their area when many of these impacts may fall under the purview of other regulatory bodies.
- The segregated approach to granting permission for each stage of development (i.e. exploration applications should be considered in isolation from potential future production) limits the extent to which LMPAs can engage with the overall potential impact of developments in their area and creates a somewhat artificial decision-making framework. Where exploratory drilling establishes the presence of hydrocarbon resources, this is likely to be material in determining whether the area is suitable for continued use in the production phase. Whilst this fragmented approach may again be needed to prevent paralysis of development, it risks exacerbating the tension LMPAs already face in their ability to balance national government support for shale gas and local concerns/impacts on the area (despite the aims of the Localism Act). This is particularly so given the success of planning appeals to date and the financial implications for LMPAs of defending a refusal.

2.3.2 Potential challenges in the planning context

Public perceptions

Whilst public perceptions are often considered in isolation from the regulatory system, they have the potential to challenge shale gas developments from within the planning system. Case law has indicated that public perception of danger/risk can form a material consideration within planning (*Newport BC).* The courts have taken a somewhat inconsistent approach to determining whether public perceptions need to be objectively justified (contrast the decisions in *Gateshead* and *Newport*). However, the more recent Court of Appeal case (*Ex p. Al Fayed.*), relating to telecommunications masts, suggest that the existence of objectively unjustified fears in the locality can, in some circumstances, be a legitimate factor for a planning authority to take into account when determining a planning application. However, they should only be given such weight as might be appropriate in the particular circumstances of the case (*Trevett*).

3. Regulation of shale gas developments

A broad range of well-established regulatory controls are potentially applicable to shale gas developments should the Government lift the presumption against issuing HFCs (for a detailed overview of the key regulations and their effect see table 1.4 in annex 1). Despite the broad range of applicable controls, concern over the regulatory system prompted the issuance of an EU recommendation on hydraulic fracturing in 2014 (M Broomfield, 2012; Milieu, 2013; EU Commission,

2014). The key areas identified as requiring further action were: strategic planning and environmental impact assessment, co-ordination of regulation where multiple agencies were involved, geological suitability/risk assessment of the exploration or production site, baseline studies, operational requirements and Best Available Techniques (BAT), use of chemical substances and water, monitoring requirements, environmental liability, and public dissemination of information. Regulatory reform in England has not been lacking and has led to numerous changes, both legislative and non-legislative, in the regulatory framework (for a detailed overview of these changes and their effect see table 1.5 in annex 1). These changes work towards addressing the deficiencies identified by the European Commission in 2014. More than this, a response to NGO concerns, and issues of particular pertinence in England (e.g. protected areas, baseline monitoring) are visible in the regulatory response. Overall however, the regulatory changes reflect the underlying government support for industry development visible up until November 2019. Whilst the changes have undoubtedly increased the certainty of the regulatory framework, in particular the dedicated guidance on shale gas developments from regulators and industry bodies, the applicability and suitability of the relevant regulations is something that requires ongoing attention should the industry develop. So too, particularly should the industry develop and move to a production phase of development, is the regulators ability to build capacity, and the potential challenges posed by a system that (much like many other regulated industries) relies heavily, although not solely, on operator self-reporting (National Audit Office, 2019).

3.1 Areas of the regulatory framework in need of review

In particular, the following areas of the regulatory framework still require attention:

Role of Environmental Impact Assessments (EIA)
EIAs are designed to ensure that, where projects are likely to have a significant impact on the environment, the LMPA has full knowledge of these effects when making its decision (EIAs also require public participation that can be bypassed if no such assessment is undertaken). The voluntary conducting of an EIA by UKOOG members, in order to ensure that decision makers have a robust body of evidence, is a very welcome undertaking by industry. However, conducting an EIA should not be dependent on best practice or voluntary actions. The EU Commission has already noted the lack of a systematic EIA requirement in England for developments involving high volume hydraulic fracturing (as was required under the 2014 Recommendation) (EU Commission, 2018). Under current regulations an EIA is only compulsory for Schedule 1 activities. Shale gas developments will potentially fall under this criterion where 500,000 cubic metres of gas is extracted from the site per day (this is unlikely to be relevant at the exploration stage). Alternatively, an EIA may be required under schedule 2 para 2(d) on the basis that activities involve either deep drillings (where the area of works exceeds 1 hectare) or para 2 (e) on the basis that activities involve surface industrial installations for the extraction of natural gas (where the development exceeds 0.5 hectares). Notably however, even where these schedule 2 thresholds are triggered, this does not equate to an automatic EIA requirement. Rather, it compels the local authority to screen the development and determine whether significant effects on the environment are likely. Many projects that trigger the initial schedule 2 thresholds will still not require an EIA following this screening if they are not considered to have such effects. The current indicative guidance on when a development will have significant effects on the environment suggests that this is likely where (under para 2 (d)) a deep drilling activity involves a surface site of more than 5 hectares (exploratory drilling on its own being explicitly listed as unlikely to require an EIA), or (under para 2 (e)) where the surface installation for the extraction of natural gas exceeds 10 hectares (MHCLG, 2015). During screening, local authorities are also required to consider the nature and location of the development to comply with the EIA Directive (Case C-392/96). To ensure the objective of the EIA Directive is not undermined, particularly at the exploratory stage, it is crucial that local authorities do not use the current indicative criteria to create a practice which exempts projects from the requirement of an EIA due to the size of the site alone. This is particularly important when the effects, on the environment, of developments taken together (i.e. cumulative impacts) could be significant. The current lack of a systematic EIA means careful ongoing scrutiny of the existing triggering thresholds in the context of shale gas developments, and the guidance on their application, is required.

Industrial Emissions Directive/ Environmental Permitting
Unconventional hydrocarbon exploration and exploitation are not explicitly mentioned activities under the IED. This means permit requirements are triggered if relevant activities (where relevant thresholds are met) take place as part of the development e.g. combustion through flaring, waste management. Where triggered, permits are currently awarded on an individual well pad basis and the EA has clarified that it expects this to continue at the exploration stage (European Commission, 2018: Part B pg 154). Clarification on whether a group of well pads could be deemed an installation was provided in EA guidance (2015) and the EA have indicated that, at further stages of development, they may consider regulating sites under one permit where sites are located close together, appear to have a very clear connection and are

managed by the same operator. It is crucial that this is kept under review to achieve the IED's purpose of an integrated approach to the regulation of emissions and to ensure that cumulative impacts are not allowed to develop due to overly fragmented permitting. This also acts to reduce the unnecessary duplication of permit applications for operators. An integrated approach is crucial if a large number of exploration sites are established, or should we move beyond the exploratory phase.

Best Available Techniques (BAT)

Given the newly published 'Best Available Techniques Guidance document on Upstream Hydrocarbon Exploration and production' by the EU Commission, any future permit applications should review their proposed methods in light of this.

Definition of HVHF

At present the discrepancy between the Infrastructure Act's (and associated regulations) definition of hydraulic fracturing, and the definition within planning guidance is leading to uncertainty for LMPAs. Whilst clarity over the definition would be welcome, questions remain over the suitability of the definition used within the Infrastructure Act (which is liquid/volume based). Such concerns are reflected in North Yorkshire County Council's draft joint waste and minerals plan where the authority have opted to adopt a broader definition of fracking (which does not adopt a minimum volume threshold) (North Yorkshire County Council 2016 & 2019). Notably the Housing, Communities and Local Government Select Committee also concluded that the definition of fracking used in the planning context should not be liquid or volume based (HCLG Committee, 2018). Any definition used within planning and/or statute should be kept under continuous review. In defining 'hydraulic fracturing' there is a risk that activities which use underground injection stimulation/have a similar impact, but do not meet any technical definition will fall outside the scope of the regulations. Should the industry develop, any definition should be reviewed to reflect practices on the ground to ensure that the new controls achieve their purpose on a site-by-site basis.

Buffer Zones

To date, the Government has been clear that it considers the designation of protected areas to strike the right balance between protecting the most sensitive areas whilst also allowing the shale industry to develop. The use of buffer zones in local development plans as a general principle associated with shale gas development could find itself open to challenge on the basis that it contradicts planning practice guidance. Guidance states that buffer zones may be appropriate in specific circumstances, based on site specific assessments (MCHLG, 2014: para 126). This suggests that LMPAs may be able to impose buffer zones but that this should be done on a site-specific basis rather than forming a general principle of the Local Development Plan (LDP). The current approach to buffer zones in England contrasts approaches in a number of US states where such set-back zones are mandated for hydraulically fractured wells (e.g. in Pennsylvania wells must be 500 feet from buildings and water wells unless a waiver is obtained. In Ohio wells must be more than 150 feet from occupied dwellings unless the owner of the dwelling provides a written waiver. In West Virginia wells must be more than 250 feet from existing water wells and springs, as well as being more than 650 feet from occupied dwellings and large livestock buildings (Wiseman, 2017)).

Financial Resilience and remediation of land

At present, responsibility for the restoration and aftercare of mineral sites lies with the minerals operator. However, in the case of default by the operator, responsibility can shift to the landowner (MHCLG 2014, para 36). Whilst section 106 (Town and Country Planning Act 1990) agreements between operators and LMPAs can be used to impose planning obligations to cover the remediation of sites, this is only of use provided the operator can be found. In considering the imposition of a bond, this is not required and can only be imposed if 'necessary; relevant to planning and to the development to be permitted; enforceable; precise and; reasonable in all other respects' (NPPF, 2018 para 55). Notably, any conditions which are considered to place an unjustifiable/ disproportionate financial burden on an applicant will fail the test of reasonableness (MHCLG, 201: para 48; MHCLG, 2019: para 5). This suggests that planning authorities have limited scope in terms of requiring large financial bonds as a condition of planning permission. The OGA has now committed to conducting an assessment of financial resilience relating to license commitments. This is a welcome step in addressing concerns relating to the financial viability of shale gas exploration companies, particularly given that a number of companies are/are expected to be new entrants to the market (OGA, 2018). However, it is not a substitute assessment and other regulators, including mineral planning authorities, are advised to conduct their own assessment. The National Audit Office has highlighted that at present the lack of clarity over potential landowner liability in the case of operator insolvency is problematic. More than this, should a landowner face liability for which they are unable to cover the costs, there is a further issue. Whilst the Department for Business, Energy and Industrial Strategy (BEIS) explicitly recognises ultimate government liability for decommissioning of offshore oil and gas infrastructure (where an operator cannot decommission) it does not do so for onshore wells leaving a significant potential gap in liability/responsibility (National

Audit Office, 2019). This is an ongoing area of concern in the regulatory system that requires further dedicated attention to ensure the issue of remediation is fully addressed.

Baseline monitoring and liability for environmental damage

The compulsory baseline monitoring introduced under s50 of the IA 2015, and the air quality monitoring required as part of the environmental permitting regime are welcome developments. Whilst additional monitoring has taken place at some sites (such as Kirby Misperton) the limited measurements on soil, status of buildings and infrastructure and land use were highlighted as potential areas for concern when looking at the extent to which England has fully addressed the regulatory gaps identified by the EU Commission in 2014 (EU Commission, 2018: part c, 510). The importance of baseline monitoring is key given that at present, uncertainty remains over potential liability under the Environmental Liability Directive. The whole lifecycle of the project may not be covered by strict liability (SL) (although the management of mining waste would be covered) meaning that fault/causation must be established to attribute liability. This reinforces the importance of baseline monitoring to different mediums, in particular the importance of the additional British Geological Survey (BGS) monitoring that is ongoing, to ensure that, should any damage occur, the potential absence of SL does not act as an obstacle to attributing liability. It is of note that this additional monitoring through the BGS is not part of the regulatory system and as such is not expected to take place in other potential areas for shale gas exploration.

3.2. Brexit and potential regulatory changes

The UK's exit from the EU has the potential to significantly impact on the way in which environmental law and policy operate in the UK. Whilst the final picture may be affected by the type of deal, if any, struck between the UK and the EU, the Draft Environment (Principles and Governance) Bill 2018 offered the first concrete insight into the Government's intended approach to domestic environmental regulation post Brexit. The Draft Bill was subject to extensive criticism at the pre-legislative scrutiny stages (Environmental Audit Committee 2019; Environment, Food and Rural Affairs Committee, 2019; Lee 2019; Fisher, 2019), and suggested that environmental protection plans post Brexit would result in significant regression of EU standards (Lee and Scotford, 2019). A new Environment Bill was published in October 2019, and whilst it made some welcome changes, numerous deficiencies remained. Following the general election in December 2019, the latest Environment Bill has now been introduced. This new Bill, and the scrutiny process, provides an opportunity to reflect upon the following key issues in order to ensure that current environmental standards are maintained post Brexit.

Accountability

For shale gas developments, the issue of accountability is a particularly pertinent one, both from the perspective of ensuring developments take place within an appropriate legislative framework of environmental protection, but also in terms of securing public trust in that framework. The central issue in the Environment Bill relates to the Government's intention to establish oversight and enforcement of environmental law through the Office for Environmental Protection (OEP). At present, the European Commission acts as the relevant oversight body and its independence has proved particularly important when it comes to holding member states (MS) governments to account for environmental law breaches and failures. The financial set up of the OEP, a non-departmental government body whose appointments and budget are determined by the Secretary of State, appears to severely restrict its true independence. This in turn risks a significant accountability gap, particularly when it comes to criticising or holding the government to account. To compound this, the OEP's powers of enforcement are focussed around a 'failure to comply' with environmental law. This is problematic for two key reasons. First, the Secretary of State can remove legislative provisions from the definition of 'environmental law', thus removing the OEP's remit/enforcement powers. Second, 'failure to comply' means unlawfully failing to take proper account of environmental law when exercising functions or unlawfully exercising/failing to exercise functions. The premise in this definition that the law is something to be taken account of, and not complied with, is worrying, (Lee, 2019).

Notably, in considering the impact of the OEP's enforcement role, their ability to take action against 'public authorities' has important implications. It may mean that individual local authorities or arm's-length bodies (not the Government), could be held to account for failing to meet environmental standards and targets which may well be outside their control. This could be a significant risk for local authorities should shale gas activities result in any breach of environmental standards for the area.

Role of environmental principles

Principles under EU law, (such as the polluter pays and precautionary principle) are essentially manifestations of the broader overarching visions of environmental policy, which are given legal force. They have shaped obligations in legislation, and informed legal tests in the review of public decision-making. They are currently binding on all public authorities. Under the Environment Bill, principles will become creatures of pure policy to which only Ministers (not all public bodies) must simply 'have due regard'. Environmental principles have been key to shaping regulatory decisions in the context of shale gas (and relevant reviews of such decisions as already evidenced in a number of the legal challenges, see table 1.3 in annex 1). The weakening of the role of principles undermines assurances that environmental protections post Brexit will be at least equivalent to those already in place (Lee, 2019).

Environmental improvement plans

The Environment Bill introduces a new requirement that the Secretary of State set legally binding environmental improvement targets. The Secretary of State may set long-term targets on any matter relating to the natural environment or people's enjoyment of it, and must set a long-term target in respect of at least one matter in the four priority areas of air quality, water, biodiversity and resource efficiency and waste reduction. However, there are two key issues with the current environmental targets.

- The obligation to 'significantly improve the natural environment' is not a requirement for each individual long-term target. Instead, it is a review tool against which all targets will be cumulatively assessed. This cumulative review opens the door to potentially backwards steps in some areas provided that improvement is taking place in others (resulting in a cumulative improvement upon review). More than this, 'significant improvement' in the current Bill does not refer to existing targets and standards (to which, as an EU member state, we are already committed) but rather focusses on current environmental conditions. This framing risks providing a route for regression of existing standards/targets and a de-regulatory agenda in England (Lee, 2019).
- Targets can be revoked or weakened if the Secretary of State is satisfied that meeting the target would have no significant benefit or when, because of changes in circumstances, the environmental, social, economic or other costs of meeting it would be disproportionate to the benefits. The scope for regression here, even where targets are set under the Bill, is clear (Lee, 2019).

If the Government's approach to environmental regulation post Brexit is to avoid the regression of environmental standards, the above issues must be addressed. Whilst the latest Environment Bill makes some welcome changes (e.g. the inclusion of climate change in the OEP's remit) worryingly, it appears to provide scope for an immediate de-regulatory agenda. In conjunction with the ongoing risk that negotiating new trade deals, in particular the UK-US trade deal, poses to further downward pressure on environmental standards in England this is concerning (Burns, 2019). This is compounded by clause 26 of the European Union (Withdrawal Agreement) Act, which allows for the making of regulations that may mean courts/tribunals will no longer to be bound by retained EU case law. The potential to overturn existing case-law from the CJEU poses a significant threat to key strands of existing environmental law (Reid, 2020).

Given the centrality of environmental regulation to shale gas developments, the Environment Bill has significant potential consequences for the overarching framework which governs developments and will require ongoing scrutiny.

3.3 Legal challenges to the existing regulatory framework (beyond planning)

Legal challenges outside the planning context, using the judicial review mechanism, have been brought against numerous areas of the regulatory framework (for a detailed overview of these challenges, outcomes, and points of note see table 1.6 in annex 1).

3.3.1 Key lessons

Again, a number of key lessons can be drawn from the legal challenges that have taken place to date which are of importance should the Government lift the current presumption against issuing HFCs.

- The restricted scope of judicial review is designed to reflect its purpose; the prevention of unlawful decisions. It is not a second chance to debate a decision that particular individuals/groups disagree with nor a forum for discussion

of broader policy issues. The case law has firmly illustrated that establishing the restricted grounds is challenging (see overview of the limited basis on which judicial review can be sort in section 1.3). Whilst the grounds used to challenge shale gas developments have been varied, the overall picture is clear. The courts are reluctant to interfere in regulatory decisions provided that the correct procedure has been followed. Expert bodies (e.g. the EA, HSE) are involved in highly specialised decision making regarding the environment and shale gas developments. It is not for the court to re-examine the merits of any such decision or to substitute its own opinion.

- The limited scope of judicial review, and the courts limited role, re-enforces the fundamental importance of ensuring that the relevant expert bodies ensure that the substance of the system is comprehensive and coherent. Given that regulatory functions span across a number of bodies, this, and the co-ordination of controls, should be a key focus of the new virtual regulator.
- Cases such as Stephenson illustrate that the judicial review mechanism is a crucial means of holding the government and regulatory bodies to account. However, issues relating to access to justice, and the legal cost of bringing a judicial review warrant attention. New rules, introduced in February 2017, scrapped automatic caps which limited the costs of losing a legal challenge in England and Wales. Costs and the potential barriers they could create, pose a potential threat to ensuring that environmental standards are met.

3.3.2 Potential challenges to the framework

Climate change

Given the UK Government's recent commitment to net zero by 2050 (Climate Change Act 2008 (2050 Target Amendment) Order 2019), the scope for legal challenge here should not be ignored. Should the presumption against issuing HFCs be lifted, climate related challenges could potentially be brought at different stages of the regulatory framework. First, at the planning stage. As discussed in section 1.1 LDPs are subject to independent examination which includes consideration of whether the plan is 'sound' and the consistency with national policy is a key factor. Whilst local decision makers can weigh the support for shale gas in the NPPF against para 148 and 149 of the NPPF (to take decisions that support reductions in greenhouse gas (GHG) emissions and plan proactively for climate change) given the strong support for shale gas in the WMS and NPPF any strong deviation from this could be open to challenge. At an individual application level, especially at the exploration stage, refusal of an application on the basis of climate change is likely to be subject to an appeal. At this stage of development applications for exploration should be considered in isolation from the potential production that may follow, suggesting that, climate change grounds for refusal may be difficult to defend at appeal (the Ellesmere Port inquiry will be of significance in clarifying LMPAs discretion in this regard, see table 1.6 in annex 1). Such grounds may however hold greater sway at the production stage of development. Even if this is so, given the macro level issue posed by GHG emission and climate change, it is questionable how well placed each individual authority is, and how desirable it is, that they consider the issue on such an individualised basis.

Second, where climate-related challenges are brought to other regulatory decisions e.g. permits, the isolated nature of the regulatory decision combined with the fact that the review is concerned with whether the correct procedure has been used/the decision is lawful, broader policy arguments are likely to be outside the scope of challenge.
At the broader scale, challenges on the basis of the Climate Change Act and binding reduction targets may also face issues. Despite recent success (e.g. by Client Earth (*R (ClientEarth (No 3)*) in relation to government air quality targets, the issues relating to accountability and enforcement mechanisms post Brexit (highlighted in section 2.4), could prove a significant hurdle in ensuring that government commitments under the Climate Change Act are more than rhetoric.
It is of note that climate change actions are increasingly looking to target companies responsible for GHG emissions, and not just governments, and this is something that warrants further consideration for shale gas operators (Setza and Byrnes, 2019).

4. Summary

Should the presumption against issuing HFCs be lifted, the existing tension between national policy and localism in the planning system is likely to continue generating high levels of uncertainty. A lack of clarity over the limits of LMPAs power/discretion under the current planning system risks generating inconsistency in decisions. This in turn renders the identification of potentially suitable sites difficult to predict as well as risking increased financial burdens for both operators and LMPAs.

Beyond planning, the regulatory framework in England has undergone numerous changes since 2010. Clarity of the framework has been enhanced both through legislative provisions and through important non-legislative guidance

and policy from regulatory and industry bodies. However, should the current presumption against issuing consents to hydraulically fracture be lifted, an ongoing review of regulatory controls, in particular triggering thresholds, is crucial to ensure that should the industry develop, the purpose of regulatory controls is not undermined by practices on the ground. Given that the regulatory framework involves numerous regulatory bodies, ongoing review of co-ordination is key to ensuring the aims of the framework are met and that diversity of expertise does not generate gaps/duplication in regulatory oversight. Ongoing review of the framework is particularly important given that the Government's approach to environmental law post Brexit looks set to regress the overarching standards of environmental protection in England. Given that legal challenges to the regulatory framework are focussed on issues of procedure, it is crucial that the substance of the regulations/regulatory procedures are subject to active scrutiny by the relevant expert bodies, in particular as part of SERG's co-ordinating role.

About the Author

Joanne Hawkins is a Lecturer of Business Law at the University of Leeds. She completed her undergraduate studies at Cardiff University (LLB) and gained her PhD at the University of Bristol. Her research engages with regulatory decision making in the context of risk and uncertainty.

Acknowledgements

The research underpinning this review is part of the NERC-ESRC Funded project: *Assessing and Monitoring the UK Shale Gas Landscape* [NERC REF: NE/R017492/1]. For further information see:
http://www.ukuh.org/ theukshalegaslandscapeuksgl/ or email: UKUH@newcastle.ac.uk.

Annex 1 - Tables referred to in main document

Table 1.3 of legal challenges in the planning context

Key challenges:	Points of note:
2014 - Judicial review of the grant of planning permission for 'temporary permission for exploration and appraisal comprising the flow testing and monitoring of the existing hydrocarbon lateral borehole - R. (on the application of Frack Free Balcombe Residents Association) v West Sussex CC [2014] EWHC 4108 (Admin).	Claim dismissed. ▶ It was for West Sussex County Council (WSCC), and not for the Court, to determine the merits of an application. ▶ WSCC was entitled to leave matters within the purview of the EA, the HSE and other statutory bodies entitled to them/WSCC was entitled to assume that the relevant regulatory controls would operate effectively.
2015 - Planning appeal APP/Q2371/W/15/3134385 by Cuadrilla against refusal of permission at Roseacre Wood for 'up to four exploratory wells and hydraulic fracturing of the wells LCC/2014/0101' and for 'monitoring site locations in a 4km radius of the proposed exploration site LCC/2014/0102'.	Appeal allowed and planning permission granted. ▶ Local planning officer recommended refusal. The Secretary of State granted permission for the monitoring sites and confirmed that he would give Cuadrilla and other parties the opportunity to provide further evidence on highway safety at a new inquiry on the exploration site. Following this new inquiry, the Secretary of State (SoS) refused planning permission in February 2019.
2015 - Planning appeal APP/Q2371/W/15/3134386 by Cuadrilla against refusal of permission at Preston New Road for 'up to four exploratory wells and hydraulic fracturing of the wells LCC/2014/0096' and for 'monitoring site locations in a km radius of the proposed exploration site LCC/2014/0097'.	Appeal allowed and planning permission granted. ▶ Local planning officer recommended grant of permission.
2016 - Judicial review of the grant of planning permission at Kirby Misperton to 'hydraulically stimulate and test the various geological formations previously identified during the 2013 KM8 drilling operation, followed by the production of gas from one or more of these formations into the existing production facilities' - R. (on the application of Friends of the Earth Ltd) v North Yorkshire CC [2016] EWHC 3303 (Admin).	Claim dismissed ▶ Council acted lawfully in the exercise of its discretion, in deciding not to seek a financial bond. ▶ Council was entitled, in the exercise of its judgment, to conclude that an assessment of the environmental impacts of burning gas from the KMA well site at Knapton was not required. Any gas piped to Knapton would be within the existing limits of the permits awarded at Knapton/within purview of other regulatory regimes.

2017 - Statutory review of grant of planning permission on appeal APP/Q2371/W/15/3134386 for Preston New Road exploration site - Preston New Road Action Group v Secretary of State for Communities and Local Government [2017] EWHC 808 (Admin)/ [2018] EWCA Civ 9.	Claim dismissed and decision upheld by the Court of Appeal. ▶ Relevant planning policies lawfully interpreted and applied. ▶ No procedural unfairness. ▶ There were no indirect, secondary or cumulative impacts which had to be assessed arising due to potential use of the site for gas extraction after the completion of this development. ▶ Assuming that the relevant regulatory controls would operate effectively to prevent harm to the environment and to human health was consistent with the 'precautionary approach'.
2017 - Planning appeal APP/P4415/W/17/3190843 by Ineos as a result of non-determination by the LMPA at Harthill for 'construction and drilling of a vertical hydrocarbon exploratory well B2017/0805'.	Appeal allowed and planning permission granted. ▶ Local planning officer initially recommended refusal, this changed following submission of a revised traffic management plan at the inquiry stage. Rotherham County Council continued to oppose the development at the appeal.
2017 - Planning appeal APP/U1050/W/17/3190838 by Ineos as a result of non-determination by the LMPA at Marsh lane exploration site for 'construction and drilling of a vertical hydrocarbon exploratory well CM4/0517/10'.	Appeal allowed and planning permission granted. ▶ Local planning officer recommended grant of permission, the planning committee voted to reject this recommendation.
2018 - Planning appeal APP/A0665/W/18/3207952 by Island Gas against refusal of planning permission at Ellesmere Port for 'a workover drill stem test and extended well test of the hydrocarbons encountered during the drilling of the EP1 well'. Note this is for an onshore gas site in the Pentre Chert formation (the application is not seeking permission to drill, deepen or hydraulically fracture the existing well but it is acknowledged that geological data from the well may be used to target the best areas for potential shale gas appraisal/production in the future (Eversheds Sutherland, 2019). However, the decision has significant implications in clarifying the scope LMPAs have to take account of and balance broader policy issues at the local level i.e climate change.	Planning appeal recovered by Secretary of State (SoS) (where instead of an inspector making the decision, an inspector's report will make a recommendation on how the appeal should be determined. This report will then be passed to the Secretary of State who makes the final decision). ▶ Local planning officers recommended approval of the application. ▶ Permission refused on the basis that the application did not comply with local planning policy (which required oil/gas applications to address climate change and make the best of opportunities for renewable energy). This is the first inquiry to consider the issue of climate change. Decision postponed to seek comments/ representations following Government's Climate Change Committee's net-zero report.
2019 -Planning appeal APP/P4415/W/19/3220577 by Ineos against refusal of permission at Woodsetts exploration site for 'construction and drilling of a vertical hydrocarbon exploratory well RB2018/0918'.	Planning appeal recovered by SoS.
2019 - Statutory review of the decision, granted by an inspector at APP/P4415/W/17/3190843 concerning the Harthill exploration site - Barlow v Secretary of State for Housing, Communities and Local Government [2019] EWHC 146 QB.	Challenge failed ▶ The Inspector's refusal to adjourn the inquiry and the reasonable and proportionate measures adopted instead to cater for the position of interested parties, did not deprive the Claimant of a reasonable opportunity to challenge INEOS' case. There was no procedural unfairness, and there was no material prejudice.

Table 1.4 of key regulations and their effect

Key areas of regulation/potentially applicable controls (grouped according to the different elements of shale gas operations):	Main effect of regulation:
Licensing and strategic environmental assessment:	
▶ Petroleum Act 1998/ Petroleum Licensing (Applications) Regulations 2015	▶ Vests rights to petroleum in the Crown allowing issue of a petroleum exploration and development licence (PEDL) by the Oil and Gas Authority (OGA).
▶ The Petroleum Licensing (Exploration and Production) (Landward Areas) Regulations 2014)	▶ Provides model PEDL clauses.
▶ Directive 2001/42/EC (SEA Directive)/ The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No.1633)	▶ Plans/programmes likely to have significant environmental effects should be subject to a Strategic Environmental Assessment (conducted for 14th onshore licensing round).
▶ Directive 92/43/EEC (The Habitats Directive) and Directive 2009/147/EC (Wild Birds Directive) / The Conservation of Habitats and Species Regulations 2017	▶ If connected to a Natura site an assessment is required to ensure developments have no adverse impact on the integrity of a protected site.
Land Access	
▶ Mines (Working Facilities and Support) Act 1966	▶ Allows courts to grant access to land (surface) to search for/extract oil and gas if it is in the national interest and it is not reasonably practicable to obtain the surface access right by private arrangement.
Planning	
▶ Town and Country Planning Act 1990	▶ Planning applications should be determined in accordance with national and local development plans.
▶ Directive 2011/92/EU (EIA Directive)/ Town and Country Planning (Environmental Impact Assessment) Regulations 2017	▶ Where developments are likely to have significant environmental effects, an EIA ensures that the LMPA has full knowledge of these effects before making a planning decision.
Permitting	
▶ Directive 2010/75/EU (Industrial Emission Directive)/The Environmental Permitting (England and Wales) (Amendment) Regulations 2018	▶ Provides a single extended permitting and compliance system. Permits contain measures to control emissions to air, water and land.
Air and Climate	
▶ Directive 2010/75/EU (Industrial Emission Directive)/The Environmental Permitting (England and Wales) (Amendment) Regulations 2018	▶ Provides permit for/limits on emissions to air.
▶ Climate Change Act 2008	▶ Sets reduction targets for carbon dioxide/other greenhouse gases.
▶ Ambient Air Quality Directive (2008/50/EC) and Directive 2004/107/EC / Air Quality (Standards) Regulations 2010	▶ Sets limits for concentrations of pollutants in outdoor air.
▶ EU National Emissions Ceilings Directive (2001/81/EC)/The National Emission Ceilings Regulations 2002	▶ Sets national emission limits (ceilings) for SO2, NOX, NH3 and volatile organic compounds.
▶ Clean Air Strategy 2019	▶ Sets out Government strategy for emissions reduction.
▶ If permit not required for relevant activity: The Clean Air Act 1993 and Environmental Protection Act 1990 (Part III)	▶ Gives LAs power to monitor and investigate pollution such as smoke, dust, fumes where no permit is deemed necessary for the relevant activity.
Water Usage	
▶ The Water Abstraction and Impounding (Exemptions) Regulations 2017	▶ Licence required to abstract water from rivers, streams and canals, or from groundwater.

Borehole construction, operation, and decommissioning	
▶ Borehole Sites and Operations Regulations 1995 and Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996	▶ Requires notification to HSE of the design and operation of wells.
▶ Directive 2000/60/EC (Water Framework Directive), Directive 2006/118/EC (Groundwater Daughter Directive)/ The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, The Environmental Permitting (England and Wales) (Amendment) Regulations 2018	▶ Substances that have been assessed as being non-hazardous pollutants under the Groundwater Daughter Directive may be used in hydraulic fracturing fluids. Groundwater permit may be required if the EA consider there to be a risk that pollutants might enter groundwater as a result of injecting fracturing fluid.
Management of fracturing and drilling fluids	
▶ Control of Substances and Hazardous to Health Regulations 2002	▶ Controls workplace exposure to harmful chemicals including respirable crystalline silica.
▶ Regulation (EC) No 1907/2006 (REACH)/ REACH Enforcement Regulations 2008	▶ Requires registration and authorisation of chemicals and risk assessment/exposure scenarios.
▶ Regulation (EU) No 528/2012 (Biocidal Products)/ The Biocidal Products and Chemicals (Appointment of Authorities and Enforcement) Regulations 2013	▶ Authorisation for use of biocidal products required and permitted only where 'evaluation shows no unacceptable effects on the environment'.
▶ COMAH (Control of Major Accident Hazard) Regulations 2015	▶ Requires identification of dangerous substances and relevant hazard scenarios/mitigation action.
Waste	
▶ Directive 2008/98/EC (Waste Framework Directive), Directive 2006/21/EC (Extractive Waste Directive)/ The Environmental Permitting (England and Wales) (Amendment) Regulations 2018	▶ Requires licence and waste management plan (including, where relevant, need for waste permit to cover naturally occurring radioactive material (NORM)).
▶ The Hazardous Waste Regulations (England and Wales) 2005 and Special Waste Regulations (1996)	▶ Set out the regime for the control and tracking of the movement of hazardous waste.
Land Contamination	
▶ The Environmental Permitting (England and Wales) (Amendment) Regulations 2018 and Directive 2004/35/EC (Environmental Liability Directive) / The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	▶ Based on the polluter pays principle. Requires the 'operator' to proactively identify where or when there is an imminent threat or actual damage to the environment, and to notify the authorities/take remedial action.
▶ Environmental Protection Act 1990 (Part IIA) and The Contaminated Land (England) (Amendment) Regulations 2012	▶ Places responsibility on LAs for securing remediation of contaminated land (focussed on dealing with historic land contamination).
Remediation of land	
▶ Town and Country Planning Act 1990 (s106)	▶ Planning conditions which impose obligations relating to the restoration and aftercare of a site.

Table 1.5 of key changes to the regulatory framework post 2010 and their effect

Key Legislative changes:	Effect:
▶ Infrastructure Act 2015 ▶ Onshore hydraulic fracturing (protected areas) Regulations 2016 ▶ Petroleum Licensing (Exploration and Production) (Amendment) (Landward Areas) (England and Wales) Regulations 2016	Removal of subsurface trespass for deep level drilling and the introduction of additional regulatory requirements relating to hydraulic fracturing e.g. baseline monitoring, prior to the grant of a consent to hydraulically fracture and restrictions on areas in which HVHF can take place.
▶ The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016	Removal of the requirement for planning permission to drill boreholes for the purpose of groundwater and seismic monitoring.
Key Non-legislative changes:	
Environment Agency ▶ Establishing Best Available Techniques (BAT) for the On-Site Handling, Treatment and Disposal of Produced and Flow Back Waters and Other Aqueous Effluent Streams from Onshore Oil and Gas Activities. An Atkins report for the Environment Agency (2016). ▶ Best Available Techniques (BAT) for Onshore Oil and Gas Activities: Management of Extractive Wastes. An AECOM report for the Environmental Agency dated (2016.) ▶ Best Available Techniques (BAT) for Onshore Oil and Gas Activities: Monitoring. An AECOM report for the Environmental Agency (2016) ▶ Onshore Oil & Gas Sector Guidance (2019)	Series of reports on BAT used to inform 2019 guidance document for oil and gas companies on which environmental permits are needed, how existing regulation applies to operations, and identifying the relevant BAT that should be used.
Oil and Gas Authority ▶ Petroleum Operations Notice No. 9b - Record and sample requirements for onshore geophysical surveys and wells (amended version, 2016). ▶ Guidance on application for hydraulic fracturing consent under section 4A of the Petroleum Act 1998 (inserted by section 50 of the Infrastructure Act 2015) (2017) ▶ Oil and Gas Authority (OGA) Habitats Regulations Assessment: 14th Onshore Oil and Gas Licensing Round (2015) ▶ Required submission by operators of Hydraulic Fracturing Plan and operation of the Traffic Light System for Seismicity (2015) ▶ OGA Guidance for Extended Well Tests (EWTs) and Hydraulic Fracturing Plans (HFP) (2016).	▶ Summary of requirements for records and samples, and the timeframe within which the items should be sent. ▶ Dedicated guidance on fulfilling the new criteria to obtain hydraulic fracturing consent. ▶ Considered each licensing block against the requirements of the 'Habitats Regulations'. Concluded that the approval of individual licences will not directly lead to any adverse effects on the integrity of European sites. ▶ Requirement of licences issued under the Petroleum Act 1998 that operators identify/assess the location of existing faults to prevent hydraulic fracturing taking place near them and provide plans for monitoring seismicity before, during, and after the well operation. ▶ Dedicated guidance for operators on applying for extended well tests and the requirements of a hydraulic fracturing plan.

United Kingdom Onshore Operators Group (UKOOG) ▶ Community Engagement Charter (2013)	▶ Covers how operators will communicate and engage with the community and makes commitments in key areas of concern e.g. local logistics, health and safety, compliance with environmental regulation and jobs. Pledges to provide benefits to local communities at the exploration/appraisal stage of £100,000 per well site where hydraulic fracturing takes place and 1% of production revenues during the production stage.
▶ Guidelines for Addressing Public Health in Environmental Impact Assessments for Onshore Oil and Gas, Issue 1 (2015).	▶ Dedicated guidance for operators on addressing and communicating environmental and public health impacts.
▶ High Volume Hydraulic Fracture Plan High Level guidance, Issue 1 (2016).	▶ Dedicated guidance and methodology on completing a HFP for operators.
▶ Guidelines for the Establishment of Environmental Baselines for UK Onshore Oil and Gas (2015)	▶ Dedicated best practice guidance on baseline monitoring for shale gas developments.
▶ Health, Safety, Security and Environment Training and Induction Guideline (2016)	▶ Dedicated guidance on health and safety standards.
▶ Shale Gas Well Guidelines (2016)	▶ Dedicated best practice for exploration and appraisal well construction and operation.
▶ Guidelines for Operators: Underground Land Access Community Benefit Payment and Notification Scheme (2017)	▶ Commits to voluntary payment of £20,000 per unique lateral over 200m in length and below 300m depth.
▶ Seismic Communication Protocol Guidance	▶ Dedicated guidance on how operators should communicate with regulators, local communities and their representatives and other connected stakeholders if there is a seismic event that exceeds the traffic light or Peak Particle Velocity (PPV) thresholds.
British Geological Survey ▶ Environmental baseline monitoring by the British Geological Survey (along with the Universities of Birmingham, Bristol, Liverpool, Manchester and York and partners from Public Health England (PHE)).	▶ Monitoring of the quality of groundwater and surface water, seismicity, atmospheric composition assessment, ground motion (subsidence and uplift) in Lancashire and the Vale of Pickering.
HM Treasury ▶ Shale Wealth Fund Consultation (2016) and Response to Consultation (2017)	▶ Fund announced for community benefits that will initially consist of up to 10% of tax revenues from shale gas production. A number of areas have been identified as requiring further evidence (e.g defining the relevant area that receives benefit) before the Government provides more detail on how the scheme will be administered.
New bodies ▶ Shale Gas Environmental Regulator Group (SERG) established (2018)	▶ SERG is intended to work across EA, HSE and the OGA to co-ordinate regulation of shale gas sites.
▶ Independent Commissioner for Shale Gas appointed (2018)	▶ To provide a direct communication link between local communities, the shale gas industry and the industry regulators. First Commissioner appointed October 2018, resigned April 2019.

EU developments	
▶ Recommendation for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing (Recommendation 2014/70/EU) (2014)	▶ Sets out minimum principles for member states when applying or adapting their legislation in key areas of concern.
▶ New Best Available Techniques Guidance document on Upstream Hydrocarbon Exploration and production (2019)	▶ A document which attempts to unify, in terms of practice, the range of regulations, standards and guidance that apply to hydrocarbon exploration (including shale gas) and should prove to be a valuable tool for industry, regulators and the public in providing predictability and transparency for shale gas activities.
▶ REACH amendment (2015 further supported by update of IUCLID software in 2016)	▶ Amended so that 'hydraulic fracturing' now exists as a descriptor for registration of chemical use to enable appropriate risk assessment and exposure scenarios for chemicals used during hydraulic fracturing.

Table 1.6 of legal challenges to the regulatory framework (beyond planning)

Key Challenges:	Outcome/points of note:
1) 2017 - Judicial review of a licence variation for PEDL area 189 - R. (on the application of Dean) v Secretary of State for Business, Energy and Industrial Strategy [2017] EWHC 1998 (Admin)	Claim dismissed ▶ Neither the legislation nor the terms of PEDL 189 prohibited the variation which was made.
2) 2018 - Application for interim injunction to prevent hydraulic fracturing and permission for judicial review of a local authority's decision over the management and regulation of the environmental risk involved at the Preston New Road exploration site - R v (on the application of Dennett) v Lancashire CC [2018] 10 WLUK 224.	Application refused. ▶ The court refused to grant an interim injunction ▶ Permission for judicial review of LA decision was refused. The risks had been properly considered and it was not for the court to substitute its own risk assessment for that of the experts.
3) 2019 - Judicial review of the failure to conduct a Strategic Environmental Assessment (SEA) prior to publishing the revised National Planning Policy Framework - Friends of the Earth v Secretary of State for Housing, Communities and Local Government [2019] EWHC 518 (Admin).	Claim dismissed ▶ Strategic Environmental Assessment was not required by law. Despite the fact that the NPPF is recognised as having more than 'mere influence' over planning authorities and the formulation of their future local plans (as such falling within art. 3(2) of the Directive) it failed to meet the definition in art. 2(a) of being required under 'legislative, regulatory or administrative provisions'.
4) 2019 - Judicial review of para. 209 (a) of the revised National Planning Policy Framework - Stephenson v Secretary of State for Housing, Communities and Local Government [2019] EWHC 519.	Grounds 1 and 4 held to be made out. ▶ Failure to consider material considerations rendered para. 209(a) and the duty to facilitate shale gas developments unlawful. ▶ The consultation exercise involved breaches of the Sedley principles which are the requirements for a fair and lawful consultation exercise.
2019 - Judicial review of a permit variation concerning mining waste activities at the Preston New Road exploration site on the grounds the EA was required to reconsider whether the permit required the use of the "best available technique" ("BAT") - R. (on the application of Friends of the Earth Ltd) v Environment Agency [2019] EWHC 25 (Admin).	Claim dismissed ▶ The Agency was only required to review either the Waste Management Plan, or the permit conditions, where there was a 'substantial change to the operation of the waste facility or the waste deposited'. ▶ No such review was triggered by the making of a variation application which did not give rise to such 'substantial change'.

Annex 2 - References

Government Documents

Clark, G. (2015) *Planning for onshore oil and gas: written statement.* (HCWS201) London: Department for Communities and Local Government.

Clark, G. (2018) *Energy policy: written statement*. (HCWS690) London: Department for Business Energy and Industrial Strategy.

Department for Business Energy and Industrial Strategy (2017) *Directions to the Oil and Gas Authority in the exercise of its powers to grant completion of work approval.* London: Department for Business Energy and Industrial Strategy.

Department for Business, Energy and Industrial Strategy (2018) *Inclusion of shale gas production projects in the nationally significant infrastructure project regime. Initial consultation on the timings and criteria for including major shale gas production projects in the nationally significant infrastructure project regime.* London: Department for Business Energy and Industrial Strategy.

Department for Business, Energy and Industrial Strategy (2019a) *Government sets out position on shale gas exploration.* London: Department for Business Energy and Industrial Strategy.

Department for Business, Energy and Industrial Strategy (2019b) *Energy Policy Update: written statement*. (HCWS68) London: Department for Business Energy and Industrial Strategy.

Department for Communities and Local Government (2011) *A plain English guide to the Localism Act.* London: Department for Communities and Local Government.

Department for Energy and Climate Change (2013) *Annual energy statement.* London: Department for Energy and Climate Change.

Department for Environment Food and Rural Affairs (2019) *Clean Air Strategy 2019*. (PB14554). London: Department for Environment Food and Rural Affairs

Hansard, 2018. H.C. Vol 646, col. 328WH *Shale gas exploration: planning permission* (September 2018)

HM Treasury (2017) *Shale wealth fund response to the consultation.* London: HM Treasury.

National Audit Office (2019) *Fracking for shale gas in England.* (HC99, 2019-2020). London: Department for Business, Energy and Industrial Strategy.

Ministry of Housing, Communities and Local Government (2014) *Planning practice guidance: minerals.* London: Ministry of Housing, Communities and Local Government.

Ministry of Housing, Communities and Local Government (2015) *Indicative screening thresholds.* London: Ministry of Housing, Communities and Local Government. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630689/eia-thresholds-table.pdf

Ministry of Housing, Communities and Local Government (2018a) *Permitted development for shale gas exploration consultation.* London: Ministry of Housing, Communities and Local Government.

Ministry of Housing, Communities and Local Government (2018b) *Compulsory community pre-application consultation for shale gas development.* London: Ministry of Housing, Communities and Local Government.

Ministry of Housing, Communities and Local Government (2018c) *National planning policy framework*. London: Ministry of Housing, Communities and Local Government.

Ministry of Housing, Communities and Local Government (2019) *Guidance environmental impact assessment.* London: Ministry of Housing, Communities and Local Government. Available at: https://www.gov.uk/guidance/environmental-impact-assessment accessed 12 August 2019.

Shale Gas Environmental Regulator Group (SERG) (2018) *Working together agreement*. London: Shale Gas Environmental Regulator Group

Tolhurst, K. (May 2019) *Fracking regulation: Department for business energy and industrial strategy written question 250018.* London: House of Commons.

Oil and Gas Authority

Oil and Gas Authority (2015) *Habitats regulations assessment: 14th onshore oil and gas licensing round*. London: Oil and Gas Authority.

Oil and Gas Authority (2016) *Guidance for extended well tests (EWTs) and hydraulic fracturing plans (HFP)*. London: Oil and Gas Authority.

Oil and Gas Authority (2016) *Petroleum operations notice no. 9b - record and sample requirements for onshore geophysical surveys and wells.* London: Oil and Gas Authority.

Oil and Gas Authority (2017) *Guidance on application for hydraulic fracturing consent under section 4A of the Petroleum Act 1998 (inserted by section 50 of the Infrastructure Act 2015).* London: Oil and Gas Authority.

Oil and Gas Authority (2018) *Financial Guidance.* London: Oil and Gas Authority.

Oil and Gas Authority (2019) *Interim report of the scientific analysis of data gathered from Cuadrilla's operations at Preston New Road.* London: Oil and Gas Authority.

Environment Agency

Environment Agency (2015) *Understanding the meaning of regulated facility. Regulatory Guidance Series, No. RGN 2.* Bristol: Environment Agency.

Atkins (2016) *Establishing best available techniques for the on-site handling, treatment and disposal of produced and flow back waters and other aqueous effluent streams from onshore oil and gas activities*. Bristol: Environment Agency.

AECOM (2016) *Best available techniques (BAT) for onshore oil and gas activities: management of extractive wastes.* Bristol: Environmental Agency.

AECOM (2016) *Best available techniques (BAT) for onshore oil and gas activities: monitoring.* Bristol: Environment Agency.

Environment Agency (2019) *Onshore oil & gas sector guidance*. Bristol: Environment Agency.

United Kingdom Onshore Operators Group

United Kingdom Onshore Operators Group (2013) *Community engagement charter*. UKOOG.

United Kingdom Onshore Operators Group (2015) *Guidelines for addressing public health in environmental impact*. UKOOG.

United Kingdom Onshore Operators Group (2015) *Guidelines for the establishment of environmental baselines for UK onshore oil and gas.* UKOOG.

United Kingdom Onshore Operators Group (2016) *High Volume Hydraulic Fracture Plan High Level guidance*. UKOOG.

United Kingdom Onshore Operators Group (2016) *Health, Safety, Security and Environment Training and Induction Guideline.* UKOOG.

United Kingdom Onshore Operators Group (2016) Shale Gas Well Guidelines. UKOOG.

United Kingdom Onshore Operators Group (2017) *Guidelines for Operators: Underground Land Access Community Benefit Payment and Notification Scheme.* UKOOG.

United Kingdom Onshore Operators Group *Seismic Communication Protocol Guidance.* UKOOG.

Case Law and Planning Appeals

Barlow v Secretary of State for Housing, Communities and Local Government [2019] EWHC 146 QB.

Case C-392/96 under Article 169 of the Treaty (now Article 226 EC) Commission of the European Communities v Ireland.

Ineos Upstream v Lord Advocate [2018] CSOH 66.

Eversheds Sutherland LLP (2019) *Planning Appeal APP/A0665/W/18/3207952 Case on behalf of the appellant.* Leeds: Eversheds Sutherland LLP. Available at https://pa.cheshirewestandchester.gov.uk/online-applications/files/4D1F46B8C23CF0D1DADFC4ED6A350A27/pdf/17_03213_MIN-CASE_STATEMENT-3225947.pdf accessed 13 September 2019.

Gateshead MBC v Secretary of State for the Environment [1994] 5 WLUK 148.

Newport Borough Council v Secretary of State for Wales [1997] EWCA Civ 1894.

Planning appeal APP/U1050/W/17/3190838.

Planning appeal APP/A0665/W/18/ 3207952.

Planning appeal APP/P4415/W/17/3190843.

Planning appeal APP/P4415/W/19/3220577.

Planning appeal APP/Q2371/W/15/ 3134385.

Planning appeal APP/Q2371/W/15/ 3134386.

Preston New Road Action Group v Secretary of State for Communities and Local Government [2018] EWCA Civ 9.

Preston New Road Action Group v Secretary of State for Communities and Local Government [2017] EWHC 808 (Admin).

R (ClientEarth (No 3)) v (1) Secretary of State for Environment, Food and Rural Affairs (2) The Secretary of State for Transport and (3) Welsh Ministers [2018] EWHC 315 (Admin).

R on the application of Alconbury Developments Limited and Others v Secretary of State for the Environment, Transport and the Regions [2001] UKHL 23.

R v Tandridge District Council ex parte Mohamed Al Fayed [2000] 1 P.L.R. 58.

R. (on the application of Frack Free Balcombe Residents Association) v West Sussex CC [2014] EWHC 4108 (Admin).

R. (on the application of Friends of the Earth Ltd) v North Yorkshire CC [2016] EWHC 3303 (Admin).

Trevett v Secretary of State forTransport, Local Government and the Regions Queen's Bench Division [2002] EWHC 2696 (Admin).

Legislation

Air Quality (Standards) Regulations 2010. SI 2010/1001. London: The Stationary Office.

Borehole Sites and Operations, Regulations 1995. SI 1995/2038. London: The Stationary Office.

Climate Change Act 2008. (c.27). London: The Stationary Office.

Climate Change Act 2008 (2050 Target Amendment) Order 2019. SI 2019/1056. London: The Stationary Office.

COMAH (Control of Major Accident Hazard) Regulations 2015. SI 2015/483. London: The Stationary Office.

Control of Substances and Hazardous to Health Regulations 2002. SI 2002/2677. London: The Stationary Office.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive).

Draft Environment (Principles and Governance) Bill 2018. Secretary of State for Environment, Food and Rural Affairs (CM9751). London: The Stationary Office.

Environment Bill 2019. Parliament: House of Commons. Bill no. 3. London: The Stationary Office.

Environmental Protection Act 1990. (c. 43). London: The Stationary Office.

European Commission Recommendation 2014/70/EU for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing. [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2000/60/EC of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2001/42/EC of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2001/81/EC of 23 October 2001 on national emission ceilings for certain atmospheric pollutants (EU National Emissions Ceilings Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2004/35/EC of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (Environmental Liability Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2006/118/EC of 12 December 2006 on the protection of groundwater against pollution and deterioration (Groundwater Daughter Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2006/21/EC of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC (Extractive Waste Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2008/50/EC of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (Ambient Air Quality Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2008/98/EC of 19 November 2008 on waste and repealing certain Directives (Waste Framework Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (Wild Birds Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Industrial Emission Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Directive 2011/92/EU f 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (EIA Directive). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Regulation 1907/2006 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (REACH regulation). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

European Parliament and Council Regulation 528/2012 of 22 May 2012 concerning the making available on the market and use of biocidal products (Biocidal Products). [Online]. [Accessed 26 September 2019]. Available from: http://eur-lex.europa.eu/.

Mines (Working Facilities and Support) Act 1966. (c.4). London: The Stationary Office.

Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996. SI 1996/913. London: The Stationary Office.

Petroleum Act 1998. (c.17). London: The Stationary Office.

Petroleum Licensing (Applications) Regulations 2015. SI 2015/766. London: The Stationary Office.

REACH Enforcement Regulations 2008. SI 2008/2852. London: The Stationary Office.

Special Waste Regulations (1996). SI 1996/972. London: The Stationary Office.

The Biocidal Products and Chemicals (Appointment of Authorities and Enforcement) Regulations 2013. SI 2013/1506. London: The Stationary Office.

The Clean Air Act 1993. (c.11). London: The Stationary Office. London: The Stationary Office.

The Conservation of Habitats and Species Regulations 2017. SI 2017/1012. London: The Stationary Office.

The Contaminated Land (England) (Amendment) Regulations 2012. SI 2012/263. London: The Stationary Office.

The Environmental Assessment of Plans and Programmes Regulations 2004. SI 2004/1633. London: The Stationary Office.

The Environmental Damage (Prevention and Remediation) (England) Regulations 2015. SI 2015/810. London: The Stationary Office.

The Environmental Permitting (England and Wales) (Amendment) Regulations 2018. SI 2018/110. London: The Stationary Office.

The Hazardous Waste Regulations (England and Wales) 2005. SI 2005.894. London: The Stationary Office

The National Emission Ceilings Regulations 2002. SI 2202/3118. London: The Stationary Office.

The Petroleum Licensing (Exploration and Production) (Landward Areas) Regulations 2014. SI 2014/1686. London: The Stationary Office.

The Water Abstraction and Impounding (Exemptions) Regulations 2017. SI 2017/1044. London: The Stationary Office.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. SI 2017/407. London: The Stationary Office.

Town and Country Planning (Environmental Impact Assessment) Regulations 2017. SI 2017/571. London: The Stationary Office.

Town and Country Planning Act 1990. (c.8). London: The Stationary Office.

EU Documents

Broomfield, M. (2012) *Environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe*. Didcot: AEA.

Milieu Ltd. (2013) *Regulatory provisions governing key aspects of unconventional gas extraction in selected EU Member States*. Brussels: Milieu Ltd.

European Chemical Agency (2015) *ECHA clarifies how to report substances used in hydraulic fracturing Annex 1*. (ECHA/NI/15/08). Helsinki: European Chemical Agency.

European Commission (2018) *Application in relevant Member States of the Commission recommendations on minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing and related developments relevant for hydrocarbon activities.* Luxembourg: European Commission.

Wood Environment and Infrastructure Solutions UK Ltd (2019) *New best available techniques guidance document on upstream hydrocarbon exploration and production*. Luxembourg: European Commission.

Brexit

Reid, C. (2020) The Withdrawal Agreement Bill: new legal uncertainty? *Brexit and Environment Blog.* Available at https://www.brexitenvironment.co.uk/2020/01/06/withdrawal-agreement-bill-legal-uncertainty/ accessed 15 January 2020.

Burns, C. (2019) What happens to the environment in times of economic trouble and why should we care? 20 August. *Brexit and Environment Blog.* Available at https://www.brexitenvironment.co.uk/2019/08/20/environment-economic-trouble/ accessed 12 September 2019.

Environmental Audit Committee (2018) *Scrutiny of the draft Environment (Principles and Governance) Bill.* (HC 1951) London: House of Commons.

Environment, Food and Rural Affairs Committee (2018) *Scrutiny of the draft Environment (Principles and Governance) Bill.* (HC1983). London: House of Commons.

Fisher, L. (2019). Imagining the future of UK environmental law. 16 May. *Brexit and Environment Blog.* Available at: https://www.brexitenvironment.co.uk/2019/05/16/imagining-environmental-law/ accessed 12 August 2019.

Lee, M. and Scotford, E. (2019) e*nvironmental principles after Brexit: the draft Environment (Principles and Governance)* .

Bill (working paper). Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3322341 accessed 12 August 2019

Lee, M. (2019) The Environment Bill : A framework for progressive environmental law? 18 October. *Brexit and Environment Blog.* Available at https://www.brexitenvironment.co.uk/2019/10/18/framework-progressive-environmental-law/ accessed22 October 2019.

Setzer, J. and Byrnes, R. (2019) *Global trends in climate change litigation: 2019 snapshot.* Available at: http://www.lse.ac.uk/GranthamInstitute/publication/global-trends-in-climate-change-litigation-2019-snapshot/ accessed 12 August 2019.

Other Sources

Bradshaw, M. & Waite, C. (2017) Learning from Lancashire: exploring the contours of the shale gas conflict in England 47 *Global Environmental Change* 47 (28-36).

Cuadrilla Resource (2019) *Response to Written Ministerial Statement on Shale Gas Exploration.* Available at https://cuadrillaresources.uk/response-to-written-ministerial-statement-on-shale-gas-exploration/ accessed 15 January 2020.

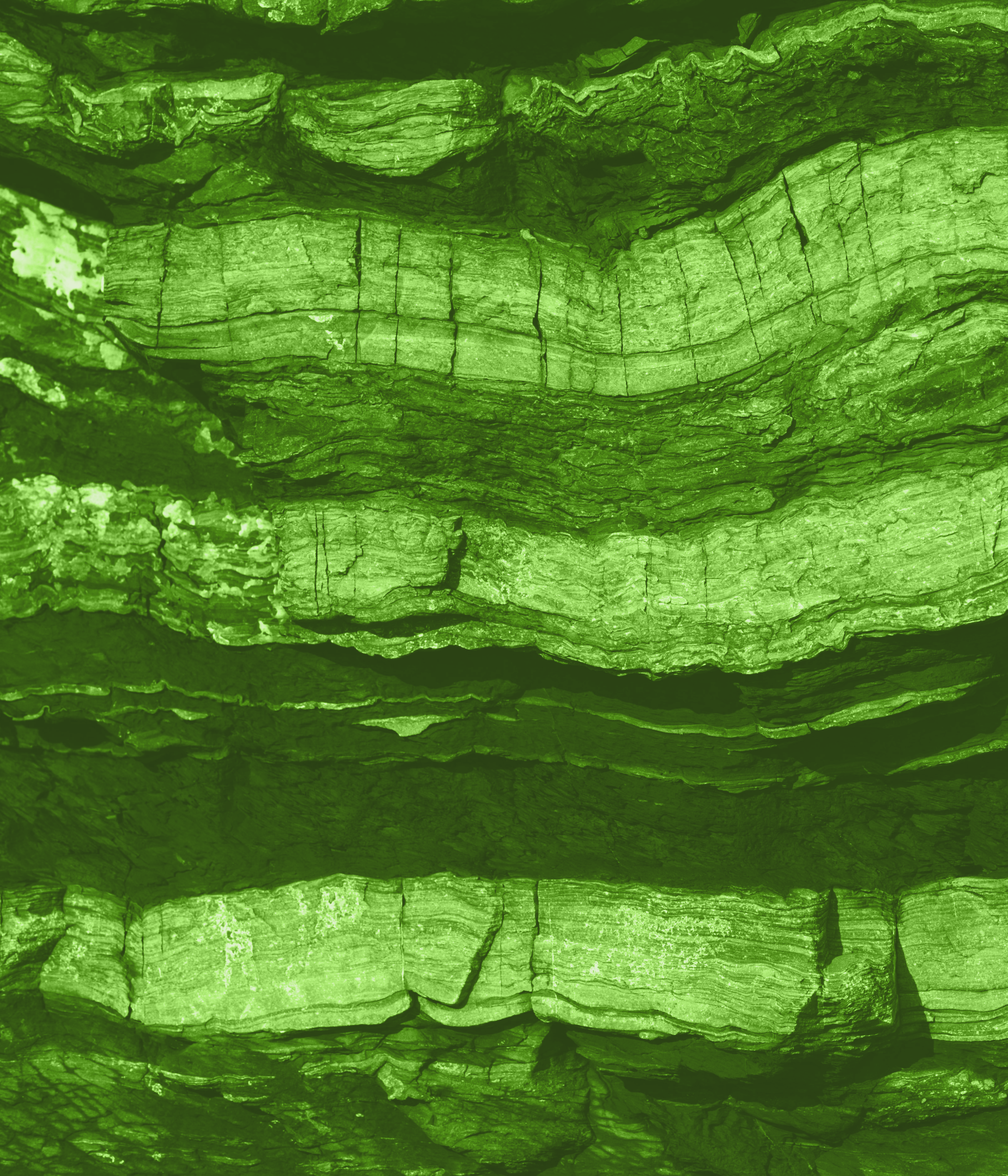
Cotton, M. (2017) Fair fracking? Ethics and environmental justice in United Kingdom shale gas policy and planning *Local Environment* 2(2) (185-202).

Greater Manchester Combined Authority Spatial Framework (2019) *Greater Manchester's plan for homes, jobs and the environment. Spatial framework draft revised.* Manchester: Greater Manchester Combined Authority.

North Yorkshire County Council, City of York, North Yorkshire National Park (2016) *Minerals and waste joint plan publication draft*. North Allerton: North Yorkshire County Council.

North Yorkshire County Council, City of York, North Yorkshire National Park (2019) *Joint plan authorities' response – additional hearing questions January 2019, appendix. Matter : unconventional oil and gas additional hearings 24 and 25 January 2019, questions 16 and 17.* Available at https://www.northyorks.gov.uk/sites/default/files/fileroot/Planning%20and%20development/Minerals%20and%20waste%20planning/Examination%20Library/Evidence%20Base/Minerals/LPA101%20Main%20Modifications%20reference%20definition%20of%20fracking%2C%20Q16%20and%2017.pdf accessed 12 August 2019.

Wiseman, H. (2017) Hydraulic fracturing and legal frameworks, Oxford handbooks online. [online] Oxford: Oxford University Press. Available at: https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199935352.001.0001/oxfordhb-9780199935352-e-32 accessed 12 September 2019.



FOR FURTHER INFORMATION
j.hawkins@leeds.ac.uk