



Department
of Energy &
Climate Change

Surface Development Restrictions for Hydraulic Fracturing

Government Response to the Consultation

June 2016

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Executive Summary

The Government supports the development of domestic energy sources in a safe and sustainable manner. Exploring and developing our shale gas resources could potentially bring substantial benefits and help meet our objectives for secure energy supplies, economic growth and lower carbon emissions. For these reasons the Government is committed to exploring the UK's shale gas potential, whilst at the same time protecting our most sensitive areas. The Infrastructure Act 2015 set out restrictions for hydraulic fracturing beneath the surface in Protected Areas. In order to reinforce these restrictions and reassure the public that the shale industry is proceeding in a balanced way, the Government has also decided to make sure hydraulic fracturing cannot be conducted from wells that are drilled at the surface of a number of protected sites.

From 4 November to 16 December 2015, the Department of Energy and Climate Change (DECC) ran a Consultation on Surface Development Restrictions for Hydraulic Fracturing. The proposals described in the consultation are designed to ensure that, through the Petroleum Exploration and Development Licensing regime, no consent be given to the carrying out of "associated hydraulic fracturing" from new or existing wells drilled at the surface in specified protected areas. In the consultation document the Government outlined that it was minded to apply the surface restrictions in Sites of Special Scientific Interest, Ramsar and Natura 2000 sites, as well as the areas covered by the draft Onshore Hydraulic Fracturing (Protected Areas) Regulations 2015¹ (National Parks, the Broads, Areas of Outstanding Natural Beauty, World Heritage Sites and areas that are most vulnerable to groundwater pollution).

As this is a technical issue about how to implement a public commitment, the Government opted for a targeted consultation, choosing to consult a broad, representative group of stakeholders to ensure the consultation was fair and proportionate. The consultation sought views from new and existing petroleum exploration and development licence holders on the impact that the proposed changes will have. The Government also consulted with representative bodies that have a particular interest in this matter and in the management of the specified protected areas. All responses received, including those from non-targeted stakeholders, were considered to inform the Government's response.

The first question the consultation asked was whether or not consultees agreed with the proposed approach and scope of the surface restrictions for hydraulic fracturing. Having considered the evidence presented, the Government continues to believe that the proposals provide an appropriate level of additional protections to reassure the public that the shale industry is being taken forward in a measured and reasonable manner. As they strike the right balance between protecting our most sensitive areas while at the same time enabling the nascent shale industry to develop, the Government does not intend to significantly modify them. In their response to the consultation, the Welsh Government noted that as the surface restrictions are intended to complement sections 4A and 4B of the Petroleum Act 1998² and the Protected Areas Regulations, both of which apply to England and Wales, they should be applied consistently. The Government agrees and will therefore extend the scope of the surface restrictions to include Wales.

¹ Having been made on 10 March 2016, they are now the Onshore Hydraulic Fracturing (Protected Areas Regulations) 2016.

² As amended by section 50 of the Infrastructure Act 2015

The second question concerned the impact of the proposals on new and existing licensees. The majority of responses received did not specify any impacts on licensees. Of those which addressed the question, none of the responses provided evidence that required us to alter our Impact Assessments. Respondents also pointed to effects of the proposed measures in terms of enhanced environmental protections and clarity for all stakeholders involved. The Government agrees that these measures will provide further clarity. Recognising the high level of public concern around hydraulic fracturing, in particular in protected areas of significance due to their environmental, landscape or heritage characteristics, the Government further believes that the measure is the right step to assure the public that the shale industry is being taken forward in a measured and reasonable manner.

The third question the consultation asked concerned whether or not existing regulation provides sufficient protection for the areas in which the Government is proposing to restrict surface activities. It also asked what the additional benefit would be if the proposals were adopted. In terms of additional benefits, respondents highlighted the certainty that would be provided by the surface restrictions, referring also to the economic value of protected areas and local tourism. A large number of respondents argued that while the surface restriction proposals are welcome, more is needed to protect the UK from any adverse impacts of hydraulic fracturing operations. The Government is confident that the UK's regulatory system is robust and remains of the opinion that shale can and will be developed while protecting the environment.

Finally, a large number of responses to the consultation raised general concerns regarding hydraulic fracturing. While these did not directly relate to the policy being consulted on, they did relate to the Government's broader shale policy. The following response addresses some of the major concerns and explains how they are already addressed by the existing regulatory system. Indeed the Government has been clear that any shale development must be safe and environmentally sound. The UK has been successfully regulating for gas and oil drilling for over 50 years and has tough regulations in place to ensure on-site safety, prevent water contamination, and mitigate seismic activity and air pollution. The surface development restrictions for hydraulic fracturing are designed to enhance the regulatory regime already in place for shale, and to reassure the public that our most sensitive areas will be adequately protected.

Section 1: Introduction to the Consultation

Surface Development Restrictions for Hydraulic Fracturing

- 1.1 Exploring and developing the UK's shale gas and oil resources could potentially bring substantial benefits and help us meet our objectives for secure energy supplies, economic growth and lower carbon emissions. The Government is committed to exploring the UK's shale gas potential whilst maintaining the very highest safety and environmental standards, which the UK has established as a world leader in extracting oil and gas over decades.
- 1.2 In order to assure the public that the shale industry is being taken forward in a measured and reasonable manner, the Infrastructure Act 2015 set out restrictions on hydraulic fracturing in "protected groundwater source areas" and "other protected areas". These terms are defined in the Onshore Hydraulic Fracturing (Protected Areas) Regulations 2016 (the "Protected Areas Regulations"), which were approved by both Houses of Parliament in December 2015.
- 1.3 While the Infrastructure Act 2015 and the Protected Areas Regulations address hydraulic fracturing which occurs within certain protected areas, the Government considers that safeguards should also be put in place where the surface activities for hydraulic fracturing occur in specified protected areas. When the Protected Areas Regulations were laid before Parliament in draft, the Government therefore also set out its commitment to ensure that hydraulic fracturing cannot be conducted from wells that are drilled at the surface in specified protected areas.
- 1.4 The Consultation on Surface Development Restrictions for Hydraulic Fracturing, issued on 4 November 2015, set out proposals to give effect to this commitment. It ran for six weeks, closing on 16 December 2016.
- 1.5 In the consultation document, the Government proposed to include a licence condition in all new Petroleum Exploration and Development Licences (PEDLs) to be awarded from the 14th Onshore Licensing Round onwards, that will prevent hydraulic fracturing operations from taking place from new or existing wells that are drilled at the surface in specified protected areas.
- 1.6 For existing PEDLs, the Government proposed to set out in a policy statement that the Secretary of State is minded not to approve any proposed programme of works which includes the carrying out of hydraulic fracturing from new or existing wells drilled at the surface in specified protected areas.
- 1.7 The consultation document posed the following questions:
 - **Question 1:** Do you agree with the proposed approach to restricting surface developments in specified protected areas (National Parks, the Broads, Areas of Outstanding Natural Beauty (AONBs), World Heritage Sites, Source Protection Zones 1, Sites of Special Scientific Interest, Natura 2000 areas and Ramsar sites) through

licence conditions? Do you agree with the scope of the restrictions to be applied in England?

- **Question 2:** What would the impact(s) be on new and existing licensees if the proposals were adopted? Please provide evidence where possible, and specify whether your response relates to new and/or existing PEDLs.
- **Question 3:** Does existing regulation provide sufficient protection for the areas in which the Government is proposing to restrict surface developments? If not, what would be the additional benefit if the proposals were adopted (e.g. in terms of environment, heritage, landscape value, economic impacts)?

1.8 Sections 3 to 5 below outline the key issues raised by respondents, and provide the Government's response to these. Section 6 addresses some of the more general issues and concerns that were raised by a significant number of respondents. Before moving on to these sections, it is useful to briefly outline the Government's rationale for supporting the development of the shale industry and explain the robust regulatory system for hydraulic fracturing that is already in place.

Background: Rationale for the Government's Shale Policy

- 1.9 Having access to clean, safe and secure supplies of natural gas for years to come is a key requirement for the UK's successful transition to a low-carbon economy. Gas – the cleanest fossil fuel – provides around one third of our energy supply. It is not just used for power and heating, but also for cooking and as a feedstock for the chemical industry. Studies have shown that the carbon footprint of electricity from UK shale gas would likely be significantly less than unabated coal and also lower than imported Liquefied Natural Gas. This Government believes that shale gas can create a bridge, while the UK develops its renewable energy, improves its energy efficiency and builds new nuclear generating capacity.
- 1.10 Since 2004, the UK has been a net importer of gas due to the rapid decline of production from the UK Continental Shelf. Last year around 45% of UK gas supply was made up of net imports. Projections show that in 2030 oil and gas will still be providing 70% of the UK's primary energy requirements, and any oil and gas that the UK does not produce will have to be imported at significant extra cost.
- 1.11 There are also potential economic benefits in building a new industry for the country and for communities. Consultants EY estimated in 2014 that a thriving shale industry could mean cumulative investment of £33 billion and support 64,500 jobs in the gas, oil, construction, engineering and chemical sectors at peak. Building on 50 years' worth of experience and skills developing oil and gas onshore and offshore, the UK could benefit from a new industrial sector. Locally that might mean new facilities and jobs for local companies. Development could also deliver investment in key domestic infrastructure and reduce imports, improving the balance of trade.
- 1.12 The Government does not yet know the full scale of the UK's shale resources nor how much can be extracted technically or economically. But the British Geological Survey estimates the shale gas resource in the Bowland-Hodder basin under Northern England could be 1,300 trillion cubic feet (tcf), compared to current UK annual gas

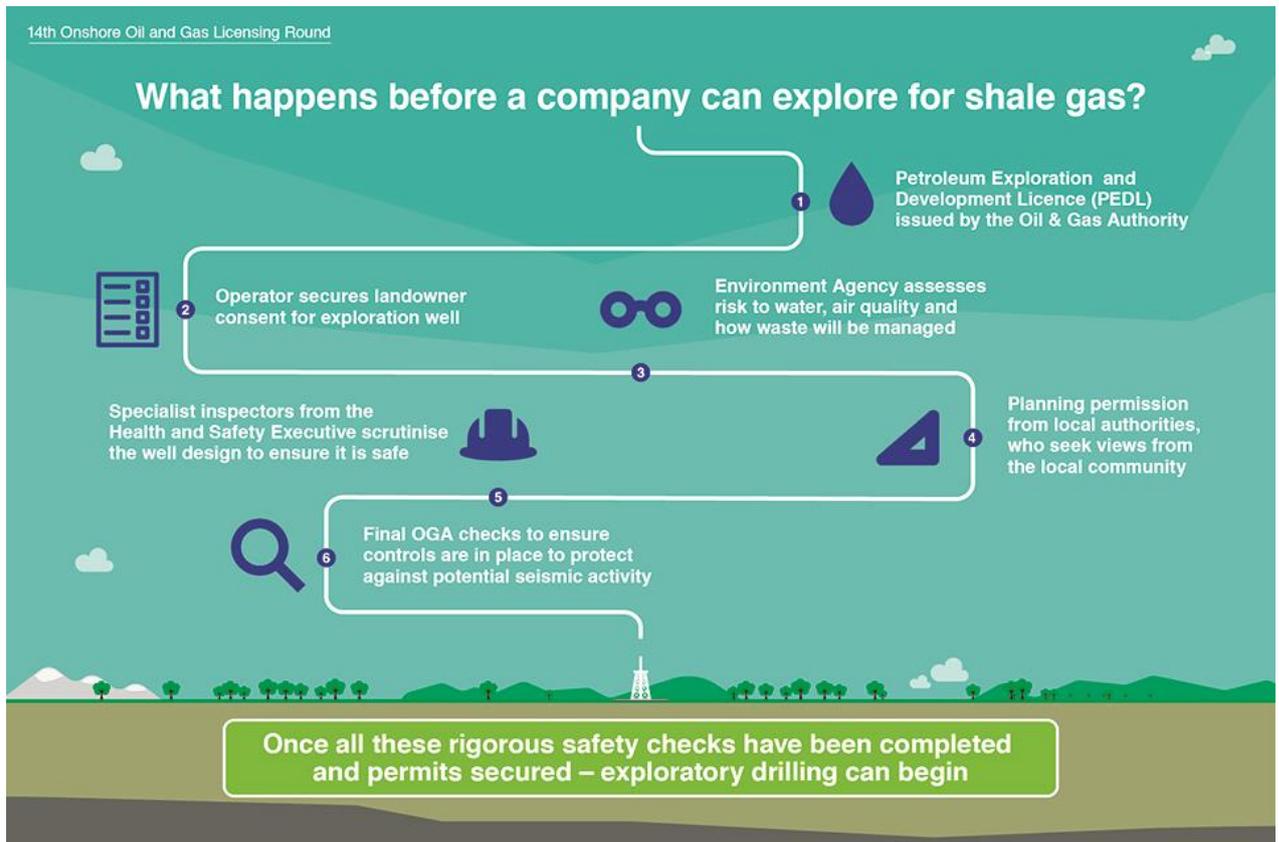
consumption of around 2.5 tcf. The industry would need to test how much of this gas in place can be extracted technically and economically in order to assess this potential. The Government believes that there is a clear need to seize the opportunity now to explore and test our shale potential.

The Regulatory System for Shale Gas and Hydraulic Fracturing

- 1.13 The Government has been clear that any shale development must be safe and environmentally sound. The UK has been successfully regulating gas and oil drilling for over 50 years and has tough regulations in place to ensure on-site safety, prevent water contamination, mitigate seismic activity and air pollution.
- 1.14 Before any onshore oil and gas operations can commence, the operator needs to have all the appropriate licences, permits and consents in place. Petroleum Exploration and Development Licences grant exclusivity to licensees within a defined area for onshore hydrocarbon exploration and extraction (including but not limited to shale gas). Any operations, including drilling, will then require a number of further permissions and consents before beginning. These consents include agreement with the landowner, planning permission and obtaining an environmental permit. Indeed, all projects must be approved by the relevant environmental agency and are scrutinised by the Health and Safety Executive (HSE). They are also subject to scrutiny through the planning system. Consent from DECC/the Oil and Gas Authority (OGA) is required before drilling, hydraulic fracturing or production activities can commence.
- 1.15 For any developments using hydraulic fracturing (as opposed to conventional means of extracting oil and gas) further measures are in place. Operators need to submit a Hydraulic Fracturing Plan to the OGA, and comply with requirements to mitigate any seismic risks. The Infrastructure Act 2015 also sets out a range of requirements that operators need to comply with before the Secretary of State will issue a hydraulic fracturing consent. These include taking into account the environmental impacts of development, groundwater monitoring, community benefits and prohibiting hydraulic fracturing in protected areas.
- 1.16 A simplified version of the regulatory regime is portrayed in the graphic below. For more information, anyone who is interested can also consult the Government's regulatory roadmap, which has been published online.³

³ <https://www.gov.uk/government/publications/regulatory-roadmap-onshore-oil-and-gas-exploration-in-the-uk-regulation-and-best-practice>

Figure 1: Overview regulatory checks for exploratory drilling



Legislative and Policy Framework for Protected Areas

1.17 The planning and regulatory systems already contain a number of protections for the areas identified in these proposals as requiring protection, which are outlined in the table below for England and elaborated on throughout the following sections.⁴

Protected Area	New and existing protections in regards to shale developments
National Park	National Planning Policy Framework ⁵ and its supporting planning practice guidance ⁶ ; Protected Areas Regulations ⁷ ; Surface Development Restrictions for Hydraulic Fracturing.
Areas of Outstanding Natural Beauty (AONB)	National Planning Policy Framework and its supporting planning practice guidance; Protected Areas Regulations; Surface

⁴ In Wales, responsibility for planning and environmental aspects of the onshore oil and gas regime are devolved and reference should therefore be made to the relevant guidance that applies in Wales. See for example Planning Policy Wales under <http://gov.wales/topics/planning/policy/ppw/?lang=en>.

⁵ <http://planningguidance.communities.gov.uk/blog/policy/>

⁶ <http://planningguidance.communities.gov.uk/blog/guidance>

⁷ <http://www.legislation.gov.uk/ukxi/2016/384/contents/made>

	Restrictions for Hydraulic Fracturing.
The Broads	National Planning Policy Framework and its supporting planning practice guidance; Protected Areas Regulations; Surface Restrictions for Hydraulic Fracturing.
World Heritage Sites	National Planning Policy Framework and its supporting planning practice guidance; Protected Areas Regulations; Surface Restrictions for Hydraulic Fracturing.
Natura 2000 sites (European sites protected under the Habitats Directive and the Birds Directive)	National Planning Policy Framework and its supporting planning practice guidance, Conservation of Habitats and Species Regulations 2010 (as amended) ⁸ ; Surface Restrictions for Hydraulic Fracturing
Ramsar Sites	National Planning Policy Framework and its supporting planning practice guidance; Surface Restrictions for Hydraulic Fracturing
Sites of Special Scientific Interest (SSSIs)	National Planning Policy Framework and its supporting planning practice guidance, Wildlife and Countryside Act 1981 (as amended); ⁹ Surface Restrictions for Hydraulic Fracturing
Other sensitive areas, such as Ancient Woodlands	National Planning Policy Framework and its supporting planning practice guidance.
Source Protection Zones (SPZ) 1¹⁰	Environmental Permitting Regulations 2010 ¹¹ ; Protected Areas Regulations; EA Guidance ¹² , Water Resources Act 1991 (water protection zones and anti-pollution works and notices) ¹³ ; Part 2A Environmental Protection Act 1990 ¹⁴ ; Contaminated Land (England) Regulations 2006 (contaminated land regime) ¹⁵ .
Source Protection Zones (SPZ) 2-3	Environmental Permitting Regulations 2010, EA Guidance; Water Resources Act 1991 (water protection zones and anti-pollution works and notices); Part 2A Environmental Protection Act 1990; Contaminated Land (England) Regulations 2006 (contaminated land regime).

⁸ <http://www.legislation.gov.uk/ukxi/2010/490/contents/made>

⁹ <http://www.legislation.gov.uk/ukpga/1981/69>

¹⁰ SPZ1s are areas close to drinking water sources where there is the greatest risk associated with groundwater contamination.

¹¹ <http://www.legislation.gov.uk/ukdsi/2010/9780111491423/contents>

¹² <https://www.gov.uk/government/publications/groundwater-protection-principles-and-practice-gp3>.

¹³ <http://www.legislation.gov.uk/ukpga/1991/57/contents>

¹⁴ <http://www.legislation.gov.uk/ukpga/1990/43/contents>

¹⁵ <http://www.legislation.gov.uk/ukxi/2006/1380/contents/made>

Section 2: Overview of Responses to the Consultation

Overview

2.1 **A total of 125 respondents replied to the consultation**, 38 of which were from stakeholder organisations, while 87 responses were submitted by individuals, including 71 campaign responses. The following categories were identified for the analysis:

- Industry (6 responses);
- National Parks and Areas of Outstanding Natural Beauty Associations (8 responses);
- Environmental Non-Governmental Organisations (6 responses);
- Councils and Planning Officers (7 responses);
- Other stakeholder organisations (such as regulatory bodies and the water industry) (11 responses);
- Individual and campaign responses (87 responses).

2.2 All responses were considered to inform the Government's response to the consultation. All of the below statements refer to new and existing licences.

For Question 1

- 47% of all respondents considered that the Government's proposals to restrict surface developments in protected areas through licence conditions were a step in the right direction, but outlined concerns.
- 39% of all respondents thought the Government's proposals to restrict surface developments in protected areas through licence conditions did not go far enough, while 3% suggested they were unnecessary.
- 6% of all respondents offered general support for the Government's proposals to restrict surface developments in protected areas through licence conditions.
- The remaining 5% did not offer a direct response to Question 1.

For Question 2

- Most respondents (86%) did not specify/know what the expected impact on the licensees would be. Industry and public bodies (regulators, devolved administrations and local Councils) provided the most detailed information when answering the question. While these public bodies expected only a limited impact, views among industry stakeholders were more varied.

For Question 3

- 7% of all respondents argued that existing regulation provides sufficient protection for the areas in which the Government is proposing to restrict surface activities.
- 84% of all respondents argued that existing regulation provides insufficient protection for the areas in which the Government is proposing to restrict surface activities.
- A number of respondents raised broader concerns about the policy area. These are discussed in Section 6.

Analysis Methodology

- 2.3 As this is a technical issue about how to implement a public commitment,¹⁶ the Government opted for a targeted consultation, choosing to consult a broad, representative group of stakeholders to ensure the consultation was fair and proportionate. The consultation sought views from new and existing petroleum exploration and development licence holders on the impact and the proposed changes will have. The Government also consulted representative bodies that have a particular interest in this matter and in the management of the specified protected areas. All responses received, including those from non-targeted stakeholders, were considered to inform the Government's response. The consultation responses were analysed using both quantitative and qualitative methods.
- 2.4 For Questions 1 and 3, all yes/no/other responses were logged and quantified. For Question 1 the Government also distinguished between and quantified those responses that expressed support for the Government's proposed approach but raised concerns, and responses that provided no direct response.
- 2.5 For Question 2, which did not allow a simple yes/no/other response, responses were grouped as follows: those that foresaw no/limited impact on licensees, those that foresaw some or considerable impact, and those that considered the impact on licensees to be unclear. For all of these groups the analysis further distinguished between responses that related to new or existing licences, or both. Responses that did not directly answer the question were also grouped, as were those that addressed environmental impacts rather than impacts to licensees.
- 2.6 This quantitative analysis was supplemented by a qualitative review of all responses received. Through this review key themes and arguments made were identified. Further quantitative analysis of these themes and arguments was subsequently conducted, to measure areas that were of most concern to respondents. This data was then used to shape the Government's response, which focuses on concerns that were either raised by a majority of respondents, or were significant enough to merit further clarification.

¹⁶ <https://www.gov.uk/government/news/government-defines-protected-areas-for-shale-developments>

- 2.7 In total, our analysis identified four different campaign texts used in 71 responses from individuals. Two of them attracted a high number of responses (41 and 26), the other two were identical texts submitted by two individuals. Where individuals deviated from the campaign text this was accounted for in our quantitative analysis of individual responses.
- 2.8 Two respondents sent in two responses to the consultation, the content of which differed. In both cases, the Government considered the individual responses rather than support expressed for a wider campaign/ stakeholder response in its analysis.
- 2.9 A number of responses commented on individual licences or specific protected areas. While the Government is unable to address individual cases in its response, all data provided was considered. Similarly, a number of respondents commented on the scope of the Protected Areas Regulations, which were completing their Parliamentary process during the Consultation. As the surface restrictions proposed in this consultation complement, but are separate to, the Regulations, the Government will not comment on the definitions in the Regulations here.

Section 3: Detailed Responses to Question 1

The Government's Approach to Surface Restrictions

- 3.1 The first question the consultation asked was whether or not people agreed with the proposed approach to restricting surface developments in specified protected areas. 6% of all respondents offered general support for the Government's proposals to restrict surface developments in protected areas through licence conditions, highlighting that they provided clarity to both licensees and bodies that had an interest in the areas in question. While industry respondents emphasised the UK's "*safe and successful history of oil and gas production both onshore and offshore*", they also "*acknowledge(d) the need to provide a measured approach to provide reassurance to the public*". Although outlining a number of concerns, an NGO noted that they were "*pleased to see the extremely sensible approach taken in this consultation*".
- 3.2 As stated earlier, 47% of all respondents considered that the Government's proposals to restrict surface developments in protected areas through licence conditions were a step in the right direction, but outlined concerns. 39% thought the proposals did not go far enough. The following section outlines key concerns that were raised by a significant number of stakeholders, and provides the Government's response to these.

The policy statement, proposed changes to licensing conditions and existing planning guidance are not enough

- 3.3 A number of National Park and AONB bodies, and individual/campaign responses, criticised the Government's approach. They suggested that a policy statement for existing licences is weak and that changes to new licences would not have as great an impact as introducing legislation. There was also criticism that the current planning guidance would not be sufficient to protect our most sensitive areas and that regulation should be introduced instead.

The Government's response

- 3.4 The licence conditions for new licensees will prohibit them from carrying out associated hydraulic fracturing from wells where the well pad is in a specified protected area. The Government considers that implementing the policy through the licence conditions is the most appropriate mechanism, as this is provided for in the Petroleum Act 1998 and is the normal way in which constraints are imposed on licensees. It will apply to all future licences, including and beyond the 14th licensing round.
- 3.5 The policy statement included in Annex A makes clear that the Secretary of State considers that it will not normally be appropriate to issue a Hydraulic Fracturing Consent, as required under section 4A of the Petroleum Act 1998 for associated hydraulic fracturing, where this would take place from a well where its well pad is located in any of the specified protected areas. As existing licensees may have carried out development activities before the Secretary of State's policy was made public, it is important that the Secretary of State can consider the particular circumstances in each case before deciding individual applications. The Government nonetheless anticipates

that it would be wholly exceptional for consent to be given in such a case. In order to further reduce that risk for sites requiring protection under European law, and consistent with government policy (described further in paragraph 3.8 below), the policy will also apply to sites which are the subject of a Government consultation on the scientific case for designation as a European site or a Ramsar site.

- 3.6 Regarding points concerning existing planning guidance, there is a clear legal framework for decision making in the planning system. Decisions on planning applications must be made in accordance with the development plan for the local authority area, unless material considerations indicate otherwise (see Section 38(6) of the Planning and Compulsory Act 2004 and section 70(2) of the Town and Country Planning Act 1990). The National Planning Policy Framework sets out the Government's planning policies for England and is a material consideration in decisions on planning applications.
- 3.7 National policy and planning guidance are clear that in considering planning applications in National Parks, the Broads and Areas of Outstanding Natural Beauty, great weight should be given to conserving their landscape and scenic beauty. They also state that any planning application for major development in National Parks, the Broads, and Areas of Outstanding Natural Beauty should be refused, except where exceptional circumstances exist and where it can be demonstrated that the development is in the public interest. National planning policy also explains that World Heritage Sites are heritage assets of the highest significance and that substantial harm to, or loss of, a World Heritage Site should be wholly exceptional. Where a proposed development for unconventional hydrocarbons would lead to substantial harm to or total loss of significance of a World Heritage Site, planning permission should be refused unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or the circumstances outlined in in the National Planning Policy Framework apply.¹⁷
- 3.8 As well as the protections described in paragraphs 3.10 to 3.13 below, national planning policy (in particular paragraph 118 of the National Planning Policy Framework) also protects sites which are the subject to a Government consultation on whether the site should be a European site (i.e. special protection area or special area of conservation) or a Ramsar site to ensure that proposed sites are not adversely affected before they are formally designated. As noted above, in line with this policy, the policy statement will also protect such proposed sites.

Buffer zones need to be introduced to sufficiently protect the areas in question

- 3.9 The majority of National Park and AONB bodies, environmental NGOs, campaign and individual responses, suggested the need for "buffer zones" to be established around the areas that would be covered by the surface restrictions. Some recommended

¹⁷ The circumstances are: the nature of the heritage asset prevents all reasonable uses of the site; and no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and the harm or loss is outweighed by the benefit of bringing the site back into use.

differentiated buffer zones depending on the area, others pointed to a need to clarify or strengthen the duties of neighbouring authorities.

The Government's response

- 3.10 There is already a duty¹⁸ on all local planning authorities – not just National Park Authorities – to have regard to the purposes of National Parks and AONBs. This duty is relevant in considering development proposals – including those for shale gas – that are situated outside National Park or AONB boundaries, but which might have an impact on the setting of, and implementation of, the statutory purposes of these protected areas.
- 3.11 Sites of Special Scientific Interest are protected through Section 28 of the Wildlife and Countryside Act 1981. National planning policy explains that proposed development likely to have an adverse impact on an SSSI should not normally be permitted, unless it can be demonstrated that the benefits of the development at this site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest.
- 3.12 Where sites are protected by European designations,¹⁹ the Conservation of Habitats and Species Regulations 2010 requires an assessment to be undertaken of plans or projects not directly connected to the management of the site, but likely to have a significant effect on the site, either individually or in combination with other plans or projects, before planning permission is granted. Exceptionally, plans or projects may be permitted where the assessment indicates that they are likely to have an adverse effect on the integrity of a European site, but there are strict tests that have to be passed as the Regulations protect those sites and species of international importance.
- 3.13 National planning policy recognises that the significance of designated heritage assets, including World Heritage Sites, can be harmed or lost through alteration or destruction of the heritage asset or development within its setting.
- 3.14 As these existing duties apply to the respective areas identified above, the Government considers that it is not necessary to implement a fixed or differentiated buffer zone around each area.

¹⁸ Section 11A(2) of the National Parks and Access to the Countryside Act 1949, Section 17A of the Norfolk and Suffolk Broads Act 1988 and Section 85 of the Countryside and Rights of Way Act 2000 require that 'in exercising or performing any functions in relation to, or so as to affect, land' in National Parks and Areas of Outstanding Natural Beauty, relevant authorities 'shall have regard' to their purposes.

¹⁹ For more information see <http://jncc.defra.gov.uk/page-4> and <http://www.legislation.gov.uk/ukxi/2010/490/contents/made>

The scope of the regulations should be expanded, to include Source Protection Zones 2 and 3, and additional protected areas

- 3.15 Certain environmental NGOs, individuals, campaign responses, and other stakeholder organisations outlined a need for the surface restrictions to cover SPZs 2 and 3, and suggested other priority habitats should also be included.

The Government's response

- 3.16 We have aligned our proposals with existing regulatory practice. It is already the case that the Environment Agency and Natural Resources Wales do not permit drilling for oil or gas in SPZ1. Furthermore, the proposed definition of protected groundwater source areas would not impact on the environmental regulator's current powers; in line with their risk-based approach they will continue to refuse permit applications for drilling activities within SPZ1, 2, 3 or wider if they consider that an activity poses an unacceptable risk to the environment. For this reason the Government considers SPZ2 and SPZ3 are already adequately protected on a case by case basis. We understand that the bottled water industry have also been talking to the UK Onshore Oil and Gas industry body (UKOOG) about engaging in the licensing and mineral planning processes to ensure their own obligations are recognised and respected.
- 3.17 The National Planning Policy Framework makes clear that wherever a planning permission is granted for mineral development, which includes shale gas, there should be no unacceptable adverse impacts on the natural and historic environment, or on human health. Account should be taken of the cumulative effect of multiple impacts from individual sites and/ or from a number of sites in a locality. It also explains that planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, unless the need for, and benefits of, the development in that location clearly outweigh the loss.

The definition of 'hydraulic fracturing' is too limited

- 3.18 A number of respondents questioned whether the surface restrictions would apply to exploratory drilling and related infrastructure. Opposition was also voiced as to the definition of hydraulic fracturing used in the consultation document, suggesting it should not be based on the volume of fluid injected; rather the restrictions should apply to hydraulic fracturing regardless of volume, and to other unconventional developments including coalbed methane and underground coal gasification. Certain industry respondents questioned the need for differentiating between conventional and unconventional resources as they saw no significant differences between the two approaches in terms of environmental impacts.

The Government's response

- 3.19 The proposals will principally affect surface development that is used for the carrying out of "associated hydraulic fracturing", the definition of which is contained in section 4B(1) of the Petroleum Act 1998 (as inserted by section 50 of the Infrastructure Act 2015). This definition is consistent with the approach taken by the European

Commission in its Recommendation in relation to high volume hydraulic fracturing.²⁰ In the UK, this kind of high volume hydraulic fracturing has not been used for conventional operations onshore.

- 3.20 In addition, these restrictions will apply where an operator is required to get consent from the Secretary of State for hydraulic fracturing that is not “associated hydraulic fracturing” and therefore to meet an equivalent range of safeguards to those set out in section 50 of the Infrastructure Act 2015. In particular, the Secretary of State intends to require that such consent be obtained for any operations which use more than 1,000 cubic metres of fluid at any single stage, or expected stage, of the hydraulic fracturing, unless an operator can persuasively demonstrate why requiring such consent would not be appropriate in their case. The use of such amounts in one or more stages could well lead in some cases to similar impacts as operations which use 10,000 cubic metres of fluid in total. Therefore similar assurances over all the circumstances relating to the consent are likely to be as necessary for a single fracturing stage of this scale as it is with the aggregate effect of multiple stages. This cautious approach makes particular sense while the new industry gets underway during the early stages of exploration, and will be reviewed once hydraulic fracturing operations are more common to determine whether it is still appropriate at that point.
- 3.21 We do not consider that the restrictions need to be extended any further than this. Drilling for conventional hydrocarbon resources has been conducted safely for decades, including, for example, in National Parks and AONBs. The conventional onshore oil and gas industry is well-established and existing evidence shows that it can comply with the strict requirements that are already in place for protected areas.
- 3.22 More specifically, the policy statement (see Annex A) and licence conditions make clear that no hydraulic fracturing as defined in paragraphs 3.19-3.20 can be carried out from a well if the well pad is in the protected area. In effect, this restricts the construction of any well pad for these purposes in the specified protected areas. The well pad is the bunded area²¹ in which most surface activities related to the development will take place, including drilling activities, initial treatment, loading and storage. This will not restrict other related surface development, for example access roads or pipelines, in the protected areas. However, the existing legislative and policy framework outlined in Section 1.17 will apply where appropriate.
- 3.23 High volume hydraulic fracturing carried out in the exploration phase will be covered by the surface restrictions, just as it will for the production phase.
- 3.24 As outlined in the consultation document, the surface restrictions proposals will not apply to the production of other unconventional resources, such as coal bed methane (CBM) and underground coal gasification (UCG), which do not use high-volume hydraulic fracturing. Developers have been exploring for CBM in the UK since as early

²⁰ Commission Recommendation of 22 January 2014 on minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing (2014/70/EU): <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0070&from=EN>

²¹ A bunded area is an area isolated by an impermeable, leak-proof barrier, designed to protect the surrounding and sub-surface environment from any surface spillages.

as 2006. As CBM activity is well established having taken place for more than 10 years with minimal public concern, the Government does not believe there is a case for the surface restrictions to apply to CBM. Indeed there is a robust regulatory framework in place for CBM. Planning permission would need to be obtained for any proposals to extract CBM, and any CBM development would also require approvals from the environmental and health and safety regulators.

- 3.25 Regarding underground coal gasification, while this could provide benefits to our energy mix it has not yet been tested on a commercial scale here and is not currently in operation anywhere in the UK. UCG is an entirely different process from shale gas. Gas is derived from coal seams, not shale formations, and the means of obtaining this gas is a fundamentally different technique from hydraulic fracturing. The regimes regulating the two techniques are therefore different. The Coal Authority, one of DECC's non-departmental public bodies, is responsible for issuing conditional UCG licences for coal exploration and extraction in the UK. UCG operations are not able to take place until the Licensee has satisfied the pre-conditions set out in the licence, which include the acquisition of all the other necessary rights and permissions to carry out the operations. These include planning permission for any onshore installations and the equivalent consent for offshore and environmental permits. The Health and Safety Executive scrutinise well design and monitor its progress to ensure the operator manages risks effectively throughout the life cycle of the well. The licensee will also have to secure the consent of a landowner for any surface installation (or the equivalent for sea bed installations) and satisfy the Coal Authority that the finance is in place to carry out the operations.

Changing status of designations

- 3.26 One respondent queried what would happen if an area became protected subsequent to a licence being granted. A number of respondents argued that the Forest of Dean should be designated an Area of Outstanding Natural Beauty.

The Government's response

- 3.27 The Government's policy is clear: hydraulic fracturing as defined in paragraphs 3.19-3.20 should not be carried out from a well if the well pad is in a protected area. If an area becomes a protected area, any such hydraulic fracturing should stop. This will be the effect of the new licence condition.
- 3.28 In addition, as stated in the policy statement (see Annex A), the Secretary of State's policy is to make Hydraulic Fracturing Consents subject to a condition that further consent must be obtained if the well pad location becomes a protected area or if it becomes the subject of a Government consultation on the scientific case for designation as a European site or a Ramsar site.
- 3.29 In line with good Government practice, we will review the policy statement at the same time as the Onshore Hydraulic Fracturing (Protected Areas) Regulations within 5 years' time.
- 3.30 Whether or not the Forest of Dean should become an AONB is not in scope of this consultation. Natural England is responsible for appraising suggestions for new

designated areas and does so with reference to the statutory criteria as set out in their Designations Strategy.

The proposals undermine, or should be reflected in, existing planning policy and the regulatory regime

- 3.31 A number of responses questioned the impact the proposals would have on the existing regulatory regime and planning system, arguing for example that the new provisions would imply that sub-surface hydraulic fracturing is no longer subject to the “major development test” and as such could interfere with the existing planning regime and the existing duties of local authorities to have regard to protected sites (under the Countryside and Rights of Way Act 2000, for example). Other responses commented on the need to update the National Planning Policy Framework and Planning Practice Guidance, so the surface restrictions are reflected in this guidance.
- 3.32 Questions were also raised about implications for existing legal definitions of protected areas or protections for protected sites under European and international law.

The Government’s response

- 3.33 The surface restrictions are separate to the existing protections for the specified sensitive areas. They do not change or amend these existing protections.
- 3.34 As outlined above, national planning policy and planning guidance explains that mineral planning authorities should refuse any planning application for major development in National Parks, the Broads, and Areas of Outstanding Natural Beauty, except where exceptional circumstances exist and where it can be demonstrated that the development is in the public interest. Whether a proposed development in these designated areas should be treated as a major development will be a matter for the relevant decision taker, taking into account the proposal in question and the local context.

The surface restrictions are not needed – the scope is too broad

- 3.35 The majority of industry respondents stressed that there was no need to introduce the surface restrictions through new or existing licences, pointing to the UK’s “*extremely robust regulatory framework*”. A third of industry respondents placed an emphasis on the need to avoid deterring future changes to drilling/ recovery technology, but provided limited supporting arguments as to how the proposals would do this. A case-by-case approach to protecting sensitive areas was raised a number of times, and one respondent recommended the establishment of sub-areas within PEDLs to be overseen by a specialist cross-regulatory panel, as an alternative to the proposed approach.

The Government’s response

- 3.36 The Government will keep under review any innovative drilling or recovery techniques. It will consider over time whether such techniques are sufficiently akin to hydraulic fracturing to merit the same level of public reassurance and consequently whether any changes are required to the Government’s approach. Neither a cross-regulatory panel,

nor a case-by-case analysis, would achieve the Government's policy aim of further reassuring the public that our most sensitive areas will be protected from hydraulic fracturing. The majority of industry responses acknowledged this aim as being important and legitimate, indeed one industry respondent *"welcome(d) the clarity this consultation provides and...the need to approach this in a measured way, which helps build public confidence"*.

The devolved administrations should be included in the scope of the surface restrictions

- 3.37 While some respondents agreed with the Government's proposal for the surface restrictions to apply in England only, most did not proffer an opinion. In their response to the consultation, the Welsh Government noted that as the consultation proposals are intended to complement sections 4A and 4B of the Petroleum Act 1998 (as amended by section 50 of the Infrastructure Act 2015) and the Protected Areas Regulations, both of which apply to England and Wales, they should be applied consistently.

The Government's response

- 3.38 In accordance with the new devolution settlements, the Government intends to devolve the licensing of onshore oil and gas extraction to Scotland and Wales. As such, following discussions with the Scottish and Welsh Governments and with prospective licensees, no new licences were awarded in the devolved administrations as part of the 14th Round. Consequently, the Government proposed to implement the changes in England only. However, having considered the Welsh response to the consultation the Government will extend the scope of the surface restrictions to Wales. The policy statement will apply to applications by any existing holders of licences in Wales.

Conclusions – Question 1

- 3.39 While a number of respondents to Question 1 supported the proposals, the majority suggested they should go further, and a smaller number believed them unnecessary. Most concerns were based on a belief that the proposals would not be sufficient. Having considered the evidence presented, the Government continues to believe that the proposals provide an appropriate level of additional protections to reassure the public that the shale industry is being taken forward in a measured and reasonable manner. As they strike the right balance between protecting our most sensitive areas while at the same time enabling the nascent shale industry to develop, the Government does not intend to significantly modify them. The proposals will, therefore, remain as set out in the consultation, but in line with the response from the Welsh Government, their scope will be extended to Wales.

Section 4: Detailed Responses to Question 2

Impact on New and Existing Licensees

- 4.1 The second question in the consultation concerned the impact(s) the surface restrictions would have on new and existing licensees. It also asked respondents to provide evidence where possible, and to specify whether their response related to new and/or existing Petroleum Exploration and Development Licences.
- 4.2 **Most respondents (86%) did not specify any impacts on licensees.** They either stated that the impact would be unclear (18%), provided no direct response (65%), or highlighted the general environmental benefit of the proposed measures (4%). The views of those that did specify impacts are summarised below.

Impact unclear

- 4.3 18% of the respondents stated that the impact of the proposed measures on licensees was at this stage still unclear. These responses largely related to new licences. In explaining their position, industry respondents pointed out that the characteristics of shale are not yet fully understood and that as the details of the 14th Licensing Round had not yet been released, they were unable to judge how far they as a company would be affected.²² Other stakeholders stressed that the consultation did not contain the exact formulation of the new licence conditions or of the policy statement, making it difficult for them to evaluate the impact in more detail.

Some/considerable impact

- 4.4 15% of respondents foresaw some or considerable impact on new licensees. This view was held predominantly by one campaign as well as one third of industry stakeholders. 6% of all respondents were of the opinion that there would be some or considerable impact on both new and existing licensees. This opinion was shared by half of the industry stakeholders, a National Park Authority and a stakeholder falling under the “other” category. One respondent (a local Council) expected this to be the case for existing licensees only.
- 4.5 The following potential impacts on licensees were listed by respondents:
- *Restrictions on areas available to developers:* The proposals could restrict developments or result in the relinquishment of licences. Depending on the respondent’s viewpoint, this was considered in both a negative and positive way;
 - *Sunk costs (for existing licensees):* Respondents suggested that some licensees might already have invested in preliminary investigations;

²² Please see here for more information about the 14th licensing round: <https://www.gov.uk/guidance/oil-and-gas-licensing-rounds>

- *Lack of future investment, including new technologies:* A number of respondents considered that the restrictions might impact investment in research and technological developments;
- *Legal and administrative costs:* While the actual financial impact of the proposals was considered to be limited, some operators were concerned that they might incur legal and administrative costs when reviewing their existing licences. They questioned whether or not it was fair to treat new and existing licensees differently;
- *Combined impact of different policy measures:* Some respondents pointed to Section 50 of the Infrastructure Act 2015 or the Protected Areas Regulations and suggested that combined, all of the protections could have a significant impact on the UK onshore oil and gas industry;
- *Greater clarity for developers and other stakeholders:* Some respondents stressed that the proposals could provide greater clarity, helping licensees to identify the right location for their projects.

4.6 There was no evidence provided by the campaign responses as to why new licences would be considerably impacted by the proposed measures. From the context, however, it became clear that responses primarily referred to the expected effectiveness of the proposed measures, with changes to licence conditions having been evaluated to be more effective than a policy statement (see above for the Government’s response to this).

No or limited impact on licensees

4.7 4% of all stakeholders foresaw no or a limited impact on licensees. This view was held by an equal number of environmental organisations and local councils, as well as one regulator. A third of industry stakeholders, a local council stakeholders and an environmental group agreed on this for existing licences only (3%), while one local council saw only new licensees barely affected by the proposed measures.

4.8 Respondents who held this view pointed to the existing protections already in place, such as an outright ban on drilling in Source Protection Zones (SPZ) 1 which has been imposed by the Environment Agency. Consequently, the new proposals would support, rather than change, the existing regulatory approach. One respondent concluded that protection afforded to Natura 2000 sites, for example, would already ensure that fracking was not permitted under the existing legal framework. Other respondents highlighted that licensees would ordinarily seek to avoid impacts on protected areas, with some industry stakeholders confirming that they would not believe that the restrictions would place “significant constraints or restrictions” on their planned operations or current proposals.

4.9 Some industry stakeholders consequently also questioned whether the proposed measures and a blanket approach would be necessary.

4.10 Environmental NGOs in particular saw a benefit in the proposed measures as they would reaffirm existing legal obligations to protect sensitive areas and would provide licensees with more clarity. One Council was of the opinion that the proposals would assist in screening out those hydraulic fracturing exploration and exploitation projects that would have some of the greatest risks of significant adverse environmental effects.

Where the impact on new licensees was considered marginal, the respondents pointed out that the Government has been open about its intention to restrict surface developments for some time.

- 4.11 A number of respondents also referred to the economic value of the protected areas including in respect to tourism and local jobs.

The Government's response

- 4.12 The Government recognises the uncertainty attached to evaluating the impact of the measures on licensees. The UK shale gas industry is in its infancy and it is unclear how much production will occur and at what cost. This uncertainty has also been reflected in our Impact Assessment (IA) that accompanied the Protected Areas Regulations, in which the analysis on the preferred option explicitly assumed that the restrictions to hydraulic fracturing would apply to both the spatial extent (i.e. surface) and vertical limit (i.e. depth) in the designated protected areas.²³
- 4.13 Under the central case (see below), the illustrative reduction in economic activity from implementing the restrictions was assumed to be 1 per cent of baseline activity, which resulted in an estimated cost to business of £10.2 million (Net Present Value, 2015 prices) and an Equivalent Annual Net Cost to Business (EANCB) of £0.7 million over an appraisal period of 20 years (2016-2035) at a discount rate of 3.5% real. The cost would arise from the forgone surplus of revenue over costs from the activity lost relative to the baseline as a result of designating the protected areas. The key assumptions which are documented in the IA were therefore the change in the level of activity, production levels, gas prices and finding and development costs.²⁴

Table 1: Estimated cost to business from sub-surface restrictions, £m 2015 prices (2016-35).

	Low	Central	High
Net Present Value (NPV)	£1.3m	£10.2m	£37.2m
Equivalent Annual Net cost to Business (EANCB)	£0.1m	£0.7m	£2.6m

- 4.14 The impact of the Protected Areas Regulations was assessed to be very small as a result of the existing regulations and protections provided by planning policies in the specified protected areas. It is therefore considered reasonable to assume that the restrictions on hydraulic fracturing operations at the surface in the defined protected areas will result in zero additional loss of economic activity to that previously assessed i.e. an illustrative reduction of 1% relative to the baseline.
- 4.15 While the Government notes that the figures in our Impact Assessment did not include the estimated administrative costs to business from complying with the policy measures, none of the evidence provided suggests that these costs would be

²³ http://www.legislation.gov.uk/ukia/2015/289/pdfs/ukia_20150289_en.pdf

²⁴ The methodology used was consistent with that adopted in two prior IAs (New Shale-Friendly Model Clauses for Landward Areas and Underground Access Rights clauses in 2014 Infrastructure Bill – impact on oil and gas activities) but the price and present value base years were moved forward to 2015 and various assumptions were updated (including on gas prices and development costs)

prohibitive. They must also be weighed against the potential positive benefits such as providing further clarity. As the industry is still in its infancy, the risks around retrospective application do not apply.

- 4.16 In terms of the economic value of the specified protected areas, these are already afforded a high level of protection under the existing regulatory regime. The net gain from the surface ban would therefore be to restrict those projects that would have received consent under the existing regulatory regime, notwithstanding the respective existing protections for the specified areas.
- 4.17 In terms of the potentially different treatment of new and existing licensees, it is important to stress that the Petroleum Act 1998 explicitly permits the Secretary of State to impose appropriate terms and conditions on licences, and to modify/exclude model clauses in a particular case. We also consider that it is appropriate to implement the policy through licence conditions, which is transparent and legally certain. As mentioned above, existing licensees may have carried out development activities before the Secretary of State's policy was made public. It is therefore important that the Secretary of State can consider the particular circumstances in each case before deciding individual applications.
- 4.18 The policy intention was clearly laid out in the consultation document: to prevent "associated hydraulic fracturing", as defined in 4B(1) of the Petroleum Act 1998, from taking place from new and existing wells that have been drilled at the surface in specified protected areas. As such, the Government does not believe there was a need to see the policy statement or the licence conditions in order make a judgement about what impact the proposed changes would have. However, the policy statement regarding existing licences has been included in Annex A.

Conclusions – Question 2

- 4.19 The second question concerned the impact of the proposals on new and existing licensees. The majority of the responses did not specify any impacts on licensees. Of those which addressed the question, none of the responses provided evidence that substantially altered our Impact Assessments. Respondents also pointed to effects of the proposed measures in terms of enhanced environmental protections and clarity for all stakeholders involved. The Government agrees that these measures will provide further clarity. Recognising the high level of public concern around hydraulic fracturing, in particular in protected areas of significance due to their environmental, landscape or heritage characteristics, the Government further believes that the measure is the right step to assure the public that the shale industry is being taken forward in a measured and reasonable manner, notwithstanding the impact to industry.

Section 5: Detailed Responses to Question 3

Adequacy of Existing Regulation

- 5.1 7% of all respondents argued that existing regulation provides sufficient protection for the areas in which the Government is proposing to restrict surface activities. While this included industry respondents, for the most part industry recognised that the surface restrictions are a reasonable way of providing public reassurance.
- 5.2 In terms of additional benefits, respondents highlighted the certainty that would be provided by the surface restrictions, referring also to the economic value of protected areas and local tourism.
- 5.3 84% of all respondents argued that while the surface restriction proposals are welcome, more is needed to protect the UK from any adverse impacts of hydraulic fracturing operations. A number of concerns raised in response to the consultation's first question were repeated under Question 3. This includes points around buffer zones and the adequacy of existing planning guidance to protect sensitive areas. The Government's view on both these issues can be found in Section 3 above.
- 5.4 Other key concerns highlighted by a number of respondents across the different groups consulted include:

Existing regulations are not enough to protect us from the harm hydraulic fracturing will cause

- 5.5 The majority of respondents expressing concerns suggested that the UK's regulatory system is insufficient to deal with the demands of a new shale industry.

The Government's response

- 5.6 The Government has been clear that shale development must be safe and environmentally sound. Reports by the Royal Society and Royal Academy of Engineering,²⁵ and Public Health England²⁶ have considered a wide range of evidence in the UK context. They concluded that risks can be managed if industry follows best practice enforced by regulation. The UK has been successfully regulating the gas and oil industry for over 50 years and has a strong regulatory regime for exploration, which the Government will look to continuously improve as the industry develops. Companies are legally responsible for their operations and the UK insists on high safety standards. All of this is backed up by independent checks from the regulators. All operations, such as drilling or hydraulic fracturing, require a number of permissions and consents like planning and environmental permits. Any proposals will necessarily be subject to detailed consideration and scrutiny under our legal and regulatory regimes.

²⁵ <https://royalsociety.org/topics-policy/projects/shale-gas-extraction/report/>

²⁶ <https://www.gov.uk/government/publications/shale-gas-extraction-review-of-the-potential-public-health-impacts-of-exposures-to-chemical-and-radioactive-pollutants>

- 5.7 In addition, and to reinforce our already robust regulations, the Infrastructure Act 2015 set out a range of further requirements if an operator is to carry out hydraulic fracturing, to provide the public with confidence that this industry is being taken forward in a balanced way. These include taking into account the environmental impact of development, groundwater monitoring, community benefits and prohibiting hydraulic fracturing in specified protected areas.

Concerns about the Habitats and Regulations Assessment (HRA) conducted under the 14th licensing round

- 5.8 Respondents to the surface development restrictions consultation made a number of comments about the way in which the HRA process for the 14th Licensing Round,²⁷ was carried out. Certain responses also questioned how the HRA consultation interacted with the surface development restrictions consultation, and whether or not it was necessary to know the outcome of the HRA consultation before responding to this consultation.

The Government's response

- 5.9 The OGA carried out its HRA consultation in August and September 2015, and included in that consultation a proposal to attach conditions to certain licences issued following the 14th Licensing Round in light of its strategic plan-level HRA of the potential licensing blocks. The conditions will prohibit certain activities at or near the surface within any area of a block which is a European site, in order to prohibit activities that would have an Adverse Effect on Integrity (AEIO) on a European site from taking place in the licensed area. The OGA's response to the HRA consultation was published after this consultation closed. However, it was not necessary to see the response to the HRA consultation in order to provide an informed response to this consultation as the two issues (licence conditions to prevent any activities that would have an AEIO on protected European sites and licence conditions dealing with other surface development restrictions) are entirely separate. The surface development restrictions apply to all licences; such restrictions are not dependent on the licence also containing restrictions prohibiting activity that would otherwise have an AEIO on a protected European site.

Existing regulation is not enough to protect us from environmental, heritage and landscape degradation

- 5.10 A number of respondents expressed concerns as to the impacts shale development would have on the environment, raising concerns that the countryside, for example, might become blighted with shale wells.

²⁷ See <https://www.gov.uk/government/consultations/habitats-regulations-assessments-of-14th-onshore-oil-and-gas-licensing-round>

The Government's response

- 5.11 As mentioned above, the National Planning Policy Framework makes clear that wherever a planning permission is granted for mineral development, which includes shale gas, there should be no unacceptable adverse impacts on the natural and historic environment, or on human health. Account should be taken of the cumulative effect of multiple impacts from individual sites and/ or from a number of sites in a locality.
- 5.12 Regarding other environmental concerns linked to hydraulic fracturing, please see Section 6 below.

Existing regulation is not enough to protect wells from failing

- 5.13 A number of respondents raised concerns about well integrity. One cited US and Australian experience showing that 6% of wells fail in the first year and over 50% within 15 years, leading to water contamination and leakage of gases into the air.

The Government's response

- 5.14 Loss of integrity from well bores is very rare in Britain.²⁸ A ReFINE report looked at the 2152 hydrocarbon wells drilled onshore in the UK between 1902 and 2013. Of the 143 active UK wells producing at the end of 2000, the report noted that evidence of well integrity failure has been found in only one case.
- 5.15 Consequently, if a well is designed, built and constructed properly, there is negligible risk of water contamination of actual or potential water supplies. Few instances are known of problems with decommissioned wells, and the Government knows of none where significant pollution has been caused by onshore decommissioned wells.
- 5.16 In the UK, the Health and Safety Executive (HSE) scrutinises well design and monitors its progress to ensure the operator manages risks effectively throughout the life cycle of the well. The well design is scrutinised by the HSE through the well notification system before construction. The HSE also monitors well construction based on weekly reports to its well specialists and inspects the well site. Any significant changes to well construction are subject to the same scrutiny, as is the decommissioning/ abandonment process.
- 5.17 The HSE will also respond promptly to health and safety concerns raised about the operations on a site. HSE inspectors have a range of regulatory powers including ordering improvements to operations, prohibiting activity that puts people at risk, or prosecution where regulations are not adhered to.
- 5.18 An independent well examiner will also review the design and construction of the well. The Government has been clear that wherever shale gas hydraulic fracturing is conducted, it must be done in a safe way. Consequently, the Infrastructure Act 2015

²⁸ For more information, see: R. J. Davies et al., *Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation*, Marine and Petroleum Geology (2014)

makes clear that hydraulic fracturing activities cannot take place unless appropriate arrangements have been made for the independent inspection of the integrity of the relevant well.

Our regulators are not sufficiently resourced to deal with a new shale industry

- 5.19 A number of respondents questioned whether or not the Health and Safety Executive and Environment Agency are sufficiently resourced to deal with a new shale industry.

The Government's response

- 5.20 The UK has decades of experience in safely conducting surface activities and constructing onshore gas wells, regulated by the Health and Safety Executive and the Environment Agency, which have confirmed that they have sufficient specialist inspectors to deliver the regulatory regime they are responsible for during the current shale gas exploratory phase. If a large number of wells are drilled in order to produce shale gas, the Health and Safety Executive and the Environment Agency may need to increase resource accordingly for the production phase. There are plans in place to review their resource at the relevant times.
- 5.21 Ensuring the onshore oil and gas industry is regulated effectively is a corporate priority for the Environment Agency. The Environment Agency has about 50 officers who are working on this sector. Their work includes development of the regulatory process, determining permit applications, checking compliance with permits and engaging with local communities.
- 5.22 Funding for setting up the regulatory regime comes from Defra grant-in-aid. Work to regulate individual sites is financed through the charges the EA raises for environmental permits and licences, supported where necessary by grant-in-aid. As a result, the number of staff will be adapted accordingly to meet the regulatory demand.

Conclusions – Question 3

- 5.23 While the Government acknowledges that a large number of respondents argued that even though the surface restriction proposals are welcome, more is needed to protect the UK from any adverse impacts of hydraulic fracturing operations, it remains of the opinion that the UK's regulatory system is robust. None of the responses raised issues that convinced the Government that there are any gaps in the regulatory system, which will of course be reviewed as the shale industry develops. Shale can and will be developed while protecting the environment.

Section 6: General Concerns

- 6.1 A large number of responses to the consultation raised general environmental concerns regarding hydraulic fracturing. While these did not directly relate to the policy being consulted on, they did relate to the Government's broader shale policy. This section outlines some of the major concerns and explains how they are already addressed by the existing regulatory system.
- 6.2 About two thirds of the respondents highlighted potential groundwater contamination as a key concern, rendering it the single most frequently raised issue. Respondents also questioned the potential impact of hydraulic fracturing on the UK's collective climate change goals. Comments were made about the UK's approach to dealing with seismic activity associated with hydraulic fracturing; one respondent suggested using an independent body to monitor seismic activity (as opposed to the onus being on the operator to carry out this work). A further issue identified by a number of respondents was day-to-day impacts resulting from hydraulic fracturing on those living within close proximity of shale prospective sites.
- 6.3 There is **no international evidence that hydraulic fracturing (when properly regulated) should cause contamination of water supplies or other environmental damage.** The UK has one of the most stringent regulatory systems in the world and in the unlikely event that operations posed a risk of pollution or risk to communities, the Government has the powers to close them down. A company looking to develop shale needs to obtain all the necessary permissions, like planning and environmental permits. As part of the process, the proposed activities are considered by the Environment Agency or the Health and Safety Executive, who will also check and enforce compliance. In addition, the Protected Areas Regulations restrict hydraulic fracturing in Source Protection Zones 1 (SPZ1s). SPZ1s are areas close to drinking water sources where there is the greatest risk associated with groundwater contamination. The surface restrictions currently under discussion would also apply to SPZ1s. The Environment Agency has said that it will not license abstraction above environmentally sustainable levels and will not grant a permit where the risks to groundwater are unacceptable. It has powers to impose conditions to ensure proper protection, or to prohibit activities which they consider to pose unacceptable risks.
- 6.4 Regarding publication of the chemicals used in hydraulic fracturing, **it is a requirement of section 4A of the Petroleum Act 1998 (as amended by the Infrastructure Act 2015) that the substances used, or expected to be used, in associated hydraulic fracturing are approved, or are subject to approval, by the environmental regulator.** The onshore oil and gas industry, through UK Onshore Oil and Gas (UKOOG) guidelines, has also agreed to publish on its website all chemicals that are used in hydraulic fracturing on a well-by-well basis, including regulatory safety data and maximum concentrations and volumes. Before operations begin, an environmental permit will be given by the relevant environmental regulator containing a condition that requires substances used in associated hydraulic fracturing to be approved by that regulator. In addition, the Environment Agency assesses the hazards presented by fracturing fluid additives or drilling muds on a case-by-case basis and will not permit the use of chemicals hazardous to groundwater where they may enter groundwater and cause pollution. Indeed the Environment Agency has the power to

restrict or prohibit the use of any substances where they would pose an environmental risk.

- 6.5 **The Government believes that UK shale development is compatible with our goal to cut greenhouse gas emissions and does not detract from our support for renewables.** Shale gas can create a bridge while we develop renewable energy, improve energy efficiency and build new nuclear. To make absolutely sure, section 49 of the Infrastructure Act 2015 requires the Secretary of State to seek advice from the Commission on Climate Change (CCC) on the implications of shale gas and any other onshore oil and gas for our legally binding carbon targets. The CCC is an independent, statutory body, whose purpose is to advise the UK Government and Devolved Administrations on emissions targets and report to Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change.
- 6.6 **Strong controls are also in place to mitigate seismic risks.** The British Geological Survey has published regional data on tectonic history and faulting in many prospective areas and DECC set out new requirements for operators to control seismic risks, including a ‘traffic light’ system to pause or halt hydraulic fracturing if unusual seismic activity is detected. Operators have to use all available geological information to assess the location of faults before wells are drilled to avoid hydraulically fracturing near faults. They must then monitor seismic activity in real time, before, during and after operations, and halt if seismic activity exceeds a predefined level. Operations stop if a tremor of magnitude 0.5 or greater is detected and the pressure of fluid in the well is reduced immediately. The magnitude 0.5 threshold has been adopted as an initial precautionary level set on the basis of a report by a group of independent experts and can only be detected at the ground’s surface by sensitive equipment.
- 6.7 In addition, the operator will be required to submit frac-related geotechnical data promptly to the OGA and to publish up-to-date information on their website. For the first few operations the OGA will have an independent expert on site during shale gas hydraulic fracturing to observe that the protocols are followed and that the monitoring is proceeding as planned. The need for further OGA onsite observation will be reviewed after the first few wells.
- 6.8 The BGS monitors a National Network of Seismometers and publishes historical seismicity maps and updates on felt earthquakes and international large earthquakes national scale.²⁹ In addition, the BGS is conducting entirely independent seismicity monitoring near potential hydraulic fracturing sites in North Yorkshire and Lancashire as part of their delivering an Environmental Monitoring Baseline programme and they will conduct their own analysis, make the data available to academic researchers and publish the results on their website.³⁰
- 6.9 Finally, the **planning system provides sufficient protections to ensure that development takes place at appropriate locations.** National policy makes clear that wherever a planning permission is granted for mineral development, which includes

²⁹ For more information see: <http://www.earthquakes.bgs.ac.uk/monitoring/home.html>

³⁰ See <http://www.bgs.ac.uk/research/groundwater/shaleGas/monitoring/home.html>

shale gas there should be no unacceptable impacts on the natural and historic environment, and on human health. Like any construction project, there may be some element of disruption. The planning guidance explains that the principal issues that should be addressed by mineral planning authorities include noise, dust, air quality, lighting, visual impact on the local and wider landscape, landscape character, traffic and land instability, although not all issues will be relevant at every site to the same degree.

Section 7: Conclusions and Next Steps

- 7.1 The Government is grateful to those who took the time to respond to this consultation. Whilst a wide range of arguments were put forward and points covered, the Government is confident that the key concerns have been addressed above and will, therefore, be proceeding as proposed. The one change is that Wales will be included in the scope of the proposals, which, as pointed out by the Welsh Government, brings them in line with the scope of sections 4A and 4B of the Petroleum Act 1998 (as amended by section 50 of the Infrastructure Act 2015).
- 7.2 The Government will therefore implement the surface restrictions through the licensing regime and issue a policy statement for existing licences.
- 7.3 If anyone who is interested would like to find out more about shale gas in the UK, how it is regulated and how the Government approaches development, please visit the links on the next pages.

References and links

Legislation, regulations, policy and guidance referred to

- Infrastructure Act 2015, <http://www.legislation.gov.uk/ukpga/2015/7/contents/enacted>
- Onshore Hydraulic Fracturing (Protected Areas) Regulations 2016, <http://www.legislation.gov.uk/uksi/2016/384/contents/made> .
- Petroleum Act 1998, <http://www.legislation.gov.uk/ukpga/1998/17/contents>
- Petroleum Licensing (Exploration and Production) (Landward Areas) Regulations 2014 (SI 2014/1686), <http://www.legislation.gov.uk/uksi/2014/1686/contents/made>
- The Conservation of Habitats and Species Regulations 2010 (SI 2010/490), <http://www.legislation.gov.uk/uksi/2010/490/contents/made>
- The National Planning Policy Framework and Planning Practice Guidance, <http://planningguidance.planningportal.gov.uk/>

Consultations and policy announcements referred to

- Consultation on surface development restrictions for hydraulic fracturing (4 November 2015), <https://www.gov.uk/guidance/oil-and-gas-licensing-rounds#surface-development-restrictions>
- Government defines Protected Areas for shale developments (16 July 2015), <https://www.gov.uk/government/news/government-defines-protected-areas-for-shale-developments/>
- Consultation and OGA Response on Habitats Regulations Assessments of 14th onshore oil and gas licensing round, <https://www.gov.uk/government/consultations/habitats-regulations-assessments-of-14th-onshore-oil-and-gas-licensing-round>

Overview maps of protected areas

- For National Parks, AONBs, SSSIs and European sites see <http://magic.defra.gov.uk/MagicMap.aspx>
- For World Heritage sites see <http://whc.unesco.org/en/statesparties/gb>
- For groundwater protection zones, see <http://apps.environment-agency.gov.uk/wiyby/37833.aspx>

Annex A – Policy Statement for Existing Licences

1. Policy Background

- 1.1 As set out in the Government Response to the consultation “Surface Development Restrictions for Hydraulic Fracturing” dated 23 March 2016, the Government has committed to ensuring that hydraulic fracturing cannot be conducted from wells that are drilled at the surface in specified protected areas. The Government Response and the consultation document³¹ provide the rationale for this additional protection, how it fits with existing protections already provided by the regulatory and planning regime and how the areas to be protected were identified.³²
- 1.2 Further to the Government Response, this policy statement explains how this commitment applies when the Secretary of State decides whether to consent to hydraulic fracturing by the holder of a Petroleum Exploration and Development Licence.

2. Hydraulic fracturing consent

- 2.1 Under section 4A of the Petroleum Act 1998³³ (“the Act”), well consents for onshore Petroleum Exploration and Development Licences in England or Wales must include a condition requiring licensees to obtain the Secretary of State’s consent (“HFC”) before carrying out associated hydraulic fracturing in land at a depth of 1000 metres or more.³⁴
- 2.2 “Associated hydraulic fracturing” is defined in section 4B(1) of the Act as hydraulic fracturing of shale or strata encased in shale which:
- (a) is carried out in connection with the use of the relevant well to search or bore for or get petroleum, and
 - (b) involves, or is expected to involve, the injection of:
 - (i) more than 1,000 cubic metres of fluid at each stage, or expected stage, of the hydraulic fracturing, or
 - (ii) more than 10,000 cubic metres of fluid in total.

³¹ See

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/473795/Consultation_Surface_Restrictions_-_04_11_2015_FINAL.pdf.

³² See Section 1.21 of the consultation document,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/473795/Consultation_Surface_Restrictions_-_04_11_2015_FINAL.pdf.

³³ Sections 4A and 4B are inserted by section 50 of the Infrastructure Act 2015 (c.7).

³⁴ Section 4A(1)(a) prohibits associated hydraulic fracturing from taking place in land at a depth of less than 1000 metres.

- 2.3 Section 4A(3) prevents the Secretary of State from issuing a HFC unless he or she is satisfied that the conditions specified in that section are met, and is otherwise satisfied that it is appropriate to issue the consent.

Operations which are not associated hydraulic fracturing

- 2.4 Where a licensee is required (by their licence or a consent issued under it) to obtain the Secretary of State's consent before carrying out hydraulic fracturing which is not associated hydraulic fracturing, the Secretary of State will apply this policy as if that consent was a HFC.

3. Surface Development Restrictions for Hydraulic Fracturing

- 3.1 The Secretary of State considers that it will not normally be appropriate to issue a HFC for associated hydraulic fracturing from a well where its well pad is located in any of the following areas ("protected areas"):

- (a) Protected groundwater source areas as defined by regulation 2 of the Onshore Hydraulic Fracturing (Protected Areas) Regulations 2016.
- (b) Other protected area as defined by regulation 3 of the Onshore Hydraulic Fracturing (Protected Areas) Regulations 2016. For the avoidance of doubt this includes:
 - (i) Areas of Outstanding Natural Beauty;
 - (ii) The Broads;
 - (iii) National Parks;
 - (iv) World Heritage sites;
- (c) Ramsar sites (areas designated as wetlands of international importance in accordance with the Ramsar Convention);
- (d) European sites (as defined by regulation 8(1) of the Conservation of Habitats and Species Regulations 2010, including Natura 2000 sites protected under the Habitats Directive and sites protected under the Wild Birds Directive);
- (e) Sites of special scientific interest (as notified in accordance with section 28 of the Wildlife and Countryside Act 1981).

- 3.2 The Secretary of State's policy is that, save in wholly exceptional circumstances, no HFC will be issued if the well pad is located in an area in England or Wales which is a protected area at the time the consent is given.
- 3.3 The Secretary of State's policy also applies to sites which are the subject of a Government consultation on the scientific case for designation as a European site or a Ramsar site.
- 3.4 When HFCs are granted, the Secretary of State's policy is to include a condition requiring further consent to be obtained if the area in which the well pad is located subsequently becomes a protected area, or if it becomes subject to a Government consultation as described in paragraph 3.3 above.

3.5 The Secretary of State will keep this policy under review and conduct a review of the policy statement at the same time as the review required by regulation 3 of the Petroleum Licensing (Exploration and Production) (Landward Areas) (Amendment) (England and Wales) Regulations 2016.

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