



Frequently Asked Question: Onshore Oil and Gas

The information in this document is intended to provide responses to the frequently asked questions associated with onshore oil and gas regulatory activity in Wales. The responses are generalised, and do not refer to any specific site, operator or location. It is entirely possible that site specific questions may result in answers that differ to those presented in this document (as site specific answers would reflect local geology, environmental features, and the specific nature of the permit application that may not be reflective of other sites).

This document is intended for a non-technical audience and aims to provide a broad understanding of the issues, as opposed to a detailed analysis. The document will be reviewed and updated overtime to reflect any new FAQs that arise.

1. Background

1.1 Introduction to onshore oil and gas in Wales

1.1.1 What do we mean by conventional and unconventional oil and gas?

The term 'unconventional oil and gas' refers to natural gas which is trapped in deep underground rocks which is hard to reach, such as shale rock or coal beds. 'Conventional oil and gas' fields (such as in the North Sea) are usually situated in easier to reach layers of rock such as sandstone.

Until recently unconventional gas reserves have not been exploited because the cost was too high, or the technology wasn't available. Technological advances mean it could be economically viable to extract oil or gas from these sources.

1.1.2 What are the different types of unconventional oil and gas?

Both conventional and unconventional oil and gas are formed over geological time by heat converting organic material (the remains of organisms such as plants and animals) which was trapped in sediment and buried by newer deposits. Over time, increases in pressure and temperature, turn the sediment to rock and the organic material to oil and gas. Unconventional oil and gas typically refers to shale gas, coal bed methane and underground coal gasification:

- **Shale gas**

Shale gas refers to gas held in fractures and pore spaces, or gas adsorbed on organic material within shale rock. Shale gas, which is mainly methane, is extracted by creating narrow fractures in the rock using hydraulic fracturing techniques.

Hydraulic fracturing or “fracking” is a technique that uses fluid, usually water, pumped at high pressure into the rock to create narrow fractures which provide paths for the gas to flow into the production well and then to the surface. Once the fractures have been created, small particles, usually of sand, are pumped into them to keep the fractures open. The fracking water normally contains small quantities of other substances to improve the efficiency of the process, for example friction reducers (see section 3 for further details).

- **Coal bed methane**

Coal bed methane refers to the natural gas (mainly methane) extracted from unmined coal seams. It is recovered through the drilling of a series of vertical or horizontal wells directly into the coal seam and then pumping water out to lower the pressure in a process known as 'dewatering'. Reducing the pressure within the coal seams allows the methane to flow to the production well and then to the surface.

- **Underground coal gasification**

Underground coal gasification (UCG) is the process of partially combusting coal underground to produce a gas comprising of hydrogen, carbon monoxide and methane (known as 'syngas'). The UCG process typically involves drilling two wells into the coal, one for the injection of oxidants to enable combustion (water/air or water/oxygen mixtures) and another well, some distance away, to bring the gas to the surface.

1.1.3 What are the different stages of oil and gas development

The exploitation of oil and gas reserves typically occurs in four key phases (not all these phases apply to underground coal gasification). The four phases are outlined below.

- **Exploration** is likely to involve the drilling of a borehole to assess the rock formations and the potential quantity of resources available at a specific site.
- **Appraisal** is likely to include an increase in the number of boreholes and a small element of oil or gas extraction, to assess the technical feasibility and costs of extracting the oil or gas at a specific site.

- **Production** refers to full-scale commercial extraction. This is likely to require a larger number of boreholes and associated surface operations (for example gas storage and processing facilities).
- **Site remediation** and abandonment refers to the permanent removal of wells and infrastructure.

1.1.4 What is Natural Resources Wales' role in onshore oil and gas?

We are the environmental regulator for onshore oil and gas operations in Wales. We will help ensure that oil and gas operations are conducted in a way that protects people and the environment. We do this by assessing applications for permits, issuing permits when appropriate, and ensuring compliance with the permit conditions through inspections and compliance checks, and providing advice and guidance to operators. We will not issue a permit or allow companies to start work unless they can demonstrate how they will provide a high level of protection to people and the environment.

We manage the use of water, the protection of groundwater and the management of wastes such as drilling muds, gases and any naturally occurring radioactive materials (NORM). We manage environmental risks by carrying out site inspections, spot checks and audits and by reviewing operators' records and procedures. We have the authority to stop the operation if a significant hazard becomes apparent.

1.2 How we work with others

1.2.1 Which other bodies are involved in regulating oil and gas?

The Oil and Gas Authority (OGA) licenses each drilling and development activity in England. The OGA's role is to regulate, influence and promote the UK oil and gas industry to maximise the economic recovery of the UK's oil and gas resources.

From the 1st of October 2018 the Welsh Ministers assumed responsibility for the licensing of onshore petroleum extraction in Wales. No exploration or production activity can start without this licence.

The Health and Safety Executive (HSE) regulates the health and safety risks to people. In particular they are responsible for ensuring the appropriate design and construction of a well casing for any oil and gas boreholes. HSE requirements for ensuring well integrity also contribute to mitigating environmental risks.

Planning permission is needed from the Local Planning Authority.

There is a regulatory roadmap on GOV.UK to explain the roles of the different organisations and the permissions and permits required.

1.2.2 Who regulates the health impacts from oil and gas?

The Health and Safety Executive (HSE) ensures that operators of shale gas activities are adequately controlling risks to the health and safety of people, whether workers, contractors or members of the public. In addition, the work of Public Health Wales, local authorities, water companies and Natural Resources Wales all contribute to protecting people's health.

We protect people's health through regulating releases to the local environment. The level of emissions allowed - for example from flaring to combust waste gases - is based in part on the effects on people and the environment of exposure to different pollutants at different levels.

2. Natural Resources Wales Regulation

1.3 General regulatory approach

1.3.1 Does Natural Resources Wales support the development of onshore oil and gas?

As an environmental regulator, our role is to determine whether exploration and development activities can be done in a way that protects people and the environment.

We take the environmental risks associated with oil and gas exploration and production very seriously, including hydraulic fracturing for shale gas. Our regulatory controls are in place to protect people and the environment. If the activity poses an unacceptable risk to the environment, the activity will not be permitted. We are satisfied that the current regulations are sufficient to protect the environment during the exploratory phase of the industry's development. We continue to review our regulatory approach as the industry develops so that high standards of environmental protection continue, protecting people as well as the environment.

1.3.2 Why should the public have confidence in Natural Resources Wales being able to regulate the onshore oil and gas industry effectively?

We understand the environmental risks associated with onshore oil and gas and have the right regulatory controls in place. We regulate a large number of industrial sites across Wales, from landfills to steelworks, as well as the existing oil and gas extraction sector. Our specialists have decades of experience in protecting local communities and their environment (in fact, we can apply the combined experience of our legacy bodies the

Environment Agency Wales, the Countryside Council for Wales and the Forestry Commission Wales, in addition to the recent experience gained within Natural Resources Wales).

We have considerable expertise in the assessment of environmental risk and the protection of the environment. Through this expertise we ensure that the risks presented at individual sites are managed.

1.3.3 Is Natural Resources Wales still independent or are we responding to Government pressure?

We are an independent environmental regulator. Our role is to regulate the emerging industry effectively, in accordance with the law. We are also the principal adviser to Welsh Government, and adviser to industry and the wider public and voluntary sector. We have clear and established processes for internal and external consultation on environmental permitting matters to ensure our decisions are based on the application of a broad range of technical experience and data. Permit applications are determined by the requirements of EU and Domestic legislation.

1.3.4 How are people consulted on proposed oil and gas sites?

When NRW receives a permit application for oil and gas exploratory activities, details are publicised via our website and widely communicated by means of social media (NRW Twitter and Facebook Page). The publication of the application will include details of the public consultation process. The process can vary depending on the nature of the permit being applied for but will typically involve a time limited opportunity for interested parties to submit representations via the specified contact details.

Details of permit applications will also be retained within our Public Register. Arrangements to view the public register can be made by contacting:

Email: enquiries@naturalresourceswales.gov.uk

Phone: 0300 065 3000 (Mon - Friday 8am - 6pm)

If an application is considered to be of [High Public Interest](#)- (HPI), the application is advertised externally (in a local newspaper) and supported by a press release issued to all relevant media. For HPI applications, we also carry out a 'minded to' consultation period where we consult on our draft decision. Further details on the HPI process can be found on our external website.

The Mineral Planning Authority/Local Authority will consult on planning applications. NRW is a statutory consultee on local planning decisions, and any comments we make on

planning applications will be available through the Local Planning Authority (typically via their website).

1.3.5 What is Natural Resources Wales doing to prepare for the commercial development of unconventional oil and gas?

We are focusing the majority of our resources on the most immediate priority which is the exploration phase, to ensure that we are regulating the sites which are coming forward effectively. We are considering what the future industry may look like, if and when it moves to commercial production stage. This will allow us to understand whether the existing regulatory framework is sufficient or whether additional regulatory controls will be required.

1.3.6 Is Natural Resources Wales doing an effective job when there is still so much public concern about onshore oil and gas?

We recognise that the prospect of exploiting any potential unconventional onshore oil and gas reserves in Wales is of considerable interest to people living in Wales, and as an organisation, we aim to ensure that our evidence base and decision making process is robust and transparent. Our role is to protect the environment and local people. We do this by assessing applications for permits, issuing permits when appropriate, and ensuring compliance with the permit conditions through inspections and compliance checks, and providing advice and guidance to operators. We are confident we can do that.

1.3.7 What powers exist to ensure that operators rectify environmental damage caused by oil and gas activities sites?

If there is an incident which causes pollution of environment, environmental damage, or if there is a breach of the permit or non-compliance with environmental legislation, we have a range of enforcement powers available to us. Our powers include enforcement notices, suspension and revocation of permits, injunctions and ultimately criminal sanctions, including prosecution. Any enforcement action we take will be proportionate to the risks posed to people and the environment and to the seriousness of the breach of the law. We can also require operators to undertake remedial works to rectify any environmental damage.

Operators will also need to consider decommissioning as part of their environmental permits. Permit surrender is not possible until sites have been returned to satisfactory conditions.

We always aim to minimise the risk of a pollution incident by providing operators of industrial facilities with advice and guidance.

1.3.8 How does Natural Resources Wales consider the impact of oil and gas exploration on wildlife?

Natural Resources Wales already has well established processes for putting permit conditions in place to protect designated wildlife habitats. We are confident that these existing processes are sufficient to protect wildlife from the impacts of oil and gas activities.

The Conservation of Habitats and Species Regulations 2010 enable the designation and protection of areas that host certain important habitats and species out to 12 nautical miles offshore. These European protected sites are known as:

- Special Areas of Conservation (SACs) for the protection of certain habitats and species
- Special Protection Areas (SPAs) for the protection of certain wild bird species

Any application for works within or adjacent to a European site will be subject to the provisions of The Conservation of Habitats and Species Regulations 2010. This means that we will carry out a [Habitats Regulations Assessment \(HRA\)](#).

1.4 Environmental Permitting

1.4.1 Which environmental permits are needed from Natural Resources Wales to explore for onshore oil and gas?

This will depend on the methods used and the geology of the sites, but for exploratory boreholes, the developer would require up to twelve different consents, licences and permissions from NRW before they could start any drilling operations. The permits cover a range of activities, which manage groundwater, radioactive substances, mining waste, water abstraction, flaring, water discharge and flood defence. To obtain these permits, companies need to demonstrate that they understand the risks to the environment from their operations and show how they will reduce those risks to as low a level as possible.

For each of the first three stages (exploration, appraisal and production), the developer will be required to secure separate planning permissions, environmental permits and other notifications. Separate permissions may also be required if the developer wishes to significantly change their activities, i.e. drilling to a greater depth than originally permitted. For each permit application, people will be provided with an opportunity to comment. Further information is available on our [website](#).

1.4.2 How do developers make permit applications?

In making an application for the relevant permits the developer would be required to submit the relevant application forms and outline the specific details of the proposed activity. We will vigorously assess the details of any permit application, and check that the proposed

activity will not have a significant impact on the local environment. We will also assess the proposed activity against the requirements of EU and domestic legislation. Should we determine that an environmental permit can be granted, we will include permit conditions that provide the necessary protection to the environment and public health. If we consider that an activity poses an unacceptable risk to the environment we will not grant the necessary permits.

If exploratory activities demonstrate that there are economically viable oil and or gas reserves, a new and separate planning permission and new environmental permits would be required before any commercial oil or gas extraction could take place.

1.4.3 How can residents' view permit applications?

Details of the permit application will be retained within our Public Register. Arrangements to view the public register can be made by contacting:

Email: enquiries@naturalresourceswales.gov.uk

Phone: 0300 065 3000 (Mon - Friday 8am - 6pm)

1.4.4 How long does it take Natural Resources Wales to issue permits for oil and gas sites?

We aim to determine permit applications within 4 months, although if we deem a site to be high public interest it can take longer, due to extra public consultation. Please see our website for further information on high public interest sites.

1.4.5 Who regulates the noise from oil and gas sites?

Noise is regulated jointly by the local authority and Natural Resources Wales. The local authority will set conditions on the level of noise allowed. We consider noise issues as part of the permitting process. We look at site-specific issues, including how close the proposed activity is to sensitive receptors, for example local housing. If we have concerns about noise from a proposed activity we can ask the operator to draw up a noise management plan (this is the same for any site). The plan would identify the risk of pollution from noise and vibration and identify ways to control it. We review and approve this plan before we issue permits for the site. Operators must ensure that they implement the plan as part of their permit conditions.

1.4.6 How do you apply the precautionary principle in relation to oil and gas activities?

The assessment of risk is site-specific. For certain, specified small-scale activities, where sufficient information is supplied with the application, we may be able to undertake an initial risk assessment ourselves; but generally operators must also assess the environmental

impact of their proposal, to demonstrate an acceptable environmental outcome at the site (further information can be found in [Regulatory Guidance Series, No RGN 4](#)).

Our assessment to date on oil and gas exploratory sites has been that the risks can be managed effectively. Much of the activity proposed (for example borehole drilling and casing, surface run-off management) is not new and has been commonly used in conventional onshore oil and gas exploration for decades.

1.4.7 What guidance does Natural Resources Wales use?

We currently use a raft of existing guidance documents prepared by Natural Resources Wales and the Environment Agency. Although these documents may not be specific to onshore oil and gas activities, we are confident that they effectively encompass the appropriate regulatory/legislative requirements for the current phase of the industry in Wales. We will continuously review the requirement to prepare bespoke onshore oil and gas guidance.

1.5 Compliance

1.5.1 Will Natural Resources Wales carry out site inspections following the commencement of drilling? What do we monitor?

A site's permit sets out the conditions for operation of the site and will include, but not be limited to, conditions on groundwater, surface water, emissions, safe storage of waste, noise and air pollution caused by site operations. We undertake inspections to ensure compliance with these permit conditions. We focus our inspection work on those sites where we believe the risk of harm to the environment or local communities is higher or where the community has concerns about a site. Natural Resources Wales does not need to give companies operating sites in Wales any notice of inspections and can make unannounced visits.

1.5.2 How will Natural Resources Wales monitor air emissions from oil and gas sites?

We will assess the details of any permit application, such as the flare design for example (a flare is used to combust waste gas), and check that the proposals in the application will not have a significant impact on local air quality. The local authority has responsibility for measuring and monitoring local air quality.

1.5.3 When do you require groundwater monitoring?

We would require groundwater monitoring as part of any environmental permit for a groundwater activity, in which we deemed groundwater may be at risk.

1.5.4 What type of groundwater monitoring is required for oil and gas sites?

The type and period of monitoring required will depend on the risks from activities at particular sites. For example, exploration 'drill & core' wells, which do not include any form of fluid injection, would not normally be required to undertake groundwater monitoring prior to operations as there is no discharge to the environment.

As required by the Infrastructure Act 2015, environmental permits issued by NRW will contain a condition that requires monitoring of the level of methane in groundwater in the period of 12 months before any hydraulic fracturing begins.

1.5.5 What will be the requirements for land monitoring?

The Mining Waste Permit requires the operator to provide a site condition report at the permit application stage. The report may include soil sampling information, but specific requirements will vary depending on the sensitivity of the location and the nature of the activity.

At the time when the operator wishes to vacate the site, they will be required to 'surrender' their environmental permit. When applying to surrender their permit, the operator will be required to provide an updated site condition report. Natural Resources Wales will not allow the operator to surrender their permit until we are satisfied with the contents of the report.

1.5.6 How does the operator know what to monitor?

The permit we issue will identify the monitoring outcomes required. For example, we may limit emissions from the site except to certain levels from specific points such as flares, in which case these are the emissions that are acceptable. Operators are required to use qualified companies to measure those types of emissions.

The nature and scope of any environmental monitoring that is required on the part of the operator will be considered as part of our permit application assessment process. The exact requirements will be based on the nature of the specific activity proposed by the developer, local environmental variables, and UK and EU law. These requirements will be set out in the permit conditions. For low risk exploratory borehole drilling, environmental monitoring may not be required.

We do not specify monitoring techniques, although we would expect the technique to be in line with established good practice. The reason for this is that new monitoring technologies are continuously emerging, and we do not want to hamper innovation which may lead to improvements in monitoring effectiveness.

1.5.7 Is it appropriate to allow operators to undertake their own monitoring?

It is the operator's responsibility to comply with the conditions of their permits, including any monitoring conditions. If we have required monitoring at a site, data will be submitted and checked by us to ensure compliance. We focus our monitoring work on those sites where

we believe the risk of harm to the environment or local communities is highest. This practice is common across most industry sectors that we regulate.

Monitoring companies are subject to their own certification schemes that they are required to maintain in order to operate.

1.5.8 Does Natural Resources Wales check the credentials of a company before it grants its environmental permits to explore for oil and gas?

We undertake a Fit and Proper Persons test before we issue an environmental permit to an operator. We also check that the operator has the appropriate management systems in place to manage the activities they have applied for.

1.6 PEDL licences

1.6.1 What is a PEDL Licence?

PEDL stands for Petroleum Exploration and Development Licence. Licences in Wales were previously awarded by the Oil and Gas Authority (OGA) with this power now devolved to Welsh Ministers. The PEDL gives a company exclusive rights to explore for and develop oil or gas in a particular area. PEDL licenses for the 13th onshore licensing round were awarded in 2008. The 14th round licenses are expected to be awarded in 2015. A PEDL licence is initially time-limited to 6 years for exploration, but extensions can be applied for. No exploration can take place without a PEDL, plus the required planning, environmental and HSE permissions.

1.6.2 What criteria does BEIS use to decide whether a licence should be issued?

Applicants must prove technical competence, awareness of environmental issues and financial capacity before offer of a PEDL will be made.

In Wales Welsh Ministers undertake the duties previously carried out by the Oil and Gas Authority (OGA). This includes the administration of existing licences. WG Policy does not allow for any new licensing rounds for any type of Petroleum covered by the Petroleum Act 1998.

1.6.3 How can we identify where exactly the wells will be located within a PEDL licence area?

Natural Resources Wales is in regular discussion with industry, and this may mean that we know in advance where individual wells may be located. Otherwise we may first learn of the proposed well locations when operators request planning permission or submit a permit application.

1.6.4 How many wells can be drilled within each PEDL block?

Each block is a different size. Operators are likely to limit the number of exploration wells to the minimum required to evaluate the commercial nature of any resource.

1.7 Planning

1.7.1 How can I obtain a list of planning applications for onshore oil and gas?

You can go to the Planning Portal. This is the UK Government's online planning and building regulations resource for England and Wales. Local authorities publish the details of planning applications within their geographic area via their websites.

1.7.2 How does planning and permitting for onshore oil and gas fit together?

Operators will require both land use planning permission from the Local Planning Authority, which is the local authority, as well as environmental permits from Natural Resources Wales.

We are a statutory consultee in the planning process, so will comment on any planning applications. Local authorities also comment on any bespoke permit applications.

The local authority can also request an Environmental Impact Assessment (EIA) as part of the planning process. If an EIA is necessary, then we would be consulted as a statutory consultee on the scope of what the EIA should cover in relation to our remit.

1.7.3 Who is responsible for the undertaking a Strategic Environmental Assessment for onshore oil and gas?

Welsh Government would be responsible for undertaking Strategic Environmental Assessment (SEA) with regards to PEDLs in Wales

1.7.4 What is a safe distance for oil and gas activities to take place from housing?

The local planning authority determines the safe distance for oil and gas activities to take place from housing. The oil and gas company would also analyse and model the impact of any flare which would then be assessed by us as part of the application for an environmental permit.

1.7.5 What is Natural Resources Wales' role in relation to traffic to and from oil and gas sites?

The local planning authority is responsible for this, and the impact of traffic will be taken into consideration as part of the planning permission process.

1.7.6 Could oil and gas exploration happen near me?

You can view where the current licensed areas in Wales on the [Welsh Government website](#).

2 Technical Issues

2.1 Well integrity

What is a well casing?

The first phase of drilling involves drilling an initial borehole into which a steel casing pipe is set and cemented. The casing serves several functions:

- to control pressure;
- to prevent the formation from collapsing into the well;
- to isolate different formations from each other;
- to provide a means of controlling formation fluids.

The cementing or grouting process involves pumping cement down the centre of the casing and then into the space between the outside of the casing and the borehole wall.

2.1.1 How is the safety of drilling and well integrity regulated?

The operator is responsible for ensuring the safety of the well and the site. The Health and Safety Executive (HSE) regulates the working practices adopted by operators. These include the health and safety management of the site, well integrity and the reporting of dangerous occurrences.

2.1.2 Is the cement lining of the well inspected before operations begin and is it regularly inspected afterwards?

Well construction is regulated by the Health and Safety Executive (HSE). The cement casing cannot be visibly inspected, however it is pressure tested after placement. Where leakage from a well into rock formations is suspected, acoustic tools are available to locate the leak and steps can be taken to seal it.

Under the proposed Natural Resources Wales/HSE 'working together' agreement, we will be jointly inspecting wells and sharing information on sites where hydraulic fracturing is taking place.

2.1.3 Are the Offshore Regulations of 1996 suitable and robust enough for onshore applications?

The Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996 are regulations that the Health and Safety Executive (HSE) apply. Industry best practice is required to comply with these and they are considered to be appropriate for both onshore and offshore activities.

2.2 Well abandonment

2.2.1 Will monitoring be undertaken after a site is abandoned?

This will depend on the risks posed by the site, which will be assessed on a site-by-site basis. If wells are abandoned in line with Health and Safety Executive (HSE) regulations and we are satisfied that they do not pose a risk to the environment we would see no reason for continued monitoring.

Natural Resources Wales will not allow the operator to surrender their permit until we are satisfied that either no pollution has occurred at a site, or if it has, that the site has been returned to its original condition.

3 Shale Gas and Hydraulic Fracturing

3.1.1 What is fracking?

Hydraulic fracturing or “fracking” is a technique that uses fluid, usually water, pumped at high pressure into the rock to create narrow fractures which provide paths for the gas to flow into the well bore and then to surface. Once the fractures have been created, small particles, usually of sand, are pumped into them; these particles keep the fractures open when the water is flowed back up the well. The fluid normally contains small quantities of other substances to improve the efficiency of the process, e.g. to reduce friction.

The fracking technique has been used in the UK for many decades, and of the 2,000 conventional wells drilled around the UK, some 200 have been artificially fractured. Hydraulically fracturing conventional wells can help extraction by improving flow rates.

Not all borehole wells will be subject to fracking as it may not be appropriate for the local geology or required for the type of oil or gas being explored (for example, extracting coal bed methane is unlikely to require fracking).

NRW has not received any applications for permits to undertake hydraulic fracturing in Wales. Welsh Governments policy is, *‘To not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents.’*

3.1.2 Is there a moratorium on fracking in Wales?

From the 1st of October 2018 the Welsh Ministers assumed responsibility for the licensing of onshore petroleum extraction. Welsh Governments policy is, '*To not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents.*'

Welsh Government (WG) will undertake the duties previously carried out by the Oil and Gas Authority (OGA). This includes the administration of existing licences. WG Policy does not allow for any new licensing rounds for any type of Petroleum covered by the Petroleum Act 1998.

The Town and Country Planning (Notification) (Coal and Petroleum) (Wales) Direction 2018 states from the 5th December 2018 where a local planning authority (LPA) does not propose to refuse an application for coal and petroleum development the LPA must notify the Welsh Ministers. The Notification Direction is for any application for the development of petroleum or the development of coal.

3.1.3 Has Natural Resources Wales carried out studies on the environmental risks of shale gas?

The Environment Agency has published a comprehensive risk assessment of the environmental risks of shale gas. The risk assessment focuses on the exploration stage, which matches the current stage of development of the UK shale gas industry. Natural Resources Wales consider this risk assessment to also be applicable to Wales (on the basis that it was partially prepared prior to the formation of Natural Resources Wales, the regulations/legislation referenced are applicable in Wales and the risks identified are generic and not site specific).

3.1.4 What are the environmental risks from hydraulic fracturing?

Hydraulic fracturing to produce shale gas can potentially create environment risks, including:

- Using large quantities of water, potentially affecting available water for people and the environment
- Risks to groundwater, through the escape of hydraulic fracturing fluids or substances dissolved from the native rocks
- Mobilising minerals, dissolved substances and naturally occurring radioactive materials from rocks that need to be disposed of properly
- Emissions and management of wastes from drilling, hydraulic fracturing, flaring and other on-site operations

- Causing the release of methane, a greenhouse gas, and potentially other pollutants to air
- Polluting water or the ground from operations on the surface

All these risks can be controlled by good operational practice, reinforced through effective regulation.

3.1.5 Is the shale gas industry dirtier and more dangerous than other industries?

We regulate a wide range of industries. Each presents their own risks to the environment and the shale gas industry is no different. We have years of experience of working with the oil and gas industry to protect the environment and local communities.

3.1.6 Are the risks of hydraulic fracturing too high to allow this activity to take place?

Every industry has its risks and our role is to make sure that companies demonstrate that they understand the risks to the environment from their operations and show how they will reduce those risks to acceptable levels prior to granting an environmental permit.

3.1.7 Can we expect shale gas to be produced in the Wales?

The Welsh Governments policy is, '*To not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents.*' With this Policy in place we do not expect shale gas to be produced in Wales.