



# Onshore oil and gas exploration: environmental risks and the regulatory framework in England

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# An established onshore industry



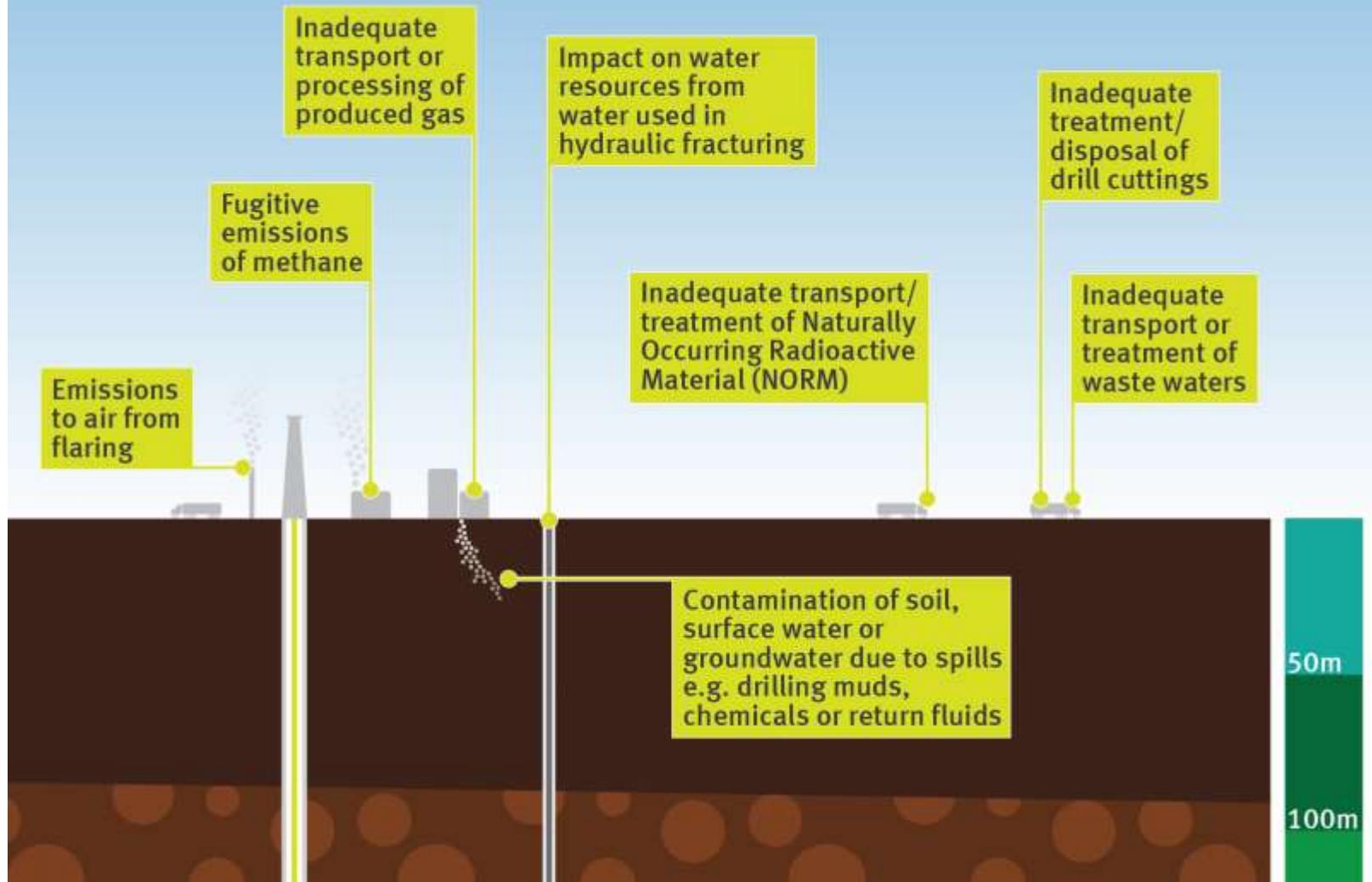
4th most expensive real estate in the world (reputedly)

AONB and SSSI

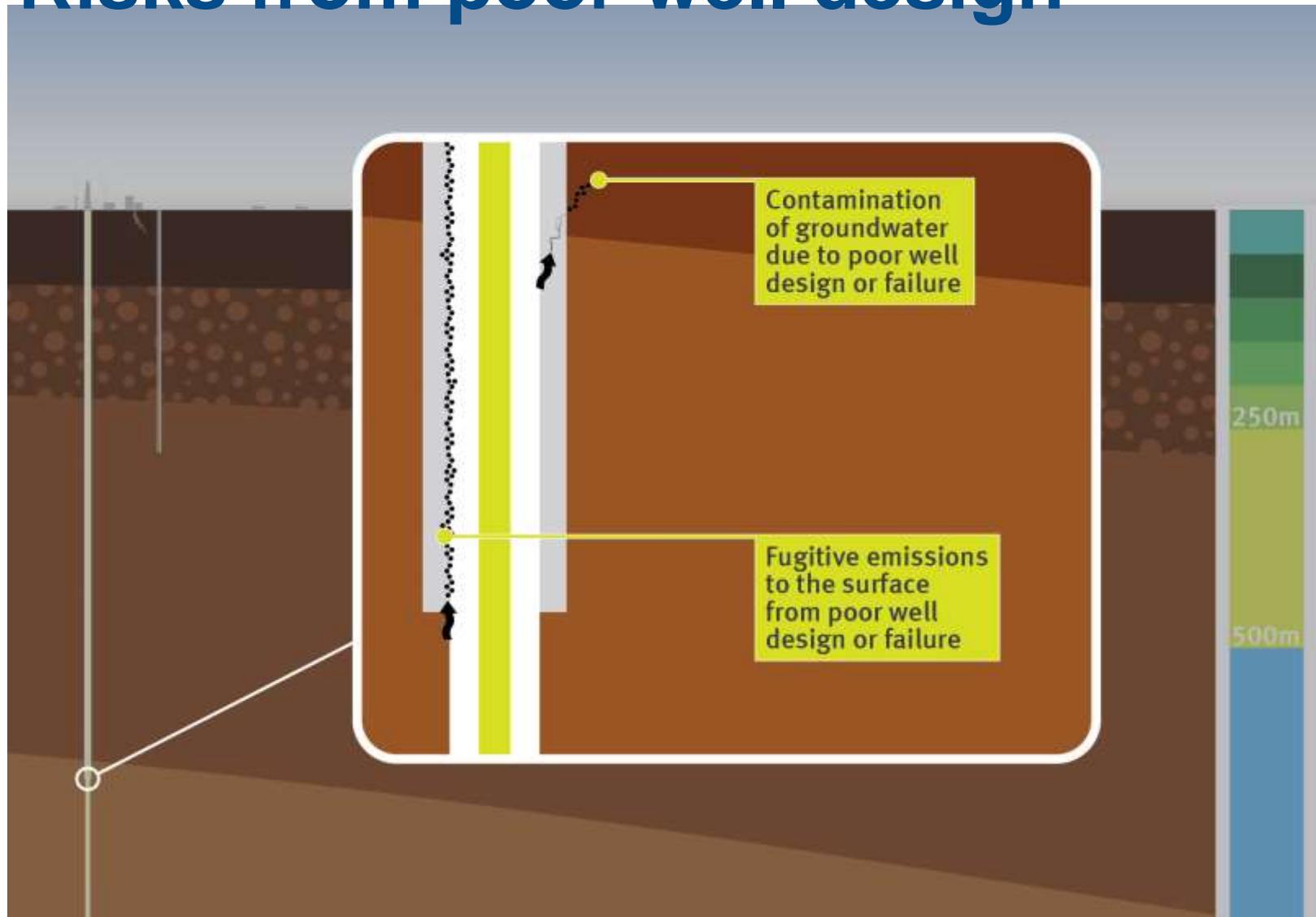
Part of drilling operations at Wytch Farm, Europe's largest onshore oil field

Source: Silson Communications Ltd.

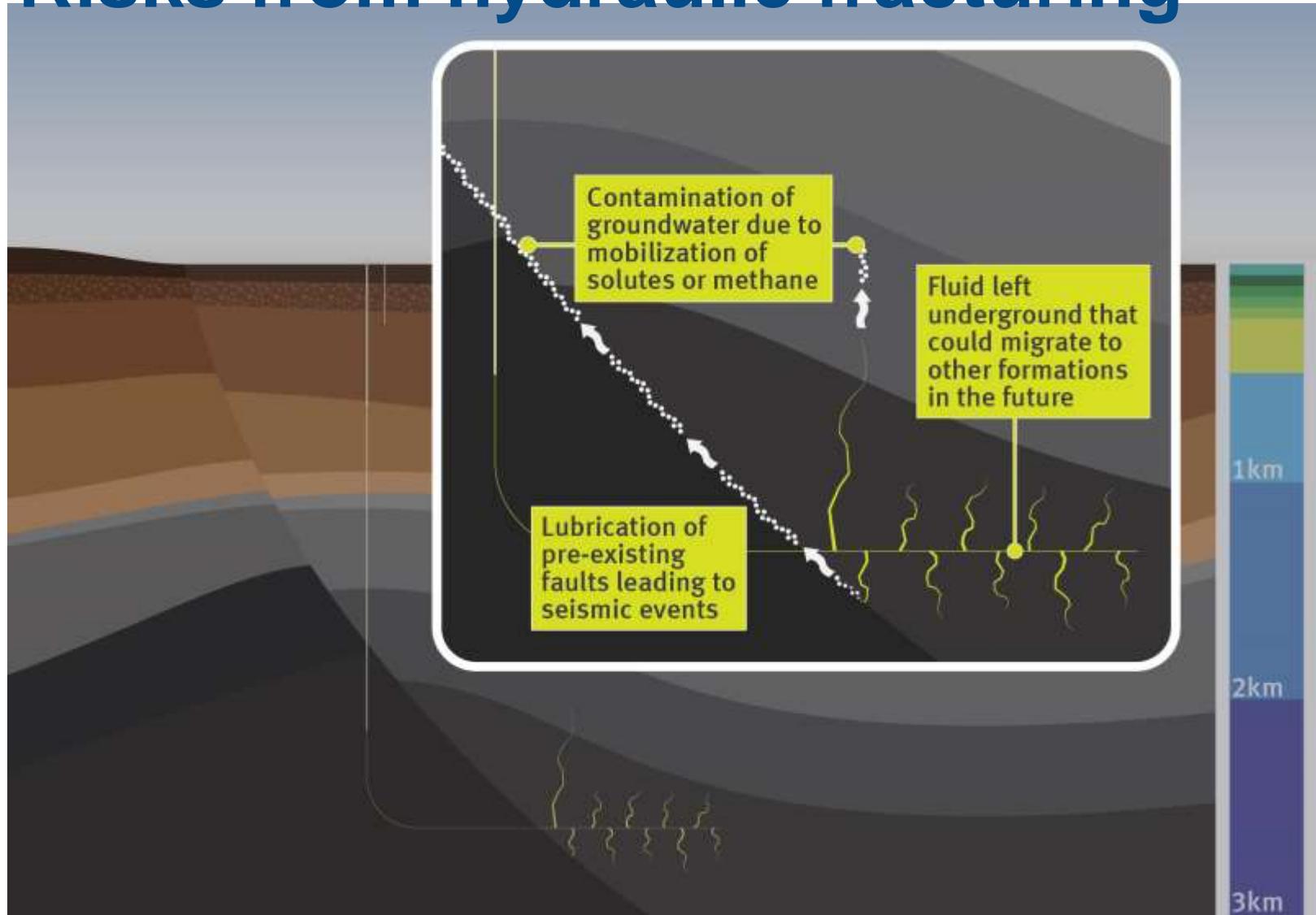
# Risks from surface operations



# Risks from poor well design



# Risks from hydraulic fracturing

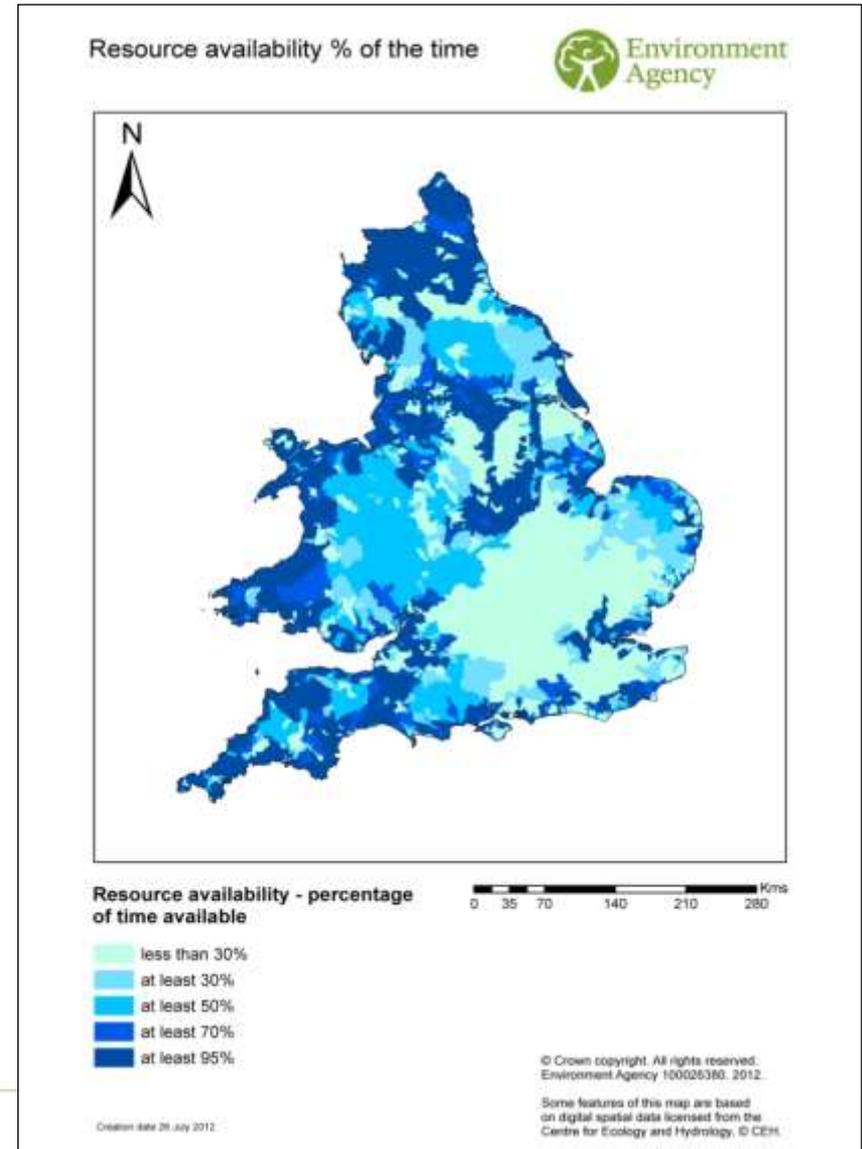


# Environmental controls

Risk	Controls
Over abstraction of water	<ul style="list-style-type: none"> <li>• <b>Abstraction licensing</b> under the Water Resources Act.</li> </ul>
Groundwater pollution	<ul style="list-style-type: none"> <li>• Notice under <b>Section 199 of the Water Resources Act 1991</b></li> <li>• <b>Environmental permit for a Groundwater Activity</b> (unless we are satisfied that there is no risk of inputs to groundwater)</li> <li>• Assessment of drilling mud and fracturing additives</li> </ul>
Poor management of wastes, including used and residual hydraulic fracturing fluid	<ul style="list-style-type: none"> <li>• <b>Environmental permit for a Mining Waste Operation (or Mining Waste Facility)</b></li> <li>• <b>Environmental permit for a Radioactive Substances (NORM)</b></li> <li>• Site inspection and compliance regime</li> </ul>
Fugitive methane emissions and other air quality concerns	<ul style="list-style-type: none"> <li>• <b>Environmental permit for a Mining Waste Operation</b></li> <li>• <b>Environmental permit for an Installation (IED)</b> (flaring more than 10 tonnes per day)</li> </ul>
Surface spills	<ul style="list-style-type: none"> <li>• <b>Environmental permit for a Water Discharge Activity</b> (if surface water run-off becomes polluted)</li> </ul>

# Water resources

- ➔ Catchment Abstraction Management Strategies (CAMS) assess how much water is reliably available on a catchment by catchment basis.
- ➔ Abstraction licence needed for  $>20\text{m}^3$  per day.
- ➔ Will be refused if not enough water available.
- ➔ Water bought from utility company needs to be met from their licensed supply.



# Groundwater protection

- ➔ Environmental Permit for a Groundwater Activity
  - ➔ No drilling in SPZ1 or where activity would have an unacceptable effect on groundwater
  - ➔ Detailed evaluation of risks to groundwater and mitigation measures
  - ➔ Assessment of nature of chemicals to be used
  
- ➔ S199 Notice of Intention to Drill – detailed Method Statement, including info on:
  - ➔ well drilling
  - ➔ well casing
  - ➔ storage of substances including fuel and chemicals
  - ➔ proposed Drilling Mud Management Plan
  
- ➔ Joint working and inspections with the Health & Safety Executive



# Extractive wastes

- ➔ Environmental permit for the management of extractive wastes, including:
  - ➔ Drill cuttings and spent drilling muds
  - ➔ Flowback fluids, including proppants
  - ➔ Waste gases, including fugitive emissions
  - ➔ Waste well stimulation fluids left underground
- ➔ Waste Management Plan needs to:
  - ➔ Characterise wastes, and describe risks
  - ➔ Set out mitigations, in line with waste hierarchy
  - ➔ Disclose chemicals
  - ➔ Set out monitoring and closure plans
- ➔ ‘Flow back’ fluid can be re-used in well stimulation if properly treated
- ➔ We will require ‘green completions’ as Best Available Technique (BAT) at the production stage



Source: Betsy Bicknell, Ricardo-AEA

# Radioactive substances

- ➔ Flowback fluid likely to contain naturally occurring radioactive materials - NORM
- ➔ If above defined levels will require an environmental permit
- ➔ Requirement for radiological assessment
- ➔ Flowback fluid in bunded tanks only and stored for no longer than three months
- ➔ Disposal at an appropriately licensed facility



# Waste gas

- ⇒ Environmental permit required for incineration of waste gas:
  - ⇒ Under Industrial Emissions Directive if flaring more than 10 tonnes of waste gas per day
  - ⇒ Under Mining Waste Directive if less
- ⇒ Best option is use of gas to generate energy or feed directly into the gas grid. Less likely at exploration stage.
- ⇒ Flaring is considered Best Available Technique (BAT) at the exploration stage. We will only allow an enclosed flare or other methods of oxidising waste gas
- ⇒ Flaring is better than venting because methane is a potent greenhouse gas.



Source: Renew Economy



Source: Uniflare

# Monitoring and decommissioning

- ➔ Requirement to produce a site condition report at the beginning and end of operations
- ➔ Monitoring regime set out in the permit or Waste Management Plan
  - ➔ Point sources of combustion emissions e.g. particulates, volatile organic compounds, sulphur and nitrogen
  - ➔ Surface water and groundwater e.g. dissolved methane, total suspended solids
- ➔ At least 3 months baseline monitoring of groundwater where fracking is proposed
- ➔ Post-decommissioning monitoring until we are satisfied that there is no significant ongoing environmental risk



# Public engagement

- ➔ Local consultation on bespoke permits
- ➔ Extra consultation for sites of high public interest – including fracking sites
- ➔ Close working with local authorities and other regulators
- ➔ Developing a short video and leaflet that explain our role

# Streamlining regulation

⇒ Oil and Gas Unit and Single Point of Contact



⇒ Technical guidance: consultation draft



⇒ Single application form



⇒ Bespoke permits within 13 weeks, unless they are sites of high public interest



⇒ Standard rules permits –  
1<sup>st</sup> tranche (Autumn 2014)  
2<sup>nd</sup> tranche (Spring 2015)



Forthcoming

# Infrastructure Bill

- ➔ Government has accepted an amendment that would require:
  - ➔ 12 months monitoring prior to hydraulic fracturing
  - ➔ No hydraulic fracturing in groundwater source protection zones
  
- ➔ There are further stages of the Bill to go

# Conclusions

- ➔ We have thoroughly assessed the environmental risks for exploration
- ➔ We have the right regulatory controls in place
- ➔ We will work with partners to ensure joined up regulation
- ➔ We will consult and engage with local communities on bespoke permit applications
- ➔ We will streamline the permitting process, whilst maintaining high standards of environmental protection
- ➔ We will keep this under review, especially as we move forward into the production phase