

The logo for IGas Energy, featuring the text "IGas" in a bold, black, sans-serif font above the word "Energy" in a smaller, black, sans-serif font. To the right of the text is a stylized green graphic consisting of two overlapping triangles pointing upwards.

IGas
Energy

A photograph of a worker in an orange high-visibility jacket and a white hard hat, seen from behind, walking on a gravel path. The worker is in the foreground, and the background shows a large industrial structure, likely an exploratory well, with a tall light pole. The sky is blue with some clouds. A large green diagonal graphic is overlaid on the right side of the image.

Community Information Tinker Lane Exploratory Well

Introduction

This brochure contains the information from our exhibitions held in North Nottinghamshire in November 2015.



The logo for IGas Energy, featuring the text 'IGas Energy' in a bold, sans-serif font. The 'I' and 'G' are larger and more prominent. To the right of the text is a stylized green arrow pointing upwards and to the right, composed of two overlapping triangles.

IGas
Energy



Welcome

Who are IGas Energy Plc?

IGas Energy Plc is the UK's leading onshore oil and gas exploration business, with licences to explore for oil and gas in a number of locations including the North West, east Midlands and the Weald Basin near the south coast of England and Caithness in Scotland.

The business has more than thirty years' experience of successfully extracting oil and gas onshore, in the UK, which has one of the most stringent regulatory regimes in the world.

We are a British business operating over 100 sites around the country employing more than 160 staff, who largely live and work in the areas in which we operate.

IGas is committed to the environment and the communities in which we operate and we have a long track record of engaging with local residents. IGas operates its own Community Fund which has committed to distribute several hundred thousand pounds a year to local projects that are charitable, educational or benevolent.

A photograph showing two oil pumpjacks in a rural setting. The pumpjacks are black metal structures with a characteristic walking beam. They are situated behind a fence and surrounded by green trees and a field of green crops in the foreground. The sky is blue with scattered white clouds.

What does IGas do?

We explore and produce oil and gas at a rate of approx 3,000 barrels a day, to help provide the UK with secure energy supplies. We extract oil and gas trapped underground in reservoirs. These are referred to as 'conventional' resources.

We are currently producing coal bed methane (CBM) at our Doe Green site near Warrington from the coal measures. The gas produced is used to generate electricity which is then fed into the grid for use in homes and businesses. This was a pilot to demonstrate the potential of CBM and we have been producing successfully for three years from this site. We are now looking to identify other opportunities for developing CBM in the area.

Whilst IGas already produces oil and some gas from its conventional wells, the potential of unconventional resources could be a significant opportunity for Britain. In the areas where the geology is suitable and government-issued licences are available, our aim is to use data from exploratory wells to help better understand this resource potential.

Our operations



1. GAINSBOROUGH, East Midlands

Our fields in Gainsborough and Beckingham in the east Midlands have become a part of the local community. The wells produce approximately 14 barrels of oil per day from a site the size of the local basketball court. Not far away, on the Gainsborough golf course, are three more well sites set amongst the fairways which have been producing oil since 1959. Our East Midlands area under licence consists of 17 oil fields and 80 sites and has produced more than 31 million barrels of oil to date.

2. DOE GREEN, Warrington

Within sight of the Fiddlers Ferry coal-fired power station and on the edge of Penketh, our Doe Green field has four wells and an onsite electricity generator. This is powered by the gas produced from the underlying coal seams. Each well has a production well head, known as a Christmas Tree, which stands approximately 6 feet tall. We have been producing coal bed methane (CBM) here to generate electricity for the grid since 2010.

3. SINGLETON, west Sussex

The Singleton field, in the South Downs National Park, an area of Outstanding Natural Beauty (AONB), has been producing oil since 1991. It currently produces around 500 barrels per day. IGas works with the landowners, the Forestry Commission and other regulatory bodies to nurture the habitats and surroundings of the native flora and fauna.

4. CAITHNESS, Scotland

In December 2013 Igas acquired Caithness Oil which owns and operates the Lybster Field that is drilled from onshore to offshore. The field was put into production in May 2012 producing both oil and gas.

Tinker Lane

We have recently identified a new site off the A638 and Tinker Lane, in the Parish of Torworth, which we plan to develop as an exploration site. The proposed development would be to drill a single vertical well down through the coal and shale layers to collect the rock samples for analysis. For the avoidance of doubt, no hydraulic fracturing will take place as a part of this application.

We are in a very early stage of the process and have only recently submitted a scoping request to Nottinghamshire County Council setting out environmental matters we believe need to be addressed in order to progress any future planning

application. Details of this Scoping Request can be viewed on the Nottinghamshire County Council website* and via our dedicated Tinker Lane page on our Engage website**.

Our Tinker Lane site will complement our Springs Road site and give our technical teams a better picture of the geology across the area in order to better inform any future operational decisions.

* www.nottinghamshire.gov.uk/media/109835/tinker-lane-scoping-report.pdf

** www.igas-engage.co.uk/tinker-lane-2



What is exploratory drilling?

Exploratory/appraisal drilling – what does this involve?

Exploratory drilling is a process in which a well is drilled to enable evaluation of the oil and gas present in the ground at a particular area and to assess the quality and quantity of those hydrocarbons.

Prior to drilling, a well pad is constructed. The site is levelled and an impermeable membrane is laid to prevent fluids escaping into the subsurface or the local environment.

The construction and integrity of the well is vital.

As wells are drilled, each section is cased off with steel pipes (casing) cemented into place.

The containment of the gas or oil within the well, all the way to the surface, is what we mean by 'well integrity'. This is of the utmost priority in order to protect groundwater and ensure isolation from the surrounding rock formation.

The process involves several cycles of drilling where a casing (a steel pipe to line the well) is put in place with cement.

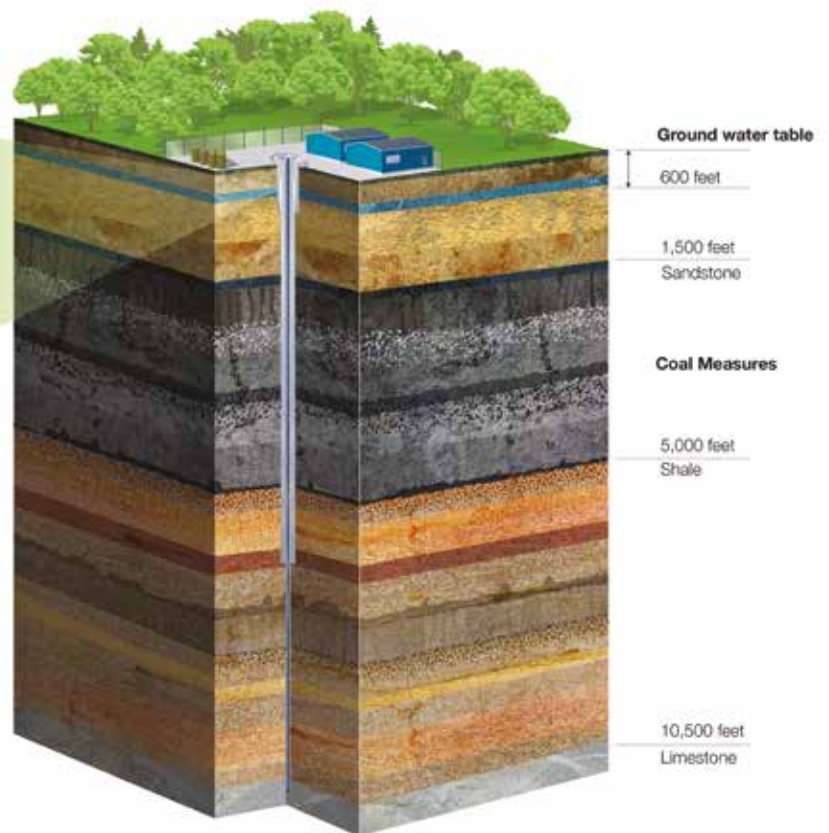
The integrity of each section is tested to confirm it is robust before further well operation takes place and each part continues to be monitored throughout the full life cycle of the well.



What is exploratory drilling?

Schematic Coal Bed Methane Well

SURFACE CASING DETAIL



How we drill – the drilling sequence

As operator of our sites, all aspects of the programme including the design, construction and integrity of the well bore, are our responsibility.

Wells are drilled using a mobile drilling rigs and the well bore is formed using a drill bit on the end of a rotating drill string.

During drilling, a drilling fluid (mud) is pumped down the drill string and then back up again. The fluid is circulated for lubrication, cooling and the removal of drill cuttings. The fluid also ensures the hole is stable and prevents formation fluids entering the well bore.

As each section of the well is drilled, lengths of steel tubing (casing) are run into the hole and cemented in position to form a high-strength liner which seals the rock formation from the well bore and protects groundwater.

Once drilled, the rock formation is evaluated to understand what it is made of and what it could potentially contain.

Formation samples including cuttings and cores are obtained for analysis during the drilling phase to help us work out how much gas or oil may be present in the rock.

In addition to physical samples, electronic images of the formations are acquired by running special tools into the wellbore to further build up our understanding of the area's geology and its development potential.

Should the samples prove attractive, the well may be further cased with cemented steel pipe, otherwise the well will be abandoned in accordance with guidance from the regulatory authorities. This typically entails setting cement plugs in the wellbore and removing the near-surface steel casing and wellhead before the site is returned to its original state.



Protecting the environment

- **Environmental Risk Assessment**

An Environmental Risk Assessment considers how various factors, including waste, drainage, air quality and foliage could relate to our activities and decides the most suitable methods to be put in place in order to mitigate risk.

The first stage Environmental Risk Assessment (ERA) is prepared by IGas and is refined using data from seismic survey.

The Environmental Risk Assessment will be further refined at the same time as the conclusion of the Environmental Impact Assessment (EIA) and the Environmental Permit.

- **Environmental Impact Assessment**

IGas' consultants prepare a Scoping Report which leads to the submission of an Environmental Impact Assessment (EIA) to support a planning application.

The preparatory work for the Scoping Report includes a 'scoping exercise' in the seismic area which assesses which locations would be most suitable for the development of a site. The aim is to identify the key issues of concern at an early stage in the planning process. The scoping exercise will consider such matters as transport access, noise sensitive receptors, visual impact and other environmental matters which could influence the site selection and operation.

After site selection, the Scoping Report will go to a further level of detail to consider all aspects of establishing a drilling site, including: site construction, hours of operation, traffic generation, pollution control, waste management, lighting and safety. The report will assess the potential adverse environmental effects of establishing a new site, including the impacts to: visual amenity, traffic and highways, ecology, noise, historic environment, air quality and water environment. The report will also look at community and social impacts and the cumulative and combined effects.

Protecting the environment

As soon as the Scoping Report is completed the following actions will take place:

- Presentation and circulation to stakeholders for comment
- The views of stakeholders will be invited and evaluated
- Submission to the relevant local authorities for consideration.

The planning authority will respond to the Scoping Report and then IGas' consultants will prepare the formal EIA to accompany a planning application.

In parallel with the production of the ERA and the EIA, discussions will be on-going with the Environment Agency with the applications for a number of Environmental Permits.



Environmental site monitoring

On every site IGas works hard to ensure its operations have minimum impact on the surrounding land and our neighbours.

Key to this is a thorough understanding of the starting position for the site in terms of the current environment. IGas works with independent environmental consultants to assess our sites both before work starts and throughout the programme.

These consultants carry out a series of tests to understand the current condition of air, water and soil on different parts of the likely site. This information provides a baseline against which we can measure our ongoing operation.

In particular, our consultants will assess and monitor:

- **Groundwater**

- Dedicated monitoring wells allow us to assess groundwater at different depths

- Sensors will be installed to continuously monitor water quality for a three-month period
 - Three rounds of groundwater samples will be collected from the monitoring wells for detailed lab analysis
 - Further groundwater monitoring and samples will be taken during drilling operations

- **Ground Gas**

- This occurs in the spaces between soil particles above the water table and includes naturally occurring methane, carbon dioxide and other man-made gases such as landfill gas.

- As methane is the target natural gas for the exploration drilling, it's important to identify the existing ground gas composition.

Environmental site monitoring

• Surface Water

The network of waterways that drain the area represent sensitive receptors for any possible, existing contamination.

- Three rounds of surface water samples will be collected from any drainage ditches nearest to the site for detailed laboratory analysis of the water composition
- Further samples and analysis will be undertaken during drilling operations

• Air Quality

Existing air quality may be affected by nearby road traffic or industry:

- On-site and off-site monitoring of the air composition is carried out by three periods of continuous monitoring and sent to a laboratory for detailed analysis
- On-site dust monitoring, recording the direction and quantity of dust in the atmosphere, is recorded over three periods
- Particulate matter is assessed by one period of continuous monitoring at the site
- Air quality monitoring continues through drilling operations.

• Surface Soil Samples

Soils can be contaminated by a range of activities including spills of tractor fuel, fertilizers and pesticides. The existing chemical composition of the soils in the area will be assessed by the collection of soil samples from four locations around each proposed well site, once they have been identified.

All the data collected as part of this programme will be used to create a baseline report against which we will continuously monitor the environmental conditions throughout any exploratory drilling operations.

After analysis and verification we intend to make these results available at igas-engage.co.uk



How oil and gas is formed and trapped

All of the oil and gas we use today began as microscopic plants and animals living in the ocean millions of years ago. As they lived, they absorbed energy from the sun, stored as carbon molecules in their bodies. When they died, they sank to the bottom of the sea. Over millions of years, layer after layer of sediment and other plants and bacteria were formed.

As they became buried ever deeper, heat and pressure began to rise. The amount of pressure and the degree of heat, along with the type of biomass, determined if the material became oil or natural gas.

After oil and natural gas were formed, some became trapped under

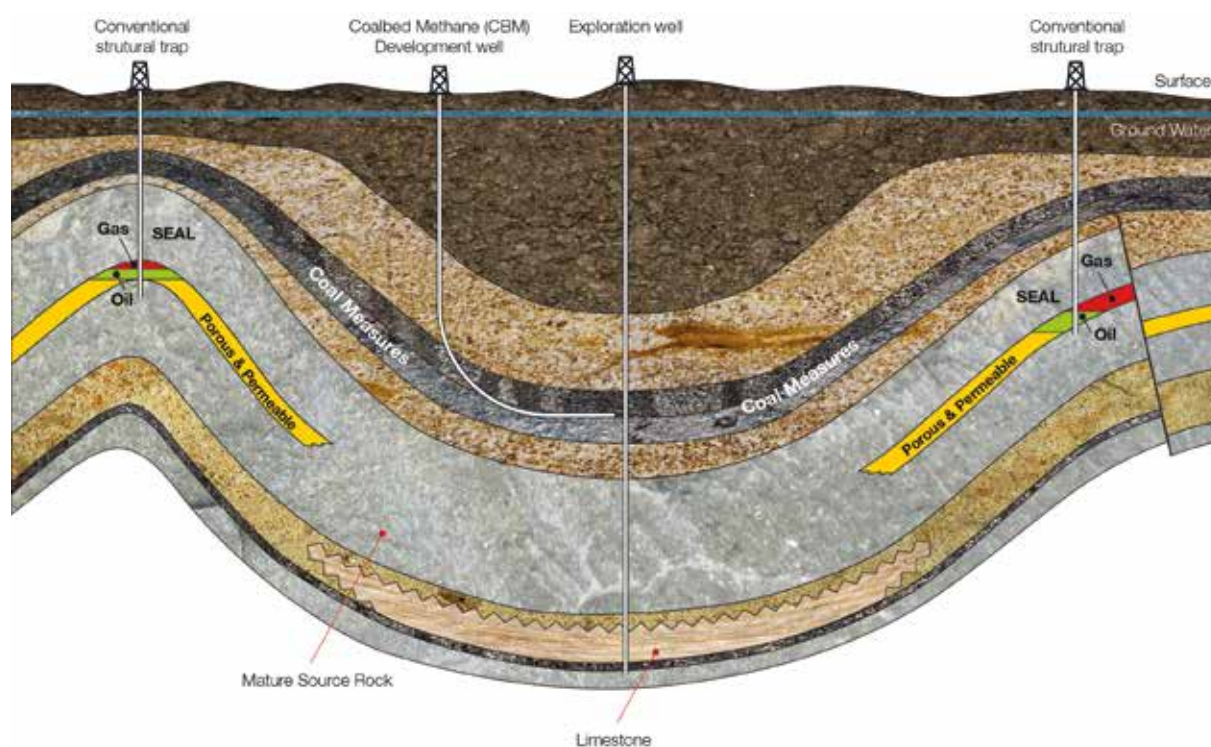
impermeable layers of rock or clay – what we call ‘cap rock’. These trapped deposits are held in a ‘reservoir rock’ and this is where we find oil and natural gas today.

Cap rock is impermeable

The cap rock seals the hydrocarbons in place and prevents them from leaving the reservoir rock and migrate to the surface. Typical cap rocks includes clay stones and shales.

Reservoir rock is porous and permeable

The reservoir rock is typically sandstone or limestone. Oil or gas is stored in spaces in the rock that was deposited in tropical seas 200 million years ago.



IGas in the community

We place huge importance on building trust and understanding within the local communities in which we operate.

Our philosophy is an open approach to communication at all stages of our work, from pre-planning through to reinstatement of the land.

Where we can, we identify potential issues in advance and work with communities to solve any problems that arise. Typical issues include:

- Visual impact
- Ecology and nature conservation
- Vehicle movements
- Noise
- Air quality and water protection
- Operating hours and lighting
- Geology and landscape
- Cultural heritage

Our approach to community liaison

We regard communicating with our neighbours in local communities as essential, recognising that they have the right to be consulted and given every opportunity to comment.

We initiate Community Liaison Groups at sites where new developments are proposed and feel that both IGas and the groups benefit greatly from the resulting two-way dialogue.

The Community Liaison Groups are supported by local exhibitions, presentations, brochures, meetings with neighbours, media relations and, where appropriate, web-based activity to ensure we are as accessible as possible.

Above all else, IGas believes in ongoing contact with the communities where our sites are based.



Birchwood Colts

The IGas energy community fund

The IGas Energy Community Fund was set up in 2008 and is committed to distributing several hundred thousand pounds a year.

We recognise that we can have the potential to affect our neighbours and we accept the responsibility to try and minimise those impacts and to operate in a socially acceptable manner. We know that a good corporate neighbour is one who contributes to the wider well-being of the community and the Community Fund was set up to support this aim.

An independent panel made up of four representatives from community groups supported by two senior executives from IGas come together to decide which community causes should be awarded the grants.

So far, the fund has supported numerous projects in towns and villages close to our sites in the North West, East Midlands and the South of England.

The projects are a diverse range from the re-ordering of a historic building in Barton, to a riverside picnic area in Surrey.

LIVES, Sudbrooke

Grant: £6,966

Nettleham, Welton and Stainton

Locally based to our East Midlands fields is LIVES (Lincolnshire Integrated Voluntary Emergency Service), a voluntary emergency responders' group, set up to provide vital life-saving response cover to residents in the remote villages of Sudbrooke, Scothern, Langworth and Stainton. We are proud to have supported the group to expand their reach with an additional set of equipment and vehicle signage, allowing a second volunteer team to be deployed. Support from local volunteers like those from LIVES can mean the difference between life and death.



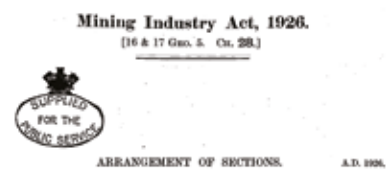
The regulatory framework

Drilling and regulation

The drilling programme will be completed in accordance with industry best practice and all applicable regulatory requirements, set out by the Department of Energy and Climate Change (DECC), the Environment Agency and the Health and Safety Executive as well as the conditions set out in the planning consent. There are numerous standards and guidelines that we have to conform to, irrespective of the type of well being drilled (CBM, conventional oil or gas or a shale well).

Regulation in the UK

In the UK, we have an exemplary regulatory regime which drives responsible and effective management for the health and safety of any drilling operation and the associated environment.





Thank you for visiting our exhibition

We hope you found your visit today useful.

IGas will continue to update the community as and when the plans for this site develop so we hope to see you again soon.

If you need any further information please visit our website **igas-engage.co.uk**

Or call our information line **0203 675 6058***
open weekdays from 10am - 4pm.

*Calls are charged at the standard rate. Calls from mobiles may cost more.



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