

KM8 HYDRAULIC FRACTURING FACT SHEET



Third Energy received planning permission to hydraulically fracture its existing KM8 well in Kirby Misperton on 27 May 2016. This fact sheet contains information on the current operations and will be updated as the project develops.

Third Energy has permission to hydraulically fracture the KM8 well in five separate zones to see if the natural gas we know is present can be made to flow. These zones are at depths of between 7,000 and 10,000 feet or (1.3 to 1.9 miles) below surface. If the gas flows after the fracturing, it will be tested to measure pressure, flow rate and other data. We do not know how the natural gas will flow or for how long but we have permission, following the test phase, for ongoing production for up to nine years.

- Well site** The KMA site, one of two near Kirby Misperton, has been in existence for over 30 years and producing natural gas for over 20 years.
- KM8 well** The KM8 vertical well was drilled in 2013, from an extension to the original KMA well site. No new drilling is required.
- No Flaring** No natural gas will be flared. All natural gas produced will be mixed with existing production and exported through the existing pipeline infrastructure to the Knapton Generating Station (KGS) and used to produce electricity.
- Noise Barrier** A noise attenuation barrier has been constructed around three sides of the well site using 2.9 metre high shipping containers at the base and a scaffold frame on top, covered by Echo Barriers. The overall height is 9 metres. On completion of the hydraulic fracture work programme the barrier will be removed from the well site.
- Operations** Actual operations began with the “workover” to prepare the well for the fracs, and this activity is now completed. This involved a small rig coming on to site to installing new casing and cementing it in place.
- The hydraulic fracturing phase of the work programme will take approximately three weeks from beginning to end. The frac equipment or “spread” (there is no such thing as a “fracking rig”) is being mobilised and will be constructed onsite. The standard equipment - pumping and mixing equipment, storage tanks and pipework – is compliant with UK and EU regulations and used in a number of industries.
- The operations required to open a fracture in each zone will take approximately five hours in total, with the main pumping operation taking just one to two hours. The fracs will start with a step down test and then a mini-frac test to gather pump and rock data. This will confirm the properties of the rocks to be fraced; ensure we have a good connection to the reservoir and optimise the implementation of the main frac.
- After the fractures have been completed, the frac spread will leave the site and we will install the operational well head. It will then demobilise leaving only well testing equipment on site. The well testing equipment will measure the gas flow from the well and send it by pipeline to KGS. Depending upon the results, the zones would be flow tested for up to 90 days. If the test results are very successful, the well would be rigged up for continuous production.
- Site Hours** Frac operations 7am to 7pm Monday to Friday
- Fracturing operations will only be conducted in daylight hours and take place Monday to Friday between 7am - 7pm. Other site operations will continue 24 hours a day.
- Deliveries** 7am to 7pm Monday to Saturday

- Production** If the fracs and well test generate enough gas flow, the well will go into production. At the surface, this requires a standard series of valves – known as a Christmas Tree. The well site will then look and operate very much as it did before the start of operations.
- Well Bore** The well bore casing is 26 inches in diameter at surface and seven inches at final depth of over 10,000 feet. Production tubing (inside the casing) will be 2 3/8 inches in diameter. For comparison, private water wells in Kirby Misperton range from about 6 to 100 feet deep and the Corallian aquifer lies around 600 feet below surface.
- Water** The hydraulic fracturing programme requires a maximum of 4,000 cubic metres of water in total. This will be supplied by Yorkshire Water who supplies the region with 1.2 million cubic metres daily. The water will be stored in tanks at KGS and delivered to the well site through Third Energy’s own existing pipeline.
- Waste Water** The water that returns to the surface after the fracturing is complete is called flow back water. When it comes to the surface, this water will flow into a fully contained system and be stored above ground in double skinned, steel tanks prior to removal from site. The water will be taken from the site in specialist road tankers by an EA approved transport company to the treatment facility. The water is treated to a high standard at the EA approved treatment facility so that it can be released back into the water cycle.
- Frac** Designing and executing fracs is very technical involving specialist engineers and scientists. We have a lot of knowledge about the target formation through studying the rock samples (cores) and other well data. Our specialist contractors are very experienced in the safe completion of hydraulic fractures. Working together, we have used this knowledge and expertise to identify the five zones most likely to produce natural gas and developed a customised design for each frac to maximise the potential gas flow from the formation under test.
- The frac fluid will be pumped into the target zones to create a narrow, vertical wing shape pair of cracks in the rock – the fracs. The fractures are very thin, between just half and one inch wide. The shortest fracture will extend 300 feet and the longest 1000 feet into the formation. As the five separate fracs have been designed for their own target zone, their dimensions will vary.
- The frac is designed to take advantage of the formation’s geology – naturally fractured interbedded shale and sandstone – to connect the network of tiny, natural fractures and provide a pathway for the gas to flow. These pathways are kept open by the proppant in the frac fluid.
- Frac Fluid** Hydraulic fracturing fluid is made up of approximately: 95% water; 4% proppant; and less than 1% chemical additives. The chemicals that Third Energy will be using have been approved by the Environment Agency (EA) who issued the permits required in April 2016. The additives which will be used are commonly found in food, toiletries or other household products. Under UK law, only additives approved by the EA as “non-hazardous to groundwater” are permitted and requires information on additives to be fully disclosed in both total quantity and concentration in the fluid.
- Monitoring** To establish current local environmental conditions, Third Energy commissioned a range of baseline studies. These cover everything from local air quality and ambient noise, to water quality in private wells in the area and groundwater conditions at the KM8 site. Ongoing monitoring – both during and after operations – will establish if there are any changes in local conditions.
- Separately, the government has provided funding for the British Geological Survey (BGS) to carry out its own monitoring programme. This is completely independent of both Third Energy and regulators such as the Environment Agency, North Yorkshire County Council and the Health & Safety Executive. Information from both monitoring projects will be available to the general public.
- Restoration** The planning permission includes a provision for site restoration once all operations cease. The financial commitment required of Third Energy, or any subsequent owner of the site, to deliver the restoration and aftercare of the development has been approved by NYCC.