

Briefing

Stopping fracking before it starts: seismic surveying and fracking near you

This guide is to help people who live in areas across the country where [Ineos has licences allowing fracking](#)¹ to spot where fracking applications might happen, and most importantly, to know how to prevent them at an early stage in the process.

For over five years, the actions of people across the country have kept the UK free from fracking. By using a diverse range of methods and campaigning communities have continuously stopped the fossil fuel in it's tracks and protected the climate.

Companies are awarded licences by the Government to exploit the oil or gas under the ground in a given area. But having a licence is not enough – the company has to apply to the local council for permission to frack within that area. But, before they do this, they will carry out a 'seismic survey' to help them assess where they want to frack. It is the first clear indication of a fracking company's interest in an area. It might also be the first on the ground activity that you see. Targetting seismic surveying with your actions and campaigns is a great opportunity to raise awareness and put a stop to fracking before it starts.

We've put together this briefing to help explain what seismic surveys are, why you should care about them and how to take action on them in your community.

The guide contains information on how to find out if seismic surveying is happening in your area and gives ideas for what you can do if seismic surveying is taking place near you. There are also in-depth explanations of land-use planning in relation to seismic surveying, and of what your rights are as a householder or landowner.

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1 What are seismic surveys and why are they needed for fracking?

Seismic surveys (also called geophysical surveys) are used to understand what the rock looks like underground where companies want to frack. They work by using acoustic scans of the ground to produce detailed images of the rock layering and structure beneath the Earth's surface.

They are commissioned by oil and gas companies during exploration to reveal oil and gas reservoirs. The surveys will help companies judge the potential of such sites - size, amount of oil or gas and "frackability" (brittleness) of the reservoir - and the best place for drilling wells.

The company holding a licence for a particular area (known as a Petroleum Exploration and Development Licence, or PEDL) will use seismic surveys to assess where in their licensed area to submit an application to frack. The company may carry out the seismic survey itself or may employ contractors.

For more information on seismic surveys (what they are, how they are carried out and how they are used) see Appendix C.

2 How to find out if seismic surveying is happening in your area

There are several ways to find out if seismic surveying is happening in your area:

- Companies will usually notify local residents to tell them what is happening, so look out for letters through doors, notices on town and village noticeboards and adverts in local papers. Some companies may hold public meetings or drop-in information sessions.
- [Look on our map](#)² to see if someone has already added information about seismic surveying and fracking near you.

- Planning permission is not usually needed for seismic surveys but, in some cases, the company must inform the county or unitary council (depending on where you live) to see if they need a planning application to be submitted. See Appendix A below for more information.

You don't have the right to be informed if companies write to the county or unitary council informing them about a planned seismic survey, but you can request this information from them by calling or emailing the Minerals Planning Officer.

If you know any parish or district councillors, then they would be good people to ask for this information for areas they represent, although they don't have the right to be informed either.

- You can also look out for the thumper trucks and other equipment which are used to carry out seismic surveys – see Appendix C below for more details on what this equipment looks like – especially in rural areas, they can quite easy to spot!

3 What to do if there is seismic surveying in your area

As seismic surveying might be the first on the ground activity in an area after a licence is awarded, this makes it a great opportunity to raise awareness in the local community that fracking might be coming your way.

By getting involved at this stage, you can slow down or even stop seismic surveying in your area. Even if seismic surveying goes ahead, this work will show a company wanting to frack that they will face stiff opposition and will help build a strong local anti-fracking campaign before a planning application is even submitted to the council.

The overall aim is to get people informed, and to get parish councils and as many householders and land-owners as possible to refuse access to their land. This has already been done in some parts of the UK and abroad, and has worked – see Section 4 below for examples.

There are three key action areas:

- Raise awareness and share information
- Refuse access to land and encourage others to do so
- Get involved in any planning process

a) Raise awareness and share information

If you know that seismic surveying is or could be happening, this is a great opportunity to raise awareness of the threat of fracking in your area and start building a local campaign.

- Run a stall, hold a public meeting, or do media and social media work. The aim is to make sure as many people as possible know about what is happening, what it might lead to, and what they can do about it.

There are many different possible media angles, such as:

- Asking 'is fracking coming to Little Snoring (or wherever)?'
- Publicise where the company wants to do its surveying: playing fields? common land? Allotments? Build up a picture by finding out who in your area has been contacted. You could highlight these areas by arranging a tour round the sites, as Halsall Against Fracking did (see below)
- Announcing a public meeting on the potential for fracking in your area
- If seismic surveying is actually happening, following the company around and protesting peacefully.

See Friends of the Earth's Stop Fracking Action Guide for guidance and suggestions on stalls and meetings.

- Put up your own notices – if a company has put up information notices about seismic surveys, put up your own underneath. These could encourage people to refuse access to their land and advertise a public meeting. You can also distribute these in cafes and community centres.
- Talk to people and share information: talk to your neighbours and other people in the area who might have been approached to allow permission. Make sure they know their rights and that they can refuse access if they want – see Appendix B for details.
- Share information about what is happening in your area with other campaigners and local residents. You can add information to Friends of the Earth's map of where and when seismic surveying is happening or being proposed [using this form](#). This will help people fight fracking locally and nationally by spreading the word about where is most at risk. Please send information to us using [our form](#)³ or contact the Friends of the Earth Regional Campaigner in your area. For contact details, see section 5 below.

b) Refuse access to land and encourage others to do so

A company wanting to carry out a seismic survey needs access to land, and needs permission for this. If a company cannot get access to the land it wants, it will have to go through the courts. This will at least slow it down and could make it change its plans. In 2015, plans by Tesla Exploration International Ltd to carry out seismic testing in Cheshire on behalf of Ineos were significantly delayed when Chester Zoo and local farmers refused permission for access to their land⁴.

What can you do:

- Encourage householders and land-owners to refuse access to their land. You could organise a meeting specifically for farmers and other major landowners to explain to them about seismic surveying and fracking. If you have one farmer or landowner onside, ask them to approach others.

See Appendix B below for an explanation of the process and guidance on how you can get involved.

- Encourage local parish councils to refuse access to common land. Parish councils often have responsibility for village greens and common land within their boundaries, so they have the power to do this. If a parish council refused access to this land for seismic surveying, it would send a significant signal to both local people that this is an important issue, and to the company that its activities are not welcome. Upton Parish Council passed a motion refusing access – see section 4 below for how Frack Free Dee worked with them to do this.

You can find out who your parish councillors are either by looking at local noticeboards or by asking your district council for details. Your district council will have a website with contact details.

c) Get involved in any planning process

Seismic surveys do not normally need planning permission from the council but, in some cases, it might be needed. See Appendix A below for full details. If there is a planning process, get involved, make sure your voice is heard, and encourage others to do so too.

- If the council does require the company to get planning permission, you can participate in the planning process and object, and encourage others to do the same. Friends of the Earth's Stop Fracking Action Pack has much more information on how to get involved in the planning process – see Section 5 for how to get a copy.
- As Appendix A explains, if a seismic survey is likely to have a significant effect on a European designated wildlife site or on a European protected species, then the company must get specific approval from the council under the Habitats Regulations.
- European designated wildlife sites are Special Areas for Conservation (SACs) and Special Protection Areas (SPAs). There are 235 SACs and 80 SPAs in England. You can find out if there is one near you via the DEFRA website: see <http://jncc.defra.gov.uk/page-1515> for SACs and <http://jncc.defra.gov.uk/page-2598> for SPAs. If you believe that seismic surveying would affect one of these sites, write to the planning officer at the council to make the case that planning permission is required.
- If planning permission is not required, this will be because the company's plans meet certain conditions such as not being within 50 metres of occupied homes. You could monitor the activity – if this can be done lawfully – to ensure the conditions are met, and inform the council if there are any breaches.

4 What have other groups done?

Some groups have already faced seismic surveys. This section explains what they have done and their advice to other groups.

Halsall Against Fracking

Residents in Halsall, a rural village in West Lancashire, first heard about forthcoming seismic surveys in 2014 in their Parish newsletter. The Parish Council had received an advance notification from Tesla (the company carrying out seismic surveying on behalf of the licence holder Aurora).



Members of Halsall Against Fracking (picture from the Southport Visiter⁵)

Members of the community mobilised immediately, leafleting the village, hosting a presentation with Frack Off, and carrying out a survey which found 88% of residents were opposed to fracking – and Halsall Against Fracking (HAF) was born.

“Residents need to know they do not have to allow these people to gain access to their properties without consent. There is action they can take if this happens and at public meetings we ensured people were fully aware of their rights.”

Maureen Mills, Halsall Against Fracking

One of the first aims of the group was to raise awareness about what was happening – they produced posters and leaflets to spread the word, and put “We say NO to Aurora seismic survey” signs on the major routes that Tesla would travel.



Tesla carried out their seismic surveying over summer 2016. It was distressing for many residents, including one who had experienced shot-firing (the use of explosives – see Appendix C below). HAF were on call with a designated mobile number for people to phone – the group responded and has kept a log of experiences. They found out where Tesla were based – a local farmyard, easily spotted by the amount of equipment and portacabins on site – and held peaceful demonstrations outside. They followed Tesla around and monitored what they were doing.



On one summer Sunday the group organised a bus tour of the surveying sites to demonstrate to local residents how far-reaching it was and the places at risk from fracking. It was family-friendly and the group always emphasised the peaceful nature of their activities.

One of the frustrations the group had was that the process could have been delayed and even stopped by challenging the “permitted development” rights that operators have to carry out seismic surveys without planning permission – due to potential impacts on protected habitats nearby. They advise other groups to check whether there are any local circumstances that would enable them to call on council to refuse seismic surveying under permitted development and require companies to go through the planning permission process.

Frack Free Dee

A campaigner in Frack Free Dee who is also a parish councillor in the village of Upton in Cheshire proposed a motion opposing the use of parish council land for seismic surveying. This simply stated “*we shall not allow access to companies undertaking seismic testing on Parish Council owned land.*”



Protest outside Upton Parish Council meeting (photo from the Chester Chronicle⁶)

Residents gathered outside and, at the meeting, parish councillors were presented with the results of a residents' survey conducted by the anti-fracking group. This revealed that 86% of the 2,284 residents consulted were against any form of exploration and development.

The motion was passed which sent a strong message to other landowners.

Elsewhere in their area where surveying was taking place, Frack Free Dee followed the seismic survey convoy through their area. They leafleted all the houses along the route of the convoy, inviting people to a public meeting. At some points, traffic on the other side of the road had to stop to allow the convoy to pass and Frack Free Dee handed out leaflets to drivers of the stationary vehicles.

'Stop Gaz de Schiste'

French anti-fracking groups have also been active dealing with seismic surveys. The 'Stop Gaz de Schiste' group in the Rhône-Alpes region set up 'Alerte Camion!' (Lorry Alert!)⁷.



This has:

- a phone number and email address for people to report sightings of suspicious convoys
- a telephone tree to pass on details of sightings
- a web page with details of sightings of convoys

5 Further information

As the government continues to push for fracking in the UK it's important to show resistance and opposition at every stage of the process. We hope this guide has helped explain what seismic surveys are and how you can start to tackle them in your area.

By taking action at this vital stage of the process, fracking applications across the country can be delayed and stopped. People have been winning against fracking, preventing any from taking place in the UK for over five years and they won't stop now. Thank you for all that you are doing to stop fracking. Together we can win.

If you want to learn more about fracking, please visit www.foe.co.uk/fracking

To get a copy of Friends of the Earth's Stop Fracking Action Pack, please go to <https://www.foe.co.uk/page/order-a-stop-fracking-action-pack>

As always you are welcome to get in touch for more information by emailing fracking@foe.co.uk or, if you want to contact someone at Friends of the Earth about what's happening in your area, please email the Regional Campaigner for your area:

North West	Pollyanna Steiner	pollyanna.steiner@foe.co.uk
	or	Helen Rimmer
		helen.rimmer@foe.co.uk
Yorkshire & North East	Simon Bowens	simon.bowens@foe.co.uk
Midlands	Chris Crean	chris.crean@foe.co.uk
South East	Brenda Pollack	brenda.pollack@foe.co.uk
South West	Mike Birkin	mike.birkin@foe.co.uk

Appendix A Seismic surveys and land-use planning

Land-use planning regulations about seismic surveys are complicated. This section explains what companies and councils must do and what they can do.

- *Does a company need planning permission?*
Seismic surveys are classed as 'permitted development' which means that they do not normally need planning permission from the council. However they must meet certain conditions – see the box below. There are two exceptions:
 - if the seismic survey would last for more than 28 days, then the company might need planning permission
 - if the seismic survey would affect a European-designated wildlife site, then the company would need specific approval from the council

- *What are the types of 'permitted development'?*
Under the Town and Country Planning (General Permitted Development) Order 2015, there are two types of permitted development that can apply to seismic surveys, involving different processes and different safeguards:
 - 'temporary use of land for petroleum exploration' (class JA in Schedule 2 of the Order)
 - 'use of land for petroleum exploration' (class KA in Schedule 2 of the Order)

- *What does 'temporary use of land' involve?*
'Temporary use of land' applies where a seismic survey would last for 28 consecutive days or less. The company does not have to notify the council but can proceed as long as its

plans meet certain conditions. For example, these conditions include that the seismic surveying:

- Must be 50 metres or more away from occupied homes, schools and hospitals.
 - Must not be within a designated area such as a National Park, an Area of Outstanding Natural Beauty, a site of archaeological interest or a Site of Special Scientific Interest.
 - Must not be within a protected groundwater source area.
 - Must only involve operations during specified daytime hours
- *What does 'use of land' involve?*
If a seismic survey would last for 28 consecutive days or more, the company must inform the council first. This gives the council an opportunity to consider what is planned and its impacts on the local area, and decide if it will ask the company to submit a full planning application.

The council has 21 days to decide whether it will intervene and ask for a full planning application (known as an Article 5 Direction). The council might do this, for example, if a company wanted to test near occupied homes, in a designated area (as listed above) or in an area protected as a source of groundwater. But it is not automatic that planning permission will be needed. And if the council decides that planning permission is required, this can be overturned by the Secretary of State for Communities & Local Government..

If the council does nothing, then the company can proceed after 21 days.

The council can also decide before the 21 days are up that it will not intervene. If this happens then the company can proceed straightaway.

- *Can a company choose which process to follow?*
If the seismic survey will last 28 days or less, then the company can decide which of the two processes above it wants to follow. If the seismic survey will last longer than 28 days then the company must follow the second process.
- *What happens if the seismic survey would affect a European-designated site or species?*
If a seismic survey is likely to have a significant effect on a European designated wildlife site or on a European protected species, then the company must get specific approval from the council under the Habitats Regulations. The onus is on the company to notify the council. If the council cannot say that the activity would not adversely affect the site or protected species, it can issue a direction restricting permitted development rights and require a full planning application. If planning permission is not needed but the seismic survey might affect a European designated species around a site, the developer should go directly to Natural England for a wildlife licence.
- *What happens if the seismic survey would affect a UK designated site?*
The above provision about European-designated sites does not apply to UK or local designations such as Sites of Special Scientific Interest (SSSIs). If seismic surveying is 'likely to damage' the features of a SSSI that make it of special interest, then (under Section 28 of the Wildlife & Countryside Act 1981) the council can contact Natural England for further opinion or make their own assessment. Natural England will respond if

contacted by the council about whether or not the seismic surveying should be permitted, or alternatively will offer planning conditions should they be consulted linked to a planning application. Natural England has suggested the council doesn't have to consult or take Natural England's linked to SSSI advice but, if it doesn't, it must explain why it hasn't and justify their approach.

Appendix B What are your rights as a householder or landowner?

Your rights as a householder or landowner are also complicated. In brief, you can refuse access to a company wanting to carry out a seismic survey but they can try to overturn this. This section explains what you and they can do..

- *Can a company just come on to your land?*
No, a company wanting to carry out a seismic survey has to have permission to use your land. If you refuse permission then the company cannot use your land, as this would constitute trespass. Cuadrilla was accused of trespass by some Lancashire residents while carrying out seismic tests in 2012 and settled at least one case out of court⁸. But a company can try to get around this – see below.
- *Is it any different if you're a leaseholder?*
No, the company still has to get your permission, unless there are specific clauses in your lease.
- *Does a company have to pay you for access*
No, a company is not obliged to pay you but, in practice, most will offer to do so. Ineos has been reported to be offering householders £200⁹.
- *Can a company try to get round your refusing access?*

Yes, a company can try to get round a refusal by a landowner or householder. A company can apply to the courts for the right to enter the land under the Mining (Working Facilities and Support) Act 1966 and the Petroleum Act 1998. This is known as an 'ancillary right' (of entry).

The first stage is that a company must write to the Department for Communities & Local Government to get ministerial approval to go to court. Given the Government's support for fracking, this is likely to be granted.

To grant access, the court must be satisfied that:

- the application is 'expedient in the national interest'. Again, given the Government's position on fracking, this test is likely to be passed.
- the company could not get access through negotiation with the landowner. This might be because the refusal of access was unreasonable, or unreasonable terms were demanded for access.

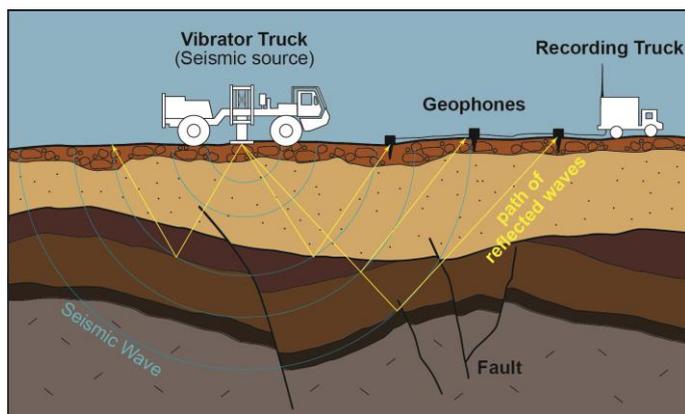
The court must also consider the impact of a seismic survey on local amenities. It might decide that because the activity is temporary and does not require deep drilling or construction at the surface, then it's low impact and can be allowed.

- *Will you be told if a company applies to overturn your refusal of access?*
You won't automatically hear from a company if it tries to overturn a refusal of access. However you will be told if the application goes to court.
- *How can you get involved in any legal process?*
If a company goes to court to try to overturn your refusal of access, you can get involved in this process. You can get involved at the following stages:
 - If you know a company is trying to overturn your refusal, write to the Secretary of State for Business, Energy & Industrial Strategy asking him/her not to refer the case to the court
 - If the case does go to court, you can make representations to the court, explaining why you believe access should not be granted
- *Will you have to pay legal costs?*
The company must pay its own legal costs for the application (under the 1998 Act). It cannot, in normal circumstances, claim these from the landowner. It also has to pay the landowner's reasonable costs.
- *How long would this court process take?*
It is likely to take several months.
- *Can you claim compensation from the company?*
You could be entitled to some compensation depending on how you are affected. But the sums involved are typically low. If the court regards the impacts of seismic surveying as low and non-permanent, then it is unlikely that the court will order much compensation at all. This may be a factor in discussions. In pure financial terms, landowners could potentially get higher compensation through negotiation than via the court, as the operator might want to avoid delay and having to pay legal costs.

Appendix C Seismic surveys: technical background

How do seismic surveys work?

Seismic surveys build a model of the ground using the reflection of seismic waves. The seismic waves are generated artificially by a source, usually explosives or a special seismic truck. The waves travel through the ground and bounce back to the surface at all the interfaces between distinct layers of rocks. The signals of the reflected waves are then captured at the surface by sensors known as geophones. The geophones convert the wave signal into an electric signal transmitted to a recording station located in a data-collection truck.



(Image: Julie Schneider for Friends of the Earth)

The rough signal is then processed using computer programs to produce a clean image. The image is then interpreted by geophysicists to build a 3D model of the ground.

Seismic sources

The simplest type of source involves explosives such as dynamite but its use is limited to open areas at a safe distance from any population, such as open farmland. The charge is buried in the ground at a depth of more than 6 metres in a specially-drilled hole, known as a ‘shot hole’.

The other common source involves purpose-built trucks, either Thumper Trucks, which drop a heavy weight to produce the signal or Vibrator Trucks (Vibroiseis), which use vibrating plates to produce a continuous signal lasting a few seconds. These large trucks travel on and off-road in convoy (often 4 trucks) and stop regularly to lower their plate/weight simultaneously to produce enough energy.



Vibrator truck used for seismic surveys

The recording unit

Geophones are highly sensitive captors deployed at ground level in clusters to receive the seismic waves. Recording vehicles are located nearby the geophone network to record and store the transmitted signal.



How long does seismic surveying take?

Getting complete data from an area can take weeks or months: Cuadrilla's 2012 survey of the Fylde lasted over three months¹⁰. The sources and recording unit move around to cover the whole survey area of several kilometres in all directions. It might then take several months to process the data to get a comprehensible 3D model of the ground and a good geological interpretation.

Can seismic surveys cause damage?

There have been some reports from the US of damage to properties from seismic surveys¹¹ but the link has never been proved. The vibrations can however affect underground wildlife and their habitat.

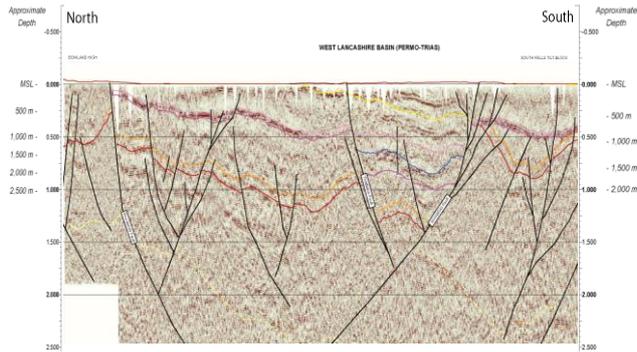
How the data is processed to create a model of the ground

The first step is to create a seismic profile of the ground. The rough signal is filtered from background noise and processed by computer programs to produce the seismic profile.

A seismic profile is an image made of stripes of various intensities. Each stripe corresponds to a returning signal being reflected at the boundary of a rock layer and recorded at the surface. The vertical position of the stripe indicates the time taken to travel from the source to the rock layer and back to the surface. Also, the darkness of the stripes varies according to the nature of the rocks. The result is a distorted image of the structure of the rock layers in the ground.

The intensity of the signal and the speed at which the signal travels vary according to the type of rock. This means that it is possible to calculate information about the nature of the different layers and possible gases or fluids content in rock formations.

The seismic profile is then converted into a geological cross section. This involves more calculations and also correlation with rocks logged in an exploratory well drilled in the survey area. This is not straightforward and can take several months.



Interpreted seismic profile from West Lancashire Basin¹²

Why might they be important for local people?

Seismic surveys can also be a useful tool for communities living close to a possible fracking site as they can identify potential risks. They can identify pre-existing fractures like faults, which are very important in the context of fracking as they could be potential pathways for gas leaks or for fracking fluids that could contaminate groundwater, and faults can be reactivated by fluid injection which will trigger earthquakes (known as induced seismicity).

¹ See map at

https://www.google.com/maps/d/u/0/viewer?mid=1V0Vt9m8FhKBAQ_SJulLeYvdLHUI&map%3Bll=53.28419092195224%2C-1.3829722097777903&map%3Bz=9&ll=53.256220458200616%2C-1.6052736929320872&z=9

² Link as above

³

<https://docs.google.com/forms/d/e/1FAIpQLScYTtC4kBoKs5e3HzERYjv1nOhkC1J0zsvCyvf3AGBBWw4jqA/viewform>

⁴ <http://www.chesterstandard.co.uk/news/149569/chester-zoo-and-farmer-refuse-request-for-seismic-surveys-on-land.aspx>

⁵ <http://www.southportvisiter.co.uk/news/southport-west-lancs/anti-fracking-campaign-launched-sefton-11389156>

⁶ <http://www.chesterchronicle.co.uk/news/chester-cheshire-news/upton-parish-council-backs-moratorium-9745865>

⁷ <https://stopgazdeschiste.org/alerte-camion/>

⁸ <https://www.theguardian.com/environment/2013/aug/02/fracking-cuadrilla-trespassed-private-land>

⁹ <https://drillordrop.com/2016/08/26/200-access-offer-to-notts-residents-for-fracking-seismic-surveys-but-whos-working-for-who/>

¹⁰ <http://www.cuadrillaresources.com/what-we-do/geophysical-survey/>

¹¹ <http://www.denverpost.com/2013/03/15/seismic-surveying-rattles-colorado-homeowners-2/>

¹² <http://ukogf.org.uk/archives/>