Fracking: Are short-term economic benefits far outweighed by long-term damage to the environment?

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This article is in part a response to Gareth Jones' interview in *Inshore Ireland* June-July (see www.inshore-ireland.com.)

Here I address only some of the environmental issues associated with extracting natural gas from shales through the process of high volume hydraulic fracturing - otherwise known as SGHV fracking. Numerous other concerns intrinsically associated with this practice exist however, such as severe health problems and negative impacts on the economy of affected areas.

NEGATIVE EXPERIENCES

The prospect of introducing SGHV fracking to Ireland has already raised concerns amongst citizens all over the island alarmed by reports of some negative experiences in the USA and Canada.

SGHV fracking is much more than just a refinement of the older technique used both in the gas and oil industry and for water wells. In the 'old fracking' method, the volume of water used was relatively small, and wells did not have a significant horizontal section.

More crucially, 'old fracking' was often carried out as a last resort before abandoning a well. In the case of proposed development, fracking is the pivotal aspect upon which the whole project is based. Without repeated hydraulic fracturing at each well, viable commercial extraction of shale gas cannot occur.

Moreover, in Ireland fracking has been used on isolated wells. With SGHV fracking however, the wells will be placed very close to each other – in 7-acre (2.8 hectare) pads, each containing up to 24 wells. Pads will be between 2 and 4 km apart, all over the licenced areas. The potential detrimental consequences on the environment of SGHV fracking would clearly be much more severe.

ENVIRONMENTAL IMPACT

Tamboran Resources which holds a licence covering more than1,750 km^2 in Fermanagh, Leitrim, Cavan and Sligo, says it will drill between 2,500 and 9,000 wells. Each well will be fracked 3-5 times - each one requiring up to 10,000 m^3 of water.

That is an enormous amount of water to be removed from the water cycle and would have inevitable negative impacts on the receiving environment, in the form of groundwater level decline and/or lowering of river flow, for example. It should be noted too that the licenced area in question also has up to 50 protected sites (NHAs, SPAs, SACs and ASSIs), most of which are surface water-dependent.

Tamboran proposes to drill to depths of only 700-1500m, as the shales are relatively shallow. These shales however sit directly above a 'Regionally Important' aquifer (RIA), and are separated from another overlying RIA by 400-700 m of sandstone, shale and limestone. These are classified as 'Locally Important' aquifers.

Incidentally, this RIA also hosts an extensive network of caves and conduits that constitute an exceptional geological heritage of international importance, as represented by the Marble Arch Caves Global Geopark in Cavan and Fermanagh.

Furthermore, a number of elevated faults are present in the area which can act as a preferential pathway for the movement of groundwater.

SEPARATION DISTANCE

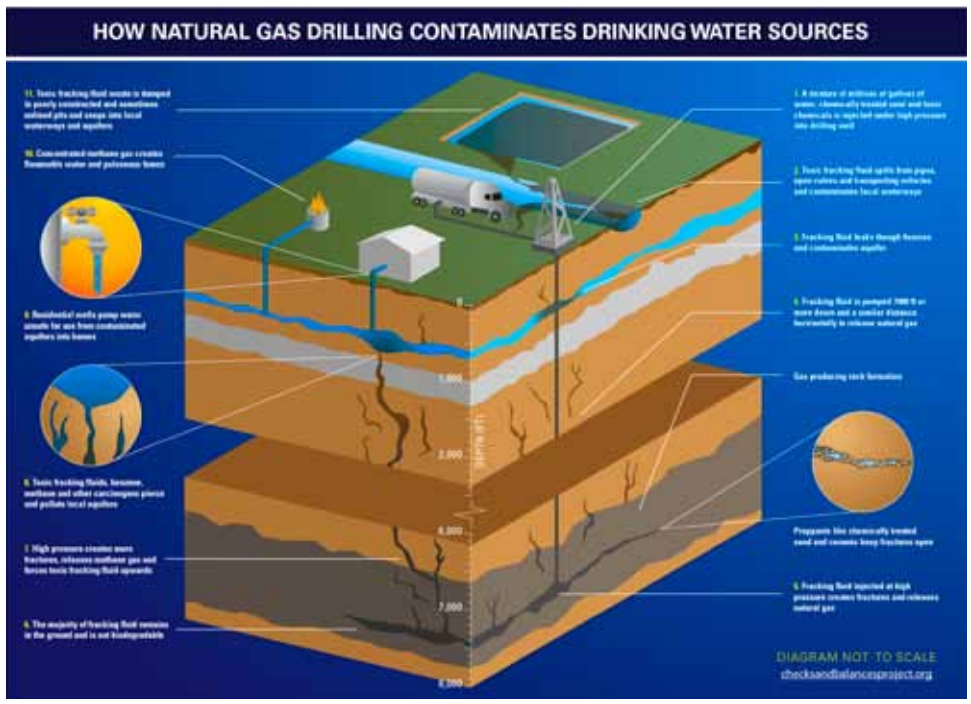
A report** published in the UK in April suggests that deriving from the experience of currently fracked areas in USA and Canada, a minimum precautionary separation distance of 600m between the target formation and the aquifers should be maintained. This is because the hydraulically-induced fractures tend to develop in unpredictable directions and lengths.

Once a fracture is created it is not possible to close it and move on. A permanent potential pathway for water pollution, possibly connecting the shale with the major aquifers, or connecting two or more wells, will have been created. It is quite evident that the geological conditions of this area make the project a risk too great for such a doubtful prize.

LEAKAGE EVIDENCE

Data released by the oil and gas industry reveal that 1% of wells were leaking within one year and that 50% will leak within 30 years. It is not a question of good drilling practice - unless we assume that in the USA and in Canada drillers do not know their job. It appears that the engineering is not up to the task.

Tamboran also declare that no toxic or carcinogenic compounds such as dimethylformaldehyde; polyacrylamide and glutaraldehydes among numerous others will be used.



Fracked landscape, Wyoming, USA

This is a welcome decision, although it is being challenged by independent experts.

Nevertheless, not injecting chemicals into the ground does not eliminate the risk of pollution as the fracking fluids have been known to return to the surface with heavy metals, radioactive materials and hydrocarbons.

POTENTIAL DAMAGE

Tamboran claims that salt will be the only product that the fracking fluid will bring back to the surface. In a freshwater environment however, salt would be a pollutant. If a salty fracking fluid manages to find its way into a surface water body or an aquifer, it will kill both vegetation and aquatic life and/or make it unsuitable for human consumption.

If a major case of pollution is caused by the proposed development, it is easy to foresee the damage it will bring to Ireland's international reputation as 'a green, clean, unpolluted, almost pristine country' producing high quality meat and milk.

We have only to look at recent food scares i.e. 'mad cow; 'foot-and-mouth', 'dioxins in pork' etc to get an idea of the associated negative effects on exports from the agricultural sector – a major contributor to the Irish economy. To foreign buyers it will not matter if the pollution happened in Leitrim but the imported meat comes from Wexford: Ireland is Ireland.

Regulations, no matter how stringent, do not guarantee a job will be carried out properly, as witnessed first-hand recently within the banking and financial sectors.

INFAMOUS LOOP-HOLES

In the USA the *Clean Water Act*; *Clean Air Act* and the *Safe Drinking Water Act* were in place when the 'shale gas boom' began. The industry managed to be excluded from some crucial requirements of these Acts, under the infamous 'Halliburton loop-hole'.

In conclusion, it would be great if shale gas could be extracted in a safe way for the benefit of this island. Unfortunately, this is not the case.

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*** Preese Hall Shale Gas Fracturing – Review and Recommendations for Induced Seismic Mitigation - April 2012. Downloadable from http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/oil-gas/5055-preese-hall-shale-gas-fracturing-review-and-recomm.pdf*