James Verdon: misleading explanations of fracking

Posted on 26th November 2014 by Professor David Smythe (http://www.davidsmythe.org/frackland/?author=1)

JV video pores in shale (http://www.davidsmythe.org/frackland/wp-content/uploads/2014/11/JV-video-pores-in-shale.jpg)

On his Bristol University web page (http://www1.gly.bris.ac.uk/~JamesVerdon/) James Verdon reproduces a video first published by *Physics World* in August 2012 (http://youtu.be/1LiILf7xt-Y). It is a 100-second explanation, 'What is fracking?".

He purports to explain that "*the pores, where the gas is trapped in the shale reservoir are not well connected*" while pointing to a whiteboard cartoon of pores near a wellbore. This picture only applies to limestones, such as the Kimmeridgian limestones in the Weald, which are the target of companies like Cuadrilla and Celtique Energie.

In shale the pores are extremely small, and the dominant mechanism by which kerogen (the source material for hydrocarbons) is both stored and migrates is via *microfractures*. These microfractures are enlarged by the thermal maturation process as the rock is buried, and also by the mechanical man-made process of fracking.

Verdon seems to have a limited understanding of the fundamental mechanical properties of shale. His misleading video explanation cannot be explained away by a need to simplify the explanation for the lay person. He confuses:

- a porous medium with possibly good porosity but poor permeability, within which the gas is *absorbed* (such as a limestone), with
- shale, which has very low porosity and permeability, but a large area of microfractures (NB not 'pores') onto which the gas is *adsorbed*.

Although there is only one letter of a difference between *absorption* and *adsorption*, the two processes of storing gas in a medium are very different. There is no excuse for a post-doctoral researcher in shale fracking techniques to have got this wrong.

Verdon, referring to another whiteboard diagram, goes on, *"as geophysicists, we monitor where the fractures are going, and we make sure the fractures stay within the formation and do not move up between the one and the three kilometre depth from the shale formation and the water table"*. But he says nothing about pre-existing faults, and the fact that the microseismic monitoring technique **cannot trace the silent passage of fluids up pre-existing faults or fractures**.

The video is aimed at a British, not a north American, audience, but he makes the common error of grossly oversimplifying UK geology as simple flat layers, as is the case in the US shale basins. In my view the video is a poor explanation, and should be withdrawn.

Glossary to aid Dr Verdon

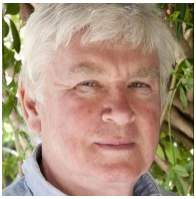
Porosity The relative volume of a medium made up of spaces or holes. It is usually expressed as a percentage.

Permeability A measure of the interconnectedness of the spaces in a solid medium.

Absorption The process by which atoms (http://en.wikipedia.org/wiki/Atom), molecules (http://en.wikipedia.org/wiki/Molecules), or ions (http://en.wikipedia.org/wiki/Ion) enter a volume of gas (http://en.wikipedia.org/wiki/Gas), liquid (http://en.wikipedia.org/wiki/Liquid), or solid (http://en.wikipedia.org/wiki/Solid) material, and are taken up by the volume.

Adsorption The adhesion (http://en.wikipedia.org/wiki/Adhesion) of atoms (http://en.wikipedia.org/wiki/Atom), ions (http://en.wikipedia.org/wiki/Ion), or molecules (http://en.wikipedia.org/wiki/Molecule) from a gas, liquid, or dissolved solid to a surface (http://en.wikipedia.org/wiki/Surface_science).

Categories: Frackademics, Tags: errors, UK, Verdon



Professor David Smythe

I am Emeritus Professor of Geophysics in the University of Glasgow (a courtesy title). I retired from the University in 1998 and live in France, where I continue my research in geology and geophysics.
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Response to James Verdon: misleading explanations of fracking

Julie Wassmer
4th February 2015 at 12:44 am

In other words, Verdon doesn't know what he's fracking talking about? I wonder why he should make such errors? Could it really be down to ignorance or could he possibly be employing disingenuous ststements to support a pro fracking argument? Either way, shouldn't he post a comment explaining, apologising or at least responding? Tsk tsk. Post-doctoral researchers in shale fracking techniques are clearly not what they used to be. And no match for an emeritus prof! Many thanks Prof Smythe.

rebecca martin
15th February 2015 at 10:11 am

The thing that disturbs me most about James Verdon is that he is conducting academic research, which should be approached with a neutral outlook to avoid bias affecting results, yet he is an outspoken champion of the shale industry. As a former post doctoral researcher in cancer biology (on career break to raise child), this seems like poor practice.