

Fracking 101

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Introduction

Fracking has become a hot button issue, lining up beside topics like climate change, gun control and, in the southern States at least, evolution. That's sad, because it is very much simpler than any of those but still shares the uninformed shouting that passes for public debate.

This book is an attempt to inform, to pass on details of the technique so anyone – for or against – can argue their case based on an understanding of the facts. I won't say I don't care what position you take but recently I have been really, really annoyed by the media, by friends and by the proverbial man in the pub who all give the world the benefit of their opinions at maximum volume, and are just making themselves look stupid.

Say what you want, but at least take the time to understand what you are talking about.

As with the other topics above, you should not take anything at face value. You have to ask just who is writing, and are they representing any vested interest. So to come clean, I - that is Eric George – used to work for an international oilfield service company, one of the two big players in the business. At the very end of last century I was made redundant for the crime of being over fifty in a year of falling oil prices. I felt bitter at the time, but that was fifteen years ago and I have to admit the game has always been played that way. Why keep a fifty year old around and fire the younger engineers you will need in ten years' time when the oil price recovers? Now I live in Queensland, on the shores of the Coral Sea, and you would not get me near an oil well with wild horses.

My line of work was mostly high pressure pumping into oil wells. Pumping cement to set the well casing in place, pumping acid and chemicals to clean up wells and, very occasionally, pumping frack jobs.

Counting on my fingers, I was involved in frack jobs in six different countries. Always as part of a team, sometime humping pipe, sometimes operating pumps, sometime designing and supervising. So I do know what I am talking about.

Am I pro or anti fracking? I have to say, that's not a good question. Fracking is a technique that can be used well or badly. It's a bit like asking if you are for or against axes because axe murders are particularly gruesome. Banning axes is not practical, and the axe is not the root of the problem.

Fracturing is just a technique. Get it right and you can turn an impossible reservoir into a practical source of oil and gas. Get it wrong, and you can mess up the environment. I have to add here, get it wrong under a proper regulatory framework, and you will be forced to fix things before the damage is done – but we will talk about that later.

The fact is that a bad well – fractured or not – can cause a lot of damage. On the other hand, a well-designed, constructed and operated well can be a great benefit to mankind.

I want to help the debate along and the best way to do that is to give everyone a good understanding of fracking and possible problems. I hope this book will help.

Hydrocarbons and where they live

The first step in forming an opinion on fracking is to understand what we are talking about. That sounds like an obvious statement, and so it is. Fracking is a public issue and – in most countries – anyone can say what they like about it. However, if you want to influence public policy, you had better have some grasp of the techniques involved, and their implications. You can't argue a case unless you know what you are talking about, and you can't counter your opponents' arguments unless you can pick if they are telling the whole truth or leaving some dirty laundry in the basket.

I'm sorry, but this is going to involve a little serious reading. I will try and make it as painless as possible. I know some people have an allergy to maths and technological detail, so let's try and do as much as we can with just descriptions and pictures. If you don't understand something the first time around, that's normal. Go back and read it again, and you will soon be on track again.

You may find it helps to have a 1 ft (yes – 30 cm) ruler on the table as you read. You will see why in a minute.

Fracking – more properly hydraulic fracturing – is one of the last steps in the making of an oil or gas well and it does not make any sense to look at it in detail until we have covered the basics of well siting and construction. As we go along, you will find that most well problems are created during construction and we have to understand the basics of well drilling before we can identify the problems. Let's begin with some fundamentals.

Hydrocarbon Basics

Oil and gas wells are drilled to produce oil and gas, but rarely produce just one or the other. They nearly all produce a mixture of the two, and they nearly all produce significant amounts of water as