

## **Gas is the new gold: as investors lick their lips and locals load their rifles.**

Recently there has been interest from major oil companies in the underground shale gas reserves in the South African Karoo. There has been uproar from South African locals who are concerned about the environmental impact. The positives and negatives of this, from a South African perspective, will be reviewed and a final report will be presented setting out whether it should be permitted or not by authorities.

At the outset, we need to know and understand what “fracking” is. Hydraulic fracturing, also known as “fracking”, is a procedure to extract shale gas supplies which are 'sealed' in underground rock formations. To get to these supplies, a fluid is pushed down a drill channel, at enormously high pressures, into rock that contains shale gas. By doing this it causes the rock to fracture (hence ‘fracking’), creating fissures and cracks in the rock where the gas will ‘leak’ into wells, from where the gas is extracted. The liquid pressured into the rocks usually consists of mainly water, mixed with sand and chemicals. The shale gas is natural gas which is an alternative to coal and oil. The gas is sent through pipes into houses, where it is burnt to heat water, dry clothes, cook food and heat up houses.

Royal Dutch Shell, Bundu Oil and Gas Falcon Oil & Gas are the oil companies who are interested in the shale gas trapped in the rock formations in the Karoo. Shell recently applied for exploration licences for a land space of 90,000 square kilometres. This is approximately three times bigger than Lesotho. Local communities in the Karoo have expressed anger and concern. They are angry because they have no say in what happens to the minerals underneath their own land. They are concerned because of the environmental damage the shale gas fracking may bring to the area.

In this process, various different chemical agents are used, which have been labelled as harmful to humans and the environment. Fracking from a single well demands large volumes of water (anything from nine to twenty nine million litres). The chemicals used make up 2% of the fracturing liquid. From that fluid which is pumped in, 15-80% is recovered, meaning that the other liquid stays underground, where it contaminates the water sources. The shale gas threatens valuable ground and

surface water. This pollution may be harmful to drinking water and rivers, hence damaging to humans and the wildlife in the Karoo.

Because the Karoo is a desert area, water is very scarce and the possibility of contaminated water has upset the local cattle and agricultural farmers, who already are experiencing a scarcity of water. Fracking uses large volumes of water and knowing that parts of South Africa experience water shortages, the prospect of further stress on water supplies could lead to serious problems in the region. One of these wells only lasts five to eight years and the productivity drops significantly over the first five years. This means that new wells will be constantly created, causing environmental damage on a huge scale. Companies will also have to find a way to dispose of all the toxic wastewater or sludge that each well produces. The closest place to dispose of waste is hundreds of miles away. *“If our government lets these companies touch even a drop of our water, we’re ruined,”* a local farmer says.

Although there are many concerns raised, the oil companies have denied that fracking will inevitably have a negative impact. They refer to the new revenue from tax being charged on the gas extracted; creating thousands of jobs for one of South Africa’s poorest areas and using the gas to fuel the power plants to provide electricity to approximately ten million South Africans, who live without it. The General Manager of Shell said that it could produce millions of dollars in direct investment and would help lower South Africa’s unemployment rate of 25 %.

South African drilling officials emphasized that generating and using more natural gas would help reduce the country’s air pollution and lessen heavy reliance on coal for electricity, seeing as coal is dirtier when burnt than natural gas. The energy demand is rapidly increasing and the introduction of shale gas could aid in meeting the demand and lowering South Africa’s dependence on gas from Mozambique.

*“We believe that there is the capability technologically to extract that gas in a way that is entirely safe,”* Mr Obama said in a speech at an international shale gas conference. Just like President Obama, Shell believes they have the methods to extract gas safely. They believe protecting fresh water aquifers is not difficult because the natural gas is sometimes thousands of metres below the aquifers, making it almost impossible for liquid or gas to reach the drinking water.

Shell has made a legally binding commitment that *“nobody will go short of fresh water because of our operations; either in the exploration phases, or if there is any*

*further development*". The water manager for Shell's Karoo project said that Shell intended to recycle as much wastewater as possible, storing it temporarily in closed containers. Trucks will not be the main method to transport waste, waste which could be high in uranium deposits and very toxic. Waste will be shipped to disposal plants by pipes or by rail. Water needed for fracking may be brought in by rail from the coast, which is hundreds of miles away in some parts, or drawn from aquifers far below the ones that supply water for farmers. The company says that it will only tap into the aquifers that farmers cannot use.

They say they adhere to strict regulations to ensure the wells are built properly. They line their wells with various steel and concrete barriers to prevent gas from leaking out the well.

Shell believes SA would gain enormously from producing its own gas, which is a much cleaner form of fuel than the coal that is currently used to generate about 90% of the country's electricity. It has been estimated that there are 485 trillion cubic feet of shale gas in the Karoo, enough to make SA self-sufficient in energy for decades to come. We would invest billions if it proves fruitful says Shell. Exploration alone would cost Shell 200 million dollars even if it was found that the reserves were not exploitable. Shell's plan is to drill at least 6 investigative wells over the next 3 years, and if the gas reserves appear worthwhile, it will start production with at least 1 500 wells in years to come. But even before this phase started, an environmental impact assessment (EIA) would have to be made, a process that could take between 18 months and two years. But in this sun-flooded Karoo, where there are more sheep than humans and corroded windmills pumping water blotch the horizon, many residents say they would prefer to see the government bring in wind or solar farms, not new drilling.

Advertising Standards Authority of South Africa ruled that several of Shell's advertised claims , including one that said fracking had never led to groundwater contamination were misleading or unproven. Shell said the advertisements were an accurate reflection of its opinion.

At the beginning of April 2011, several scientists and consultants responded to Shell's application with an extensive 104 page critical review. *"It just takes one big spill, leaky pipe or crack underground that their studies didn't catch, and a farm my family has run for four generations is done,"* says a local farmer. Farmers had been

frustrated by the lack of information from Shell officials about the chemicals they would inject into the ground during fracking. Shell officials said that they would disclose what they could, about fracking formulas, if they started drilling but that they might be limited by trade secrets. Mineral Resources Minister Susan Shabangu has established a task team to investigate the pros and cons of fracking for gas and is expected to receive a report in the next few months.

Even if the fracking operations by Shell could be performed without compromising a clean environment, the question still arises where Shell would get the massive amounts of water needed. The company has made a commitment "*not to compete with the people of the Karoo for their water needs.*" One of the options Shell considers is to get water from the sea. Shell has also stated it is committed to providing full compensation to any landowner who has evidence of a direct negative impact or loss on their land as a result of its activities. This is not very reassuring. How do farmers prove that Shell has polluted their lands? What lengths do people have to go through to protect their rights? Shell said they could not guarantee the integrity of their well casings when fracking and an accident would be simple to clean up. Is this the attitude we want?

The influx of foreign construction workers to these projects could also lead to conflict with local and tribal communities, as happened in America. Residents near drilling sites have complained that natural gas has seeped into their water wells, making their tap water flammable (caused by the release of Methane). Drillers have denied responsibility. What will happen if there's a spill out on the surface, as has happened in many recorded cases in America. What impact will the chemicals have on the soil?

The Karoo extends about 800 miles between Johannesburg and Cape Town. Its name means "*thirsty land*". This arid expanse sees less rain, in some parts, than the Mojave Desert. "*The government is under a great deal of pressure to hurry up,*" said Hein Rust, director of disaster management for the central Karoo region. "*But I don't think these decisions should be made on faith or until all the costs are known.*"

The National Environmental Management Act contains a precautionary principle which says that a risk-averse and cautious approach applies by law, especially where the impact is unknown. South Africans must promote debate and have solid discussions based on facts and not on misconceptions. Doctor Turton, a

distinguished trans-disciplinary water scientist says that: *“In the absence of certainty, it is prudent to assume the worst and respond accordingly. Fracking has several unknown technological. Invariably the costs exceed the benefits if one takes potential environmental damage into consideration. But because the benefits are so few, if things go wrong, there is not enough to pay for environmental remediation.”*

Mark Botha, head of conservation at environmental group WWF South Africa says: *“We have some serious concerns about fracking; it is as yet an unproven technology with unacceptable risks for fresh water abstraction and pollution.”*

Princess Irene of the Netherlands who owns land in the Karoo says: *“There are other ways to generate energy, for which we do not exploit nature but cooperate with it. With wind or solar energy nothing gets polluted, nothing gets broken. More companies are recognizing that we are partners of nature. Shell is stuck in its old patterns.”*

Long-distance swimmer Lewis Gordon Pugh says: *“Growing up in Grahamstown, I learnt how scarce water is in the Karoo. Why on earth would we allow a foreign company to come and drill for gas in a vulnerable ecosystem? Why would we risk contaminating our water supply? It is morally wrong. It also makes poor economic sense. We must look after our water for future generations.”*

Shale gas exploitation is invasive and unsustainable. Exploration of shale gas should be put on hold until the environmental impacts are understood. The Karoo is a beautiful and untouched area. The potential to jeopardise our scarce water resources and this mystical wonderland which so many have fallen in love with is too great. We should focus on truly clean, renewable energy solutions. South Africa should not allow this, as current organizations against fracking are saying.

**Joshua Pama** February 2012

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