

## **Hydraulic Fracturing in the Karoo Basin – Potential groundwater impacts:**

### **Can we? Shall we?**

Fanie de Lange

*University of the Free State, Bloemfontein, South Africa. delangess@ufs.ac.za*

#### **Abstract**

Research on possible impacts associated with Hydraulic Fracturing (HF) on shallow groundwater resources has yielded some varying and surprising results. From a groundwater perspective, initial arguments supported a resounding “NO” and anti-fracking viewpoint. Complex aquifer systems as well as lack of information regarding deep groundwater systems added to the environmental outcry against HF.

Three distinct phases form part of the HF life cycle: 1.) Exploration, 2.) Production and 3.) Closure. Each of these phases requires its own EIA process, which should allow for a critical assessment of any risks to shallow groundwater resources. There are more than enough expertise and experience as well as scientific knowledge and protocols within the South African hydrogeological community to be able to perform this type of assessment.

Unfortunately, decisions are not always made based on sound scientific research and/or assessments and often without any input from experienced geohydrologists. The answer to the question on whether our shallow groundwater resources are safe from HF activities seems to be not too difficult to research and to answer but decisions are influenced by external drivers e.g. politics and creative economics where few individuals will benefit to the disadvantage of most of the actual dependents of a life giving resource.

Research on what we know and what we don't know as well as what happens in reality has influenced this theoretical approach on possible impacts on shallow groundwater resources. A tool was developed to assist geohydrologists in perform a risk assessment on possible impacts that could be associated with HF on these resources and will be briefly discussed. This tool can also be adapted for any other groundwater risk assessments and any comments and suggestions would be welcomed by the developers.

#### **Fanie de Lange - biography**

Has been a geohydrologist for the past 19 years. Geohydrological experience has been mostly related to the mining environment. Although involved in all aspects of hydrogeology, his experience in field work related to geohydrology and numerical modeling of groundwater is his trademark. He has been a lecturer/researcher at the Institute for Groundwater Studies (IGS), University of the Free State, for the past nine years and is responsible for introducing students to field work with regard to gathering and compilation of general hydrocensus information, borehole drilling techniques, aquifer testing and tracer tests.

He is currently involved in research on hydraulic fracturing of the Karoo shales (Ecca Formation) and the possible impacts associated with hydraulic fracturing on shallow fresh water aquifers.