FRACKING: KAROO BASIN (INCLUDES KZN) GEOLOGICAL BACKGROUND

The Karoo basin was the site of an inland sea, where fossil deposition took place, predominantly during the Permian period. The sea was deepest (and therefore has the thickest deposits) between Graaff Reinet and Somerset East, thinning out completely at the Mvoti River in the north. Over time these deposits formed what is now referred to as the [Ecca geological group](http://en.wikipedia.org/wiki/Ecca_Group), comprising shale and sandstone formations. In KZN the shale is thin, which means that it is not the best place to start fracking, as the yields will be low. Where shale and coal are found in same place in KZN, such as in the Vryheid area, the coal industry will take precedence over fracking.

In the KZN Midlands there are three main types ot of Ecca shale - Vryheid shale, Volksrust shale and Pietermaritzburg shale. Estcourt shale is also evident from Mooi River northwards.

In the KZN Midlands there is also a lot of dolorite formation. Both sills (horizontal), and dykes (vertical), with the dykes in such numbers in the Berg and around Nottingham Road, that they are referred to as Dyke Swarms. The dolorite dykes compartmentalise the shale, and once breached, gas can escape and polluted groundwater can rise.

On the maps below, the Ecca Shale groups (Vryheid, Pietermaritzburg, Volksrust and Escourt) are marked Pv, Pp, Pvo and Pes respectively. Shale is shown as the browny colour. The pink colour is dolorite. The Midlands has similar geology to that of the Karoo, and is intruded by dolerite – the dykes are shown as red lines on the map. The presence of Dolorite makes drilling more difficult and less profitable. The Berg area has very little shale and it is intersected by dolerite dykes. Nottingham Road has Escourt shale and swarms of dolerite.

In the Karoo situation, it has been modelled that within two months, the polluted groundwater from dolerite intrusions can move 6 kms to affect a neighbouring borehole. This means that this KZN Midlands shale should not be mined or prospected to protect our ground- and surface-water. Groundwater is recharged from the surface water and eventually flows to the surface naturally, “daylighting” into springs and seeps. If our groundwater is contaminated, then not only will it affect those using water from boreholes, but also the streams and rivers into which it ultimately flows and from which most of us get our daily supplies.



