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## Deep stratigraphic borehole for shale gas geo-environmental baseline research in the Karoo

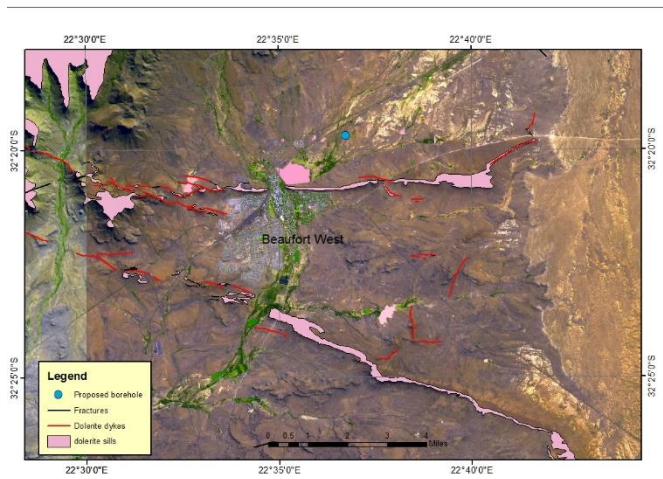
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Drilling of a 4000 m deep stratigraphic borehole coupled with shallow groundwater monitoring holes, supported by a wide range of regional, local and site specific geoscientific investigations are planned for a selected pilot site near Beaufort West. This research programme will lead to the collection of new information on the geology of the Permo-Triassic Karoo Basin at depth and the assessment of the gas potential together with various geo-environmental impacts associated with drilling and exploration activities. The site is located in the municipal area east of Beaufort West within the “sweet spot”, an area defined with the highest gas recovery potential from the Whitehill Formation (Ecca Group). This carbonaceous shale formation is expected to be intersected at a depth of 3500 m where it is anticipated to be free of dolerite intrusions and therefore likely to be unaffected by thermal metamorphism that can destroy the gas-producing potential. The borehole is expected to reach the underlying Dwyka Group and the Cape Supergroup at a depth of 4000 m where deep artesian water has been recorded from previous deep boreholes drilled by SOEKOR nearby. This three year research programme comprises a

base-line study, deep drilling activity with down-the-hole logging and monitoring of the changes caused by the drilling and a range of aquifer tests. For the baseline study the following activities (not restricted) are being carried out at regional and local scales around the borehole site: high resolution airborne



*Figure 1: Dolerites of the Beaufort West area and position of the planned deep borehole.*

magnetic and radiometric survey, geological mapping of the catchment area, analysis of existing seismic profiles, ground geophysics including Time Domain Electromagnetics and Magnetotellurics, surface gas emanation, groundwater investigations at catchment scale, seismological monitoring. Drilling will be accompanied by down-the-hole geophysics, core logging, geochemical and gas analysis of the carbonaceous shales, groundwater monitoring at nearby shallower holes, groundwater sampling,

injection of pressurised water for enhancing permeability. This pilot site will be open to the scientific community and especially young scientists in order to build a knowledge-based scientific capacity, which can support the transition to long-term exploration of the unconventional gas resource without detrimentally impacting the environment.

