Coring performance to characterise the geology in the "Cran aux iguanodons" of Bernissart (Belgium)

J-P. Tshibangu K., F. Dagrain, B. Deschamps, H. Legrain,
Faculty of Engineering, Mons Belgium

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Abstract

The "Cran aux iguanodons" of Bernissart is a sinkhole (or chimney caving) with a valuable paleontological deposit due to the exceptional quantity and diversity of fossils found during the excavation conducted from 1878 to 1881. In fact, bones have been discovered in a clayey geological formation when digging à mine gallery at the –322 m level. A subsequent extraction gave an overall production of 29 iguanodon's skeletons. Referring to the available data at the Natural Sciences Museum of Brussels where the found skeletons are exhibited, one does not know the degree of depletion of the deposit after the extraction.

In order to gain a good knowledge on the real fossil content of the sinkhole we conducted a feasibility study which showed that it was desirable to drill 3 exploration wells of 400 m depth. The global study had different objectives: evaluate the chance of finding more fossils in the sinkhole, understanding how and when the geological formations moved down during the course of time, testing a seismic geophysical technique for ground imaging. The typical geological formations contained are : chalk, limestone, conglomerate, clays, and layers of silex contained in hard or soft materials.

In October 2002 the workings started and one of the three well (the number 3) was completely cored using the PQ wireline technique. During drilling operations, different parameters have been recorded : drilling time and rate of penetration, core recovery percentage and brief core description. Before equipping the well with a plastic casing, geophysical logs have been performed (trajectory, radioactivity, caliper). Some typical problems have been encountered when crossing silex stones contained in a clayey matrix. This paper summarises the main results obtained on the number 3 well in terms of drilling logs and presents the problems with the proposed solutions.