Magnetic and Radiometric Signatures in Soils above Hydrocarbon Accumulations. Toqui-Toqui and Maná Fields, Tolima, Colombia

Henry Martínez-Gómez

[1]Universidad de los Andes

Abstract

Diagenetic processes are significantly influenced by the redox conditions within the environment they take place. Long-term leakage of hydrocarbon, as well as seepage (macro or micro), can set up near-surface oxidation-reduction zones that favor chemical and mineralogical changes in soils, thus producing an anomalous concentration of minerals, including magnetic and radiometric ones, which can be measured with geophysical field instruments. Although there exist numerous studies about this topic, most of them are based on empirical observations. Schumacher (1996), in his overview of the major hydrocarbon-induced changes affecting soils and sediments, highlighted the importance of a scientifically development of these methods and a rigorous understanding of the factors dominating these processes, so they can be used for a successful surface hydrocarbon exploration. The purpose of this study was to analyze magnetic and radiometric data on Toqui-Toqui and Maná fields (Colombia), and identify if there are anomalies which can be correlated with their location. This study was made in a locality with known hydrocarbon presence, but it can be utilized in low-cost exploration and in prospect evaluation as well.