

Delineation of Oil - Polluted Sites in Ibeno LGA, Nigeria, Using Geophysical Techniques

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Abstract : Ibeno, Nigeria hosts the operational base of Mobil Producing Nigeria Unlimited (MPNU), a subsidiary of ExxonMobil and the current highest oil and condensate producer in Nigeria. Besides MPNU, other oil companies operate onshore, on the continental shelf and deep offshore of the Atlantic Ocean in Ibeno, Nigeria. This study was designed to delineate oil polluted sites in Ibeno, Nigeria using geophysical methods of electrical resistivity (ER) and ground penetrating radar (GPR). Results obtained revealed that there have been hydrocarbon contaminations of this environment by past crude oil spills as observed from high resistivity values and GPR profiles which clearly show the distribution, thickness and lateral extent of hydrocarbon contamination as represented on the radargram reflector tones. Contaminations were of varying degrees, ranging from slight to high, indicating levels of substantial attenuation of crude oil contamination over time. Moreover, the display of relatively lower resistivities of locations outside the impacted areas compared to resistivity values within the impacted areas and the 3-D Cartesian images of oil contaminant plume depicted by red, light brown and magenta for high, low and very low oil impacted areas, respectively confirmed significant recent pollution of the study area with crude oil.

Keywords : electrical resistivity, geophysical investigations, ground penetrating radar, oil-polluted sites

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