

Polluted Soil Rehabilitation Using Genetically Engineered Mix Microbial Inoculum.

By

Dr . N.S Isinguzo, Head HSE, Offshore Operations, Shell Nigeria Exploration and Production Company (SNEPCo) NAL Towers, 21/22 Marina, Lagos Nigeria.

Abstract

Every natural system is self purifying. This is made possible by the diverse micro and macro flora and fauna in soils. Bacteria and Fungi constitute the greatest population in soils implying that in the case of pollution, microbes are the major agents of purification.

A study was carried out in situ with Nigerian crude oil (Bonny light) in polluted teak soil using: axenic cultures of bacteria and fungi; a mix culture of bacteria and fungi and a mixed culture of genetically engineered bacteria (*Bacillus sp*) and a fungus (*Aspergillus niger*). The ability to degrade crude oil was measured directly by oil disappearance (Spectrophotometrically) and indirectly (Stokzky 1965) by the amount of CO₂ produced in a controlled environment.

Results showed that mixed cultures of the isolated bacteria and fungi degraded the crude oil in the teak soil better than axenic cultures by about 85% over a month period. This is a reduction of the pollution to less than 15%, while the genetically engineered mix culture (Mutant *Bacillus sp.* and *Asp. niger*) degraded crude oil in a similar soil and condition by 99.3 % over the same period, thus reducing pollution to less than 1% and can be applied in bioremediation.

Key Words: Polluted soil, Rehabilitation, Genetic Engineering, Mixed microbial culture.