

**ECOLOGICAL RISK AND BIOAVAILABILITY ASSESSMENT OF  
A CRUDE OIL IMPACTED SITE IN A TROPICAL RAINFOREST**

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An oil exploration and production facility (Site) located in the Amazonian lowland rainforest experienced releases of crude oil and produced water, resulting in a large impacted area. Satellite imagery, along with on-site observations, indicated that the oil was highly weathered, and the majority of the Site was undergoing significant natural re-vegetation by both native and non-native wetland flora. To guide planning for an accelerated remediation and restoration of the Site, a comprehensive investigation and an ecological risk assessment was performed. Forensic chemistry results and microbial data were used to identify and evaluate the degree of weathering of the crude oil, and to assess the potential bioavailability and ecological risks from residual constituents such as PAHs. The chemical and microbial data confirmed that the oil is weathering and degrading due to the activity of a consortium of indigenous microbes. The more bioavailable, lower carbon range fractions have been largely eliminated, leaving only a weathered and tarlike residual that is not likely to cause toxicity to native fauna and flora. A remedial plan was developed based on this information that includes limited physical removal, in situ biostimulation of identified indigenous microbes, phytoremediation and mitigating exposure to residual crude oil.

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