

EROSION CONTROL AND REVEGETATION IN OIL PLATFORMS AND GAS RIGHT-OF-WAY IN TROPICAL FORESTS

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ABSTRACT

This document presents the erosion control and revegetation work carried out between 1997 and 2000 as part of the exploration and development of three oil drilling wells and one gas pipeline right-of-way in the Peruvian and Bolivian jungles. These projects encountered problems of laminar erosion, runoff, and collapse of poorly compacted embankments because of heavy runoff. Because of time constraints and the magnitude of the problems it was decided to use basic erosion control techniques to resolve these problems quickly, employing materials from each locale wherever possible.

In tropical forests, the impact of rainfall on uncompacted soil fill causes the soils to desegregate. In addition, uncompacted soils allow the rainwater to penetrate and fill the interstices, causing embankments to collapse. Oil operations conducted in the Amazon rain forest, mainly located in hilly areas, faced serious erosion and sediment processes during platform and pipeline construction and operation. This work induced by trees clearance and earth movement changed original drainage patterns, exposing soil to rainfall and delivering sediment to streams.

Erosion control, stabilization of embankments and revegetation are directly related components making up an integrated soil protection system. A dearth of publications and experience in erosion control and stabilization of embankments in tropical zones made it necessary to review the basic concepts and methods of soil conservation to identify and find those that would function in the conditions where oil exploration and extraction were being carried out.

Basically, projects had two phases: *erosion control /and revegetation*. The first phase comprises erosion and sediment control with traditional technologies using local material to reduce costs. To reduce runoff on steep slopes, wood and bamboo terraces were built and to re-build some collapsed structures, jute sacks were placed. The revegetation phase was commenced once slopes were stabilized in order to ensure the rehabilitation in long term. Different species of trees and herbaceous plant material suitable for disturbed environments were planted in high density per hectare (10,000 seedlings/ha).

During the projects described, valuable experience and information were acquired, which have enabled erosion control techniques in tropical zones to be adapted and improved thus improving their results. It is important to point out, that although the systems for stabilizing these embankments constitute one solution for controlling landslides, it is not suggested that they should replace engineering works designed to stabilize all embankments.