بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

BIOREMEDIATION OF INDUSTRIALWASTES OF OIL REFINERIES AS AN ENVIRONMENTAL SOLUTION FOR POLLUTION OF ISMAILIA CANAL

By
Eng. Tamer Raafat Mohamed Youssef

A Thesis Submitted to Cairo University
In Partial Fulfillment For the Requirements of
The Degree of Master of Science

In
Environmental&Sanitary Engineering

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رئيس مجلس القسم
٢٠٠٦/ ٤/ ١٢

Public Works Department
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ABSTRACT

Pollution of waterways due to oil spills is a global environmental problem which represents a great danger to these ecosystems. Management of water quality, control of water pollution and environmental protection are major issues to preserve living conditions for the future. Egypt has been listed among the ten countries that are threatened by the need of water by the year 2025 due to the rapidly increasing population. About 97% of Egypt's water resources are from the Nile River. About 350 industries are discharging their waste water either directly into the Nile or through the municipal system. Although industrialization is considered the cornerstone of the development strategies due to its significant contribution to the economic growth and hence human welfare, however, in most developing countries it led to serious environmental degradation *(Abdel Gelil et al, 1998)*.

By the beginning of fifties, heavy industries were born in Egypt along the Nile Delta and in Cairo and Alexandria metropolitan areas. Ismailia Canal –like other parts of the Nile River- suffers from serious environmental problems due to the presence of a number of industries along its side in Mustord ;mainly oil industries. In this research Cairo Oil Refining Company (CORC) was taken as an example of these industries. For treatment of wastes resulting from the refining processes , mechanical treatment is used employing API separators followed by physico-chemical treatment using Dissolved Air Floatation (DAF) aided with ferric chloride ($Fecl_3$) as a flocculant.

The main aim of this research is concerned with the application of crude oil degrading microorganisms –as a mean of biological treatment- to water coming out of the API separator. This biological phase is intended to improve the water quality coming out from the mechanical treatment. Biological treatment-being in this case a controlled treatment process – has its remediation products mostly harmless, in addition to the fact that using an effective bacterial strain using the oil contained in the waste water as the only source of carbon will result in the removal of dissolved hydrocarbons. Dissolved hydrocarbons are mainly poly-aromatic hydrocarbons which are mostly carthenogenic *(Clair et al, 1987)*. These compounds cannot be removed by mechanical treatment which has proven efficiency in the removal of dispersed oil (mainly n-paraffins).

Hence studying he probability of employing an effective biological treatment phase may result in improving the quality of waste water discharged into the River Nile from oil refineries since it contains high concentrations of dissolved aromatics which are difficult to remove by mechanical or physico-chemical processes.

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