

HIGHER TECHNICAL INSTITUTE

CIVIL ENGINEERING COURSE

DIPLOMA PROJECT

TREATMENT OF SOLID WASTES

C/902

NICOLAIDOU OLGA

JUNE 2000

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TREATMENT OF SOLID WASTES

PROJECT REPORT SUBMITTED

BY

OLGA NICOLAIDOU

**To the Department of Civil Engineering
Of the Higher Technical Institute
Nicosia Cyprus
In partial fulfillment of the requirements
for the diploma of
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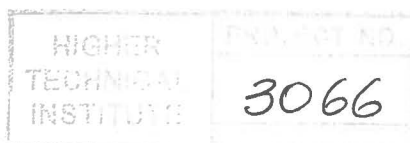
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ABBREVIATIONS

bar = unit of pressure

cm³ = cubic centimeter

cm = centimeter

cal / g = calories per grammars

dia. = diameter

ha = hectares

Kg = Kilogram

Kg / capita' day = Kilograms per capital per day

Km = Kilometer

KN = Kilonewton

KN / m² = Kilonewtons per square meter

m = meter

m³ = cubic meter

EPA = Environmental Protection Agency of the U.S. Federal Government

ICE = Institution of Civil Engineers

FoE = Friends of the Earth

MSW = Municipal Solid Wastes

RCRA = Resource Conservation and Recovery Act

WTE = Waste To Energy

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PREFACE

Humanity pays a price for the benefits of an industrial society. Cancer deaths increase people's concern because of poor control of land disposal plans. We waste energy and live in a throwaway dreamland.

Large areas of the world have lost many birds, plants and animals. Otters, kingfishers, many orchids and other once-common species are threatened. Most of the wildflower rich meadows have been destroyed. Wild species and vital seeds are lost. The climate is altered. Nations foolishly continue to pollute the air, earth and sea- upon which we are relying. Creatures and natural resources are exploited for short-term greed and gain.

And all of these, because the methods of storage, collection and disposal of solid wastes are found to be inadequate and as a result environmental impacts are focalized in specific areas such as:

- Socio-economy and culture
- Hydrology, hydrogeology and water quality
- Health and safety
- Air quality
- Noise
- Ecology
- Off-site traffic
- Visual, landscape and amenity

Conservation is a vital lifeline for the future.

New techniques of solid waste treatment are supposed to be developed in order to protect the environment where we live. Care must be taken during the detailed design of future landfills in order avoid any kind of pollution and destruction.

INTRODUCTION

Human beings in all civilisations have been sensitive to the importance of the environment to their health and progress. Increasing human population and the rapid industrialisation of this century have made us realise that respect for a cleaner environment is essential to our survival.

The term solid wastes, contains the heterogeneous mass of throwaways from the urban community as well as the more homogeneous accumulations of agricultural, industrial and mineral wastes. In an urban setting, the centralization of solid wastes is a direct consequence of life.

In the past, the disposal of human and other wastes did not perturb. The population was less and the available land for the assimilation of wastes was large. Nowadays we talk about recycling, in the past the farmers had no idea about recycling of the energy and fertilizer values of solid wastes.

The disposal of wastes commence to be a problem the time when humans first began to congregate in tribes, villages and communities and the accumulation of wastes became a consequence of life. Throwing of the food and other solid wastes into streets and roadways, led to the breeding of rats, fleas and as a consistency, diseases such as plague was outbroken.

In the fourteenth century half of the European population was killed by the epidemic of plague, called Black Death.

Until the nineteenth century nobody realized that food wastes had to be collected and disposed of, in a sanitary manner to control the vectors of disease.

Over the past few decades, public awareness of environmental issues has resulted in various federal and state environmental regulations. The primary

aim of these regulations is to protect the human health and the environment. This means re-mediation of existing waste disposal sites with properly design features.

PROBLEM

Solid wastes are considered a problem to be solved as cheaply as possible rather than a resource to be recovered.

Solid wastes disposal creates a problem primarily in highly populated areas. The more concentrated the population, the greater the problem becomes.

In 1990, the EPA estimated that the national average rate of solid wastes generated was 1.95Kg/capta.day. (REF.2)

The relationship between public health and the improper storage, collection and disposal of solid wastes is quite clear. Public health authorities have shown that rats, flies and other disease vectors breed in open dumps, as well as in poorly constructed or poorly maintained housing in food storage facilities and in many other places where food and harborage are available for rats and the insects associated with them.