EFFECTIVENESS OF DOMESTIC WASTEWATER TREATMENT WITH A NATURAL POLYMER, *MORINGA OLEIFERA*

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PERLANTIKAN BAGI MENJALANKAN PENYELIDIKAN

Merujuk kepada perkara di atas, bersama-sama ini dimajukan salinan surat kelulusan menjalankan penyelidikan untuk pensyarah dari Fakulti Kejuruteraan Awam;

Tajuk Projek	:	**Effectiveness Of Sludge Thickening And Dewatering With A Natural Polymer, Moringa Oleifera**
Ketua Projek	:	Puan Azinoor Azida Abu Bakar
Kos Projek	:	RM 17,350.00
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Sekian, untuk tindakan pihak tuan selanjutnya.

Terima kasih.

Yang benar

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LAPORAN AKHIR PENYELIDIKAN "EFFECTIVENESS OF DOMESTIC WASTEWATER TREATMENT WITH A NATURAL POLYMER, *MORINGA OLEIFERA*"

Merujuk kepada perkara di atas, bersama-sama ini disertakan tiga (3) naskah Laporan Akhir Penyelidikan bertajuk "**Effectiveness of Domestic Wastewater Treatment with a Natural Polymer, *Moringa oleifera***".

Segala kerjasama dan jasa dari pihak tuan sepanjang projek ini dijalankan diucapkan ribuan terima kasih.

Sekian.

Yang benar,

AZINOOR AZIDA BINTI ABU BAKAR
Ketua Projek

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CHAPTER ONE

INTRODUCTION

1.1 General

Sewage is the wastewater released by residences, businesses and industries in a community. It is 99.94 percent water with only 0.06 percent of the wastewater dissolved and suspended solid material (Hammer, 2004). The cloudiness of wastewater is caused by suspended particles which in untreated sewage ranges from 100 to 350 mg/l. A measure of the strength of the wastewater is biochemical oxygen demand, or BOD_5. The BOD_5 measures the amount of oxygen microorganisms require in five days to break down wastewater. Untreated wastewater has a BOD_5 ranging from 100 mg/l to 300 mg/l. Pathogens or disease-causing organisms are present in wastewater. Coliform bacteria are used as an indicator of disease-causing organisms. Sewage also contains nutrients (such as ammonia and phosphorus), minerals, and metals. Ammonia can range from 12 to 50 mg/l and phosphorus can range from 6 to 20 mg/l in untreated sewage (McGhee, 1991).

Wastewater treatment is a multi-stage process to renovate wastewater before it reenters a body of water, is applied to the land or is reused. The goal is to reduce or remove organic matter, solids nutrients disease-causing