THE STRENGTH OF DOMESTIC INFLUENT WASTEWATER FOR KLANG RESIDENTIAL AREAS

IBERAHIM BIN JANTAN 99510404

A thesis submitted in partial fulfillment of the requirements for the award of Bachelor Engineering (Hons.)(Civil)

Faculty of Civil Engineering
Universiti Teknologi MARA (UiTM)

MEI 2003

ACKNOWLEDGEMENTS

I would like to thank the Faculty of Civil Engineering, Universiti Teknologi MARA

(UiTM) for providing me with all the facilities towards the successful completion of my

final project.

I also would like to express my gratitude to my advisor Ir. Dr. Hj Suhaimi Bin Hj. Abdul

Talib for his comments, advice, guidance and encouragement throughout the preparation

until the completion of this project. Also my gratitude to my former advisor Dr. Shamsul

Rahman Mohamed Kutty for his guidance during the early stage of this final project.

I would like to extend my appreciation to En. Aiman Hakim Bin Abdullah, Operation

Manager of Indah Water Konsortium and En Muhammad Asri Bin Idris for their

continuous support in providing all the necessary information required.

Finally, thank you to my family, colleagues and all parties involved directly or indirectly

in making this project successful.

Iberahim Bin Jantan

B. Eng. (Hons.)(Civil)

Mei 2003

ii

ABSTRACT

Biochemical oxygen demand (BOD) gives a better measurement of oxygen demand by biological processes that occur at wastewater treatment plant. However the 5-day BOD (BOD₅) is a slight disadvantage associated with this parameter. The chemical oxygen demand (COD) is a rapid way of determining the oxygen demand as it takes between 3 to 5 hours to determine the values. By establishing the correlation between BOD₅ and COD, the "equivalent BOD₅" may be predicted.

The strength of a wastewater is significant as it represents the organic loading entering the wastewater treatment plant and the treatability indicates how easy would be the wastewater be treated.

The study on 14 locations of residential areas in Klang, Selangor shows that generally the influent wastewater at all the locations is categorized as 'weak' and 'easy to treat. Further there is no clear correlation between the BOD5 and COD to enable to predict the 'equivalent BOD₅'

TABLE OF CONTENT

		Page
Page title		i
Acknowledgement		îi
Abstract		iii
Table of contents		iv
List of Tables		vii
List of Figures		viii
Notation		ix
CHAPTER 1	INTRODUCTION	
1.1	General	ĩ
1.2	Problem statement	2
1.3	Objective of study	3
1.4	Scope of study	3
CHAPTER 2	LITERATURE REVIEW	
2.1	Introduction	5
2.2	Wastewater characteristic	5
2.3	Residential wastewater characteristic	9
2.4	Wastewater contaminants	12
	2.4.1 Organic matter	12
	2.4.2 Nitrogen	13
	2.4.3 Phosphorus	13
	2.4.4 Pathogenic microorganism	13

		2.4.5 Biochemical oxygen demand	14
		2.4.5.1 Carbonaceous oxygen demand	14
		2.4.5.2 Nitrogenous oxygen demand	14
		2.4.5.3 BOD ₅ as organic Pollutants	15
		2.4.6 Chemical oxygen demand	15
2.5		Effects of contaminants on wastewater	16
2.6		Wastewater strength	18
2.7		Treatability	18
CHAPTER	3	METHODOLOGY	
3.1		Source of data	19
3.2		Selection of raw data for analysis	19
3.3		Treatment of data for analysis	20
		3.2.1 Histogram	20
		3.2.2 Median	22
		3.2.3 Strength of wastewater	23
		3.2.4 Treatability	24
		3.2.5 Correlation between BOD ₅ and COD	25
CHAPTER	4	RESULTS	
4.1		Range of raw data	27
4.2		Raw data distribution	27
4.3		Influent wastewater strength and treatability	33
44		Correlation between BODs and COD	34