LEACHATE FILTRATION BY USING LOW COST MATERIAL

By

FARAHDILLA BT AHMAD FAUZY

Report is submitted as
the requirement for the degree of
Bachelor Engineering (Hons) (Civil)

UNIVERSITI TEKNOLOGI MARA
MARCH 2006

DECLARATION BY THE CANDIDATES

I (Farahdilla binti Ahmad Fauzy, 2003339812) confirm that the work is my own work and the appropriate credit has been given where references has been made to the work of others.

(_____31 March, 2006)

ACKNOWLEDGEMENT

All praise to Allah S.W.T, Lord of the Universe, the Merciful and gracious Salam to Nabi Muhammad S.A.W, his companion, his friends and the people who follow his path, the author would like to express her gratitude to the Almighty Allah S.W.T for giving her guidance and strength making his project research as a great.

Special thanks to En. Mohamed Ali B. Abd Karim, my supervisor of the Final Year Project for this valuable guidance and who has spend his time to give me to borrow the books, explanation, comments and the required technical advice in carrying out this Final Year Project.

Special thanks also to En Sufian, Site Engineer and Landfill Manager of Idaman Bersih Sdn Bhd (IBSB) for giving a lot of information about management of leachate and solid waste landfill in Penang and Seberang Perai and giving a permission to take the sample at site. Also thanks to Pn. Rokibah, technician of Environment Laboratory for give me a guidance to do all the test lab.

To my lovely mom, Fatimah Bt Ramlee, thank you very much for your money and moral support that you give for me. Also to all my friend, thanks for your comments and suggestion. Without all of you, I believed that, my Final Year Project will not complete.

Thank you, may the Almighty Allah S.W.T be with for all the time.

Amin….

ABSTRACT

Filtration is a mechanism by which leachate constituents are physically trapped. Filtration efficiency depends on pore size and hydraulics gradients of the leachate. The main purpose of this Final Year Project is to remove the parameter of COD, SS, pH, conductivity, Iron (Fe) and Manganese (Mn) in leachate. This treatment is important to ensure that the values of parameter are fulfilling the Environment Quality (Sewage and Industrial Effluents) Regulation, 1979 based on maximum effluent parameter limits Standard A and B. This treatment is a pre-treatment of leachate where we use the crush stone and charcoal as a filtration media at different diameter. The sample that be used in this treatment is a leachate from landfill Idaman Bersih Sdn Bhd (IBSB) at Sg Burong. In order to fulfill the objective of this study, one of the experiment will carry on, whish using the low cost material to obtain the values of parameter COD, SS, pH, conductivity, Iron (Fe) and Manganese (Mn) of sample before(influent) and after(final effluent) treatment. Comparison between influent and final effluent parameters will be taken to evaluate the effectiveness the crush stone and charcoal as a filtration media. This medium can remove the parameters such as SS up to 80%, Conductivity up to 52% and Manganese up to 56.25%. The results show the removal a percentage is influence by detention time and size of filtration media. The removal percentages of these parameters were better for 5 hours detention time. The filtration process will be done by using the same filtration media without backwashing process.

CHAPTER 1

INTRODUCTION

1.1 Background

Every community produces both liquid and solid waste. Wastewater is the combination of the liquid or water carried wastes removed from residences, institutions, commercial and industrial establishment together with such groundwater, surface water and storm water. Wastewater is characterized in terms of its physical, chemical and biological composition. For example, temperature, a physical property, the affect both the amount of gasses dissolved in the wastewater and the biological activity in the wastewater. Much of the wastewater must be treated before it is released back to the environment. (Metcalf & Eddy 2003). Wastewater is used water. It includes substances such as human waste, food scraps, oils, soaps and chemicals. In homes, this includes water from sinks, showers, bathtubs, toilets, washing machines and dishwashers. Businesses and industries also contribute their share of used water that must be cleaned. Wastewater also includes storm runoff. Although some people assume that the rain that runs down the street during a storm is fairly clean, it isn't. Harmful substances that wash off roads, parking lots, and rooftops can harm our rivers and lakes. (http://ga.water.usgs.gov)

Treatment is any process that changes the physical, chemical, or biological character of a waste to make it less of an environmental threat. Treatment can neutralize the waste, recover energy or material resources from a waste, render the waste less hazardous, or make the waste safer to transport, store, or dispose of. The major aim of