CHAPTER 8

CONCLUSION
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The findings in the waste audit and characterizations studies are summarized below:

i. Spent bleaching earth generated was 2.23 tonnes in a day with a moisture content of 0.88% and a TOC value of 63.8%. Heavy metals content are at trace limits only.

ii. Waste filter cake generated was 0.78 tonnes in a day with a moisture content of 4.8% and a TOC value of 48.4%. Estimated loss due to glycerine loss in the filter cake was RM 16,330 per year. Heavy metals content are at trace limits only.

iii. Residue fatty acids generated from the distillation and fractionation processes, on average have an acid value below 45 with a yield factor of 4.88% and 3.86% respectively.

iv. Approximately 167kg of spent nickel catalyst were produced with an average nickel content of 17.8%.

v. Biological sludge produced from the wastewater treatment plants has a moisture content of 4.84% and a TOC value of 14.6%. Around 621kg of sludge is produced in a day. Heavy metals content is at trace limits only.

vi. Glycerine pitch has an average COD value of 9,784ppm. The amount of glycerine pitch produced in average is 494kg, which cost an annual lost of RM 487,575.
vii. Raw process wastewater daily flowrate to the treatment plant was around 9.28 m³/h with a COD of 7,827ppm, BOD of 3,106ppm, TSS of 172ppm, O&G of 771ppm and pH of 4.8. The treated wastewater discharged from Palm-Oleo had the following characteristics: COD (42ppm), BOD (14ppm), TSS (28ppm), O&G (4.3ppm) and pH (7.5).

viii. 2.5 tonnes of spent activated carbon is generated in a month.

The benefits of practicing Cleaner Technology (waste minimization) are as below:

i. Reduction in the amount of hazardous spent nickel catalyst waste which need to be handled and a savings around RM924,000 per year by recycling the spent catalyst

ii. Spent earth disposed at landfill contains less amount of oil and a savings of RM60,960 per year can be achieved by extracting the retained oil in the spent bleaching earth.