UNIVERSITI TEKNOLOGI MARA

HEAVY METAL CONCENTRATION IN STREET DUST FROM MUKIM KLUANG AND THEIR HEALTH RISK ASSESSMENT

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Project submitted in fulfillment of the requirements for the Degree

of

Bachelor of Environmental Health and Safety (Hons.)

Faculty of Health Sciences

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DECLARATION BY STUDENT

Project entitled Heavy Metal Concentration in Street Dust from Mukim Kluang and Their Health Risk Assessment is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature and acknowledgement of collaborative research and discussions. The project was carried out under the guidance of Dr. Shantakumari Rajan as Project Supervisor. This project has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety.

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ABSTRACT

Heavy Metal Concentration in Street Dust from Mukim Kluang and Their Health Risk Assessment

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In Malaysia, several studies have been conducted with regards to the presence of heavy metals in dust. However, the studies conducted have been done in an indoor environment. As there is scarce of study conducted to determine the concentration of heavy metals in the street dust, which is in an outdoor environment, it is very important for this study to be conducted as street dust caused environmental pollution and might cause health risk in long-term exposure. So, this study was conducted to determine the concentration of heavy metals (cadmium, lead and copper) in street dust from residential, industrial and commercial areas of the Kluang City in Mukim Kluang and to compare their concentration as well as to evaluate the health risk assessment of street dust exposure of heavy metals towards human health. Therefore, 90 samples of street dust were collected from residential, industrial and commercial areas at Kluang City and the samples were digested based on USEPA Method 3050B. The concentration of cadmium, lead and copper was determined using atomic absorption spectrophotometer (AAS). Based on the result obtained, it can be seen that the highest level of cadmium concentration was found in the sample from industrial area with a reading of 3.800 mg/kg. For lead concentration, the highest concentration was found in commercial area with a reading of 29.850 mg/kg, while the highest concentration of copper was found in industrial area with a reading of 860.000 mg/kg. Besides that, Kruskal Wallis analysis showed that there is a significant difference ($p < 0.05$) in the mean concentration of cadmium and copper in those three functional areas, whereas for lead, the result showed that there is no significant difference ($p > 0.05$) in the mean concentration between residential, industrial and commercial areas. Furthermore, evaluation of health risk assessment showed that there was no significant risk of health for heavy metals in residential, industrial and commercial areas towards children and adult. This is because the value of the hazard quotient (HQ) and total hazard quotient (THQ) are less than 1. Therefore, this study provides a contribution to a new findings and knowledge in public health as the study has never been conducted in this area previously.

Keywords: Heavy metal, street dust, health risk.