

UNIVERSITI TEKNOLOGI MARA

**SPATIAL DISTRIBUTION OF HEAVY METALS
IN TOPSOIL OF SOLID WASTE LANDFILLS IN
PAHANG**

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Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor of Surveying Science and Geomatics (Hons)

Faculty of Architecture, Planning and Surveying


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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Heavy metal is the metallic chemical element that has a relatively high density and it is toxic and poisonous at low concentrations while soil is a complex matrix and a major reservoir of contamination. Soil can be polluted through many ways. For the soil in landfills, it can be polluted through the waste that disposed in the soil. The polluted soil is from leachate that triggered soil contamination in waste landfill through sorption and migration process. Hence, the high contamination of heavy metal in soil in landfill give risks for the public health due to the potential exposure to pathogenic agents, toxic substances, gases. The aim of this study is to detect the heavy metal on soil at solid waste landfills in Pahang. 12 sample of soil collected from topsoil of 4 landfill sites to determine the level of contamination of Copper (Cu), Chromium (Cr), Lead (Pb) and Zinc (Zn). Analytical determination is performed using ICP-OES. By using GIS (Geographical Information System), spatial analyst tools with interpolation method is performed. The study then produce the spatial distribution of heavy metal of the presence of heavy metal in the topsoil sample. The overall finding from this research that Zn have the highest contamination in topsoil of 4 landfills sites. The results shows heavy metal contamination on soil orders is $Zn > Cr > Cu > Pb$. For the spatial distribution of heavy metals, the high contamination of heavy metals for method IDW and natural neighbour is at Jengka landfill site. While for kriging and spline method, the high contamination of heavy metals in soil is at Jabor landfill. In conclusion, this research shows how the heavy metals distribute to their surrounding area through the interpolation methods that is used.

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