

UNIVERSITI TEKNOLOGI MARA

**VOLATILE ORGANIC COMPOUNDS (VOCs)
RELEASE FROM WASTE STORAGE AND THE
POTENTIAL HEALTH RISK TO WASTE
COLLECTORS**

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Project submitted in fulfilment of the requirements for
the degree of

**Bachelor in Environmental Health and Safety
(Hons.)**

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DECLARATION BY STUDENT

Project entitled “Volatile Organic Compounds (VOCs) Release from Waste Storage and the Potential Health Risk to Waste Collectors” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Mrs Siti Rohana Bt Mohd Yatim. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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In the name of Allah, The Most Gracious, The Most Merciful

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ABSTRACT

Volatile organic compound (VOCs) are known as a biogas produced from the decomposition of biodegradable materials through the action of bacteria, fungi and other living microorganisms. Among all the air pollutants, emission of VOCs in air leads to various short-term and long-term diseases based on the concentration level in the air. In this study, the samples were prepared by collecting about 15kg for each type of waste (food waste and mixed waste) and were stored in modified waste storage bins. The experiment was conducted in the outdoor setting for 21 days to stimulate the decomposition of the waste during extended collection. The type of VOCs tested in this study are benzene, toluene, ethylbenzene, m-xylene, limonene and dimethyl disulphide. This study found that the type of waste influence the level of VOCs emitted where, $p\text{-value} < 0.05$. Meanwhile, the time for waste collection does not influence the level of VOC emitted from the modified waste storage bin. Regarding public health, a few pollutants have been identified in previous studies that maybe not cause odor annoyance, but they can represent a health threat which contained hazardous compound with carcinogenic properties. Health risk assessment was also determined by calculating Hazard Quotient, Hazard Index and Cancer Risk. For the non-carcinogenic effects in this study have higher values of hazard index ($HI > 1$) for food waste and mixed waste which signify the occurrence of non-carcinogenic effects while the carcinogenic risk which is benzene in this study found to below the acceptable range. As a result, the determination of VOCs in a waste disposal bin and conducting health risk assessment is necessary to assess the impact on the health and also the environment.

Keyword: *Volatile organic compound (VOCs), food waste, mixed waste, decomposition, health risk assessment*