

Sansarith Thianpopirug 2008: Evaluation of Methane, Volatile Organic Compounds and Odour Emission from Municipal Solid Waste Disposal Site. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Chart Chiemchaisri, D.Eng. 180 pages.

The measurement of methane and volatile organic compounds (Benzene, Toluene, Ethylbenzene and Xylene: BTEX) emission from new waste piles at Nonthaburi solid waste disposal site with and without soil cover were conducted. Highest average methane emission rate was found to be $53.51 \text{ g/m}^2\text{-d}$ from waste pile with soil cover under rainy season. This rate was higher than $20.87 \text{ g/m}^2\text{-d}$ detected under dry season and $5.23 \text{ g/m}^2\text{-d}$ and $3.99 \text{ g/m}^2\text{-d}$ on the surface of open dump waste pile under rainy and dry seasons respectively. The emission of BTEX compounds were found highest from the waste pile with cover soil under dry season at 7.11×10^{-2} , 9.76×10^{-2} , 4.80×10^{-2} and $7.62 \times 10^{-2} \text{ g/m}^2\text{-d}$. These rates were higher than under rainy season and open dump waste pile.

The dispersion of methane and BTEX in ambient air was modeled by AERMOD and ISCST. It was found that both models gave the results having significant difference from each other. The AERMOD model provide more accurate results as determined by coefficient of determination and root mean square error. The risk of BTEX compounds to workers and nearby communities was found at low level as suggested by hazardous index less than critical level.

The dispersion of odour from solid waste disposal site was also studied using field olfactometer and the models. The result show that the dispersion of odour compounds were 940 metres from the disposal site boundary where level of 30 dilution-to-threshold (D/T) and 1,600 metres until a D/T level of 15 was reached.

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