

Pimla Raddawannapong 2011: Using of CALINE 4 Program to Predict Benzene, Toluene, Ethylbenzene and Xylene Dispersion on Phaholyothin Road from Soi Phaholyothin 9 to Soi Phaholyothin 15. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Mr. Suchart Leungprasert, Ph.D. 171 pages.

Volatile organic compounds (such as Benzene, Toluene, Ethylbenzene and Xylene: BTEX), is an air pollution that can be harmful to people health. Most of them are founded in the place where caused a traffic congestion. However, the price of the substance measurement cost too high and the examination procedure may last for a long time. CABLIN 4 program can be the alternative to reduce the expenses and to save the analytical examination time by predicting the intensity of Benzene, Toluene, Ethylbenzene and Xylene. Thus, this research was conducted to estimate the dispersion of BTEX by using the CALINE 4 program. We compared the collected results with the field results at Saphan Khwai intersection by using the Paired-Sample T-Test method, which is including risk assessment for respiratory tract infections for human health by exposure of the carcinogenic and hazardous Volatile organic compounds (BTEX).

After the comparative measurements and prediction by using CALINE4, we found that the concentration of BTEX compounds were not significantly different at the significant level 0.05. The average measurement and prediction of the concentration of BTEX compounds in April was $9.21 \mu\text{g}/\text{m}^3$, $2.82 \mu\text{g}/\text{m}^3$, $0.031 \mu\text{g}/\text{m}^3$, and $0.066 \mu\text{g}/\text{m}^3$; $6.07 \mu\text{g}/\text{m}^3$, $2.28 \mu\text{g}/\text{m}^3$, $0.025 \mu\text{g}/\text{m}^3$ and $0.058 \mu\text{g}/\text{m}^3$ respectively.

The risk assessment from the concentrations of CALINE4 observed and model CALINE4 found that the receptor 1 and the receptor 4 (the entrance of Bangkok) had higher cancer risk (9×10^{-7} - 2.2×10^{-6}) compared with the receptor 2 and the receptor 3 which the ranks are between 7×10^{-7} - 1.7×10^{-6} . So the Cancer Risk based on the volume of vehicles on the road. However, to receive the BTEX vapor in the observed area at least a hour is acceptable according to US.EPA Standard.

Student's signature

Thesis Advisor's signature