

DISPERSI POLUTAN CO DAN NO₂ DI UDARA AKIBAT AKTIVITAS TRANSPORTASI KENDARAAN BERMOTOR DI TERMINAL JOMBOR MENGGUNAKAN MODEL GAUSSIAN

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INTISARI

Pemodelan konsentrasi dan penyebaran polutan CO dan NO₂ di udara akibat aktivitas transportasi kendaraan bermotor di sekitar Terminal Jombor Kota Yogyakarta Menggunakan Model Gaussian telah dilakukan, penelitian ini bertujuan untuk melakukan pemodelan dispersi polutan CO dan NO₂ di kawasan Terminal Jombor, Kota Yogyakarta menggunakan model gaussian dalam software AERMOD, serta menilai dampak polutan CO dan NO₂ dari aktivitas kendaraan bermotor di sekitar Terminal Jombor terhadap risiko kesehatan manusia dan risiko kesehatan lingkungan.

Penelitian diawali dengan melakukan pengumpulan dan pengolahan data-data untuk penunjang pemodelan AERMOD seperti sumber emisi, data meteorologi, data topografi dan peta wilayah penelitian. Pemodelan dilakukan dengan perangkat lunak AERMOD, selanjutnya dilakukan pengambilan dan pengujian sampel langsung di lapangan untuk memvalidasi hasil pemodelan. Pengujian statistik dilakukan menggunakan metode NMSE, FB, FAC2, r dan IOA.

Hasil penelitian menunjukkan bahwa hasil pemodelan memenuhi hipotesis (H1), yakni AERMOD berhasil memodelkan polutan di lingkungan sekitar Terminal Jombor. AERMOD berhasil memodelkan dispersi polutan dengan skenario EURO, variasi kecepatan kendaraan dan skenario pertumbuhan kendaraan 5–10 tahun mendatang. Semakin tinggi jumlah kendaraan bermotor di sekitar Terminal Jombor, semakin tinggi konsentrasi CO dan NO₂ di udara ambien. Potensi dampak lingkungan yang diakibatkan dari polutan akibat aktivitas kendaraan bermotor hingga 10 tahun mendatang di sekitar Terminal Jombor diantaranya adalah eutrofikasi, asidifikasi, oksidasi fotokimia, hingga toksisitas pada manusia. Berdasarkan perhitungan, potensi dampak lingkungan tertinggi adalah pemanasan global.

Kata kunci: AERMOD, CO, Model Gaussian, NO₂, Terminal Jombor.

DISPERSION OF CO AND NO₂ POLLUTANTS IN THE AIR DUE TO MOTOR VEHICLE TRANSPORTATION ACTIVITIES IN THE JOMBOR TERMINAL USING GAUSSIAN MODEL

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ABSTRACT

The modeling concentration and spread of CO and NO₂ pollutants in the air due to motorized vehicle transportation activities around the Jombor Terminal, Yogyakarta City Using Gaussian Model has been carried out, this study aims to model the dispersion of CO and NO₂ pollutants in the Jombor Terminal area, Yogyakarta City using gaussian model on the AERMOD software, and assess the impact of CO and NO₂ pollutants from motorized vehicle activities around the Jombor Terminal on human health risks and environmental health risks.

The research begins with collecting and processing data to support AERMOD modeling such as emission sources, meteorological data, topographical data and maps of the research area. Modeling was carried out using AERMOD software, then samples were taken and tested directly in the field to validate the modeling results. Statistical testing was carried out using the NMSE, FB, FAC2, r and IOA methods.

The results showed that the modeling results met the hypothesis (H1), namely AERMOD succeeded in modeling pollutants in the environment around the Jombor Terminal. AERMOD succeeded in modeling pollutant dispersion with EURO scenarios, vehicle speed variations and vehicle growth scenarios for the next 5–10 years. The higher the number of motorized vehicles around the Jombor Terminal, the higher the concentration of CO and NO₂ in the ambient air. The environmental impacts arising from pollutants due to transportation activities around the Jombor Terminal include eutrophication, acidification, photochemical oxidation, and toxicity to humans. Based on calculations, the highest potential environmental impact is global warming.

Keywords: AERMOD, CO, Gaussian Model, Jombor Bus's Terminal, NO₂.