



Title: Total SO₂ Emissions from Power Stations and Evaluation of their Impact in Kuwait Using a Gaussian Plume Dispersion Model

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Abstract: In Kuwait, most of the power stations use fuel oil as the prime source of energy. The sulphur content (S%) of the fuel used as well as other factors have a direct impact on the ground level concentration of sulphur dioxide (SO₂) released by power stations into the atmosphere. The SO₂ ground level concentration has to meet the environmental standards set by Kuwait Environment Public Authority (KEPA). In this communication we present results obtained using the Industrial Sources Complex Short Term (ISCST3) model to calculate the SO₂ concentration resulting from existing power stations in Kuwait assuming zero background SO₂ concentration and entire reliance on Heavy Fuel Oil. 1, 2, 3 and 4S% scenarios were simulated for three emission cycle cases. The computed annual SO₂ concentrations were always less than KEPA standards for all scenarios. The daily SO₂ concentrations were within KEPA standards for 1S% but violated KEPA standards for higher S%. In general, the concentrations obtained from the combined hourly and seasonal cycle were the lowest and those obtained from the no cycle case were the highest. The comparison between the results of the three cycles revealed that the violation times cannot be solely attributed to the increase in emissions and the meteorological conditions have to be taken into consideration.