

ANALYSIS OF SUSPENDED PARTICULATE LEVELS IN AN INDUSTRIAL AREA OF GREECE OVER A MULTI-YEAR PERIOD

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EXTENDED ABSTRACT

The study of the variation in the air quality of the Ptolemais – Kozani greater area, an area with escalated industrial activity during the last decades, constitutes object of particular interest. The lignite mining and combustion has been identified as one of the major contributors to elevated ambient particulate levels in this industrialized area

In this area four lignite power stations are operated, with a total installed generating capacity of 4 GW. Moreover, a new power station of 660 MW is under construction, as a result of an increasing demand for electric power. These PSs, which are operated by the Greek Public Power Corporation (GPPC), contribute to about 70 % of the total electrical energy produced in Greece. The lignite used is mined in the nearby open-pit coal-mines.

The intensive industrial activity in this area had resulted in major air quality problems, mainly caused by the lignite-fired power stations and the lignite mining operation. Although particulate controls in the power stations exhibit high collection efficiency rates (nearly 99.9% for most electrostatic precipitators), considerable amounts of fly ash are discharged into the environment owing to the large amounts of coal burned. In addition to the particulate emissions, fugitive dust, caused by mine operating procedures, is another significant particle source in this area.

The air quality control around the area is monitored by a measurement stations network, which has been installed by the Greek Public Power Corporation since 1983 This network has been upgraded in 1997 by employing automatic measurement stations capable of automatic collection and transmission of data. Furthermore, three automatic monitoring stations, have operated in the area under the supervision of Prefecture of Kozani since 1995. Specific atmospheric pollution measurements are also carried out by the Laboratory of Atmospheric Pollution and Environmental Physics of T.E.I of West Macedonia.

In this work the results of a multi-year period sampling program is described. More specifically ambient concentrations of Total Suspended Particles (TSP) over much of the period 1983 – 2001 are analyzed, as well PM10 concentrations for the period 1996 - 2000. The TSP measurements were taken in eight monitoring stations located in the mining/industrial areas and the PM10 in urban area. Emphasis is given on the assessment of the levels of the daily average concentrations for the data period as well as the determination of the spatial and temporal variation of suspended particle concentrations. The interannual concentrations trend is also investigated. Based on the data analysis, useful information is provided about air quality levels after taking into account air quality standards.

Key words: TSP, lignite power stations, lignite mines, Ptolemais – Kozani