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Severe particulate pollution from deposition practices of primary materials of cement plants

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Analysis of ambient particulates sampled at a residential area near a cement manufacturing plant in Greece, showed total aerosol mass in the sampled air 1.3-30.4 mg/m3 and PM10 concentrations 0.04-3 mg/m3. These concentrations are very high and seriously exceed air quality standards. Morphological examination and elemental analysis of air samples and primary materials with Scanning Electron Microscopy (SEM)/Energy Dispersive X-Ray Spectroscopy (EDS) showed that ambient particulates shared appearance features and had similar elemental synthesis to clinker and fly ash, showing heavy impacts on the ambient aerosol load from the cement plant practice of open deposition of primary materials. Satellite-derived AOD over the area during the period 2000-2010 shows extended spatial impact, while satellite overpass data indicate a 33% decrease in AOD over this period, possibly due to changing production and primary material deposition practices. Although the sampling was performed more than one decade ago in Greece, environmental legislation and its reinforcement practices at that time in Greece are similar to current ones in many parts of the world. The global increase in cement production, especially in south-east Asia, make these measurements particularly relevant.