



Source Apportionment of Particulate Matter Collected Upwind and Downwind of a Steel Facility in Granite City, IL (USA)

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St. Louis is currently in nonattainment of the annual PM2.5 National Ambient Air Quality Standard (NAAQS). Granite City Steel Works (GSCW), located in Granite City, IL is considered to be a significant source impacting the St. Louis area and the largest PM2.5 point source contributor. Twelve grab samples were collected in and around the steel facility including the basic oxygen furnace, steel and iron slag crushing, coal pulverizing, baghouse dust, paved road dust, and unpaved road dust. The bulk samples were resuspended in a resuspension chamber using a PM2.5 cutpoint and collected on Teflon, quartz and polycarbonate filters. Fine particulate matter (PM) samples (12-hr and 24-hr) were collected upwind and downwind of GSCW from October 13 to December 13, 2007 to identify sources contributing to nonattainment in St. Louis. The samples were analyzed for trace metals (X-Ray Fluorescence), ions (Ion Chromatography), elemental and organic carbon (thermal optical analysis), and organic species (solvent extraction Gas Chromatography/Mass Spectrometry). Source apportionment was conducted using the EPA Chemical Mass Balance (CMB) Model (v 8.2). Major sources impacting the 12-hr samples included the blast oxygen furnace, secondary sulfate, and road dust. Higher excess steel and coke works contributions were associated with higher wind speeds (greater than 5 mph) and more variability in source impacts was observed. Major sources impacting the 24-hr samples included secondary sulfate and motor vehicles (diesel and gasoline). Contributions were similar between the coke and steel works sources.

Disclaimer:

Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.