## COMPARISON OF DISPERSION MODEL CASE STUDIES USING NUMERICAL WEATHER PREDICTION OR SYNOPTIC OBSERVATIONS

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**Abstract:** Local government has responsibility in the U.K. for managing air quality in their localities. The U.K. Environment Agency manages impacts from large sources. The ADMS model, with boundary layer algorithms that process the input met data, has been much used in local air quality management in the UK, including the recent detailed studies of future air quality at London Heathrow airport, as was discussed at Harmo 11 by Carruthers. Dispersion modelling of emissions from diverse sources including roads and individual stacks generally uses input hourly synoptic observations (OBS). Key variables are wind speed and direction, cloud amount, and precipitation. An alternative source of input met data can be obtained from numerical weather prediction (NWP). Large amounts of NWP data are produced at intervals, e.g. hourly or 3-hourly. These NWP data are available for use in air quality management. They can include heat flux and boundary layer depth, which are not routinely measured. Air quality forecasting in the UK using the Met Office NAME III model already uses such NWP data. Files of NWP data may also be processed into a format to suit particular models like ADMS. Initial comparisons of NWP (at two grid scales) and OBS data as used for dispersion modelling have been presented at the Harmo 11 Conference in July 2007. With this background, the present study compares the dispersion modelling results using the ADMS model for a case study based upon real emissions scenarios, namely a single stack. Pollutant concentrations including hourly, daily and annual averages have been generated for each case study using each type of hourly input meteorological data: synoptic OBS, NWP mesoscale and NWP global. The sensitivity of the output concentrations to choice of met data will be presented. Lessons learned from the comparisons will be discussed in the light of uncertainties already experienced in local air quality management (LAQM), drawing upon parallel work for Harmo 12 by Middleton which compares the corresponding meteorological pre-processor results.