M. Koerber

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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Air & Radiation Branch
U.S. EPA Region V

MEMORANDUM

SUBJECT: Use of RTDM for Ashland Petroleum

FROM: Joseph A. Tikvart, Chief J. Tikvart
Source Receptor Analysis Branch (MD-14)

TO: Bruce P. Miller, Chief
Air Programs Branch, Region IV

The Model Clearinghouse has reviewed your request to use RTDM to analyze the GEP emission limit for the Ashland Petroleum Company in Kentucky. We have concluded that since this analysis involves GEP stack heights there is not any way to establish the impacts at GEP height from ambient data alone; modeling appears to be unavoidable.

We agree with you that current guidance would suggest that RTDM is an appropriate model for estimating complex terrain impacts. However, this model should be used in conjunction with a simple terrain model since 1) it is possible that maximum impacts, especially from the shorter stacks, could occur at receptors below stack height, and 2) the modeling guideline indicates that, for receptors between stack height and plume height, estimates should be made with both a complex terrain model and a simple terrain model and that the higher of the two estimates should be chosen. To accomplish this second requirement, given the large number of stacks and the fact that RTDM is really a single stack model, it appears that it will be necessary to model each stack separately, choosing the higher of the simple terrain/complex terrain estimates at each receptor on an hour-by-hour basis and then writing some software to sum the estimates from the various stacks and compute 3-, 24-hour and annual estimates. Thus, in response to your first action item, our guidance indicates that a combination of RTDM and a simple terrain model (probably ISCST) would be appropriate.

With regard to the use of the M3 meteorological data in RTDM, we have concluded that, while not optimum, these data should be sufficiently representaive in this case for modeling the 76m stacks. Wind direction taken at 30m on Tower M3 should be used directly but wind speed data should be profiled down to a level equivalent to the 65m GEP stack height on the 76m stacks. For modeling the many stacks with heights of 12-20m it would be more appropriate to use data collected from one of the other 10m meteorological towers in the valley. We also understand that there are some 56m stacks; we leave it to your professional judgment which

meteorological data to use for these stacks. In any event if you find it necessary to collect additional meteorological data to accomplish this modeling we suggest 1) that a tower of at least 65m in height be erected and that data be collected from three levels, corresponding approximately to the stack heights at the refinery and 2) discussion take place with the SO_2 Particulate Matter Program Branch concerning the problems with OAQPS SIP delays inherent in the data collection process.

Finally, we recognize, as you have in your memorandum, that the methodology discussed above may not be consistent with various studies conducted in the past in the area but that an analysis and a SIP are required by the stack height regulations. There are, however, no techniques available to complete the requisite analysis other than those identified in current guidance. The source may, however, wish to propose an alternate type of modeling analysis, e.g., the model evaluation study comparing RTDM and LAPPES suggested in your memorandum. The EPA would be receptive to such a proposal to the extent that the study can be completed and the results submitted to the EPA within a reasonable time.

cc: R. Bauman
W. Keith
W. Laxton
S. Reinders
D. Wilson