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

FEB 7 1995

MEMORANDUM

SUBJECT: Use of CTSCREEN/ISCST2 for Multi-Source Complex Terrain Applications

FROM: Joseph A. Tikvart, Group Leader J. Tikvart
Air Quality Modeling Group, EMAD (MD-14)

TO: Alan J. Cimorelli, Lead Meteorologist
Region III

The Clearinghouse has reviewed the request described in your January 6, 1995 memorandum concerning the application of the CTSCREEN and ISCST2 models for two multi-source complex terrain modeling scenarios. You describe modeling applications for two State implementation plans (SIPs) that require modeling of sources for differing stack top elevations. In these cases, a receptor on a terrain feature may be considered in simple terrain (i.e., below stack top elevation) for one source, while for another source the receptor would be considered in complex terrain (i.e., above stack top elevation).

One application described in your memorandum is for a single-source SO2 SIP revision for the Ohio Power Company Kammer Station. The other is an area-wide SO2 SIP revision for the WV New Manchester-Grant Magisterial District. Both SIP applications require modeling of SO2 sources in both simple and complex terrain. It is being proposed that the ISCST2 model be used for the simple terrain receptors and the CTSCREEN model be used for the complex terrain receptors. An issue surfaces in these multi-source modeling analyses when, for a specific receptor, ISCST2 would be appropriate for one source and CTSCREEN would be appropriate for another source. Typically in multi-source modeling scenarios, the predicted concentrations for each source are combined for a particular receptor to yield a total concentration. However, in this case, the models utilize different types of meteorological data and physics to obtain the predicted concentrations. Under this approach, combination of the modeled predictions for each source in some instances may be inappropriate.

To accommodate this issue, you propose to apply both the CTSCREEN and ISCST2 models for receptors in terrain located between the shortest and tallest stacks in the emissions inventory. Under this option, each model would be run

separately, with the complete emissions inventory, on a common receptor grid covering the area between the heights of the shortest and tallest stacks. Then receptor-by-receptor, the higher of the two predictions would be selected to represent the total concentration for that particular hour.

Your proposal is patterned from a similar approach presented at the 1994 Regional Office/State/Local Modeler's Conference. At that Conference the Complex/Intermediate Terrain Workgroup recommended that this approach be considered case-by-case through the Model Clearinghouse. The Workgroup noted several reasons why this approach could be acceptable. These reasons were noted in the August 25, 1994 Workshop Summary Report and briefly summarized in Attachment 1.

After reviewing the information presented in your memorandum, we conclude that your proposal has technical merit. Therefore, we concur with your proposal to use this approach for the two SIP analyses described in your January 6, 1995 memorandum. However, other applications proposing a similar approach would need to be reviewed for their own technical merits on a case-by-case basis.

If you have any further questions, please contact Dennis Doll at (919) 541-5693.

cc: D. Doll
J. Irwin
D. Wilson

FY-95 MODEL CLEARINGHOUSE MEMORANDA

Date	Region	Subject
11/04/94	V	Model Clearinghouse Review of Modeling Approaches in the Stuebenville-Follansbee Area
01/17/95	I	Request for Clarification on CTDMPLUS Model Inputs (Merrimack Generating Station, BOW NH)
02/06/95	III	Use of CTSCREEN/ISCST2 for Multi-Source Complex Terrain Applications