Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
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22 April, 1999

Received 4/26/99 Rob

Rob Wilson (OEA-095)
EPA Region X
1200 Sixth Avenue
Seattle, WA 98101

RE: Request for approval for using AERMOD

Dear Mr. Wilson,

As the attached letter shows, US Gypsum is requesting authorization to use AERMOD for modeling of impacts from their proposed facility in Rainier, Oregon. OAR 340-28-1940 requires approval from both our Department and from EPA for using any model that is not currently in 40 CFR Part 51, Appendix "W."

I am supporting US Gypsum's request to use AERMOD for the following reasons:

- AERMOD is scheduled to be proposed to become a part of 40 CFR 51, Appendix "W" with the Seventh National Modeling Conference this year.
- AERMOD uses newer atmospheric physics that is not available in ISCST3.
- ISCST3 predicts US Gypsum having their highest predicted impacts at an elevation of only 7 meters above the highest stack height. This is in "intermediate terrain" where ISCST3 predictions may not be well characterized. AERMOD is theoretically superior to ISCST3 in this area as it has a smooth transition in treating topography.
- ISCST3 predicts maximum PM_{10} impacts at over 30 building heights downwind. This is outside of the wake effects area. One exception is that the current ISCST3 model makes modifications to the plume rise calculation for all distances downwind (even beyond the wake effects area). This is documented in section 1.1.4.10.1 of Volume II of the EPA ISCST3 user's guide.
- AERMOD has been tested in areas of intermediate terrain (e.g., the Lovett, NY database) and has been shown to perform well.

This is a case-specific request, as it would only apply to this source. Any future applications for using AERMOD before it is incorporated into 40 CFR part 51, Appendix "W" will need to be requested separately.

US Gypsum is proposing to build a sheet rock manufacturing plant at this site. Estimated annual emissions are 30.5 tons/year of PM_{10} and 176.5 tons/year of NO_x. This source is not on the list of PSD sources and is not subject to Federal PSD as no emissions exceed

250 tons/year. However, it is subject to State PSD as these emissions are greater than the Significant Emission Rates for these two pollutants. The current ISCST3 runs for NO_x are sufficient to show compliance with all modeling threshold criteria. However, ISCST3 was showing a need for large stack height increases to show compliance with the PM_{10} 24-hour increment. With AERMOD, these increases may not be necessary.

In an earlier e-mail and in our earlier telephone conference, you requested additional information regarding this application. These include the following:

- Documentation that the latest version of AERMOD (currently on SCRAM) has been used, or that Trinity's version is equivalent.
  - This is addressed in section 13.1 of the enclosure. I have further asked that Trinity Consultants provide the critical runs for this application with the EPA version of AERMOD to demonstrate equivalency.
- The applicability of AERMOD to the US Gypsum case, including why AERMOD would be expected on a theoretical basis to do a better job of simulating this source/building/terrain situation than ISC3.
  - This is addressed in section 13.2 of the enclosure.
- A summary of AERMOD's performance information in comparison to ISC3, highlighting source/building/terrain scenarios, if any, that are similar to the US Gypsum case.
  - This is addressed in section 13.3 of the enclosure.
- A consequence analysis of using AERMOD in place of ISC3 for this application, including sensitivity of the model to small variations of the input (e.g., receptor location/elevation, stack parameters, building dimensions).
  - This is addressed in section 13.4 of the enclosure and the results are summarized in Table 13.2 of the enclosure.

Thank you for your consideration. If you have any questions, please contact me at 503-229-6048.

Sincerely,

Patrick L. Hanrahan
Modeling Coordinator
Air Quality Division

cc: Ed Druback, NWR

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