UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

August 13, 1996

MEMORANDUM

SUBJECT: Application of the Ozone Limiting Method (OLM)

FROM: Richard L. Daye, Regional Meteorologist
Air Planning and Development Branch—Region VII

TO: Joseph A. Tikvart, Group Leader
Air Quality Modeling Group
Office of Air Quality Planning and Standards (MD-14)

This is a question on how the OLM should be applied to predicted nitrogen oxides (NO_x) concentrations from multiple sources to obtain nitrogen dioxide (NO_2) concentrations, and how that procedure is related to regulatory modeling guidance.

BACKGROUND:

The KN-Energy Company submitted a prevention of significant deterioration permit application to the Nebraska Department of Environment (NDEQ) for the Company's rural gas compressor facility located near Big Springs, Nebraska. Many of the low-level stacks at the source are less than Good Engineering Practice Stack height and their plumes are subject to downwash. Although the Company informed the NDEQ in August 1995 that it intended to use the OLM, it did not meet with the NDEQ to discuss specific modeling procedures before it submitted the permit application. A modeling protocol was never approved.

The air dispersion modeling submitted in September 1995, prior to the effective date of Supplement C to the Guideline on Air Quality Modeling, included analyses for NO_x. The OLM, as applied by the Company in this ozone limiting situation, indicated NO_2 concentrations less than the 100 $\mu g/m^3$ of national ambient air quality standards. The NDEQ, using the Company's NO_x

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analyses, calculated predicted annual NO_2 concentrations greater than 300 micrograms per cubic meter ($\mu g/m^3$) when the default ambient NO_2/NO_x ratio value of 0.75, as recommended in the Ambient Ratio Method (ARM) in Supplement C, was used. The application was determined to be incomplete because no increment analysis nor cavity concentrations had been done.

COMPANY'S NO_2 ANALYSIS:

The OLM was applied on an hourly basis to determine the annual NO_2 concentrations. The combined hourly NO_x concentration from each of the several company stacks was subjected to the oxidizing potential of the hourly background ozone concentration to determine the NO_2 concentrations. The predicted NO_x concentrations greatly exceed the off-site background ozone concentrations.

NDEQ'S AND THE EPA'S EVALUATION:

The technically correct application of the OLM should have been to apply the OLM independently to the hourly predicted NO_x concentrations from each of the sources, instead of subjecting the combined predicted NO_x source contributions to the oxidizing potential of the background ozone. The contribution from each individual source should then have been summed for all sources at each receptor to obtain a total NO_2 concentration. The consideration of the contribution from each individual source is consistent with Cole and Summerhays' paper in the August 1979 issue of the Journal of the Air Pollution Control Association.

CURRENT STATUS:

A proposal to correct the modeling deficiencies was submitted on April 29, 1996. The NDEQ advised the Company that the ARM is the recommended procedure to determine NO_2 concentrations, but the OLM could be used on a case-by-case situation if it were done by considering individual source contributions. The NDEQ is suggesting that NO_x and NO_2 be monitored at critical sites to obtain site specific ambient ratios to use to determine the predicted NO_2 concentrations.

The Company claims that applying the OLM as described by the EPA as the technically correct application of the OLM lacks "regulatory authority" and it is a change in the EPA guidance. This is after the NDEQ advised the company that there has not been a change in policy but a clarification of how the OLM should be applied.

ACTION ITEM:

Please review our position and let us know whether you agree with it. Also, please clarify whether our position is consistent with current regulatory modeling guidance and how we can best respond to the Company's position that such guidance lacks "regulatory authority."