



Pennsylvania Department of Environmental Protection

Rachel Carson State Office Building

P.O. Box 8468

Harrisburg, PA 17105-8468

September 15, 1999

Bureau of Air Quality

RECEIVED

717-787-9702

Mr. W. Michael McCabe
Regional Administrator
U.S. EPA Region III
1650 Arch St.
Philadelphia, Pennsylvania 19103-2029

SEP 20 1999

**DEP REGION III
AIR QUALITY SECTION**

Dear Mr. McCabe:

I am writing to you regarding a recent Prevention of Significant Deterioration (PSD) air permit application submitted to the Pennsylvania Department of Environmental Protection (DEP) by the Pennsylvania Power & Light Company (PP&L) in support of a proposed modification to their Martins Creek Steam Electric Station (MCSES). This application contains air dispersion modeling, performed with an 'alternative' model, and not with a 'preferred model'. As you may know, according to the Guideline on Air Quality Models (GAQM), specific, written approval by the Regional Administrator must be obtained in order to use an alternative model in a regulatory modeling application.

The PSD regulations (codified at 40 CFR 51.166) specifies that air quality modeling be based on models in the GAQM, except where the GAQM model is inappropriate. In that case a modified or alternative model can be used. The GAQM states in Section 3.2.2: "Determination of acceptability of a model is a Regional Office responsibility. Where the Regional Administrator finds that an alternative model is more appropriate than a preferred model, that model may be used subject to the recommendations below." In this specific case involving PP&L's PSD modeling application, the alternative model is AERMOD, while the preferred model is any appropriate model listed in Appendix A of the GAQM.

AERMOD is a dispersion model developed by a working group comprised of three American Meteorological Society (AMS) scientists and four EPA scientists with the designated goal of introducing advances in boundary layer meteorology into regulatory dispersion models. AERMOD currently does not have 'Guideline status' as do the models listed in Appendix A of the GAQM, but could possibly have guideline status as early as January 2000 once it is formally proposed by EPA at the 7th National Conference on Air Quality Modeling.

According to Section 3.2 of the revised (draft form) GAQM, "an alternative refined model may be used provided that:

- i. the model has received a scientific peer review;
- ii. the model can be demonstrated to be applicable to the problem on a theoretical basis;
- iii. the databases which are necessary to perform the analysis are available and adequate;
- iv. appropriate performance evaluations of the model have shown that the model is not biased toward underestimates; and
- v. a protocol on methods and procedures to be followed has been established."

The Pennsylvania DEP believes that the AERMOD model meets all five provisions listed above. The following paragraphs address each provision and describe the reasons why AERMOD, as the alternative model, should be used in PP&L's PSD modeling application. Where applicable, page numbers in parenthesis refer to the attached document AERMOD: Model Formulation and Evaluation Results (1999).

The model has received a scientific peer review:

In March of 1998, a Peer Review Panel was established by EPA to review the new short-range dispersion model AERMOD. Throughout the rest of 1998, several comment and response documents were exchanged between the Panel and the AERMOD committee group, with the basic conclusion of the Panel that AERMOD is ready to be proposed as a replacement for the preferred model (ISCST3) for regulatory air quality applications (see attached May 26, 1999, e-mail to AERMOD committee).

The model can be demonstrated to be applicable to the problem on a theoretical basis:

The AERMOD model has been considered an applicable model for a current air quality analysis at PP&L's existing MCSSES involving an on-going SO₂ Nonattainment Area issue in New Jersey. AERMOD was suggested for use in the SO₂ Nonattainment Area modeling study by EPA Region's II and III modeling staff in January 1999. All parties involved, including PP&L, GPU (a nearby contributing SO₂ source), New Jersey and Pennsylvania, agreed that AERMOD should be used. The modeling analysis was completed in June 1999, and is currently under regulatory review.

In addition, during AERMOD's development, PP&L provided one year of ambient SO₂, meteorological and hourly emissions data from MCSES to EPA to be one of several data sets used to evaluate AERMOD. For the MCSES performance evaluation of AERMOD, the results indicated a nearly unbiased result for the 3-hour average (1.06 ratio), an overprediction for the 24-hour average (1.74 ratio), and a modest underprediction for the annual average (0.74 ratio) (page 9).

The databases which are necessary to perform the analysis are available and adequate:

The databases necessary to perform the model are available and very adequate. PP&L collected extensive meteorological data on-site from July 1991 through July 1994. The detailed meteorological data that PP&L collected is essential in order to run AERMOD for optimal performance.

Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates:

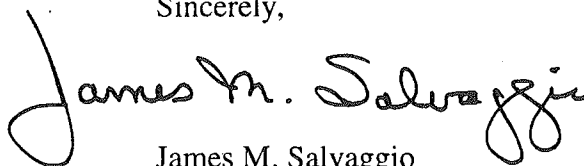
The performance evaluations of AERMOD indicate results that are nearly unbiased, on average, across all averaging times. For all averaging times in general and in most cases, AERMOD's model performance was better than that of ISCST3 (page 10).

A protocol on methods and procedures to be followed has been established:

A protocol describing the modeling methods and procedures to be used in the air quality impact analysis for the modification at MCSES was submitted by PP&L to the Pennsylvania DEP for review and approval in January 1999. The protocol review was completed in mid-February, with minor revisions requested by DEP and agreed to by PP&L.

Clearly, the use of the alternative model AERMOD for this application is justified. The Pennsylvania DEP believes that AERMOD is the more appropriate model to determine the air quality impact from the modification at PP&L's MCSES than the preferred model. If there are any specific questions relating to the technical aspect of this air modeling issue, please call Ms. Jane Mahinske of our modeling section at (717) 787-0765.

Sincerely,



James M. Salvaggio
Director

Attachments