



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

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SUBJECT: Indiana County PA Performance Evaluation Network Design

FROM: Joseph A. Tikvart, Chief *J. Tikvart*
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TO: Jesse Baskerville, Chief
Air Programs Branch, Region III (3AM10)

In response to your request the Model Clearinghouse has reviewed the proposed ambient monitoring network for the comparative performance evaluation of LAPPES vs RTDM/MPTEP. Our comments below include comments on the draft protocol (Table 1 of the August 31, 1987 TRC letter to Penelec), the monitor locations and some general comments on the overall direction of the study.

Protocol

1. This may be a matter of semantics, but we would refer to Table 1 as the proposed "weighting scheme" rather than a "scoring system" or "scoring scheme". We assume that in the future a technique will be developed to determine what actual score each model will receive for each performance measure. These scores would be related to the statistical deviation of the model estimates from the measured data. In the past it is this specification of how "points" will be awarded that has been referred to as scoring.

2. It is our understanding that Table 1 not only applies to Chestnut Ridge, as the title implies, but the Laurel Ridge monitoring data as well.

3. It is our understanding that Table 1 is in draft form, developed primarily for purposes of establishing that data from the proposed monitoring network will be in harmony with the requirements of the performance evaluation. We are satisfied the Table serves this purpose well enough. Further negotiations on the details of Table 1 should take place when the detailed protocol is developed.

4. We do have one major concern on Table 1 at this time. It appears to us that the performance measures 1, 3, and 5 are redundant with measures 2 and 4. We recommend that only measures 2, 4, 6 and 7 be retained. Also measure 2c is not very clear. Is the mean square error computed using the results of the robust estimates of peak values at individual stations? If so, the number of observations is equal to the number of stations. If not,

computed in this manner, what is "N"? Finally, what is the rationale for normalizing by the standard deviation, e.g. why not by the product of the averages of observed and predicted values?

Monitoring Network

1. We believe that the preliminary estimates from both the regulatory model(s) and LAPPES indicate the need for at least two additional monitors on Laurel Ridge. One monitor should be located on or near the terrain peak approximately 1.5km NNW of Baldwin Creek. Another monitor should be located in the vicinity of high estimated concentrations approximately 1.2km WNW of the Laurel Ridge site.

2. While we recognize that estimates on Chestnut Ridge are lower than those on Laurel Ridge they are still high enough to be of concern and we do not think that a single monitor can adequately cover the situation. We recommend that at least two, and preferably three, monitors be located on that ridge. One should be located in the vicinity of the maximum RTDM/MPTER estimates and one or two monitors along the ridge top in areas of high estimates.

3. Little information is provided on how background will be computed. Thus it is difficult to agree or disagree with TRC's choices (which seem to be loose) on which two or three monitors will be retained for this purpose. We recommend that you pin this aspect of the monitoring down more precisely rather than allow the source to choose with such flexibility.

General

1. TRC has indicated that the version of MPTER they used for the preliminary estimates will produce identical answers to the UNAMAP6 version of the model, for this case. Your staff should examine the printouts (we do not have a copy), and perhaps consider other situations not covered by the equivalency demonstration, to verify the claim. In any event, for purposes of executing the protocol and for eventual regulatory modeling, the latest version of MPTER/RTDM should be used.

2. Some important concepts that will need to be defined in the upcoming protocol are: a) techniques to correct or otherwise deal with any underprediction problems, b) a clear definition of how the chosen model(s) will be applied in a regulatory mode, c) quality assurance procedures for meteorological and air quality data, and d) treatment of missing data.

3. The October 29, 1987 memorandum from Al Cimorelli to Dean Wilson proposed a procedure for deciding between MPTER and RTDM estimates. We agree that the proposal is probably the only reasonably workable procedure in this case. However, we disagree with a justification based on "this is the way the model will be run for the regulatory application". That rationale may lead to dual performance criteria for the regulatory models vs the proposed model. We would have preferred to decide on the appropriate model based on the monitoring results. Al will recall that the current guidance to use the higher of the two estimates was developed without the benefit of

any data to suggest which way to go. Thus, to ensure protection of NAAQS/PSD increments, we chose the conservative approach of using the worst estimate. In this case, however, we have some ambient data which could, in theory, suggest the proper model and we would have preferred to employ the model that produced more accurate estimates. AI's proposal, on the other hand, leads to a systematic overprediction bias for the EPA models and may ultimately result in poorer statistical performance than LAPPES. However, analysis of the ambient data to this end becomes ambiguous because each datum represents a composite contribution of as many as four different sources, each which might be modeled in different manner. This creates an intractable situation. As a result, in this case we concur with AI's proposal but in future evaluations of this type we would like to revisit this issue.

SUBJECT

If you have any questions please contact Dean Wilson or me.

cc: S. Reinders
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