UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: SEP 2 4 1987

SUBJECT: Adjustment of Monitored Concentrations in Rollback Calculations for the Gibson Generating Station

Michael Koerber

FROM: Michael Koerber
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TO: Dean Wilson (MD-14)
OAQPS, MDAD, SRAB

On June 19, 1987, I requested comments from the Model Clearinghouse on two issues related to the Public Service of Indiana (PSI) Gibson Generating Station: model evaluation study and monitored exceedances. Region V believed that the model evaluation study was not acceptable (and the appropriate guideline model should be used to set the emission limitation for Gibson), and the monitored exceedances were valid (and should considered in setting the emission limit). In your response dated July 1, 1987, you agreed with our position on these two issues. The purpose of this memo is to present Region V's approach on how the monitored exceedances will be used in developing a revised emission limit and to request comments from the Model Clearinghouse on this approach.

BACKGROUND - At the Gibson Generating Station, there are five 650 MW units, with Units 1,2 vented to a common 152.4m stack, Units 3,4 vented to a common 152.4m stack, and Unit 5(NSPS unit) vented to a 152.4m stack. On November 28, 1986, the Mt. Carmel (Illinois) monitor recorded two exceedances (0.655 and 0.755ppm) of the 3-hour secondary sulfur dioxide ($SO_2$) standard (0.5ppm). During these two 3-hour periods, Units 2,3, and 4 were operating generally above 90% load and were burning coal with an emission level of about 4.29 #/MMBTU.

ROLLBACK CALCULATION - A straightforward rollback calculation yields an emission limitation of 3.24 #/MMBTU (assuming a background of 0.008ppm). Region V believes, however, that it is necessary to adjust the actual measured concentrations to account for the impact of the non-operating units. (Recall that Region V performed this adjustment in the rollback analysis for the Baldwin Power Station.)

The State of Indiana has proposed two methods for adjusting the monitored data, both of which rely on dispersion modeling.

Method 1 - For Unit 1, apply ISCST with one receptor at the distance of the Mt. Carmel monitor (3.4km) and either five years of available on-site meteorological data or the PTMAX wind speed-stability class combinations (assuming a 1-hour to 3-hour conversion factor of 0.9). Units 1,2 are modeled at full load, 4.29 #/MMBTU and Unit 2 is modeled at full load, 4.29 #/MMBTU. The difference in concentrations represents the impact from Unit 1.

For Unit 5, apply ISCST with one receptor at the distance of the Mt. Carmel monitor and either five years of available on-site meteorological data or the PTMAX wind speed-stability class combinations (assuming a 1-hour to 3-hour conversion factor of 0.9). Unit 5 is modeled at full load, 1.2 #/MMBTU.

Method 2 - Same as Method 1, except a string of receptors extending from the source is used and the maximum concentration independent of distance is chosen to represent the impact from Units 1 and 5.

(Note, modeling of the actual concurrent meteorological conditions shows no ground-level concentration because the effective stack height is predicted to be above the mixing height. For this reason, the alternative meteorological data bases identified above must be used.)

Region V believes that both methods have some merit. Method 1 is more relevant to the issue of estimating the concentrations at the monitor if Units 1 and 5 were operating. Method 2, on the other hand, recognizes that our current models may not be reliable in estimating short-term concentrations at specific locations (i.e., they are only reliable in estimating the magnitude of highest concentrations occurring sometime, somewhere within an area).

Please let me know whether the Model Clearinghouse would support the concept of adjusting the monitored data using dispersion modeling for this situation and whether the Clearinghouse prefers either of the proposed methods for this situation.

cc: Tim Method, Indiana Department of Environmental Management