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April 20, 1989

Mr. James W. Yarbrough
SIP New Source Section (6T-AN)
U. S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Mr. Yarbrough:

The Texas Air Control Board (TACB) has investigated methods to model emissions from municipal solid waste landfills. Our study indicates that the Industrial Source Complex (ISC) area source algorithm, as currently programmed, should not be used for modeling landfills or any other area sources where two or more sources share a common boundary. We would appreciate it if you could investigate the problems with the ISC area source algorithm. We would appreciate your assistance in determining the most technically appropriate method to use to evaluate emissions from a landfill.

Landfills appear to be an area source and are typically located in remote rural areas, so we attempted to locate a model with an area source algorithm that uses rural dispersion coefficients. To perform a complete air quality review, it is frequently necessary to evaluate other sources that may be in the vicinity, so the subject model must be able to predict concentrations from standard point sources. We have performed an analysis of the area source algorithm in the Industrial Source Complex Short Term (ISCST) model using version 6.8 of the model.

The area source algorithm used in ISCST is based upon a square source. To approximate area sources that are not square, the ISC User's Guide suggests using various arrays of square area sources of different sizes to cover the area source to be modeled. Since most landfills are an irregular shape, it is imperative that this approach be used for

modeling these sources. Another characteristic of landfills is that there is a small buffer between the edge of the area source and the property line. Sometimes this distance is as little as 50 feet. It is therefore necessary that the model coupled with the method being used to model these landfills be capable of predicting ground-level concentrations close to the edge of the landfill.

For an area source algorithm to appropriately function, it must be possible to take a given square and subdivide it into smaller squares and with each approach obtain the same results. The TACB performed such an analysis with the area source algorithm in ISCST and found that it does not provide consistent results. A summary of the results, along with copies of the model runs, are enclosed. Also enclosed is a copy of a paper that James Red of the TACB Modeling Section wrote. This paper has been accepted for presentation at the National Air and Waste Management Association (AWMA) Meeting in Anaheim, California in June, 1989.

In Texas, the landfill permits have been the subject of very intense public hearings. At these public hearings, all information is presented following the rules of a civil court trial with cross examination of expert witnesses. Our modeling approaches must be well founded and based upon defensible technical facts.

The TACB has recommended two screening approaches that permit applicants may use to model landfills. These are described in the AWMA paper. In summary, the first screening method uses an array of uniformly spaced pseudo-point sources and the second screening method uses an arrangement of volume sources.

If you wish to discuss this information or need more information, please call me at (512) 451-5711.

Sincerely,

Cyril Durrenberger, P.E.
Chief, Modeling Section
Control Strategy Division

Enclosures

cc: Mr. Robert E. Layton, Jr., Regional Administrator,
U. S. Environmental Protection Agency, Region 6,
Dallas