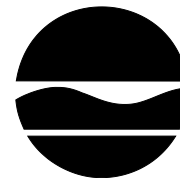


**New York State Department of Environmental Conservation  
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Erin M. Crotty  
Commissioner

September 17, 2003

Mr. Bill Kuykendal  
D205-01  
United States Environmental Protection Agency  
Research Triangle Park, North Carolina 27711

Re: Revision to Paved Roads section of Chapter 13, Miscellaneous Sources, of EPA's  
*Compilation of Air Pollutant Emission Factors, Volume I, (AP-42)*

Dear Mr. Kuykendal:

The New York State Department of Environmental Conservation (Department) respectfully submits the following comments on the proposed August 22, 2003 Paved Roads draft section (draft) of Chapter 13 of AP-42, as discussed above. As we explain in more detail, we do not believe the AP-42 emission factors are appropriate for use in State Implementation Plan (SIP) development and urge the United States Environmental Protection Agency (EPA) to conduct a peer review of the draft emission factor calculation before finalizing this proposal.

The Department has been concerned with how EPA evaluates road dust emissions for several years. In 1993, we evaluated the impact re-entrained road dust had on particulate matter concentrations in New York County, and determined that AP-42's emission factor overestimated this emission source. We documented our analysis in the 1995 *New York State Implementation Plan, Inhalable Particulate (PM<sub>10</sub>), Redesignation Request and Attainment Demonstration for New York County* (1995 SIP Submittal).

The Department's concerns with AP-42's road dust emission factor go beyond its use in the 1995 SIP Submittal, as it is the Department's understanding that EPA is considering requiring road dust emissions to be included in Rate-of-Progress (ROP) calculations and transportation conformity budgets for Particulate Matter 2.5 (PM<sub>2.5</sub>) SIPs. AP-42's road dust emission factor is not adequate to use for these purposes, as is explained below. In addition, many published independent studies question the validity of earlier versions of AP-42's road dust emission factor. The changes proposed in EPA's draft should undergo a thorough peer review before final publication in AP-42 to ensure consensus among all stakeholders. EPA should publish a notice in the Federal Register announcing the draft and extend the comment period for

30 days after the publication of the notice.

EPA's latest changes to section 13.2.1, Paved Roads, of AP-42 attempt to correct two of the discrepancies of earlier versions of the section: the double counting of re-entrained road dust with vehicle tailpipe emissions, brake and tire wear, and the failure of earlier versions of the re-entrained road dust equation to comply with dimensional analysis. Although the proposed changes do address the issues they were intended to, there are still questions remaining regarding the use of the emission factor, such as its accuracy and how and when it should be applied. As AP-42 emission factors are often considered to be the only acceptable method of calculating emission levels, it is vital that these emission factors be as accurate as possible and developed with the appropriate end uses in mind.

The Department believes that AP-42's re-entrained road dust emission factor, in its proposed form, may be adequate for evaluating transitory situations, such as the application of road salt for de-icing, where Vehicle Miles Traveled (VMT) is relatively constant. However, the emission factor is not adequate for use in ROP and conformity budgets, where VMT will change over long periods of time. For paved roads especially, the AP-42 emission factor has been incorrectly applied in the past, where it was assumed that the silt loading would remain constant with increased VMT, thus resulting in predictions of increased emission levels over time. However, unless an increase in VMT is accompanied by an equal increase in road dust deposition - something that is not likely as nearly all of the deposition processes are independent of VMT - the silt loading of the affected street will initially decrease with increased VMT as removal begins to exceed deposition. This decrease will stop when the silt loading diminishes to the point where removal again equals deposition, re-establishing equilibrium with re-entrainment at the same rate as it was before the increase in VMT.

In addition to the equilibrium issue, the emission factor relies too heavily on default values for use in either ROP or conformity. When we calculated an emission factor for  $PM_{2.5}$  for limited access roadways using EPA's default silt loading of  $0.015 \text{ g/m}^2$  and the draft equation, we came out with a negative number. Also, the parameter 'C' that this draft section of AP-42 introduces to represent the portion of re-entrained road dust caused by vehicle exhaust along with brake and tire wear was developed using a "typical" value for the fleet weight and emission factors for a generic 1980 fleet distribution. This is in contrast to how ROP and conformity budgets are calculated, where area-specific values are required. The use of default values for silt loading further weaken the equation's value for ROP and conformity. The draft (and earlier versions of AP-42) states that "the use of a default value . . . should be expected to yield only an order-of-magnitude estimate of the emission factor." ROP and conformity budgets become meaningless if significant portions of these projections are only order-of-magnitude estimates.

The draft section also states that no tests of "stop and go" traffic were available for inclusion in the data base used in developing the equation. The majority of  $PM_{2.5}$  nonattainment areas will be urban, where traffic is better characterized as "stop and go" than free flowing. As the emission factor was not developed with urban "stop and go" traffic in mind, it cannot be used to characterize such traffic, again pointing to its inappropriateness for use in either ROP or

conformity budgets. The Department is willing to work with EPA to develop studies to estimate road dust emissions in areas with stop and go traffic.

In addition to the emission factor being inadequate for use in ROP or conformity budgets, there is evidence that it overestimates re-entrained road dust emission levels. As discussed above, the Department performed a study to characterize microscale (street level)  $PM_{10}$  ambient air concentrations as part of the 1995 SIP submittal. This study, based on actual sampling and the application of EPA's chemical mass balance model, showed that the  $PM_{10}$  concentrations in the ambient air were dominated by vehicle exhaust, not re-entrained road dust. However, the emission inventory developed for the SIP submittal relied on the AP-42 road dust emission factor and predicted road dust emissions four to five times higher than vehicle exhaust; even after vehicle weights were lowered substantially below average and road dust loading fractions were measured.

Studies other than the Department's question the accuracy of the AP-42 emission factor, and whether silt loading is the appropriate basis for a re-entrained road dust emission factor. Research performed by the Transportation Research Board of the National Academies, Desert Research Institute and the University of California, Riverside indicates that the AP-42 emission factor over-predicts re-entrained road dust emissions, and that the relationship between silt loading and road dust emission levels may not be as straight forward as the AP-42 emission factor predicts. Because of the uncertainty surrounding this emission factor, a thorough peer review is needed.

The Department would like to again express its appreciation for the opportunity to comment on EPA's re-entrained road dust emission factor, and would like to continue discussing this issue with EPA. We hope EPA will consider our request to further examine this proposed emission factor through a peer review processes and we would like to be part of that process. Should you have any questions regarding our comments, please contact Steven Botsford, P.E., of my staff at (518) 402-8396 or at [srbotsfo@gw.dec.state.ny.us](mailto:srbotsfo@gw.dec.state.ny.us).

Sincerely,

James E. Ralston, P.E.  
Director  
Bureau of Air Quality Planning

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John Filippelli  
Rudy Kapichak  
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