



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION



August 29, 2007

Stephen L. Johnson
Air and Radiation Docket
U.S. Environmental Protection Agency
Mail Code 6102T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Attention: Docket ID No. EPA-HQ-OAR-2006-0971

Re: *Comments of the Connecticut Department of Environmental Protection on the Proposed National Volatile Organic Compound Emission Standards for Aerosol Coatings*

Dear Administrator Johnson:

The Bureau of Air Management of the Connecticut Department of Environmental Protection (CTDEP) has reviewed the U.S. Environmental Protection Agency's (EPA's) proposed *National Volatile Organic Compound Emission Standards for Aerosol Coatings* (72 FR 38952, July 16, 2007) (Proposed Rule) and offers this brief statement in full support of comments submitted to you in this docket by the Northeast States for Coordinated Air Use Management (NESCAUM), an organization in which CTDEP is an active member. By including the NESCAUM comments as Attachment A to this letter, CTDEP incorporates the NESCAUM comments as its own.

Given Connecticut's geography and the significance of transported emissions to our ozone nonattainment status, we support the development of national and regional rules that result in reduced emissions of ozone precursors from our upwind neighbors. However, we have significant concerns with EPA's choice at this time of a reactivity-based approach to reducing volatile organic compound (VOC) emissions from aerosol coatings. As proposed, the rule may well result in adverse impacts on ambient fine particulate matter levels, air toxics and – despite the single-minded focus on ozone reductions – downwind ozone levels. Further, as proposed, the rule is difficult, if not practically impossible, to enforce. Until the science of aerosol formation is better understood at a level comparable to our understanding of ozone chemistry, we strongly recommend that EPA set aside the reactivity-based paradigm for aerosol coatings. Instead, EPA should create the desired national rule and satisfy its Clean Air Act mandate under Section 183(e) using a mass-based approach; the well-established mechanisms of such a program would lend to rapid adoption of a rule without significant concomitant harms.

We hope you will act on the concerns expressed here and in the attached NESCAUM submission. Thank you for this opportunity to comment.

Sincerely,

Anne R. Gobin, Chief
Bureau of Air Management

ATTACHMENT A

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Administrator Stephen L. Johnson
U.S. Environmental Protection Agency
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Mail Code 6102T
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Attention: Docket ID # EPA-HQ-OAR-2006-0971

Re: *National Organic Volatile Compound Emissions Standards for Aerosol Coatings*

Dear Administrator Johnson:

NESCAUM offers the following comments on the U.S. Environmental Protection Agency's (EPA's) notice of proposed rulemaking (NPR) entitled *National Organic Volatile Compound Emissions Standards for Aerosol Coatings* and published on July 16, 2007 in the Federal Register (72 FR 38952-38991). NESCAUM includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

Through the NPR, EPA is responding to a Clean Air Act mandate, under section 183(e), to develop federal ozone measures designed to reduce volatile organic compound (VOC) emissions from consumer or commercial products. EPA proposes a nationwide reactivity standard for aerosol coatings, citing that this approach will "better control a product's contribution to ozone formation by encouraging the use of less reactive VOC ingredients, rather than treating all VOC in a product alike through the traditional mass-based approach" (72 FR 38952).

We believe that a reactivity-based approach to controlling VOC precursors may have merit, but only if such an approach first addresses many unanswered questions about the potential adverse impact of such an approach on other equally important, if not more so, components of air quality management programs in the US. Specifically, the approach as proposed simply does not address the potential adverse impacts of an ozone-only approach on two key components of the air management programs, namely, the effect on ambient fine particulate matter (PM_{2.5}) levels (and the resulting nonattainment of the daily and annual federal PM_{2.5} standards) and air toxics. Additionally, there are important issues regarding the potential adverse impact of such an approach on downwind ozone levels. Finally, the inherent complexity included in the design of the proposed rule makes it practically unenforceable. In summary, we believe the scientific and operational uncertainties associated with the proposed rule are simply too large for EPA to adopt such a nationwide approach at this time that only addresses ozone impacts in an isolated, single-pollutant approach.

The Aerosol-Forming Potential of VOCs Needs to be Considered in Reactivity-Based Ozone Strategies

At present, the need to address the issue of organic aerosols (both primary organic aerosols (POA) and secondary organic aerosols (SOA)) is much more important, relevant, and timely compared to what was discussed in the Reactivity Research Workgroup (RRWG) process (1998-2005), which forms the scientific basis of the proposed EPA rule. The RRWG process only emphasized the ozone-forming potential of VOCs. Any final rule therefore must consider its impact on the organic aerosol fraction of measured ambient PM_{2.5} (and the resulting policy issue of nonattainment of daily and annual PM_{2.5} standards). For example, ambient measurements of PM_{2.5} in urban areas across the country, including the Northeast, indicate that approximately 50 percent of PM_{2.5} mass on an annual basis is organic aerosol that is either emitted as POA (directly emitted) or SOA that is formed in the air through complex chemical reactions of VOCs. Recent ground-breaking work of the research team at Carnegie Mellon University¹ strongly implies that ozone-only regulations may need to be revised to control SVOC (semivolatile VOC) and IVOC (intermediate volatility VOC) emissions because of their importance as SOA precursors. The paper goes on to state, "Ultimately a relatively local urban emissions [of VOCs] problem is transformed into a regional source of oxidized..... organic aerosol." Just as some VOCs have higher/lower potential to form ozone than other VOCs, some VOCs are capable of producing higher/lower levels of organic aerosols than others. Based on high and low ozone-forming potential of VOCs, as well as high and low aerosol-forming potential of VOCs, the proposed rule needs to categorize various VOCs in "high ozone-high aerosol," "low ozone-low aerosol," "high ozone-low aerosol," and "low ozone-high aerosol" bins. Thus, the ozone reactivity factors included in the proposed rule need to be supplemented with aerosol reactivity factors, so as to jointly address the impact of this or similar rules on ozone and fine PM. In the absence of such an effort, the proposed ozone reactivity-based rule has the potential to increase the fine PM levels for cases where the substituted VOCs have high aerosol-forming potential even though they have low ozone-forming potential based on ozone-only reactivity factors included in Table 2A of the Proposal.

The Toxicity Implications of this Rule Need to be Considered in Reactivity-Based Ozone Strategies

This proposal could also have negative impacts on other air pollution concerns, namely increased emissions of hazardous air pollutants. Table 2 in the proposed rule lists organic compounds with their ozone reactivity factors, but does not include any information on whether the compound is a hazardous air pollutant and its relative toxicity. In fact, the list includes known hazardous air pollutants, with good toxicity information data bases and health-based exposure values as well as chemicals that have minimal toxicity data associated with them. The list also contains chemicals (carbon tetrachloride and 1,1,1-trichloroethane) with low reactivity factors that have been banned under Title VI of the 1990 Clean Air Act because they are known to contribute to depletion of the stratospheric ozone layer. It appears that the toxicity of the individual chemicals was not considered in this proposal. For example, benzene, a known human carcinogen, has a low reactivity factor (0.81), while other less toxic chemicals have high reactivity factors. It is thus possible that the end result will be the reformulation of an aerosol coating that contains more air toxics of concern. The same example holds for the diisocyanate compounds listed in the proposal. The reactivity factors for these highly toxic compounds are low and range from 0 to 0.93. Simply stated, the proposed rule overlooks the basic fact that in addition to their different ozone-forming

¹ "Rethinking Organic Aerosols: Semivolatile Emissions and Photochemical Aging," Allen L. Robinson, et al., *Science*, Vol. 315, pp. 1259-1262 (March 2, 2007).

potentials, VOCs also have different rankings relative to their toxicity potential. For example, the substitution protocol of VOCs under the aerosol coating rule can include “low to high” toxicity in addition to low to high potential for ozone and fine PM formation as outlined above.

In addition, general claims are made regarding toxicity reductions that would be obtained from this proposed rule based on the expectation of reduced xylene and toluene use without any attempt to quantify them. Since this rule has been in place in California for some years, we suggest that EPA analyze the reformulation data from California to determine whether that rule has improved ozone levels, if it had any negative impact on product toxicity, and whether those results are applicable to the national market.

Potential Effect of the Rule on Downwind Ozone Levels

The preamble to the proposed rule states that the substitution of less reactive VOCs for more reactive VOCs “can be effective in controlling ozone in episodes where NO_x is at its highest levels, such as in urban areas.” The rule goes on to say that “downwind ozone could increase due to upwind substitution of larger amounts of lesser reactive VOCs.” Contrary to the rule’s assertion that “realistic changes in formulation ... are unlikely to result in a noticeable increase in ozone downwind,” it is quite possible that this is not actually the case. This is important for the fact that, based on the time scale of atmospheric photochemistry of ozone, ozone nonattainment areas in the northeastern United States and other parts of the country have the highest recorded ozone values downwind of the urban centers and not the urban centers themselves. The implementation of the rule thus has the potential to increase ozone in the very places that ozone reductions are most needed, thus confounding ozone attainment plans being developed by the States. Also, increases in ozone in areas downwind of urban centers could result in adverse impacts to agricultural and forested areas of the country. EPA needs to consider the impact this proposed rule will have on agricultural and forested areas, especially in light of its recently proposed revisions to the secondary ozone NAAQS.

EPA states that the proposed rule will reduce *both* VOC emissions and the amount of ozone generated from the use of aerosol coatings. This is not necessarily true, as replacement of high reactive compounds with ones with lower ozone reactivity can potentially result in increase of the total mass of the VOCs emitted into the atmosphere. Based on the magnitude of this increased mass of VOCs, and on the complex nature of photochemistry of urban and regional environments, it is just as likely to result in more ozone formation as not.

Finally, in the context of ozone attainment planning, we are concerned that the EPA proposal appears to be encouraging the states to take credit for the adoption of this rule by offering the states SIP credits for a rule that is not even on the books. As noted in the Preamble, “[W]e have calculated the reductions associated with the rule in terms of mass VOC emissions and we will refer to a reduction in mass VOC emissions when discussing the impacts of the proposed regulation.”

Lack of Enforceability of the Proposed Rule

These proposed regulations are simply not practically enforceable. Identifying the individual compounds that make up an aerosol coating product makes the determination on product formulation much more difficult than mass-based VOC limits. In order to determine compliance, EPA and the States will need to know the formulation of every single aerosol coating product on the market. In addition, the regulatory

bodies will need to be able to readily access this information and be able to compare it to the reactivity limits included in the proposed rule (Table 1). In order to avoid confusion and provide regulatory certainty, EPA and the States will need to make baseline compliance determinations for each product formulation prior to rule implementation and at the time of each new reformulation. Still, this does not assure compliance as each batch of product manufactured could have somewhat different components than exist in the baseline formulation. While not necessarily indicative of non-compliance, the proponent will need to understand the tolerances its formulations have with respect to the reactivity limits in the proposed rule. For each new batch, a compliance determination will need to be made by the proponent to assure that it meets the prescribed formulation criteria.

To determine whether an “on-the shelf” product is in compliance, it will be necessary to determine constituents of the product and whether those constituents meet the baseline formulation for which compliance is determined. Since it is much more efficient to determine what is in the product if the constituents are already known, regulatory authorities will need to get the batch formulation data from company before it begins its analysis. Since each batch will differ slightly, EPA and the States will need to determine if what is reported as the constituents matches the actual measured contents and if that actual formulation is compliant or not. This does not even speak to the ability of test results to be repeated or confirmed. This is a much more complicated scenario than what needs to be done to determine compliance with the current mass-based VOC limit.

Conclusion

In summary, EPA’s proposed aerosol coating rule has merit only if the reactivity-based approach first addresses unanswered questions about a number of potential adverse impacts outlined in these comments. We encourage EPA to conduct research and evaluate the impact of its approach on other equally important components of air programs including fine PM, air toxics, increased downwind ozone levels, and practical enforcement of a more complex program.

We support and refer you to comments also submitted to this Docket from the Ozone Transport Commission. If you or your staff has any questions, please contact Dr. Praveen Amar on my staff at 617-259-2000.

Sincerely,



Arthur N. Marin
Executive Director

Cc: NESCAUM Directors
J. Kaye Whitfield, U.S. EPA
Bruce Moore, U.S. EPA