Children's Health Protection Advisory Committee

Melanie A. Marty, Ph.D., Chair
Cal/EPA , Office of Environmental
Health Hazard Assessment
1515 Clay St. 16th Floor
Oakland CA 94612
(510) 622-3154

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Stephen L. Johnson, Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

RE: Proposed Rulemaking for the National Ambient Air Quality Standards for Lead

Dear Administrator Johnson:

The Children's Health Protection Advisory Committee (CHPAC) writes this letter to present our comments and recommendations on the Notice of Proposed Rulemaking (NPR) for the National Ambient Air Quality Standard (NAAQS) for Lead. We support the Administrator in his clear statement that a lead standard should be maintained and lowered considerably. We differ, however, in our conclusion regarding an appropriate level for the standard based on available scientific evidence of harm from low levels of lead exposure in children. We offer the following recommendations and provide support for these recommendations in the body of the letter:

- The standard should be lowered to 0.02 $\mu g/m^3$;
- The averaging time should be shortened to one month; the form of the standard should continue to be the highest value, rather than the second, unless the level of the standard is lowered to below 0.1 $\mu g/m^3$;
- The indicator for the standard should be based on the widespread availability of appropriate monitors that capture children's exposures to lead.

Level of the standard

The CHPAC strongly recommends that the Administrator reduce the NAAQS lead standard to 0.02 µg/m3, the lower limit analyzed within the Agency risk assessment. As noted in a previous CHPAC letter, there is clear scientific evidence to support a NAAQS lead standard below 0.1 µg/m3. Lowering the standard below what the agency has proposed is of special relevance to children because there is a steeper dose-response curve for children's neurological effects

at lower levels of exposure, and because a higher ratio of blood lead to air lead has been observed in children at lower air lead concentrations. We further note that the upper end of the range that the Agency has proposed for the standard, 0.3 $\mu g/m^3$, is above the range recommended by the Clean Air Scientific Advisory Committee (CASAC).

Strong evidence indicates that lead exposure at low levels poses even greater harm per unit of lead than does exposure at higher levels. Canfield et al. (2003) reported a 4.6 IQ point decrease per 10 μg/deciliter increase in blood lead for levels greater than 10 μg/dl, but a 7.4 IQ point decrease in lead in going from a 1 to a 10 μg/dl blood lead level. In a pooled analysis of multiple studies of the effects of lead on IQ, Lanphear et al. (2005) concluded that the lead-associated intellectual decrement for children was significantly greater for blood lead levels <7.5 μg/dl than for higher levels. There was no evidence of a threshold. These results demonstrate that even low exposures to lead, such as those from ambient lead-containing particulates, have significant adverse impacts on children's neurological development. The data provide support for preventing even small increases in blood lead levels from inhaled lead as part of avoiding cumulative exposures to lead in children.

In addition, there are multiple studies that demonstrate that the ratio of blood to air lead concentrations is higher when air lead concentrations are low. Thus, there are steeper declines in blood lead per unit decrease in air lead concentration at lower air levels. In particular, the Hayes et al., 1994 study showed a ratio of 1:16 at an air concentration of 0.25 ug/m^3, a level within the range of standards proposed in the NPR. [1] The CASAC has noted that ratios of 1:5 and 1:10 are supported by several credible sources. The CHPAC therefore recommends that the agency employ an air:blood lead ratio of 1:10 or greater in its analysis of children's risk at different levels of the standard. The higher attained blood lead concentrations that are modeled with a ratio of 1:10 would support a more protective standard for children than the assumption that the ratio is 1:5.

The studies demonstrating heightened loss of IQ points at lower blood lead levels coupled with studies showing a steeper decline of blood lead levels at lower air concentrations provide strong scientific justification for choosing a level below the current minimum proposed standard of 0.10 $\mu g/m^3$. Choosing a lower level is especially important in light of the uncertainty regarding the degree of risk at lower levels of exposure.

Averaging time of the standard

The CHPAC strongly supports the use of a one month averaging time in determining compliance in order to more closely monitor potential high exposures. Short-term high exposures are a concern because some effects of lead may result from only a few weeks of elevated exposure. In fact, even brief, intense episodes of exposure, such as those

[1] To clarify further, in the Hayes study, at 0.25 ug/m3, for every decrease of 0.1ug m3 in air lead, there was a decline of 1.62 ug/dl in blood lead (ratio of 1:16 air lead to blood lead); but at an air lead level of 1.0ug/m3 , for every 0.1 ug/m3 decrease in air lead there was only a decline of 0.56 ug/dl (ratio of 1:5 air lead to blood lead) (Hayes et al., 1994).

occurring during renovation activities, can cause significant elevations in blood lead levels in children. The half-life of lead is sufficiently long that repeated short-term elevated exposures may result in significant accumulation of lead within a child's body. In addition, a monthly averaging time is more likely to capture exceedances related to periodic activities as occur with industrial activity, construction or demolition. We do not support the use of the second highest level for the form of the standard, unless a level significantly lower than 0.1 $\mu g/m^3$ is selected. Unusual weather conditions or other circumstances can be handled in a more specific fashion without the need to allow single exceedances in all counties.

Indicator of the standard

The Administrator has proposed to retain TSP as the indicator for the primary standard, based on the fact that ingestion plays a significant role in lead exposure, and particles in the ultracoarse fraction, which would not be measured by PM10 monitors, contribute substantially to lead ingestion. The Administrator has also proposed to allow states to use PM10 data with a site specific scaling factor.

The CHPAC notes that there are technical difficulties with the use of either TSP or PM10 as the indicator. There is clearly a need for a far more robust monitoring network than currently exists. In setting both the level and the indicator for the lead standard, the Administrator should take into account the fact that use of PM10 as the indicator will result in missing an unknown and potentially substantial portion of lead exposure. Therefore, should PM10 be chosen as the indicator, the level of the standard must be set low enough to retain an adequate margin of safety for children, acknowledging this unknown missed fraction of lead exposure.

Conclusions

We support the Agency in its conclusions that airborne lead remains a significant threat to children's neurological development in the United States, and that the current NAAQS for lead provides inadequate protection. We urge the Administrator to apply appropriate precaution in interpreting the scientific data, recognizing the growing body of evidence that shows significant benefits can be achieved through reducing air concentrations to levels below the range he has proposed. We urge the Agency to develop adequate monitoring for lead that takes into account lead exposure from ingestion of ultracoarse particles. We look forward to working with the agency to finalize a standard that affords adequate protection to the nation's children.

Sincerely,

Melanie A. Marty

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Cc: Robert Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation
Steve Page, Director, Office of Air Quality Planning and Standards
Lydia Wegman, Director, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards

REFERENCES

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