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To: D. R. Diggs

From: A. J. Palmke

A. J. Palmke

AIR QUALITY CRITERIA REPORT FOR LEAD

Attached you will find my critique of the EPA External Draft Copy of the "Air Quality Criteria for Atmospheric Lead" document. I have gone through the entire report in detail. The following general comments are offered:

- In general, the report is a good report - complete, unbiased, well written and reasonably well organized.
- The text of the report, Sections 2-10, is complete and from my viewpoint required little editing. The small number of comments is because there was no need to make comments rather than from any lack of attention on my part.
- The front summary section is well written but tends to confuse at times in the interest of being brief.
- To me, the most important criticism of the report is the dependence on Zielhuis's biological guideline for lead without justifying the use of the guideline or citing positive assessments, critiques, hearings, review of guidelines. This should have been done in Section 8 and highlighted in the first section.
- A second serious deficiency of the report is the weakness of the one page argument on page 1-12 supporting an air lead standard of $5 \mu\text{g}/\text{M}^3$. The argument is too simplistic and is based on selected results. To me the data do not support a level as low as $5 \mu\text{g}$.
- A third major deficiency of the report is the lack of attention given to the accuracy and precision of measurement methods for air lead and blood lead.

AJP/mbn
Attachment

AIR QUALITY CRITERIA REPORT FOR LEAD
CRITIQUE BY A. J. PAHNKE

ABSTRACT

Looks fine. One possible change would be to break up the first paragraph into one describing the occurrence of lead in nature and a second consisting of the last two sentences of the first paragraph.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Complete and well organized. There are several sections where further clarification could be helpful.

Page 1-4, l. 22. The statement, "... aging of automobile exhaust have shown significant chemical transformation", is probably applicable to the breakdown of lead alkyl vapor but is questionable if applied to inorganic lead salts in the exhaust.

Page 1-5, l. 10. The statement, "The capability is generally adequate for inorganic lead measurements ...," is a lot more positive than is probably warranted particularly for studies carried out prior to 1970. This is an important point to make since many literature references in the lead area are quite old. This paragraph deserves greater amplification. E. S. Jacobs plans to comment further on this point.

Page 1-5, l. 3. Unable to find reference in report supporting statement, "microorganisms in lake sediments can convert --- into a volatile tetra-alkyl lead.

Page 1-6, l. 12. The only underlined sentence in the summary. Question the need to underline, particularly since the statement is not discussed further in the paragraph or for that matter in the report. In fact, unless there is information which says this is a significant effect, the sentence may best be deleted.

Page 1-9, l. 25. The statement, "A 20 to 30 percent decrease in ALAD activity does not appear to be accompanied by any detectable changes in the biological functions of a healthy individual," when viewed in connection with the previous sentence, "... with 60 to 70 percent inhibition at levels of 40 $\mu\text{g}/100\text{ g}$ " implies a significant effect at blood lead levels of much less than 40 $\mu\text{g}/100\text{ g}$. Perhaps the effect may occur but is it meaningful in view of the many other statements made in the report that nothing of concern happens below 40 $\mu\text{g}/100\text{ g}$ and/or perhaps below 60 $\mu\text{g}/100\text{ g}$.

Page 1-10, l. 21. The statement, "The following distribution of blood lead levels constitutes an acceptable biological guideline (see Section 8 for details)" is made without providing justification for such a conclusion. Section 8 does not provide this justification nor does it cite any assessment or reviews of the proposed biological guideline.

Page 1-12. This section seems very weak to me for the following reasons: (a) the analysis depends upon acceptance of a biological guideline of $100\% = 40 \mu\text{g}/100 \text{ ml}$ which may not be justified, (b) the analysis involves selection of Okeana, Ohio, Pasadena, California and Honolulu as representative locations. Why ignore all the other available locations?, (c) the rationale developed to justify a $5 \mu\text{g}/\text{M}^3$ appears to be too simplistic to satisfy knowledgeable people, (d) with wide variations in lead exposure from non-inhalation sources, it is difficult to see how any easy way can be devised to justify an air quality standard as low as $5 \mu\text{g}/\text{M}^3$.

Conclusions

Page 1-16, l. 9. I question a conclusion which says, "airborne concentration of lead high enough to make inhalation the primary intake route for human exposure occur ... in areas immediately adjacent to high-density automobile traffic." Where is the data supporting this conclusion?

Page 1-16, l. 17. The 30% figure is correct but isn't a much lower figure also correct?

Page 1-16, l. 18. Sentence structure in error. Should be -- "The fraction of inhaled lead absorbed into the body is greater than the fraction of ingested lead absorbed into the body."

Page 1-17, l. 5. Support for the biological guideline cited in the fifth conclusion is needed.

Recommendations

Page 1-20, l. 3. Support for a standard as low as $5 \mu\text{g}/\text{M}^3$ offered in this report appears very weak if it exists at all. Other recommendations appear excellent.

Section 4

This section appears to be heavily weighted towards describing methods of measurement. More information is needed on the accuracy and precision of measurement methods particularly for air lead and blood lead. More information is needed on trends in test method accuracy with time.

E. S. Jacobs will provide further comments on this section.

Section 5

Page 5-35, Table 5-13. Data for Chicago appear out of line when Table 5-13 is compared with Table 5-9. Other cities look okay.

Page 5-87, 1. 21. Pierrard needs to check the statements on photolysis of auto exhaust.

Section 8

Page 8-36. This is the place to discuss any justification for selecting the biological guideline of Zielhuis.

Page 8-46, 1. 21. The validity of the Southwest Research Institute results, Reference 8-75, was seriously questioned when they were used in hearings in California. Certainly, the Day 1 - Day 2 results presented in Table 8-17, p. 8-48 are difficult to understand in view of the long time usually needed to shift blood lead levels.

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