Kaz Ito: Comments on CASAC AAMM Peer Review and Consultation on Monitoring Issues for Lead National Ambient Air Quality Standard (NAAQS)

General Comment:

I understand that, because of the schedule for the proposed new FRM for Pb-PM_{10}, we are asked specific charge questions at this point. However, based on the conversations that took place during the July 14th conference call, it seems to me that there are some important uncertainties that need to be investigated or characterized further even after the new method and alternative low-volume TSP samplers are considered. Specifically, as Dr. Hopke pointed out, it seems unclear if the Pb-PM_{10} (or perhaps even Pb-TSP) is the most appropriate indicator of Pb exposure if the relevant route of exposure is ingestion of surface deposited Pb.

Charge Questions and comments:

• Attachment 1 Draft Federal Reference Method (FRM) Lead in PM_{10} (Pb-PM_{10})

What are your comments on the use of the low-volume PM_{10c} FRM sampler as the Pb-PM_{10} FRM sampler?

To the extent that we are interested in Pb in PM_{10} size fraction, the PM_{10c} sampler is acceptable and appropriate for Pb-PM_{10} FRM, given the performance shown in the past tests.

What are your comments on the use of XRF as the Pb-PM_{10} FRM analysis method?

I imagine the information on the issues associated with Pb analysis by XRF is available from the nationwide $PM_{2.5}$ speciation data collected since 2000. Analysis of such data would be informative.

What are your comments on the specific analysis details of the XRF analysis method contained in the proposed Pb-PM_{10} FRM analysis method description?

The document describes potential spectral interferences and spectral overlaps, but it does not give us a sense of the extent of this problem in the real data. It would be helpful if the document could also describe likely extent of this issue. Again, how serious a problem was this in the nationwide $PM_{2.5}$ chemical speciation data?

Do you think the precision, bias and MDL of the XRF method for the proposed Pb range will be adequate?

I think this answer depends on the extent of spatial variation of Pb-PM_{10} in the locations of interest as well as the actual NAAQS level for Pb. The goal for a 15% precision for co-located monitors may be adequate if a coefficient of variation of

annual means for multiple monitors within an area of interest is, say, 50%, but this would vary from city to city. I happened to look at within-city variation of several $PM_{2.5}$ chemical species including Pb in 28 MSA's several years ago for a different reason (I was comparing within-city vs. across-city variation of PM components). Figure 1 shows the coefficient of variation (CV) for the across-MSA variation vs. distributions of CV's of within-MSA variation for the 28 MSA's where there were multiple monitors for years '00-'03. For Pb, the CV ranges from nearly zero to 60% with the median of ~ 25%. Therefore, the adequacy of precision of 15% may be OK for the cities where high Pb levels occur (I imagine Pb-PM_{10} variation would be larger than that for Pb-$PM_{2.5}$).

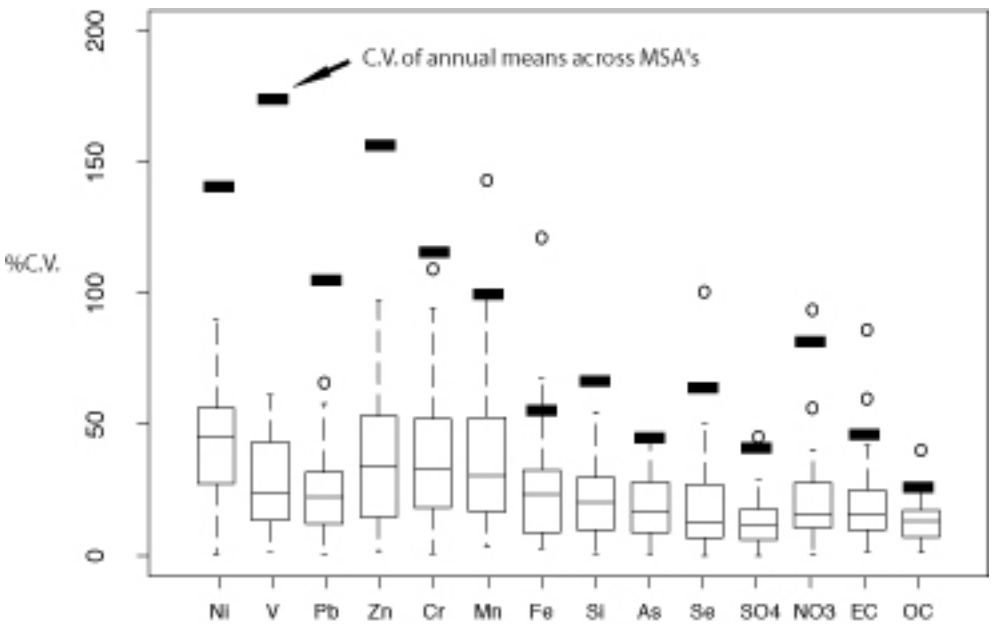

Figure 1. Comparison of coefficient of variation (C.V.) of annual (multi-year, '00-'03) means across MSA's (denoted with bold "-") and distribution of within-MSA C.V. of annual means in the 28 MSA's where multiple monitors were available. "o" represents extreme value.

Are there any method interferences that we have not considered?

I don't know of any.

• Attachment 2 Options for the Development of a Low Volume Lead in Total Suspended Particulate (Pb-TSP) Sampler

I am not familiar with the characteristics of available low-volume Pb-TSP samplers and therefore I cannot respond to the charge questions.