U.S. EPA's Pb NAAQS Review: Indicator and Monitoring Issues

March 25, 2008 Consultation Meeting

CASAC AAMM Subcommittee Review Comments, Bart Croes

Overall, the documents provided to the Subcommittee continue the impressive responsiveness by U.S. EPA staff to CASAC and our Subcommittee's comments. Staff should be commended for taking a systematic approach towards implementation of a likely revised lead (Pb) National Ambient Air Quality Standard (NAAQS). I appreciate the opportunity to comment during this intermediate stage of the process. The documents provide a good description of the issues and a reasonable rationale for changes to the Pb Federal Reference Method (FRM) and Federal Equivalent Method (FEM) process. I agree with the basic approach taken by U.S. EPA, and offer comments on several aspects that need further attention. My comments address the consultation questions posed by Lewis Weinstock in his March 3, 2008 memo to Fred Butterfield. These comments also reflect input from California Air Resources Board staff responsible for implementing U.S. EPA monitoring requirements and using the data in source apportionment and health studies.

<u>Charge Questions:</u>

Attachment 1 – Options for Lead NAAQS Indicator: Monitoring Implications

1. *Considering issues such as sampler performance, size cuts, operator maintenance, integration with other measurement systems, and usefulness as the measurement system for the indicator, please describe the advantages and disadvantages of sampling and analysis of Pb-TSP versus sampling and analysis of Pb-PM10.*

   The primary advantages of a PM10 size cut for Pb monitoring are that these are inhalable particles (which are more relevant for human health effects from ambient air), the data is of better quality, and there is a large existing PM10 monitoring network that can be adapted for Pb monitoring.

   However, the disadvantage is that super coarse particles that contribute to human health effects through ingestion by multi-media routes would be ignored. Also, there would be a disconnect with four decades of Pb-TSP data.

   From a resources point of view, it makes most sense to build off of one of the existing networks (e.g., HiVol PM10, TSP Total Metals). The California Air Resources Board has a 20-site Toxics Network (12 lpm TSP, teflon filter, ICP/MS analysis) that we would like to see considered as an option for meeting compliance requirements. By taking advantage of existing PM10 or TSP monitors, the need for additional monitors would be limited, which would make the program less costly for U.S. EPA and the SLT entities.

2. *Is it appropriate to monitor for Pb-PMl0 near Pb sources? And if so, under what conditions?*

   For large fugitive or stationary sources, TSP monitors capture all health-relevant Pb particles and seem to be a better choice than PM10 monitors. Specifically, from Figure 2, Pb-PM10 levels are about half of Pb-TSP levels.

3. *One indicator option suggests using scaling Pb-PM10 monitoring data up to an equivalent Pb-TSP level in lieu of Pb-TSP monitoring data. Under what circumstances would it be appropriate to scale data (e.g., non-source oriented sites, low concentration sites) and when would it not be appropriate to scale data?*

   From Figures 1 and 2, Pb-PM10 to Pb-TSP correlations seem relatively high, but further collocated monitoring and analysis would strengthen the analysis.

4. *We have limited collocated Pb-PM10 and Pb-TSP monitoring data. What types and "scaling factors" are appropriate to create using this data (e.g., non-source oriented, source oriented)? What levels are appropriate for the types of scaling factors identified in the white paper?*

   The data are limited and further collocated monitoring and analysis is needed, especially for the source-oriented monitoring that has the highest Pb levels.

Attachment 2 – Draft Federal Reference Method (FRM) and Federal Equivalent Method (FEM) Criteria for Lead in PM10 (Pb-PM10)

1. *Is it appropriate to use the low-volume PM10coarse FRM sampler as the Pb-PM10 FRM sampler?*

   If the decision is to move away from total health risk (as represented by TSP) to inhalable risk (PM10), then the use of the low-volume PMl0coarse FRM sampler is reasonable.

2. *What other PMl0 samplers should be considered as either FRM or FEM for the Pb-PMl0 FRM?*

   SLT entities should be permitted to use the HiVol TSP and all existing FRM and FEM PM10 samplers. Even if the Pb NAAQS goes from TSP to PM10, TSP would be a conservative (i.e., health-protective) measurement.

3. *Is XRF an appropriate Pb-PM10 FRM analysis method?*

   Yes. While it has problems with non-uniform deposits, XRF is a cost-effective technique.

4. *What other analysis methods should be considered for FRM or FEM for the Pb-*

PM10 FRM?

AAS, ICP/MS, and PIXIE.

5. *Have we selected appropriate precision, bias, and method detection limit requirements for FEM evaluation?*

   Yes. The current FEM requirements of 15% maximum precision and 5% accuracy seem reasonable, as well as the proposed requirement that the MDL must be equal to or less than 1/10th the level of the Pb NAAQS.

Attachment 3 – Lead NAAQS Ambient Air Monitoring Network: Network Design Options Under Consideration

1. *What types of monitoring sites should be emphasized in the network design (e.g., source oriented monitors, population monitors, near roadway monitors)?*

   Source oriented monitoring should be emphasized as these are the areas likely to have the highest levels. If below the NAAQS, then no further monitoring is needed. Otherwise, population and near roadway monitors should be considered.

2. *We are considering proposing requirements for monitoring near sources exceeding an emissions threshold and discuss a number of options for determining this threshold in the white paper. What options should be considered in establishing an emissions threshold?*

   The analysis is reasonable, but the issue of periodically emitting sources should be considered, which would lower the emissions threshold.

3. *We are considering proposing requirements for non-source oriented monitoring in large urban areas to provide additional information on ambient air concentrations in urban areas. Considering other monitoring priorities and a potential requirement for Pb monitoring near sources, what size of a non-source oriented Pb network is appropriate?*

   Non-source oriented monitoring should only be considered if analysis of existing data (e.g., Pb-TSP data, PM2.5 speciation Pb data, special study data, reconstructed Pb levels using air quality modeling or interspecies correlations) show the potential to exceed the Pb NAAQS.

4. *What factors should we base non-source oriented monitoring requirements on (e.g., population, design value)?*

   It should only be based on the potential to exceed the Pb NAAQS.

5. *We are considering proposing requirements for Pb monitoring near roadways and interstates. Is it appropriate to include separate monitoring requirements for near*

roadway monitoring, or should near roadway monitors be a part of the non-source oriented monitoring requirement?

Unless the Pb NAAQS is very low, near roadway exposures should not be a problem, as shown in Table 7.

6. *Under what conditions would it be appropriate to waive the monitoring requirements for either source or non-source oriented monitors?*

   These conditions should be consistent with decisions for other criteria pollutants.

Attachment 4 – Lead NAAQS Ambient Air Monitoring Network: Sampling Frequency Options Under Consideration

1. *What sampling frequency would be appropriate if the Pb NAAQS is based on a monthly average?*

   The California Air Resources Board has had a monthly average Pb-TSP standard (not to be exceeded) of 1.5 $\mu g/m^3$ since 1970 and has always used one-in-six-day sampling. California has always met a monthly 75% completeness criteria as compared to the federal requirement of 75% across a quarter. One-in-three-day sampling should only be considered for sites that are near or exceed the standard.

2. *Is it appropriate to relax the sampling frequency in areas of low Pb concentration? If so, at what percent of the Pb NAAQS?*

   If a one-in-six-day sampling frequency is chosen, then no. If a one-in-three-day sampling is selected, then the frequency should be relaxed if peak Pb levels are 30% or less of the NAAQS, as proposed by U.S. EPA staff.

3. *Is it appropriate to relax the sampling frequency in areas considerably higher than the NAAQS? If so, at what percent of the Pb NAAQS?*

   No, as that would be unprecedented for criteria pollutant and not health protective for periodic sources.