

**Comments for the March 25, 2008 Clean Air Scientific Advisory Committee (CASAC)
Ambient Air Monitoring & Methods (AAMM) Subcommittee Teleconference**

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General comment: The range of “candidate NAAQS level” shown in these tables (0.02 to the current $1.5 \mu\text{g}/\text{m}^3$) is quite wide (I understand that the Staff Paper recommends no higher than $0.2 \mu\text{g}/\text{m}^3$). It may be important to compare the extent of uncertainty associated with the reported exposure/health effects relationships and the estimated uncertainty associated with Pb monitoring network design.

• “Options for Lead NAAQS Indicator: Monitoring Implications”

Q1. 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.

Advantages: The better precision and ability to accommodate sequential sampling in case more frequent sampling (i.e., every 3rd day) is required.

Disadvantages: Possible requirement for “scaling factor” to adjust for larger particles that the Pb-PM₁₀ sampler may miss.

Q2. Is it appropriate to monitor for Pb-PM₁₀ near Pb sources? And if so, under what conditions?

Figure 2 on page 7 indicates a good linear relationship. This suggests that Pb-PM₁₀ works in source-oriented situations, but I think more data (pilot studies?) are needed to more fully characterize the factors (e.g., size distribution, wind-direction dependency, etc.) that affect comparability between Pb-TSP and Pb-PM₁₀ samplers.

Q3. 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?

The source oriented sites’ data (Figure 2) support justification for scaling factor using the relatively good relationship. It is more difficult to tell what we should do for non-source monitoring unless we look at the data for any pattern by city, region, or period. I feel a bit uncomfortable using scaling factors based on data such as those shown in Figure 1. In Figure 1, it is not clear how much of the scatter is due to the imprecision of TSP. As I mentioned in the conference call, I think it would help if we can see the scatter plots of co-located Pb-TSP monitors and co-located Pb-PM₁₀ monitors.

Regarding Figure 2, since the data came from 1200 data pairs from 31 non source-oriented sites that collected data between the years 1993 and 2006, I imagine that the overall regression could be masking potentially important information such as variation in slope across sites, regions, and years. During the conference call, Mr. Kevin Cavender mentioned that the slope of individual sites varied between 1 and 1.4, which made me feel more comfortable, but I would still consider running a regression model that takes into consideration the fact that the data came from different sites (mixed effects model).

• **“Draft Federal Reference Method (FRM) and Federal Equivalent Method (FEM) Criteria for Lead in PM₁₀ (Pb- PM₁₀)”**

Q1. Is it appropriate to use the low-volume PM_{10c} FRM sampler as the Pb-PM₁₀ FRM sampler?

It seems reasonable given the better precision than the Pb-TSP sampler.

Q2. What other PM₁₀ samplers should be considered as either FRM or FEM for the Pb-PM₁₀ FRM?

I don't know.

Q3. Is XRF an appropriate Pb-PM₁₀ FRM analysis method?

It sounds reasonable based on the required characteristics. It is also comparable with the PM_{2.5} and PM_c speciation monitor data. During the conference call, Dr. Phil Hopke mentioned possibility of As-Pb spectral interference. I think the EPA can check how much of a problem this is by analyzing available data from various source types.

Q4. What other analysis methods should be considered for FRM or FEM for the Pb-PM₁₀ FRM?

I don't know.

Q5. Have we selected appropriate precision, bias, and method detection limit requirements for FEM evaluation?

Given the expected concentration range and the possible range of Pb NAAQS, the requirements seem appropriate.

• **“Lead NAAQS Ambient Air Monitoring Network: Network Design Options Under Consideration”**

Q1. What types of monitoring sites should be emphasized in the network design (e.g., source oriented monitors, population monitors, near roadway monitors)?

I get a mixed impression about the relative importance of source types from these documents. The statement on page 1, "...there is substantial uncertainty about ambient air Pb levels resulting from historic Pb deposits near roadways," suggests that, at least initially, we need near-roadway monitors. However, Table 7 (page 8) suggests that the Pb levels near roadways are not that high, though we don't have much data on this table.

In cities where densities of roadways are high, what is the distinction between "non-source oriented monitoring" and "near roadway monitoring"? Also, during the conference call, the issue of aviation gasoline being an important source came up. I imagine most airports are also surrounded with major roadways. Thus, many of the major city neighborhoods may be difficult to characterize as "non-source".

Source-oriented monitors are clearly important when populations living nearby are at risk, but it seems we do need more data to characterize spatial variation of Pb in "near roadway" and "non-source" areas. I found that the rationale to emphasize ozone and PM_{2.5} monitors in comparison to Pb a bit unconvincing - the levels of ozone and PM_{2.5} would be fairly uniform within a city because they are secondary formed pollutants. One can argue that we need more monitors for the pollutants that are spatially more variable because they are locally generated.

Q2. 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?

This idea of using the ratio of the observed Pb levels to the emission rate to come up with an emission threshold seems reasonable. The tables prepared in this document are very useful in supporting this idea. The only obvious issue we see with this approach is that, when we get to Table 5 (page 6), it becomes clear that we may need to monitor at a large number of locations (> 1,000) if the Pb NAAQS is set at 0.2 µg/m³ or less. Given the range of variability in the concentration-to-emission ratios (Table 2), an initial site-specific surveillance may be required to determine if monitoring is needed in that location.

Q3. 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?

It is difficult to figure out how many monitors we need unless we know the extent of spatial variation of Pb. We need some kind of pilot study to characterize the spatial variation.

Q4. What factors should we base non-source oriented monitoring requirements on (e.g., population, design value) ?

(1) Population size; (2) existing data indicating Pb concentrations higher than "background" levels.

Q5. 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?

Given the high density of roadways in many urban areas, I think there is no need to separate sampling requirements for these two monitoring types.

Q6. Under what conditions would it be appropriate to waive the monitoring requirements for either source or non-source oriented monitors?

(1) no population being impacted; (2) existing or initial monitoring suggests sufficiently low ambient Pb concentrations.

• “Lead NAAQS Ambient Air Monitoring Network: Sampling Frequency Options Under Consideration”

Q1. What sampling frequency would be appropriate if the Pb NAAQS is based on a monthly average?

Every-3rd-day sampling appears appropriate if the Pb-PM₁₀ low flow sampler is going to be used. I would also find out, from a pilot study, if this sampling frequency satisfies DQO. In addition, I would take the every-6th-day part of the every-3rd-day data in pilot study and check if the precision is sufficient for DQO. If it is, then allow the sampling frequency to be every-6th-day.

Q2. Is it appropriate to relax the sampling frequency in areas of low Pb concentration? If so, at what percent of the Pb NAAQS?

Again, this depends on the precision of the data and DQO.

Q3. Is it appropriate to relax the sampling frequency in areas considerably higher than the NAAQS? If so, at what percent of the Pb NAAQS?

It is hard to comment on this without actually looking at data.