

Comments on EPA's White Paper on PM Light Extinction Measurements
for CASAC AAMMS meeting Feb 24-25

Donna Kenski

Lake Michigan Air Directors Consortium

These comments on the White Paper are more general than EPA requested in its charge questions. Regretfully, I lack expertise in the specifics of visibility monitoring and equipment. However, there were aspects of the White Paper that raised some concerns that I want to express.

The White Paper did a fine job laying out some of the issues that need to be discussed at the upcoming meeting. Nevertheless, the discussion on FRMs/FEMs and measurement goals seems quite premature and I fear that EPA is rushing to establish a secondary standard and accompanying monitoring method without laying the appropriate groundwork or considering reasonable alternatives. While the Visibility Assessment made a solid case for determining what visibility conditions are acceptable to the public, it did not provide any discussion on the level, form, or averaging time of a potential standard. The White Paper seems to presume that a standard would be set in terms of light extinction and measured at hourly intervals, and that those measurements should be made with a combination of nephelometers and aethalometers, which are to be operated in ways not currently accepted as standard practice (i.e., without drying the sample stream before measurement). While that MAY be the optimum way of determining light extinction, I believe it is possible to propose a standard that is protective of visibility and yet does not require rolling out hundreds of untested monitors at a time when states are struggling to maintain existing criteria networks and meet new monitoring regulations that are inadequately funded. EPA needs to more carefully examine the alternatives, and take a more inclusive view of methods. Specifically, methods based on mass measurements should be included for consideration – both total PM_{2.5} and speciated PM_{2.5}. Long path instruments and photographic methods also seem to have been dismissed without adequate discussion of their potential advantages and disadvantages. The measurement goals, as laid out in the White Paper, are much too restrictive at this point in the process. Our need to measure visibility with accuracy and precision should not supersede a common sense approach that tolerates greater measurement variability but yields significant benefits through ease of use, dependability, and economy. A standard that protects visibility could be posed in a number of ways that take advantage of existing networks and data—just one of which might be light extinction as calculated from the IMPROVE equation from speciated PM_{2.5} data (as done in the Visibility Assessment) or from hourly PM_{2.5} mass measurements and RH. The hourly PM mass measurements could be incorporated into a sub-24-hour but more than 1-hour standard to help smooth out the greater variability in these measurements. Along those lines, the White Paper and Visibility Assessment seem to put undue weight on the coarse mass contribution to visibility impairment. From the data presented there (with the possible exception of Phoenix) coarse mass contributes little to visibility impairment and its presence could generally be ignored, or perhaps incorporated only when it is a significant fraction of total PM as established by historic data.

I urge EPA and CASAC to carefully consider the pragmatic aspects of a visibility standard. Visibility has been determined for years from speciated and mass measurements of PM. Neither the Visibility Assessment document nor the White Paper make a strong case for discarding this time-tested and practical method. It simply is not feasible, in our current economic climate, to consider requiring states to implement a new network of monitors without first showing decisively that such equipment is vastly superior to alternatives. By all means, new technology should be encouraged, but it needs to be thoroughly vetted in the field. It has been my experience that technologies which appear promising in the lab almost inevitably exhibit significant flaws when deployed under real-world monitoring

conditions. Thus any proposed FRM/FEM technology must be first be demonstrated in a pilot study that compares its performance with these older, time- and field-tested technologies. It seems unlikely that such a study could be completed in this review cycle. Consequently any secondary standard proposed as part of this review should not require measurements that meet the very tightly prescribed goals in the White Paper, but rather allow for extinction to be measured or estimated from the data being collected now as part of the PM2.5 network.