

June 9, 2011

Research Screening Committee  
California Air Resources Board  
1001 I Street  
P.O. Box 2815  
Sacramento, CA 95812

Re: Draft Final Report for Contract No. 06-332 "Spatiotemporal Analysis of Air Pollution and Mortality in California Based on the American Cancer Society Cohort"

Dear Committee Members,

I request that you consider in detail the following comments regarding the Draft Final Report for Contract No. 06-332 by Principal Investigator Michael Jerrett, Ph.D., "Spatiotemporal Analysis of Air Pollution and Mortality in California Based on the American Cancer Society Cohort" ([http://www.arb.ca.gov/research/rsc/06-09-11/agenda4\\_contract06-332\\_draft\\_report\\_cynthia\\_0520\\_v2.pdf](http://www.arb.ca.gov/research/rsc/06-09-11/agenda4_contract06-332_draft_report_cynthia_0520_v2.pdf)).

1) This is a major new document (145 total pages) that presents detailed results in Tables 27-32 (pages 81-87) on the relationship between PM<sub>2.5</sub> and mortality from various causes during 1982-2000 in the 1982 American Cancer Society Cancer Prevention Study (CPS II) cohort. However, the ABSTRACT (pages 4-7), DISCUSSION (pages 108-113), and CONCLUSION (pages 7 and 113) do not accurately reflect the results in the body of the report, particularly in the tables. Before this report is accepted it is important that the ABSTRACT, DISCUSSION, and CONCLUSION be rewritten in order to fully and fairly summarize the findings in the report. Also, if at all possible, it is important that additional results be included in the report in accord with the terms of the original January 2007 Agreement No. 06-332 between CARB and UC Berkeley (Agreement) (<http://www.scientificintegrityinstitute.org/jerrett012510.pdf>).

2) Abstract Table 1 (page 5), Abstract Figure 1 (page 6), Table 44 (page 108), and Figure 25 (page 109) overstate and misrepresent the "all cause" results for California (CA), by citing the outlier hazard ratio (HR) of 1.08 (1.00–1.15) and by claiming in the text (pages 7 and 113) that there are "significant associations between PM<sub>2.5</sub> and all causes of death." Furthermore, it is inappropriate to focus on the outlier HR = 1.08, which is based on a post-hoc analysis of a "conurbation" model that was not specified in the Agreement.

3) Figure 22 (page 105) summarizes the relationship between PM<sub>2.5</sub> and all cause mortality for the nine models that were tested. Full results for six of the models are presented in Tables 27-32 (pages 81-87). However, tables need to be included for the three remaining models, including the "conurbation" model, "LUR IND+5Met," that yielded HR = 1.08. It is particularly troubling that there is no way to examine the "conurbation" model results in full because the table for this model is missing. Furthermore, the weighted average of the HR for the nine

models in Figure 22 (page 105) is Summary HR = 1.002 (0.992-1.012), where the weight for each HR is based on its 95% confidence interval. Given that all nine HRs are statistically consistent with the Summary HR and with 1.00, the outlier HR = 1.08 does not provide evidence of a significant association between PM2.5 and all causes of death.

4) The following two sentences in the “CONCLUSION” (pages 7 and 113) are highly misleading: “We also found significant associations between PM2.5 and all causes of death, although these findings were sensitive to model specification.” and “We conclude that combustion-source air pollution, especially from traffic, is significantly associated with premature death in this large cohort of Californians.” The only fair conclusion, based on an objective examination of all the results presented in the report, is that there is NO significant relationship between PM2.5 and all causes of death (premature death) in this cohort.

5) At the February 26, 2010 CARB Symposium “Estimating Premature Deaths From Long-term Exposure to PM2.5,” Dr. Jerrett presented the finding that HR ~ 0.994 (0.965-1.025) for all causes of death (<http://www.scientificintegrityinstitute.org/carbjerrett022610.pdf>). He made no claim at this Symposium that PM2.5 causes premature deaths in California based on his analysis of the ACS CPS II cohort up to that time. It is very important that the Research Screening Committee study the webcast and PPT presentations for the February 26, 2010 CARB Symposium and understand the intense scientific controversy that is associated with the relationship between PM2.5 and total mortality.

6) Table 1 (page 23) does not present the CA-specific evidence on PM2.5 and total mortality and entirely omits the CA-specific results of Enstrom 2005 and 2006. Table 1 should be redone and it should include all the existing CA-specific evidence, including the evidence summarized by Enstrom (<http://www.scientificintegrityinstitute.org/enstrom121510.pdf>). In particular, Enstrom 2005 should be included under “Description of Cohort Studies Reporting PM2.5 Mortality Risks” (pages 20-22).

7) According to Table 3 (page 24) and Table 24 (page 78), PM2.5 exposure data is based solely on measurements made during 1998-2002. This is contrary to the statement within “PM2.5 Database” on page 13 of the Agreement: “To refine estimates of long-term exposures to fine particles among the study subjects, we will rely on a historical reconstruction of PM2.5 levels throughout California. Analyses were performed by Dr. C. Blanchard to estimate PM2.5 levels for years prior to 1999.” It is important to use PM2.5 exposure data dating back to 1979 since the mortality follow-up period is 1982-2000. The 1979-1983 data have been used in prior analyses of this cohort by these authors (Krewski 2000, Krewski 2009, and Krewski 2010). Results should be presented based on both 1979-1983 and 1998-2002 PM2.5 data, as well as on a historical reconstruction of all available PM2.5 data, as stated in the Agreement.

8) The Final Report should include as an appendix the “interim progress report after the first 18 months of the contract documenting the results of our statewide analysis . . . .” This interim progress report is listed as one of the deliverables on page 31 of the Agreement.

Thank you very much for your consideration.

Sincerely yours,

A handwritten signature in blue ink that reads "James E. Enstrom". The signature is written in a cursive style with a light blue background behind the text.

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