



# EARTH SYSTEM SCIENCES, LLC

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**From:** Nicole Downey, Ph.D.  
**To:** CASAC  
**Date:** May 18, 2014  
**Subject:** Comments on CASAC Letters to the Administrator

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## **Comments on CASAC Letter Regarding Air Quality Considerations and the Primary Standard in the HREA**

The recommendations made by CASAC regarding air quality considerations and the primary standard in the Health Risk and Exposure Assessment are important and useful. In particular, the support for the use of HDDM to estimate ozone concentrations when ‘just meeting’ the current and alternative air quality scenarios is an important step forward scientifically. There remain a few issues, however, that should be addressed in the letter to the administrator.

- For the first time, EPA is presenting total risk down to zero ozone. Along with this estimate, however, EPA should also present the risk at background ozone levels, which represents the level of risk achievable by US emissions reductions. Due to the relatively high contribution of background to total observed ozone (particularly as proposed standards approach 60 ppb) it is important to understand what fraction of the total risk is controllable by US emission reductions. CASAC should recommend that EPA calculate and present the risk at US background levels.
- In the HREA, EPA calculates risk for the ozone season, which in many cities excludes fall and winter months. As I presented in my public comments at the CASAC meeting in March 2014, this leads to a systematic overestimate for decreases in ozone in cities where the ozone season does not cover the entire year. Now that EPA is calculating risk down to zero ozone, and EPA's calculations of mortality risk are driven by ozone levels extending down to zero, the concept of an ozone season (which was meant to capture high ozone days) is outdated. Many cities do not monitor ozone year-round, so an estimate of this seasonal effect would need to be model based. CASAC should recommend that EPA estimate the effect of including only the ozone season on mortality risk estimates.

## Comments on CASAC Letter Regarding Air Quality Considerations and the Primary Standard in the PA

Overall, the recommendations made by CASAC regarding air quality considerations and the primary standard in the Policy Assessment are important and useful. In the cover letter to the Administrator, CASAC discusses the impact of international transport on average ozone conditions in the United States. It would be more appropriate, however, to present the peak contributions of international transport to ozone events over 60 ppb along with the mean values. These peak contributions will give some indication of the importance of international transport on expected exceedance days if the standard is lowered toward 60 ppb.

Since CASAC has mentioned international transport in their cover letter, I believe it would be appropriate to include discussion of the large contribution of natural ozone sources to total background ozone. A combination of background sources, including natural background and international transport will drive an increasing number of exceedance days as the proposed standard approaches 60 ppb. The Exceptional Events Rule is intended to allow for the exclusion of high ozone days driven by natural ‘exceptional events’, and is the primary mechanism by which uncontrollable high ozone days can be excluded for attainment purposes. The exceptional events policy requires that the following must be demonstrated to obtain approval from the agency for an exceptional event.

- The event affected air quality (40 CFR 50.1(j))
- The event was not reasonably controllable or preventable (40 CFR 50.1(j))
- The event was caused by human activity that is unlikely to recur at a particular location, or was a natural event (40 CFR 50.1(j))
- There exists a clear causal relationship between the specific event and the monitored concentration (40 CFR 50.14(c)(3)(iv)(B))
- The event is associated with a measured concentration in excess of normal historical fluctuations including background. (40 CFR 50.14(c)(3)(iv)(C))
- There would have been no exceedance or violation but for the event. (40 CFR 50.14(c)(3)(iv)(D))

In 2012, EPA issued guidance on the exceptional events policy that states that ‘Routine anthropogenic emissions outside of the U.S. contribute to Policy Relevant Background, but are not exceptional events’. As it stands now, the Exceptional Events Policy is not a workable solution to exclude these uncontrollable events. In particular, there is no scientifically valid technique to identify if exceedances greater than 60 ppb could be classified as exceptional events. Due to the complex nature of ozone chemistry and the dynamic nature of individual source impacts on downwind locations, this is not a trivial issue to solve. Significant new developments in ozone source apportionment technology are necessary to allow states to efficiently deal with the tremendous increase in exceedance days at standards below 75 ppb. Finally, as it is worded now, the policy requires that the ‘event is associated with a

measured concentration in excess of normal historical fluctuations including background.' The 4<sup>th</sup> highest MDA8 of background in the intermountain west is approaching 60 ppb as shown by Zhang et al. (2011) and Emery et al. (2012). This implies that despite the fact that background ozone is not controllable by local, regional or national emissions reductions, it could lead to exceedances that are not eligible for exclusion for attainment designation. This policy was clearly designed for an ozone NAAQS that is well above background. If CASAC recommends reducing the ozone standard, it is important that a short discussion on the need for a more workable exceptional events policy is included.

In the CASAC response to Charge Question 1 on Chapter 2, CASAC states that 'The Second Draft PA should be clear that controls designed to reduce the peak levels of ozone (e.g., the 4<sup>th</sup> highest annual MDA8) may not be effective at reducing lower levels of ozone on more typical days and may actually increase ozone levels on days where ozone concentrations are low'. Dr. Ted Russell's individual statement on this issue is more factually correct when he says 'The PA should provide the Administrator with a firm understanding that controls oriented at reducing the peak levels of ozone (e.g., the 4<sup>th</sup> highest annual MDA8) may not be that effective at reducing more typical levels and may actually increase ozone levels on lower ozone [days] and also increase 24 hour levels on a broader range of days.' It may also be worth noting that there is strong spatial heterogeneity in the response of ozone to precursor controls, and that not all areas will respond in the same manner as emissions of NO<sub>x</sub> are reduced. This discussion should be moved to the main body of the letter to the Administrator.

CASAC should include asking for presentation of the percent NO<sub>x</sub> reductions required to meet proposed standards in the main document rather than in the appendix in the consensus response to charge questions.

### **Comments on CASAC Letters Regarding the Secondary Standard in the WREA and PA**

CASAC's comments on the WREA and PA are useful, but contradictory. CASAC 'finds that the Second Draft WREA largely achieves its ambitious goal of characterizing ambient ozone exposure and its relationship to ecological effects and estimating the resulting impacts to ecosystem services', but then goes on to re-interpret EPA Staffs conclusions based on that analysis. In the PA, EPA Staff comes to the conclusion that a secondary standard of 7 to slightly higher than 15 ppm\*hours would be sufficient to protect public welfare. CASAC argues in their letter on the PA that the range should be 7 to 13 ppm\*hours, based on biomass loss effects observed at 15 ppm\*hours and foliar injury, which seems to occur at levels above 10 ppm\*hours. In their letter on the WREA, CASAC calls into question the use of across the board regional cuts in emissions that were used to simulate air quality just meeting the current and proposed secondary standards. These across the board regional cuts were made to bring the highest site in each region into attainment with the secondary standard. The highest site was located in a city in

each region, which led to very large emissions reductions necessary to meet both the current and proposed alternative standards. As Dr. Ted Russell points out in his individual comments on the PA, ‘if across the board cuts are used to reduce ozone exposure in the highest locations, then ozone exposure in locations where it is lower to start with will tend to become very low...impacts of ozone under the alternate standards would be underestimated because ozone exposure values are underestimated for much of each region.’ Indeed, in most areas reaching a standard of 15 ppm\*hours in each region led to most areas being below 3 ppm\*hours. EPA based its entire analysis of the welfare impacts of ozone on these rolled back regional ozone fields, and their analysis shows nearly no difference between attainment of the current standard and attainment of an alternative standard between 7 and 15 ppm\*hours (Attachment 1). The secondary standard is intended to protect public welfare, and cannot be based on crop damage or biomass loss alone. Therefore, EPA has spent significant time and effort to quantify the impacts of ozone exposure to public welfare. As it stands now, the WREA does not show that there is a significant difference in public welfare between the current and alternative secondary standards. It seems that CASAC has reservations about how these estimates were made, in particular with EPA’s implementation of the regional HDDM rollback, which leads to minimal ozone exposure across most areas. CASAC has offered a range of acceptable standards based on crop and biomass loss data, but it is unclear what the welfare impacts of these ranges would be. At this stage, it is more appropriate for CASAC to recommend that EPA construct a more realistic regional rollback technique and quantify what levels of ozone exposure are protective of public welfare and summarize these results in a third draft welfare risk and exposure assessment.