Preliminary Comments from Dr. Stephanie Lovinsky-Desir on EPA's *Policy Assessment (PA) for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter (External Review Draft – October 2021)* 11-30-21

Chapter 3 - General Comments:

Chapter 3 was well written and appropriately characterizes the key aspects of the evidence assessed in the ISA and ISA supplement. The summary at the introduction of the chapter was a helpful review of the approach taken to integrate the evidence from the ISA and supplement. I appreciated the review provided in section 3.1.1. that offers a summary for those who have not read the 2019 ISA and 2020 PA. The section on the technical approach taken to update the risk assessment and evaluate the impacts in at-risk populations was clear. I agree with the staff's interpretations of the results regarding the adequacy of the current primary $PM_{2.5}$ standard.

The draft PA under-emphasizes the risk of current $PM_{2.5}$ standards on the respiratory health of children. As stated in the ISA and the supplement, there is a likely to be causal relationship between $PM_{2.5}$ and respiratory health effects, particularly asthma exacerbations and hospitalizations. Specifically, regarding children, the ISA documents substantial epidemiologic evidence that demonstrates the relationship between $PM_{2.5}$ and impaired lung function growth, decrements in lung function, and asthma development in children. I appreciate that the risk assessment modeling was based on all-cause mortality, thus did not specifically consider children. However, given the depth of data that were presented regarding the high-risk population of children, a risk assessment analysis that considered children in the models would provide greater support for reducing the current standard. It is important to note that the current respiratory impact on children may later place them in the high-risk health categories (respiratory and cardiovascular diseases) as adults. Thus, reducing the health impact on them now could have greater population health benefits in the future.

I appreciated the thorough discussion of the limitations of the risk assessment analysis. It would be helpful to also include thoughts on whether each limitation is expected to bias the results in favor of a greater or lesser percent reduction in risk and/or mortality (where able).

Whenever racial or ethnic groups are discussed throughout the document White is always listed first followed by other racial categories. Similarly, there are several places that refer to White and non-white populations. It would be more inclusive to list races and ethnicities in alphabetical order, especially if there is no other basis for ordering within a particular section. Similarly, it is currently more inclusive to use the term 'people of color' rather than 'non-white'.

Chapter 3 - Specific Comments:

It would be helpful to restate how long- and short-term $PM_{2.5}$ is defined at the start of Chapter 3.

Page 3-2, Line 17,18: Mentions that some of the epidemiological studies that informed the ISA came from Asia, but I thought that studies in Asia were excluded so this point should be clarified throughout.

The discussion on the impacts of the PM2.5 standard on at risk populations (Section 3.3.2) was very well written and provides a succinct summary of the evidence that identifies particularly high-risk groups of individuals.

Page 3-50, line 18,19: I believe that the studies documented in the ISA supplement strengthen our understanding of human populations at risk of health effects from PM2.5, particularly people living in communities with lower SES and communities of color.

Table 3-2: listing household incomes in the past 12 months may be misleading as it doesn't account for family size.

Page 3-55, lines 1-2: some Latino populations (e.g. Puerto Ricans) have the highest rates of asthma prevalence.

Table 3-3: is very informative. Perhaps a separate table (or incorporated in this table) that illustrates similar breakdown in race and ethnicity for childhood asthma would be equally informative.

Page 3-69, lines 1-3: The language around inclusion of studies from Canada and not other countries is confusing. I do not believe the rationale for excluding non-US or Canadian studies is compelling, especially since the objective of this section is to determine if exposure to $PM_{2.5}$ is associated with health outcomes and not to determine the sources of $PM_{2.5}$ or exposure patterns.

Page 3-135, line 26 and Figure 3-17: consider revising to list racial and ethnic categories in alphabetical order.

Table 3-19 and 3-20: consider reordering in alphabetical order according to race and ethnicity.

Figure 3-22: It is a bit challenging to see if the mortality risk rate is shifting in the second column when stratified by race and ethnicity.

Page 3-156, line 19: important to add as part of this conclusion that the at-risk assessment estimated that Black populations may experience the greatest reduction in exposure and risk with a revised standard.

Chapter 4 - General Comments

Chapter 4 offers a succinct summary of the limitations of the current research evidence base that have led to the preliminary conclusion to retain the decision in the 2020 review to retain current PM_{10} standard. I believe that the chapter appropriately characterizes the key aspects of the evidence assessed in the 2019 ISA. The consideration of the evidence with respect to short and long-term PM10-2.5 exposures is clearly communicated. I agree with the preliminary conclusions based on the evidence that was presented in this document.

I appreciate the inclusion of section 4.5 that describes areas for future research and data collection as it has the potential to not only influence future research but also funding agencies that support air pollution research. In addition to the areas noted, I believe it would be important to specifically design and execute future studies that identify the risk of exposure to PM_{10} and related outcomes in high-risk populations, including children. I recommend adding research specifically targeting exposure risk and health effects in high-risk populations as an area for future research in section 4.5.

It would be helpful if short-term and long-term exposure durations were briefly defined at the start of Chapter 4.