

## Preliminary Comments on the ISA from Dr. Jack Harkema

### EPA Charge Questions for Executive Summary and Chapter 1 of the First Draft ISA

- 1. Please comment on the clarity with which the Executive Summary communicates the key information from the SO<sub>x</sub> ISA. Please provide recommendations on information that should be added or information that should be left for discussion in the subsequent chapters of the SO<sub>x</sub> ISA.*
- 2. Please comment on the usefulness and effectiveness of the summary presentation [in Chapter 1]. Please provide recommendations on approaches that may improve the communication of key findings to varied audiences and the synthesis of available information across subject areas. What information should be added or is more appropriate to leave for discussion in the subsequent detailed chapters?*

### Executive Summary (ES) and Chapter 1

#### General Comments:

After reviewing the first draft ISA, the Panel had the following specific comments and suggestions for the second draft: 1) It should be clearly stated in the ES and Chapter 1 that the controlled human exposure studies are the principal rationale behind the 2010 1h SO<sub>2</sub> NAAQS and that this standard also provides protection from chronic exposure effects; 2) Correlation of maximum 5-minute SO<sub>2</sub> concentrations with corresponding 1-hour concentrations should be summarized; 3) Definitions for short- and long-term exposures need to be clear and consistent throughout the text of the entire ISA, including the Executive Summary; 4) Some of the footnotes used in the first page of the Executive Summary should be elevated to the body of the text; 5) It is important that ambient background concentrations of SO<sub>2</sub> be mentioned in this summary section of the ISA. Overall the authors have adequately addressed all of these suggestions.

The summarized material (and format) in these introductory sections of the ISA appropriately highlights and summarizes the important information provided in the subsequent chapters. Integration of the chapters is somewhat limited but most effectively captured in the sections on causality determinations. The authors' causality determination for the respiratory health effects related to short-term sulfur dioxide (SO<sub>2</sub>) exposures has been appropriately highlighted in both the ES and Chapter 1, but the one change in causality determination since the last review (ISA 2008; respiratory effects related to long-term exposure) needs to be more clearly stated in the ES.

Summary tables with chapter references have been appropriately used to synthesize and streamline the study results that were used to determine causality. I have only a few remaining specific suggestions listed below for the final ISA draft.

#### Specific Comments:

Though the ES in this draft contains much less technical jargon and phrasing than the previous draft, the authors are still encouraged to further refine this important section of the ISA so that it is even more understandable (readable) for a wider sector of the public.

- 1 As requested by the Panel, the authors have clearly and consistently defined what they mean by short-  
2 term (minutes up to a month) and long-term (greater than a month to years) exposures to SO<sub>2</sub>. However,  
3 the subtext of all the tables should also include these definitions that are found throughout the text.  
4
- 5 Page 1, lines 25-34. It is not clear what questions or uncertainties remain that prevent raising the  
6 causality determination for long-term SO<sub>2</sub> exposures and respiratory health effects. This should be  
7 briefly clarified.  
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- 9 Page iii, lines 29-30. A brief example of the evidence for increased health effect risk for older adults  
10 should be provided.  
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