Summary Minutes of the
U.S. Environmental Protection Agency (EPA)
Clean Air Scientific Advisory Committee (CASAC)
Oxides of Nitrogen Primary NAAQS Review Panel
Public Meeting
November 9-10, 2016

Date and Time: Wednesday, November 9, 2016, 9:00 AM – 5:00 PM ET;
Thursday, November 10, 2016, 8:30 AM – 12:30 PM ET

Location: Embassy Suites by Hilton Alexandria Old Town, 1900 Diagonal Road, Alexandria, Virginia 22314

Purpose: The purpose of the meeting was to peer review EPA's *Policy Assessment for the Review of the Primary National Ambient Air Quality Standards for Nitrogen Dioxide (External Review Draft – September 2016).*

Participants: CASAC Oxides of Nitrogen Primary NAAQS Review Panel (for full Panel, see roster[1])
Dr. Elizabeth A. (Lianne) Sheppard, Chair
Mr. George A. Allen
Dr. Matthew Campen
Dr. Judith Chow
Dr. Douglas Dockery (by phone)
Dr. Philip Fine
Dr. H. Christopher Frey
Dr. Jack Harkema
Dr. Michael Jerrett
Dr. Joel Kaufman (by phone)
Dr. Michael Kleinman
Dr. Timothy Larson
Dr. Jeremy Sarnat
Dr. Richard Schlesinger (by phone)
Dr. Ronald Wyzga

Mr. Aaron Yeow, Designated Federal Office (DFO)
Ms. Khanna Johnston, EPA SAB Staff Office
Dr. Erika Sasser, EPA Office of Air Quality Planning and Standards (OAQPS)
Dr. Jennifer Nichols, EPA OAQPS

Other Attendees (See Attachment A)

Wednesday, November 9, 2016

Opening Remarks

Mr. Aaron Yeow, DFO, opened the meeting. He noted that as required under the Federal Advisory Committee Act (FACA) and EPA policy, the CASAC Panel's deliberations are held in public with

advanced notice given in the Federal Register,[2] and the meeting minutes will be made publicly available after the meeting. He noted that there was a public comment period noted on the agenda for members of the public who registered in advance with the SAB Staff Office to make oral comments, however no members of the public requested to make oral comments. He stated that there was also a clarifying comment period on the agenda where members of the public could request an opportunity to provide short clarifying comments and asked that members of public wishing to do so to email him or pass him a note. He noted that the Panel received a written public comment, which was distributed to the Panel and also posted on the meeting webpage. He stated that the SAB Staff Office determined that there were no issues with conflict-of-interest nor any issues with an appearance of a lack of impartiality for any of the Panel members. Mr. Yeow noted that Dr. Michael Jerrett has recused himself from discussions pertaining to the use of studies for which he is a coauthor, however he was available as a resource to answer questions or provide clarifications regarding those studies. Mr. Yeow then turned the meeting over to Ms. Khanna Johnston, Acting Deputy Director of the SAB Staff Office, who welcomed everyone and thanked them for their participation, and then turned it over to Dr. Lianne Sheppard, Chair of the CASAC Oxides of Nitrogen Panel.

Dr. Sheppard welcomed everyone and had the Panel members introduce themselves. She then provided an overview of the Agenda.[3]

EPA Presentation on Draft Policy Assessment

Dr. Erika Sasser, EPA OAQPS, made a presentation[4] to the Panel, providing the background and schedule of the review, an overview of the NAAQS process, and the current review of the Primary NO_2 NAAQS. Dr. Jennifer Nichols, EPA OAQPS, continued the presentation covering the purpose and organization of the draft Policy Assessment (PA), background on the NO_2 primary standard and monitoring network, NO_2 air quality, consideration of evidence for NO_2-related health effects, consideration of quantitative risk and exposure analyses, comparison of air quality to health-based benchmark concentrations, consideration of other quantitative analyses, preliminary staff conclusions on the adequacy of the current primary NO_2 NAAQS, and data gaps and areas for future research.

Public Comments

There were no registered public speakers so the panel moved on to the next agenda item.

Discussion of the Charge Questions and Response to Charge Questions

Chapter 1 – Introduction

The panel found Chapter 1 to be generally well crafted in terms of content and format. The Background section provides a thorough and necessary history of the previous NO_2 NAAQS reviews and the substantive bases of the Administrator's previous decisions. One thing that should be mentioned in the chapter is the uncertainties related to on-road versus near-road monitoring.

Chapter 2 – NO_2 Air Quality

In general, the panel found the chapter does provide useful context for the review and is clearly presented. The panel found some discrepancies and inconsistencies in the Atmospheric Chemistry section and found the complexity of the NO_2 pathways based on the relationship to NO and ozone to be oversimplified. There were some recommendations to clarify the NO_2 Methods, the number of NO_2

sites, and site zone of representations of the ambient monitoring network. There was some discussion about street canyon data.

Chapter 3 – Consideration of the Evidence for NO_2-Related Health Effects

The panel found that for the most part, the chapter did an excellent job characterizing the key results from the ISA. To improve the chapter, they suggested a more focused discussion of adversity, what is defined as an adverse effect, particularly with respect to airway responsiveness. Dr. Jerrett provided some clarifications to the McConnell study regarding control for confounding. For effects from long-term NO_2 exposures, there was concern that these effects could be occurring at levels below the current annual standard. The panel had some concern that the discussion of co-pollutant correlations may be emphasized too strongly.

Chapter 4 – Consideration of NO_2 Exposures and Health Risks

Overall the panel found the chapter to be well done. There was discussion regarding whether additional quantitative analyses for long-term exposure should be performed. Some members did not think that additional analyses were needed. Other members thought that additional analyses were needed and thought that EPA overstated the role of co-pollutant confounding as a rationale for not performing additional analyses. The panel also suggested performing sensitivity analyses of potential exposures below 100 ppb. There was discussion about on-road exposures needing more attention and the use of models to provide insight into the scope of potential exposures for daily commuters. The panel generally found EPA's decision to look at both the number of exceedances of unadjusted data as well as the level of exceedance of the adjusted data to be reasonable.

Chapter 5 – Preliminary Conclusions on the Adequacy of the Current Primary NO_2 Standards

The panel found that the PA provided an appropriate and sufficient rationale to support a recommendation to retain the current primary NAAQS for NO_2. The PA provides a clear synthesis of the current scientific evidence for the causality determinations of adverse respiratory effects from NO_2 exposures, for NO_2 as the indicator, and for the averaging time. Regarding the form of the standard, the panel found this to be more of a policy judgment rather than a scientific judgement. Regarding the level of the standard, the panel found that the scientific evidence indicates adverse effects from short-term (1-hour average) exposures at concentrations as low as 100 ppb NO_2 and that there is insufficient evidence to support a level lower than that. The panel had discussion regarding the appropriate level of the standard for long-term (annual average) NO_2 exposures. Some members did not find the annual standard of 53 ppb NO_2 to be adequate to protect public health as there are studies indicating adverse effects at levels lower than 53 ppb NO_2. Other members indicated that attainment of the current short-term standard corresponds with annual design value averages of 30 ppb NO_2. There was discussion of recommending elimination of the long-term standard. Some members were in favor of eliminating it because the 53 ppb NO_2 long-term standard has no scientific basis. Other members were not comfortable with eliminating the standard, but there is not enough scientific evidence to suggest another level. The panel agreed to revisit this issue the next day and had discussion about future research needs.

The panel revisited the issue of whether to recommend additional quantitative analyses for long-term exposure to NO_2. The panel did not come to agreement and agreed to continue discussion on the next day. The panel agreed to shorten the writing session on the next day and to start the public session at 9:15 am.

Clarifying Public Comments

Mr. Yeow indicated that he did not receive any requests from the public to make a clarifying comment and asked if there was anyone from the public in the room or on the phone that wanted to make a clarifying comment.

The meeting was recessed for the day at 5:00 p.m.

Thursday, November 10, 2016

Writing Session by Subgroups

The Panel was reconvened at 8:30 a.m. and broke into subgroups for the writing session.

Summary of Major Findings and Recommendations

The panel summarized the major findings and recommendations discussed the previous day with respect to causality determinations, indicator, and averaging time. With regards to the level, the panel agreed with retaining the current level of the short-term standard. The panel found that meeting the short-term standard leads to averages of annual design values of 30 ppb. Therefore the short-term standard and long-term standard taken together is more protective than the long-term standard alone. To address both remaining issues from the previous day with respect to the need for additional quantitative analyses and the long-term standard, two options were presented: 1) Conclude that there is insufficient evidence that adverse effects occur at annual design values less than 30 ppb and therefore recommend retaining the current suite of standards 2) Ask for more quantitative analyses be performed and hence a second draft of the PA. The panel came to agreement with option 1, but wanted to make clear that this was not an endorsement that the current long-term standard of 53 ppb, by itself, was protective of public health. The panel also discussed the need for EPA to consider consistency and coherence across multiple health endpoints when evaluating the weight of evidence. The panel will not recommend additional quantitative analyses, but would like sensitivity analyses to be performed with health benchmarks less than 100 ppb. The panel summarized the major findings and recommendations for the remaining chapters.

Summary and Action Items

Dr. Sheppard discussed action items and the remaining schedule for drafting the reports.

The meeting was adjourned by Mr. Yeow at 12:00 p.m.

Respectfully Submitted:	Certified as Accurate:
/Signed/	***/Signed/***
Mr. Aaron Yeow Designated Federal Officer EPA SAB Staff Office	Dr. Elizabeth A. (Lianne) Sheppard Chair CASAC Oxides of Nitrogen Panel

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from the Panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings.

Materials Cited

The following meeting materials are available on the CASAC website: http://www.epa.gov/casac, at the November 9-10, 2016 CASAC Oxides of Nitrogen Panel Meeting page:

[1] CASAC Oxides of Nitrogen Panel Roster
[2] Federal Register Notice Announcing the Meeting
[3] Agenda
[4] EPA Presentation – Review of the Primary NO2 NAAQS: Draft Policy Assessment

ATTACHMENT A – Other Attendees
CASAC Oxides of Nitrogen Panel Public Meeting

Name	Affiliation	Wednesday, November 9, 2016	Thursday, November 10, 2016
Blase, Kurt*	Verdant Law, PLLC		
Bloomer, Bryan*	USEPA		
Bourne, Troy*	ASC Services		
Brown, James*	USEPA		
Deitrich, Casey*	ASC Services		
Desouza, Carl*			
Dutton, Steven	USEPA	x	x
Erickson, Heidi*			
Evangelopoulos, Dimitris*			
Graham, Dawn*			
Graham, Stephen	USEPA	x	
Hagan, Nicole*			
Hemby, James*	USEPA		
Hess, Judy Wendt*	Shell Oil		
Hill, Shaunta	USEPA	x	
Jenkins, Scott	USEPA	x	x
Jones, Lindsey*	Texas Commission on Environmental Quality		
Lackey, Leila	USEPA	x	x
Langworthy, Cindy	Hunton & Williams LLP	x	
Medeiros, Kevin*	Chevron		
Mills, Inga*	Cochrane Response		
Moore, Brian*	California Air Resources Board		
Nolen, Janice*	American Lung Association		
Parker, Stuart*	IWP News		
Patel, Molini	USEPA	x	
Peffers, Mel	USEPA	x	
Popovech, Marusia	Exxon Mobil Biomedical	x	x
Price, Doug	Tesoro	x	x
Schrieber, Danielle*	Verdant Law, PLLC		
Shallal, Sue	USEPA	x	
Shirley, Stephanie*	Texas Commission on Environmental Quality		
Steichen, Ted	American Petroleum Institute	x	x
Watkins, Nealson	USEPA	x	
Wesson, Karen	USEPA	x	
Williams, Melina	USEA	x	
Winningham, David	Lennox	x	
Wong, Diana*	USEPA		
Woods, Clint*	Association of Air Pollution Control Agencies		

Zawacki, Margaret*			
Zimmerman, Mara	American Petroleum Institute	x	

*participated via telephone/webcast