U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON ENVIRONMENT

HEARING CHARTER

Background Check: Achievability of New Ozone Standards

Wednesday, June 12, 2013
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

PURPOSE

The Subcommittee on Environment will hold a hearing entitled *Background Check: Achievability of New Ozone Standards* on Wednesday, June 12, 2013, at 10:00 a.m. in Room 2318 of the Rayburn House Office Building. The purpose of the hearing is to highlight the science behind Environmental Protection Agency's (EPA) forthcoming National Ambient Air Quality Standards (NAAQS) for ground level ozone ("ozone NAAQS") including EPA's estimation of background (naturally occurring/uncontrollable) ozone and its implications on, the achievability of, and compliance with, the NAAQS.

WITNESS LIST

- **Ms. Amanda Smith,** Executive Director, Utah Department of Environmental Quality
- **Mr. Samuel Oltmans**, Senior Research Associate, Cooperative Institute for Research in the Environmental Sciences, University of Colorado, and Earth System Research Laboratory Global Monitoring Division
- **Dr. Russell Dickerson**, Professor, Department of Atmospheric and Oceanic Science, University of Maryland
- **Mr. Jeffrey Holmstead**, Partner, Bracewell & Giuliani LLP
- **Dr. Kenneth Olden**, Director, National Center for Environmental Assessment, U.S. Environmental Protection Agency

BACKGROUND

Ozone **(**O_3**)** is a gas that occurs both in the Earth's upper atmosphere, as well as at ground level (troposphere). Ozone in the upper atmosphere helps protect the earth from the sun's harmful rays such as ultraviolet radiation. Ozone at ground level is not directly emitted into the air, but instead is created by chemical reactions between "precursor emissions," specifically nitrogen oxide (NOx) and volatile organic compounds (VOC**).**[1] Ground level ozone is often referred to as "smog."

[1] http://www.epa.gov/air/ozonepollution/basic.html

The Clean Air Act directed EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment.[2] EPA has set standards for six criteria pollutants including: carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution (particulate matter), and sulfur dioxide. The Clean Air Act specifies two categories of standards: primary standards for public health protection and secondary standards for public welfare protection.

The Clean Air Act requires EPA to review the NAAQS every five years to ensure adequate health and environmental protection is being provided. In 1997, the EPA replaced the existing ozone NAAQS with an 8-hour standard of 84 parts per billion (using standard rounding conventions). In 2008, EPA issued a final rule revising the ozone standard, which set the level at 75 parts per billion.[3]

In July 2011, outside of the normal five year review process, EPA submitted a draft final rule for reconsideration of the 2008 ozone NAAQS that was subsequently withdrawn in September 2011 by President Obama.[4]

EPA is now in the process of reviewing the NAAQS. In February 2013, the agency released its final Integrated Science Assessment (ISA), a document guided by advice from the Clean Air Scientific Advisory Committee (CASAC). EPA is now developing and receiving CASAC feedback on the Risk and Exposure Assessment (REA) and Policy Assessment (PA). These documents build on the ISA and discuss options for either retaining or revising existing standards. Based upon advice provided by CASAC, EPA will propose and finalize an updated ozone NAAQS (See Appendix B).

OZONE CONTRIBUTIONS:

EPA's final ISA for Ozone and Related Photochemical Oxidants makes a distinction between ozone concentrations that result from precursor emissions that cannot be controlled from those that are controllable through U.S. policies:

> "For this document, EPA has considered background O_3 concentrations more broadly by considering three different definitions of background. The first is natural background which includes contributions resulting from emissions from natural sources (e.g., stratospheric intrusion, wildfires, biogenic methane, and more shortlived VOC emissions) throughout the globe simulated in the absence of all anthropogenic emissions. The second is North American background (NA background) which includes contributions from natural background throughout the globe and emissions of anthropogenic pollutants contributing to global concentrations of O_3 (e.g., anthropogenic methane) from countries outside North America. The third is United States background (U.S. background) which includes contributions from natural background throughout the globe and emissions from anthropogenic pollutants contributing to global concentrations of O_3 from countries outside the United.States. U.S. background differs from NA background in that it

[2] http://www.epa.gov/air/criteria.html
[3] http://www.gpo.gov/fdsys/pkg/FR-2008-03-27/html/E8-5645.htm
[4] http://www.whitehouse.gov/the-press-office/2011/09/02/statement-president-ozone-national-ambient-air-quality-standards

includes anthropogenic emissions from neighboring Canada and Mexico. These three definitions have been explored in recent literature and are discussed further below."[5]

Contributions from the stratosphere account for variations in background ozone levels. Ozone is produced in the stratosphere naturally, through photochemical reactions. This ozone is often transported downward into the troposphere (ground level) through a process known as tropopause folding.[6] This phenomenon often occurs in conjunction with varying weather patterns, where tropospheric and stratospheric air mixes, contributing to increased background ozone levels at ground level. Additionally other occurrences can lead to increases in ozone; deep convection is capable of penetrating the troposphere during summer months. Biomass burning, such as wildfires, can also be a source of ozone precursors. Not only can wildfires in the US affect background ozone levels, but the ozone from wildfires in other countries can be transported to the US.

COMPLIANCE WITH THE NAAQS

As the EPA revises the NAAQS for ozone, it must designate areas in the US which meet attainment or nonattainment of the standard. Attainment simply refers to a state or region complying with federal regulations, while nonattainment means that an area is exceeding the regulated limit. States must individually develop a plan to comply with the NAAQS, while also planning to attain the standards for each area designated nonattainment. State environmental agencies must then develop State Implementation Plans (SIPs).[7] After each revised NAAQS is promulgated, both the EPA and states must undertake specific actions:

- **"Within two years after NAAQS promulgation:** With input from the states and tribes, EPA must identify or "designate" areas as meeting (attainment areas) or not meeting (nonattainment areas), the standards. Designations are based on the most recent set of air monitoring data.
- **Within three years after NAAQS promulgation:** All states must submit plans, known as state implementation plans (SIPs), to show they have the basic air quality management program components in place to implement a new or revised NAAQS, as specified in Clean Air Act section 110.
- **Within 18-36 months after designations:** Due dates for nonattainment area SIPs are based on the area designation date and vary by pollutant and area classification. SIPs for Ozone, $PM_{2.5}$, and CO nonattainment areas are generally due within 36 months from the date of designation. Each nonattainment area SIP must outline the strategies and emissions control measures that show how the area will improve air quality and meet the NAAQS. In addition, the CAA mandates that areas adopt certain specified control requirements."[8]

[5] U.S. Environmental Protection Agency, Integrated Science Assessment for Ozone and Related Photochemical Oxidants. 2013. Page 3-31. Available at: http://www.epa.gov/ncea/isa/.
[6] Ibid, pg. 3-32.
[7] http://www.epa.gov/airquality/urbanair/sipstatus/overview.html
[8] http://www.epa.gov/airquality/urbanair/sipstatus/process.html

After a state submits its SIP, the EPA then reviews and either approves it in full, in part, or disapproves. The public does have an opportunity to submit comments on the EPA's proposed actions. If a state fails to submit a plan, or if the EPA disapproves of the plan, the EPA is required to develop a federal implementation plan.[9]

ADDITIONAL READING

- U.S. Environmental Protection Agency, Integrated Science Assessment for Ozone and Related Photochemical Oxidants. 2013. Available at: http://www.epa.gov/ncea/isa/
- Emery, C., Jung, J., Downey, N., Johnson, J., Jimenez, M., Yarwood, G., Morris, R., 2012. Regional and Global Modeling Estimates of Policy Relevant Background Ozone over the United States. Atmos. Environ. 47, 206-217.
- Lin, M., Fiore, A.M., Cooper, O.R., Horowitz, L.W., Langford, A.O., Levy II, H., Johnson, B.J., Vaishali, N., Oltmans, S.J., Senff, C.J., 2012. Springtime High Surface Ozone Events over the Western United States: Quantifying the Role of Stratospheric Intrusions. J. Geophys. Res. 117, D00V22, doi:10. 1029/2012JD018151.
- McDonald-Buller, E.C., Allen, D.T., Brown, N., Jacob, D.J., Jaffe, D., Kolb, C.E., Lefohn, A.S., Oltmans, S., Parrish, D.D., Yarwood, G., Zhang, L., 2011. Establishing Policy Relevant Background (PRB) Ozone Concentrations in the United States. Environ. Sci. & Tech. 45, doi: 10.1021/es2022918, 9484-9497.

[9] Ibid

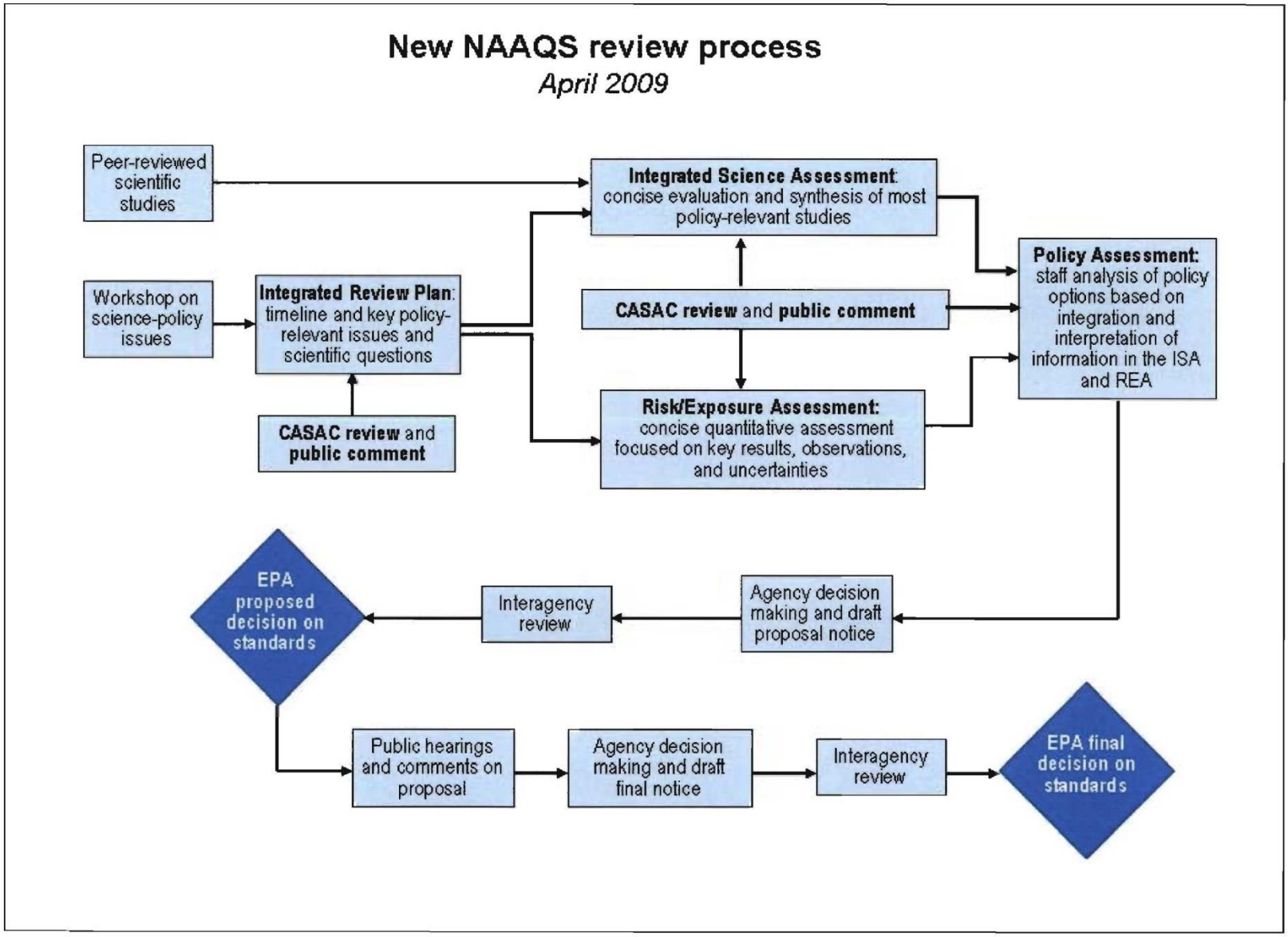
Appendix A:

Table of Historical Ozone NAAQS[10]

Final Rule/Decision	Primary/ Secondary	Indicator	Averaging Time	Level	Form
1971 36 FR 8186 Apr 30, 1971	Primary and Secondary	Total photochemical oxidants	1-hour	0.08 ppm	Not to be exceeded more than one hour per year
1979 44 FR 8202 Feb 8, 1979	Primary and Secondary	O_3	1-hour	0.12 ppm	Attainment is defined when the expected number of days per calendar year, with maximum hourly average concentration greater than 0.12 ppm, is equal to or less than 1
1993 58 FR 13008 Mar 9, 1993	EPA decided that revisions to the standards were not warranted at the time				
1997 62 FR 38856 Jul 18, 1997	Primary and Secondary	O_3	8-hour	0.08 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
2008 73 FR 16483 Mar 27, 2008	Primary and Secondary	O_3	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years

[10] http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_history.html

Appendix B[11]:



[11] http://www.epa.gov/ttnnaaqs/pdfs/NAAQSReviewProcessMemo52109.pdf

Appendix C:

Percent Change in Air Quality[12]

	1980 vs 2010	1990 vs 2010	2000 vs 2010
Carbon Monoxide (CO)	-82	-73	-54
Ozone (O_3) (8-hr)	-28	-17	-11
Lead (Pb)	-90	-83	-62
Nitrogen Dioxide (NO_2) (annual)	-52	-45	-38
PM_{10} (24-hr)	---	-38	-29
$PM_{2.5}$ (annual)	---	---	-27
$PM_{2.5}$ (24-hr)	---	---	-29
Sulfur Dioxide (SO_2) (24-hr)	-76	-68	-48

Notes:
1. --- Trend data not available
2. Negative numbers indicate improvements in air quality

National and local air quality trends graphs showing the nation's progress towards clean air are available for: carbon monoxide (CO), ozone (O_3), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM), and sulfur dioxide (SO_2).

[12] http://www.epa.gov/airtrends/aqtrends.html