

30 September 2008 Public Comments on the EPA's *Risk and Exposure Assessment for Review of the Secondary NAAQS for Oxides of Nitrogen and Oxides: First Draft*

Submitted by Ellen Porter, Air Resource Division, National Park Service

Dear CASAC panel members:

I'm Ellen Porter, a biologist from the Air Resources Division of the National Park Service. I appreciate this opportunity to address the CASAC NO_x and SO_x Secondary NAAQS Review Panel on behalf of the National Park Service. The National Park Service has been entrusted with the management of some of the most beautiful and unique areas in our country. National parks represent a legacy from Americans today to generations of Americans yet to come. As a nation, we have promised to leave these extraordinary places of discovery and power in a condition that is unimpaired so that they will continue to serve the needs of society to connect to authentic places for their educational, recreational, and restorative values. Yet in many parks, stresses from outside park boundaries have degraded resources. Deposition of air pollutants has acidified streams, reduced biodiversity, and altered nutrient cycling in soils. Some streams in Shenandoah and Great Smoky Mountains National Parks are acidified and brook trout populations have been lost. Throughout the National Park System, ecosystems are experiencing changes ranging from subtle to the extreme as a result of pollutant deposition. Alpine lakes and meadows in Rocky Mountain National Park, a park most people would consider pristine, are being significantly altered by nitrogen deposition. These effects are occurring despite the fact that these parks are in attainment of the Secondary NAAQS for nitrogen dioxide and sulfur dioxide, standards established to protect public welfare. And, as the Risk and Exposure Assessment details, these harmful effects extend well beyond national parks, including many sensitive ecosystems across the country. Current standards are clearly not providing the requisite level of protection required by the Clean Air Act.

EPA is now proposing an innovative approach to expressing the secondary standard in terms of ecological indicators and endpoints linked to atmospheric concentrations. Secondary standards based strictly on atmospheric concentrations of NO_x and SO_x have failed because there are no direct links between concentrations of these pollutants and ecosystem responses. Rather, it is the amount of nitrogen and sulfur compounds deposited into an ecosystem that affects response. The scientific literature has clearly defined relationships between deposition and many types of ecosystem responses. Ecosystem models are routinely used to predict the amount of deposition that will result in a given effect. EPA has relied on this extensive knowledge base to develop a well-reasoned conceptual model of the possible structure of a secondary standard based on an ecological indicator's response to deposition. The model illustrates the relationship between an ecosystem indicator, atmospheric and ecological variables, deposition, and atmospheric concentrations of nitrogen and sulfur compounds. In this model, the secondary standard would be based on a "standard level" established to protect an

ecological indicator. For example, for acid-neutralizing capacity, or ANC, a standard level of 100 microequivalents per liter would protect most streams and lakes from acidification. Ecosystem models can predict the amount of deposition that would maintain this ANC in an area, given bedrock and watershed characteristics, while atmospheric models can predict the concentrations of NO_x and SO_x that would result in that amount of deposition for a selected area. This approach provides a uniform level of protection to ecosystems while recognizing that deposition, meteorology, and other factors vary across regions, providing flexibility in implementation.

The National Park Service believes this approach to be reasonable and soundly based on ecosystem science, and in accord with the intent of the Clean Air Act to protect public welfare. We encourage EPA to further apply the conceptual model for the standard to ecological indicators for terrestrial acidification and nutrient nitrogen enrichment of aquatic and terrestrial ecosystems. We believe that this approach can result in a suite of secondary standards that are ecosystem-based, ecologically meaningful, and scientifically sound, eventually ensuring increased protection for national parks, and other areas, for the benefit of future generations.

Thank you.