DOCKET # EPA-HQ-OAR-2007-1145
Submitted to EPA via email on July 17, 2009

Appalachian Mountain Club (AMC) comments on: *Risk and Exposure Assessment to Support the Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur: Second Draft*

AMC is a non-profit recreation and conservation organization of 90,000 members. Our science staff have been monitoring cloud and rain water chemistry at a high elevation site on Mount Washington in the White Mountain National Forest, NH since the early 1980's. We appreciate this opportunity to comment on of the second draft REA. AMC believes there is significant evidence that the current secondary standards do not protect the public welfare and that ecologically meaningful revisions should be adopted. We support that this review includes both ambient atmospheric sulfur and nitrogen compounds jointly. We believe the proposed structure of a secondary standard outlined in this REA is appropriately based on ecological indicators and protection of ecosystems. We provide some specific comments on the second draft REA below.

Occult deposition should be included in case study analyses and metric development
EPA recognizes that occult deposition is a key component of total deposition of S and N especially in mountain regions (Section 3.5, pg. 3-91). However, because it is not routinely measured it was not taken into account in the review (Section 3.1, pg. 3-2) and EPA ignores, in it's concluding remarks, that excluding occult deposition will lead to uncertainty in deposition estimates in the case studies (Section 7.2). Red spruce, a key species in the assessment of terrestrial acidification, is often found at mid to high elevations were it can be immersed in clouds. Further, higher elevation in the Eastern US, where occult deposition is frequent, often have soils that are more susceptible to acidification.

We recognize that cloud water measurements are not common however there have been studies documenting the contribution of cloud input of S and N (e.g. MADPro) and models developed to estimate the contribution of occult deposition to higher elevation ecosystems. Because the REA is a critical document in which policy development will be based EPA should include measured and/or estimated cloud deposition of S and N in its case studies and in any development of methods to be used in establishing metrics for the secondary NAAQS.

Nitrogen enrichment in mountain ecosystems should be recommended
While EPA recognizes there is a strong relationship between nitrogen deposition and ecological impacts at high alpine lakes in the Rocky Mountains, and that there is also strong evidence for ecological impacts from terrestrial nitrogen enrichment, the agency

fails to include any nitrogen enrichment effects in the final recommendation or in the summary table to inform the decision of developing the secondary standard. The majority of high elevation mountains, including those along the Appalachian mountain range, are only receiving *atmospheric* inputs of S and N and the complexity of other sources of these pollutants is removed. EPA should develop secondary standards based on sensitive ecosystem protection rather than developing one broad national or regional standard. Therefore, based on the strong scientific effect evidence, EPA should recommend in the final REA, in addition to aquatic and terrestrial acidification, development of a secondary standard that relates specifically to nitrogen nutrient enrichment in high elevation aquatic and terrestrial systems.

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