

## **Passive Ammonia Monitoring in the United States: Comparing Three Different Sampling Devices**

Puchalski, Melissa<sup>a</sup>; Sather, Mark<sup>b</sup>; Walker, John T.<sup>c</sup>; Lehmann, Christopher<sup>d</sup>; Gay, David<sup>d</sup>; Mathew, Johnson<sup>e</sup>; Robarge, Wayne<sup>f</sup>

The contribution of nitrogen to ecosystems and to PM<sub>2.5</sub> formation is known to be significant in the United States. To date, there have been few monitoring efforts to establish a total nitrogen baseline, or measure trends and regional variability of total nitrogen. The US EPA is faced with tightening budgets and stricter PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS) with an increasing need to understand the spatial and temporal variability of NH<sub>3</sub> concentrations to evaluate and validate air quality models and deposition flux estimates. Passive samplers have the benefit of being easy to deploy, cost-effective and provide an accurate measurement. The trade-off is that passive samplers provide lower temporal resolution, typically 1 to 2 weeks. The US EPA's ORD has deployed the Adapted Low-Cost Passive High Absorption (ALPHA) passive sampler at several sites throughout NC as part of the CAMNet study. The NADP has deployed Radiello<sup>®</sup> passive samplers at more than 50 sites as part of the Ammonia Monitoring Network (AMoN). EPA's Region 6 Air Quality group deployed Ogawa passive samplers throughout the southwest and central US to begin studying the potential effects of NO<sub>x</sub> controls from the oil/gas and power generation industries on ambient NH<sub>3</sub> concentrations and regional haze. This paper compares the accuracy and precision of the three passive samplers. Each sampler was shown to be comparable and reliable; however, each sampler also has pros and cons. The lessons learned from the deployment of each sampler should be used when planning a research or network-wide study.

<sup>a</sup> Clean Air Markets Division, U.S. EPA 1200 Pennsylvania Ave NW Washington D.C. (202)343-9882 [puchalski.melissa@epa.gov](mailto:puchalski.melissa@epa.gov)

<sup>b</sup> Air Quality Analysis Section, U.S. EPA Region 6 1445 Ross Ave. Dallas, TX

<sup>c</sup> National Risk Management Research Laboratory, U.S. EPA 109 T.W. Alexander Dr. Research Triangle Park, NC

<sup>d</sup> National Atmospheric Deposition Program, Illinois State Water Survey, Univeristy of Illinois at Urbana-Champaign 2204 Griffith Dr.

<sup>e</sup> Houston Laboratory, U.S. EPA Region 6 10625 Fallstone Rd. Houston, TX

<sup>f</sup> North Carolina State University P.O. Box 7619 Raleigh, NC