Use of Next Generation Air Monitoring Sensors in Industrial Applications

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In recent years there has been considerable interest by industrial, private and regulatory sectors in the development of Next Generation Air Monitoring (NGAM) sensor technology. The primary driver behind this effort has been the prospect of a more comprehensive air quality monitoring approach that uses NGAM sensor networks to generate air quality data at much higher spatial and temporal resolution and considerably lower cost than traditional State or Local Air Monitoring Station (SLAMS) networks. However, lower cost often comes with the tradeoff of lower data quality.

To overcome inherent sensor shortcomings and improve data quality, NGAM sensor readings need to be corrected for the effects of changes in ambient conditions and matrix interferences. Traditionally, the extent of these corrections is determined by co-location of the NGAM sensors with reference method grade monitoring instruments and subsequent development of correction algorithms. Many manufacturers of NGAM equipment have developed such algorithms over numerous field trials and are updating them as new data becomes available.

Despite the constant improvement in the NGAM sensors and their correction algorithms, the perception is that ongoing quality assurance by continued and frequent co-location with reference method grade monitoring instruments is essential for the generation of defensible data. Unfortunately, this is often not practical or even possible. This paper presents an industrial use case of NGAM equipment for source identification and impact assessment and discusses data quality assurance and control approaches in applications where continued and frequent co-location with reference grade equipment is not feasible. Application-specific data quality objectives are discussed with a focus on defensible