EVALUATION OF TEOM METHOD FOR THE MEASUREMENT OF PARTICULATE MATTER

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Abstract

The National Ambient Air Quality Standard (NAAQS) for Particulate Matter (PM) is used to determine attainment and nonattainment. EPA requires state air pollution regulatory agencies (SAPRAs) to monitor PM for attainment purposes. Over the past fifteen years, many SAPRAs have begun using the Tapered Element Oscillating Microbalance (TEOM) sampler to measure PM_{10} concentrations. The TEOM sampler was designated a federal equivalent method sampler for PM_{10} by EPA. The TEOM sampler offers several important advantages over the federal reference method (FRM) gravimetric sampler including automated operation, reduced maintenance, and continuous, real-time measurement of PM. Consequently, SAPRAs have been able to lower PM monitoring costs by replacing FRM gravimetric samplers with TEOM samplers. Although the benefits of using a TEOM sampler are significant, previous research has shown that when collocated with a FRM sampler, the TEOM sampler will frequently report higher PM_{10} concentrations. Previous research has also shown that the difference between TEOM and FRM sampler concentrations is greater for areas with high levels of PM_{10}. This paper presents the results of PM_{10} and TSP concentrations measured by collocated TEOM and FRM gravimetric samplers at two Texas cattle feedlots. The results demonstrate that when sampling downwind from the cattle feedlot, the TEOM sampler measured higher TSP and PM_{10} concentrations than the FRM gravimetric sampler. Similarly, at the upwind location the TEOM sampler measured lower TSP and PM_{10} concentrations than the FRM gravimetric sampler.