Comments on Risk and Exposure Assessment to Support the Review of the SO_2 Primary National Ambient Air Quality Standards: First Draft

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Three Issues in Five Minutes

- **Decline in the Number of Monitors**
- **Prediction of 5-Minute Max Exceedances**
- **Roll-Up to "Just-Meet" Standards**

Decline in Number of Monitors

- **Draft REA documents large decline in the number of 5-minute max and 1-hour average SO_2 monitors.**

Figure 6-11: Decline in 5-Min Max Monitors

Figure 6-11. Number of ambient monitors measuring 5-minute maximum SO_2 concentrations and number of monitors with at least one benchmark exceedance by year, Years 1997 through 2007.

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Figure 6-17: Decline in 1-Hour Average Monitors

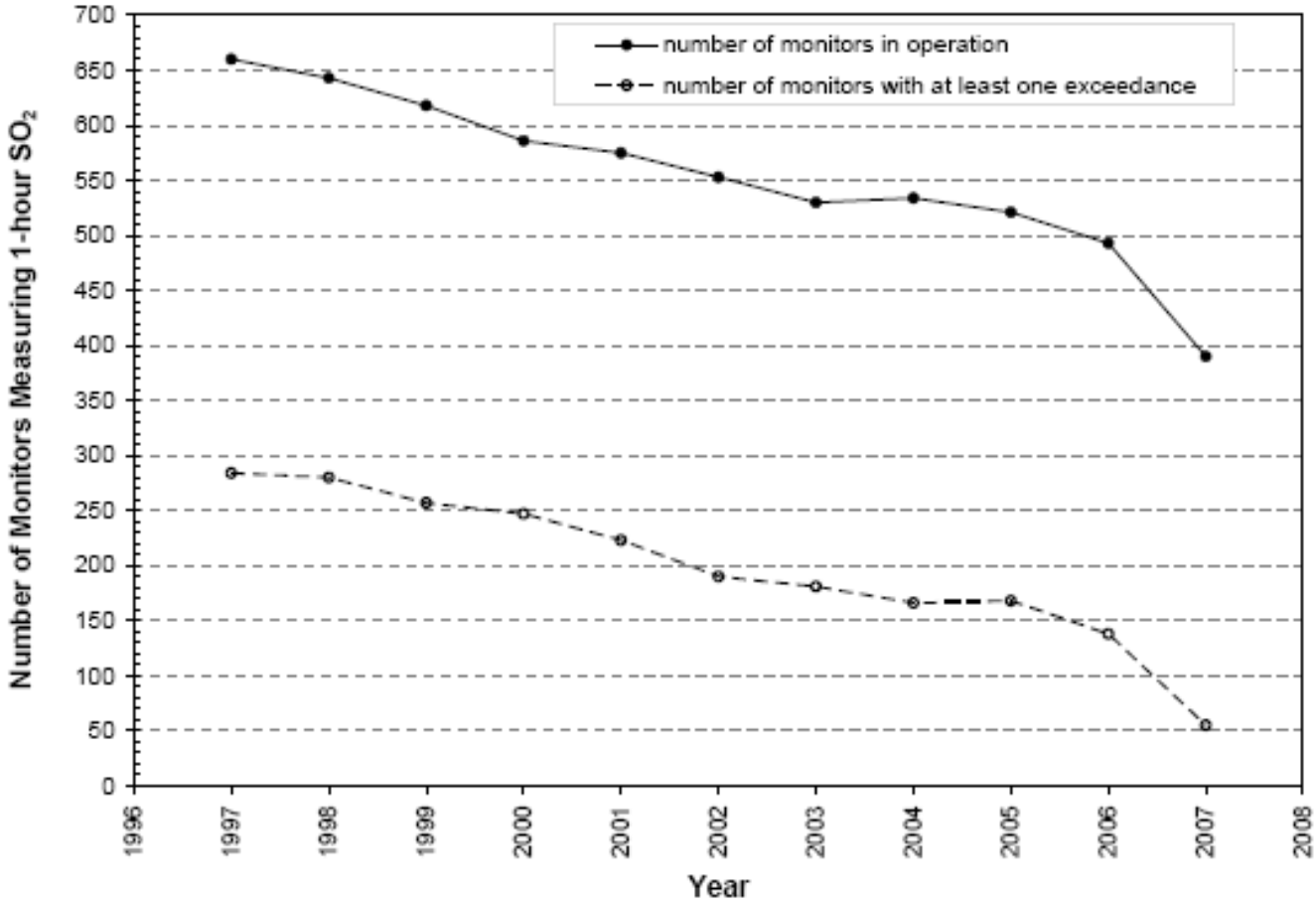

Figure 6-17. Number of ambient monitors measuring 1-hour average SO_2 concentration concentrations and number of monitors with at least one benchmark exceedance by year, Years 1997 through 2007.

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Assessing the Effect

- **EPA should explore the temporal and geographic patterns in which monitors have been removed.**
- **In particular, EPA should focus on whether non-random monitor closure could be introducing systematic bias in the prediction of exceedances.**

Prediction Using Peak-to-Mean Ratio (PMR)

- **EPA employs a PMR to predict 5-minute max concentrations from 1-hour average concentrations.**
- **EPA's current PMR is based on COV.**
- **COV is useful for summarizing dispersion of data.**
- **It is less appropriate as a predictive method in this setting.**
  - Traditional standard deviation of normally distributed data.

Evidence of Over-Prediction for 400 PPB Level

Table 6-3. Comparison of measured and modeled number of 5-minute maximum concentrations above 400 ppb located near a petroleum refinery.

Monitor ID	Number of 5-minute Maximum SO_2 > 400 ppb	
	Measured	Mean Modeled
291831002	0	3
301110066	5	13
301110079	0	0
301110080	3	3
301110082	0	0
301110083	1	1
301110084	0	0
301112008	0	0

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Predicting Exceedances

- **EPA should recognize that it is predicting exceedances, which is a "rare" event.**
- **EPA should consider using more standard parametric models for prediction.**
  - Logistic, exponential, and/or log-normal.
- **EPA should document the quality of any prediction method using actual 5-minute max concentrations as a benchmark.**
- **EPA should develop confidence intervals for any prediction method to assess the relevance of sampling variability.**

Roll-Up Approach Stretches the Bounds of Realism

- **Following the NO_2 REA, EPA conducts a roll-up of the "as-is" standard to a "just-meets" standard.**
- **EPA's roll-up factors used in the draft SO_2 REA are even larger than those used in the NO_2 REA.**
  - Median factor is 3.75.
  - Top 25% of factors range from 4.47 to 15.85.
- **Process lacks scientific credibility as it requires an unwarranted degree of extrapolation from observed data.**
- **Statistically, it is unclear whether an entire distribution can be credibly "rolled up" in such a manner.**

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