

H. 532 Section 5 Study

Monthly Progress Report November 2007

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Background and Introduction

The Section 5 study of the Omya site in Florence/Pittsford, Vermont, is being conducted in two Phases. Phase I of the Section 5 Study was completed in January 2007, culminating in a detailed Phase I project report. Phase I focused on the assessment of existing data and studies, and led to the identification of new data that have been collected in Phase II. This last stage of the Section 5 Study involves data interpretation and making final determinations regarding environmental and public health impacts.

Progress on select topics during November 2007 follows. Readers wishing to review Progress Reports from prior months may access these at:

http://www.omyainvermont.net/lib_sect5.htm#Section5Notes

Also, detailed information is forthcoming with the full Section 5 Report, due to be delivered to the Vermont Legislature in January 2008.

Meetings

A highlight of last month's activities was the November 27, 2007 meeting with the Oversight Team, at which we presented additional information on our investigations of dust, noise, hydrogeology, and toxicology. Of these topics, we provide some additional information on the topics of dust and noise in this progress report. Both dust and noise (1) have been longstanding concerns of citizens living near Omya, (2) are tangible, perceptible impacts, (3) can be difficult to define and evaluate, (4) originate from multiple, overlapping sources, (5) are objectionable to individuals at varying degrees, (6) are sometimes regarded as "only" nuisances, often determined subjectively, and (7) can usually be mitigated through controls and best management practices, provided that major sources can be identified and minimized or eliminated.

Dust

Although we are still processing data collected in the dust monitoring study, we have evaluated enough data to reach some preliminary findings regarding the extent to which Omya's operations lead to increased levels of dust in the area surrounding the facilities. Some of these data are still undergoing review, and additional data are still being processed, so specific and general conclusions may change once the complete data are available and reviewed.

The general patterns of ambient dust levels observed among the nine sampling sites are depicted in Figure 1, which provides frequency plots of the primary, filter-based Total

Suspended Particulate (TSP) concentrations measured between July 17th and October 27th. In the frequency plots, each tick mark on the vertical axis indicates two days of TSP concentrations between the levels shown on the horizontal axis. So, for example, at site 8 (the westernmost site), TSP was between 0 and 5 $\mu\text{g}/\text{m}^3$ on three days, and between 35 and 40 $\mu\text{g}/\text{m}^3$ on one day. Not all stations have the same number of days' worth of data, due to data collection problems with some particular stations and days. The red line and red number on each frequency plot show the average TSP concentration measured at that station. Overall, the average dust levels are fairly consistent among the sites, with six of the nine sites having average levels from 15 to 21 $\mu\text{g}/\text{m}^3$. The three sites with higher dust levels are site 2 (26 $\mu\text{g}/\text{m}^3$) and site 3 (35 $\mu\text{g}/\text{m}^3$), which are located along the portion of West Creek Road used by trucks traveling to/from the Omya Verpol facility, and site 9 (30 $\mu\text{g}/\text{m}^3$), which is located at the Maclure Library on Route 7 in Pittsford.

A time-series plot of the primary TSP concentrations measured from July 17th through October 27th is shown in Figure 2. The break in the data from August 13th through August 19th is due to the malfunction and repair of the microbalance at UVM. Data collected prior to this period are generally more uncertain than data collected after this period (a point to be discussed at greater length in the final Section 5 Report). On several of the sampling dates (notably September 21st and 27th, and October 6th), all nine sites displayed elevated dust levels. To examine a potential cause of these elevated concentrations, data from Vermont's ambient air monitoring network were obtained. Figure 3 shows PM_{2.5} concentrations measured at four locations throughout Vermont. PM_{2.5} is atmospheric particulate matter which has an effective aerodynamic diameter of 2.5 microns or less; it is therefore a subclass of TSP which comprises particulate matter with diameters up to about 35 microns. The PM_{2.5} concentrations shown in Figure 3 were measured using a tapered element oscillating microbalance (TEOM) instrument that records concentrations every hour. Figure 3 shows the 24-hour averages of these measurements for dates when samples were collected as part of the Omya dust study, and with the data plotted in the same way as in Figure 2. By comparing Figure 2 and Figure 3 it is clear that the patterns of elevated TSP levels measured in the dust study on September 21st and 27th, and October 6th are largely explained by elevated dust levels throughout Vermont. The statewide nature of these episodes is probably due a combination of regional-scale transport of particulate matter to Vermont from out of state and regional-scale stagnant meteorological conditions that allow elevated concentrations to develop. It can be seen from Figure 3 that the high TSP levels observed on some other dates during the dust study (*e.g.*, July 26th, August 25th) are at least partly due to regional effects.

Time-resolved dust data were collected at three of the sampling sites (numbers 3, 4, and 8 on Figure 1). These measurements provide information on short duration changes in ambient dust levels. Examples of different types of patterns among the time-resolved data are shown in Figure 4 and Figure 5. Figure 4 shows the 5-minute and 1-hour average concentrations recorded by the E-samplers on August 25th when all three monitors show elevated levels during the entire day and very high levels for several hours

in the middle of the day. These elevated concentrations were also observed at Vermont DEC monitors in other parts of the state as indicated in Figure 3. Figure 5 shows the 5-minute and 1-hour average concentrations recorded by the E-samplers on September 12th when fairly low dust concentrations were generally observed except for the period between 7:00 A.M. and 1:00 P.M. at site 3 (located along the Omya truck route). A similar pattern is seen on a number of other sampling days in the E-Sampler data, and we are evaluating potential causes of this pattern.

Noise

Lawrie Copley's investigation of noise impacts has become more comprehensive. Based on his review and analysis, Omya appears to have collected enough data with its spectral instrument to identify some of the sources that are likely contributors to noise levels experienced in the area where Markowski and Whipple Hollow Roads meet. Some important sources of noise can likely be mitigated through reasonable measures, while others may require more time to evaluate, and may or may not be easily minimized. Based on model projections, Omya's proposed dewatering facility will not be a significant source of additional noise in the Florence community. The modeling techniques used by HMMH (Omya's noise consultant) may also be a useful tool in evaluating existing sources of noise.

A challenging aspect of noise evaluation and management is the determination of "acceptability criteria". Vermont, like many states, does not have statewide numeric or other objective standards for noise; noise from industrial activity is supposed to be in harmony with nearby residential uses, otherwise undefined. Factors such as tonal quality, steadiness and intermittence, and background noise (both in quantity and quality) all affect noise perception, and should be considered in establishing site-specific acceptability criteria.

Next Steps

December work will be devoted to resolving data issues and drafting our Study Report. CLFV will be distributing drafts of report chapters and appendices to the Oversight Team as they become available. Some uncertainties will likely remain at the end of our study, in part because the findings of our investigations have led to additional questions. (This is typically the case in environmental and public health assessment of all but the simplest of sites). Regardless, based on our findings to date, we can with reasonable confidence satisfy the legislative goal of determining whether, and to what extent, Omya's Verpol operations harm the environment or public health.

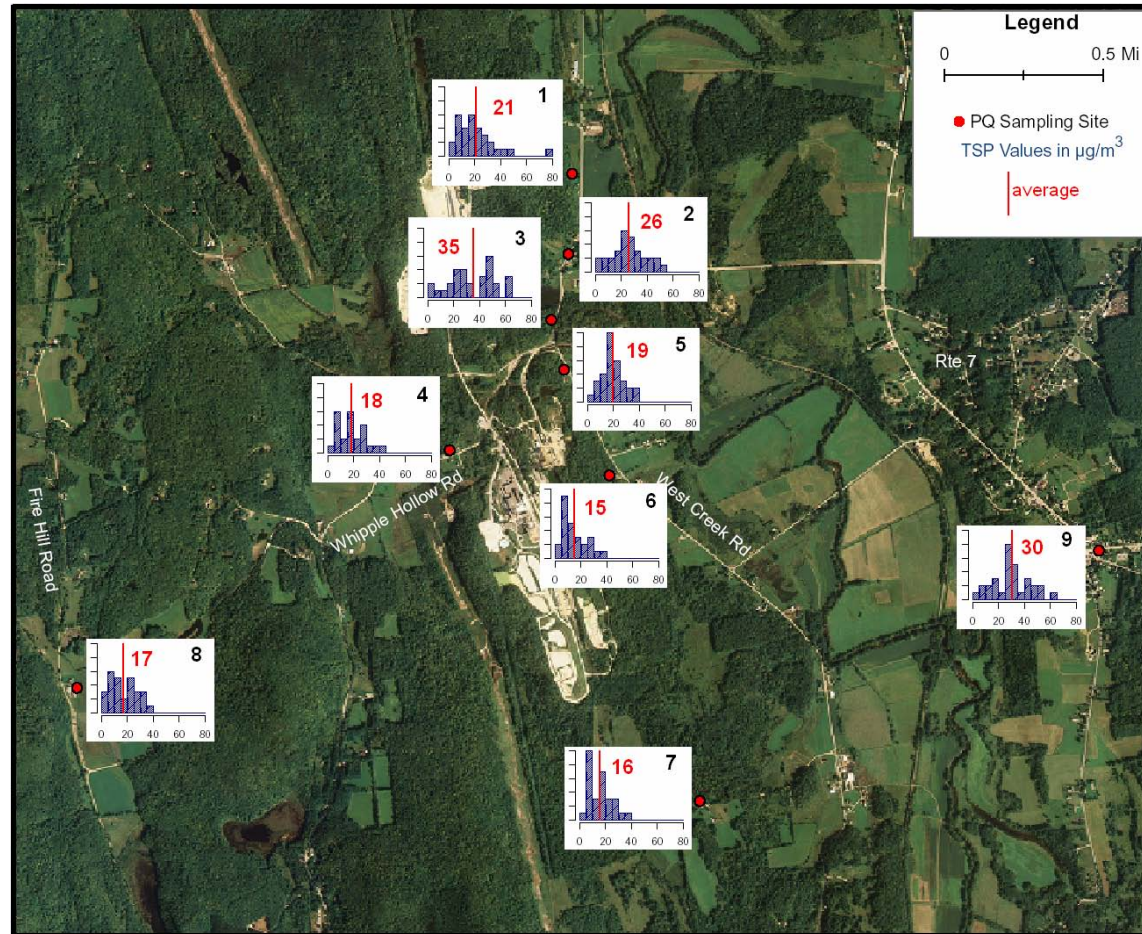


Figure 1. Overall tendencies among measured Total Suspended Particulate (TSP) concentrations in the area surrounding the Omya facilities between July 17 and October 27, 2007. The red circles show the locations of the monitoring stations (indicated in black numerical at the upper right of the frequency plots). The values in red indicate the average of the measured TSP concentrations over the period.

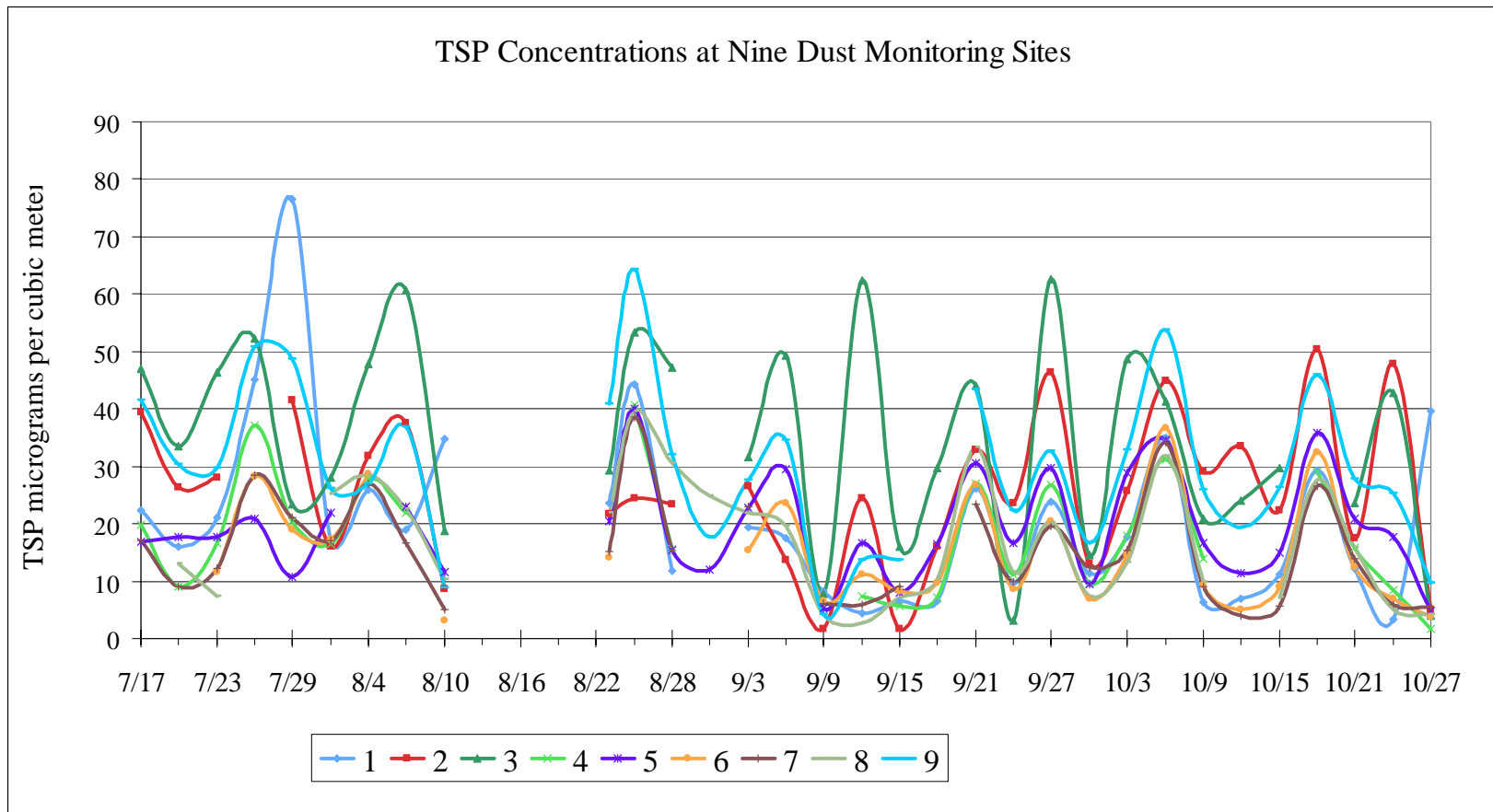


Figure 2. Time series plot of measured TSP concentrations from July 17 through October 27, 2007. Locations of the sampling sites are shown above in Figure 1. The periods of elevated TSP levels observed at all nine monitoring sites (e.g., September 21st and 27th, and October 6th) should be compared with data collected elsewhere in Vermont for the same periods shown in Figure 3.

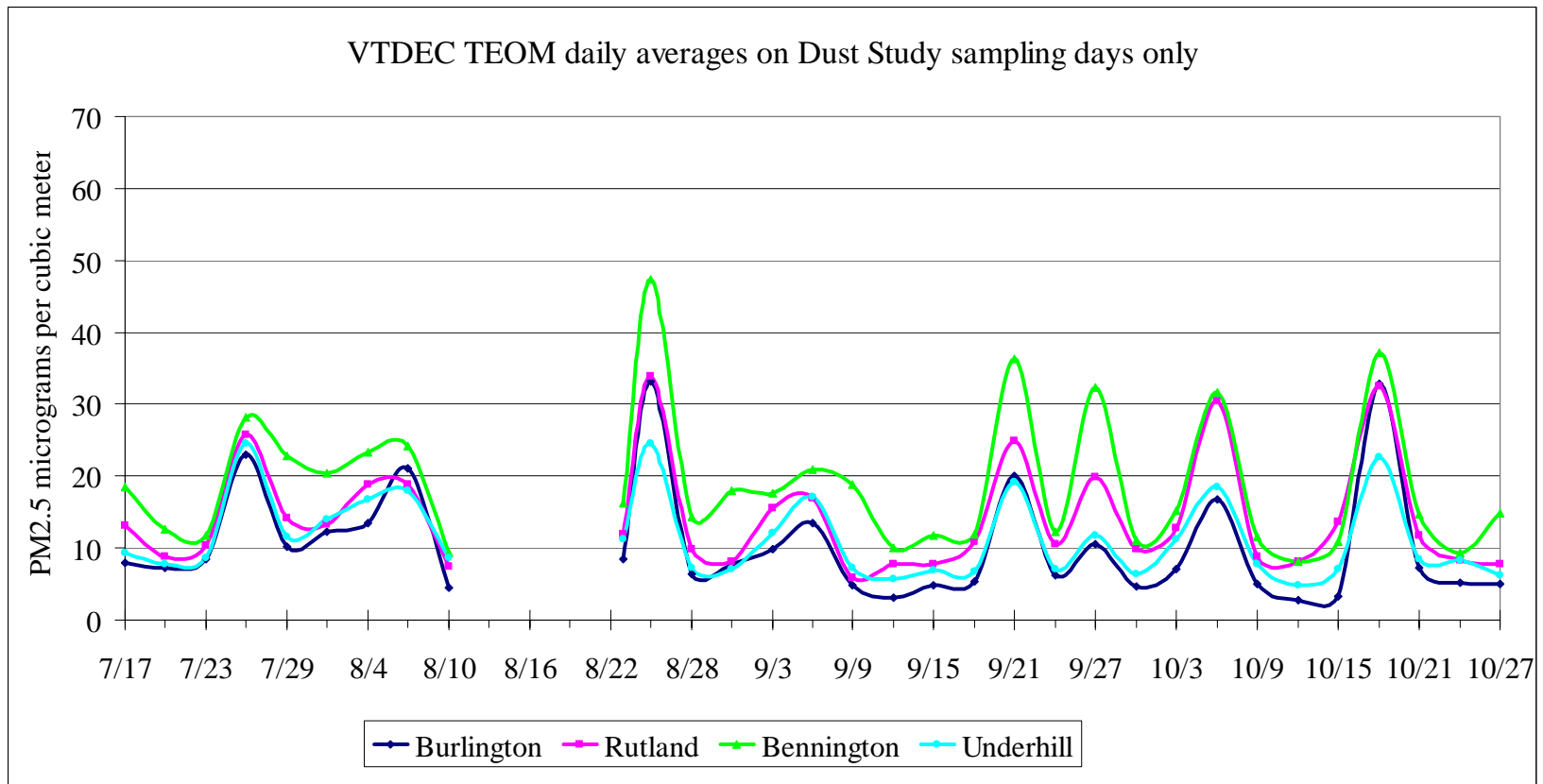
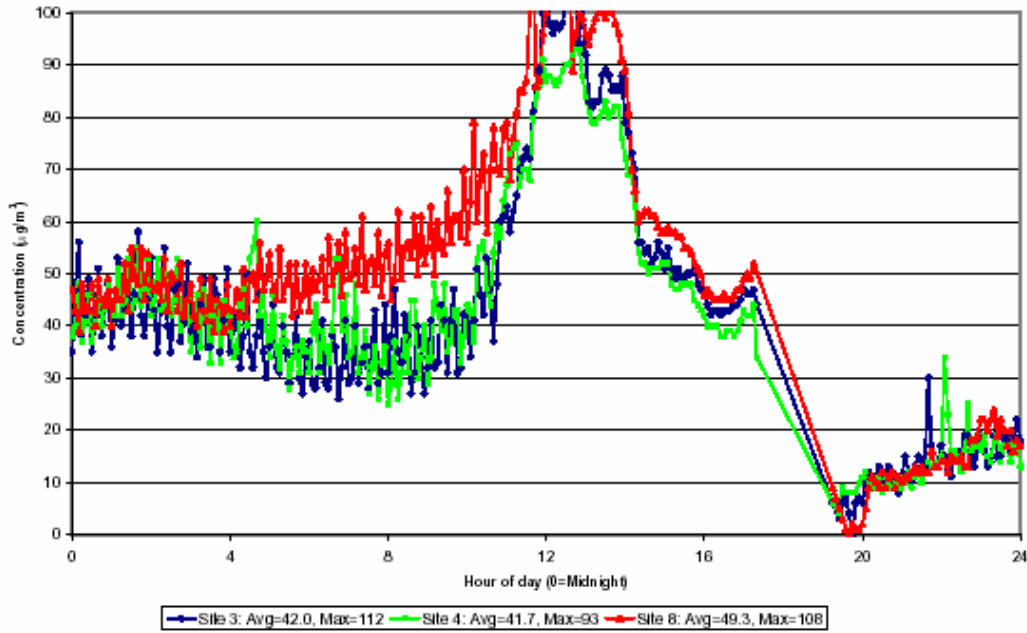


Figure 3. Time series plot of PM_{2.5} concentrations measured at four locations in Vermont by the Department of Environmental Conservation, and available at <http://www.anr.state.vt.us/air/Monitoring/cfm/PM25Current.cfm>. The measurements are taken every hour; 24-hour averages were calculated for the dates when sampling was conducted as part of the Omya Dust Study, and displayed in the same way as in Figure 2.

August 25, 2007

E-Sampler Data: Raw Measurements



August 25, 2007

E-Sampler Data: Hourly Averages

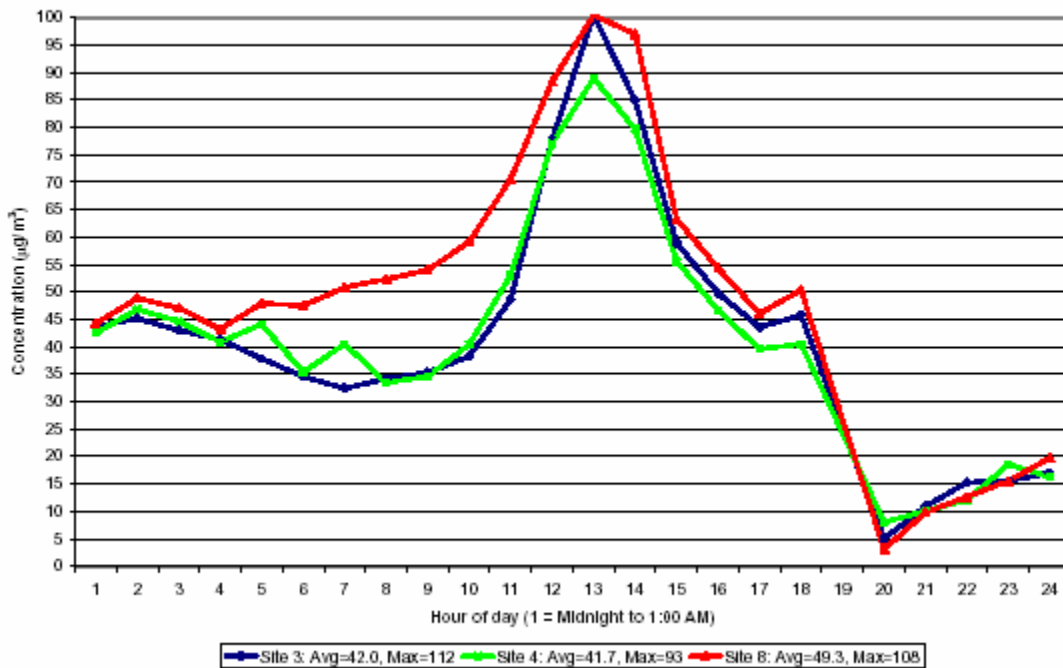
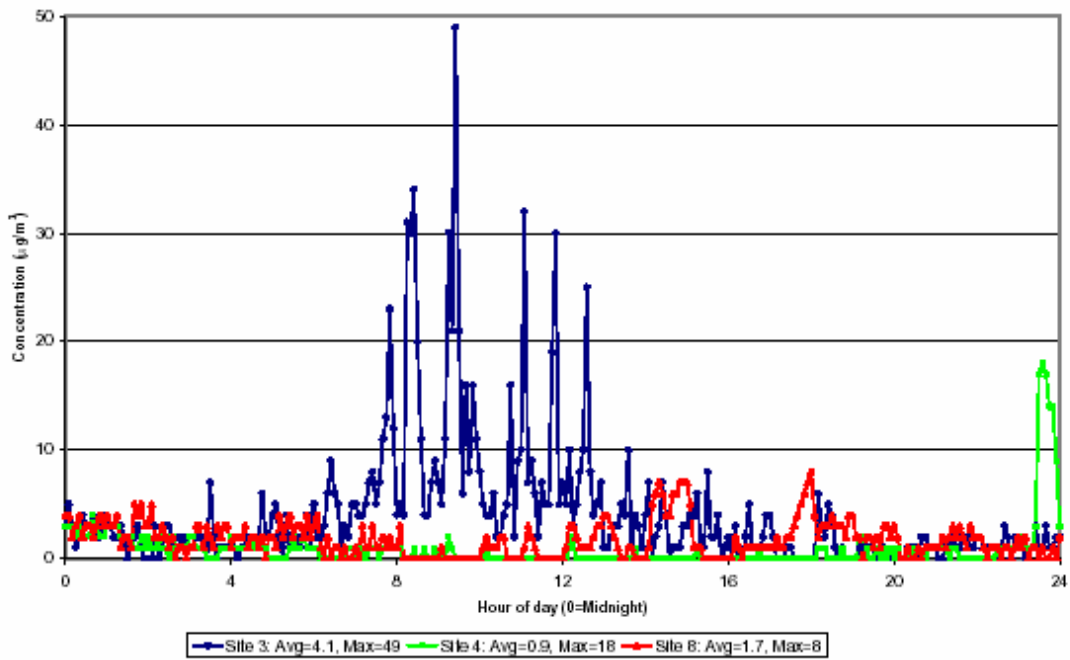


Figure 4. Five-minute and one-hour average particulate matter concentrations as measured by the Dust Study's three E-Samplers on August 25, 2007.

September 12, 2007

E-Sampler Data: Raw Measurements



September 12, 2007

E-Sampler Data: Hourly Averages

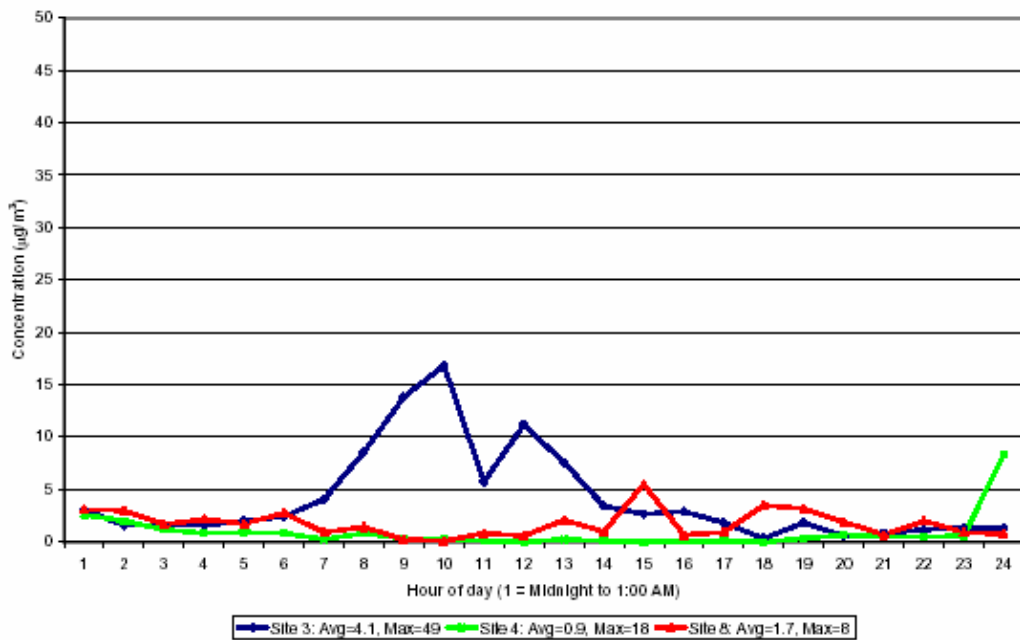


Figure 5. Five-minute and one-hour average particulate matter concentrations as measured by the Dust Study's three E-Samplers on September 12, 2007.