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DATE: February 18, 2005

SUBJECT: VARIABILITY IN DAYTIME STABILITY CLASS DESIGNATION UNDER PARTLY FOGGY CONDITIONS IN A MONITORING STUDY

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## ABSTRACT

A monitoring study conducted in August of 2004 along the Northern California coast (Wofford et al. 2005) provided an opportunity to compare two different methods for determining daytime stability classes for modeling. The ‘conventional’ method utilized field notes to determine foggy periods and assigned these hours D stability. The remaining daytime hours were assigned Pasquill-Gifford stabilities in accordance with procedures that rely on estimating the sun angle and satisfying the requirement of no more than one stability class change per hour (Johnson et al. 1999). The ‘solar radiation’ method utilized solar radiation measurements and wind speed to determine daytime hour stability (U.S. EPA 2000). Both the conventional and solar radiation methods gave similar results. The differences in stability class were well within U.S. EPA guidelines. The resulting differences in flux calculations over daytime flux intervals averaged 9.3 percent (± 11.1 standard deviation).

## INTRODUCTION

It is common along the northern coast to have foggy nights and mornings with clearing during the day. In a monitoring study of the joint application of 1,3-dichloropropene (1,3-d) and metam sodium (Wofford et al. 2005) field notes were taken to indicate times of sunny conditions and times of foggy conditions. Times were not exact but within an hour. The meteorological station measured wind speed at ten meters height and solar radiation. DPR conventionally determines daytime stability classes utilizing wind speed and sun angle in accordance with Table 1 (Johnson et al. 1999). The sun angle is classified crudely into high, moderate, and slight solar radiation. This method will be called ‘conventional.’ However, the availability of solar radiation measurements in Wofford et al., (2005) enabled use of the solar radiation Delta-T methodology (U.S. EPA 2000). The Delta-T part of the title refers to determining nighttime stability and was not employed here. Solar radiation levels are classified into four categories and together with wind speed are used to determine stability (Table 2). This will be called the ‘solar radiation’ method.

There were 18 monitoring intervals, which consisted of 4 to 12 hour periods. Nine of these were daytime intervals. The concentrations measured during the study were modeled with the industrial source complex short term (ISCST3) model (U.S. EPA 1995) using the two methods for determining stability classes. These concentration estimates were then compared to the measured values to back calculate flux for each interval (Johnson et al. 1999).

A stability class was assigned to each hour of the monitoring study using both the conventional method and the solar radiation method. Since there were no Delta-T measurements, the stability classes assigned to nighttime periods were the same. Of the nine daytime sampling intervals, there were eight intervals during which one or more hours differed in the stability class estimation (Table 3).

## RESULTS

### Stability class differences

Table 4 accounts for the differences between the two methods for estimating daytime stability classes. A count of the differences fall within U.S. EPA guidelines, which state that the solar radiation (and Delta-T) method give the same results as the Turner method about 60 percent of the time and are within one stability class about 90 percent of the time (U.S. EPA 2000). Table 4 indicates that the two methods as employed here were within one stability class 99 percent of the time. In addition, in 14 of 27 cases, which differed by one stability class, the conventional method estimated greater stability and in the remaining 13 of 27 cases it estimated less. Thus there appeared to be no consistent bias in differences between the two methods.

### Difference in individual interval flux rates

The regressions for sampling intervals 1 and 15 were not statistically significant. The concentrations and model-predicted values were each sorted from lowest to highest and regression analysis was redone. This procedure improved the $r^2$ values. For technical reasons, the conventional p values are not appropriate for sorted data and will not be reported. For the eight sampling intervals which were compared using both methods, the relative differences in flux (Tables 5 and 6) were under 20 percent, except for intervals 1 and 17 with a relative percent difference of 23.5 and 29.1 for methyl isothiocyanate (MITC), respectively, and 23.2 and 34.6 for 1,3-d, respectively. The average difference (averaging over periods) between flux calculations based on the conventional versus solar radiation approaches was 10.7 percent and 9.5 percent for MITC and 1,3-d, respectively.

To put the percent difference in context with the overall variation that occurs when calculating flux estimates, we can look at the confidence limits around the flux calculations. Table 7 lists the upper and lower 95 percent confidence limits for the flux estimates for each interval. The percent average difference was calculated for each interval and the overall mean and standard deviation for each chemical was determined. The average difference for MITC (+/- 1 sd) and 1,3-d (+/- 1 sd) was 63 percent ± 34 and 66 percent ±35, respectively.

In comparison the average differences between flux calculations based on the method used to establish stability classes for both MITC and 1,3-d were approximately six times less. Therefore, the method of determining stability classes has a smaller influence on the final estimates than the general variability involved in the calculations.

**Sensitivity of mass loss alternative schemes of analysis**
Table 8 lists the daily 24-hour Time-Weighted Average (TWA) flux for each method of stability class determination. A paired T-test on daytime fluxes found that the difference in flux results between the two methods for determining stability class was not significant for either MITC or 1,3-d. Figure 1 shows the plots of the 24-hour TWA flux rates for the two different stability class methods. In addition, the plots of the highest 24-hour TWA measured concentration found at any sampler location and the average 24-hour TWA measured concentration for all the sampler locations were added to the graph. For both chemicals the flux and concentration curves are parallel. It is interesting that while MITC flux declined; flux for 1,3-d increased over the six-day period.

Emission, as a percent of applied material, during the nine daytime sampling intervals are listed in Table 9. The total daytime emissions for MITC using the solar radiation method were seven percent higher than the conventional method. For 1,3-d, the total emission based on the solar radiation method yielded an estimate two percent below the corresponding estimate based on the conventional method.

## CONCLUSION

Two criteria were used to determine hourly daytime stability classes in conjunction with an MITC and 1,3-d monitoring study. These were called the conventional method and solar radiation method. Differences in individual hourly stability classes were within U.S. EPA guidelines for these kinds of methods. In addition, subsequent calculations based on the two different daytime stability class determinations showed statistically non-significant differences between interval-calculated fluxes. The average percent difference between flux calculations based on theses two methods was 9 percent for MITC and 9.5 percent for 1,3-d. These differences are relatively minor.

cc**:** Randy Segawa
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## REFERENCES

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U.S. EPA. 2000. Meteorological monitoring guidance for regulatory modeling applications. U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711 EPA-454/R-99-005 February 2000.

Wofford, P., J. Walters, P. Lee, J. White, J. Hsu, T. Woroniecka, S. Matsumota. 2005. Monitoring a 1,3-dichloropropene/metam sodium application in Del Norte County. State of California. Department of Pesticide Regulation. *In progress*.

Table 1. Tables from Johnson at al (1999) showing the Pasquill stability class determination based on wind speed, night/day, and solar insolation. The second table indicates how to convert information on cloud cover into solar insolation categories.

| Surface Wind Speed at a Height of 10 m (m/sec) | Day | | | Night | |
|---|---|---|---|---|---|
| | Incoming Solar Radiation* (Insolation) | | | Thinly Overcast or ≥ 4/8 Low Cloud Cover | ≤ 3/8 Cloud Cover |
| | Strong | Moderate | Slight | | |
| < 2 | A | A – B | B | F | F |
| 2 – 3 | A – B | B | C | E | F |
| 3 – 5 | B | B – C | C | D | E |
| 5 – 6 | C | C – D | D | D | D |
| > 6 | C | D | D | C | D |

The neutral class (D) should be assumed for all overcast conditions during day or night.

*Appropriate insolation categories may be determined through the use of sky cover and solar elevation information as follows:

| Sky Cover | Solar Elevation Angle > 60º | Solar Elevation Angle ≤ 60º but > 35º | Solar Elevation Angle ≤ 35º but > 15º |
|---|---|---|---|
| 4/8 or Less or Any Amount of High Thin Clouds | Strong | Moderate | Slight |
| 5/8 to 7/8 Middle Clouds (7000 feet to 16,000 foot base) | Moderate | Slight | Slight |
| 5/8 to 7/8 Low Clouds (less than 7000 foot base) | Slight | Slight | Slight |

Table 2. Key to Solar Radiation Delta-T (SRDT) method for estimating Pasquill-Gifford (P-G) Stability Categories (U.S. EPA 2000).

<table>
<tr><th colspan="5">Daytime</th></tr>
<tr><td>Wind Speed (m/s)</td><td colspan="4">Solar Radiation (W/m$^2$)</td></tr>
<tr><td></td><td>≥ 925</td><td>925 - 675</td><td>675 - 175</td><td>< 175</td></tr>
<tr><td>< 2</td><td>A</td><td>A</td><td>B</td><td>D</td></tr>
<tr><td>2 – 3</td><td>A</td><td>B</td><td>C</td><td>D</td></tr>
<tr><td>3 – 5</td><td>B</td><td>B</td><td>C</td><td>D</td></tr>
<tr><td>5 – 6</td><td>C</td><td>C</td><td>D</td><td>D</td></tr>
<tr><td>≥ 6</td><td>C</td><td>D</td><td>D</td><td>D</td></tr>
<tr><th colspan="5">Nighttime</th></tr>
<tr><td colspan="2" rowspan="2">Wind Speed (m/s)</td><td colspan="3">Vertical Temperature Gradient</td></tr>
<tr><td>< 0</td><td colspan="2">≥ 0</td></tr>
<tr><td colspan="2">< 2.0</td><td>E</td><td colspan="2">F</td></tr>
<tr><td colspan="2">2.0 – 2.5</td><td>D</td><td colspan="2">E</td></tr>
<tr><td colspan="2">≥ 2.5</td><td>D</td><td colspan="2">D</td></tr>
</table>

Table 3. The stability classes used for modeling the application monitored.

| | | | Stability Class | | | | | | Stability Class | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Interval | Date | Start Time | Conventional | Solar radiation | | Sampling Interval | Date | Start Time | Conventional | Solar radiation |
| 1 | 7/21/04 | 7:40 | 3 | 3 | | 13 | 7/24/04 | 7:40 | 4 | 4 |
| | | 8:40 | 4 | 3 | | | | 8:40 | 4 | 4 |
| | | 9:40 | 4 | 3 | | | | 9:40 | 4 | 3 |
| | | 10:40 | 3 | 2 | | | | 10:40 | 3 | 2 |
| 2 | 7/21/04 | 11:40 | 2 | 1 | | | | 11:40 | 2 | 3 |
| | | 12:40 | 2 | 2 | | | | 12:40 | 1 | 3 |
| | | 13:40 | 1 | 1 | | | | 13:40 | 2 | 3 |
| | | 14:40 | 2 | 2 | | | | 14:40 | 2 | 3 |
| 3 | 7/21/04 | 15:40 | 2 | 2 | | | | 15:40 | 2 | 3 |
| | | 16:40 | 3 | 3 | | | | 16:40 | 3 | 3 |
| | | 17:40 | 3 | 3 | | | | 17:40 | 3 | 4 |
| | | 18:40 | 4 | 4 | | | | 18:40 | 4 | 4 |
| 4 | 7/21/04 | 19:40 | 5 | 5 | | 14 | 7/24/04 | 19:40 | 4 | 4 |
| | | 20:40 | 6 | 6 | | | | 20:40 | 4 | 4 |
| | | 21:40 | 6 | 6 | | | | 21:40 | 4 | 4 |
| | | 22:40 | 6 | 6 | | | | 22:40 | 4 | 4 |
| 5 | 7/21/04 | 23:40 | 5 | 5 | | | | 23:40 | 4 | 4 |
| | | 0:40 | 6 | 6 | | | | 0:40 | 4 | 4 |
| | | 1:40 | 6 | 6 | | | | 1:40 | 4 | 4 |
| | | 2:40 | 6 | 6 | | | | 2:40 | 4 | 4 |
| 6 | 7/22/04 | 3:40 | 6 | 6 | | | | 3:40 | 4 | 4 |
| | | 4:40 | 6 | 6 | | | | 4:40 | 4 | 4 |
| | | 5:40 | 6 | 6 | | | | 5:40 | 4 | 4 |
| | | 6:40 | 6 | 6 | | | | 6:40 | 4 | 4 |
| 7 | 7/22/04 | 7:40 | 5 | 5 | | 15 | 7/25/04 | 7:40 | 4 | 4 |
| | | 8:40 | 4 | 4 | | | | 8:40 | 4 | 3 |
| | | 9:40 | 3 | 3 | | | | 9:40 | 3 | 3 |
| | | 10:40 | 2 | 2 | | | | 10:40 | 2 | 3 |
| | | 11:40 | 2 | 1 | | | | 11:40 | 2 | 2 |
| | | 12:40 | 2 | 1 | | | | 12:40 | 2 | 2 |
| 8 | 7/22/04 | 13:40 | 2 | 1 | | | | 13:40 | 2 | 2 |
| | | 14:40 | 2 | 2 | | | | 14:40 | 3 | 2 |
| | | 15:40 | 2 | 2 | | | | 15:40 | 3 | 2 |
| | | 16:40 | 3 | 3 | | | | 16:40 | 3 | 3 |
| | | 17:40 | 3 | 3 | | | | 17:40 | 3 | 3 |
| | | 18:40 | 4 | 4 | | | | 18:40 | 4 | 4 |
| 9 | 7/22/04 | 19:40 | 5 | 5 | | 16 | 7/25/04 | 19:40 | 4 | 4 |
| | | 20:40 | 5 | 5 | | | | 20:40 | 4 | 4 |
| | | 21:40 | 5 | 5 | | | | 21:40 | 4 | 4 |
| | | 22:40 | 4 | 4 | | | | 22:40 | 4 | 4 |
| | | 23:40 | 4 | 4 | | | | 23:40 | 4 | 4 |
| | | 0:40 | 4 | 4 | | | | 0:40 | 4 | 4 |
| 10 | 7/22/04 | 1:40 | 4 | 4 | | | | 1:40 | 4 | 4 |
| | | 2:40 | 4 | 4 | | | | 2:40 | 4 | 4 |

| | | | Stability Class | | | | | | Stability Class | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Interval | Date | Start Time | Conventional | Solar radiation | | Sampling Interval | Date | Start Time | Conventional | Solar radiation |
| | | 3:40 | 4 | 4 | | | | 3:40 | 4 | 4 |
| | | 4:40 | 4 | 4 | | | | 4:40 | 4 | 4 |
| | | 5:40 | 4 | 4 | | | | 5:40 | 4 | 4 |
| | | 6:40 | 4 | 4 | | | | 6:40 | 4 | 4 |
| 11 | 7/23/04 | 7:40 | 4 | 4 | | 17 | 7/26/04 | 7:40 | 3 | 4 |
| | | 8:40 | 4 | 4 | | | | 8:40 | 2 | 3 |
| | | 9:40 | 4 | 3 | | | | 9:40 | 2 | 2 |
| | | 10:40 | 3 | 3 | | | | 10:40 | 2 | 3 |
| | | 11:40 | 2 | 2 | | | | 11:40 | 2 | 2 |
| | | 12:40 | 2 | 1 | | | | 12:40 | 2 | 2 |
| | | 13:40 | 2 | 2 | | | | 13:40 | 2 | 2 |
| | | 14:40 | 2 | 2 | | | | 14:40 | 2 | 2 |
| | | 15:40 | 2 | 3 | | | | 15:40 | 2 | 2 |
| | | 16:40 | 3 | 3 | | | | 16:40 | 2 | 3 |
| | | 17:40 | 3 | 3 | | | | 17:40 | 2 | 3 |
| | | 18:40 | 4 | 4 | | | | 18:40 | 3 | 4 |
| 12 | 7/23/04 | 19:40 | 4 | 4 | | 18 | 7/26/04 | 19:40 | 4 | 4 |
| | | 20:40 | 4 | 4 | | | | 20:40 | 4 | 4 |
| | | 21:40 | 4 | 4 | | | | 21:40 | 4 | 4 |
| | | 22:40 | 4 | 4 | | | | 22:40 | 4 | 4 |
| | | 23:40 | 4 | 4 | | | | 23:40 | 4 | 4 |
| | | 0:40 | 4 | 4 | | | | 0:40 | 4 | 4 |
| | | 1:40 | 4 | 4 | | | | 1:40 | 4 | 4 |
| | | 2:40 | 4 | 4 | | | | 2:40 | 4 | 4 |
| | | 3:40 | 4 | 4 | | | | 3:40 | 4 | 4 |
| | | 4:40 | 4 | 4 | | | | 4:40 | 4 | 4 |
| | | 5:40 | 4 | 4 | | | | 5:40 | 4 | 4 |
| | | 6:40 | 4 | 4 | | | | 6:40 | 4 | 4 |

Table 4. Breakdown of stability class estimate differences.

| Estimates | Count | Percent |
|---|---|---|
| Agree | 44 | 61 |
| Differ by 1 class | 27 | 38 |
| Differ by 2 classes | 1 | 1 |
| Total | 72 | 100 |

Table 5. Results of regressions for MITC.

| Sampling interval | Conventional method | | | Solar radiation measurements | | | Percent Difference[1] |
|---|---|---|---|---|---|---|---|
| | $r^2$ | p-value | Flux ($ug/m^2/sec$) | $r^2$ | p-value | Flux ($ug/m^2/sec$) | |
| 1 | 0.47* | ** | 18.31 | 0.43* | ** | 23.18 | 23.5 |
| 2 | 0.91 | <0.001 | 49.37 | 0.90 | <0.001 | 53.83 | 8.7 |
| 3 | 0.50 | 0.002 | 25.03 | 0.50 | 0.002 | 25.03 | 0.0 |
| 7 | 0.39 | 0.010 | 5.230 | 0.36 | 0.013 | 5.230 | 0.0 |
| 8 | 0.88 | <0.001 | 6.741 | 0.88 | <0.001 | 6.972 | 3.4 |
| 11 | 0.72 | <0.001 | 4.182 | 0.70 | <0.001 | 4.274 | 2.2 |
| 13 | 0.77 | <0.001 | 1.374 | 0.77 | <0.001 | 1.347 | 2.0 |
| 15 | 0.81* | ** | 1.270 | 0.82* | ** | 1.441 | 12.6 |
| 17 | 0.86 | <0.001 | 0.7698 | 0.80 | <0.001 | 0.5742 | 29.1 |
| | | | | | | Average | 9.0 |
| | | | | | | Std deviation | ±10.7 |

[1] percent Difference = $\frac{|C1 - C2|}{(C1+C2)/2}$*100

* Concentrations were sorted before regression analysis.
**p value cannot be calculated using conventional statistics.

Table 6. Results of regressions for 1,3-d.

| Sampling Interval | Using field notes | | | Using solar radiation measurements | | | Percent Difference[1] |
|---|---|---|---|---|---|---|---|
| | $r^2$ | p-value | Flux ($ug/m^2/sec$) | $r^2$ | p-value | Flux ($ug/m^2/sec$) | |
| 1 | 0.48* | ** | 1.772 | 0.43* | ** | 2.236 | 23.2 |
| 2 | 0.49 | 0.003 | 5.320 | 0.47 | 0.003 | 5.701 | 6.9 |
| 3 | 0.94* | <0.001 | 1.144 | 0.94* | <0.001 | 1.144 | 0.0 |
| 7 | 0.56 | <0.001 | 0.8435 | 0.54 | 0.001 | 0.8505 | 0.8 |
| 8 | 0.92 | <0.001 | 2.612 | 0.92 | <0.001 | 2.697 | 3.2 |
| 11 | 0.77 | <0.001 | 5.946 | 0.76 | <0.001 | 6.108 | 2.7 |
| 13 | 0.80 | <0.001 | 5.117 | 0.82 | <0.001 | 5.079 | 0.7 |
| 15 | 0.74* | ** | 7.780 | 0.76* | ** | 8.909 | 13.5 |
| 17 | 0.72 | <0.001 | 7.208 | 0.59 | <0.001 | 5.081 | 34.6 |
| | | | | | | Average | 9.5 |
| | | | | | | Std deviation | ±12.3 |

[1] percent Difference = $\frac{|C1 - C2|}{(C1+C2)/2}$*100

* Concentrations were sorted before regression analysis.
**p value cannot be calculated using conventional statistics.

Table 7. Percent difference in 95 percent limits around flux estimate.

| | Sampling Interval | $r^2$ | p-value | Flux (ug/m$^2$/sec) | 95 percent Upper Limit | 95 percent Upper Limit | Percent Difference[1] |
|---|---|---|---|---|---|---|---|
| MITC | 1 | 0.47* | ** | 18.31 | 0.0673 | 0.2989 | 127 |
| | 2 | 0.91 | <0.001 | 49.37 | 0.4038 | 0.5836 | 36 |
| | 3 | 0.50 | 0.002 | 25.03 | 0.1065 | 0.3941 | 115 |
| | 4 | 0.87* | ** | 11.46 | 0.0894 | 0.1397 | 44 |
| | 5 | 0.70 | <0.001 | 12.31 | 0.0769 | 0.1694 | 75 |
| | 6 | 0.94 | <0.001 | 15.78 | 0.1340 | 0.1815 | 30 |
| | 7 | 0.39 | 0.010 | 5.230 | 0.0147 | 0.0899 | 144 |
| | 8 | 0.88 | <0.001 | 6.741 | 0.0532 | 0.0816 | 42 |
| | 9 | 0.78 | <0.001 | 2.289 | 0.0159 | 0.0299 | 61 |
| | 10 | 0.95 | <0.001 | 2.320 | 0.0201 | 0.0263 | 27 |
| | 11 | 0.72 | <0.001 | 4.182 | 0.0267 | 0.0569 | 72 |
| | 12 | 0.72 | <0.001 | 0.926 | 0.0059 | 0.0126 | 71 |
| | 13 | 0.77 | <0.001 | 1.374 | 0.0094 | 0.0181 | 63 |
| | 14 | 0.91 | <0.001 | 1.417 | 0.0115 | 0.0168 | 37 |
| | 15 | 0.81* | ** | 1.270 | 0.0092 | 0.0162 | 55 |
| | 16 | 0.84 | <0.001 | 1.483 | 0.0111 | 0.0185 | 50 |
| | 17 | 0.86 | <0.001 | 0.7698 | 0.0059 | 0.0095 | 46 |
| | 18 | 0.90 | <0.001 | 0.9420 | 0.0076 | 0.0113 | 39 |
| | | | | | | Average | 63 |
| | | | | | | Std deviation | 34 |
| | | | | | | | |
| 1,3-d | 1 | 0.48* | ** | 1.772 | 0.0066 | 0.0288 | 125 |
| | 2 | 0.49 | 0.003 | 5.320 | 0.0220 | 0.0844 | 117 |
| | 3 | 0.94* | ** | 1.144 | 0.0097 | 0.0132 | 30 |
| | 4 | 0.41 | 0.008 | 0.1111 | 0.0003 | 0.0019 | 138 |
| | 5 | 0.81 | <0.001 | 0.3712 | 0.0027 | 0.0047 | 55 |
| | 6 | 0.81 | <0.001 | 0.6254 | 0.0045 | 0.0081 | 58 |
| | 7 | 0.56 | <0.001 | 0.8435 | 0.0042 | 0.0127 | 101 |
| | 8 | 0.92 | <0.001 | 2.612 | 0.0218 | 0.0304 | 33 |
| | 9 | 0.67 | <0.001 | 1.245 | 0.0075 | 0.0174 | 80 |
| | 10 | 0.76 | <0.001 | 1.249 | 0.0085 | 0.0165 | 64 |
| | 11 | 0.77 | <0.001 | 5.946 | 0.0407 | 0.0783 | 63 |
| | 12 | 0.84 | <0.001 | 2.489 | 0.0186 | 0.0312 | 50 |
| | 13 | 0.80 | <0.001 | 5.117 | 0.0366 | 0.0658 | 57 |
| | 14 | 0.95 | <0.001 | 5.311 | 0.0465 | 0.0598 | 25 |
| | 15 | 0.74* | ** | 7.780 | 0.0517 | 0.1039 | 67 |
| | 16 | 0.94 | <0.001 | 9.432 | 0.0805 | 0.1082 | 29 |
| | 17 | 0.72 | <0.001 | 7.208 | 0.0464 | 0.0978 | 71 |
| | 18 | 0.98 | <0.001 | 10.79 | 0.0991 | 0.1168 | 16 |
| | | | | | | Average | 66 |
| | | | | | | Std deviation | 35 |

[1] percent Difference = $\frac{|C1-C2|}{(C1+C2)/2}*100$

* Concentrations were sorted before regression analysis.

**p value cannot be calculated using conventional statistics.

Table 8. Difference in 24-hour TWA flux (ug/m$^2$/sec).

| | Method of flux selection | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 |
|---|---|---|---|---|---|---|---|
| MITC | Conventional | 22.0 | 4.14 | 2.55 | 1.40 | 1.38 | 0.86 |
| | Solar radiation | 23.6 | 4.16 | 2.60 | 1.38 | 1.46 | 0.76 |
| 1,3-d | Conventional | 1.56 | 1.49 | 4.22 | 5.21 | 8.61 | 9.00 |
| | Solar radiation | 1.70 | 1.51 | 4.30 | 5.19 | 9.17 | 7.94 |

Table 9. Emission, as a percent of applied material, for each daytime interval for both methods.

| | MITC | | 1,3-d | |
|---|---|---|---|---|
| Sampling Interval | Conventional | Solar | Conventional | Solar |
| 1 | 1.32 | 1.68 | 0.07 | 0.09 |
| 2 | 3.57 | 3.89 | 0.21 | 0.23 |
| 3 | 1.81 | 1.81 | 0.05 | 0.05 |
| 7 | 0.57 | 0.57 | 0.05 | 0.05 |
| 8 | 0.73 | 0.76 | 0.16 | 0.16 |
| 11 | 0.91 | 0.93 | 0.72 | 0.74 |
| 13 | 0.30 | 0.29 | 0.62 | 0.61 |
| 15 | 0.28 | 0.31 | 0.94 | 1.07 |
| 17 | 0.17 | 0.12 | 0.87 | 0.61 |
| Total Daytime | 9.65 | 10.36 | 3.67 | 3.61 |

Figure 1. Comparison of 24-hour average fluxes (ug/m$^2$s) from two different stability class methods over time and the highest and average measured 24-hour TWA concentration (ug/m$^3$) for any sampling site.