**APPENDIX V** 

## MATES IV

## FINAL REPORT

Comparison Between the West Long Beach Sites in MATES III and MATES IV

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## Appendix V. Comparison between the West Long Beach Sites in MATES III and MATES IV

The monitoring station that represents the West Long Beach (WLB) area in MATES IV is located about 0.8 mile northwest of the WLB site in MATES III. Figure V-1 shows the imagery of the two stations and the surrounding environment. MATES IV WLB is a neighborhood-scale sampling site that aims to represent an area of the community with relatively uniform land use within 0.3 to 2.5 miles. To evaluate the comparability of the two stations, linear regression analyses are performed on PM mass and major  $PM_{2.5}$  species including organic carbon (OC), elemental carbon (EC), and nitrate and sulfate ions. Gaseous species, including benzene, 1,3butadiene, acetaldehyde and formaldehyde, are also evaluated. The comparisons are conducted for two time periods when the sampling was concurrent at the two stations, namely February to November of 2007, and April to December of 2008. Sampling was carried out once every six days, each for a duration of 24 hours.



Figure V-1. Location of MATES III and MATES IV West Long Beach monitoring stations

The average concentration of selected PM, VOC and carbonyl species, and their respective 95% confidence interval are presented in Table V-1. Only days when concentrations are present at both stations are included in the calculation. With the exception of acetaldehyde, the differences in average levels between the two stations are not statistically significant (p > 0.05).

## Table V-1. Average concentration of selected PM, VOC and carbonyl species, theirrespective 95% confidence interval, and the p-value for the difference between the mean atthe MATES III and MATES IV West Long Beach sites.

	PM2.5 Mass (µg/m <sup>3</sup> )	PM2.5 OC (µg/m <sup>3</sup> )	PM2.5 EC (µg/m <sup>3</sup> )	Nitrate (µg/m <sup>3</sup> )	Sulfate (µg/m <sup>3</sup> )	1,3- Butadiene (ppb)	Benzene (ppb)	Formaldehyde (ppb)	Acetaldehyde (ppb)
MATES III WLB Site	$17.6\pm2.0$	$6.50\pm0.82$	2.22 ± 0.44	$3.07\pm0.70$	$3.67\pm0.55$	$0.048\pm0.01$	$0.39\pm0.06$	$2.47\pm0.27$	$0.98 \pm 0.14$
MATES IV WLB Site	$18.5\pm2.1$	$6.30\pm0.74$	2.77 ± 0.51	$3.34\pm0.78$	$3.87\pm0.57$	$0.058 \pm 0.01$	$0.39\pm0.07$	$2.50\pm0.23$	$1.24\pm0.15$
p-value	0.26	0.36	0.06	0.31	0.32	0.15	0.45	0.44	0.01

Table V-2 shows the correlation coefficient (R), slope (m) and number of data point (n) from the linear regression analyses between the two stations for the PM, VOC and carbonyl species. The associations are high (R > 0.80) with the exception of OC and sulfate. For OC, the agreement improves considerably in 2008 (R = 0.85, m = 0.76, n = 31). The moderate association of sulfate is mainly driven by a few outliers. With the removal of four outliers out of 63 data points, the correlation is good (R = 0.80, m = 0.83).

Table V-2. Correlation coefficient (R), slope (m) and number of data point (n) from linear
regression analyses between the MATES III and MATES IV West Long Beach sites.

	PM2.5 Mass	PM2.5 OC	PM2.5 EC	Nitrate	Sulfate	1,3- Butadiene	Benzene	Formaldehyde	Acetaldehyde
R	0.92	0.46	0.89	0.85	0.68	0.94	0.91	0.91	0.94
m	0.90	0.40	1.02	0.94	0.68	1.19	1.00	0.77	0.97
n	72	68	67	64	63	84	86	90	90

The scatterplots between the two monitoring stations, segregated by year, are presented in Figures V-2 to V-10. Overall, the concentrations of PM, VOC and carbonyl species at MATES IV WLB correlate well with those from MATES III WLB.

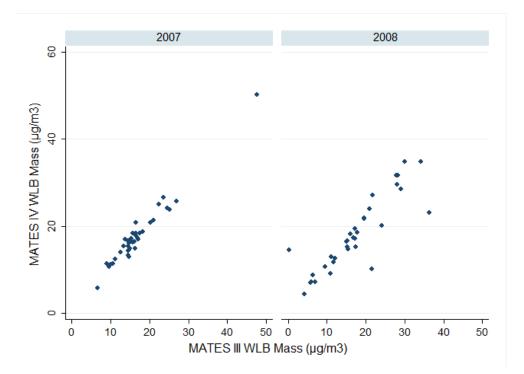


Figure V-2. Scatterplot of PM2.5 mass concentration between the MATES III and MATES IV West Long Beach sites.

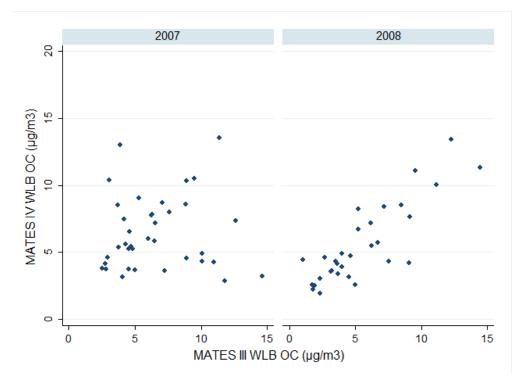


Figure V-3. Scatterplot of PM2.5 OC concentration between the MATES III and MATES IV West Long Beach sites.

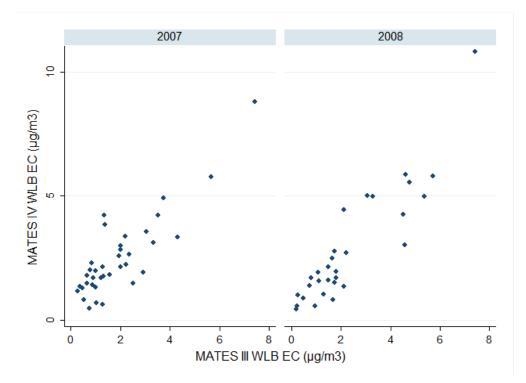


Figure V-4. Scatterplot of PM2.5 EC concentration between the MATES III and MATES IV West Long Beach sites.

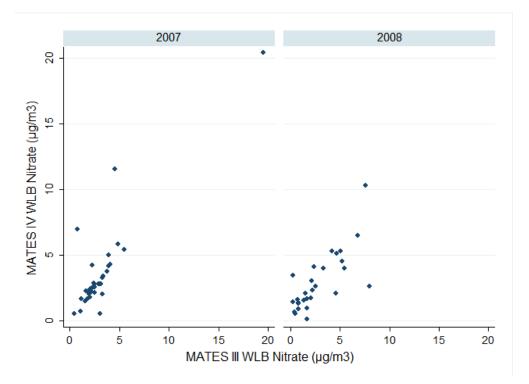


Figure V-5. Scatterplot of nitrate concentration between the MATES III and MATES IV West Long Beach sites.

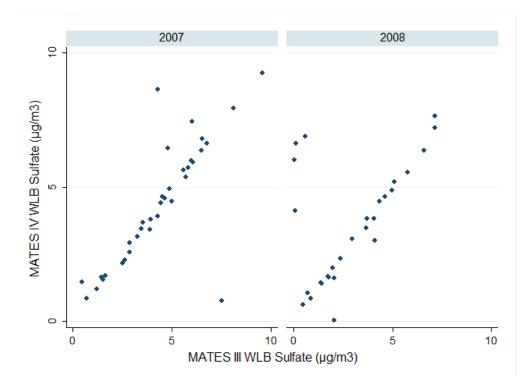


Figure V-6. Scatterplot of sulfate concentration between the MATES III and MATES IV West Long Beach sites.

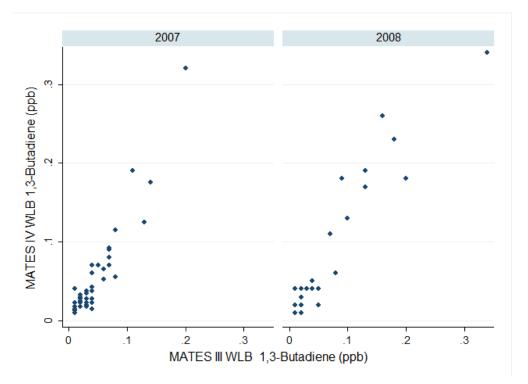


Figure V-7. Scatterplot of 1,3-butadiene concentration between the MATES III and MATES IV West Long Beach sites.

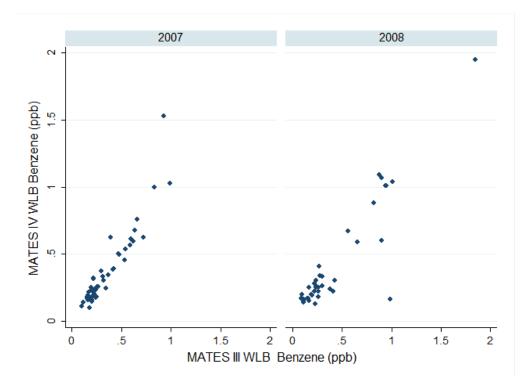


Figure V-8. Scatterplot of benzene concentration between the MATES III and MATES IV West Long Beach sites.

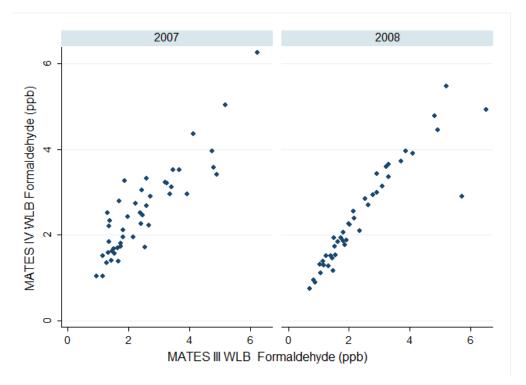


Figure V-9. Scatterplot of formaldehyde concentration between the MATES III and MATES IV West Long Beach sites.

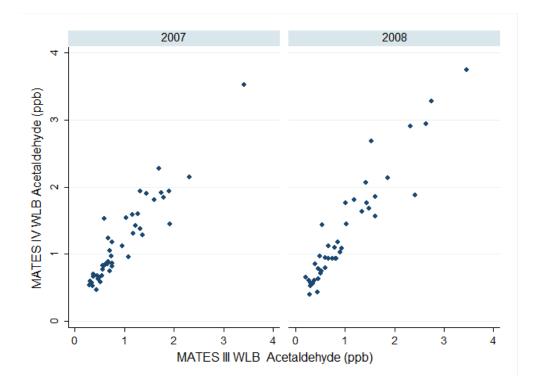


Figure V-10. Scatterplot of acetaldehyde concentration between the MATES III and MATES IV West Long Beach sites.