



March 15, 2014

Over the course of a year, we the undersigned undertook an examination of the quality of the air in the Ivy City community of NE Washington. Our analysis measured particulate matter (PM 2.5) and black carbon, both byproducts of diesel fuel exhaust, measured in the area surrounding the Alexander Crummell School site.

Our findings concluded that PM 2.5 levels in Ivy City regularly exceed EPA limits. We determined that the area's air quality is significantly compromised and threatens human health.

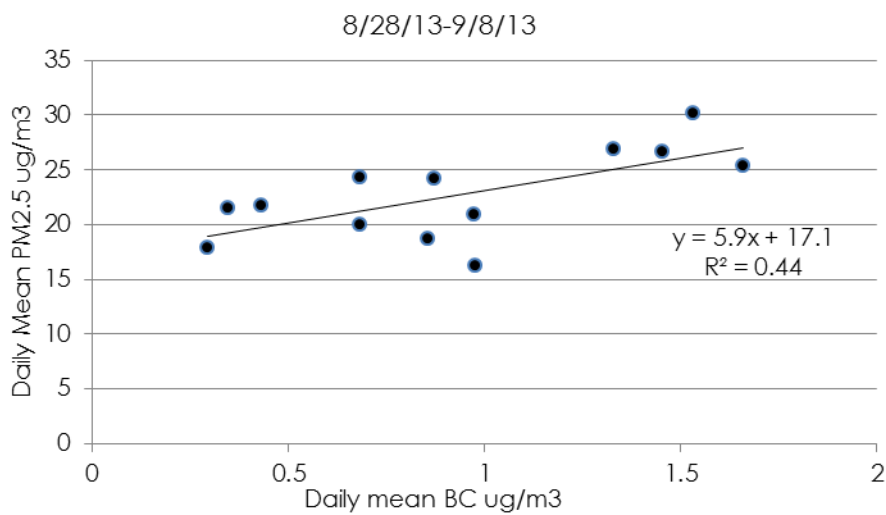
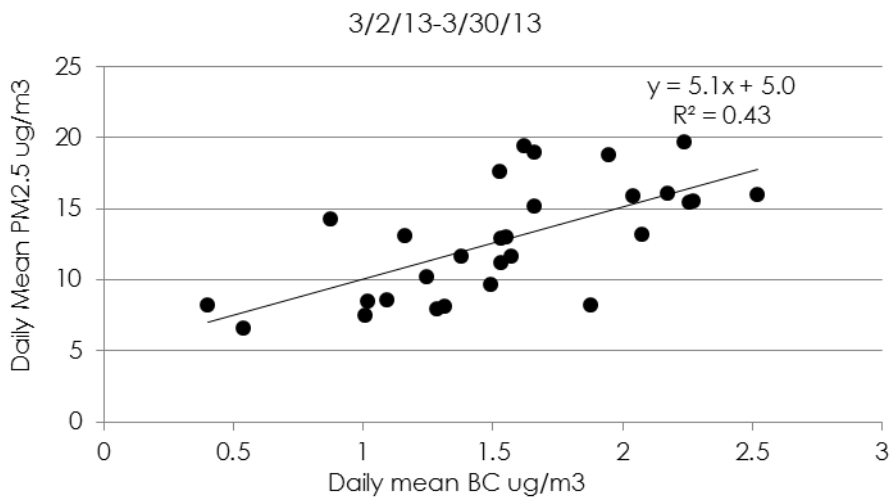
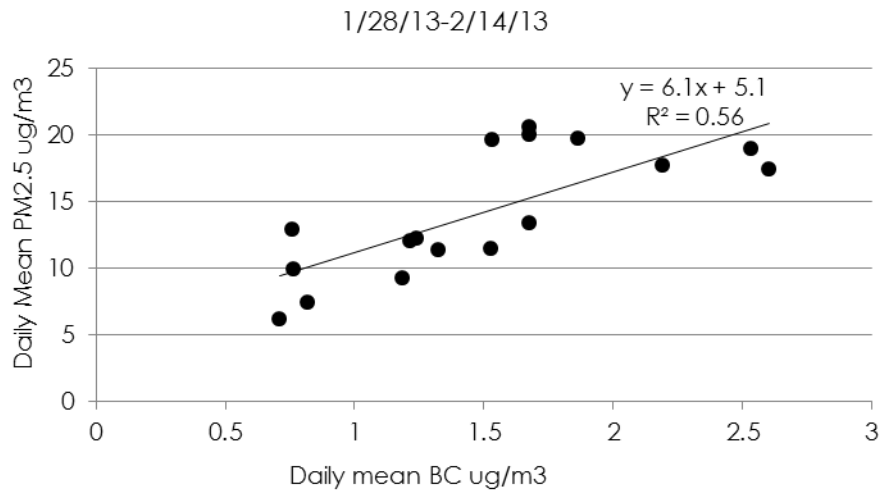
The following charts depict our findings which were shared with the DC City Council Committee on Transportation and the Environment at a hearing on Air Quality Issues held January 2, 2014.

Sincerely,

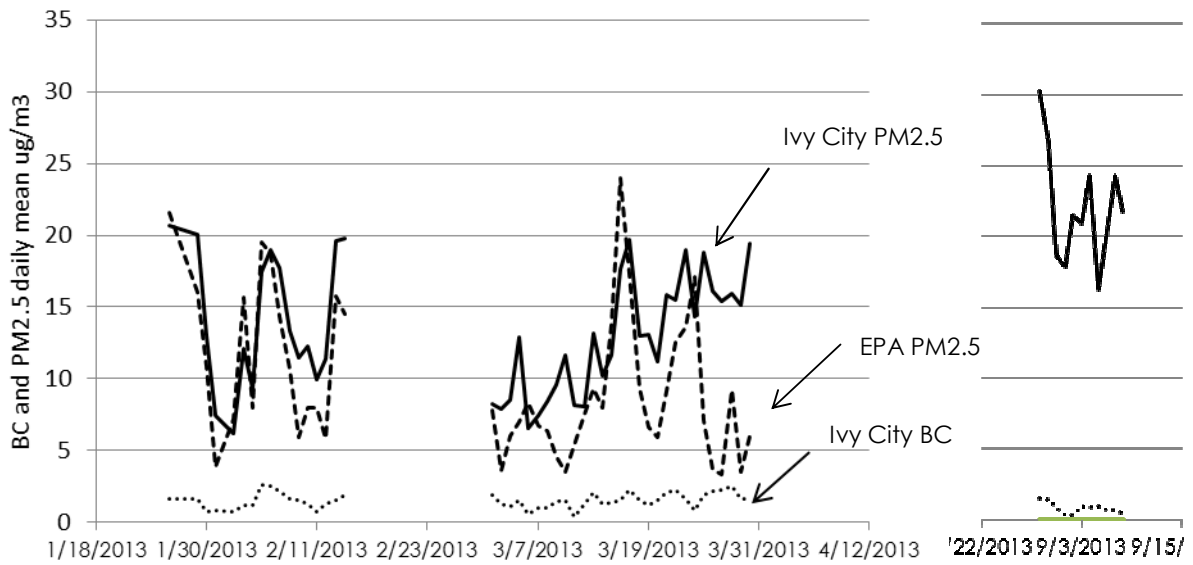
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Comparison of daily mean concentrations of Black Carbon (BC) and PM2.5 measured in Ivy City over three different time periods. BC measured using Aethelometer and PM2.5 using Dust Trak DRX, values corrected with gravimetric measurements. Data suggest that a relationship exists between PM2.5 and BC, supporting the hypothesis that diesel sources have an impact on PM2.5 concentrations in IVY City.



Daily mean concentrations of PM2.5 and BC measured in Ivy City and PM2.5 concentrations measured at EPA monitoring site 11-001-0043, located at the McMillian reservoir. The Ivy City Pm2.5 concentrations are equivalent to or higher than the EPA concentrations on a majority of days. BC, trends with the Ivy City PM2.5 concentrations.

Modeled Ivy City PM2.5 concentrations

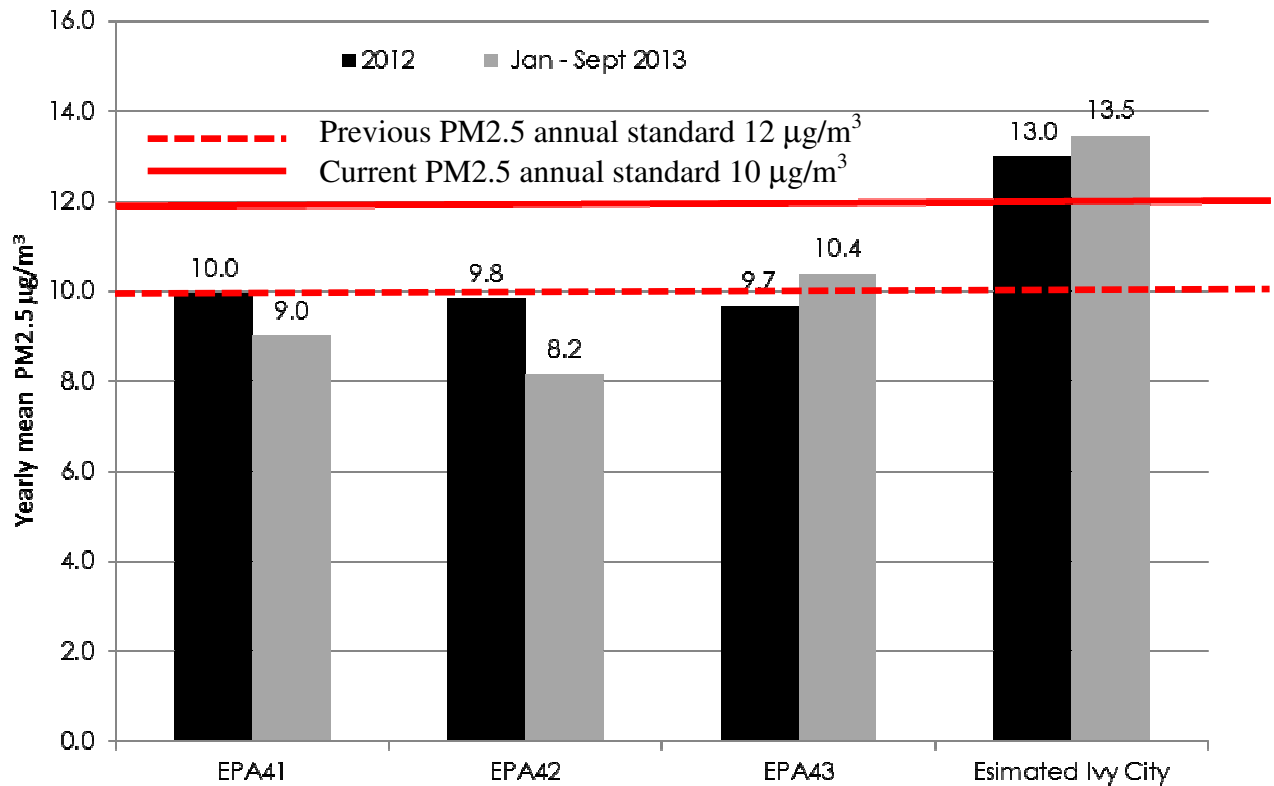
Daily PM2.5 concentrations for Ivy City were estimated for the days when no data was collected. Simple linear regression was used to produce equation 1. Daily Ivy City PM2.5 concentrations measured using the Dust Trak Drx, were regressed against daily PM2.5 concentrations measured at the EPA McMillion Reservoir monitoring site. This location reported data for the largest number of days. A separate model was developed using the Black Carbon concentrations measured in Ivy City. There were 2.5 months of BC data, for which no PM data was collected. These days occur during the time of year when PM concentrations are highest. The model developed for these days estimated higher, but more accurate ($R^2=0.73$) values for the Ivy City Daily mean concentrations of PM2.5. Equation 1 estimates lower values than equation 2, but higher than the daily EPA mean concentrations. The yearly estimated Pm2.5 concentrations using equation 2 produce values that are higher than the NAAQS standard of $12\mu\text{g}/\text{m}^3$ until Dec. 2013 and the new value of $10\mu\text{g}/\text{m}^3$.

Equation 1. $\text{IvyCity Pm2.5 } (\mu\text{g}/\text{m}^3) = 0.64*\text{EPA43} + 6.82 \quad R^2 = 0.58$

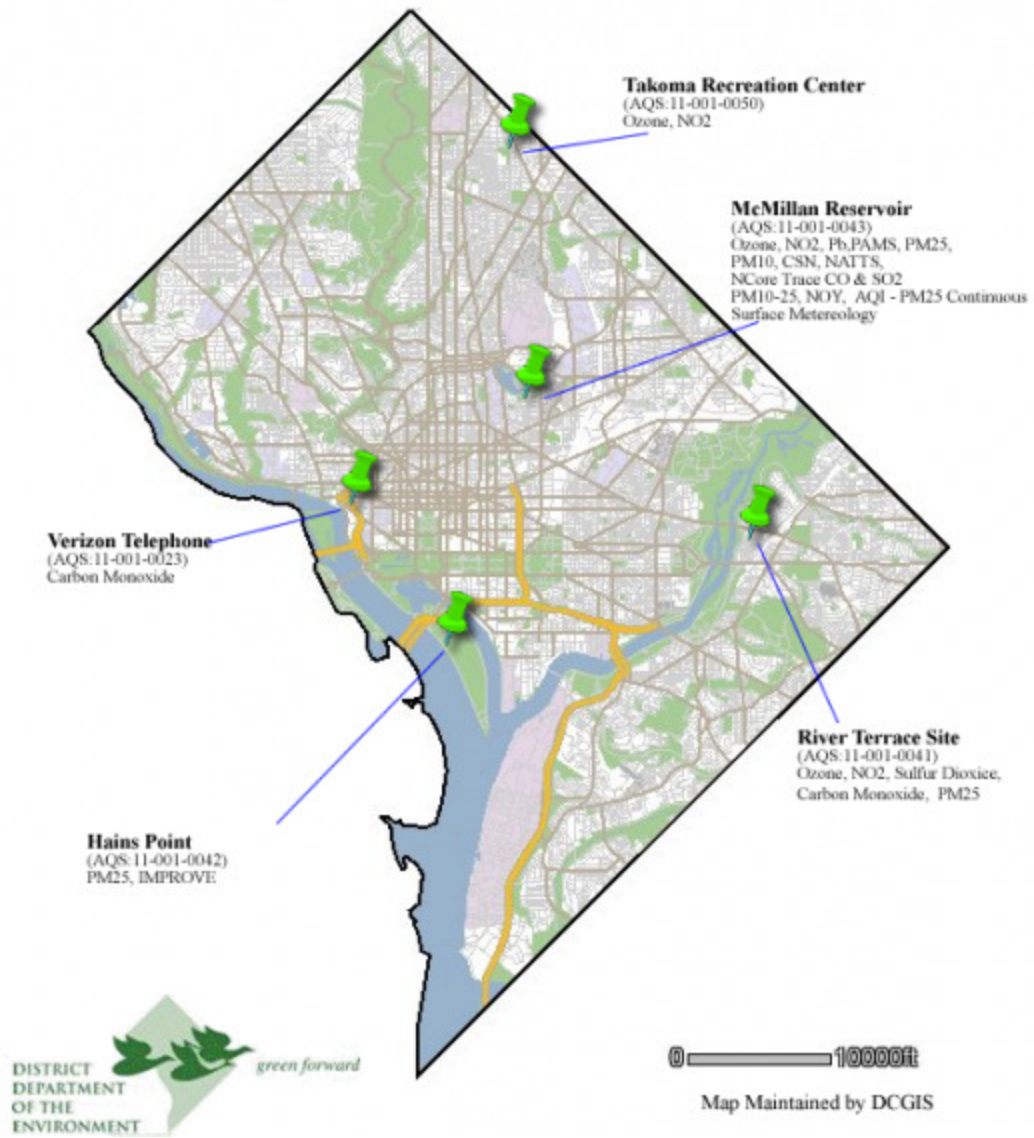
Equation 2. $\text{IvyCity Pm2.5 } (\mu\text{g}/\text{m}^3) = 0.55*\text{EPA43} + 3.77* \text{BCmean} + 2.02 \quad R^2 = 0.73$

	EPA41 PM2.5 $\mu\text{g}/\text{m}^3$	EPA42 PM2.5 $\mu\text{g}/\text{m}^3$	EPA43 PM2.5 $\mu\text{g}/\text{m}^3$	Ivy City BC $\mu\text{g}/\text{m}^3$	Ivy City PM2.5 $\mu\text{g}/\text{m}^3$ Estimate	Ivy City PM2.5 $\mu\text{g}/\text{m}^3$
2012-January	8.7	9.3	8.6	ND	12.3	ND
2012-February	10.1	9.6	9.6	ND	12.9	ND
2012-March	8.7	10.0	8.7	ND	12.4	ND
2012-April	6.9	6.9	6.5	ND	11.0	ND
2012-May	8.3	8.0	8.7	ND	12.4	ND
2012-June	10.9	9.8	10.9	ND	13.8	ND
2012-July	11.7	11.7	11.9	ND	14.4	ND
2012-August	13.2	12.5	11.7	ND	14.3	ND
2012-September	8.6	7.3	8.8	ND	12.4	ND
2012-October	8.3	6.7	7.7	ND	11.8	ND
2012-November	13.2	13.6	10.7	ND	13.6	ND
2012-December	10.9	12.7	12.3	ND	14.7	ND
2013-January	12.6	9.4	13.2	1.3	15.3	ND
2013-February	10.3	10.1	10.7	1.5	13.6	13.8
2013-March	8.7	6.3	8.6	1.5	12.3	12.8
2013-April	6.9	6.1	9.6	1.3	13.0	ND
2013-May	7.9	8.2	9.3	ND	12.8	ND
2013-June	7.1	-	9.2	ND	12.7	ND
2013-July	9.5	-	11.7	ND	14.3	ND
2013-August	9.2	9.0	10.9	ND	13.8	ND
2013-September	-	-	10.5	0.6	13.5	ND

Monthly mean concentrations of PM2.5 and Black Carbon measured at EPA Air Quality Sites and Ivy City. Estimated PM2.5 concentrations in Ivy City estimated using equation 1.



Annual PM2.5 concentrations measured at each EPA monitoring site in Washington, DC and estimated PM2.5 concentrations in Ivy City using equation 1. Red lines show the previous National Ambient Air Quality Standard for annual PM2.5 concentrations of $10 \mu\text{g}/\text{m}^3$, and the recently updated value (January 15 2013, and effective March 18, 2013) of $12 \mu\text{g}/\text{m}^3$.



EPA41 – River Terrace Site

EPA42 – Hains Point

EPA43 – Mc Millian Reservoir