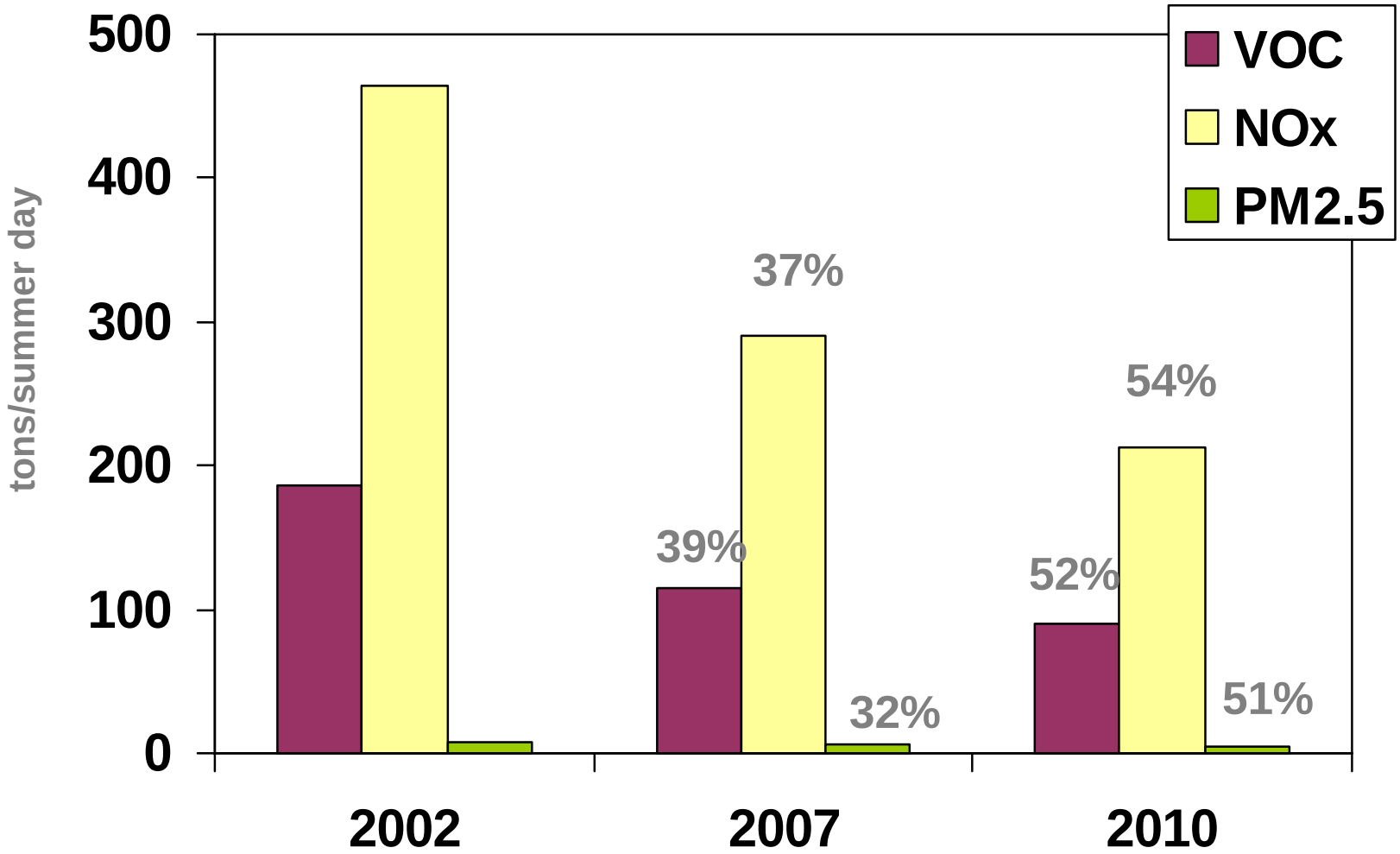
Appendix A: Tables and Figures

MDEQ PM2.5 SIP

Figure 1

Mobile Emission Reductions from National Controls



Percentages indicate reduction from 2002

Source: SEMCOG

Table 1

Model-based Projections of Future Year Air Quality

			'03-'05	'04-'06	'05-'06		Base Year Design Value*	2009 Design Value		Decrease
260990009	Macomb	New Haven	13.0	12.5	12.8		12.8	11.3		-1.5
261150005	Monroe	Luna Pier	14.1	13.8	14.2		14.0	12.1		-1.9
261250001	Oakland	Oak Park	14.3	13.4	13.8		13.8	12.3		-1.5
261470005	St. Clair	Port Huron	13.8	13.1	13.6		13.5	11.8		-1.7
261610008	Washtenaw	Ypsilanti	14.3	13.6	14.1		14.0	12.2		-1.8
261630001	Wayne	Allen Park	15.1	14.5	14.6		14.7	13.0		-1.7
261630015	Wayne	Southwest HS	16.4	15.8	15.9		16.0	14.2		-1.8
261630016	Wayne	Linwood	15.2	14.2	14.5		14.6	13.0		-1.6
261630019	Wayne	E. 7 Mile	14.8	14.1	14.6		14.5	12.8		-1.7
261630025	Wayne	Livonia	13.9	13.1	13.4		13.5	11.8		-1.7
261630033	Wayne	Dearborn	18.2	17.2	17.3		17.6	**15.7**		-1.9
261630036	Wayne	Wyandotte	15.4	14.3	14.7		14.8	13.0		-1.8
							** Average of three 3-year periods centered on 2005*			

Source: LADCO

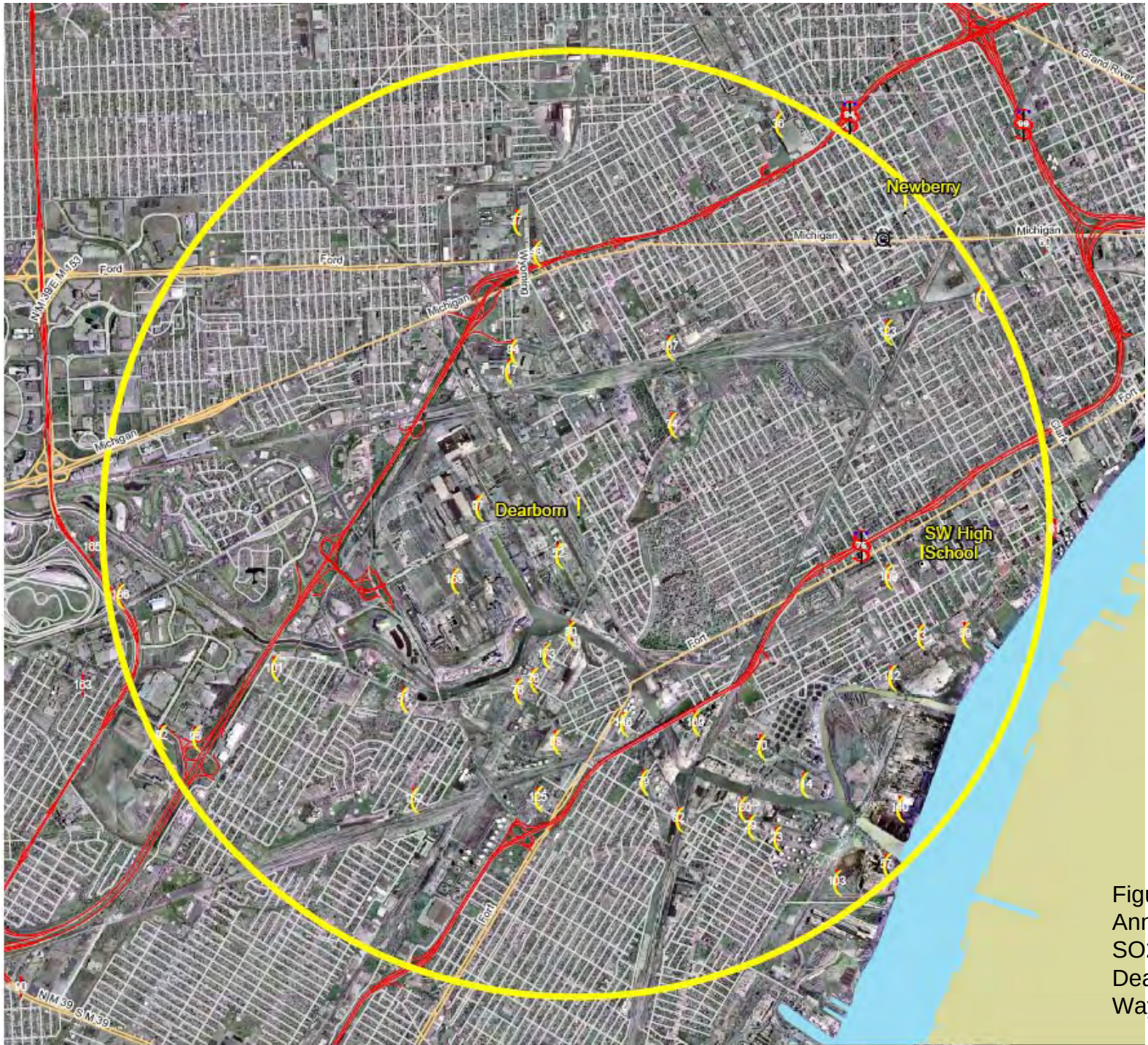


Figure 2: 2002 Annual NOx, PM10, SO2 and VOC, Dearborn Monitor, Wayne County

Figure 2: 2002 Annual NOx, PM10, SO2 and VOC, Dearborn Monitor, Wayne County, Continued

Data Source

Monitoring data obtained from the "WayneSites\WUTMSann2002Tons" spreadsheet (State of Michigan).
Last Updates: February 25, 2005

2002 USGS True Color Orthoimagery

Three Mile Buffer Area
Wayne County Monitors

Wayne County Monitors

Site Locations Within 3 Mile Buffer

Site Locations Outside 3 Mile Buffer

SITE NUMBER	FACILITY NAME	NOX / tons	PM10 / tons	SO2 / tons	VOC / tons
51	DARLING INTERNATIONAL	19	17	8	12
114	IPMC AQUISITION LLC	128	0	0	4
140	NATIONAL STEEL CORP	3785	593	4746	227
43	CROWN PLATING CO	0	0	0	0
152	REILLY PLATING/ MLOK INC	0	0	0	20
158	ROUGE STEEL CO	1307	267	352	51
97	FORD MOTOR CO ROUGE COMPLEX	41	15	0	244
92	FABRICON PRODUCTS INC	2	0	0	36
101	FRITO LAY INC	5	3	0	1
125	MARATHON ASHLAND PETROLEUM	1323	191	874	606
70	DETROIT WASTEWATER TREATMENT PLANT	276	42	52	52
29	CARMEUSE/ RIVER ROUGE	327	55	111	0
79	EQUILON ENTERPRISES DETROIT	0	0	0	36
59	DETROIT EDISON/ DELRAY POWER PLANT	17	0	0	1
57	DETROIT EDISON RIVER ROUGE	5143	38	16194	46
46	DAIMLERCHRYSLER MCGRAW	8	0	0	5
173	SUNOCO RIVER ROUGE	50	0	0	23
95	FORD MOTOR CO NEW MODEL PROGRAM CTR	2	0	0	0
23	BP PRODUCTS NORTH AMERICA RIVER ROUGE	0	0	0	52
26	CADILLAC ASPHALT PRODUCTS	7	0	1	10
160	UNITED STATES GYPSUM CO	24	6	0	1
30	CARMEUSE/DETROIT LIME	556	47	29	0
74	EDW C LEVY CO PLANT 1	0	1	0	0
169	ST MARY'S CEMENT	0	1	0	0
76	EDW C LEVY CO PLANT 6	0	0	0	0
146	OWENS CORNING TRUMBULL DIVISION	15	6	33	16
117	KASLE STEEL CORP	4	0	0	0
112	HONEYWELL	27	2	50	55
156	VISTEON TECHNICAL CENTER	5	0	0	2
37	COMPREHENSIVE ENVIRONMENTAL SOLUTIONS	0	0	0	0
167	SPARTAN INDUSTRIAL INC	0	0	0	2
109	GUTTER SUPPLIERS INC	1	0	0	16
103	FRITZ PRODUCTS	3	1	0	6
63	DETROIT SALT CO	0	1	0	0
36	COCA COLA BOTTLING CO	2	0	0	0
54	FERROUS ENVIRONMENTAL RECYCLING CORP	0	3	0	0
92	FORD MOTOR CO ALLEN PARK LANDFILL	0	0	0	3
135	MAGNI INDUSTRIES INC	0	0	0	22
111	HISPANIC MFG / GONZALEZ MFG	0	0	0	22
52	DEARBORN INDUSTRIAL GENERATION	484	79	870	5

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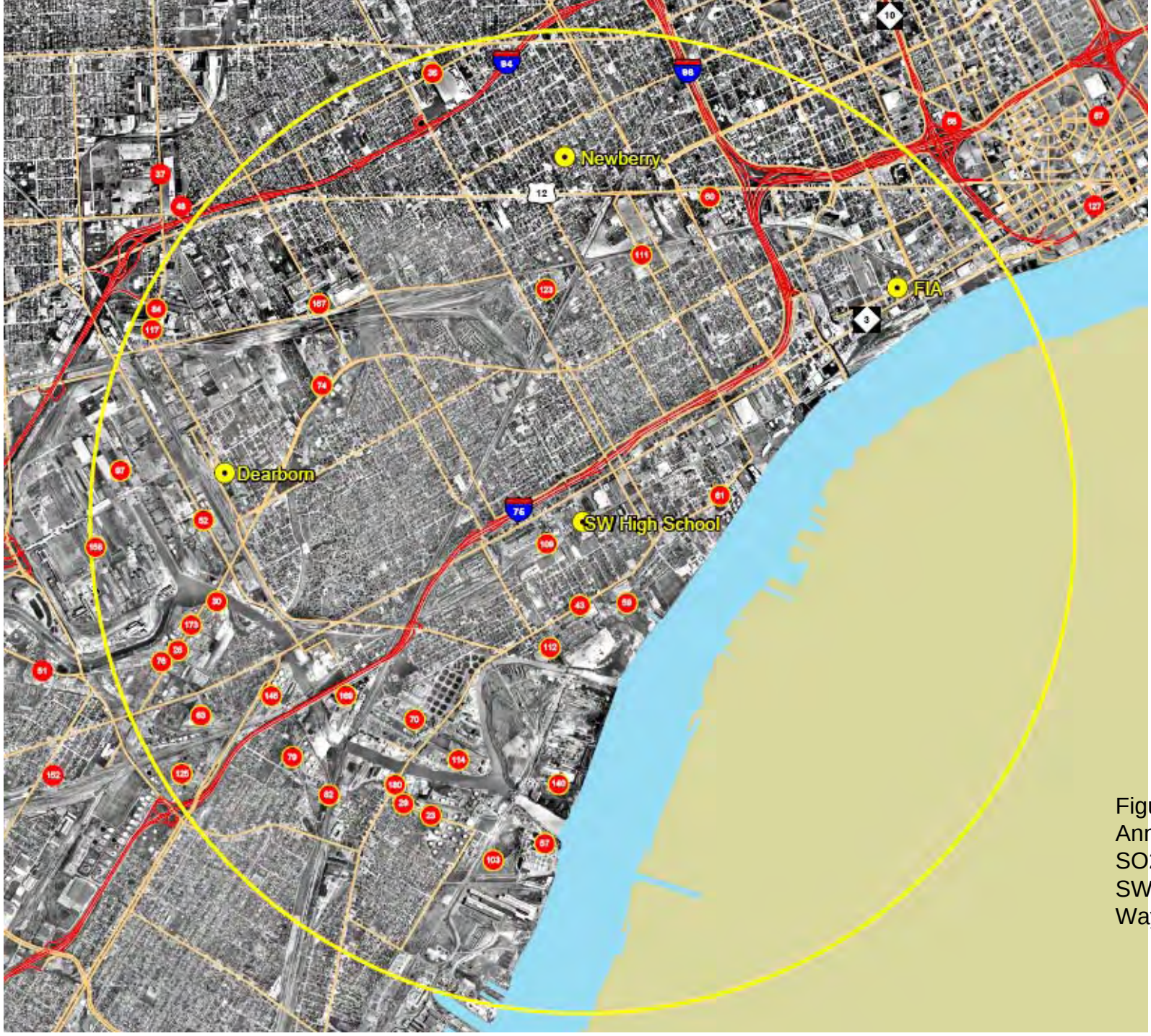

Figure 3: 2002 Annual NOx, PM10, SO2 and VOC, SWHS Monitor, Wayne County

Figure 3: 2002 Annual NOx, PM10, SO2 and VOC, SWHS Monitor, Wayne County, Continued

Data Source

Monitoring data obtained from the "WaynesSiteWUTMSand2002Tons" spreadsheet (State of Michigan)

2002 USGS True Color Orthoimagery

Three Mile Buffer Area
Wayne County Monitors

Wayne County Monitors

Site Locations Within 3 Mile Buffer

Site Locations Outside 3 Mile Buffer

SITE NUMBER	FACILITY NAME	NOX / tons	PM10 / tons	SO2 / tons	VOC / tons
114	IPMC AQUISITION LLC	128	0	0	4
140	NATIONAL STEEL CORP	3765	698	4745	227
43	CROWN PLATING CO	0	0	0	0
158	ROUGE STEEL CO	1307	267	252	51
97	FORD MOTOR CO ROUGE COMPLEX	41	16	0	244
92	FABRICON PRODUCTS INC	2	0	0	36
128	MARATHON ASHLAND PETROLEUM	1323	191	874	606
70	DETROIT WASTEWATER TREATMENT PLANT	276	42	52	52
29	CARMEUSE/ RIVER ROUGE	327	56	111	0
61	DETROIT PUBLIC LIGHTING	208	11	2	4
79	EQUILON ENTERPRISES DETROIT	0	0	0	36
59	DETROIT EDISON/ DELRAY POWER PLANT	17	0	0	1
57	DETROIT EDISON RIVER ROUGE	5143	38	16194	48
173	SUNOCO RIVER ROUGE	50	0	0	23
23	BP PRODUCTS NORTH AMERICA RIVER ROUGE	0	0	0	52
26	CADILLAC ASPHALT PRODUCTS	7	0	1	10
160	UNITED STATES GYPSUM CO	24	6	0	1
30	CARMEUSE/DETROIT LIME	556	47	29	0
74	EDW C LEVY CO PLANT 1	0	1	0	0
169	ST MARY'S CEMENT	0	1	0	0
76	EDW C LEVY CO PLANT 5	0	0	0	0
146	OWENS CORNING TRUMBULL DIVISION	15	8	33	16
117	KAGLE STEEL CORP	4	0	0	0
112	HONEYWELL	27	2	50	56
50	DETROIT ELECTRO-COATINGS COMPANY LLC	1	0	0	6
167	SPARTAN INDUSTRIAL INC	0	0	0	2
109	GUTTER SUPPLIERS INC	1	0	0	18
103	FRITZ PRODUCTS	3	1	0	6
53	DETROIT SALT CO	0	1	0	0
36	COCA COLA BOTTLING CO	3	0	0	0
94	FERROUS ENVIRONMENTAL RECYCLING CORP	0	3	0	0
123	MAGNI INDUSTRIES INC	0	0	0	22
111	HISPANIC MFG / GONZALEZ MFG	0	0	0	22
52	DEARBORN INDUSTRIAL GENERATION	484	79	870	5

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TABLE 2

SEVERSTAL EMISSIONS (2002 BASE YEAR versus 2009 POTENTIAL)

	(tons per year)		
SOURCE	**2002 Past actual**	**2009 future potential**	**net change (tpy)**
B BF Stoves (BFG)	1.94	1.94	0.00
C BF Stoves (BFG)	3.48	3.98	0.50
B BF Stoves (NG)	1.74	1.74	0.00
C BF Stoves (NG)	1.65	1.88	0.23
B BF Casthouse (Roof Monitor)	15.53	1.24	-14.29
C BF Casthouse (Roof Monitor)	27.11	2.48	-24.63
B BF Bleeders	0.12	0.12	0.00
C BF Bleeders	0.20	0.23	0.03
B BF Taphole Burning	0.14	0.14	0.00
C BF Taphole Burning	0.10	0.12	0.01
BF B Casthouse (Stack)	0.00	15.34	15.34
BF C Casthouse (Stack)	0.00	11.25	11.25
Lime Unloading - BOF Receiving	2.63	2.63	0.00
Reladling South - STACK	3.12	0.00	-3.12
Reladling South - FUGITIVES	1.08	1.18	0.10
Torch Cutting	1.99	0.00	-1.99
BOF Natural Gas	1.98	2.18	0.20
BOF ESP Stack	122.45	135.02	12.57
BOF Secondary Emiss. Baghouse	0.00	7.18	7.18
BOF Tapping (Roof Monitor)	125.27	1.58	-123.69
BOF Slag Tap (Roof Monitor)	8.57	0.11	-8.46
BOF Charging (Roof Monitor)	40.79	1.78	-39.01
Desulfurization - STACK	3.84	3.84	0.00
Desulfurization - FUGITIVES	2.96	3.23	0.27
#1 LRF Stack	29.68	29.68	0.00
#2 LRF Stack	16.96	16.96	0.00
Vacuum Degasser	0.00	0.00	0.00
DD Baghouse - Coke Transfer	3.75	3.75	0.00
EE Baghouse - Coke Unloading	4.69	4.69	0.00
Raw Material Handling	4.38	4.38	0.00
Annealing Furnaces	4.42	4.93	0.52
Reheat Furnace #1	11.84	10.52	-1.31
Reheat Furnace #2	11.84	10.52	-1.31
Reheat Furnace #3	11.84	10.52	-1.31
Hand Scarfing	13.14	17.38	4.24
B BF Slag Pit	0.01	0.01	0.00
C BF Slag Pit	0.02	0.03	0.00
Desulfurization Slag Pit	0.07	0.08	0.01
Coal Storage Silo - Bin Vent Filter	0.00	0.32	0.32
Parts Cleaning	0.00	0.00	0.00
Maintenance Paint Booth	0.00	0.00	0.00
J-9 Dip Tank	0.00	0.00	0.00
Severstal Emissions Totals	**479.34**	**312.99**	**-166.35**

•Emissions for PM2.5 calculated using RTI's (2006) PM2.5 fil ratio: PM.

•Highlighted numbers indicate past actual emissions that used RTI (2006) emission factors instead of those reported by Severstal North America.

Source: MDEQ

Table 3: Emissions reductions near Dearborn and SWHS monitors

Company	Equipement	Change Date	Nox (tpy)	SO2 (tpy)	Filterable PM (tpy)	PM (TPY)	PM10 (tpy)	Filterable PM2.5 (tpy)	HC,CO
Marathon Petroleum Co	CO Boiler[1]	Nov-03		-184.4	-10.11				
	FCCU Controls[1]	Dec-04	-242	-389	-84.04				
	BT Inter Heater[1]	Nov-05	-14						
	BT Charge Heater[1]	Nov-05	-9						
	Crude/Vac Heater[1]	Nov-05	-145						
	Street sweeping[2]					-64.1	-12.9		
	Retired offsets[2]						-71		
	Total		-410	-573.4	-94.2	-64.1	-83.9		
US Steel Corp	Blast furnace B bag house[3]	Sep-05				-76.5			
Severstal North America	Blast furnace C[4,8]	Oct-07	-30.9	702.9	-81.9			-18.3	
	Blast furnace B[4,8]	Jul-08	-81.5	256.6	4.5			1.1	
	BOF[4,9]	Oct-07	67.9	0.1	-512			-153.0	
	Torch cutting[4]	2007			-2.0			-2.0	
	Fugatives[4]	2007			2.9			0.4	
	annealing and reheat furnaces[4]	2007	60.6	0.3	-3.4			-3.4	
	Coal pulverization[4]	2007	21.5	0.1	17.0			11.1	
	other[4]	2007			5.6			4.7	
	Total		37.6	960.0	-569.4			-159.5	
--	28 Switch yard locomotives anti-idling controls[5]	2007-2008	96			2.8			
--	4 Swith yard locomotives-engine rebuild[6]	2007-2008	66			1.8			
--	School bus (diesel oxidation catalyst and crankcase filter)[7]					20% reduction/ bus			50% reduction/ bus

[1] NSR Settlement Agreement w ith Marathon Petroleum Company (reported in MDEQ PTI #388-07)

[2] MDEQ Permit to Install (PTI) application Heavy Oil Upgrade Project #388-07 for Marathon Petroleum Company

[3] MDEQ Consent Order 1-2005 for United States Steel

[4] MDEQ Permit to Install #182-05B for Severstal North America, Inc.

[5] Supplemental Environmental Project (SEP) for Chrysler

[6] Funding from the Federal Congestion Mitigation Air Quality (CMAQ) Program

[7] Funded by Severstal SEP, Clean School Bus federal grants, and possible additional buses from Marathon PTI application #388-07

[8] Used 0.15 emissions factors (Severstal uses 0.09) for blast furnace cast house roof monitors prior to control retrofits (RTI, 2006)

[9] Used 0.23 emissions factor (Severstal uses 0.046) for BOF tapping and 0.15 emissions factor (Severstal uses 0.030) for BOF charging (RTI, 2006)

Source: MDEQ

Table 4

Recent Plant Closings
Dearborn & SWHS Monitoring areas

Facility	Last Year Reported	2002 (tons/year)					Current (tons/year)					Difference (tons/year)				
		NOx	SO2	PM25	PM10	VOC	NOx	SO2	PM25	PM10	VOC	NOx	SO2	PM25	PM10	VOC
Carmeuse/ Detroit Lime	2002	555.98	29.14		5.87	0.00						555.98	29.14		5.87	
Daimler Chrystler McGraw Glass	2003	8.25	0.05			5.32						8.25	0.05			5.32
Frito Lay	2003	4.54	0.02		2.13	1.15						4.54	0.02		2.13	1.15
IPMC Acquisition	2003	128.08	0.40			3.71						128.08	0.40			3.71
Gutter Supliers, Inc	2004	0.73	0.00			1.56						0.73	0.00			1.56
Darling International*	2005	19.48	5.25		16.94	12.48	5.54	0.91	0.23	0.51	9.04	13.95	4.34	-0.23	16.43	3.44
Honeywell	2005	39.21	37.60			82.15					0.37	39.21	37.60			81.78
Total												750.74	71.56	-0.23	24.43	96.97

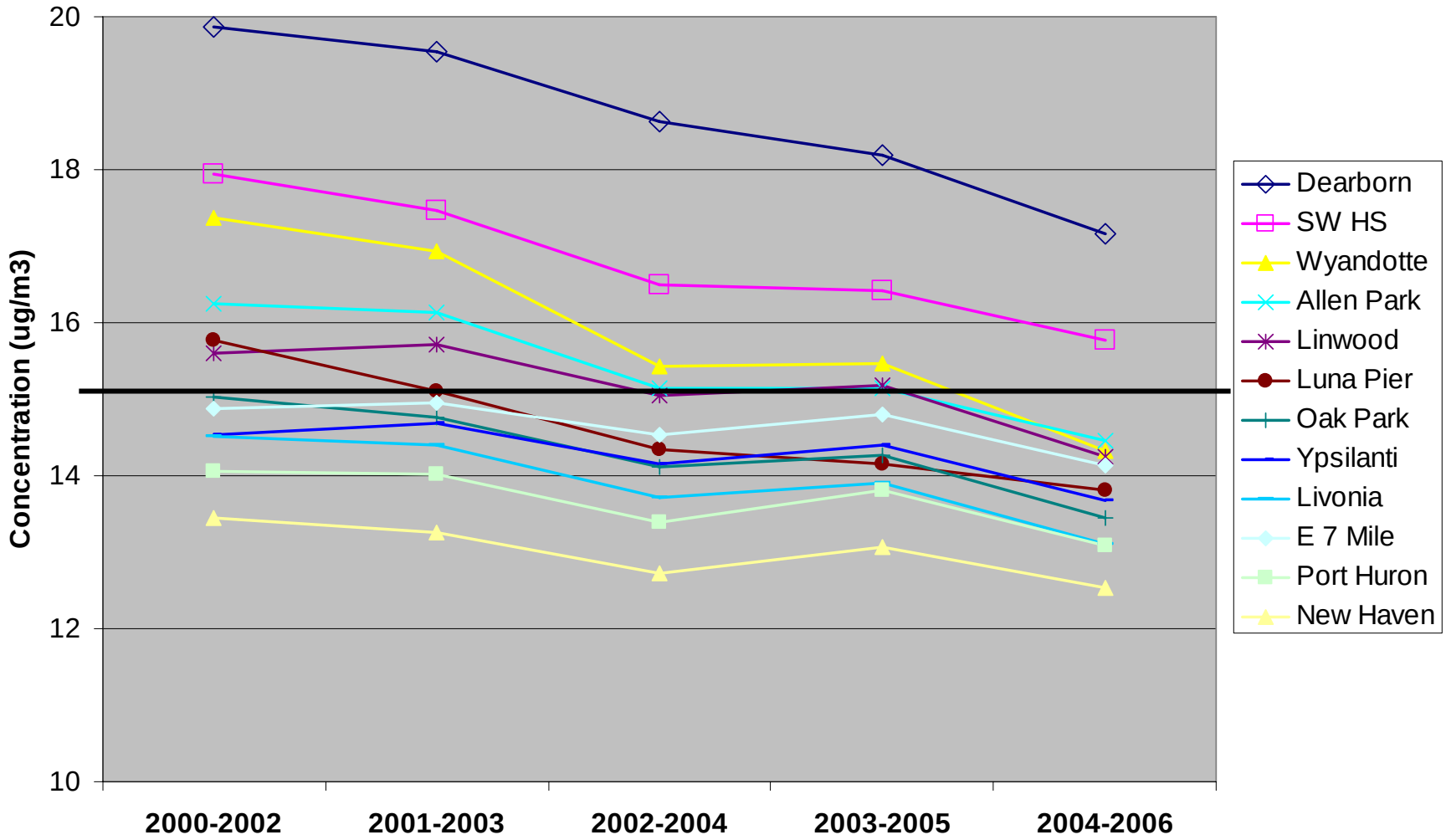
*Partial plant closing

Source: MDEQ

Figure 4

3-Year Average PM2.5 Concentrations

Southeast Michigan



Open symbols indicate monitors that currently violate the annual standard.

Source: SEMCOG

Table 5

Forecasted Impact of Local Stationary Source Controls on PM2.5 Concentrations

AERMOD Hot Spot Modeling Results - 2002

Railyard	Number of Locomotives[1]		Retrofit of all Switch Locomotives		Estimated Reduction in PM2.5 Concentrations		
	Switch	Running	Average PM Reduction (tons/day)[4]	PM Reduction (lb/day)	Dearborn µg/m³	SWHS µg/m³	Wyandotte µg/m³
Conrail - Livernois	6	6	0.001	2.51	0.004	0.005	0.000
Conrail - River Rouge[2]	4	6	0.001	1.67	0.002	0.001	0.000
CSX	6	6-10	0.001	2.51	0.213	0.003	0.001
Delray Connecting Rail yard (Zug Island)	2	NA	0.000	0.84	0.001	0.007	0.000
Norfolk Southern	7	15	0.001	2.93	0.004	0.001	0.001
Severstal[3]	2	NA	0.000	0.84	0.004	0.001	0.000
U.S. Steel (River Rouge and Ecorse)	13	NA	0.003	5.43	0.003	0.010	0.002
Total	40		0.008	7.58	0.231	0.028	0.004

[1]MDEQ, gathered from discussions with railroad representatives.

[2]Sometimes operates as many as 8 switch engines but minimum of 4.

[3]Severstal has 4 locomotives, 2 are currently in operation.

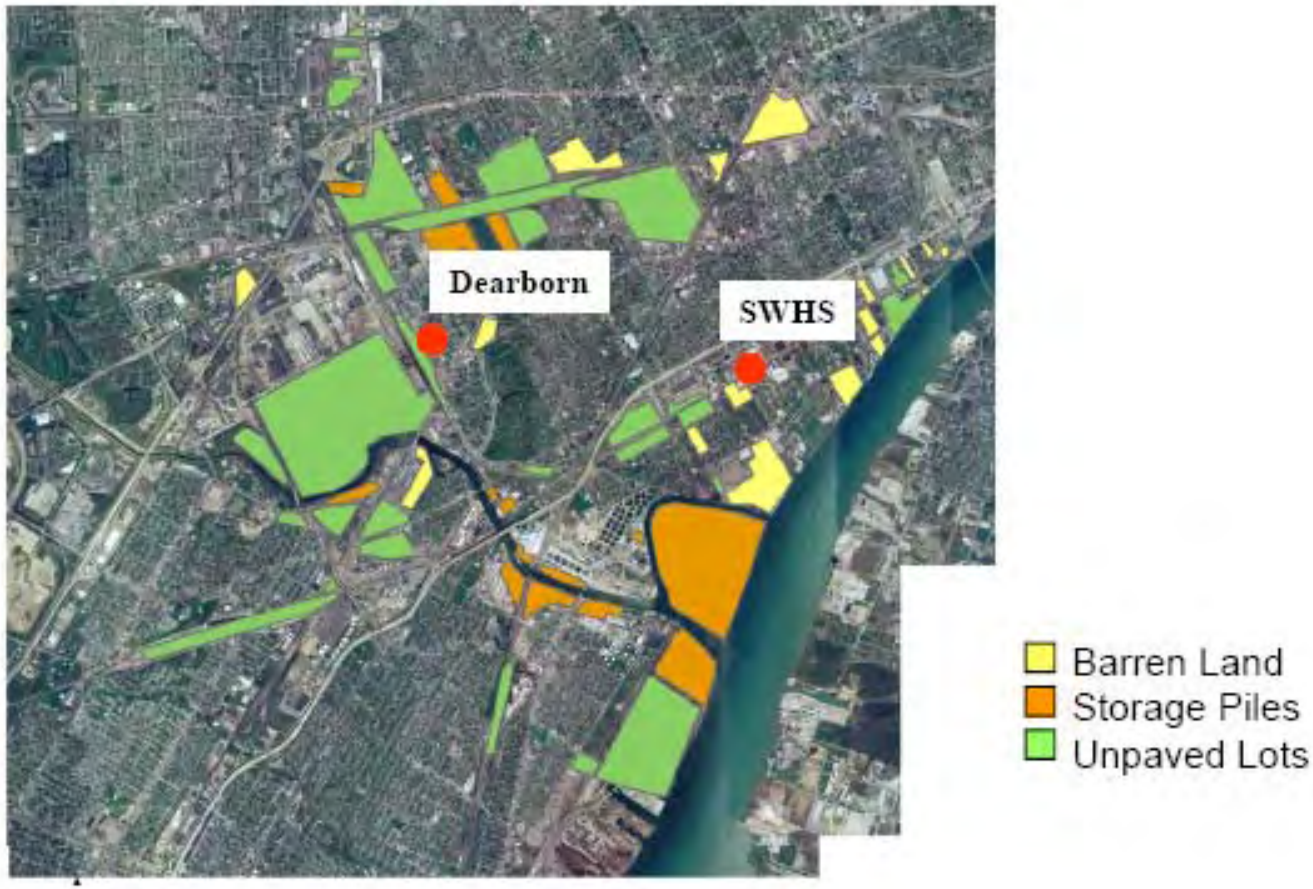
[4]EPA, Case Study: Chicago Locomotive Idle Reduction Project, March, 2004. 335 average switch engine service days/year, reduction of 2.4 tons NOx and 0.7 tons of PM per retrofitted engine per year.

Source: SEMCOG & MDEQ

Figure 5

Fugitive Dust Sources

in Vicinity of Dearborn & SWHS Monitors



Source: SEMCOG

Table 6: SO2 and NOx RACT model run for Michigan's seven county non-attainment area.

	03-05 DV (actual)	New 03-05 w / 50% RACT	Overall Reductions
New_Haven	**13.1**	**12.9**	**-0.20**
Luna_Pier	**14.2**	**14.1**	**-0.13**
Oak_Park	**14.3**	**14.2**	**-0.13**
Port_Huron	**13.8**	**13.6**	**-0.21**
Ann_Arbor	**12.3**	**12.2**	**-0.10**
Ypsilanti	**14.4**	**14.3**	**-0.12**
Allen_Park	**15.1**	**15.0**	**-0.15**
West_Fort	**16.4**	**16.2**	**-0.16**
Linwood	**15.2**	**15.1**	**-0.15**
East_7Mile	**14.8**	**14.7**	**-0.13**
Livonia	**13.9**	**13.8**	**-0.11**
Dearborn	**18.2**	**18.0**	**-0.18**
Wyandotte	**15.5**	**15.3**	**-0.15**

Source: MDEQ

Table 7
Change in Southeast Michigan PM2.5 Concentrations

Monitoring Site	3 Yr. Average		Change	Percent Change
	2000-2002	2004-2006		
Dearborn	**19.9**	**17.2**	2.69	-14%
SW HS	**17.9**	**15.8**	2.16	-12%
Wyandotte	**17.4**	14.3	3.04	-17%
Allen Park	**16.3**	14.5	1.80	-11%
Linwood	**15.6**	14.2	1.36	-9%
Luna Pier	**15.8**	13.8	1.98	-13%
Oak Park	15.0	13.4	1.58	-11%
Ypsilanti	14.5	13.7	0.86	-6%
Livonia	14.5	13.1	1.42	-10%
E 7 Mile	14.9	14.1	0.75	-5%
Port Huron	14.0	13.1	0.97	-7%
New Haven	13.5	12.5	0.92	-7%
Regional Average	15.77	14.15	1.63	-10%

Source: SEMCOG

Table 8: PM2.5 Monitoring Data Summary: Annual PM2.5

Lowest concentration at this site

1st Quarter Average

Year	Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	Oak Park	Ypsilanti	Livonia	E 7 Mile	Port Huron	New Haven
2000	**22.76**	**20.34**	**19.30**	**16.99**	**17.67**	**16.92**	**18.57**	**16.82**	**16.53**		**17.04**	**16.26**
2001	**20.95**	**19.33**	**21.49**	**20.05**	**17.19**	**16.24**	**15.58**	**15.92**	**15.39**	14.58	13.65	14.75
2002	**20.99**	**16.80**	**15.40**	**15.32**	**15.04**	14.99	12.73	14.71	13.33	14.39	12.13	11.86
2003	**22.59**	**17.41**	**15.07**	**17.37**	**18.36**	**15.93**	**18.39**	**16.70**	**15.96**	**17.05**	**18.73**	14.47
2004	**17.71**	14.95	14.48	**15.41**	14.87	13.02	13.73	13.74	12.72	13.23	11.44	11.82
2005	**21.50**	**20.20**	**16.96**	**18.45**	**18.92**	**16.50**	**17.49**	**17.49**	**17.86**	**19.82**	**16.76**	**15.21**
2006	**18.79**	**16.98**	15.10	13.70	13.04	14.55	13.51	14.80	13.34	**15.20**	**15.52**	13.68
2007	**18.84**	**15.15**	13.75	12.92	13.98	12.26	12.48	12.95	12.23	13.20	12.64	12.37

2nd Quarter Average

Year	Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	Oak Park	Ypsilanti	Livonia	E 7 Mile	Port Huron	New Haven
2000	**20.13**	**17.04**	**16.52**	13.69	13.82	14.54	14.79	12.85	14.08	13.93	14.65	12.76
2001	**18.58**	**20.05**	**17.53**	**16.68**	**15.66**	**16.58**	**17.30**	**15.46**	**15.67**	14.88	**16.26**	14.68
2002	**18.15**	**17.42**	**15.98**	**16.15**	**15.61**	**17.77**	**17.29**	14.57	14.26	**15.83**	14.03	13.37
2003	**19.03**	**15.39**	**20.37**	**15.25**	**15.33**	12.84	13.79	**15.05**	**15.36**	14.80	13.11	12.92
2004	**16.10**	**15.01**	12.74	12.22	12.10	**12.61**	11.26	11.76	11.98	12.47	12.81	11.49
2005	**16.57**	14.73	14.93	13.77	14.78	13.40	13.77	14.27	11.74	14.48	14.73	14.21
2006	12.85	12.26	10.95	11.59	11.58	10.91	10.40	10.67	11.23	10.39	10.71	9.65
2007	**15.20**	13.05	12.41	10.28	12.12	11.41	12.27	11.68	10.59	11.16	9.97	9.58

3rd Quarter Average

Year	Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	Oak Park	Ypsilanti	Livonia	E 7 Mile	Port Huron	New Haven
2000	**17.56**	**16.29**	**15.64**	14.46	13.52	14.33	11.88	13.21	13.28	13.74	12.83	12.43
2001	**18.27**	**17.67**	**18.53**	**17.46**	**16.57**	**15.68**	14.81	14.15	**15.14**	14.76	14.12	13.18
2002	**20.22**	**18.27**	**16.51**	**17.33**	**16.78**	**15.96**	**16.07**	**16.43**	**16.47**	**17.86**	**16.28**	**15.19**
2003	**17.83**	**16.68**	**16.37**	**15.11**	14.94	14.36	13.66	14.39	13.89	13.98	13.05	13.08
2004	**17.46**	**17.69**	**15.91**	**16.18**	14.78	14.83	14.78	14.17	14.13	**15.44**	13.18	14.23
2005	**18.22**	**18.73**	**18.58**	**17.15**	**16.62**	**19.78**	**17.61**	**17.69**	**17.45**	**17.43**	**16.47**	**16.14**
2006	**15.56**	14.93	13.69	13.76	12.58	12.98	10.76	13.12	10.01	11.78	9.09	9.50
2007	**16.02**	**15.12**	14.60	13.76	14.74	14.87	14.68	13.78	13.76	14.36	14.49	13.33

Source: MDEQ

Table 8: Continued

Lowest concentration at this site

4th Quarter Average

Year	Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	Oak Park	Ypsilanti	Livonia	E 7 Mile	Port Huron	New Haven
2000	**20.06**	**18.71**	**19.07**	**17.08**	**16.94**	14.96	**16.31**	14.16	14.46		12.87	12.22
2001	**20.63**	**16.07**	**15.26**	14.79	13.47	12.69	12.23	12.44	12.18	13.79	11.81	11.78
2002	**20.00**	**17.20**	**17.24**	**15.02**	14.95	**16.30**	13.90	13.72	13.43	14.48	12.91	12.98
2003	**17.34**	**17.26**	13.45	13.17	14.78	12.01	12.48	12.78	11.59	13.01	12.11	10.92
2004	**16.06**	13.90	11.52	13.14	13.00	11.47	11.26	11.79	11.45	11.76	10.99	10.29
2005	**17.90**	**15.18**	**15.19**	14.38	13.70	13.10	12.99	13.00	12.68	14.20	12.41	11.94
2006	**17.30**	14.56	11.94	13.70	14.97	12.45	13.78	11.61	12.46	13.46	12.86	12.27
2007												

Annual Average

Year	Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	Oak Park	Ypsilanti	Livonia	E 7 Mile	Port Huron	New Haven
1999	**16.82**	**17.57**	**16.28**	**16.66**	**17.08**		14.16	14.19	13.07		13.16	12.66
2000	**20.13**	**18.10**	**17.63**	**15.56**	**15.49**	**15.19**	**15.39**	14.26	14.59	14.51	14.35	13.42
2001	**19.61**	**18.28**	**18.20**	**17.25**	**15.72**	**15.30**	14.70	14.49	14.60	14.50	13.96	13.60
2002	**19.84**	**17.42**	**16.28**	**15.96**	**15.60**	**16.26**	**15.00**	14.86	14.37	**15.64**	13.84	13.35
2003	**19.20**	**16.69**	**16.32**	**15.23**	**15.85**	13.79	14.58	14.73	14.20	14.71	14.25	12.85
2004	**16.83**	**15.39**	13.66	14.24	13.69	12.98	12.76	12.87	12.57	13.23	12.11	11.96
2005	**18.55**	**17.21**	**16.42**	**15.94**	**16.01**	**15.70**	**15.47**	**15.61**	14.93	**16.48**	**15.09**	14.38
2006	**16.13**	14.68	12.92	13.19	13.04	12.72	12.11	12.55	11.80	12.71	12.04	11.28
2007												

3-Year Average

Year	Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	Oak Park	Ypsilanti	Livonia	E 7 Mile	Port Huron	New Haven
1999-2001	**18.9**	**18.0**	**17.4**	**16.5**	**16.1**	**15.2**	14.7	14.3	14.1		13.8	13.2
2000-2002	**19.9**	**17.9**	**17.4**	**16.3**	**15.6**	**15.8**	**15.0**	14.5	14.5	14.9	14.0	13.5
2001-2003	**19.5**	**17.5**	**16.9**	**16.1**	**15.7**	**15.1**	14.8	14.7	14.4	**15.0**	14.0	13.3
2002-2004	**18.6**	**16.5**	**15.4**	**15.1**	**15.0**	14.3	14.1	14.2	13.7	14.5	13.4	12.7
2003-2005	**18.2**	**16.4**	**15.5**	**15.1**	**15.2**	14.2	14.3	14.4	13.9	14.8	13.8	13.1
2004-2006	**17.2**	**15.8**	14.3	14.5	14.2	13.8	13.4	13.7	13.1	14.1	13.1	12.5
2005-2007												

Source: MDEQ

Table 9

PM2.5 Speciation Trends

ug/m3/year

Species	Allen Park Jan '01-Dec '06	Dearborn May '02 – Dec '06	Luna Pier May '02 - Dec '06	Ypsilanti June '03 – June '05
Nitrate	**-0.16**	-0.11	-0.19	0.34
Sulfate	**-0.17**	-0.19	-0.22	-0.09
EC	0.01	-0.04	0.007	-0.01
OC	**-0.17**	**-0.54**	**-0.22**	-0.43
Soil	**-0.019**	-0.08	**0.008**	-0.00
FRM PM2.5 (1999-2005)	**-0.32**	**-0.56**	-0.32	**-0.12**

Significant trends in bold.

Source: LADCO

Table 10

Organic Carbon Analysis by Wind Direction
Dearborn vs. Allen Park

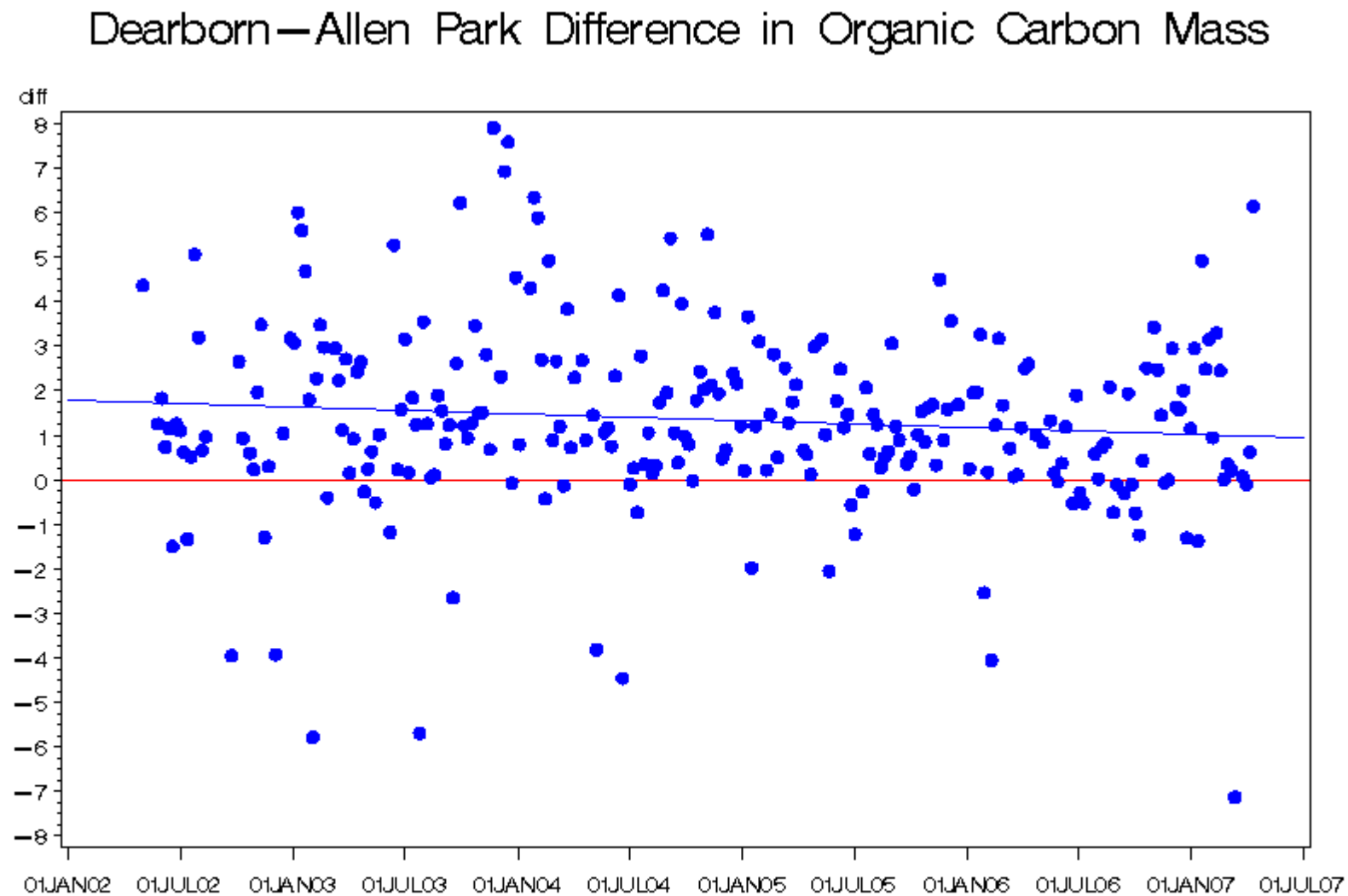
2003-2006

Measurement	Northeast Winds			East Winds			Southeast Winds		
	Dearborn	Allen Park	Difference	Dearborn	Allen Park	Difference	Dearborn	Allen Park	Difference
2003 Average	3.91	3.47	0.44	4.88	5.00	-0.12	6.69	4.91	1.79
2004 Average	2.96	2.75	0.21	4.05	3.10	0.96	5.56	4.52	1.04
2005 Average	3.14	2.69	0.45	4.60	3.96	0.64	5.58	5.11	0.47
2006 Average	3.70	3.67	0.03	3.33	2.66	0.67	5.41	4.75	0.66
4-yr Average	3.42	3.12	0.30	4.45	3.95	0.50	5.84	4.87	0.97
Median	3.39	2.86		4.38	3.56		5.75	4.33	
Std. Deviation	0.87	1.04	0.59	1.78	1.80	1.54	2.13	2.19	1.52

Measurement	Northwest Winds			West Winds			Southwest Winds		
	Dearborn	Allen Park	Difference	Dearborn	Allen Park	Difference	Dearborn	Allen Park	Difference
2003 Average	5.55	4.57	0.98	6.47	3.58	2.89	5.99	4.84	1.15
2004 Average	4.10	3.34	0.76	5.21	3.29	1.92	5.59	4.15	1.44
2005 Average	2.45	2.41	0.04	4.89	3.46	1.43	5.67	4.41	1.26
2006 Average	3.27	2.90	0.36	4.49	3.56	0.92	5.34	5.07	0.27
4-Yr Average	3.62	3.15	0.47	5.18	3.47	1.71	5.70	4.58	1.12
Median	3.65	3.03		4.82	3.21		5.68	4.49	
Std. Deviation	1.30	1.14	0.79	1.42	1.35	1.43	1.61	1.73	1.50

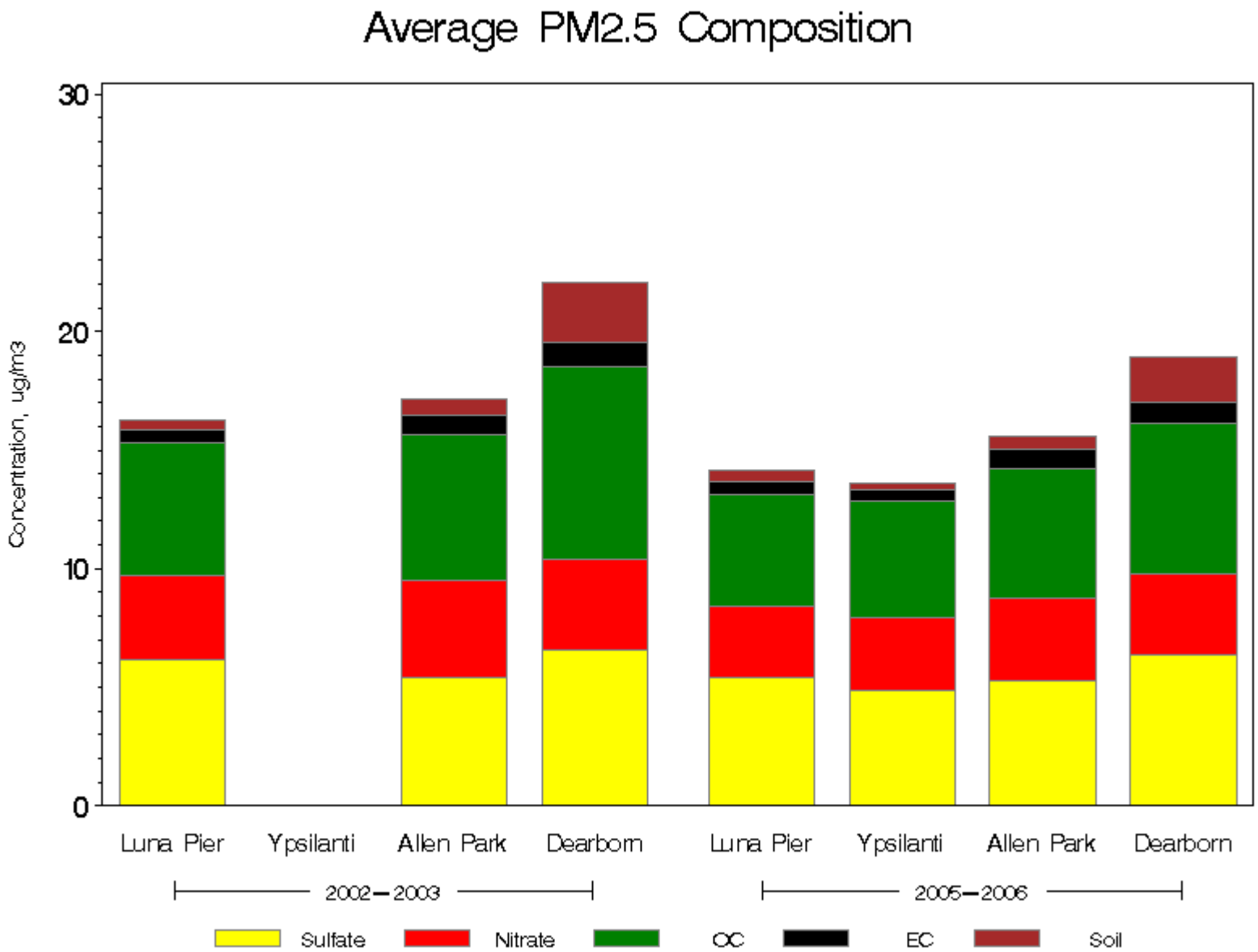
Source: SEMOS

Figure 6



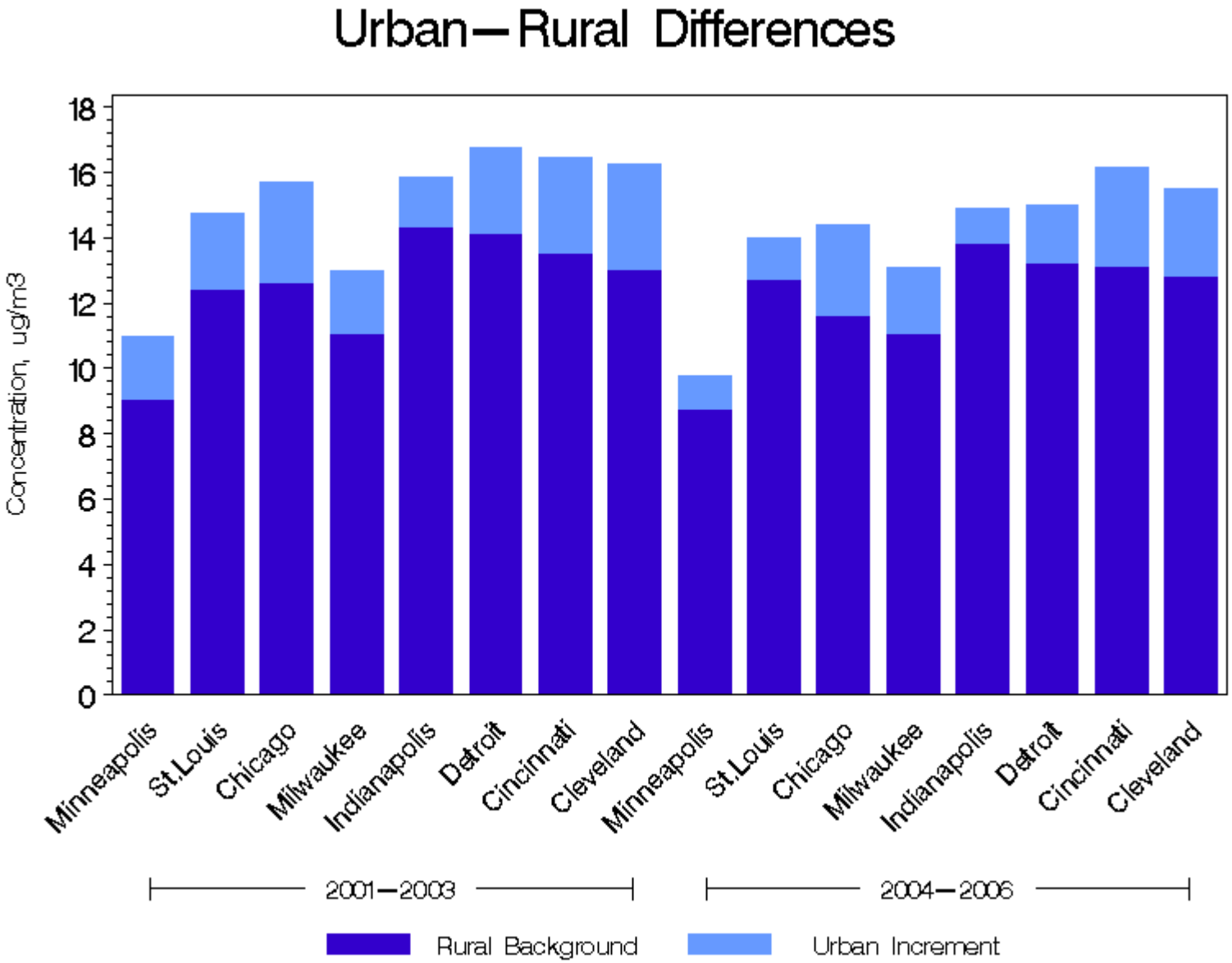
Source: LADCO

Figure 7



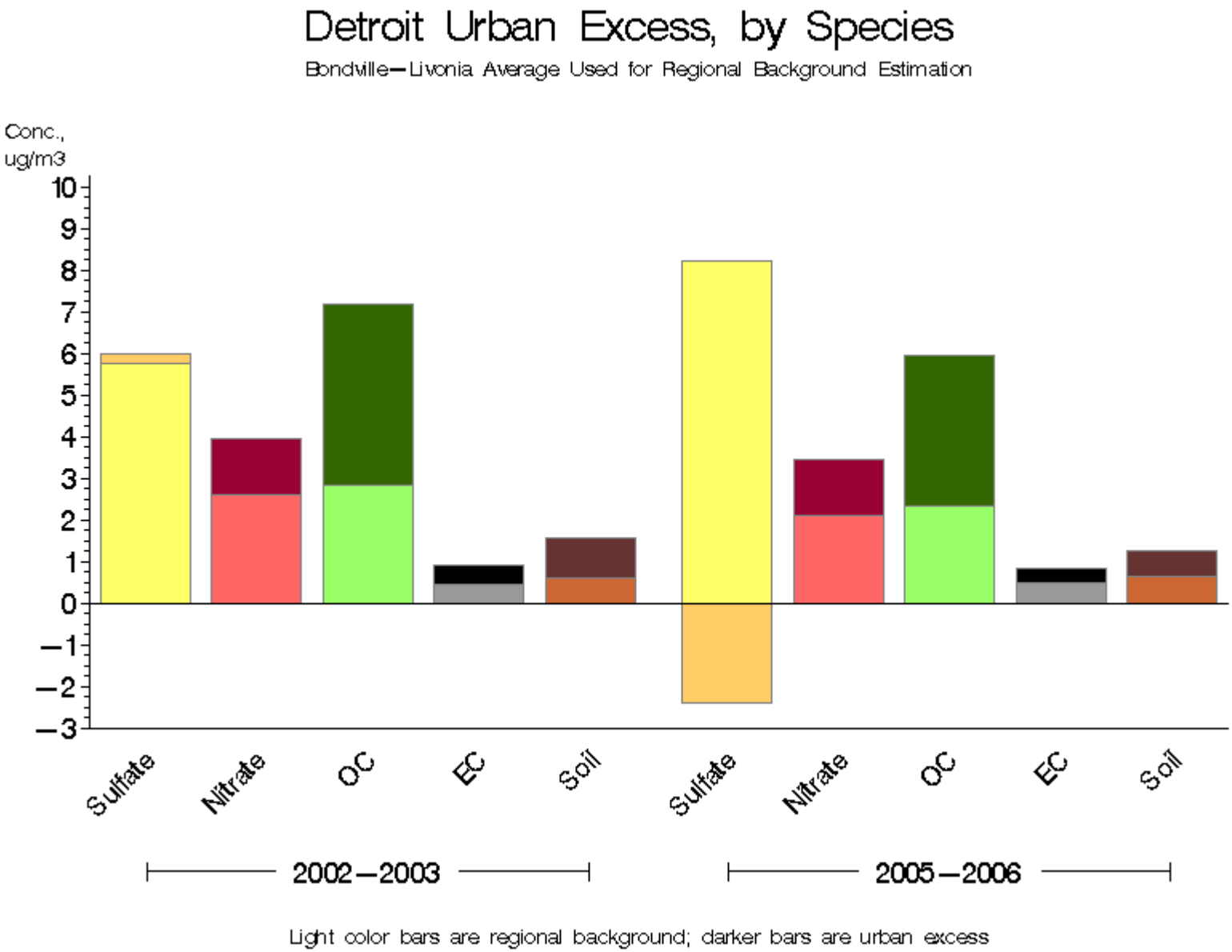
Source: LADCO

Figure 8



Source: LADCO

Figure 9

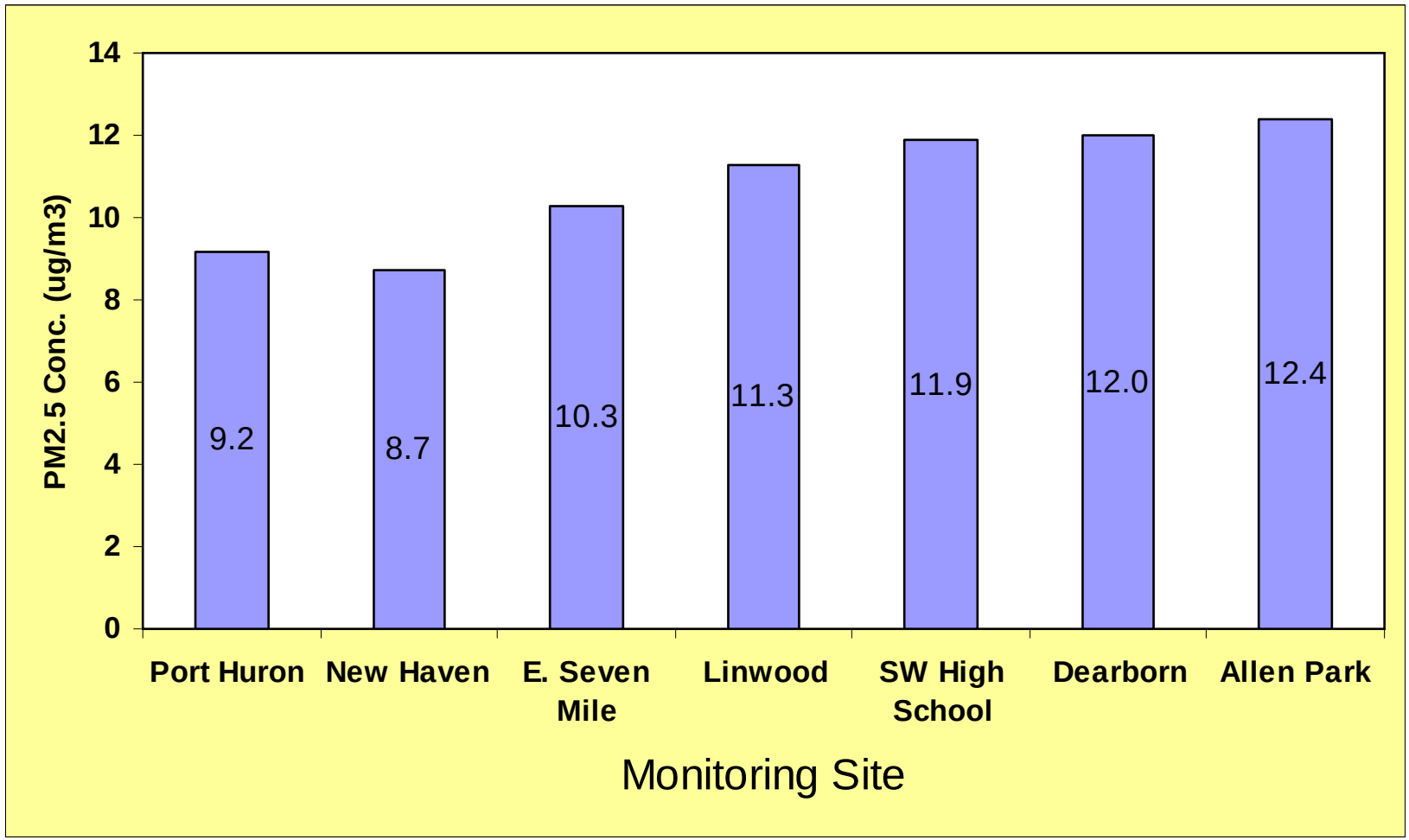


Source: LADCO

Figure 10

Average PM2.5 Concentrations When Winds Are From Northeast

2001 - 2006

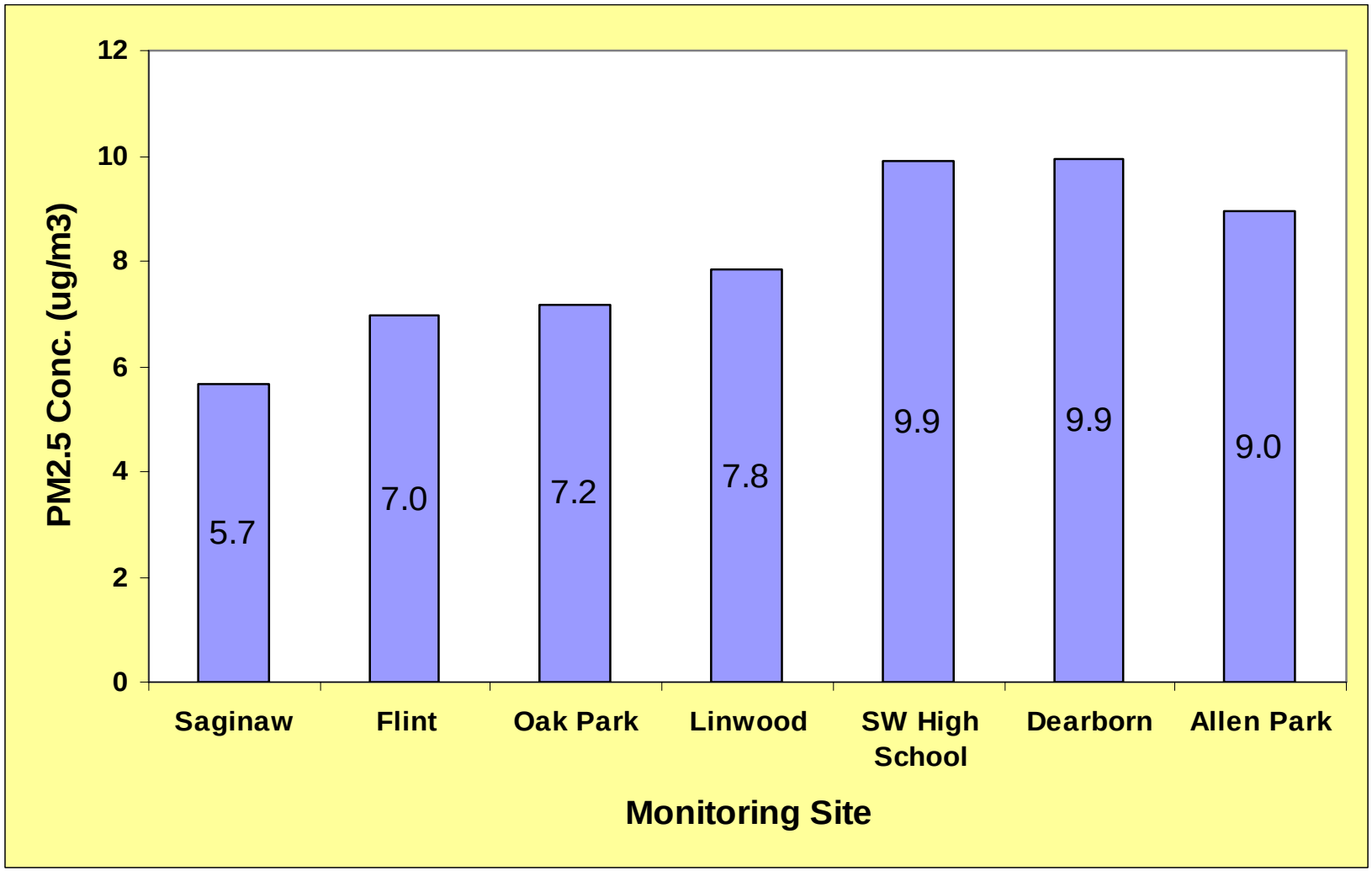


Source: SEMOS

Figure 11

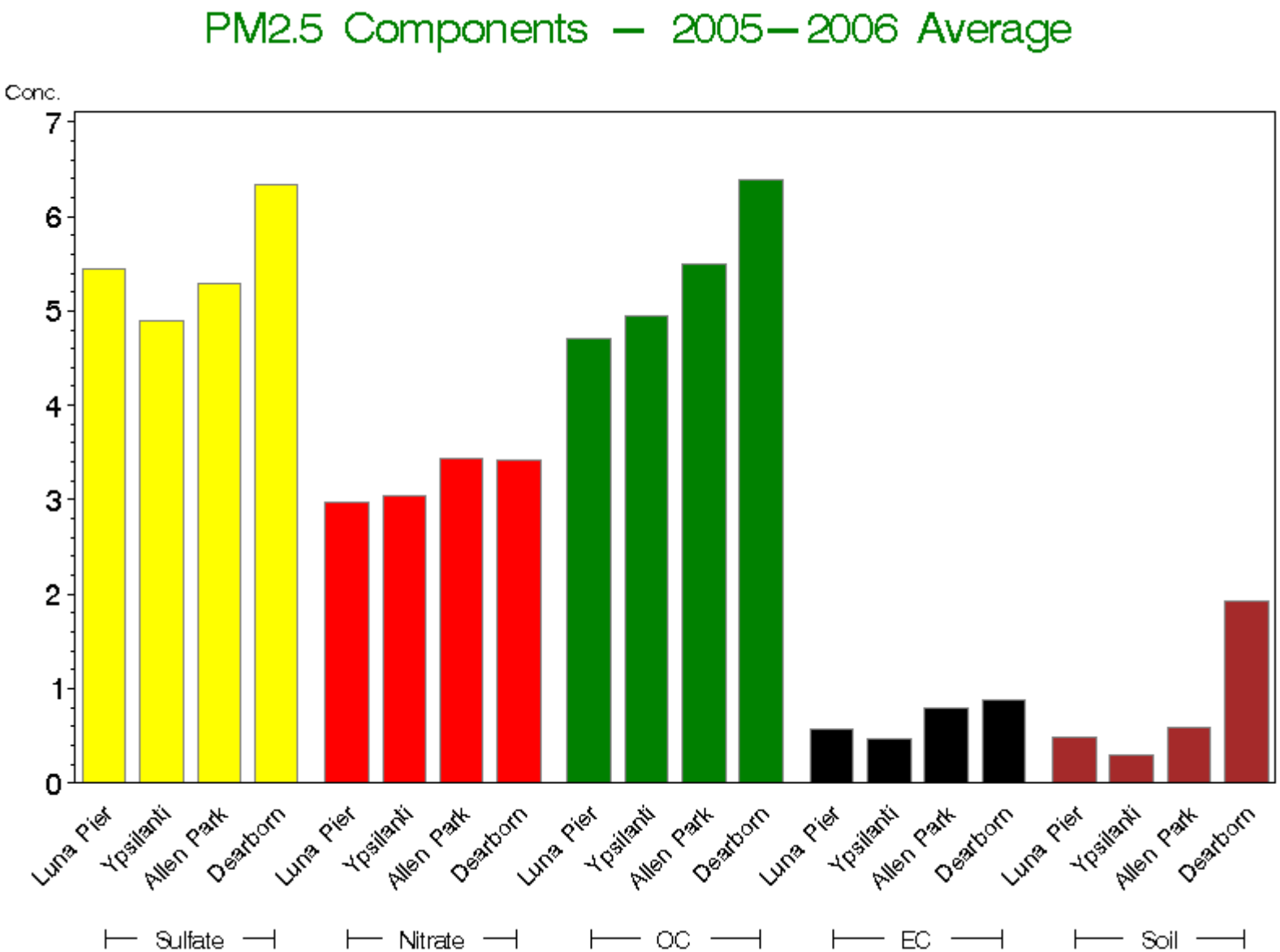
Average PM2.5 Concentrations When Winds Are From Northwest

2001 - 2006



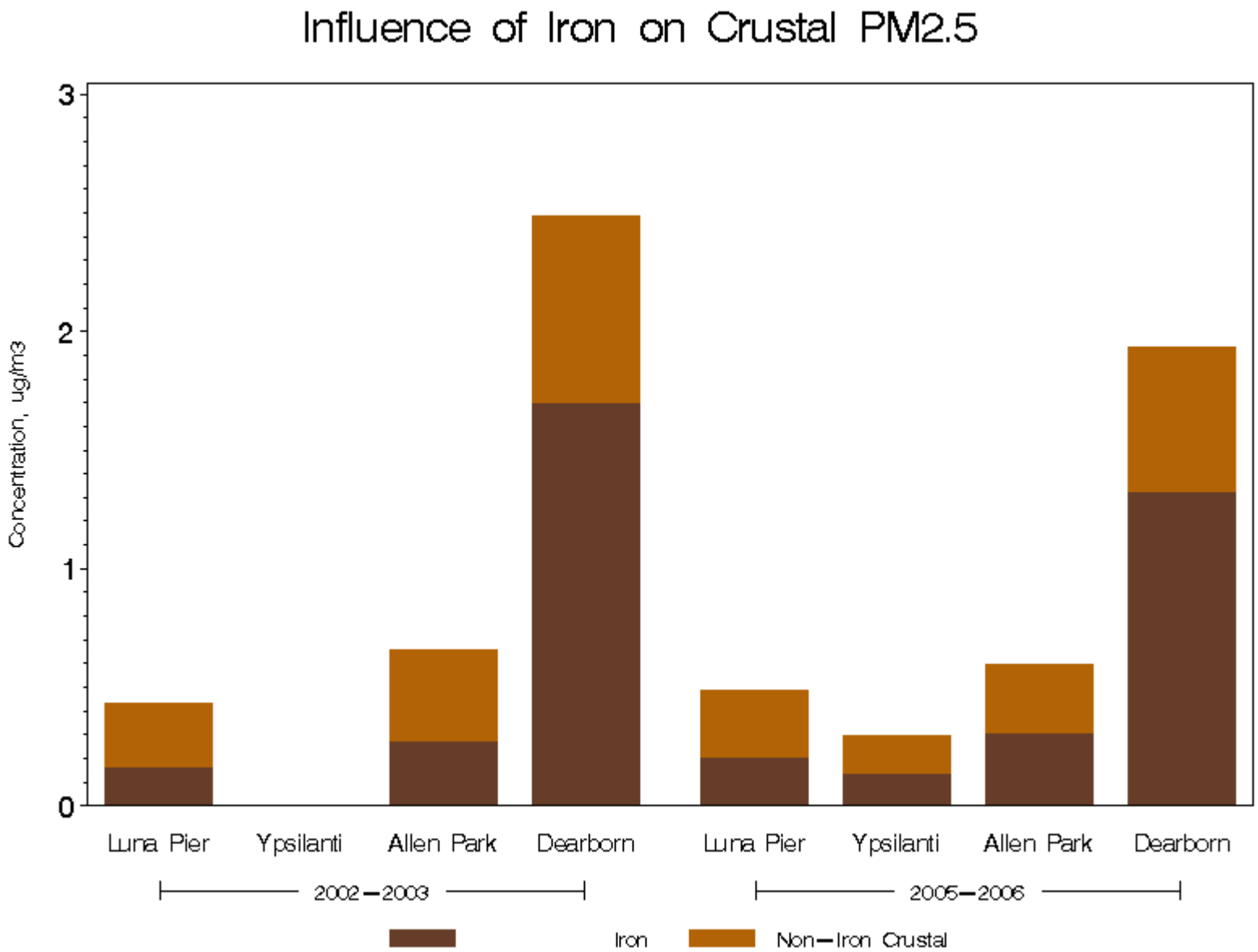
Source: SEMOS

Figure 12



Source: LADCO

Figure 13



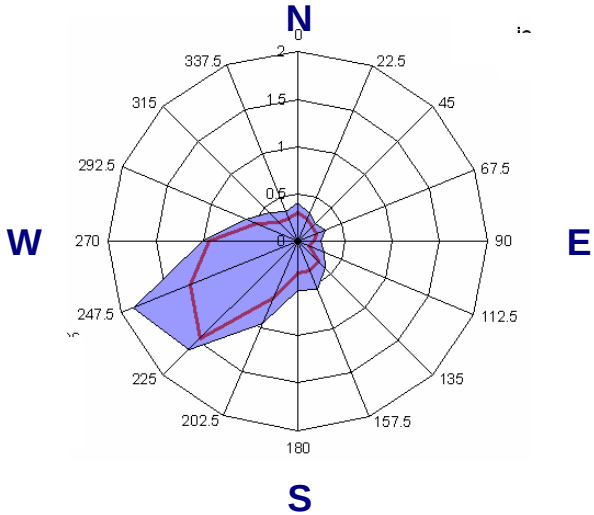
Source: LADCO

Figure 14

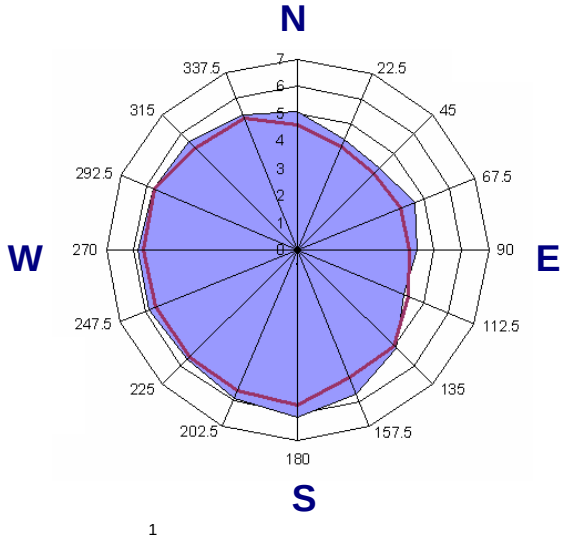
Pollution Roses

2003-2004

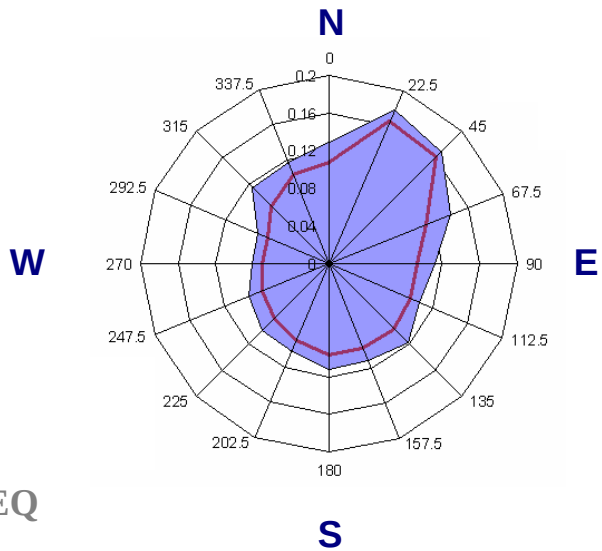
Iron – Dearborn



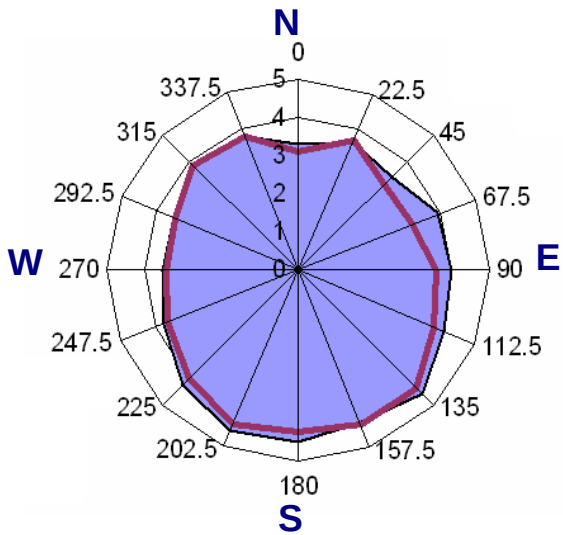
Organic Carbon - Dearborn



Iron – Allen Park



Organic Carbon – Allen Park

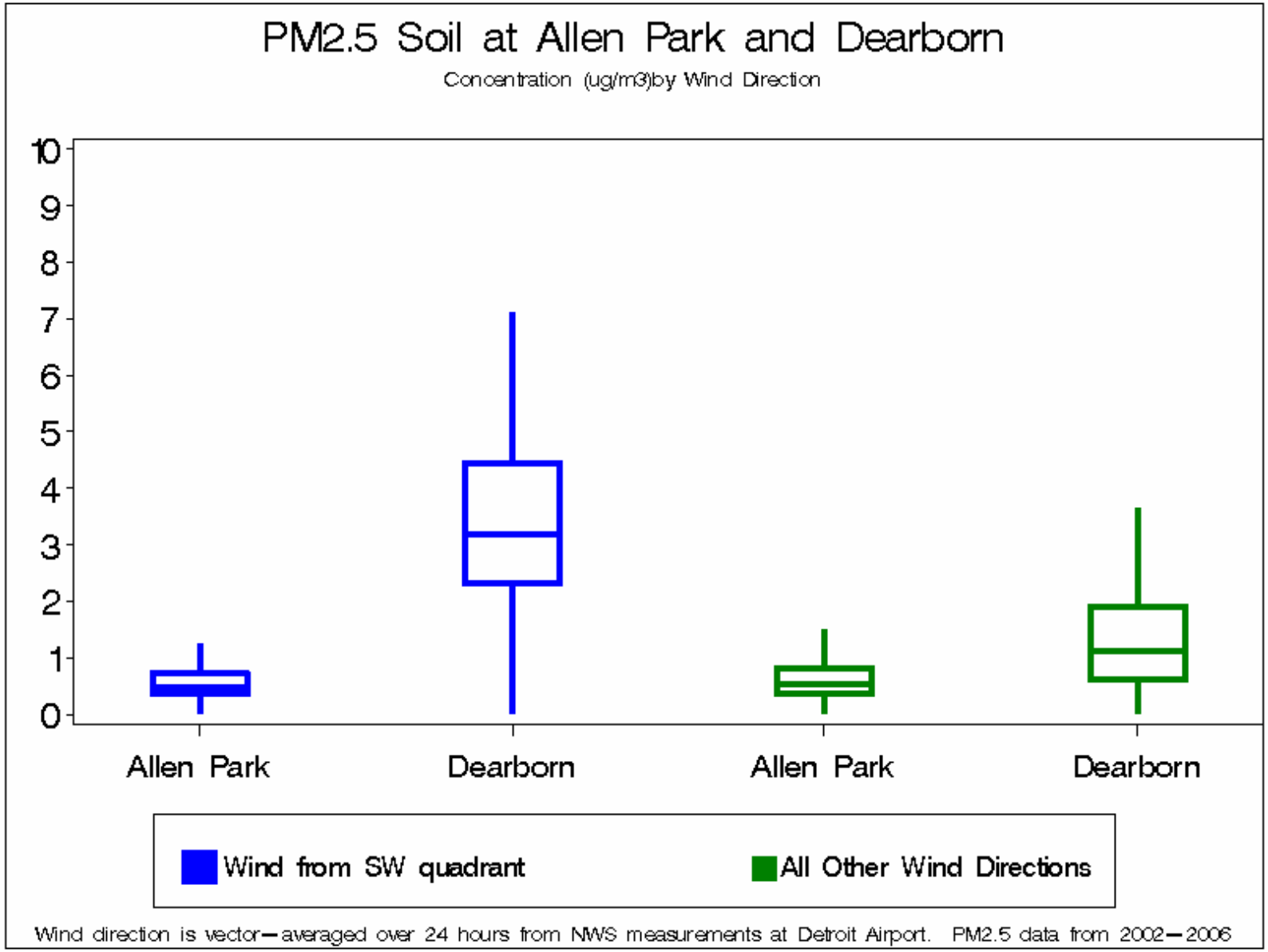


Average

Median

Source: MDEQ

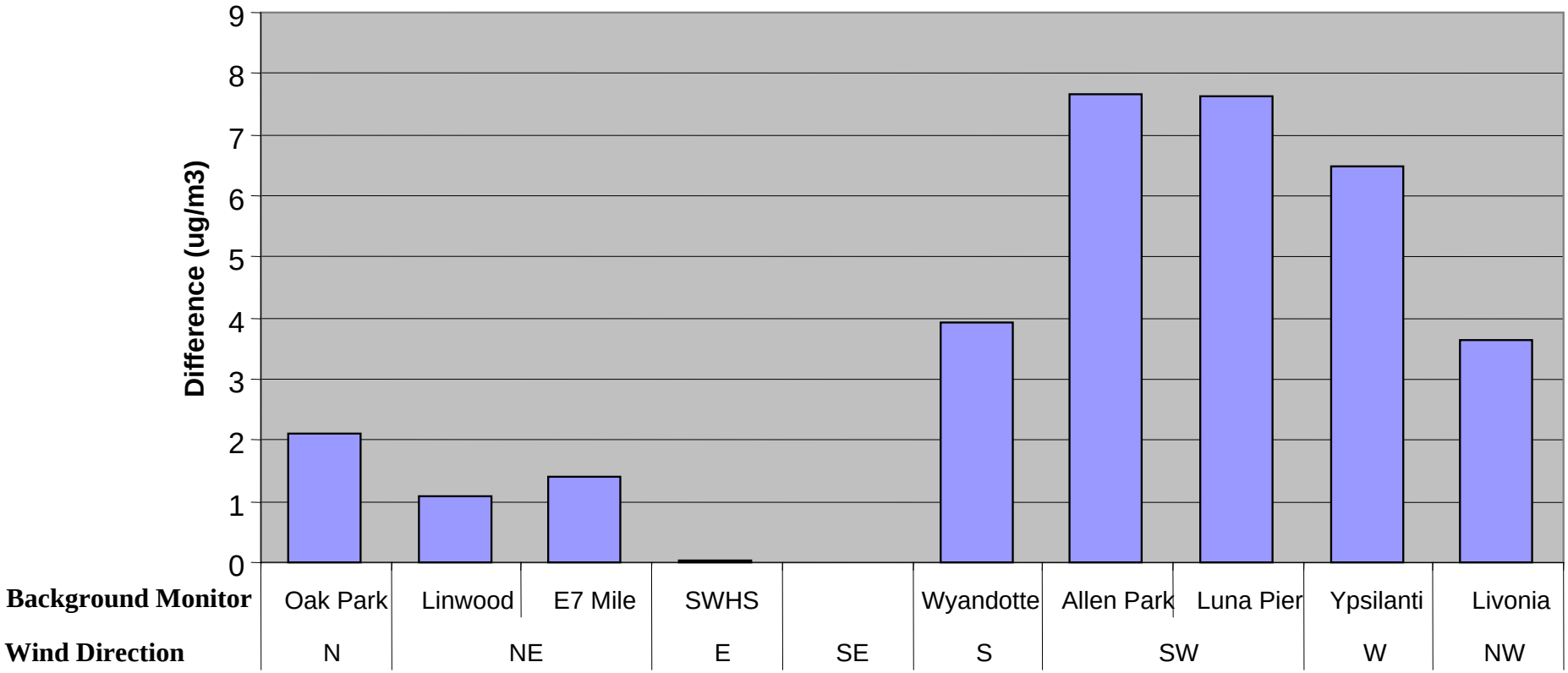
Figure 15



Source: LADCO

Figure 16

Average Difference in Concentrations Between Dearborn and Selected "Background" Monitors



Source: MDEQ

Figure 17

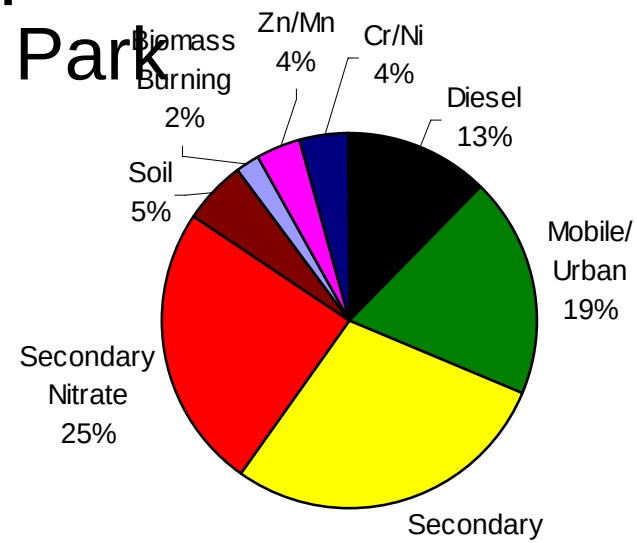
Proximity of Severstal to Air Monitors

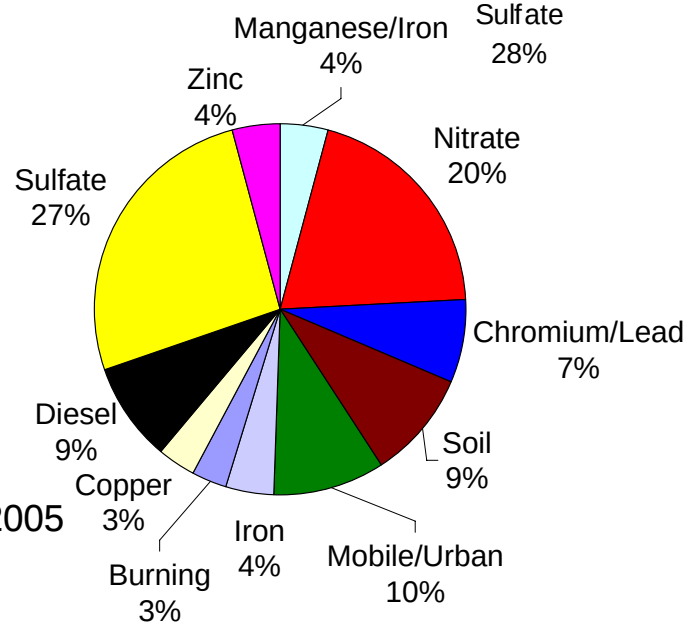
Figure 18

Organic Mass Comparison
Dearborn vs. Allen Park

- Local industrial factors at Dearborn are ~22% of the mass (not including the excess soil) while only ~ 8% at Allen Park
- More of the OM was apportioned with the mobile/urban factor at Allen Park, making this factor larger than at Dearborn
- Sulfate, nitrate and burning factors were similar between sites

Allen Park
2002-2004
Avg=15.9 µg/m³



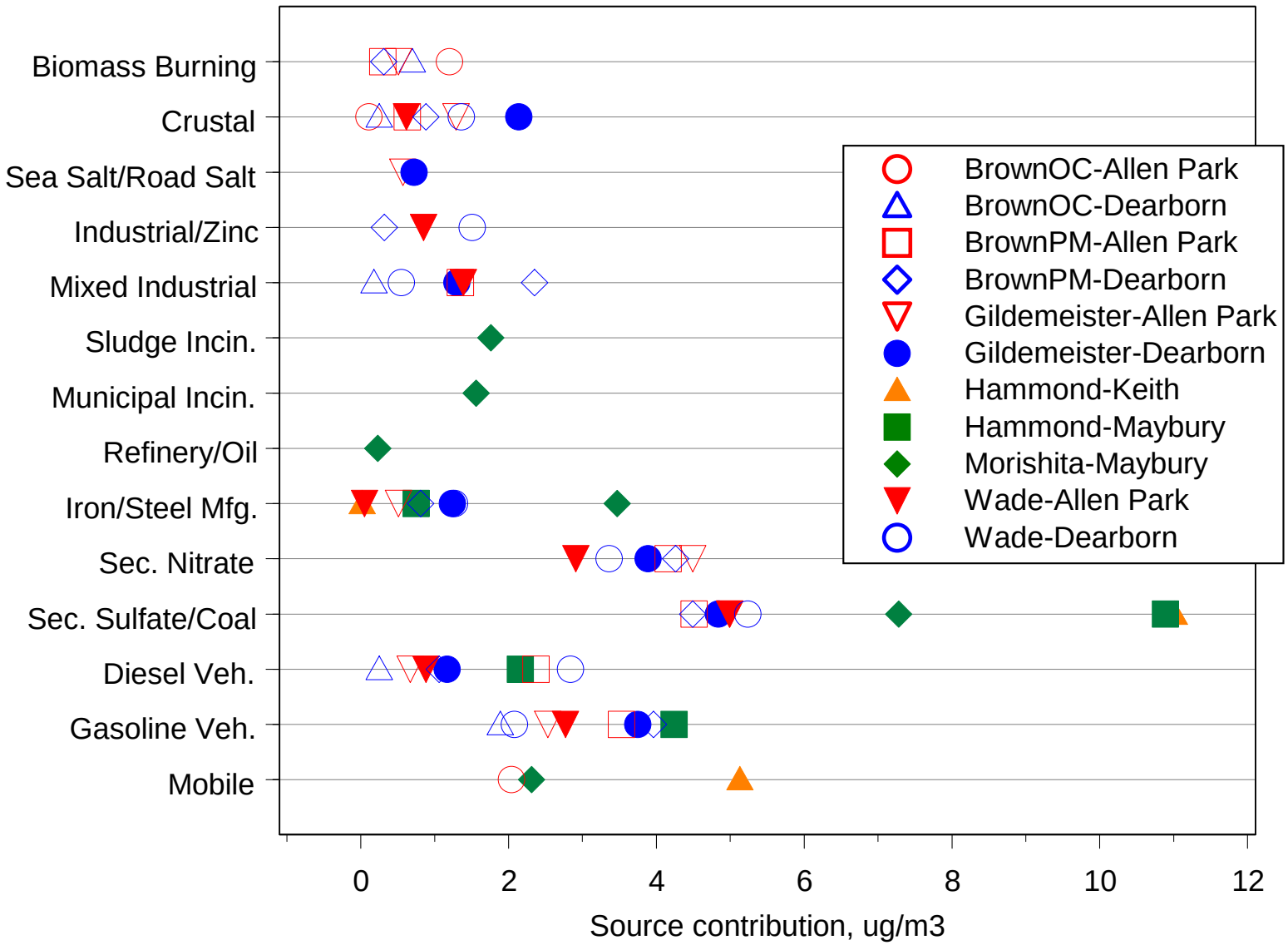


Dearborn
June 2002-May 2005
Avg=19.8 µg/m³

SOURCE: Sonoma Technologies Inc., 2006

Figure 19

Summary of Source Apportionment Results at Detroit Sites

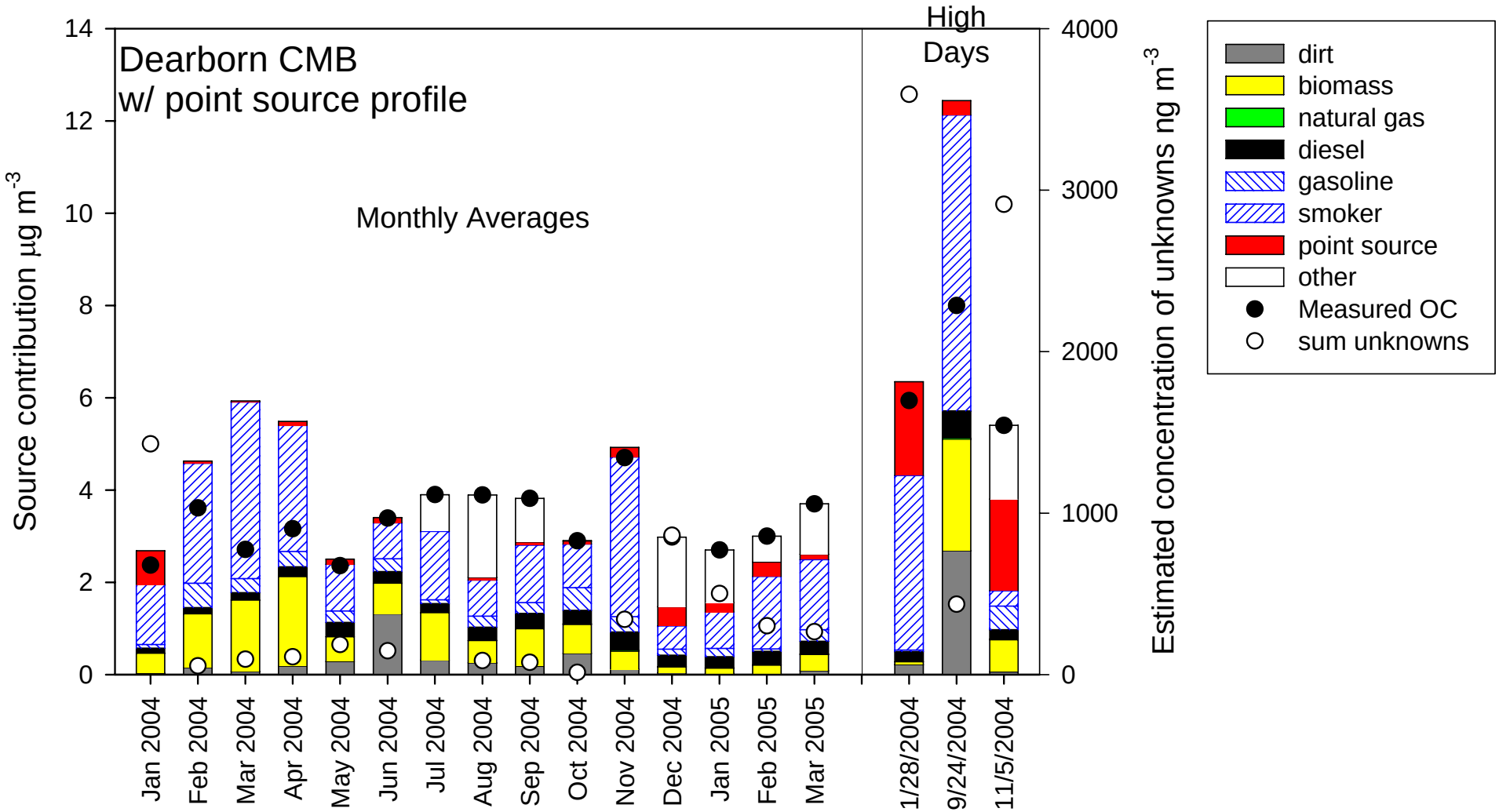


Source: LADCO

Figure 20

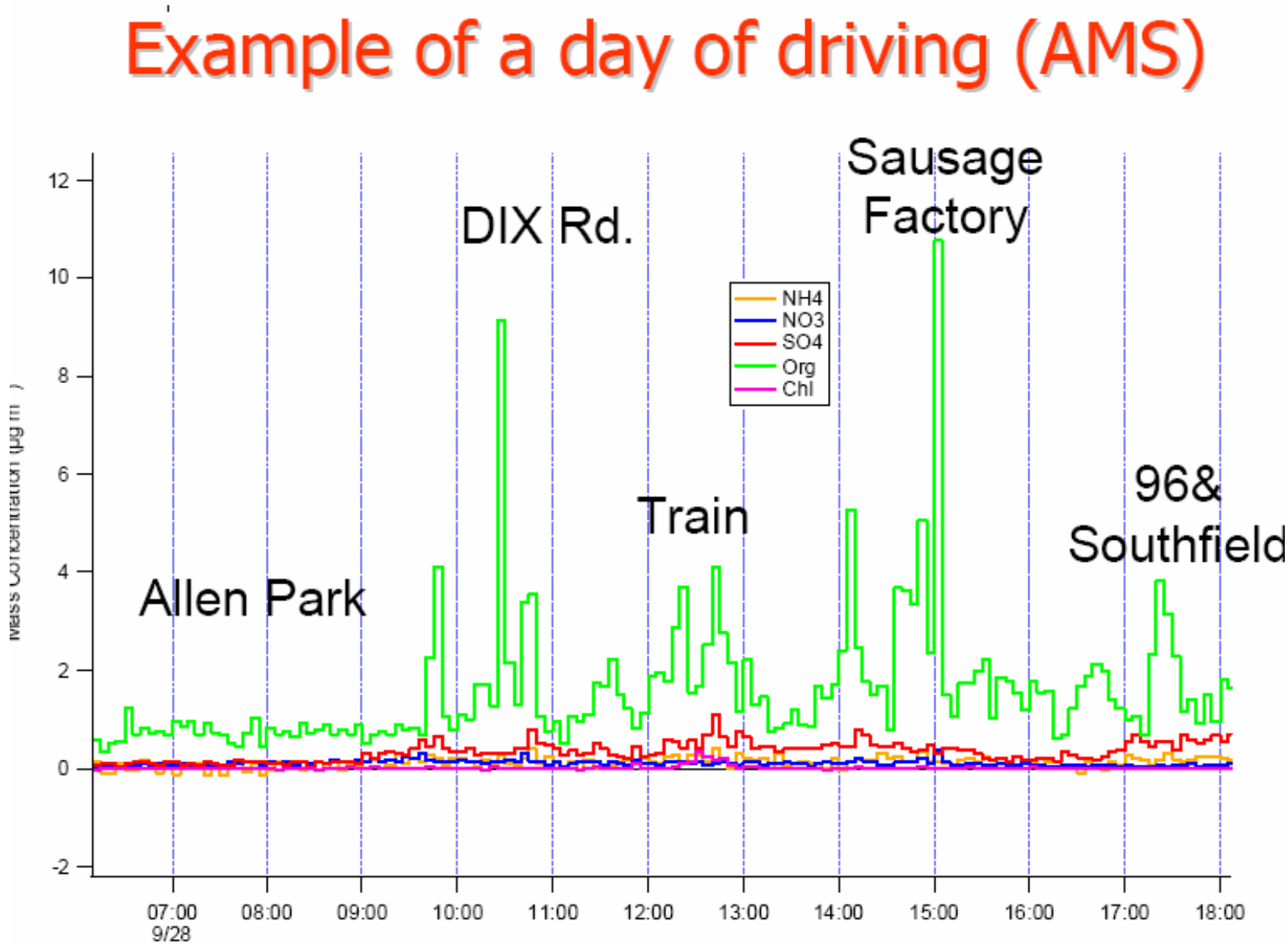
Dearborn CMB Analysis

Source Profile Comparison – Average vs. High PM2.5 Days



Source: LADCO

Figure 21



Source: "Preliminary Results from the Deployment of an Advanced Mobile Laboratory in Detroit", Jeff Brook, Environment Canada, May 7, 2007.

Table 11

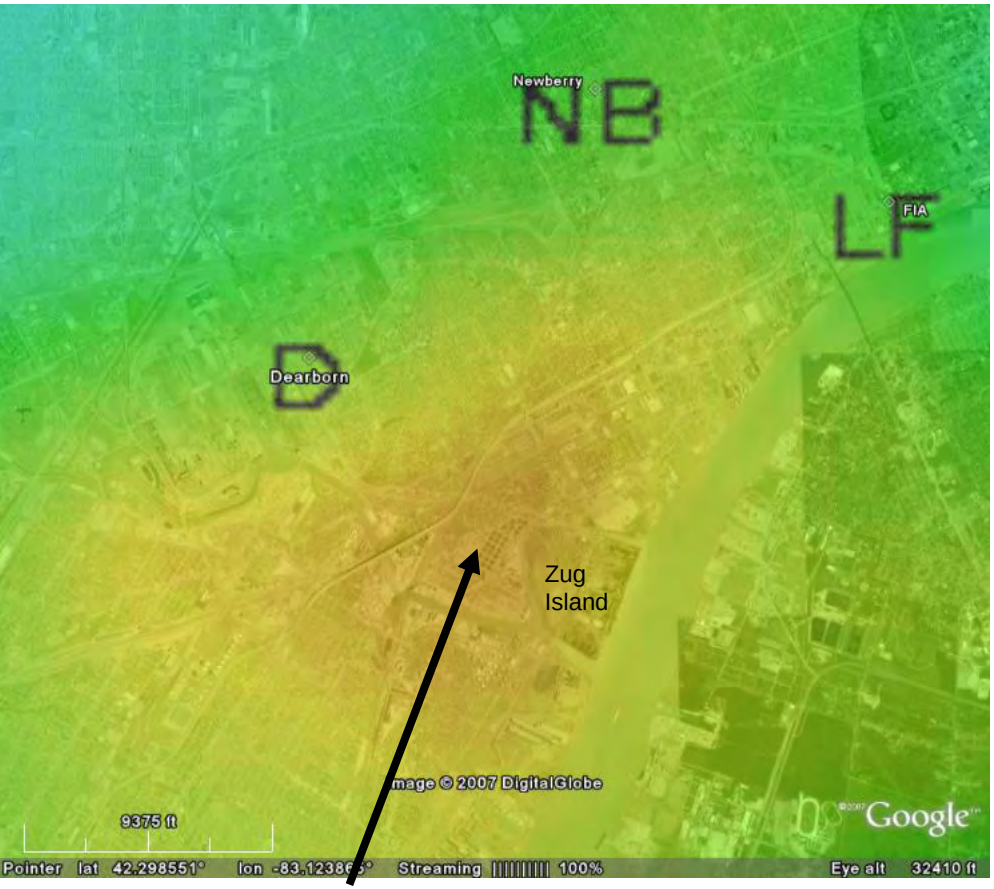
Observed Increase in Pollutant Concentrations Between Locations Immediately Upwind & Downwind of Zug Island

Fall 2006

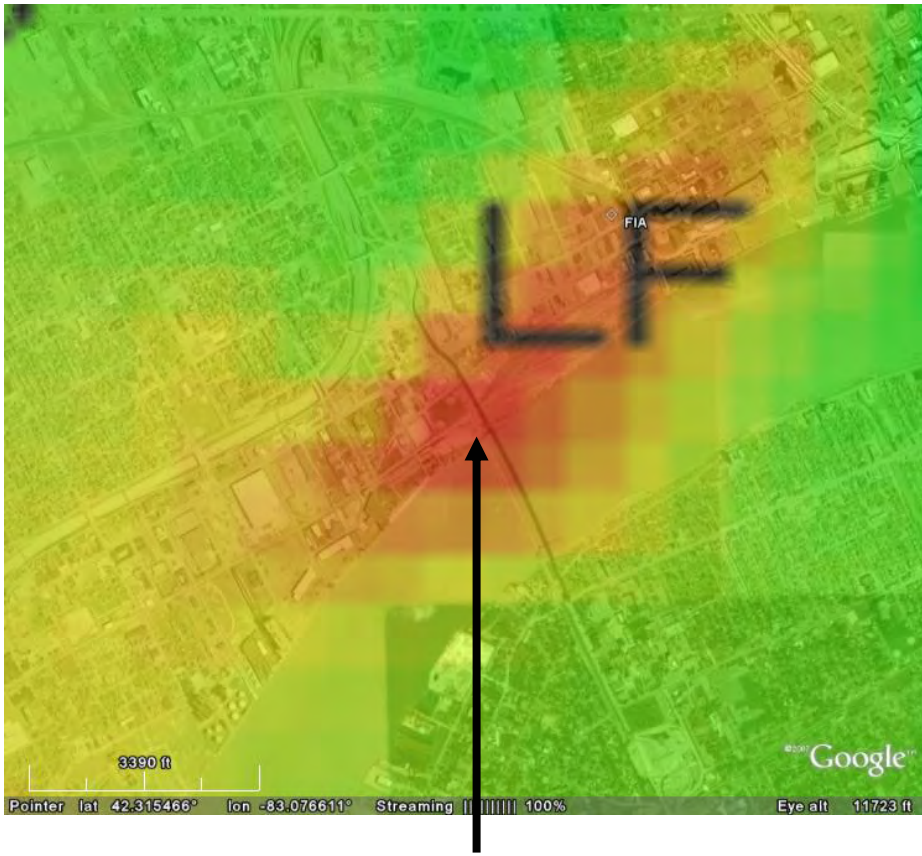
Pol.	Conc.	Unit
NO	28.3	ppb
NOy	45.2	ppb
CO	82.7	ppb
SO2	96.7	ppb
CO2	61.2	ppb
PM2.5	15.8	ug/m3
pSO4	7.8	ug/m3
pOM	0.8	ug/m3
BC	4.9	1/Mm

Source: "Preliminary Results from the Deployment of an Advanced Mobile Laboratory in Detroit", Jeff Brook, Environment Canada, May 7, 2007.

Figure 22: Black carbon (aethalometer) data for FIA (LF) and combined monitors (red indicates higher concentrations and green indicates lower concentrations).



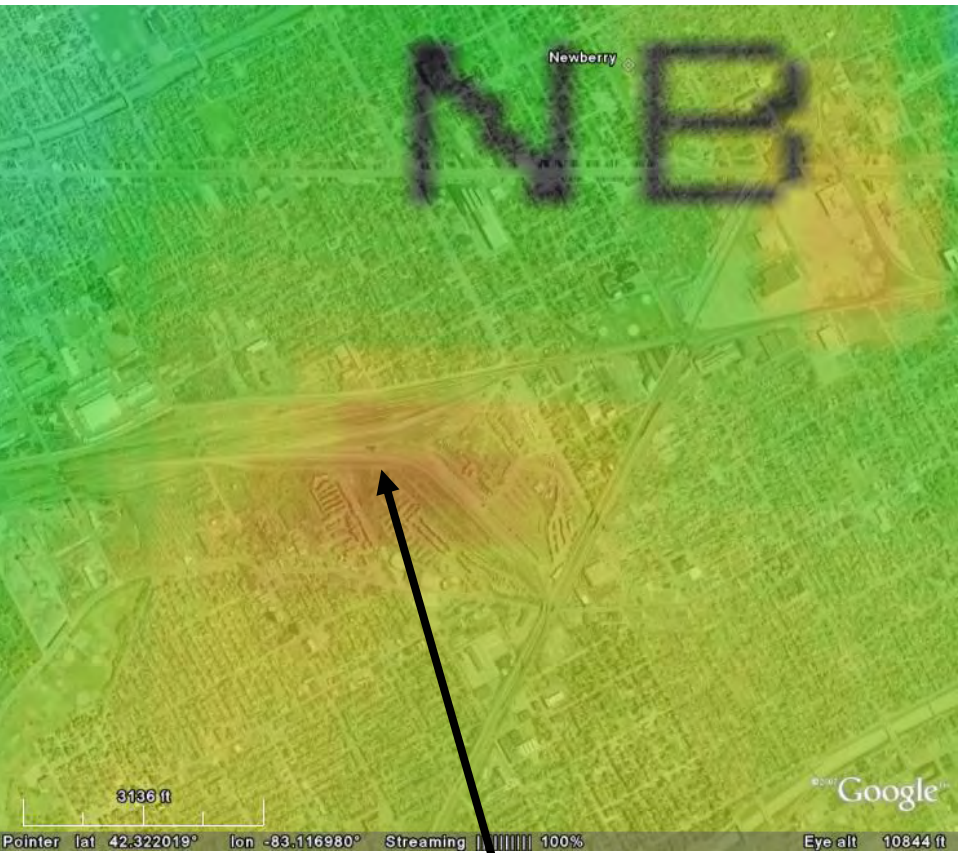
Joint surface from aethalometer data at all 4 sites – area of greatest COMBINED influence on all sites. Highly industrialized area



FIA aethalometer data points very specifically to Ambassador Bridge (1-hr data, 2006 annual)

Source: LADCO

Figure 23: Black carbon (aethalometer) and OC data for Newberry monitor (red indicates higher concentrations and green indicates lower concentrations).



Newberry aethalometer data – points very specifically to intermodal freight terminal (1 hr data, 2006)

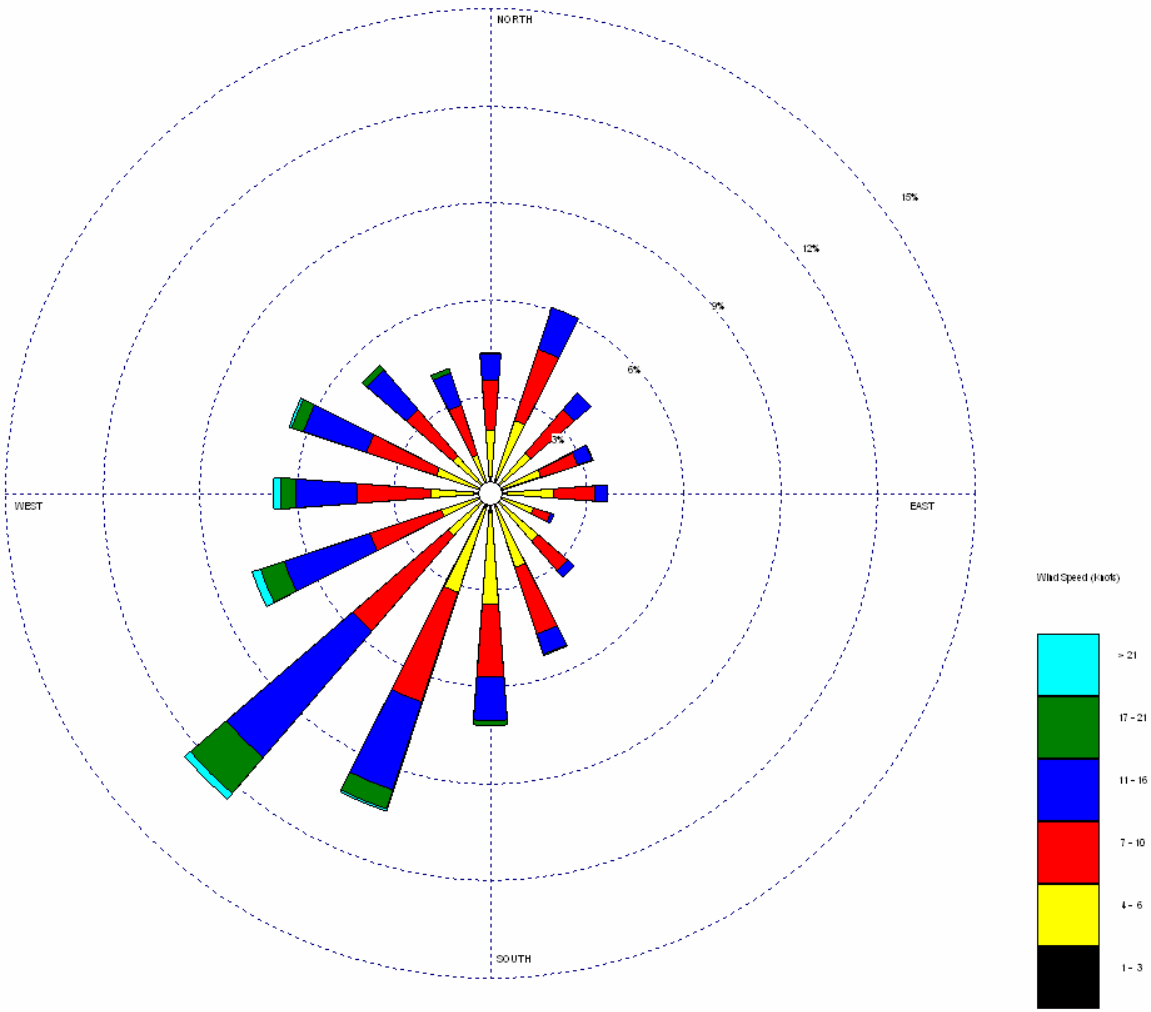
Newberry continuous OC data – also identifies freight terminal as source of OC

Source: LADCO

FIGURE 24
Dearborn Monitor Relative to Severstal Operations

Source: MDEQ

FIGURE 25
Detroit Metro Airport 2002 Windrose



Source: MDEQ

FIGURE 26
Monitors of Concern Relative to Primary Facilities

Source: MDEQ

TABLE 12				
MONITORED VERSUS MODELED LOCAL IMPACTS				
				Dearborn -
	Dearborn	**Allen Park**		**Allen Park [3]**
Monitored Values	(ug/m3)	(ug/m3)		**(ug/m3)**
2000-2004 Weighted Total Average [1]	19.3	17.3		**2.00**
Monitored Local Primary Values [2]				
Clarkson Report	4.55	2.23		**2.32**
Sonoma Report	4.36	1.98		**2.38**
LADCO Analysis [4]	3.25	0.95		**2.30**
AERMOD Modeled Value (Dearborn only) [2]	4.66			
[1] Total PM-2.5				
[2] Local Industrial Primary PM-2.5 only				
[3] Assumed to be the neighbor scale contribution to Dearborn				
[4] LADCO report assumes Soil-Fe contribution only				

Source: MDEQ

Table 13: Hotspot Modeling Impacts

	MAERS			DEARBORN TOTAL			SWHS TOTAL			ALLEN PARK TOTAL	
	EMISSIONS			4.66	µg/m³		2.35	µg/m³		0.50	µg/m³
	(tpy)										
A8640	479.3	PM-2.5	SEVERSTAL NORTH AMERICA, INC.	3.44	µg/m³		0.46	µg/m³		0.24	µg/m³
A7809	666.3	PM-10	US STEEL GREAT LAKES WORKS	0.15	µg/m³		0.97	µg/m³		0.08	µg/m³
A8648	17.0	PM-10	FORD MOTOR CO ROUGE COMPLEX	0.39	µg/m³		0.06	µg/m³		0.03	µg/m³
A9831	198.3	PM-10	MARATHON ASHLAND PETROLEUM	0.11	µg/m³		0.09	µg/m³		0.05	µg/m³
B2132	12.6	PM-10	WYANDOTTE DEPT MUNI POWER	0.00	µg/m³		0.00	µg/m³		0.00	µg/m³
B2169	71.2	PM-10	CARMEUSE LIME/ RIVER ROUGE	0.28	µg/m³		0.60	µg/m³		0.06	µg/m³
B2810	42.6	PM-10	DETROIT EDISON RIVER ROUGE	0.00	µg/m³		0.00	µg/m³		0.00	µg/m³
B2811	186.8	PM-10	DETROIT EDISON TRENTON CHANNEL	0.00	µg/m³		0.00	µg/m³		0.01	µg/m³
B3518	5.5	PM-10	UNITED STATES GYPSUM CO	0.01	µg/m³		0.02	µg/m³		0.00	µg/m³
B3533	15.0	PM-10	EDW C LEVY CO PLANT 1	0.15	µg/m³		0.08	µg/m³		0.02	µg/m³
B3567	7.3	PM-10	ST MARY'S CEMENT	0.06	µg/m³		0.04	µg/m³		0.01	µg/m³
N6631	84.4	PM-10	DEARBORN INDUSTRIAL GENERATION	0.05	µg/m³		0.01	µg/m³		0.01	µg/m³

Source: MDEQ