



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

June 1, 2011

Ms. Susan Hedman, Regional Administrator
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard (R-19J)
Chicago, Illinois 60604-3507

Dear Ms. Hedman:

In accordance with Section 107(d) of the Clean Air Act, the Michigan Department of Environmental Quality (MDEQ) is submitting its recommended designations for the new 1-hour sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS) finalized on June 3, 2010. The MDEQ recommends a sub-county boundary in Wayne County, Michigan as nonattainment, and recommends the remainder of Wayne County and each of the remaining counties in the state as unclassifiable.

The recommended geographical boundary of the nonattainment area is supported by an analysis of factors in the enclosed Weight of Evidence Document. This analysis is consistent with the process described in the U.S. Environmental Protection Agency (U.S. EPA) guidance memorandum issued on March 24, 2011, for area designations for the 2010 SO₂ NAAQS. Modeling is not included in this demonstration, but the MDEQ will continue to prepare modeling data for the state of Michigan.

Meeting the air quality standards is a very important aspect of protecting the health of the state of Michigan. The MDEQ will expeditiously develop a plan to bring the recommended nonattainment area into attainment with the SO₂ NAAQS.

If you have any questions regarding this recommendation, please contact Mr. G. Vinson Hellwig, Chief, Air Quality Division, at 517-373-7069; hellwigv@michigan.gov; or the MDEQ, P.O. Box 30260, Lansing, Michigan 48909-7760; or you may contact me.

Sincerely,

Dan Wyant
Director
517-373-7917

Enclosure

cc: Governor Rick Snyder
Ms. Cheryl Newton, U.S. EPA, Region 5
Mr. John Summerhays, U.S. EPA, Region 5
Mr. Andrew Chang, U.S. EPA, Region 5
Mr. Jim Sygo, Deputy Director, MDEQ
Mr. G. Vinson Hellwig, MDEQ
Mr. Robert Irvine, MDEQ

**Technical Support Document
for
Recommended Nonattainment Boundaries in Michigan
for the
1-Hour Sulfur Dioxide National Ambient
Air Quality Standard**



Michigan Department of Environmental Quality
Air Quality Division

June 2011

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State of Michigan
Recommendations on 1-Hour Sulfur Dioxide Designations
June 2011

Introduction

The U.S. Environmental Protection Agency (EPA) revised the primary National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO₂) on June 2, 2010. To better protect public health, the EPA replaced the 24-hour and annual SO₂ standards, set in 1971, with a new short-term standard based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum concentration. The new level was set at 75 parts per billion (ppb).

In accordance with Section 107 of the federal Clean Air Act (CAA), within one year of a new or revised NAAQS, states are to submit designation recommendations to the EPA. The recommendations should include the boundaries for areas to be designated as nonattainment. The EPA issued a guidance memorandum on March 24, 2011, to direct states on the SO₂ designation process and time line. The memo also contains a description of the five factors that the EPA will use to evaluate the states' recommendations, as well as an explanation of the expected use of modeling to support the recommendations.

The analysis and recommendations for the SO₂ designation recommendations for the State of Michigan have been developed by the Michigan Department of Environmental Quality (MDEQ), Air Quality Division, in conjunction with partners and stakeholders of the Southeast Michigan Ozone Study committee (SEMOS). The excellent contributions of the many technical experts from academia, industry, commerce, and nongovernmental organizations have been invaluable in this endeavor.

Regulatory History in Michigan

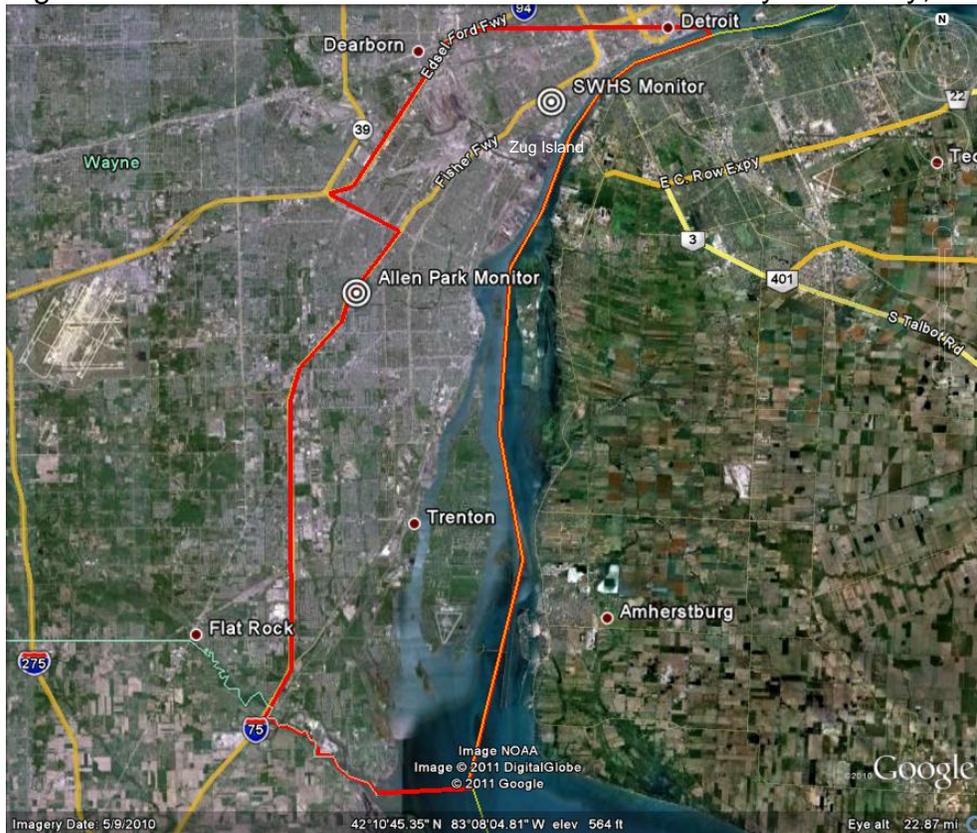
Michigan established emissions limitations and prohibitions for sulfur-bearing compounds for fuel burning equipment in 1976 (Rule 49) under 1965 PA 348, the Air Pollution Act, now established in Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 4 rules). Wayne County operated a local air pollution program for a time. The county also adopted sulfur-in-fuel regulations applicable to sources within its jurisdiction. The Wayne County sulfur limitations have been incorporated into the state's Part 4 rules, and these rules will be in the Michigan State Implementation Plan (SIP), once approved by the EPA. Michigan's Part 4 rules also limit sulfur emissions from oil and gas producing, transporting, or processing and from sulfuric acid and sulfur recovery plants.

Federal programs have also provided for SO₂ reductions both regionally and nationwide, including the federal motor vehicle and motor vehicle fuel control program under Title II of the CAA, the New Source Performance Standards under Section 111, the Acid Rain Program under Title IV, and the Clean Air Interstate Rule, which applies to the eastern half of the U.S.

Nonattainment Area

The MDEQ recommends a nonattainment area based on a weight of evidence (WOE) demonstration that takes into consideration air quality data, emissions data, meteorological data, and major SO₂ source locations in Wayne County. The recommended nonattainment area is shown in Figure 1. The nonattainment area is bound by the Canadian border on the east to the Wayne County border on the south end, follows Interstate 75 on the west side to Southfield Road (M39) to Interstate 94 East (Detroit Industrial Expressway) to Michigan Avenue (US12) on the northern boundary. Since the MDEQ has not completed their SO₂ modeling for all SO₂ sources in the state, the MDEQ is recommending the remaining counties and portion of Wayne County in Michigan be designated unclassified. The basis for this WOE nonattainment recommendation is discussed in the following sections of this document.

Figure 1. Recommended Nonattainment Area for Wayne County, MI.



Air Quality Data

The MDEQ currently operates three SO₂ monitors in Michigan. Two monitors are located in Wayne County, and one is located in Kent County. The Kent County monitor and one of the Wayne County monitors show attainment with the SO₂ NAAQS.

The two Wayne County monitors are located at Allen Park and Southwestern High School (SWHS). Figure 2 shows the location of these monitors.

Based on 2008-2010 data, the Allen Park monitor is showing attainment with the new 1-hour SO₂ NAAQS (75 ppb), with a 3-year average 4th highest daily maximum hourly value of 56 ppb. In contrast, the 3-year average 4th highest values at the SWHS monitor shows nonattainment at 96 ppb. Wayne County had two additional monitors that were shut down in 2007 due to funding issues. Values at these monitors were decreasing in 2006 and 2007. In 2007 these monitors recorded 1-hour values that would have shown attainment for the 2010 SO₂ NAAQS (See Table 1).

Figure 2. Location of SO₂ Monitors in Michigan.

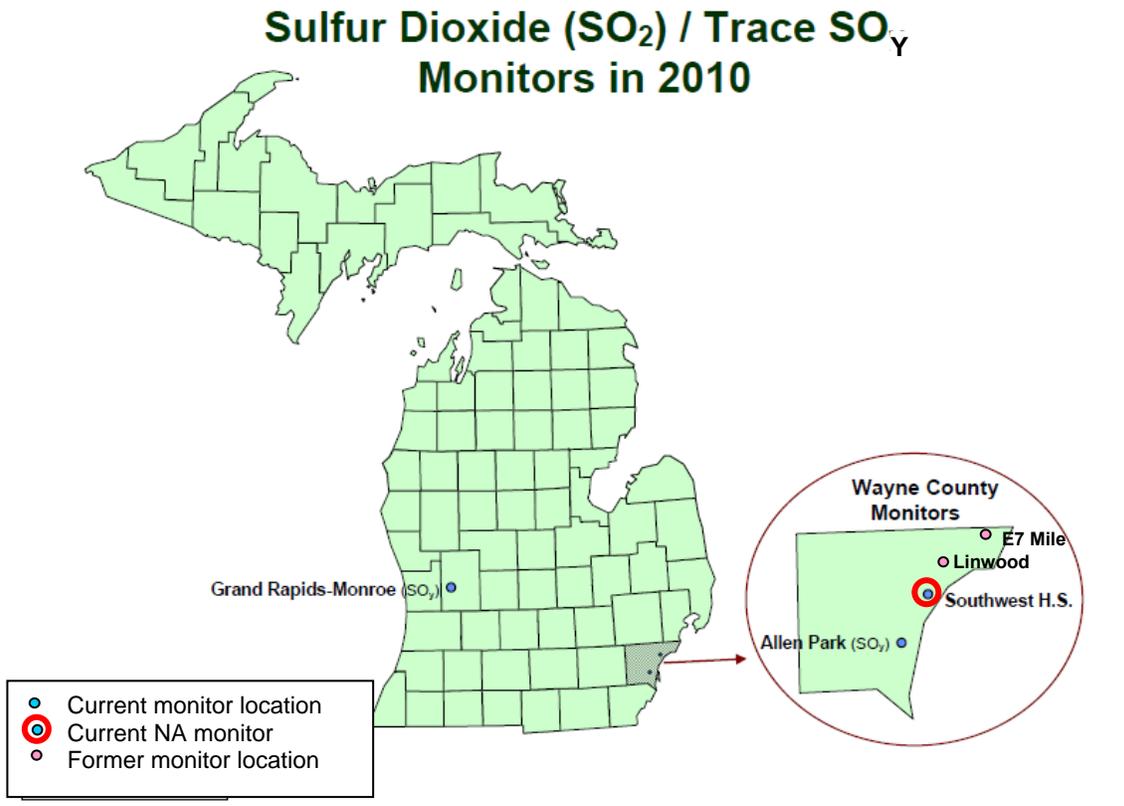


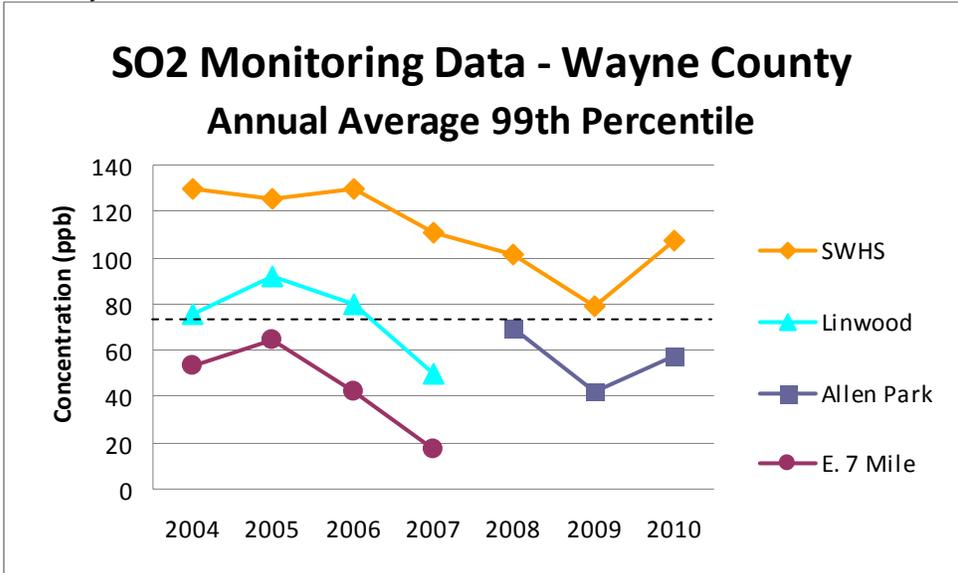
Table 1. SO₂ ambient air concentrations for current monitoring sites as well as former monitoring sites in Wayne County.

			Annual Average 99th percentile						3-year average 99th percentile					
Monitor			1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr	1 Hr
Number	Name	County	2004	2005	2006	2007	2008	2009	2010	04-06	05-07	06-08	07-09	08-10
			SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂	SO ₂
261630015	SWHS	Wayne	130	125	130	111	101	79	107	128	122	114	97	96
261630001	Allen Park	Wayne					70	42	57					56
260810020	Grand Rapids	Kent	20	23	18	15	13	13	18	20	19	15	13	14
261630016	Linwood*	Wayne	76	92	80	50				83	74			
261630019	E. 7 Mile*	Wayne	53	64	42	17				53	41			
*Monitors removed in 2007														

Figure 3 shows the graphical depiction of the values in Table 1, the annual 99th percentile of the daily maximum 1-hour values for the current and historical monitors in Wayne County from 2004-2010. The most recent annual 99th percentiles of the 1-hour values are all below the SO₂ NAAQS except at the SWHS site.

For the most recent three years, Allen Park is 30 to 50 ppb less than SWHS. These monitors are approximately seven miles apart. The Linwood monitor, which was removed in 2007, is less than four miles northeast of the SWHS monitor. When the Linwood monitor was operating, it was over the 2010 SO₂ NAAQS standard in 2004-2006 but showed attainment of the standard for 2005-2007. Given the significant SO₂ reductions that have occurred since the Linwood monitor was shut down (low-sulfur gasoline rule, ultra-low sulfur diesel rule, and CAIR) and the fact that historically its SO₂ concentrations were 30 to 50 ppb less than those measured at SWHS, we fully expect that this monitor would likely still show attainment in 2008-2010.

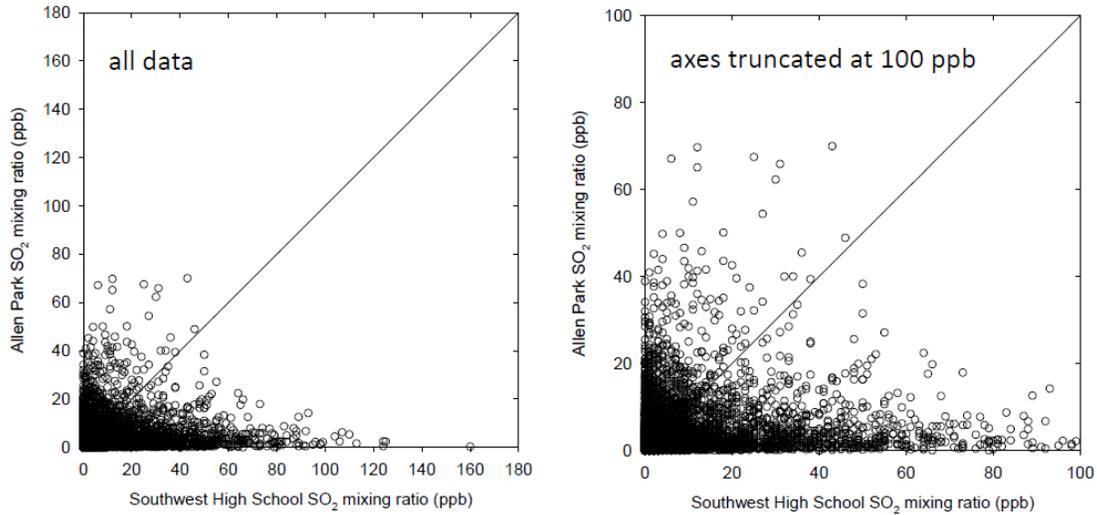
Figure 3. Annual average 99th percentile for SO₂ monitoring data in Wayne County.



This difference in the concentrations between the Allen Park and SWHS monitoring sites, despite their close proximity, also suggests the sources of the elevated concentrations at SWHS are located between the two sites. To further evaluate this idea, SWHS monitor data can be graphed against Allen Park data. If sources are affecting both monitors similarly (i.e., such as a distant source), the data points should show a strong coupling or correlation around a central axis. If there is no coupling and data tends to congregate along the axis, it means one monitor has high values when the other has low values. Since Allen Park is typically upwind of SWHS when the highest 1-hour average SO₂ concentrations are observed, the sources would have to be located between the two monitors. Figure 4 shows there is a weak coupling or correlation between high SO₂ concentrations at the Allen Park and SWHS sites, which supports, along with other information in this WOE, that SO₂ sources located nearby are likely culpable.

Figure 4. Hourly SO₂ for Allen Park plotted against SWHS for all data and truncated at 100 ppb to show greater detail.

Hourly SO₂ (2008-2010) Allen Park against SWHS



The large concentration differences in these nearby monitors indicate high spatial variability of SO₂. The SWHS monitor is located very near major SO₂ sources in Wayne County (see Figure 5). The MDEQ's recommended nonattainment area is supported by the spatial variability of SO₂ and the identification of major sources discussed further below.

Emissions-Related Data

Figure 5 shows the location of SO₂ sources in Southeast Michigan with either actual or permitted emissions of 10 tons or more. Where permit data was available, allowable limits were used. If allowable limits were not available, reported emissions inventory data for 2009 were used. Figure 6 shows the sources in Wayne County, along with the recommended nonattainment area. The red dots indicate sources either emitting or permitted to emit more than 1,000 tons per year of SO₂. The orange dots indicate sources between 100 and 1,000 tons per year of SO₂. The yellow dots indicate sources between 10 and 100 tons per year of SO₂. Sources in Southeast Michigan emitting more than 1 ton of SO₂ in 2009 are shown in Appendix A. Sources in Wayne County

emitting more than 1 ton of SO₂ in 2009 are shown in Appendix B, including their distance and direction from the SWHS monitor.

The recommended nonattainment area contains most of the SO₂ sources emitting more than 100 tons in Wayne County. Directly south of the SWHS monitor is Zug Island, which is located in the city of River Rouge. This small island contains the iron making portion (including blast furnaces and coke battery) of one of the two steel mills in the Detroit area. The remaining steel making facilities (basic oxygen furnaces and other processing) occur further south in the city of Ecorse, Michigan. Just south of Zug Island is one of the four power plants included in the MDEQ's recommended nonattainment area. Two other power plants are located 10 and 20 km SSW of the SWHS monitor along the Detroit River. Located within five miles south and west of the SWHS monitor are the other Detroit area steel mill, the fourth power plant, a wastewater treatment plant, a petroleum refinery, an asphalt plant, and a lime processing plant. All of these sources are included in the recommended nonattainment area (see Figure 6).

Another potential source of SO₂ emissions at SWHS is marine traffic along the Detroit River. This river is the only point of access to three of the Great Lakes. The SWHS monitor is located less than two miles from the river, and the main passage for the river is directly south of the monitor. Thousands of ships navigate the river each year, many of which traditionally have burned high sulfur bunker oil.

Figure 5. SO₂ sources in Southeast Michigan.

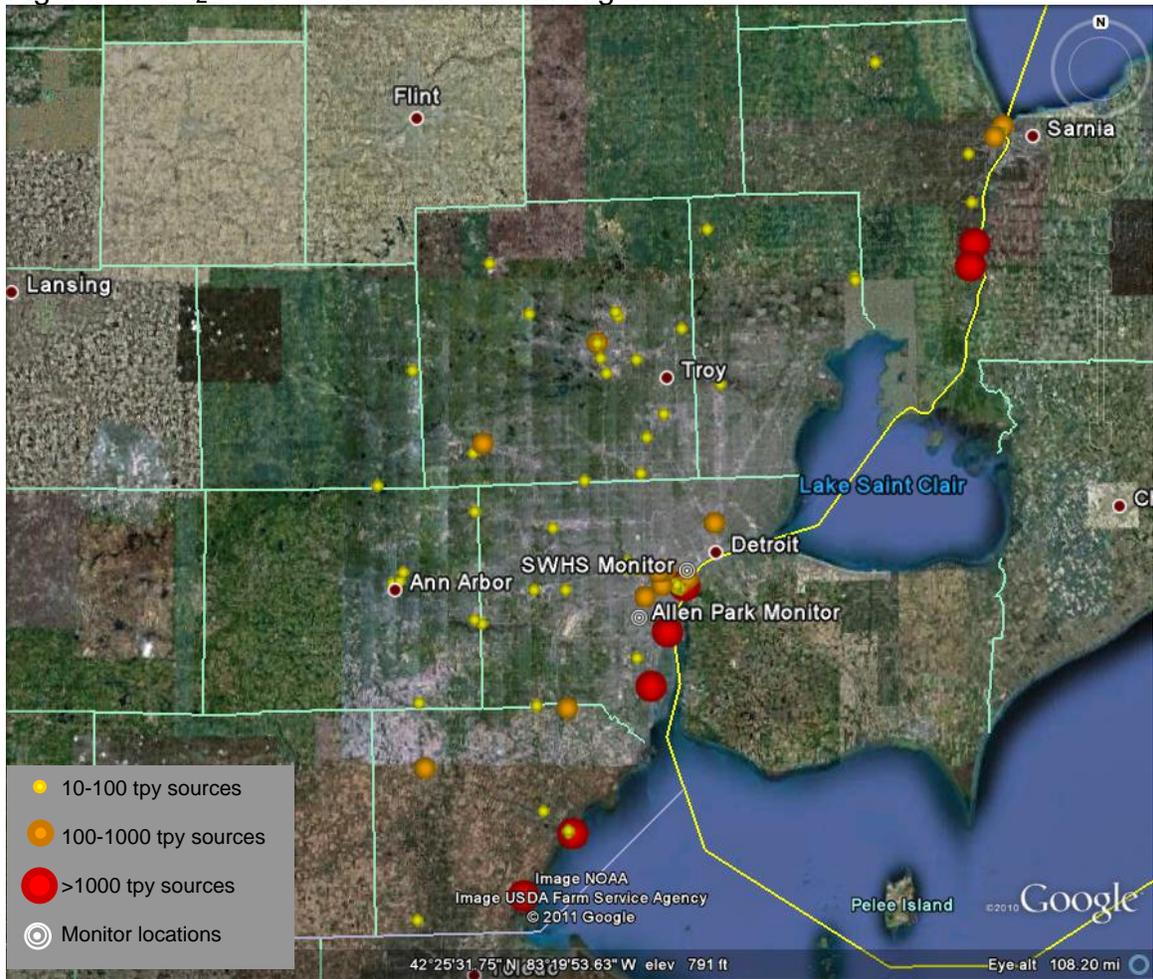


Figure 6. SO₂ sources in Wayne County including the monitors and recommended nonattainment area.



Emissions and Meteorology

Meteorology, wind direction, and wind speed, in particular, indicate movement of air around a particular point. Wind roses are particularly useful in visualizing where winds are coming from (wind direction) and how fast winds are moving (wind speed). The size of the bar indicates the frequency or how often the wind is at that particular speed and direction.

Wind roses were created using meteorological data from 2008-2010 collected at each of the two monitor locations. The wind roses for Allen Park and SWHS indicate winds from all directions, but more so from the south and west (see Figure 7).

Pollution roses indicate the wind direction of high concentrations of a pollutant. They are similar to wind roses, except that the wind speed is replaced by pollutant concentration. High pollutant concentrations in a particular wind

direction indicate a source of that pollutant is located in that wind direction in relation to the monitor.

Pollution roses were created for both monitors using 2008-2010 data. The majority of hours were below 5 ppb of SO₂ (96.97% of Allen Park's data and 92.06% of SWHS's data was below 5 ppb) at both sites. To emphasize the high days, a threshold value of 5 ppb of SO₂ was used. Although the NAAQS is set at 75 ppb, using a 75 ppb threshold would not provide enough data to create pollution roses, thus, 5 ppb was used.

Allen Park shows northeast to south wind directions during hours when SO₂ concentrations are above 5 ppb. SWHS shows a distinct southerly wind direction when SO₂ concentrations are above 5 ppb (see Figure 8). As seen in Figure 5, eastern Wayne County is very industrialized with several large sources of SO₂ south of SWHS and east of Allen Park along the river. Less than two miles directly south of the SWHS monitor is an iron making facility, a coke battery, a power plant, and the Detroit River, which greatly increase SO₂ concentration at that monitor. The major sources of SO₂ are more than three miles away and downwind of the Allen Park monitor and, thus, have little influence on SO₂ concentrations at that monitor.

Figure 7. Wind roses for the SWHS and Allen Park monitors for 2008-2010.

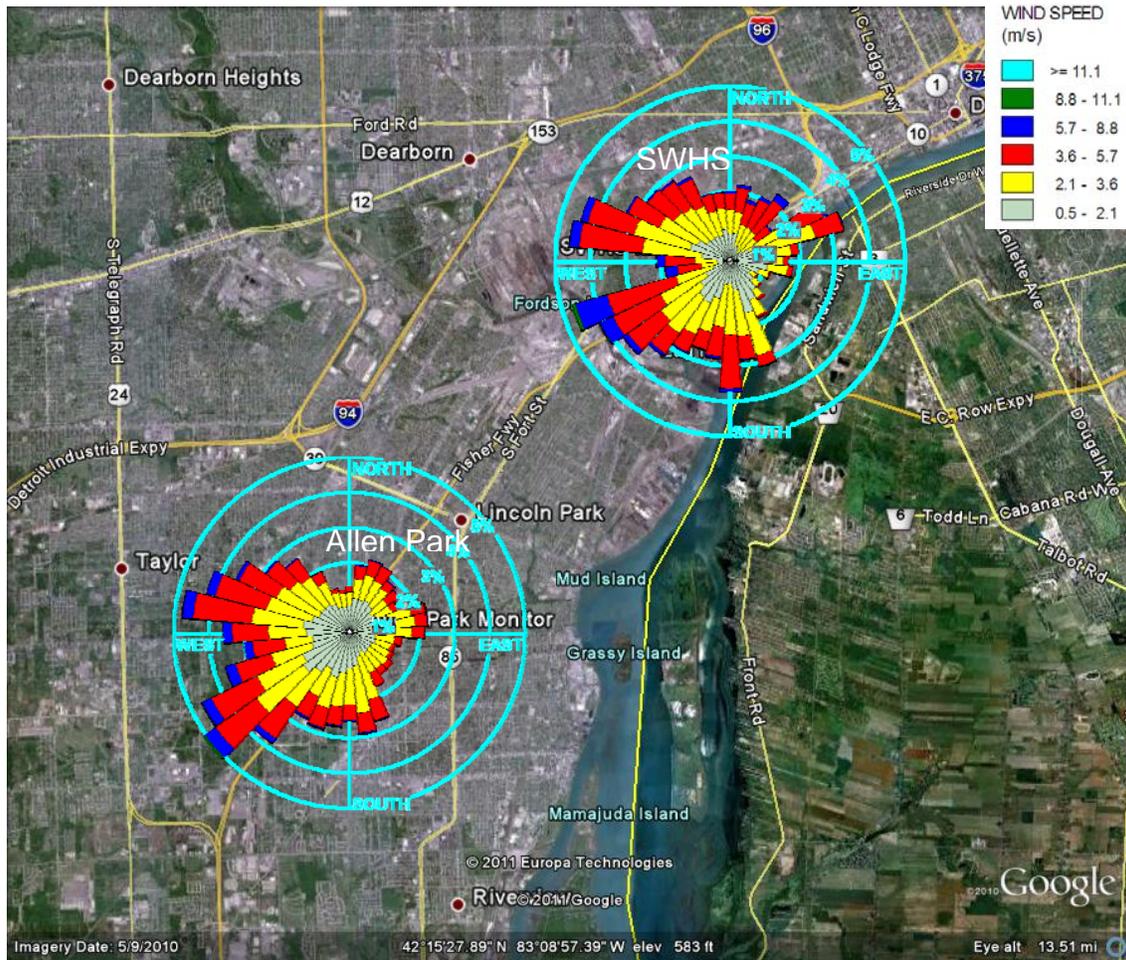


Figure 9. Nonparametric wind regression for SWHS. Rings are 5 ppb.

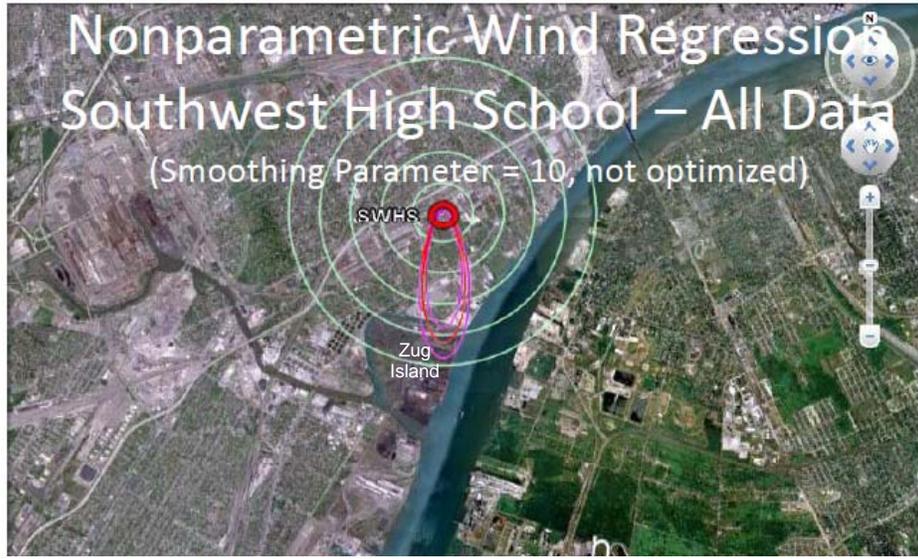
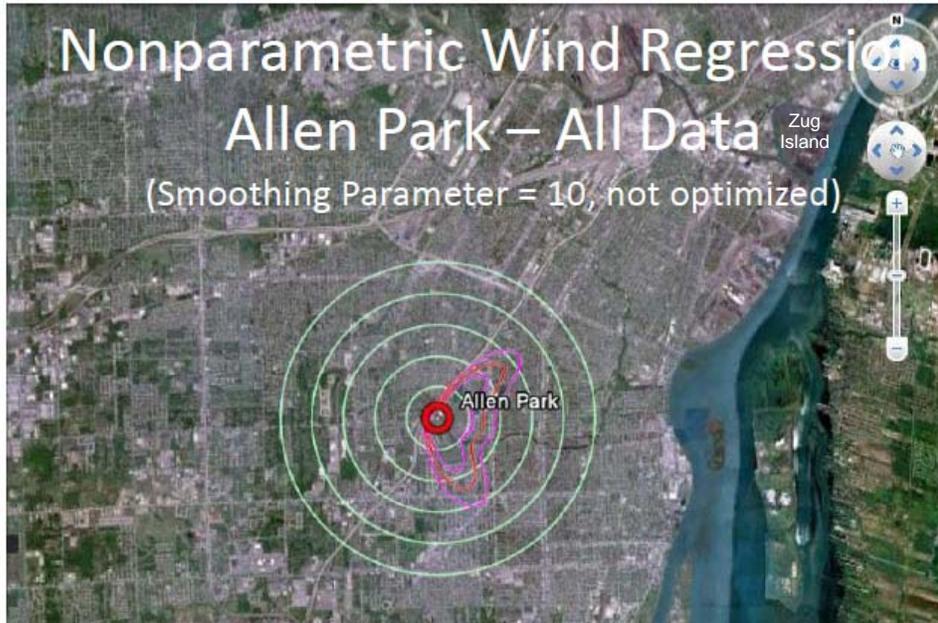


Figure 10. Nonparametric wind regression for Allen Park. Rings are 2 ppb.

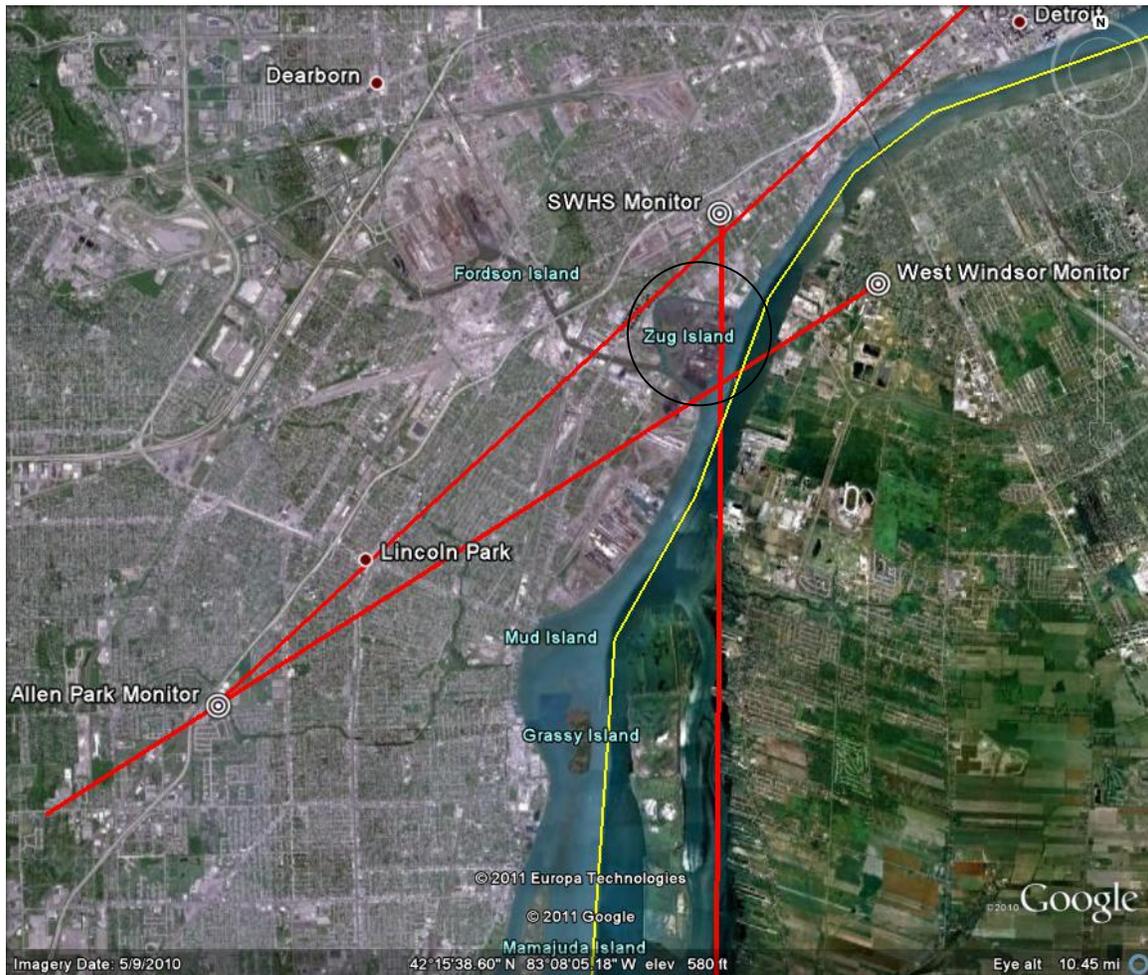


Another analysis using two-dimensional nonparametric regression was performed on SO_2 data from three sites near Detroit – Allen Park, SWHS, and Windsor West (Canadian site) for the 2008-2010 period. This approach can indicate the direction in which sources are located but cannot indicate the distance of sources from the monitor location.

Each site has a strong directional pattern when SO_2 is high: SWHS is influenced when winds are from the south, Allen Park when winds are from the northeast, and Windsor when winds are from the southwest. Figure 11 shows the

centerlines of the dominant source direction from each monitor. They intersect on and around Zug Island, which further indicates that an SO₂ source(s) there is affecting each of the monitors. As stated previously, Zug Island has a steel mill and coke battery and just south of the island is a power plant.

Figure 11. Centerlines of the trajectories for the 2-D nonparametric SO₂ regression for all three sites near Detroit.



Geography/Topography

As one of the EPA's 5 factors to be used for defining a nonattainment area, geography and topography were considered. There are no geographic or topographic barriers in this area to affect the nonattainment boundary.

Jurisdictional Boundaries

Jurisdictional boundaries are to be considered as one of the EPA's 5 factors. The recommended nonattainment area includes a portion of the eastern and southern boundary of Wayne County with the remaining boundaries being major roadways.

Conclusions

The above data supports the MDEQ's recommended SO₂ nonattainment area. The area extends somewhat north to follow a major road, Michigan Avenue, but excludes all areas north of Michigan Avenue. The main focus is directly south of the SWHS monitor based on pollution roses and nonparametric regression analysis. Since the Allen Park monitor is showing attainment, the nonattainment area should include areas east of the Allen Park monitor while still capturing the largest SO₂ sources in Wayne County.

Highways and the county borders were used as boundaries for the nonattainment area because they are easily identified and follow the general location of the large SO₂ sources in Wayne County. The Wayne County border was used on the south end of the recommended nonattainment area since no highways were available as a boundary. The Allen Park monitor indicates high SO₂ concentrations from easterly winds, justifying the western boundary to be near the Allen Park monitor. The SWHS monitor indicates highest SO₂ concentrations when winds are directly south. The southeast corner of the Wayne County is directly south of the Allen Park monitor and further south is Lake Erie (see Figure 5). Based on this WOE, high SO₂ concentrations are not observed when winds are from the west or southwest, therefore, sources or counties west and southwest of the Allen Park monitor should not be included in the nonattainment area.

Based on the above data, the MDEQ recommends the nonattainment boundary described in Figure 1 of this document.

Appendix A

Michigan Air Emissions Reporting System (MAERS) Southeast Michigan Source Emissions ≥ 1 Ton SO₂ Reporting Year : 2009

COUNTY	SRN	SOURCE NAME	CITY	TOTAL EMISSION	UNITS
MONROE	B2816	DETROIT EDISON/MONROE POWER	MONROE	85899.1	TON(s)
SAINT CLAIR	B2796	ST. CLAIR / BELLE RIVER POWER PLANT	SAINT CLAIR	57001.1	TON(s)
WAYNE	B2811	DETROIT EDISON TRENTON CHANNEL	TRENTON	25443.0	TON(s)
WAYNE	B2810	DETROIT EDISON RIVER ROUGE	RIVER ROUGE	14945.5	TON(s)
MONROE	B2846	J.R. WHITING CO	ERIE	6670.4	TON(s)
WAYNE	A7809	U S STEEL GREAT LAKES WORKS	ECORSE & RIVER ROUGE	3851.6	TON(s)
WAYNE	B2132	WYANDOTTE DEPT MUNI POWER PLANT	WYANDOTTE	1268.9	TON(s)
SAINT CLAIR	B6420	E.B. EDDY PAPER INC.	PORT HURON	981.8	TON(s)
MONROE	B1743	HOLCIM (US) INC.	DUNDEE	698.2	TON(s)
MONROE	B1877	GUARDIAN INDUSTRIES	CARLETON	608.6	TON(s)
WAYNE	A8640	SEVERSTAL DEARBORN, LLC	DEARBORN	536.7	TON(s)
SAINT CLAIR	A6240	CARGILL SALT INC.	SAINT CLAIR	450.7	TON(s)
OAKLAND	N7786	DTE PONTIAC NORTH, LLC	PONTIAC	404.7	TON(s)
WAYNE	M4199	GENERAL MOTORS HAMTRAMCK	DETROIT	385.3	TON(s)
WAYNE	N6631	DEARBORN INDUSTRIAL GENERATION	DEARBORN	364.6	TON(s)
WAYNE	M4148	GREATER DETROIT RESOURCE RECOVERY FACILITY	DETROIT	125.3	TON(s)
MACOMB	N5984	PINE TREE ACRES, INC.	LENOX	97.4	TON(s)
WAYNE	A9831	MARATHON PETROLEUM COMPANY LP	DETROIT	94.8	TON(s)
OAKLAND	B7227	GENERAL MOTORS LLC - ORION ASSEMBLY	LAKE ORION	68.7	TON(s)
WAYNE	B2169	CARMEUSE LIME Inc, RIVER ROUGE OPERATION	RIVER ROUGE	62.8	TON(s)
WAYNE	B2103	DETROIT WASTEWATER TREATMENT PLANT	DETROIT	54.8	TON(s)
SAINT CLAIR	B6145	DETROIT EDISON GREENWOOD ENERGY CENTER	AVOCA	49.5	TON(s)
WASHTENAW	N2688	ARBOR HILLS LANDFILL	NORTHVILLE	45.6	TON(s)
WAYNE	N5986	CARLETON FARMS LANDFILL	NEW BOSTON	42.4	TON(s)
WASHTENAW	B6237	YPSILANTI COMM. UTILITIES AUTHORITY	YPSILANTI	23.5	TON(s)
MACOMB	N8004	SUMPTER ENERGY ASSOCIATES	LENOX TWP	16.9	TON(s)
OAKLAND	N8086	ARROW RACING ENGINES LLC	AUBURN HILLS	11.9	TON(s)
WAYNE	M4469	RIVERVIEW LAND PRESERVE	RIVERVIEW	11.9	TON(s)
WAYNE	M4449	WOODLAND MEADOWS RDF	WAYNE	11.2	TON(s)
MONROE	B7061	GERDAU MACSTEEL MONROE	MONROE	10.5	TON(s)
SAINT CLAIR	A6218	DUNN PAPER, INC.	PORT HURON	10.1	TON(s)
OAKLAND	B4032	GENERAL MOTORS LLC - PONTIAC NORTH CAMPUS	PONTIAC	8.5	TON(s)
WAYNE	B6230	FORD MOTOR CO RESEARCH & DEV CTR	DEARBORN	8.1	TON(s)

COUNTY	SRN	SOURCE NAME	CITY	TOTAL EMISSION	UNITS
MACOMB	N2432	A G SIMPSON (USA), Inc.	STERLING HTS	8.0	TON(s)
WAYNE	A8638	DETROIT DIESEL CORPORATION	DETROIT	7.8	TON(s)
OAKLAND	N1436	CHRYSLER TECHNOLOGY CENTER	AUBURN HILLS	7.4	TON(s)
WAYNE	B8747	JOHNSON MATTHEY VEHICLE TESTING & DEVELOPMENT, LLC	TAYLOR	5.8	TON(s)
OAKLAND	G5252	OAKLAND CO. SERVICE CENTER - CENTRAL STEAM PLANT	PONTIAC	4.0	TON(s)
SAINT CLAIR	N6207	SMITHS CREEK LANDFILL	SMITHS CREEK	3.5	TON(s)
WAYNE	M4734	FORD MOTOR CO AUTO TRANSMISSION NEW PRODUCT CENTER	LIVONIA	3.0	TON(s)
OAKLAND	N3845	EAGLE VALLEY RECYCLE & DISPOSAL FACILITY	ORION TWP	2.9	TON(s)
WAYNE	A8650	FORD MOTOR CO/WAYNE COMPLEX	WAYNE	2.9	TON(s)
MACOMB	B6660	NORBROOK PLATING, INC.	WARREN	2.8	TON(s)
OAKLAND	N6008	OAKLAND HEIGHTS DEVELOPMENT, INC.	AUBURN HILLS	2.6	TON(s)
OAKLAND	N2803	LYON DEVELOPMENT, INC.	NEW HUDSON	2.6	TON(s)
WASHTENAW	N6266	FEDERAL MOGUL POWERTRAIN INC	ANN ARBOR	2.4	TON(s)
OAKLAND	N6537	PROCAT TESTING LLC	WIXOM	1.9	TON(s)
MONROE	B4321	FERMI ENERGY CENTER	NEWPORT	1.8	TON(s)
WAYNE	N6009	SAUK TRAIL HILLS DEVELOPMENT	CANTON TWP	1.7	TON(s)
OAKLAND	B1950	PONTIAC WASTEWATER TREATMENT PLANT	PONTIAC	1.7	TON(s)
MACOMB	B1792	WARREN WASTE WATER TREATMENT PLANT	WARREN	1.7	TON(s)
WASHTENAW	M0675	UNIVERSITY OF MICHIGAN	ANN ARBOR	1.6	TON(s)
OAKLAND	B4287	CADILLAC ASPHALT, L.L.C.	CLARKSTON	1.6	TON(s)
WAYNE	M4722	SORA LIMESTONE QUARRY	BROWNSTOWN	1.6	TON(s)
OAKLAND	B1960	CADILLAC ASPHALT LLC	WIXOM	1.5	TON(s)
WAYNE	B4280	CADILLAC ASPHALT LLC	BELLEVILLE	1.5	TON(s)
MONROE	N6837	ROCK RECYCLERS	S ROCKWOOD	1.4	TON(s)
OAKLAND	N7864	UMICORE AUTOCAT USA INC.	AUBURN HILLS	1.4	TON(s)
WAYNE	B3195	CADILLAC ASPHALT PRODUCTS	DETROIT	1.3	TON(s)
OAKLAND	B2329	JHP PHARMACEUTICALS LLC	ROCHESTER	1.3	TON(s)
MACOMB	B4049	GM Technical Center	WARREN	1.2	TON(s)
WAYNE	M4780	ROUSH INDUSTRIES	LIVONIA	1.2	TON(s)
MONROE	N5778	GERKEN MATERIALS INC	MONROE	1.1	TON(s)
WAYNE	M4510	CITY SAND & LANDFILL INC	SUMPTER TWP	1.1	TON(s)
MONROE	N2627	GREAT LAKES AGGREGATES, HAZMAG PLANT	S ROCKWOOD	1.0	TON(s)
SAINT CLAIR	N2626	ACE ASPHALT & PAVING CO INC PLANT 4	PORT HURON	1.0	TON(s)
MACOMB	B2763	U.S. ARMY GARRISON-DETROIT ARSENAL	WARREN	1.0	TON(s)

Appendix B

Michigan Air Emissions Reporting System (MAERS) Wayne County Source Emissions >1 Ton SO₂ Reporting Year : 2009

SRN	SOURCE NAME	CITY	TOTAL EMISSION (tons)	Distance from SWHS (km)	Direction from SWHS
B2811	DETROIT EDISON TRENTON CHANNEL	TRENTON	25,443.0	20.9	SSW
B2810	DETROIT EDISON RIVER ROUGE	RIVER ROUGE	14,945.5	3.5	SW
A7809	U S STEEL GREAT LAKES WORKS	RIVER ROUGE & ECORSE	3,851.6	2.0 & 4.8	SSW
B2132	WYANDOTTE DEPT MUNI POWER PLANT	WYANDOTTE	1,268.9	10.9	SSW
A8640	SEVERSTAL DEARBORN, LLC	DEARBORN	536.7	4.8	NW
M4199	GENERAL MOTORS HAMTRAMCK	DETROIT	385.3	10.3	NE
N6631	DEARBORN INDUSTRIAL GENERATION	DEARBORN	364.6	3.6	WSW
M4148	GREATER DETROIT RESOURCE RECOVERY FACILITY	DETROIT	125.3	8.4	NE
A9831	MARATHON PETROLEUM COMPANY LP	DETROIT	94.8	4.8	WSW
B2169	CARMEUSE LIME Inc, RIVER ROUGE OPERATION	RIVER ROUGE	62.8	3.8	SW
B2103	DETROIT WASTEWATER TREATMENT PLANT	DETROIT	54.8	2.5	SW
N5986	CARLETON FARMS LANDFILL	NEW BOSTON	42.4	34.4	SW
M4469	RIVERVIEW LAND PRESERVE	RIVERVIEW	11.9	18.3	SW
M4449	WOODLAND MEADOWS RDF	WAYNE	11.2	27.2	W
B6230	FORD MOTOR CO RESEARCH & DEV CTR	DEARBORN	8.1	10.6	W
A8638	DETROIT DIESEL CORPORATION	DETROIT	7.8	15.6	NW
B8747	JOHNSON MATTHEY VEHICLE TESTING & DEVELOPMENT, LLC	TAYLOR	5.8	16.8	SW
M4734	FORD MOTOR CO AUTO TRANSMISSION NEW PRODUCT CENTER	LIVONIA	3.0	24.6	WNW
M4734	FORD MOROT CO/ WAYNE COMPLEX	WAYNE	2.9	4.6	W
N6009	SAUK TRAIL HILLS DEVELOPMENT	CANTON TWP	1.7	28.7	WSW
M4722	SORA LIMESTONE QUARRY	BROWNSTOWN	1.6	28.3	SSW
B4280	CADILLAC ASPHALT LLC	BELLEVILLE	1.5	36.8	WSW
B3195	CADILLAC ASPHALT PRODUCTS	DETROIT	1.3	4.0	WSW
M4780	ROUSH INDUSTRIES	LIVONIA	1.2	25.7	WNW
M4510	CITY SAND & LANDFILL INC	SUMPTER TWP	1.1	38.9	SW