UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

AUG 18 2008

REPLY TO THE ATTENTION OF:

R-19J

Rick Hill
Chairman
Oneida Tribe of Indians of Wisconsin
P.O. Box 365
Oneida, Wisconsin 54155

Dear Chairman Hill:

This letter provides information on the status of fine particle ($PM_{2.5}$) pollution in the Green Bay area, in which your tribal land is located. Fine particle pollution represents one of the most significant barriers to clean air facing our nation today. Health studies link these tiny particles – about $1/30^{th}$ the diameter of a human hair – to serious human health problems including aggravated asthma, increased respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and even premature death in people with heart and lung disease. Fine particle pollution can remain suspended in the air for long periods of time and create public health problems far away from emission sources. Reducing levels of fine particle pollution is an important part of our nation's commitment to clean, healthy air.

We have reviewed the air quality data, emissions data, and other related information for the Green Bay area. Consistent with section 107(d) (1) of the Clean Air Act, this letter is to inform you that U.S. Environmental Protection Agency intends to designate all of Brown County, including all Indian country therein, as nonattainment for the 2006 $PM_{2.5}$ health standard. We have enclosed a copy of our supporting analysis for this area for your reference. If you would like to provide additional information about the $PM_{2.5}$ status of your Reservation or adjoining areas for our consideration, please provide it to us by October 20, 2008.

EPA has taken steps to reduce fine particle pollution across the country, such as the Clean Diesel Program, which we expect to dramatically reduce emissions from highway, non-road and stationary diesel engines. In addition, implementation plans developed by the states to attain the 1997 $PM_{2.5}$ standards will also help to reduce unhealthy levels of fine particle pollution.

We intend to make final designation decisions for the 2006 24-hour $PM_{2.5}$ standards by December 18, 2008. Please also be aware that EPA plans to publish a notice in the Federal Register in the near future in order to solicit public comments on our intended designation decisions. If you have any questions, please do not hesitate to contact me. We look forward to a continued dialogue with you as we work together to implement the $PM_{2.5}$ standards.

Sincerely,

Lynn Buhl

Lynn Buhl
Regional Administrator

Enclosure

Review of Designations in Wisconsin
For the Particulate Matter Air Quality Standard

The following table identifies the individual areas and counties comprising those areas in Wisconsin that EPA considered to designate as nonattainment for the 2006 fine particulate matter ("$PM_{2.5}$") air quality standard. Following this table is a discussion of each area and the basis for EPA's intended designations, followed by a description of the data EPA examined. EPA intends to designate as attainment/ unclassifiable all other Wisconsin counties not identified in the table below.

Area	**Wisconsin Recommended Nonattainment Counties**	**EPA's Intended Nonattainment Counties**
Green Bay	None	Brown
Madison	None	Columbia Dane
Milwaukee	None	Milwaukee Racine Waukesha

On June 8, 2007, in a memorandum from Robert Meyers to the EPA Regional Administrators, EPA issued guidance on a timetable for designation of areas violating the $PM_{2.5}$ air quality standards promulgated in 2006 and factors that EPA urged states to consider as they prepared recommendations for nonattainment area boundaries. This guidance was sent to the Governor of Wisconsin as an attachment to a letter dated July 9, 2007, requesting the State's recommendations.

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. The technical analysis for each area identifies the counties with monitors that violate the 24-hour $PM_{2.5}$ standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

Additional background information on each of the nine factors can also be found in the background section.

EPA also computed a Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of potential impacts of counties in and near an area on violating monitors. While this metric provides a useful synthesis of important relevant information, including weighting the emissions of various pollutants according to estimates of the relative importance of each pollutant, the CES is not the exclusive variable EPA uses to consider these factors. A summary of the CES is included in the background section, and a more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

In its letter dated December 18, 2007, Wisconsin recommended that EPA designate the entire state attainment, based on monitoring data that show most of the state to be attaining the standards and based on modeling projecting that the portions of the state that are now violating the standards will be meeting those standards by 2015. However, under section 107 of the Clean Air Act, EPA must apply a designation of nonattainment to areas that are currently violating the standards, irrespective of whether the areas might be expected to come into attainment in some future year. Furthermore, the vacatur of the Clean Air Interstate Rule by the Court of Appeals for the D.C. Circuit undercuts a key premise underlying the modeling analysis that Wisconsin is relying on. In any case, the Clean Air Act mandates that EPA define the areas that are violating and the nearby areas that are contributing to violations of the air quality standards, an action that triggers a requirement for the state to conduct a more exhaustive assessment and to provide any additional control measures that might be needed to achieve timely attainment and to meet other related requirements. Therefore, this document provides EPA's analysis of the areas within Wisconsin that are currently violating the air quality standards and the nearby areas that are contributing to those violations, constituting the areas that EPA intends to designate nonattainment.

Review for the Green Bay Metropolitan Statistical Area

The Green Bay area is currently designated attainment for $PM_{2.5}$. One monitor in Brown County is clearly showing a violation of the standard, and an additional monitor with incomplete data may also be indicating a violation. Despite these violations, Wisconsin recommended that the Green Bay area be designated attainment, based on projections that the area will attain the standards by 2015. However, the Clean Air Act requires that EPA designate as nonattainment any area that is currently violating the standard or contributing to such violation, irrespective of whether the area is expected to attain the standard at some time in the future. Therefore, EPA reviewed relevant information for the three counties in the metropolitan statistical area and for surrounding counties to determine the most appropriate boundaries for the area in and around Green Bay to be designated nonattainment.

EPA believes that the appropriate nonattainment area consists of Brown County. Brown County has substantially greater emissions and more population than any surrounding county. While Outagamie County has moderate emissions and population similar to that

of Brown County, these emissions and this population are primarily associated with Appleton, which is a separate urban area that is monitoring attainment of the standard. Only a small fraction of commuters from the Appleton area commute into the Green Bay area. Appleton is at the southern end of Outagamie County, further reducing its impact on concentrations in Green Bay, at the northern end of Brown County. No other factor warrants inclusion of any other county besides Brown County in the nonattainment area.

Figure 1 is a map of the counties in the Green Bay area and other relevant information such as the locations and design values of air quality monitors and the metropolitan area boundary. No counties were recommended as nonattainment by the State.

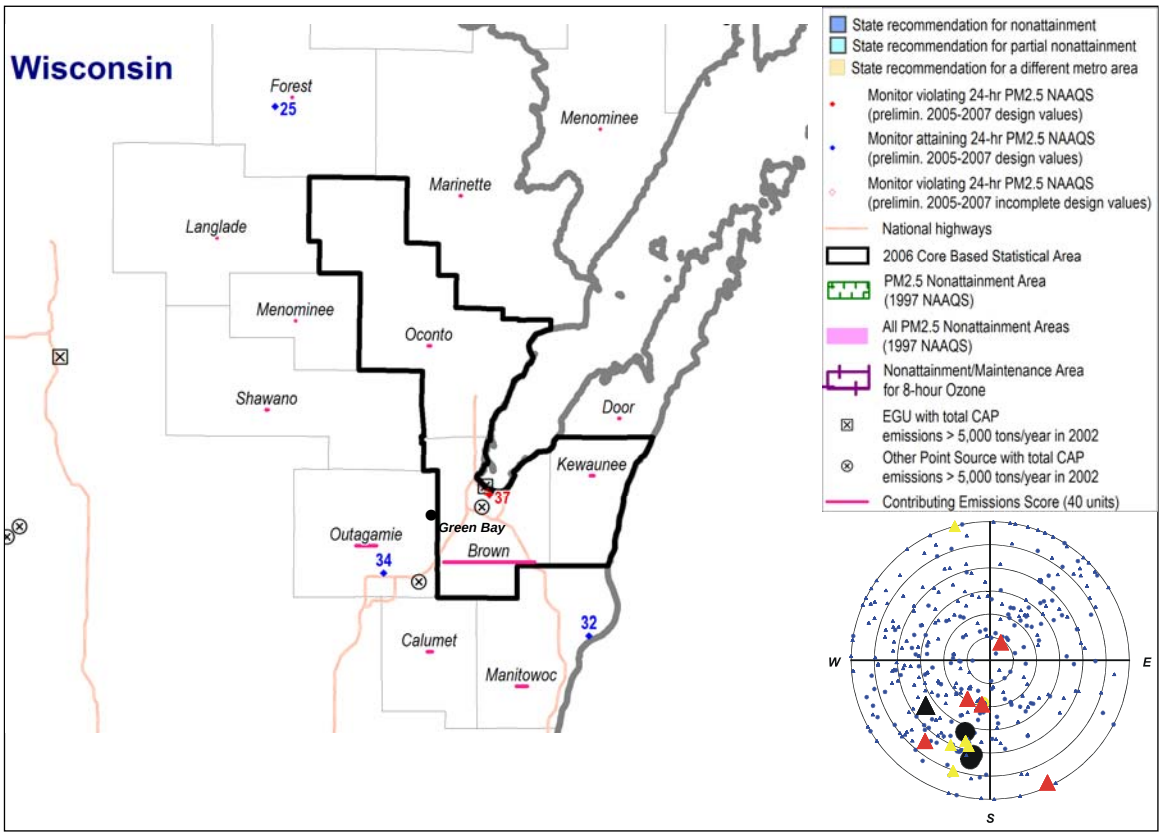

Figure 1

Factor 1: Emissions data

Table 1 shows emissions of $PM_{2.5}$ components (given in tons per year) and the CES for potentially contributing counties in the Green Bay area. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CES.

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
Brown, WI	No	100	2,541	879	1,662	29,780	24,197	18,272	3,295
Outagamie, WI	No	22	1,525	632	894	11,572	9,663	11,671	3,090
Manitowoc, WI	No	12	949	348	600	4,392	5,831	5,893	3,111
Kewaunee, WI	No	4	371	127	244	277	1,258	2,116	1,966
Oconto, WI	No	2	445	227	218	151	1,588	3,868	1,698

Brown County has the highest CES and emissions in the area. Outagamie County is the next highest in emissions and CES. Outagamie County is in the Appleton metropolitan statistical area. The other area counties have low emissions.

Factor 2: Air quality data

The 24-hour $PM_{2.5}$ design values for counties in the Green Bay area are shown in Table 2. Brown County has a design value that exceeds the 2006 $PM_{2.5}$ standards. Outagamie and Manitowoc Counties meet the air quality standards. Kewaunee and Oconto Counties do not have $PM_{2.5}$ air quality monitoring data.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Brown, WI	No	37	37
Kewaunee, WI	No		
Oconto, WI	No		
Outagamie, WI	No	34	34
Manitowoc, WI	No	29	32

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. On high concentration days during cold weather months in this area, EPA found on average a total urban contribution of 7.2 $\mu g/m^3$, consisting of 1.6 $\mu g/m^3$ of sulfate, 2.2 $\mu g/m^3$ of nitrate, 3.1 $\mu g/m^3$ of organic particles, and 0.3 $\mu g/m^3$ of miscellaneous inorganic particulate. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 5.5 $\mu g/m^3$, consisting of 3.0 $\mu g/m^3$ of sulfate, 2.4 $\mu g/m^3$ of organic particles, and 0.1 $\mu g/m^3$ of miscellaneous inorganic particulate. These estimates were used for weighting of the emissions of different pollutants in calculating the contributing emissions scores.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 3 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards. Brown County has the highest population. Kewaunee and Oconto Counties have small populations. Outagamie County has moderate population, but its population density is well less than the Brown County population density.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Brown, WI	No	238,610	447
Kewaunee, WI	No	20,746	60
Oconto, WI	No	37,727	37
Outagamie, WI	No	170,930	266
Manitowoc, WI	No	81,828	138

Factor 4: Traffic and commuting patterns

Table 4. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Brown, WI	No	2,643	108,890	92	110,410	93
Oconto, WI	No	413	6,520	38	15,330	88
Outagamie, WI	No	1,750	5,570	7	5,630	7
Kewaunee, WI	No	234	3,450	33	9,370	89
Manitowoc, WI	No	1,130	1,580	4	1,870	4

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The commuting into the statistical area data shows a high percent of commuting in Brown, Kewaunee, and Oconto Counties while Outagamie and Manitowoc Counties have limited commuting. This suggests that Brown, Kewaunee, and Oconto Counties are integrated. It also implies that there is not a strong relationship between Outagamie and Manitowoc Counties workers and the Green Bay area, reflecting the fact that Appleton (in Outagamie County) and Manitowoc (in Manitowoc County) are separate urban areas from Green Bay. The VMT is low in Kewaunee and Oconto Counties.

Factor 5: Growth rates and patterns

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the Green Bay area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 5. Population and VMT Growth and Percent Change.

Location	Population (2005)	Population % change (2000-05)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Kewaunee, WI	20,746	3	234	35
Outagamie, WI	170,930	6	1,750	29
Brown, WI	238,610	5	2,643	28
Oconto, WI	37,727	5	413	24
Manitowoc, WI	81,828	-1	1,130	15

There was moderate population growth for all the area counties with the exception of Manitowoc County. Manitowoc County experienced a small decrease in its population from 2000 to 2005. The VMT grew a high rate through the area. Kewaunee County led with a 35% increase from 1996 to 2005 to its small VMT. Brown and Outagamie Counties follow closely with VMT growth approaching 30%. The other counties also observed rapid VMT growth. These data suggest that the distribution of population and emissions are not changing in a way that would significantly influence the choice of boundaries of the nonattainment area.

Factor 6: Meteorology (weather/transport patterns)

A pollution rose for the Green Bay area is provided in the map above.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The Green Bay area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor provides no reason to exclude any nearby county as a contributing county.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

The metropolitan planning organization for Green Bay is the Brown County Planning Commission. Its web site is: http://www.co.brown.wi.us/planning_and_land_services/planning/county_web//transportation.html.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the State in the Green Bay area before 2005 that may influence emissions of any component of $PM_{2.5}$ emissions (i.e., total carbon, SO_2, NOx, and crustal $PM_{2.5}$).

Review for the Madison Metropolitan Statistical Area

The Madison area is currently designated attainment for $PM_{2.5}$. One monitor in Dane County is showing a violation of the standard based on 2005 to 2007 data. Wisconsin did not acknowledge this violation and made no recommendations specifically addressing

this nonattainment area. Therefore, EPA reviewed relevant information for the four counties in the metropolitan statistical area and for surrounding counties to determine the most appropriate boundaries for the area in and around Madison to be designated nonattainment.

EPA believes that the appropriate nonattainment area consists of Columbia and Dane Counties. Dane County is violating the standard and is also contributing substantially to those violations. Columbia County has significant emissions which are commonly upwind on days with high concentrations of $PM_{2.5}$.

EPA believes that a significant fraction of the emissions of Columbia County may be due to a power plant in the county. In considering county-level emissions, EPA considered 2005 emissions data from the National Emissions Inventory. EPA recognizes that some major sources may have installed emission controls or otherwise significantly reduced emissions since 2005 and that this information may not be reflected in this analysis. EPA will consider additional information on emission controls in making final designation decisions. In cases where specific plants already have installed emission controls or plan to install such controls in the near future, EPA requests additional information on:

- the plant name, city, county, and township
- identification of emission units at the plant, fuel use, and megawatt capacity
- identification of emission units on which controls will be installed, and units on which controls will not be installed
- identification of the type of emission control that has been or will be installed on each unit, the date on which the control device became / will become operational, and the emission reduction efficiency of the control device
- the estimated pollutant emissions for each unit before and after implementation of emission controls
- whether the requirement to operate the emission control device will be federally enforceable by December 2008, and the instrument by which federal enforceability will be ensured (e.g. through source-specific SIP revision, operating permit requirement, consent decree)

In the designation process for the 1997 PM2.5 standards, in some cases EPA identified a nearby county as contributing to a violating monitor, and it was determined that a very high percentage of the county's emissions came from a large power plant. In certain cases, EPA concluded that only the portion of the county including the source with the contributing emissions needed to be designated as nonattainment. If Wisconsin believes that a similar situation exists for Columbia County, the State should provide EPA the necessary information to demonstrate that the source dominates the overall county emissions and to identify a reasonable partial county boundary.

The other counties in and near the Madison area have substantially lower emissions, and no other factor warrants inclusion of any other county besides Columbia and Dane Counties in the nonattainment area.

Figure 2 is a map of the Madison area counties and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary. As stated above, the State made no specific recommendations for this area.

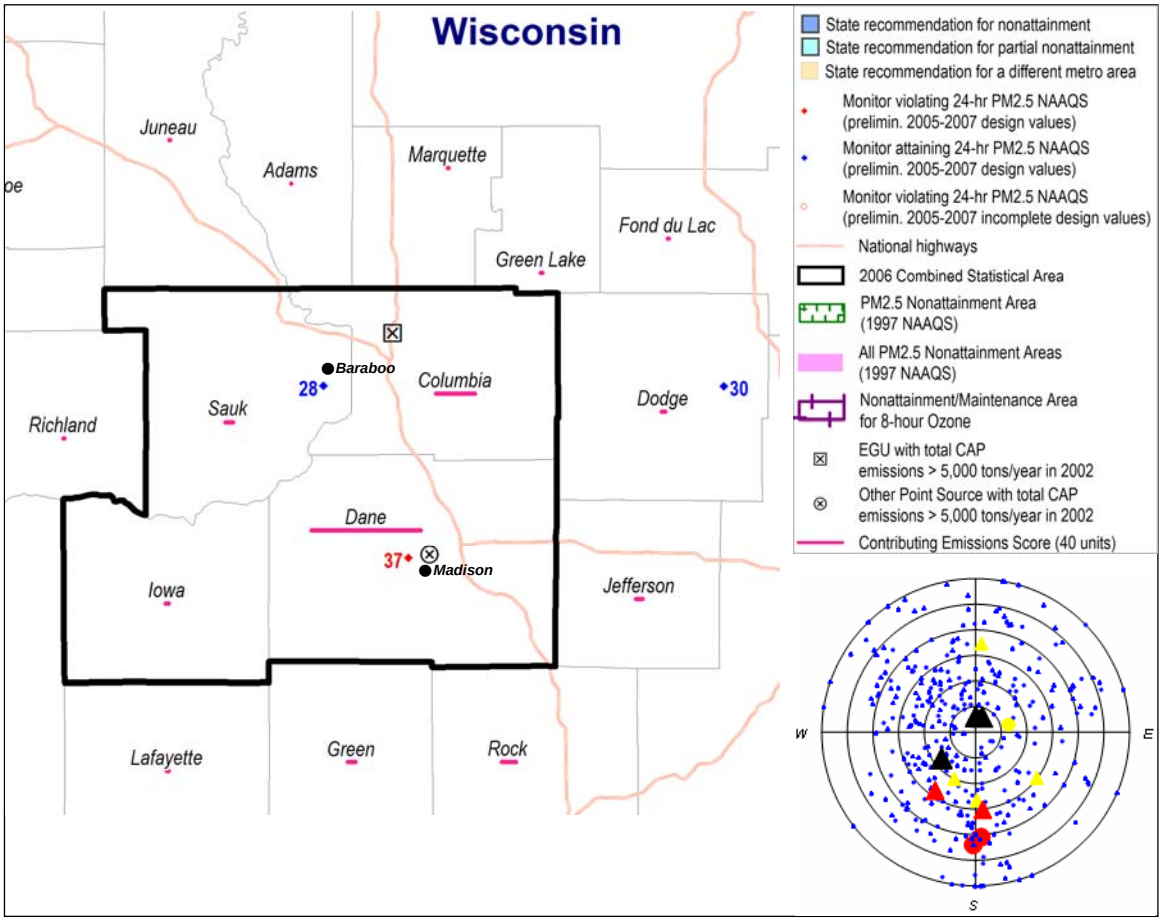

Figure 2

Factor 1: Emissions data

Table 1 shows emissions of $PM_{2.5}$ components (given in tons per year) and the CES for potentially contributing counties in the Madison area. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CES.

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
Dane, WI	No	100	4,263	1,700	2,562	8,717	18,818	29,797	5,091
Columbia, WI	No	36	1,281	373	908	26,406	11,514	6,718	2,321
Sauk, WI	No	7	902	410	493	365	2,936	5,309	2,601
Iowa, WI	No	3	364	141	223	97	1,024	2,132	2,572

The CES show that Dane County stands out in terms of contribution to the violation. Columbia County has a CES that trails well below Dane County, but it still has substantial emissions. Columbia County has the highest sulfur dioxide emissions in the area. The CES and emissions are low in Iowa and Sauk Counties.

Factor 2: Air quality data

The 24-hour $PM_{2.5}$ design values for counties in the Madison area are shown in Table 2. Dane County has a design value that violates the 2006 standards while Sauk County monitoring data shows it meets the standards. There is no PM2.5 air quality monitoring data for Columbia and Iowa Counties.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Dane, WI	No	35	37
Columbia, WI	No		
Sauk, WI	No	29	28
Iowa, WI	No		

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. On high concentration days during cold weather months in this area, EPA found on average a total urban contribution of 7.2 µg/m3, consisting of 1.6 µg/m3 of sulfate, 2.2 µg/m3 of nitrate, 3.1 µg/m3 of carbon particles, and 0.3 µg/m3 of miscellaneous inorganic particulate. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 5.5 µg/m3, consisting of 3 µg/m3 of sulfate, 2.4 µg/m3 of carbon particles, and 0.1 µg/m3 of miscellaneous inorganic particulate. These estimates were used for weighting of the emissions of different pollutants in calculating the contributing emissions scores.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 3 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards. Dane County easily has the largest population and the highest population density in the Madison area. Columbia, Iowa, and Sauk Counties all have small populations.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)

Dane, WI	No	458,333	371
Columbia, WI	No	55,122	69
Sauk, WI	No	57,738	68
Iowa, WI	No	23,535	31

Factor 4: Traffic and commuting patterns

Table 4. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Dane, WI	No	4,584	229,390	95	233,440	96
Sauk, WI	No	706	3,430	12	27,460	96
Columbia, WI	No	916	8,930	33	24,810	92
Iowa, WI	No	266	3,160	26	11,490	93

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. Dane County has the highest VMT in the area. The other counties all have much lower VMT. Columbia County has a moderate percent of commuters going to Dane County. The number of Columbia County commuters is still small when compared with Dane County. This statistic is low for Iowa and Columbia Counties.

Factor 5: Growth rates and patterns

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the Madison area. Counties are listed in descending order based on VMT growth between 1996 and 2005. Dane County experienced the most growth in both population and VMT. All area counties had limited growth from 2000 to 2005. Dane County had VMT growth that exceeded 20% from 1996 to 2005. Columbia and Iowa had better than 10% VMT growth over that period. Sauk County had a little less VMT growth. These data suggest that the distribution of population and emissions are not changing in a way that would significantly influence the choice of boundaries of the nonattainment area.

Table 5. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-05)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Dane, WI	458,333	7	4,584	21
Iowa, WI	23,535	3	266	15
Columbia, WI	55,122	5	916	11
Sauk, WI	57,738	4	706	8

Factor 6: Meteorology (weather/transport patterns)

The pollution rose for the Madison area is provided in the map above.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The Madison area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor provides no reason to exclude any nearby county as a contributing county.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

The Madison Area Transportation Board is the metropolitan planning organization for Dane County, Wisconsin. Its web site is: www.madisonareampo.org.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the State in the Madison area before 2005 that may influence emissions of any component of $PM_{2.5}$ emissions (i.e., total carbon, SO_2, NOx, and crustal $PM_{2.5}$).

Review for the Milwaukee Combined Statistical Area

The Milwaukee area is currently designated attainment for $PM_{2.5}$. Several monitors in Milwaukee County are showing violations of the standard, several of which are well above the standard. Despite these violations, Wisconsin recommended that the Milwaukee area be designated attainment, based on projections that the area will attain the standards by 2015. However, the Clean Air Act requires that EPA designate as nonattainment any area that is currently violating the standard or contributing to such violation, irrespective of whether the area is expected to attain the standard at some time in the future. Therefore, EPA reviewed relevant information for the five counties in the combined statistical area and for surrounding counties to determine the most appropriate boundaries for the area in and around Milwaukee to be designated nonattainment.

EPA believes that the appropriate nonattainment area consists of Milwaukee, Racine, and Waukesha Counties. As noted above, Milwaukee County is observing violations at multiple locations. Waukesha County has relatively high emissions, and the winds commonly blow these emissions into Milwaukee County on high concentration days. Waukesha also has substantial population, a high percentage of which population commutes into Milwaukee County. Racine County also has relatively high emissions which commonly blow into Milwaukee County.

EPA believes that Kenosha, Ozaukee, and Washington Counties do not warrant inclusion in the nonattainment area. The 2005 emissions inventory shows high emissions in Kenosha County, but these 2005 emissions were attributable in large part to the WEPCO Pleasant Prairie power plant. By the end of 2006, this plant had highly effective NOx control equipment in place on both units, and by the end of 2007 the plant had highly effective SO_2 control equipment in place on both units. As a result, Kenosha County now

has relatively low emissions which EPA believes no longer contribute to violations in Milwaukee County. A federally enforceable consent decree assures that these emissions will remain low. Ozaukee and Washington Counties have moderate emissions and a moderate fraction of the commuters from these counties commute into Milwaukee County. However, the population in these counties is lower than the population in Milwaukee, Racine, and Waukesha Counties, the frequency with which the wind blows from these counties into Milwaukee County on high concentration days is lower, and the emissions are enough lower than the emissions of Milwaukee, Racine, and Waukesha Counties for EPA to judge that these counties do not contribute to the violations.

EPA also reviewed relevant information for counties adjacent to the combined statistical area in order to determine the appropriate nonattainment area. These other counties have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 3 is a map of the Milwaukee area counties and other relevant information such as the locations and design values of air quality monitors, the metropolitan area boundary, and counties recommended as nonattainment by the States. The state recommended that no counties be designated nonattainment.

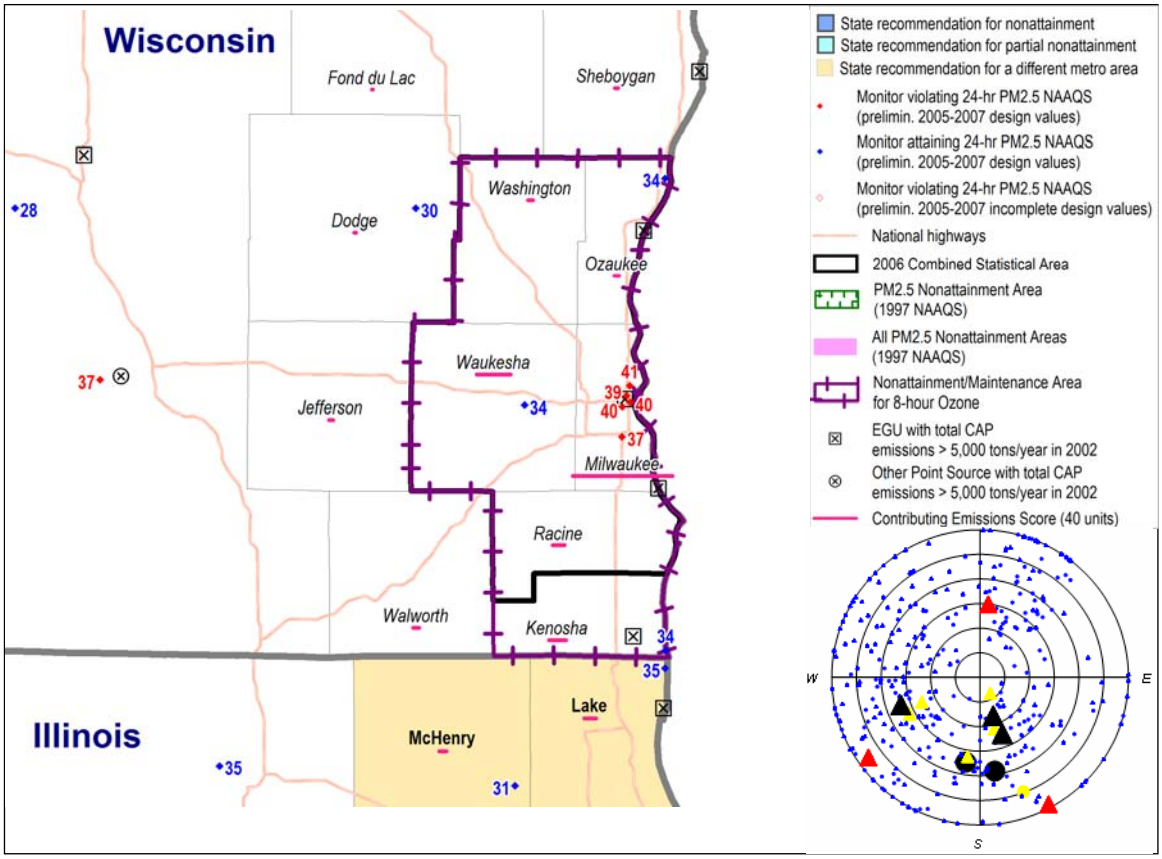

Figure 3

Factor 1: Emissions data

Table 1 shows emissions of $PM_{2.5}$ components (given in tons per year) and the CES for potentially contributing counties in the Milwaukee area. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CES.

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
Milwaukee, WI	No	100	5,802	2,583	3,219	24,239	36,376	48,898	1,181
Waukesha, WI	No	34	2,134	1,132	1,002	1,020	12,168	24,705	893
Kenosha, WI	No	17	1,489	460	1,030	33,988	15,967	7,857	647
Racine, WI	No	12	1,242	547	695	761	5,858	11,809	791
Lake, IL	Other	12	2,657	1,070	1,587	14,719	29,478	32,778	747
McHenry, IL	Other	7	2,102	634	1,468	592	9,493	10,596	1,224
Ozaukee, WI	No	5	841	344	496	377	4,492	5,421	871
Washington, WI	No	5	807	391	416	337	4,090	9,053	1,410

Milwaukee County has the highest emissions for most of the pollutants and the highest CES in the area. Waukesha and Racine Counties have lower emissions and CES. Still, the emissions and scores indicate that the counties may contribute the violations in the area. Kenosha County also has a moderate CES, but this is due to the high sulfur dioxide emissions. The CES was calculated using 2005 emissions data. As shown on Table 1, the sulfur dioxide emissions for Kenosha County were the area's highest. Sharp sulfur dioxide emissions reductions have occurred at a Kenosha County power plant which have greatly reduced the county's impact on the Milwaukee area violations.

Factor 2: Air quality data

The 24-hour $PM_{2.5}$ design values for counties in the Milwaukee area are shown in Table 2. The design value for Milwaukee County exceeds the 2006 $PM_{2.5}$ standards. The Waukesha County 2004 to 2006 design value was above the standard, but it now below the standards based on 2005 to 2007 data. Kenosha and Ozaukee Counties also meet the standards. There are no $PM_{2.5}$ air quality data for Racine and Washington Counties.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Milwaukee, WI	No	41	41
Waukesha, WI	No	36	34
Racine, WI	No		
Ozaukee, WI	No	31	34
Washington, WI	No		
Kenosha, WI	No	32	34
Lake, IL	Other	33	35
McHenry, IL	Other	31	31

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. On high concentration days during cold weather months in this area, EPA found on average a total urban contribution of 7.2 µg/m3, consisting of 1.6

µg/m3 of sulfate, 2.2 µg/m3 of nitrate, 3.1 µg/m3 of carbon particles, and 0.3 µg/m3 of miscellaneous inorganic particulate. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 5.5 µg/m3, consisting of 3 µg/m3 of sulfate, 2.4 µg/m3 of carbon particles, and 0.1 µg/m3 of miscellaneous inorganic particulate. These estimates were used for weighting of the emissions of different pollutants in calculating the contributing emissions scores.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 3 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards. Milwaukee County has the largest population and highest population density. Waukesha County has the next largest population. Racine, Kenosha, and Washington Counties follow with lower populations.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Milwaukee, WI	No	918,673	3788
Lake, IL	Other	704,086	1504
Waukesha, WI	No	378,804	654
McHenry, IL	Other	304,701	499
Racine, WI	No	195,219	574
Kenosha, WI	No	160,382	574
Washington, WI	No	125,928	289
Ozaukee, WI	No	85,983	368

Factor 4: Traffic and commuting patterns

Table 4. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Milwaukee, WI	No	8,924	402,450	94	419,000	98
Waukesha, WI	No	3,423	180,500	94	186,020	97
Racine, WI	No	1,395	17,060	19	78,740	88
Washington, WI	No	1,107	24,320	38	61,010	96
Ozaukee, WI	No	967	17,420	40	41,900	96
Kenosha, WI	No	1,250	2,990	4	9,660	13
Lake, IL	Other	6,016	950	0	1,430	1
McHenry, IL	Other	2,104	130	0	200	0

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. Kenosha County along with Lake and McHenry Counties in Illinois have rather limited commuting into the Milwaukee statistical area. All three

counties are in the Chicago statistical area. The commuting statistics also show a link between the other counties as all have a high percent of commuting within the Milwaukee area. Milwaukee and Waukesha Counties have the highest number and percentage of workers who commute to a violating county.

Factor 5: Growth rates and patterns

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the Milwaukee area. Counties are listed in descending order based on VMT growth between 1996 and 2005. The counties in the Chicago statistical area, Kenosha and Lake and McHenry, Illinois, have the highest growth rates. The population and VMT growth is higher for these three than for the five counties in the Milwaukee statistical area. The population growth is limited for the Milwaukee area counties. Milwaukee County lost population from 2000 to 2005. The growth of VMT was moderate for the Milwaukee area counties from 1996 to 2005. These data suggest that the distribution of population and emissions within the Milwaukee area are not changing in a way that would significantly influence the choice of boundaries of the nonattainment area.

Table 5. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-05)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
McHenry, IL	304,701	16	2,104	196
Lake, IL	704,086	9	6,016	82
Kenosha, WI	160,382	7	1,250	12
Washington, WI	125,928	7	1,107	10
Ozaukee, WI	85,983	4	967	9
Racine, WI	195,219	3	1,395	7
Waukesha, WI	378,804	5	3,423	4
Milwaukee, WI	918,673	-2	8,924	1

Factor 6: Meteorology (weather/transport patterns)

The pollution rose for the Milwaukee area is provided with the map above.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The Milwaukee area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor provides no reason to exclude any nearby county as a contributing county.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

The Southeastern Wisconsin Regional Planning Commission is the metropolitan planning organization for the Milwaukee area. Its web site is: www.sewrpc.org.

The Milwaukee, Wisconsin ozone nonattainment area is composed of Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha Counties.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the State in the Milwaukee area before 2005 that may influence emissions of any component of $PM_{2.5}$ emissions (i.e., total carbon, SO_2, NOx, and crustal $PM_{2.5}$).

Background on Criteria EPA used to define its intended nonattainment areas

On June 8, 2007, in a memorandum from Robert Meyers to the EPA Regional Administrators, EPA issued guidance on a timetable for designation of areas violating the $PM_{2.5}$ air quality standards promulgated in 2006 and factors that EPA urged states to consider as they prepared recommendations for nonattainment area boundaries. This guidance was sent to the Governor of Ohio as an attachment to a letter dated July 9, 2007, requesting the State's recommendations. The guidance identified nine factors: emissions, air quality, population density and degree of urbanization, traffic and commuting patterns, growth rates and patterns, meteorology, geography/topography, jurisdictional boundaries, and level of control of emission sources.

The Clean Air Act dictates that nonattainment areas be defined to include both areas that are violating the standards and nearby areas that are contributing to the violations. Assessment of areas contributing to violations is complicated by the multiple pollutants that are components of fine particulate matter, the variable significance of these multiple components, and the complexities of photochemical formation and dispersion. To facilitate its review of available information, EPA prepared a "Contributing Emissions Score" (CES) for each potentially violating county. EPA derived a CES for each relevant county using information on emissions, air quality, and meteorology. The score for each county is computed relative to the highest scoring county in the area, so that scores range between 0 and 100. These scores represent an estimate of the relative maximum influence that emissions in that County have on a violating county. The weight that the CES plays in determining the boundaries of any violating area varies from area to area depending on how well the CES methodology takes into account characteristics of an area that impact transport and dispersion of $PM_{2.5}$ and depending on the significance of other factors.

Briefly, a CES for each county was derived by incorporating the following information and variables that impact $PM_{2.5}$ transport into the screening approach:

- Major $PM_{2.5}$ components: total carbon (organic carbon (OC) and elemental carbon (EC)), SO_2, NO_x, and inorganic particles (crustal).
- $PM_{2.5}$ emissions for the highest (generally top 5%) $PM_{2.5}$ emission days (herein called "high days") for each of two seasons, cold (Oct-Apr) and warm (May-Sept)

- Meteorology on high days using the NOAA HYSPLIT model for determining trajectories of air masses for specified days
- The "urban increment" of a violating monitor, which is the urban $PM_{2.5}$ concentration that is in addition to a regional background $PM_{2.5}$ concentration, determined for each $PM_{2.5}$ component
- Distance from each potentially contributing county to a violating county or counties

A more detailed description of the CES can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Factor 1: Emissions data

For this factor, EPA looked at county-based levels of emissions of the following $PM_{2.5}$ components: $PM_{2.5}$ emissions total (which includes $PM_{2.5}$ emissions carbon and emissions other), $PM_{2.5}$ emissions carbon (includes organic carbon OC and elemental carbon (EC)), and $PM_{2.5}$ emissions other (which includes inorganic particles (crustal)), as well as emissions of SO_2 and NO_x which are precursors of secondary $PM_{2.5}$ components. Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html. EPA also considered each county's Contributing Emissions Score (CES), whose derivation is briefly described above.

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values, in $\mu g/m^3$, for air-quality monitors in counties in each area based on data for the 2004-2006 and 2005-2007 periods. A monitor's design value indicates whether that monitor attains a specified air-quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met. EPA is only using air quality data collected in accordance with 40 CFR Parts 50, 53, and 58.

Factor 3: Population density and degree of urbanization (including commercial development)

The tables show the 2005 population for each county in the area being evaluated, as well as the population density for each county in the area. Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the area, the percent of total commuters in each county who commute to other counties within area, as well as the total vehicle miles traveled (VMT) for each county in millions of miles. A county with numerous commuters is generally an integral

part of an urban area and could be an appropriate county for implementing mobile-source emission control strategies, thus warranting inclusion in the nonattainment area.

The 2005 VMT data used for table 4 and 5 of the 9-factor analysis has been derived using methodology similar to that described in "Documentation for the final 2002 Mobile National Emissions Inventory, Version 3, September 2007, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/, in particular in the file named 2002_mobile_nei_version_3_report_092807.pdf. The 2005 VMT data were taken from documentation which is still draft, but which should be released in 2008.

Factor 5: Growth rates and patterns

This factor looks at the population and VMT trends for the each area from 2000 to 2005, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source and other emission-control strategies, thus warranting inclusion in the nonattainment area.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered the most representative National Weather Service wind direction and speed data throughout the year, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons (an October-April "cold" season and a May-September "warm" season). These high days are defined as days where any FRM or FEM air-quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values. For this factor, EPA also considered each County's CES, which includes an analysis of trajectories of air masses for high $PM_{2.5}$ days.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

EPA also conducted trajectory analyses to assess the likelihood that each county was upwind on high concentration days. EPA used these results directly and also used these results in computing each County's CES. Further documentation of this analysis is provided in the documentation of the derivation of the CES.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis looks at physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

The analysis of jurisdictional boundaries considered the planning and organizational structure of the area to determine if the implementation of controls in a potential nonattainment area can be carried out in a cohesive manner.

Factor 9: Level of control of emission sources

This factor considers emission controls currently implemented in the area. The emission estimates under Factor 1 include any control strategies implemented in each area before 2005 that may influence emissions of any component of $PM_{2.5}$ emissions (i.e., total carbon, SO_2, NOx, and crustal $PM_{2.5}$).