



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

The Honorable Mitchell E. Daniels, Jr.
Governor of Indiana
Indianapolis, Indiana 46204

Dear Governor Daniels:

Thank you for your recommendations on the status of fine particle ($PM_{2.5}$) pollution throughout Indiana. As you know, fine particle pollution represents one of the most significant barriers to clean air facing our nation today. Health studies link these tiny particles – about $1/30^{\text{th}}$ 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 December 17, 2007, and May 30, 2008, letters from Thomas W. Easterly, Indiana Department of Environmental Management Commissioner, submitting Indiana's recommendations on air quality designations for the 2006 24-hour $PM_{2.5}$ standards. We have also reviewed the technical information submitted to support Indiana's recommendations. We appreciate the effort your State has made to develop this supporting information. Consistent with the Clean Air Act, this letter is to inform you that the U.S. Environmental Protection Agency intends to make modifications to Indiana's recommended designations and boundaries.

We have enclosed a detailed description of areas where EPA intends to modify your state recommendations, and the basis for such modifications. Your Environmental Commissioner will also receive a copy of this letter and the enclosure. Should you have additional information that you wish EPA to consider in this process, 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, State programs to attain the 1997 $PM_{2.5}$ standards will 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
Regional Administrator

Enclosure

cc: Thomas W. Easterly
Commissioner
Indiana Department of Environmental Management

**Review of Designations in Indiana
For the Particulate Matter Air Quality Standard**

The table below identifies the counties in Indiana that EPA intends to designate as not attaining the 2006 24-hour fine particle (PM_{2.5}) standard.¹ A county will be designated as nonattainment if it has an air quality monitor that is violating the standard or if the county is determined to be contributing to the violation of the standard.

Where EPA intends to include only part of a county in a nonattainment area, we have indicated the boundaries of the portion of the county that will be included. Following this table is a discussion of each area and the basis for EPA's intended designations and then a description of the data EPA examined. EPA intends to designate as attainment/unclassifiable all other Indiana counties or parts thereof not identified in the table below.

Area	Current PM_{2.5} Nonattainment Area	Indiana Recommended Nonattainment Counties	EPA's Intended Nonattainment Counties
Chicago, IL- IN	Lake Porter	Lake	Lake Porter
Cincinnati, OH-KY-IN	Dearborn: Lawrenceburg Township	none	Dearborn: Lawrenceburg Township
Evansville, IN-KY	Vanderburgh Warrick Dubois Gibson: Montgomery Township Pike: Washington Township Spencer: Ohio Township	Vanderburgh	Vanderburgh Warrick Dubois Gibson: Montgomery Township Pike: Washington Township Spencer: Ohio Township
Indianapolis, IN	Hamilton Hendricks Johnson Marion Morgan	Marion	Hamilton Hendricks Johnson Marion Morgan
Lafayette, IN	None	Tippecanoe	Tippecanoe
Louisville, KY-IN	Clark Floyd Jefferson: Madison Township	none	Clark Floyd Jefferson: Madison Twp

¹ EPA designated nonattainment areas for the 1997 fine particle standards in 2005. In 2006, the 24-hour PM_{2.5} standard was revised from 65 micrograms per cubic meter (average of 98th percentile values for 3 consecutive years) to 35 micrograms per cubic meter; the level of the annual standard for PM_{2.5} remained unchanged at 15 micrograms per cubic meter (average of annual averages for 3 consecutive years).

Vincennes, IN	None	Knox	Knox
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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 Indiana 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.

General Issues that Indiana Raised

Indiana's submittal raises a number of general issues that are germane to several areas in Indiana. While the specific character of these issues in particular areas is discussed in

more detail in the area-specific discussions below, these issues warrant a general discussion of these issues that is provided here.

The first issue raised in Indiana's recommendations concerns the size of nonattainment areas. Indiana's recommendations for nonattainment areas included only counties that monitored nonattainment and did not include any additional counties that contributed to nonattainment. In some cases Indiana also recommended that each county monitoring violation be treated as a single county nonattainment area separate from any nearby counties that might also be violating the standards.

Clean Air Act Section 107 requires that nonattainment areas be defined to include not only the area that does not meet the air quality standard but also the area that "contributes to ambient air quality in a nearby area that does not meet" the air quality standard. Generally in the Eastern United States, and in particular in all of the nonattainment areas in and near Indiana, violations of the PM_{2.5} standard reflect both regional scale impacts from contributions originating outside the metropolitan area and more local scale impacts. Indeed, the different components of PM_{2.5} have different ranges of impacts, with some components showing greatest impacts very close to the emissions sources, some components showing peak impacts at a moderate distance from the emissions (such as from rapid photochemical reactions), and some components showing similar impacts over distance ranges of hundreds of kilometers. Consequently, the existence of neighboring counties with somewhat different concentrations, like Lake County observing design values as high as 37 µg/m³ versus the Porter County site having a design value of 32 µg/m³, does not signify that emissions in the county with lower concentrations fails to contribute to the higher concentrations in the neighboring county.

Further considerations apply to mobile sources. By definition, these sources can be associated with a residence or business in one county but emit PM_{2.5} and its precursors in another county. Some of the relevant control measures address the "home" of these vehicles. This consideration supports including counties that are the origin of sizable numbers of vehicles in the nonattainment area.

Indiana has not provided convincing evidence to rebut EPA's general view of the typical characteristics of the PM_{2.5} problem, nor has Indiana demonstrated that a different view should apply in any Indiana areas. Therefore, EPA intends to include the additional counties that it believes contribute to the observed violations in the nonattainment areas it promulgates.

A second issue relates to exceptional events. Indiana has submitted claims that a variety of monitored observations were significantly influenced by exceptional events and should be treated as if significantly lower concentrations had been observed. The first request, submitted on March 27, 2008, addressed observations in 2004, 2005, and 2006 at monitors in the Louisville area. A separate enclosure evaluates this request. The air quality data provided below for the Louisville area reflect the results of our evaluation.

Indiana submitted a second request on June 30, 2008, addressing observations in 2007 at numerous monitors around the state. EPA is still evaluating this second request and will inform the state when this evaluation is complete.

A third issue concerns the timing by which we promulgate designations. Indiana requests that we delay designations for a year, with the expectation that air quality will improve and some areas that are currently violating the standards will then be meeting the standard.

Indiana correctly notes that section 107 of the Clean Air Act authorizes EPA to delay designations for one year. However, Indiana does not address the restrictions on this authority, namely that this extension is authorized only “in the event the Administrator has insufficient information to promulgate the designations.” EPA believes that it has sufficient information to promulgate designations for all areas in Indiana. The State may wish for EPA not to use the presently available information—the State may wish for EPA to use a set of data available in the future rather than the currently available data—but the State has not presented an argument that EPA has insufficient information to judge current air quality. EPA believes that currently available information is sufficient to promulgate designations in all areas in Indiana, and so EPA believes under the circumstances that the Clean Air Act requires it to promulgate designations for Indiana this December.

Review for the Chicago-Naperville-Michigan City Combined Statistical Area

EPA reviewed the relevant information for the ten counties including two counties in Indiana partly or fully within the area designated nonattainment for the 1997 standards as well as for surrounding counties. There are violating monitors in Lake County as well as in Cook and Will Counties in Illinois. Indiana recommended that Lake County be designated as a single county nonattainment area, and Indiana recommended that Porter County and other counties in and near the Chicago-Naperville-Michigan City area be designated attainment.

EPA believes that two Indiana counties, namely Lake and Porter Counties, should be included in the Chicago-Naperville-Michigan City nonattainment area. Lake County has among the highest emissions in the area, and both the pollution rose provided below and trajectory information indicate that these emissions routinely contribute to the violations observed in Cook and Will Counties in Illinois. The proximity of Lake County to the violations in Illinois, i.e., the fact that Lake County directly abuts these neighboring violating counties, enhances the contribution to these violations from Lake County. Porter County also has substantial emissions that contribute to violations elsewhere in the Chicago metropolitan area on a high percentage of days. Both Lake and Porter Counties have high numbers of commuters that drive into other parts of the Chicago metropolitan area. In addition, establishment of a nonattainment area for the 2006 standards that matches the existing nonattainment area boundaries set for the 1997 standards will

simplify planning by assuring that the corresponding requirements for the two sets of air quality standards apply to the same area.

EPA reviewed the relevant information for other counties within the combined statistical area as well as counties adjacent to the combined statistical area in order to determine the appropriate nonattainment area. Other Indiana counties in or near the combined statistical area have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 1 is a map of the counties in the Chicago area 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.

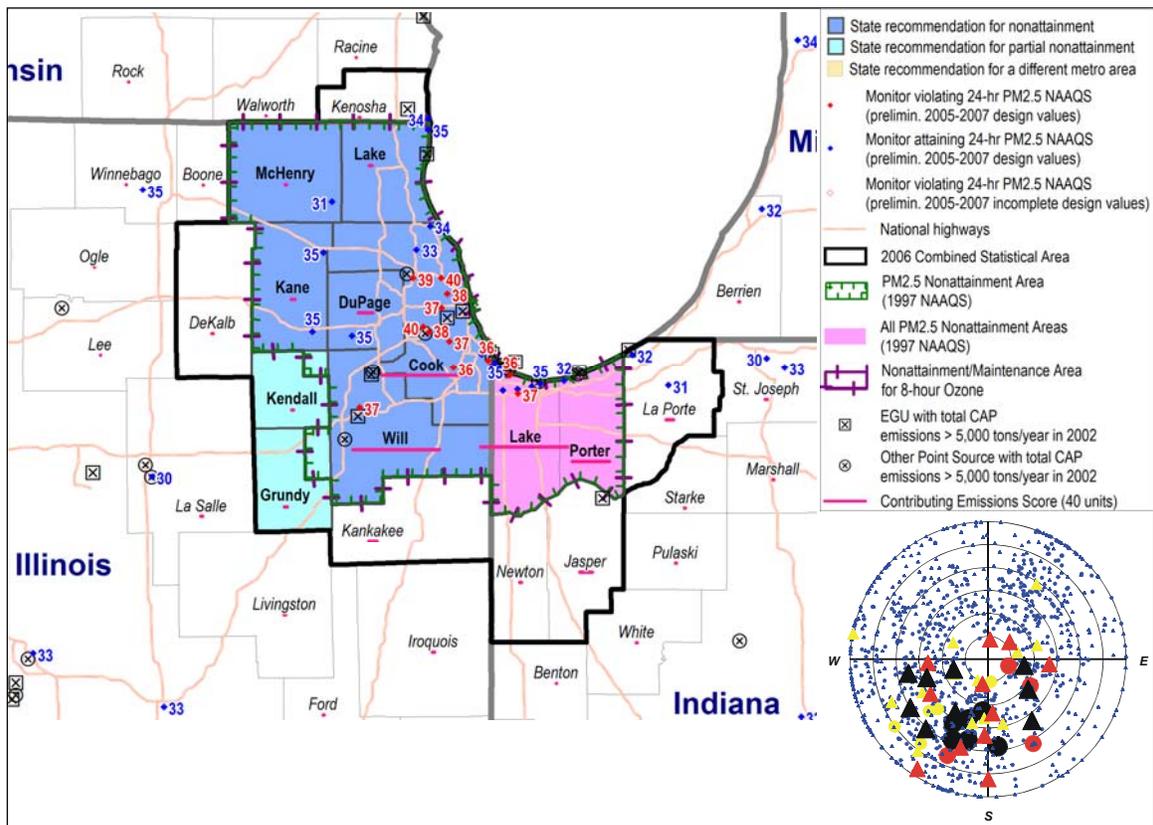


Figure 1 Note: Map produced prior to Indiana’s nonattainment recommendation for Lake County, Ind.

Factor 1: Emissions data

Table 1 shows emissions of PM_{2.5} components (given in tons per year) and the CESs for potentially contributing counties in the Chicago area. Counties that are part of the Chicago nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Counties are listed in descending order by CES.

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

County	State Recommended	CES	PM _{2.5} emissions	PM _{2.5} emissions	PM _{2.5} emissions	SO ₂ (tpy)	NO _x (tpy)	VOCs (tpy)	NH ₃ (tpy)
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	Nonattainment?		total (tpy)	carbon (tpy)	other (tpy)				
Cook, IL	Yes	100	10,081	5,407	4,674	35,354	175,267	152,288	4,550
Lake, IN	No	100	7,079	1,219	5,861	39,500	54,203	24,679	3,784
Will, IL	Yes	95	5,432	1,236	4,195	78,792	46,028	19,886	1,407
Porter, IN	No	41	3,901	719	3,183	24,458	29,930	9,795	909
DuPage, IL	Yes	16	2,075	1,259	816	2,013	36,880	29,541	1,385
Jasper, IN	No	14	2,641	280	2,360	40,723	20,104	3,367	2,929
Kankakee, IL	No	9	1,660	419	1,242	366	7,351	6,830	1,699
Kane, IL	Yes	4	1,997	733	1,263	1,037	16,528	15,578	1,293
Grundy, IL	Partial	3	1,105	248	857	362	4,057	4,223	1,027
Lake, IL	Yes	3	2,657	1,070	1,587	14,719	29,478	32,778	747
Kendall, IL	Partial	2	811	230	581	351	3,697	3,693	753
McHenry, IL	Yes	1	2,102	634	1,468	592	9,493	10,596	1,224
Kenosha, WI	No	1	1,489	460	1,030	33,988	15,967	7,857	647

Within Indiana, emissions are highest in Lake and Porter Counties. Emissions are lower in Jasper County.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Chicago area are shown in Table 2. The design value for Lake County, Indiana is above the air quality standard. There are also violations in Illinois.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Cook, IL	Yes	42	40
Lake, IN	Yes	38	37
Will, IL	Yes	36	37
Porter, IN	No	31	32
DuPage, IL	Yes	33	35
Kane, IL	Yes	32	35
Grundy, IL	Partial		
Lake, IL	Yes	33	35
Kendall, IL	Partial		
McHenry, IL	Yes	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 8.8 µg/m³, consisting of 0.4 µg/m³ of sulfate, no nitrate, 8.4 µg/m³ of organic particles, and no inorganic particulate emissions. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 3.9 µg/m³, consisting of 0.5 µg/m³ of sulfate, 3.1 µg/m³ of organic particles, and 0.3 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.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Cook, IL	Yes	5,303,943	5545
Lake, IN	Yes	491,706	980
Will, IL	Yes	642,625	758
Porter, IN	No	157,408	375
DuPage, IL	Yes	931,219	2769
Kane, IL	Yes	483,208	923
Grundy, IL	Partial	43,736	102
Lake, IL	Yes	704,086	1504
Kendall, IL	Partial	79,597	247
McHenry, IL	Yes	304,701	499

In the Indiana portion of the Chicago area, Lake County has a sizable population and population density. Both are more moderate in Porter County, but still larger than other area counties proposed as nonattainment.

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
Cook, IL	Yes	35,294	2,113,930	89	2,352,120	99
Lake, IN	Yes	4,588	193,610	93	206,350	99
Will, IL	Yes	4,605	185,690	77	239,340	99
Porter, IN	No	1,677	25,470	35	70,940	98
DuPage, IL	Yes	8,802	161,940	35	464,630	99
Kane, IL	Yes	3,517	36,290	19	190,780	99
Grundy, IL	Partial	623	6,990	38	17,310	95
Lake, IL	Yes	6,016	83,930	26	313,250	99
Kendall, IL	Partial	678	4,230	15	27,860	99
McHenry, IL	Yes	2,104	31,680	24	130,520	98

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The listed counties are all in the nonattainment area for the 1997 PM_{2.5} NAAQS. All counties in this table are highly integrated into the Chicago area.

Factor 5: Growth rates and patterns

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

Table 5. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-05)	2005 VMT (10 ⁶ mi)	VMT % change (1996-05)
Kane, IL	483,208	18	3,517	364
McHenry, IL	304,701	16	2,104	196
Kendall, IL	79,597	44	678	166
Will, IL	642,625	26	4,605	135
Lake, IL	704,086	9	6,016	82
DuPage, IL	931,219	3	8,802	43
Grundy, IL	43,736	16	623	30
Porter, IN	157,408	7	1,677	10
Lake, IN	491,706	1	4,588	0
Cook, IL	5,303,943	-1	35,294	-14

Factor 6: Meteorology (weather/transport patterns)

A pollution rose for the Chicago area is provided in the map above. This pollution rose indicates that violations in the area generally occur with southerly winds, including southeasterly as well as southwesterly winds, which would bring emissions from Porter County into Lake County, Indiana, and from Porter and Lake Counties, Indiana, into Cook County and possibly Will County, Illinois.

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

The Chicago area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

The Chicago Area Transportation Study (CATS) Policy Committee is the Metropolitan Planning Organization (MPO) for the northeastern Illinois region. CATS webpage: <http://www.catsmpo.com/>. Northwest Indiana has a separate MPO called the Northwest Indiana Regional Planning Commission, serving Lake, Porter, and LaPorte Counties, with a web site at: <http://www.nirpc.org>.

The Chicago ozone nonattainment area consists of the following counties: Cook, Du Page, Kane, Lake, Mc Henry, Will, Aux Sable and Goose Lake Townships in Grundy County, and Oswego Township in Kendall County, Illinois and Lake and Porter Counties in Indiana.

The proposed Chicago nonattainment area is identical to the nonattainment area designated under the 1997 PM_{2.5} standard. Thus, the nonattainment area includes Lake and Porter Counties in Indiana.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the States in the Chicago area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}).

Review for the Cincinnati Combined Statistical Area

EPA reviewed the relevant information for the eight counties, including a portion of one county in Indiana, partly or fully within the area designated nonattainment for the 1997 standards as well as for surrounding counties. There are violating monitors in Hamilton and Butler Counties in Ohio and in Kenton County in Kentucky. While EPA designated Lawrenceburg Township of Dearborn County as nonattainment for the 1997 standards, Indiana recommended that this entire county be designated as attainment.

EPA believes that Lawrenceburg Township of Dearborn County contributes to violations elsewhere in the Cincinnati Combined Statistical Area. The county has high emissions relatively close to the locations of violations and is commonly upwind on days with high concentrations. In addition, establishment of a nonattainment area for the 2006 standards that matches the existing nonattainment area boundaries set for the 1997 standards will simplify planning by assuring that the corresponding requirements for the two sets of air quality standards apply to the same area.

Based on information available to EPA, EPA does not expect the power plant in Lawrenceburg Township to install significant emission controls in the near future. Nevertheless, EPA welcomes further information on controls on this plant. 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)

EPA reviewed the relevant information for other counties within the combined statistical area as well as counties adjacent to the combined statistical area in order to determine the appropriate nonattainment area. Other Indiana counties in or near the combined statistical area have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 2 is a map of the counties in the Cincinnati area 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.

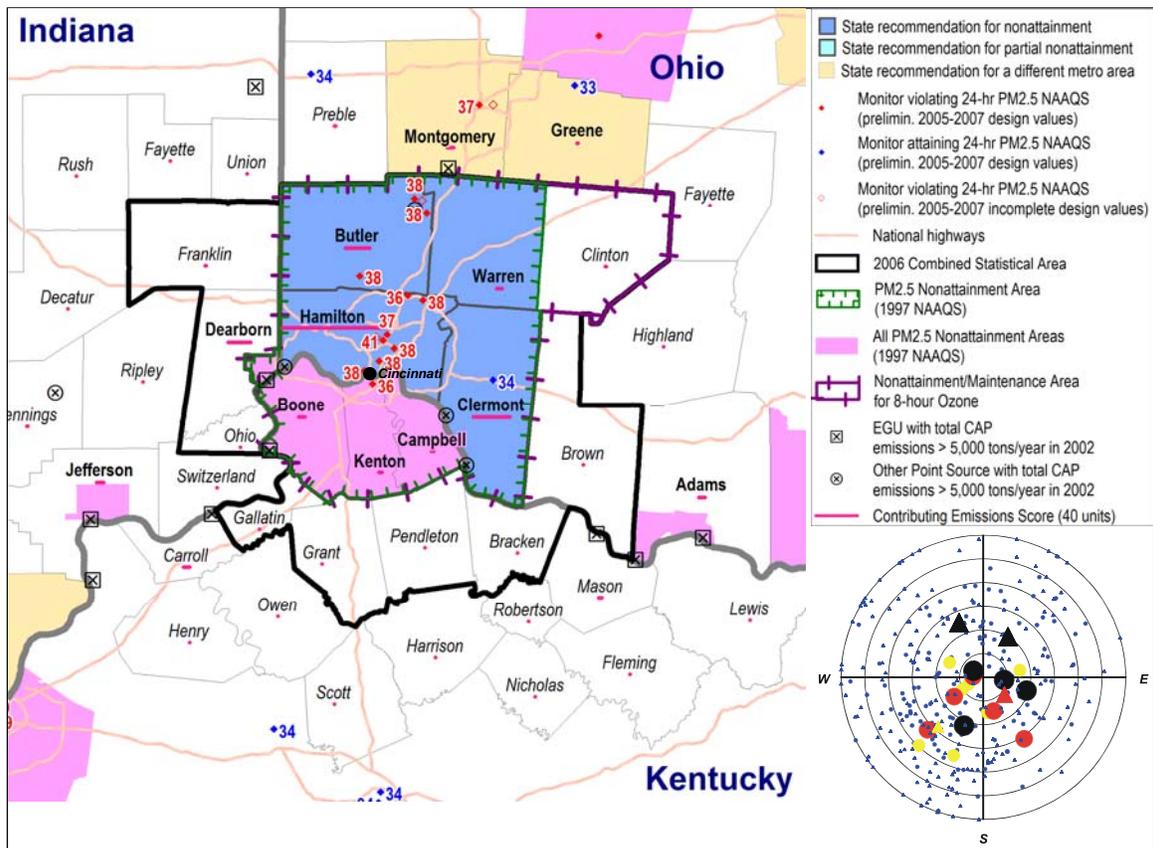


Figure 2

Factor 1: Emissions data

Table 1 shows emissions of PM_{2.5} components (given in tons per year) and the CESs for potentially contributing counties in the Cincinnati area. Counties that are part of the Cincinnati nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Counties are listed in descending order by CES.

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

County	State	CES	PM _{2.5}	PM _{2.5}	PM _{2.5}	SO ₂	NO _x	VOCs	NH ₃
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	Recomm ended Nonattai nment?		emissions total (tpy)	emissions carbon (tpy)	emissions other (tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Hamilton, OH	Yes	100	6,489	1,244	5,245	88,139	50,060	38,552	2,359
Clermont, OH	Yes	36	5,399	733	4,665	90,341	35,748	6,982	407
Butler, OH	Yes	24	2,269	563	1,706	10,636	16,661	12,734	1,105
Dearborn, IN	No	22	2,780	288	2,492	47,908	12,881	3,268	229
Jefferson, IN	No	7	1,265	168	1,097	75,319	25,214	2,272	341
Boone, KY	No	6	1,629	615	1,014	5,383	10,852	5,883	286
Adams, OH	No	6	5,970	494	5,476	126,316	33,822	1,918	837
Warren, OH	Yes	5	1,304	535	768	568	7,244	7,278	792
Kenton, KY	No	3	537	269	268	1,300	6,316	5,606	266
Campbell, KY	No	2	412	179	233	731	4,231	2,923	196

Dearborn County has similar emissions as Butler and Clermont Counties. There is a power plant in Lawrenceburg Township, the recommend partial county area of Dearborn County, which accounts for most of the county’s emissions. Jefferson County, Indiana has a low CES score in the Cincinnati area even though its emissions are similar to those of Dearborn County. It was also considered as part of the Louisville area.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Cincinnati area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Hamilton, OH	Yes	40	41
Clermont, OH	Yes		34
Butler, OH	Yes	38	38
Dearborn, IN	No		
Boone, KY	No		
Warren, OH	Yes		
Kenton, KY	No	35	36
Campbell, KY	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 3.2 µg/m³, consisting of 1.3 µg/m³ of sulfate, 0.8 µg/m³ of nitrate, 1.1 µg/m³ of organic particles, and no miscellaneous inorganic particulate. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 10.9 µg/m³, consisting entirely of sulfate emissions. 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.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/mi ²)
Hamilton, OH	Yes	828,487	2007
Clermont, OH	Yes	190,329	417
Butler, OH	Yes	349,966	745
Dearborn, IN	No	48,930	160
Boone, KY	No	106,278	414
Warren, OH	Yes	196,793	484
Kenton, KY	No	153,314	930
Campbell, KY	No	87,048	547

The population and population density of Dearborn County are both the lowest of the area counties listed on Table 3. This is consistent with the view that the emissions in the county predominantly arise from the power plant in Lawrenceburg Township and not from population-oriented sources.

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
Hamilton, OH	Yes	8,132	364,380	92	391,410	98
Butler, OH	Yes	3,059	143,800	90	153,070	96
Clermont, OH	Yes	1,799	45,070	51	86,620	98
Kenton, KY	No	1,647	51,980	68	74,830	99
Warren, OH	Yes	1,692	41,510	54	62,590	82
Boone, KY	No	1,074	17,300	39	43,420	98
Campbell, KY	No	1,000	21,460	50	42,160	99
Dearborn, IN	No	708	8,920	40	20,700	92

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The listed counties are all in the Cincinnati nonattainment area for the 1997 PM_{2.5} NAAQS. The VMT figure for Dearborn County is lower than the other listed counties, but 92% commuting into the statistical area suggests a tie to the Cincinnati area.

Factor 5: Growth rates and patterns

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

Table 5. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-05)	2005 VMT (10 ⁶ mi)	VMT % change (1996-05)
Boone, KY	106,278	22	1,074	48
Warren, OH	196,793	22	1,692	34
Dearborn, IN	48,930	6	708	30
Butler, OH	349,966	5	3,059	28
Clermont, OH	190,329	7	1,799	16
Campbell, KY	87,048	-2	1,000	4
Hamilton, OH	828,487	-2	8,132	3
Kenton, KY	153,314	1	1,647	3

The low VMT of Dearborn County, Indiana is growing at a fair rate from 1996 to 2005. Its low population is also growing, though not nearly as fast as Boone County, Kentucky and Warren County, Ohio are growing.

Factor 6: Meteorology (weather/transport patterns)

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

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

The Cincinnati area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

The Ohio-Kentucky-Indiana Regional Council of Governments (OKI) is the Metropolitan Planning Organization (MPO) for Butler, Warren, Clermont, and Hamilton Counties in Ohio; Campbell, Kenton, and Boone Counties in Kentucky; and Dearborn County, Indiana. OKI webpage: <http://www.oki.org/>.

The Cincinnati ozone nonattainment area consists of the following counties: in Ohio- Butler, Clermont, Clinton, Hamilton, and Warren; in Indiana-Lawrenceburg Township in Dearborn; in Kentucky-Boone, Kenton, and Campbell.

Factor 9: Level of control of emission sources

No state of the art SO₂ or NO_x emission control equipment is expected to be installed at the power plant in Lawrenceburg Township of Dearborn County in the next few years.

Review for the Evansville Metropolitan Statistical Area

EPA reviewed the relevant information for the six counties partly or fully within the area designated nonattainment for the 1997 standards as well as for surrounding counties. There are monitors in Vanderburgh and Dubois Counties showing violations of the 2006 standards, in particular the 24-hour standard. In 2005, EPA designated a nonattainment area for the 1997 standards that included the entirety of Dubois, Vanderburgh, and Warrick Counties and a township in each of Gibson, Pike and Spencer Counties. Indiana has requested redesignation of this area with respect to the 1997 standards. Nevertheless, EPA's designations in 2005 reflect EPA's determination at that time that those six counties contributed to the violations of the annual standard that were then being observed in Vanderburgh and Dubois Counties. EPA finds in general that violations of the 24-hour PM_{2.5} standard reflect the same combination of local scale, metropolitan scale, and regional scale contributions as contribute to violations of the annual standard, and EPA believes in particular that this combination of contributors are responsible for the violations of the 24-hour standard in the Evansville.

Indiana submitted information to suggest that a number of observations of high concentrations, most notably in Dubois County, would not have been high but for exceptional events. EPA has not completed its review of this information. EPA will inform Indiana when it has completed its review.

EPA further believes that Warrick County is contributing to violations in the Evansville area. This county has relatively high emissions that are commonly upwind of violating monitors.

EPA also included Montgomery Township in Gibson County, Washington Township in Pike County, and Ohio Township in Spencer County in the Evansville nonattainment area for the annual PM_{2.5} standard. These townships have power plants that have a substantial majority of these counties' emissions. These townships have a sizable fraction of the Evansville area emissions. Indeed, the contributing emission scores, derived from EPA's screening tool for comparing potential impacts of different counties, suggests that Warrick, Gibson, and Spencer Counties may have more impact on violations in Vanderburgh County than Vanderburgh County itself, with Pike County potentially having nearly as much impact as Vanderburgh County itself. Thus, EPA believes that these townships also contribute to violations of the 24-hour standard.

In considering county-level emissions, EPA considered 2005 emissions data from the National Emissions Inventory. EPA recognizes that PSI's Gibson Station and IPALCO's Petersburg Station have installed substantial emission control equipment, and some of these controls (particularly at Gibson Station) may not be reflected in the 2005 inventory. At the same time, with the recent court decision regarding the Clean Air Interstate Rule,

EPA is concerned about the enforceability of effective operation of this control equipment. 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 summary, EPA intends to designate an Evansville nonattainment area that includes Vanderburgh, Warrick, and Dubois Counties along with Montgomery Township in Gibson County, Washington Township in Pike County, and Ohio Township in Spencer County.

Violations are also being recorded in Knox County, which is in the Vincennes Micropolitan Statistical Area, an area that adjoins the Evansville Metropolitan Statistical Area. As is true in many areas in the Eastern United States, emissions in the Evansville area have some impact on the adjoining Vincennes area. Clean Air Act Section 107 instructs EPA to designate as nonattainment any area “that contributes to ambient air quality in a nearby area that does not meet” the standard. While the transport of fine particulate matter in the Eastern United States is such that sources even 1000 kilometers away can influence air quality, suggesting the possibility of defining a single nonattainment area including large parts of the Eastern United States, Section 107 instructs EPA to define multiple separate nonattainment areas that are limited to particular areas with violations and the nearby source areas that contribute to those violations. In implementing this provision, EPA generally defines separate metropolitan areas as separate nonattainment areas, even if (as here) the metropolitan areas are contiguous. That is, in judging what areas influencing air quality at a violating monitor can be considered to be “nearby,” EPA commonly views separate metropolitan areas as insufficiently nearby to include in the nonattainment area.

The Evansville area also reflects an exception to this general approach, with the inclusion of portions of the Jasper micropolitan statistical area which includes Dubois and Pike Counties along with portions of the Evansville metropolitan statistical area in a combined Evansville nonattainment area. However, in 2005, when EPA defined the Evansville

nonattainment area, the Office of Management and Budget had not defined any micropolitan statistical areas, and Dubois and Pike Counties were not included in any metropolitan area and were implicitly defined as rural. Under those circumstances, EPA concluded that the violation in Dubois County and the emissions in Dubois and Pike Counties as well as Gibson County, which was then considered rural but is now part of the Evansville metropolitan area, and Spencer County all contributed to nonattainment in a combined area that also included Vanderburgh and Warrick Counties. Applying nonattainment area boundaries that match the boundaries applied to the area violating the 1997 standards has the additional advantage of providing for planning that is consistent with planning for attaining those standards, notwithstanding Indiana's request for redesignation of this area relative to those standards. We believe that Vincennes/Knox County presents a different situation, and we intend to designate a separate Vincennes nonattainment area.

EPA reviewed the relevant information for other counties within the metropolitan statistical area as well as counties adjacent to the combined statistical area in order to determine the appropriate nonattainment area. Other Indiana counties in or near the combined statistical area have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 3 is a map of the counties in the Evansville area 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.

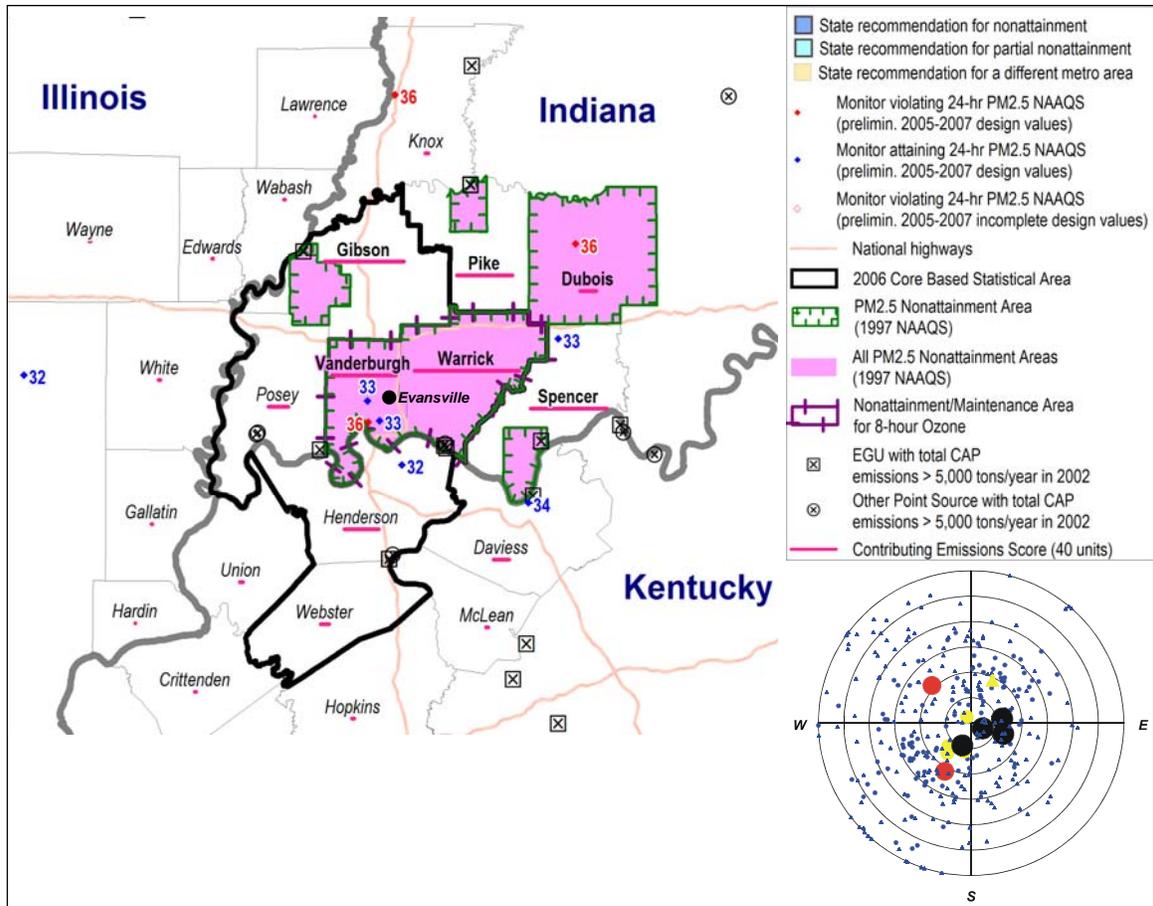


Figure 3- Note: Map produced prior to Indiana recommending nonattainment for Knox and Vanderburgh Counties

Factor 1: Emissions data

Table 1 shows emissions of PM_{2.5} components (given in tons per year) and the CESs for potentially contributing counties in the Evansville area. Counties that are part of the Evansville area nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Counties are listed in descending order by CES.

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

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)
Warrick, IN	No	100	8,412	540	7,872	92,222	18,291	3,856	735
Gibson, IN	No	76	6,642	420	6,223	154,782	32,655	3,679	1,921
Spencer, IN	No	73	1,568	201	1,367	67,705	24,104	2,223	1,297
Vanderburgh, IN	Yes	61	1,558	308	1,250	2,029	7,048	8,405	469
Pike, IN	No	53	2,412	163	2,249	52,836	18,990	1,206	487
Henderson, KY	No	33	1,202	267	936	8,612	5,525	3,068	670
Posey, IN	No	19	1,602	193	1,409	14,531	12,161	3,443	1,343
Dubois, IN	No	15	1,204	228	977	2,131	3,438	5,792	3,917
Daviess, KY	No	15	1,413	367	1,046	7,605	11,880	6,322	1,547

The emissions from Gibson, Spencer, Vanderburgh, and Warrick Counties are all significant. The emissions from Dubois and Posey Counties in Indiana and Daviess and Henderson Counties in Kentucky are all moderate.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Evansville area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Warrick, IN	No		
Gibson, IN	No		
Spencer, IN	No	31	33
Vanderburgh, IN	Yes	34	36
Pike, IN	No		
Dubois, IN	No	34	36
Henderson, KY	No	30	32
Posey, IN	No		
Daviess, KY	No		34

Dubois and Vanderburgh Counties have design values that exceed the air quality standards and therefore must be designated nonattainment. These data do not reflect review of exceptional event claims for 2007 air quality data. 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 1.0 µg/m³ of sulfate, no nitrate, 5.5 µg/m³ of organic particles, and 0.7 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 7.2 µg/m³, consisting of 1.0 µg/m³ of sulfate, no nitrate, 5.5 µg/m³ of organic particles, and 0.7 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. Vanderburgh County, Indiana with the City of Evansville has the largest population in the area. The other area counties all have modest populations.

Table 3. Population

County	State	2005	2005
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	Recommended Nonattainment?	Population	Population Density (pop/sq mi)
Warrick, IN	No	56,435	144
Gibson, IN	No	33,347	67
Spencer, IN	No	20,476	51
Vanderburgh, IN	Yes	172,774	734
Pike, IN	No	12,766	37
Dubois, IN	No	40,922	94
Henderson, KY	No	45,563	98
Posey, IN	No	26,834	64
Daviess, KY	No	92,837	195

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
Vanderburgh, IN	Yes	1,452	75,290	90	81,640	98
Warrick, IN	No	797	14,890	56	24,950	95
Henderson, KY	No	508	3,570	17	19,430	94
Gibson, IN	No	469	4,330	28	13,880	90
Posey, IN	No	553	5,600	44	12,520	98
Spencer, IN	No	430	3,020	31	2,200	22
Daviess, KY	No	782	660	2	1,740	4
Pike, IN	No	169	2,310	41	920	16
Dubois, IN	No	539	19,030	93	450	2

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The counties that are in the nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Vanderburgh County stands out with its VMT being well above the other area counties. Daviess and Dubois Counties show limited commuting into the MSA.

Factor 5: Growth rates and patterns

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

Table 5. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-05)	2005 VMT (10 ⁶ mi)	VMT % change (1996-05)
Posey, IN	26,834	-1	553	22
Dubois, IN	40,922	3	539	21
Spencer, IN	20,476	0	430	20
Gibson, IN	33,347	2	469	19
Warrick, IN	56,435	7	797	9

Henderson, KY	45,563	2	508	1
Pike, IN	12,766	0	169	0
Daviess, KY	92,837	1	782	0
Vanderburgh, IN	172,774	1	1,452	-7

Dubois, Gibson, Posey, and Spencer Counties all have VMT growth of around 20%. The VMT growth is lower in the other counties. The population growth is limited across the area.

Factor 6: Meteorology (weather/transport patterns)

A pollution rose for the Evansville area is provided with the map above.

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

The Evansville area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

The MPO for Vanderburgh and Warrick Counties is the Evansville Urban Transportation Study.

Vanderburgh and Warrick Counties are in the Evansville ozone maintenance area. All other area counties were designated as attainment/unclassified for 8-hour ozone.

Dubois and Pike Counties are included in the PM_{2.5} Evansville nonattainment area designated under the 1997 standards.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the States in the Evansville area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}).

Review for the Indianapolis Combined Statistical Area

EPA reviewed the relevant information for the five counties in the area designated nonattainment for the 1997 standards as well as for surrounding counties. There are violating monitors in Marion County. While EPA designated Hamilton, Hendricks, Johnson, Marion, and Morgan Counties as nonattainment with respect to the 1997 standards, Indiana recommended that only Marion County be designated nonattainment.

EPA believes that all of the areas designated nonattainment for the 1997 standards also contribute to violations of the 2006 standards. While Marion County likely makes the

greatest contribution to violations within Marion County, the other four counties designated nonattainment for the 1997 all have substantial emissions, are commonly upwind of the violating monitors on high concentration days, and are relatively nearby to the violating monitor.

EPA reviewed the relevant information for other counties within the combined statistical area as well as counties adjacent to the combined statistical area in order to determine the appropriate nonattainment area. Other Indiana counties in or near the combined statistical area have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 4 is a map of the counties in the Indianapolis area 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.

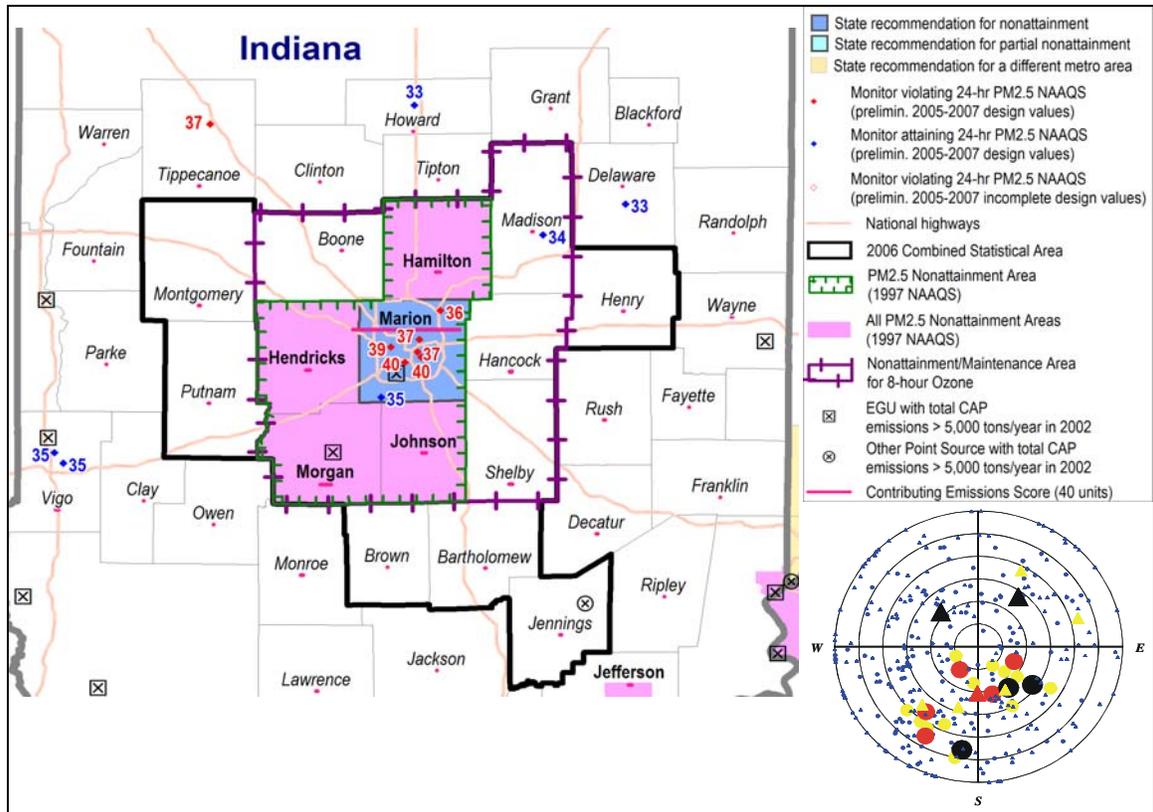


Figure 4

Factor 1: Emissions data

Table 1 shows emissions of PM_{2.5} components (given in tons per year) and the CESs for potentially contributing counties in the Indianapolis area. Counties that are part of the Indianapolis nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Counties are listed in descending order by CES.

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

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)	NO _x (tpy)	VOCs (tpy)	NH ₃ (tpy)
Marion, IN	Yes	100	6,606	1,245	5,361	60,898	37,673	37,017	1,876
Morgan, IN	No	10	1,617	240	1,376	19,016	6,643	3,881	413
Hamilton, IN	No	4	1,801	432	1,369	1,226	7,988	9,210	754
Hendricks, IN	No	4	1,342	319	1,022	602	5,799	4,898	685
Johnson, IN	No	4	1,108	221	887	944	4,704	6,593	1,276
Shelby, IN	No	3	1,346	238	1,107	768	4,511	3,571	964
Hancock, IN	No	2	948	169	777	430	3,144	3,308	763
Boone, IN	No	1	1,041	189	852	401	3,507	3,378	1,353

Marion County stands out with its emission figures being well above the other area counties. The sulfur dioxide emissions in Morgan County push its CES above the remaining area counties. The other counties all have similar emissions.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Indianapolis area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Marion, IN	Yes	38	40
Morgan, IN	No		
Hamilton, IN	No		
Hendricks, IN	No		
Johnson, IN	No		
Shelby, IN	No		
Hancock, IN	No		
Boone, IN	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 8.1 µg/m³, consisting of 4.6 µg/m³ of sulfate, 1.1 µg/m³ of nitrate, 2.3 µg/m³ of organic particles, and 0.1 µg/m³ of inorganic particulate emissions. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 5.8 µg/m³, consisting of 3.5 µg/m³ of sulfate, 2.3 µg/m³ of organic particles, and no nitrate or inorganic particulate emissions. 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.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Marion, IN	Yes	861,760	2140
Morgan, IN	No	69,751	171
Hamilton, IN	No	240,732	598
Hendricks, IN	No	127,261	312
Johnson, IN	No	129,823	404
Shelby, IN	No	43,775	106
Hancock, IN	No	62,972	205
Boone, IN	No	51,918	123

Marion County has the highest population in the area. Hamilton, Hendricks, and Johnson have the next largest populations. The other counties have much smaller populations.

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
Marion, IN	Yes	7,913	368,840	87	417,860	99
Hamilton, IN	No	2,035	43,360	46	90,100	96
Johnson, IN	No	1,359	28,610	49	57,810	99
Hendricks, IN	No	1,373	28,500	54	52,030	98
Morgan, IN	No	932	13,780	42	31,680	96
Hancock, IN	No	813	14,000	50	27,440	98
Boone, IN	No	844	8,970	40	21,490	95
Shelby, IN	No	698	5,560	26	20,940	97

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The counties that are in the nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Again Marion County stands out in the area. Its VMT is well higher than the other Indianapolis area counties. The commuting into the statistical area figures suggests an integration of all the counties into the Indianapolis area.

Factor 5: Growth rates and patterns

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

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)
Boone, IN	51,918	12	844	28
Hamilton, IN	240,732	30	2,035	24
Hancock, IN	62,972	13	813	23
Shelby, IN	43,775	0	698	22
Hendricks, IN	127,261	21	1,373	22
Johnson, IN	129,823	12	1,359	11
Morgan, IN	69,751	4	932	10
Marion, IN	861,760	0	7,913	-10

There is solid growth in VMT in the counties that ring the central county, Marion. Five of the counties have VMT growth that exceeds 20%. The other two counties, Johnson and Morgan, have seen VMT increase by about 10% from 1996 to 2005. Marion County has seen its VMT decrease during this period. The population growth appears sporadic with some counties experiencing no growth, while other saw moderate growth, and two counties experienced strong growth. Hamilton County grew by 30% while Hendricks County saw 21% growth.

Factor 6: Meteorology (weather/transport patterns)

The pollution rose for the Indianapolis area is provided above.

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

The Indianapolis area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

The Indianapolis Metropolitan Planning Organization (MPO) serves Boone, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, and Shelby Counties.

The Indianapolis ozone maintenance area is composed of Boone, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, and Shelby Counties in Indiana.

The proposed Indianapolis nonattainment area is identical to the nonattainment area designated under the 1997 PM_{2.5} standard. The nonattainment area consists of Hamilton, Hendricks, Johnson, Marion, and Morgan 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 Indianapolis area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}).

Review for the Lafayette Metropolitan Statistical Area

The Lafayette Metropolitan Statistical Area consists of Benton, Carroll, and Tippecanoe Counties. EPA reviewed the relevant information for these counties as well as for surrounding counties. There is a violating monitor in Tippecanoe County. These counties were designated as attaining the 1997 standards. Indiana recommended that the Lafayette nonattainment area include only Tippecanoe County.

EPA agrees with Indiana’s recommendation. Tippecanoe County violates the standard and contributes to its own violations. The other counties in and around the metropolitan area have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 5 is a map of the counties in the Lafayette area 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 State.

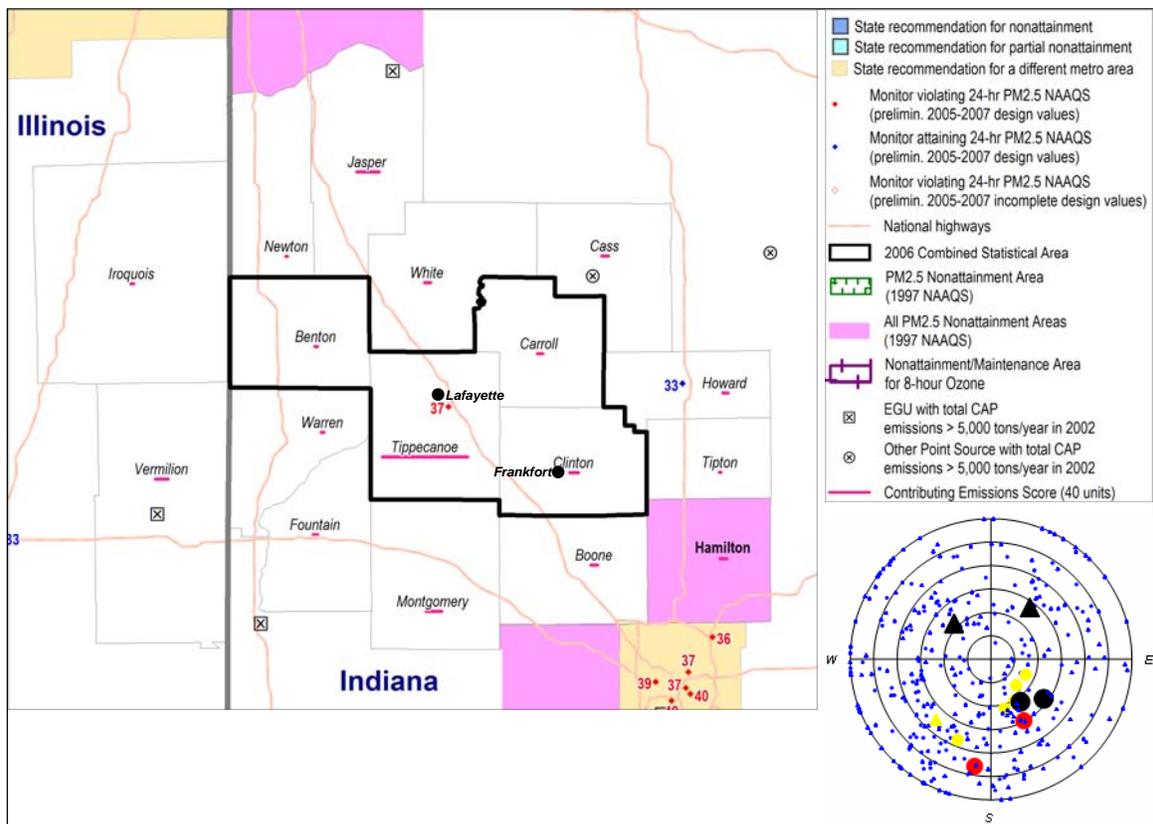


Figure 5- Note: Map produced prior to Indiana nonattainment recommendation for Tippecanoe County

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 Lafayette 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)	NO _x (tpy)	VOCs (tpy)	NH ₃ (tpy)
Tippecanoe, IN	Yes	100	2,341	425	1,917	8,286	8,566	9,370	1,492
Jasper, IN	No	26	2,641	280	2,360	40,723	20,104	3,367	2,929
Montgomery, IN	No	18	1,306	252	1,052	1,287	3,656	3,626	1,534
Vermilion, IL	No	15	2,278	358	1,920	12,462	6,427	7,751	1,694
Clinton, IN	No	10	1,044	130	914	743	2,334	2,776	2,162
Carroll, IN	No	6	894	112	782	293	1,391	2,016	2,654
Benton, IN	No	3	828	88	740	119	827	1,203	1,203

Tippecanoe County has the highest CES, well ahead of the other counties in the area. Jasper County has the next highest score, a modest 26, but it is not adjacent to Tippecanoe. Jasper County is adjacent to Lake and Porter Counties of the Chicago nonattainment area. Other counties have even lower emissions.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Lafayette area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Tippecanoe, IN	Yes	34	37
Clinton, IN	No		
Carroll, IN	No		
Benton, IN	No		
Jasper, IN	No		
Montgomery, IN	No		
Vermilion, IL	No		

Tippecanoe County is the only county with a violating design value. Surrounding counties do not have fine particulate monitoring data.

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

$\mu\text{g}/\text{m}^3$ of sulfate, $2.2 \mu\text{g}/\text{m}^3$ of nitrate, $3.1 \mu\text{g}/\text{m}^3$ of organic particles, and $0.3 \mu\text{g}/\text{m}^3$ of inorganic particulate emissions. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of $5.5 \mu\text{g}/\text{m}^3$, consisting of $3.0 \mu\text{g}/\text{m}^3$ of sulfate, $2.4 \mu\text{g}/\text{m}^3$ of organic particles, and $0.1 \mu\text{g}/\text{m}^3$ of inorganic particulate emissions. 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 $\text{PM}_{2.5}$ standards. The population and population density of Tippecanoe are much higher than any of the other counties in the area.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Tippecanoe, IN	Yes	154,024	307
Clinton, IN	No	34,073	84
Carroll, IN	No	20,446	55
Benton, IN	No	9,023	22
Jasper, IN	No	31,761	57
Montgomery, IN	No	38,189	76
Vermilion, IL	No	82,178	91

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
Tippecanoe, IN	Yes	1,332	67,730	93	69,120	95
Clinton, IN	No	526	2,750	18	12,380	83
Carroll, IN	No	272	2,500	26	7,410	76
Benton, IN	No	146	1,650	36	3,970	87
Montgomery, IN	No	751	1,250	7	1,330	7
Jasper, IN	No	757	280	2	310	2
Vermilion, IL	No	838	50	0	70	0

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. Tippecanoe County has much higher VMT than other area counties. The commuting into any violating county data suggests that not many people from Carroll and Clinton Counties commute into Tippecanoe County. When compared with commuting into the statistical area figures, no strong connection between these

counties is suggested. Carroll, Clinton, and Tippecanoe Counties are all in the Lafayette statistical area.

Factor 5: Growth rates and patterns

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the Lafayette 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)
Montgomery, IN	38,189	2	751	25
Clinton, IN	34,073	0	526	24
Jasper, IN	31,761	5	757	20
Carroll, IN	20,446	1	272	19
Vermilion, IL	82,178	-2	838	17
Benton, IN	9,023	-4	146	15
Tippecanoe, IN	154,024	3	1,332	6

The VMT growth for Tippecanoe County is low. It is higher in other area counties, but none of these counties stand out in VMT growth. Population change is low for all area counties.

Factor 6: Meteorology (weather/transport patterns)

A pollution rose for the Lafayette area is provided with the map above.

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

The Lafayette area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

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

The metropolitan planning organization for the Lafayette area is the Tippecanoe County Area Plan Commission (TCAPC). The web site for the TCAPC is www.county.tippecanoe.in.gov/apc .

Factor 9: Level of control of emission sources

This factor considers emission controls currently implemented in the Lafayette area.

The emission estimates on Table 1 include any control strategies implemented by the State in the Lafayette area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}).

Review for the Louisville Metropolitan Statistical Area

EPA reviewed the relevant information for the five counties, including three counties in Indiana, partly or fully within the area designated nonattainment for the 1997 standards as well as for surrounding counties. There are violating monitors in Jefferson County, Kentucky, and Clark County, Indiana. While EPA designated Clark, Floyd, and Madison Township of Jefferson County as part of the Louisville nonattainment area with respect to the 1997 standards, Indiana recommended that no portion of this area be designated nonattainment.

Indiana submitted information to indicate that some occurrences of high concentration in Clark County should be attributed to exceptional events. EPA has evaluated the information for the occurrences in 2004, 2005, and 2006, and is providing documentation of its evaluation in a separate attachment. While EPA has not completed its review of the events in 2007, EPA nevertheless has sufficient information to conclude that the area is violating the 2006 standards.

EPA believes that all of the areas designated nonattainment under the 1997 standards also contribute to violations of the 2006 standards, as part of a single Louisville nonattainment area. Given the range of distance scales over which PM_{2.5} forms and transports, it is clear that the violations in Jefferson County, Kentucky and Clark County, Indiana are interrelated and must be addressed in a combined planning effort that fully addresses the interrelationships. Floyd County has relatively high emissions as well as substantial population, a significant fraction of which commutes into counties with violations. Emissions in Madison Township of Jefferson County, Indiana are also relatively high, and the wind blows with sufficient frequency on high concentration days from Jefferson County toward the violating monitors for these emissions to be judged to contribute to those violations.

While the power plant in Madison Township of Jefferson County is expected to install emission controls to reduce emissions significantly within a few years, the current emissions must be considered to contribute to current violations of the air quality standards. Nevertheless, EPA welcomes further information on controls on this plant. 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

Factor 1: Emissions data

Table 1 shows emissions of PM_{2.5} components (given in tons per year) and the CESs for potentially contributing counties in the Louisville area. Counties that are part of the Louisville nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. Counties are listed in descending order by CES.

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

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)
Jefferson, KY	No	100	5,941	2,726	3,215	53,066	58,643	38,095	1,628
Floyd, IN	No	33	3,206	285	2,920	57,498	8,169	3,462	258
Clark, IN	No	16	1,398	338	1,060	4,043	5,749	6,049	800
Bullitt, KY	No	6	659	283	376	857	3,140	5,816	182
Oldham, KY	No	6	579	220	359	504	3,306	1,821	254
Harrison, IN	No	5	746	238	507	672	3,423	2,379	1,208
Jefferson, IN	No	3	1,265	168	1,097	75,319	25,214	2,272	341

Clark and Floyd Counties in Indiana both have sizable emissions. The counties' CES rank second and third in the area ahead of Bullitt County, Kentucky. Jefferson County, Indiana has a lower CES than these other counties but as high or higher CES than other nearby counties, and it has the largest sulfur dioxide emissions in the area.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Louisville area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Jefferson, KY	No	36	39
Floyd, IN	No	32	35
Clark, IN	No	37	40
Bullitt, KY	No	34	36
Jefferson, IN	No		
Oldham, KY	No		
Harrison, IN	No		

In Indiana, Clark County has a violating design value and therefore must be designated nonattainment. Floyd County monitors attainment of the 2006 PM_{2.5} air quality standards. There is no monitoring data for Jefferson County, Indiana. There are also violations in the Kentucky portion of the Louisville area.

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 4.2 $\mu\text{g}/\text{m}^3$, consisting of 1.0 $\mu\text{g}/\text{m}^3$ of sulfate, 0.3 $\mu\text{g}/\text{m}^3$ of nitrate, 2.9 $\mu\text{g}/\text{m}^3$ of organic particles, and no inorganic particulate emissions. On high concentration days during warm weather months in this area, EPA found on average a total urban contribution of 4.0 $\mu\text{g}/\text{m}^3$, consisting of 0.7 $\mu\text{g}/\text{m}^3$ of sulfate, 3.1 $\mu\text{g}/\text{m}^3$ of organic particles, and 0.2 $\mu\text{g}/\text{m}^3$ of inorganic particulate emissions. 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 $\text{PM}_{2.5}$ standards. Jefferson County, Kentucky stands out in the Louisville area as having a much larger population and higher population density than the other counties. Clark and Floyd Counties, Indiana and Bullitt County, Kentucky all have similarly moderate populations. Jefferson County, Indiana has a low population and population density.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Jefferson, KY	No	699,051	1755
Floyd, IN	No	72,025	485
Clark, IN	No	101,625	270
Bullitt, KY	No	71,440	238
Jefferson, IN	No	32,379	90
Oldham, KY	No	53,459	273
Harrison, IN	No	36,729	76

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
Jefferson, KY	No	9,030	312,660	95	322,950	98
Clark, IN	No	1,218	41,100	85	47,410	98
Bullitt, KY	No	852	28,570	94	30,160	99
Floyd, IN	No	768	18,380	52	34,590	99
Oldham, KY	No	526	13,050	61	21,020	98
Harrison, IN	No	585	6,200	36	16,550	96
Jefferson, IN	No	382	660	4	1,130	8

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The counties that are in the nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface. The number and percent of commuting to any violating county figures are all high for Clark County, Indiana along with Jefferson and Bullitt Counties, Kentucky. Floyd County, Indiana and Oldham County, Kentucky show more modest commuting figures. All commuting data for Jefferson County, Indiana is low.

Factor 5: Growth rates and patterns

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

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)
Jefferson, IN	32,379	2	382	24
Harrison, IN	36,729	6	585	23
Oldham, KY	53,459	14	526	19
Jefferson, KY	699,051	1	9,030	18
Bullitt, KY	71,440	16	852	13
Clark, IN	101,625	5	1,218	10
Floyd, IN	72,025	2	768	3

There is substantial population growth in the Kentucky portion of the Louisville area. The Indiana counties show limited population growth. Jefferson County, Indiana has the largest VMT percent expansion. Table 5 shows the VMT growth for other area counties follows closely behind Jefferson County, Indiana.

Factor 6: Meteorology (weather/transport patterns)

A pollution rose for the Louisville area is provided above. This pollution rose indicates that emissions in Jefferson County, Indiana, are sometimes upwind on days when the Louisville area records high concentrations.

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

The Louisville area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

The Kentuckiana Regional Planning and Development Agency serves as the Metropolitan Planning Organization (MPO) for Clark and Floyd Counties in Indiana.

The Louisville ozone maintenance area is made up of Clark and Floyd Counties in Indiana and Bullitt, Jefferson, and Oldham Counties in Kentucky.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the States in the Louisville area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}).

Review for the Vincennes Micropolitan Statistical Area

The Vincennes Micropolitan Statistical Area consists of Knox County. EPA reviewed the relevant information for this county as well as for surrounding counties. There is a violating monitor in Knox County. Knox County was designated as attaining the 1997 standards. Indiana recommended that the Vincennes nonattainment area include only Knox County.

EPA agrees with Indiana's recommendation. Knox County is adjacent to the Evansville area, an area that includes several counties with high emissions. Nevertheless, as discussed in the review of the Evansville nonattainment area, EPA believes that Vincennes warrants being designated as a separate nonattainment area from Evansville. Other Indiana counties near Knox County have relatively low emissions, and no other factor warranted inclusion of the counties in the nonattainment area.

Figure 7 is a map of the counties in the Vincennes area and other relevant information such as the locations and design values of air quality monitors, and the micropolitan area boundary (labeled the "core based statistical area").

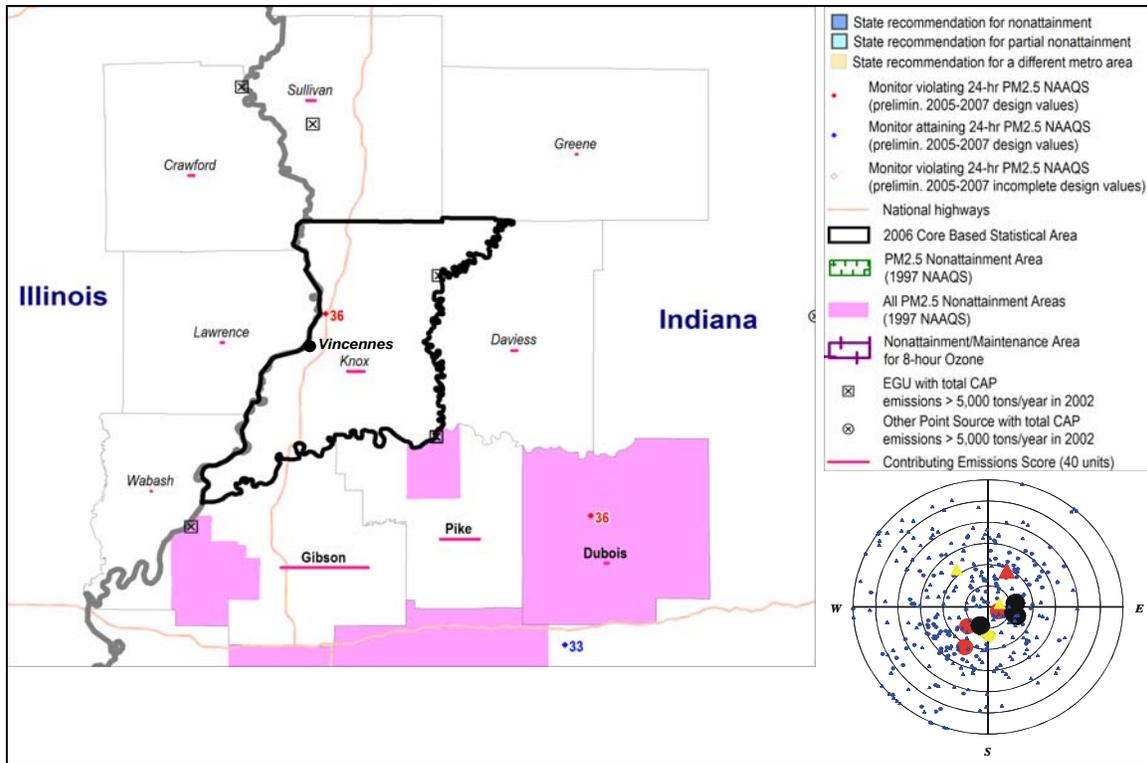


Figure 7- Note: Map produced prior to Indiana recommending nonattainment for Knox and Vanderburgh Counties

Factor 1: Emissions data

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

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

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)	NO _x (tpy)	VOCs (tpy)	NH ₃ (tpy)
Gibson, IN	No	100	6,642	420	6,223	154,782	32,655	3,679	1,921
Pike, IN	No	45	2,412	163	2,249	52,836	18,990	1,206	487
Knox, IN	Yes	19	1,250	178	1,073	7,422	3,793	3,270	1,429
Sullivan, IN	No	10	1,572	189	1,383	20,971	11,354	1,851	643

Gibson and Pike Counties were considered with the Evansville area and included (in part) in that area. The emissions from Knox County are modest. Sullivan County has similarly low emissions data.

Factor 2: Air quality data

The 24-hour PM_{2.5} design values for counties in the Vincennes area are shown in Table 2. Knox County has a design value above the 2006 PM_{2.5} standard. The other area counties do not have air quality monitoring data.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 (µg/m ³)	Design Values 2005-07 (µg/m ³)
Knox, IN	Yes	36	36
Gibson, IN	No		
Pike, IN	No		
Sullivan, IN	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 organic particles, and 0.3 µg/m³ of inorganic particulate emissions. 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 3.0 µg/m³ of sulfate, 2.4 µg/m³ of organic particles, and 0.1 µg/m³ of inorganic particulate emissions. 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. Knox County along with the other area counties all have low population figures. This appears to be a mostly rural area.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Knox, IN	Yes	38,298	73
Gibson, IN	No	33,347	67
Pike, IN	No	12,766	37
Sullivan, IN	No	21,675	48

Factor 4: Traffic and commuting patterns

Table 4. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT	Number Commuting to	Percent Commuting to	Number Commuting	Percent Commuting
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		(10 ⁶ mi)	any violating counties	any violating counties	into statistical area	into statistical area
Knox, IN	Yes	448	15,020	85	14,910	84
Gibson, IN	No	469	640	4	300	2
Sullivan, IN	No	245	280	3	280	3
Pike, IN	No	169	1,920	34	130	2

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The commuting data suggests the Knox County is separate from the other counties. Only a few hundred people commute into Knox County from each of the other 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 Vincennes area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

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)
Gibson, IN	33,347	2	469	19
Knox, IN	38,298	-2	448	15
Sullivan, IN	21,675	0	245	12
Pike, IN	12,766	0	169	0

Gibson, Knox, and Sullivan Counties have experienced some VMT growth. The populations of all the counties kept stable.

Factor 6: Meteorology (weather/transport patterns)

A pollution rose for Knox County is provided above.

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

The Vincennes area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

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

Knox County is not in any current or former nonattainment areas.

Factor 9: Level of control of emission sources

The emission estimates on Table 1 include any control strategies implemented by the State in the Vincennes area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, 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 Indiana 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)), SO₂, 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 SO₂ 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 µg/m³, 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 98th percentile values are 35 µg/m³ 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. As noted above, the data presented above reflect EPA's review of Indiana's request to attribute some high concentrations observed in the Louisville area in the 2004 to 2006 period to exceptional events; EPA has not completed its evaluation of Indiana's request to attribute high concentrations at various monitors around the state in 2007 to exceptional events.

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 µg/m³ 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, SO₂, NO_x, and crustal PM_{2.5}).

AUG 14 2008

MEMORANDUM

SUBJECT: PM_{2.5} Exceptional Events Flags for Jeffersonville and New Albany, 2004-2006

FROM: Michael Compher – Air Monitoring and Analysis Section

M.P. Compher

TO: John Summerhays

The Indiana Department of Environmental Management (IDEM) submitted a letter and justification for several Exceptional Event claims to Region 5 on March 27, 2008 and has requested EPA concurrence. This request included six exceptional events at the Jeffersonville monitoring site and five events at the New Albany monitoring site.

EPA Region 5 has reviewed IDEM's submitted demonstration package and documented the view of each claim. The documentation follows the criteria set forth in the Exceptional Events rule (40 CFR 50.14). Specifically, the demonstration to justify data exclusion shall provide evidence that: (1) The event satisfies the criteria set forth in 40 CFR 50.1(j); (2) There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area; (3) The event is associated with a measured concentration in excess of normal historical fluctuations, including background; and (4) There would have been no exceedance or violation but for the event. In addition, with the submission of the demonstration, the State must document that the public comment process was followed.

Based on the documentation provided by IDEM, EPA Region 5 concurred on flagged events related to the Fort Knox wildfire on November 12, 2005, and fireworks on July 4th, 2006. However, EPA did not concurring on the remaining four events attributed to wildfires in surrounding states, occurring on August 4, 2004, September 10th, 2005, September 13th, 2005, and July 19th, 2006. The Regional concurrence and nonconcurrence indicators have been place in EPA's Air Quality System (AQS) database as detailed in the following tables.

Table 1: Jeffersonville Site (AQS ID 18-019-0006)

Event Date	Cause	24-hour Concentration	EPA Concurrence
08/04/2004	Northwest Wildfires	43.6	No
09/10/2005	Arkansas/Texas/Mississippi Wildfires	45.6	No
09/13/2005	Arkansas/Texas/Mississippi Wildfires	45.5	No
11/12/2005	Fort Knox Wildfire	21.4	Yes
07/04/2006	Fireworks	31.4	Yes
07/19/2006	Kansas Wildfires	36.4	No

Table 2: New Albany Site (AQS ID 18-043-1004)

Event Date	Cause	24-hour Concentration	EPA Concurrence
08/04/2004	Northwest Wildfires	38.1	No
09/10/2005	Arkansas/Texas/Mississippi Wildfires	40.1	No
09/13/2005	Arkansas/Texas/Mississippi Wildfires	42.5	No
11/12/2005	Fort Knox Wildfire	33.2	Yes
07/19/2006	Kansas Wildfires	38.1	No

If you have any questions, please contact Michael Compher, of the Air Monitoring and Analysis Section, at (312) 886-5745.

Attachments:

08042004_decision_documentation
09102005_decision_documentation
11122005_decision_documentation
07042006_decision_documentation
07192006_decision_documentation

cc:

Loretta Lehrman
Mary Pat Tyson
file

2004, September 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025

Event Date: August 04, 2004

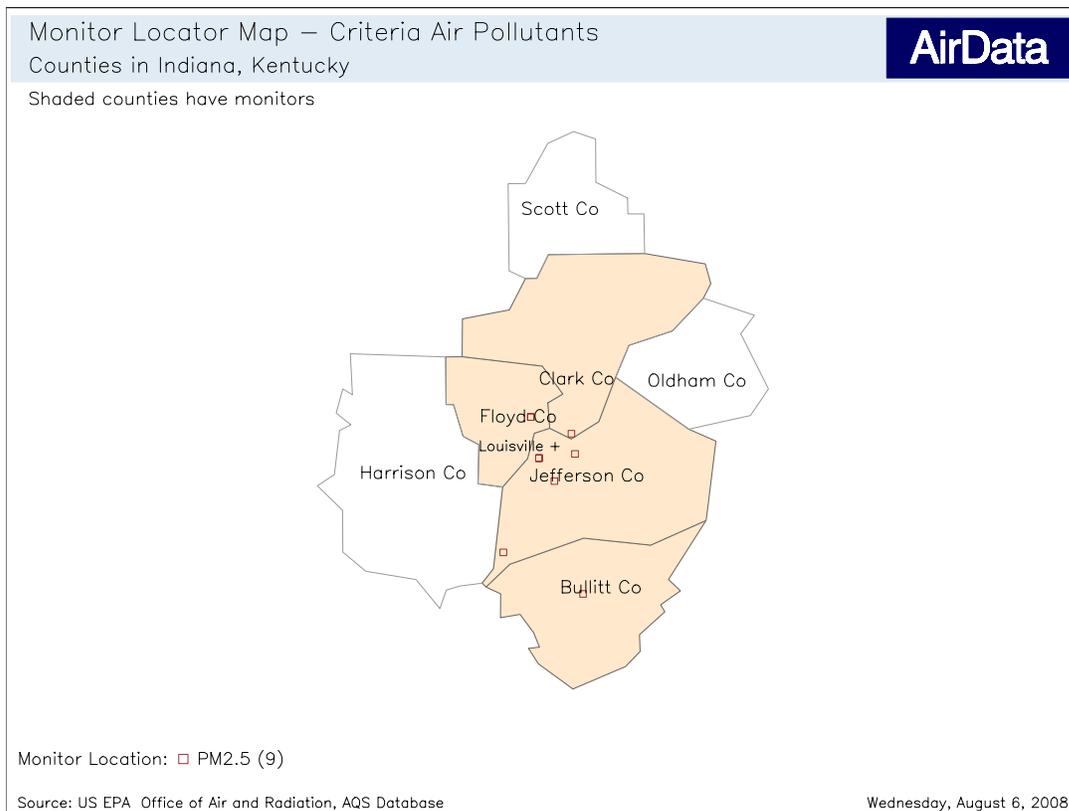
Pollutant: PM_{2.5}

Cause: Northwest Wildfires

Monitors Affected: 43.6 µg/m³ at Jeffersonville (AQS Site ID: 18-019-0006)
 38.1 µg/m³ at New Albany (AQS Site ID: 18-043-1004)

Monitor Locations:

Both monitoring sites are located near the Indiana and Kentucky border in the Louisville metropolitan statistical area. The Jeffersonville monitor is located in Clark County, whereas the New Albany Site is located in Floyd County, IN. Both monitors are depicted in the following map, along with other monitoring sites in Jefferson and Bullitt Counties in Kentucky.



Description of Event: IDEM’s documentation states, “Smoke from wildfires occurring some distance from an area can affect the PM_{2.5} levels measured at a particular site. In late July and early August 2004 wildfires occurred in the Northwest. From August 2 to August 4 the air quality in the Jeffersonville and New Albany areas was affected. PM_{2.5} values were 43.6 µg/m³ and 38.1 µg/m³ respectively on August 4th, 2004.”

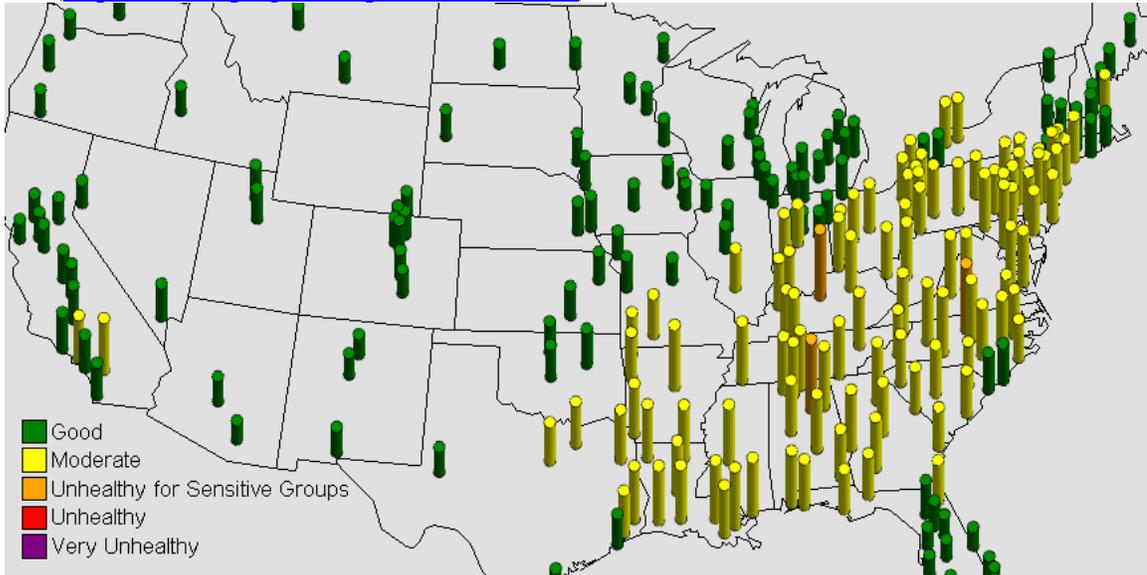
Site Specific Evidence: IDEM provided the following evidence in the exceptional event documentation package.

1. PM_{2.5} averages prior to, during, and after the event

2. Wind rose depicting local meteorological conditions on August 4th
3. Backward trajectory modeling from NOAA HYSPLIT Model
4. Smoke plume maps from NOAA Satellite and Information Services

Supplemental Information used by Region 5 in evaluating the EE request:

1. PM_{2.5} speciation data was not available for the Louisville area on August 4th, 2004. Speciation data is collected on a 1:6 day schedule in this area and the nearest observations were August 1st and August 7th.
2. The National AQI map, which indicated widespread moderate levels on 08/04/04, with unhealthy for sensitive groups observed in the Louisville metropolitan area. (<http://www.epa.gov/mxplorer/index.htm>)



3. Maps from DatFed's Analyst Console, www.datafed.net

http://www.datafed.net/consoles/user_consoles.asp?view_states=ARC/FRMPM25_Day_map,ARC/AIRNOW_PM25_map,ARC/NOAA_HMS_FirePix_map,ARC/OMI_AI_map,ARC/MODIS_AOT_map,ARC/MODIS_Terra_RGB_OnEarthJPL_map,ARC/MODIS_Aqua_RGB_OnEarthJPL_map,ARC/OMI_NO2Trop_map,ARC/CATT_FRMPM25_Traj_map,ARC/VIEWS_SO4_map,ARC/VIEWS_OCfCombined_map,ARC/NAAPS_NoAm_Sulf_map,ARC/NAAPS_NoAm_Smok_map,ARC/FRMPM25_30DayMedian_map,ARC/FRMPM25_diff_map&datetime=2004-08-04T18:00:00&Title=040804_Northwest_Wildfires

Does the event meet the definition of an exceedance? Yes, both monitors measured 24-hr concentrations above 35 ug/m³ on August 4th, 2004.

Was there a causal connection between the event and air quality? A strong connected was not established between the event and air quality observations. The further away the emission event occurs and the higher the observed concentration, the stronger the evidence needs to be to attribute causality.

Was the concentration higher than typical air quality, including background? Yes. The August 4th concentrations observed at the two monitoring sites were both above the 98th percentile of concentrations historically recorded at each site, and above the annual 98th percentiles at each site.

Would the exceedance or violation not have occurred, “but-for” the event?

Widespread elevated PM_{2.5} levels occurred throughout the Southeast, including Southern portions of Illinois, Indiana and Kentucky. There is insufficient information that this widespread event was affected by Northwest wildfires. More specifically, there is insufficient evidence that the exceedances observed at the Jeffersonville and New Albany monitoring sites would not have occurred but for the event. Contour maps of sulfate(SO₄) and organics (OCf) from the Analyst Console estimate that this event was predominately driven by anthropogenic sulfate.

Was there a sufficient public comment process? Did the documentation include the public announcement, description of the public forum in which events were received and the specific public comments, if any? Yes. IDEM provided Region 5 with a link to the website containing the exceptional event description, documentation, and information on providing comment. IDEM received no comments during the 30-day public comment period.

Regional Decision: IDEM did not fully establish a causal connection to the event and failed to meet the “but-for” test, therefore Region 5 does not concur on the August 4th, 2004 exceptional event request at the New Albany and Jeffersonville monitoring sites.

Event Date: September 10, 2005 and September 13, 2005

Pollutant: PM_{2.5}

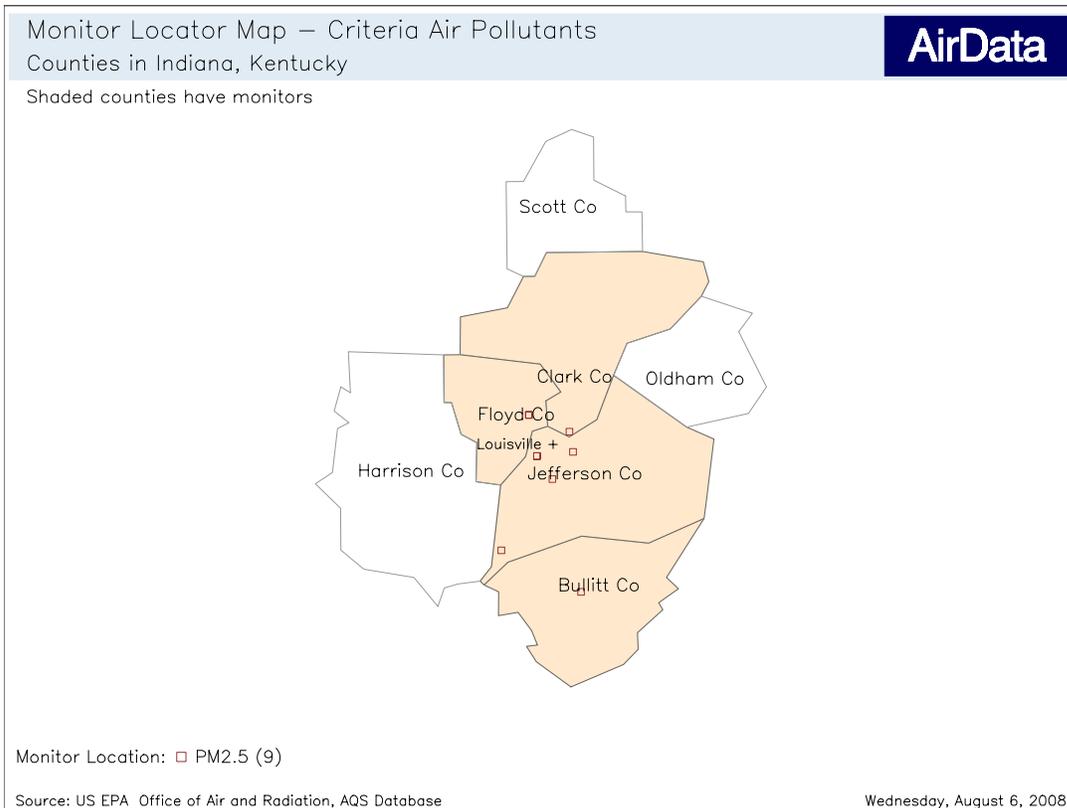
Cause: Arkansas / Texas / Mississippi Wildfires

Monitors Affected:

Date	New Albany 18-043-1004	New Albany (col) 18-043-1004	Jeffersonville 18-019-0006
09/10/05	40.1	no sample	45.6
09/13/05	42.5	43.2	45.5

Monitor Locations:

Both monitoring sites are located near the Indiana and Kentucky border in the Louisville metropolitan statistical area. The Jeffersonville monitor is located in Clark County, whereas the New Albany Site is located in Floyd County, IN. Both monitors are depicted in the following map, along with other monitoring sites in Jefferson and Bullitt Counties in Kentucky.



Description of Event: IDEM’s documentation states, “Smoke from wildfires in Arkansas, Mississippi and Texas impacted the Jeffersonville and New Albany sites on September 10th and 13th, 2005. A front from the west and a front from the east caused by

hurricane Ophelia effectively channeled smoke plumes into the area causing elevated levels of PM_{2.5}.”

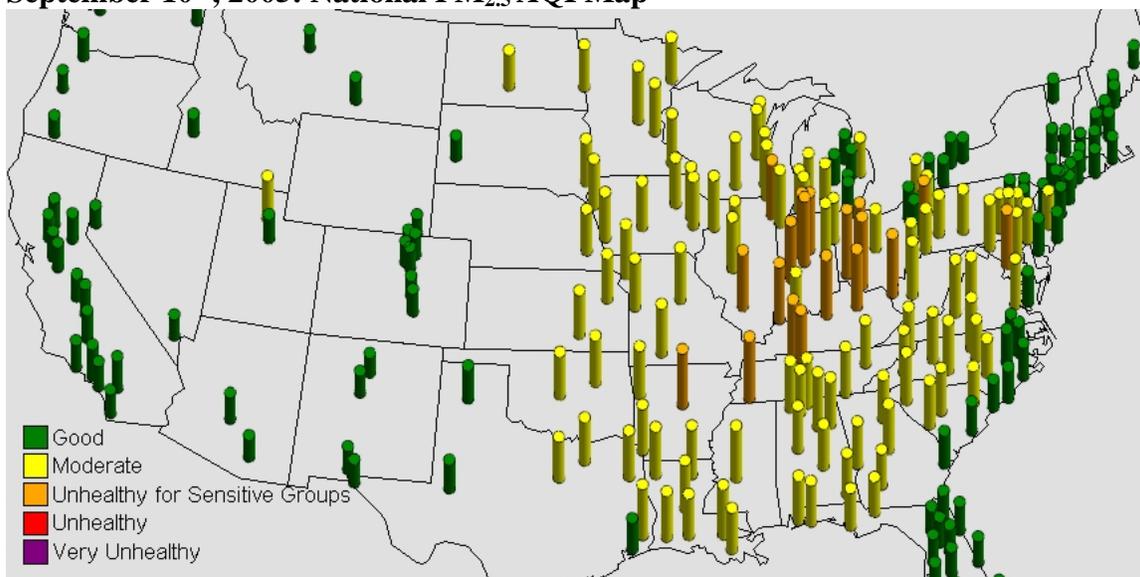
Site Specific Evidence: IDEM provided the following evidence in the exceptional event documentation package.

1. PM_{2.5} averages prior to, during, and after the event
2. Wind rose depicting local meteorological conditions on September 10th and 13th
3. Backward trajectory modeling from NOAA HYSPLIT Model
4. Smoke plume maps from NOAA Satellite and Information Services

Supplemental Information used by Region 5 in evaluating the EE request:

1. PM_{2.5} speciation data available at two monitoring sites in KY, not far away from the two Indiana sites, and within the Louisville metropolitan statistical area.
2. National PM_{2.5} AQI maps, which indicate widespread moderate and unhealthy for sensitive group levels on 09/10/05 and 09/13/05
(<http://www.epa.gov/mxplorer/index.htm>)

September 10th, 2005: National PM_{2.5} AQI Map



September 13th, 2006: National PM_{2.5} AQI Map



3. Maps from DatFed’s Analyst Console, www.datafed.net

September 10, 2005

http://www.datafed.net/consoles/user_consoles.asp?view_states=ARC/FRMPM25_Day_map,ARC/AIRNOW_PM25_map,ARC/NOAA_HMS_FirePix_map,ARC/OMI_AI_map,ARC/MODIS_AOT_map,ARC/MODIS_Terra_RGB_OnEarthJPL_map,ARC/MODIS_Aqua_RGB_OnEarthJPL_map,ARC/OMI_NO2Trop_map,ARC/CATT_FRMPM25_Traj_map,ARC/VIEWS_SO4_map,ARC/VIEWS_OCfCombined_map,ARC/NAAPS_NoAm_Sulf_map,ARC/NAAPS_NoAm_Smok_map,ARC/FRMPM25_30DayMedian_map,ARC/FRMPM25_diff_map&datetime=2005-09-10T18:00:00&Title=100905_Arkansas_Texas_Mississippi_Wildfires

September 13, 2005

http://www.datafed.net/consoles/user_consoles.asp?view_states=ARC/FRMPM25_Day_map,ARC/AIRNOW_PM25_map,ARC/NOAA_HMS_FirePix_map,ARC/OMI_AI_map,ARC/MODIS_AOT_map,ARC/MODIS_Terra_RGB_OnEarthJPL_map,ARC/MODIS_Aqua_RGB_OnEarthJPL_map,ARC/OMI_NO2Trop_map,ARC/CATT_FRMPM25_Traj_map,ARC/VIEWS_SO4_map,ARC/VIEWS_OCfCombined_map,ARC/NAAPS_NoAm_Sulf_map,ARC/NAAPS_NoAm_Smok_map,ARC/FRMPM25_30DayMedian_map,ARC/FRMPM25_diff_map&datetime=2005-09-13T18:00:00&Title=130905_Arkansas_Texas_Mississippi_Wildfires

Does the event meet the definition of an exceedance? Yes, both monitors measured 24-hr PM_{2.5} concentrations above 35 ug/m³ on September 10th and 13th, 2005.

Was there a causal connection between the event and air quality? A strong connected was not established between the event and air quality observations. The further away the emission event occurs and the higher the observed concentration, the stronger the evidence needs to be to attribute causality.

Was the concentration higher than typical air quality, including background? Yes. The September 10th and 13th concentrations observed at the two monitoring sites were both above the 98th percentile of concentrations historically recorded at each site, and above the annual 98th percentiles at each site.

Would the exceedance or violation not have occurred, “but-for” the event?

Widespread elevated PM_{2.5} levels occurred throughout the Southeast, including Southern portions of Illinois, Indiana and Kentucky. There is insufficient information that this widespread event was affected by wildfires in Arkansas, Texas, and Mississippi. More specifically, there is insufficient evidence that the exceedances observed at the Jeffersonville and New Albany monitoring sites would not have occurred but-for the event. Contour maps of sulfate(SO₄) and organics (OCf) from the Analyst Console estimate that this event was predominately driven by anthropogenic sulfate.

Was there a sufficient public comment process? Did the documentation include the public announcement, description of the public forum in which events were received and the specific public comments, if any? Yes. IDEM provided Region 5 with a link to the website containing the exceptional event description, documentation, and information on providing comment. IDEM received no comments during the 30-day public comment period.

Regional Decision: IDEM did not fully establish a causal connection to the event and failed to meet the “but-for” test, therefore Region 5 does not concur on the September 10th and 13th exceptional events requests at the Jeffersonville and New Albany monitoring sites.

Event Date: November 12, 2005

Pollutant: PM_{2.5}

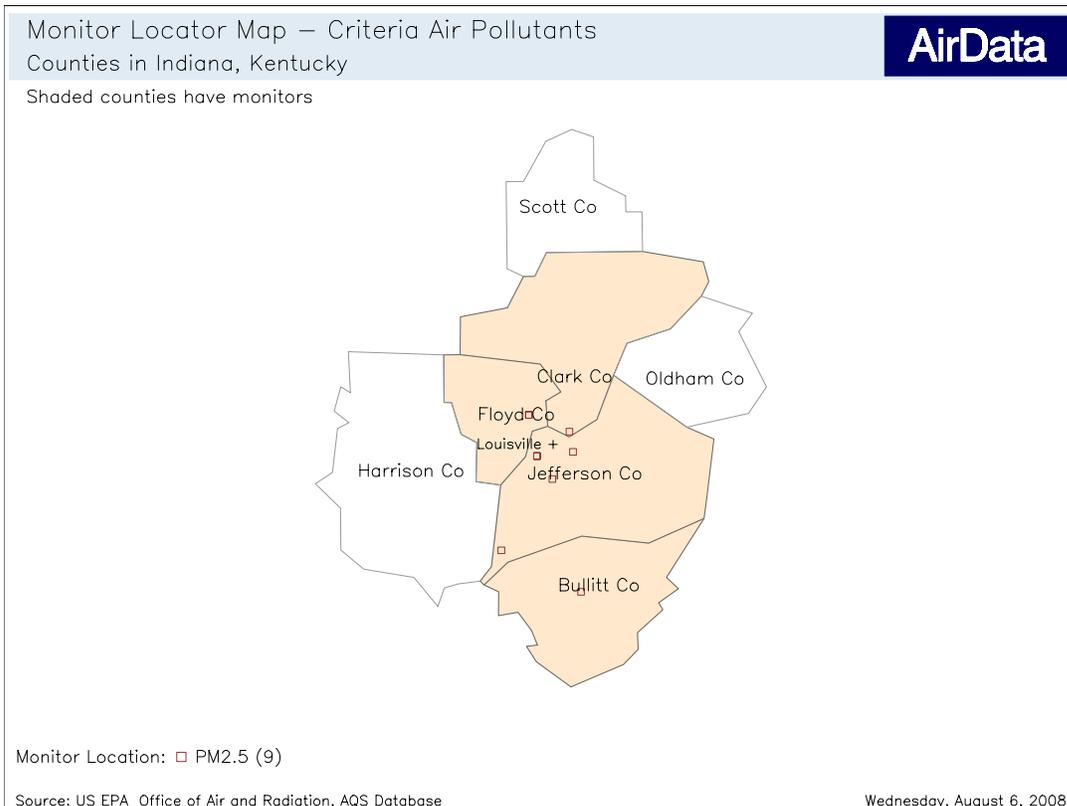
Cause: Ft. Knox Wildfire

Monitors Affected:

Date	New Albany 18-043-1004	New Albany (col) 18-043-1004	Jeffersonville 18-019-0006
11/12/2005	33.2	34.4	21.4

Monitor Locations:

Both monitoring sites are located near the Indiana and Kentucky border in the Louisville metropolitan statistical area. The Jeffersonville monitor is located in Clark County, whereas the New Albany Site is located in Floyd County, IN. Both monitors are depicted in the following map, along with other monitoring sites in Jefferson and Bullitt Counties in Kentucky.



Description of Event: IDEM’s documentation states, “Smoke from a fire at the Fort Knox Military Reservation that was caused by tracer rounds that ignited a brush pile, causing a brush fire which impacted the Jeffersonville and New Albany areas. The fire

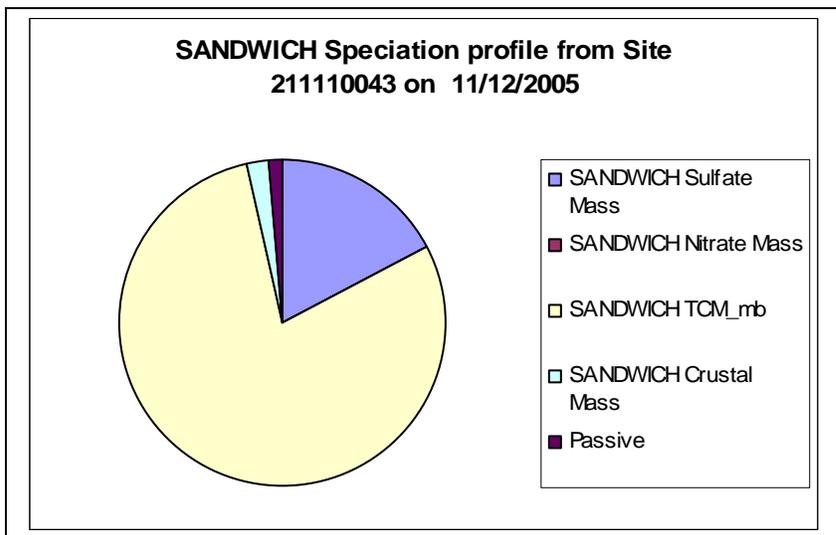
was allowed to burn because unexploded ordinance in the area prevented fire crews from moving in.”

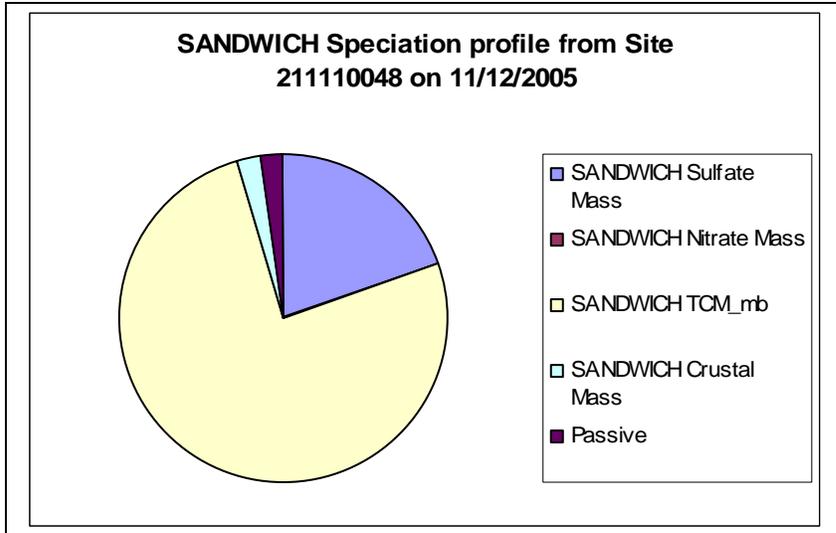
Site Specific Evidence: IDEM provided the following evidence in the exceptional event documentation package.

1. PM_{2.5} averages prior to, during, and after the event
2. *Courier-Journal* newspaper article
3. Wind rose depicting local meteorological conditions on November 12th
4. Smoke plume maps from NOAA Satellite and Information Services

Supplemental Information used by Region 5 in evaluating the EE request:

1. PM_{2.5} speciation data was available for the Louisville area on November 12th, 2005. Fire events are dominated by high elemental and organic carbon fractions (SANDWICH TCM_mb). As a comparison, carbon usually only accounts for about a third of the total speciation mass at these two sites. The two pie charts below indicate that approximately 75% of the mass (16 ug/m³ and 29 ug/m³) was carbon.





2. Maps from DatFed’s Analyst Console, www.datafed.net

http://www.datafed.net/consoles/user_consoles.asp?view_states=ARC/FRMPM25_Day_map,ARC/AIRNOW_PM25_map,ARC/NOAA_HMS_FirePix_map,ARC/OMI_AI_map,ARC/MODIS_AOT_map,ARC/MODIS_Terra_RGB_OnEarthJPL_map,ARC/MODIS_Aqua_RGB_OnEarthJPL_map,ARC/OMI_NO2Trop_map,ARC/CATT_FRMPM25_Traj_map,ARC/VIEWS_SO4_map,ARC/VIEWS_OCfCombined_map,ARC/NAAPS_NoAm_Sulf_map,ARC/NAAPS_NoAm_Smok_map,ARC/FRMPM25_30DayMedian_map,ARC/FRMPM25_diff_map&datetime=2005-11-12T18:00:00&Title=111205_Ft_Knox_Wildfire

Does the event meet the definition of an exceedance? Yes, both monitors measured 24-hr concentrations above 15 ug/m³ on August 4th, 2004.

Was there a causal connection between the event and air quality? Yes. Using the newspaper article description of the Ft. Knox fire event, location of the military reservation, predominant wind direction, and location of the monitors, there is a causal connection between the event and air quality observations.

Was the concentration higher than typical air quality, including background? Yes. The November 12th concentrations observed at the two monitoring sites were both above the 97th percentile of concentrations historically recorded at the New Albany Site and above the 78th percentile at the Jeffersonville site. The concentrations were above the annual 94th percentiles at the New Albany site and above the annual 67th percentile at the Jeffersonville site.

Would the exceedance or violation not have occurred, “but-for” the event? Based on the high contribution of carbon to total mass observed at nearby PM_{2.5} speciation monitors, the event would not have occurred but for the event.

Was there a sufficient public comment process? Did the documentation include the public announcement, description of the public forum in which events were received and the specific public comments, if any? Yes. IDEM provided Region 5 with a link to the website containing the exceptional event description, documentation, and information on providing comment. IDEM received no comments during the 30-day public comment period.

Regional Decision: IDEM established a causal connection to the event, the concentration was higher than the typical air quality, the event met the “but-for” test, and IDEM properly sought public comment; therefore, Region 5 concurs on the November 12, 2005 exceptional event request at the Jeffersonville and New Albany monitoring sites.

Event Date: July 4, 2006

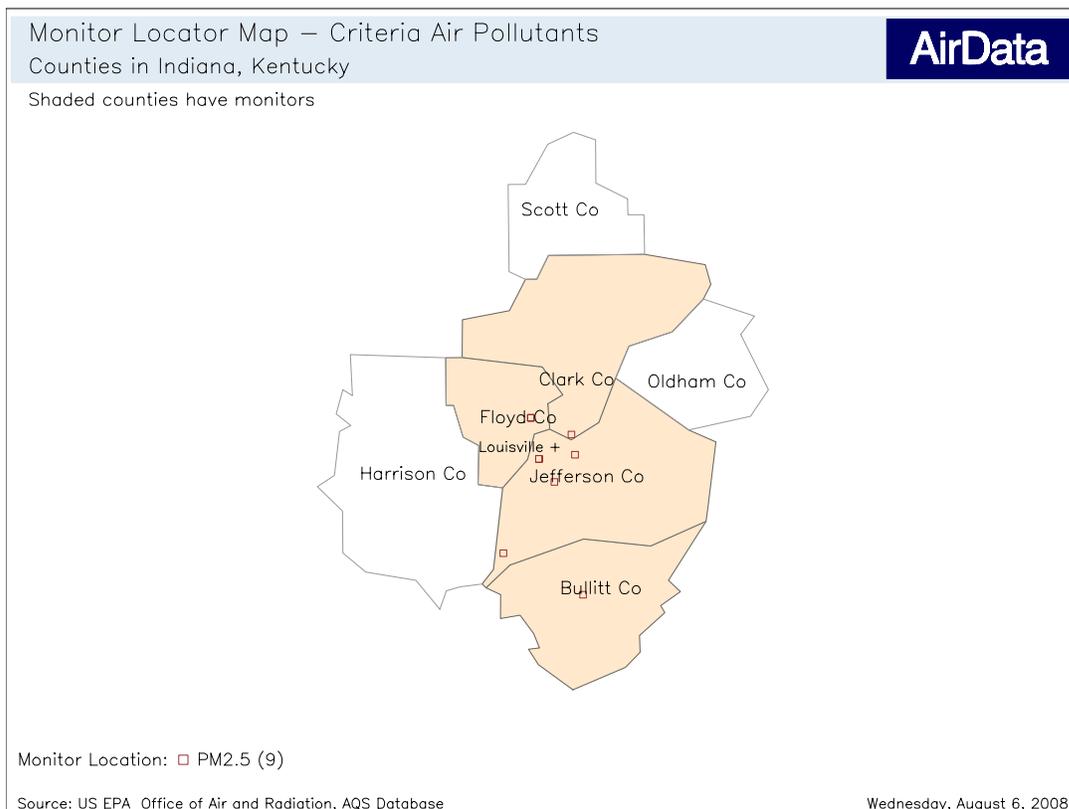
Pollutant: PM_{2.5}

Cause: Fireworks

Monitors Affected: 31.4 µg/m³ at Jeffersonville (AQS Site ID: 18-019-0006)

Monitor Locations:

The Jeffersonville monitoring site is located in southern Clark County, near the Indiana and Kentucky border. This site is to the NE of Louisville. The Jeffersonville monitor is depicted in the following map, along with other monitoring sites in the Louisville metropolitan area.



Description of Event: IDEM’s documentation states, “The Jeffersonville / Louisville Metro community like many large communities has a tradition of celebrating the Fourth of July with several activities throughout the day ending with huge fireworks displays that typically begin between 9-10 pm. Unfortunately, this traditional celebration may have a short term impact on air quality especially if meteorological conditions are such that dispersion of the smoke plumes from these events are hindered. The short term effects typically last 2-4 hours and depending on the conditions and duration can substantially impact the particulate loading on PM_{2.5} samples.”

Site Specific Evidence: IDEM provided the following evidence in the exceptional event documentation package.

1. PM_{2.5} averages prior to, during, and after the event
2. Wind rose depicting local meteorological conditions on July 4th

No Supplemental Information was used by Region 5 in evaluating the exceptional event request

Does the event meet the definition of an exceedance? Yes, the Jeffersonville monitor measured 24-hr concentrations above 15 µg/m³ on July 4th, 2006.

Was there a causal connection between the event and air quality? Yes. Most, if not all large metropolitan areas have numerous organized fireworks displays on July 3rd and 4th, as well as unorganized firework lighting. Wind blowing predominantly from the SW carried the fireworks emissions in the direction of the Jeffersonville monitoring site.

Was the concentration higher than typical air quality, including background? Yes. The July 4th concentrations observed at the Jeffersonville site was both above the 94th percentile of concentrations historically recorded at the monitoring site, and above the annual 95th percentiles at the site during 2006.

Would the exceedance or violation not have occurred, “but-for” the event?

The Jeffersonville monitoring site does not have PM_{2.5} speciated data, or hourly PM_{2.5} concentrations. However, given much lower concentrations measured at the nearby New Albany monitoring site, which was also impacted, although less directly, by the metropolitan area’s fireworks, the violation would not have occurred but for the event.

Was there a sufficient public comment process? Did the documentation include the public announcement, description of the public forum in which events were received and the specific public comments, if any? Yes. IDEM provided Region 5 with a link to the website containing the exceptional event description, documentation, and information on providing comment. IDEM received no comments during the 30-day public comment period.

Regional Decision: IDEM established a causal connection to the event, the concentration was higher the typical air quality, the event met the “but-for” test, and IDEM properly sought public comment; therefore, Region 5 concurs on the July 4th, 2006 exceptional event request at the Jeffersonville monitoring site.

Event Date: July 19th, 2006

Pollutant: PM_{2.5}

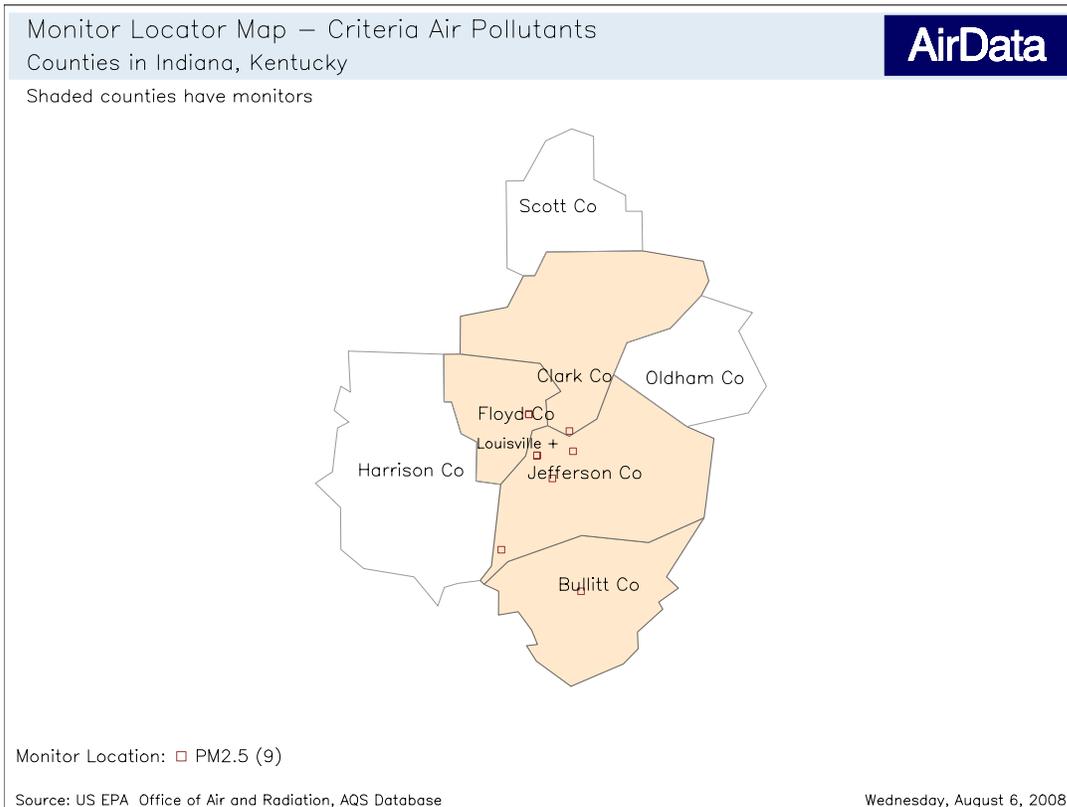
Cause: Numerous wildfires in Kansas and surrounding states

Monitors Affected:

Date	New Albany 18-043-1004	New Albany (col) 18-043-1004	Jeffersonville 18-019-0006
07/19/06	38.1	no sample	36.4

Monitor Locations:

Both monitoring sites are located near the Indiana and Kentucky border in the Louisville metropolitan statistical area. The Jeffersonville monitor is located in Clark County, whereas the New Albany Site is located in Floyd County, IN. Both monitors are depicted in the following map, along with other monitoring sites in Jefferson and Bullitt Counties in Kentucky.



Description of Event: IDEM’s documentation states, “Smoke from numerous wildfires in Kansas, and surrounding states impacted the PM_{2.5} values at the Jeffersonville and New Albany sites.”

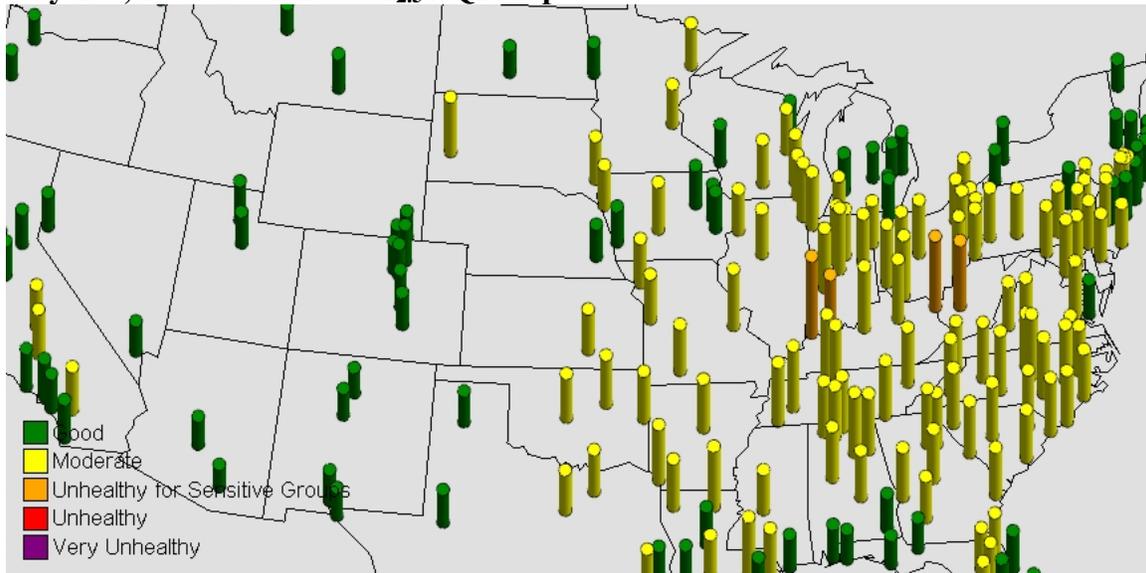
Site Specific Evidence: IDEM provided the following evidence in the exceptional event documentation package.

1. PM_{2.5} averages prior to, during, and after the event
2. Backward trajectory modeling from NOAA HYSPLIT Model
3. Smoke plume maps from NOAA Satellite and Information Services

Supplemental Information used by Region 5 in evaluating the EE request:

1. PM_{2.5} speciation data was not available for the Louisville area on July 19, 2006. Speciation data is collected on a 1:6 day schedule in this area and the nearest observations were July 16th and July 21st at two monitoring sites in KY, not far away from the two Indiana sites, and within the Louisville metropolitan statistical area.
2. National PM_{2.5} AQI maps, which indicate widespread moderate and unhealthy for sensitive group levels on 07/19/06.
(<http://www.epa.gov/mxplorer/index.htm>)

July 19th, 2006: National PM_{2.5} AQI Map



3. Map from DatFed's Analyst Console, www.datafed.net

July 19th, 2006

http://www.datafed.net/consoles/user_consoles.asp?view_states=ARC/FRMPM25_Day_map,ARC/AIRNOW_PM25_map,ARC/NOAA_HMS_FirePix_map,ARC/OMI_AI_map,ARC/MODIS_AOT_map,ARC/MODIS_Terra_RGB_OnEarthJPL_map,ARC/MODIS_Aqua_RGB_OnEarthJPL_map,ARC/OMI_NO2Trop_map,ARC/CATT_FRMPM25_Traj_map,ARC/VIEWS_SO4_map,ARC/VIEWS_OCfCombined_map,ARC/NAAPS_NoAm_Sulf_map,ARC/NAAPS_NoAm_Smok_map,ARC/FRMPM25_30DayMedian_map,ARC/FRMPM25_diff_map&datetime=2006-07-19T18:00:00&Title=190706_Wildfires%20in%20Kansas%20and%20Surrounding%20States

Does the event meet the definition of an exceedance? Yes, both monitors measured 24-hr PM_{2.5} concentrations above 35 µg/m³ on July 19th, 2006.

Was there a causal connection between the event and air quality? A strong connected was not established between the event and air quality observations. The further away the emission event occurs and the higher the observed concentration, the stronger the evidence needs to be to attribute causality.

Was the concentration higher than typical air quality, including background? Yes. The August 1st concentrations observed at the two monitoring sites were both above the 97th percentile of concentrations historically recorded at each site, and above the annual 98th percentiles at each site.

Would the exceedance or violation not have occurred, “but-for” the event? Widespread elevated PM_{2.5} levels occurred throughout the Southeast, including Southern portions of Illinois, Indiana and Kentucky. There is insufficient information that this widespread event was affected by wildfires in Kansas and surrounding states. More specifically, there is insufficient evidence that the exceedances observed at the Jeffersonville and New Albany monitoring sites would not have occurred but for the event.

Was there a sufficient public comment process? Did the documentation include the public announcement, description of the public forum in which events were received and the specific public comments, if any? Yes. IDEM provided Region 5 with a link to the website containing the exceptional event description, documentation, and information on providing comment. IDEM received no comments during the 30-day public comment period.

Regional Decision: IDEM did not fully establish a causal connection to the event and failed to meet the “but-for” test, therefore Region 5 does not concur on the July 19th, 2006 exceptional events requests at the Jeffersonville and New Albany monitoring sites.