UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUN 29 2004

4APT-APB

Honorable Ernie Fletcher
Governor of Kentucky
State Capitol
700 Capitol Avenue
Frankfort, KY 40601

Dear Governor Fletcher:

Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. These tiny particles – about 1/30th the diameter of a human hair – have been scientifically linked to serious human health problems. Their ability to be suspended in air for long periods of time makes them a public health threat far beyond the source of emissions. An important part of our nation's commitment to clean, healthy air deals with reducing levels of this fine particle or PM2.5 pollution.

In February, your State submitted its recommended boundaries for PM2.5 attainment and nonattainment areas. We have thoroughly reviewed your recommendations and the technical information you have submitted to support your recommendations. We appreciate the effort your State has made to develop this supporting information. Consistent with the Clean Air Act, this letter is to notify you that based on the information contained in your submittal, EPA intends to make modifications to recommended designations and boundaries in your State.

The detailed enclosure contains a description of areas where EPA intends to modify your State recommendations, and the basis for such modification. Should you have additional information that you wish to be considered by EPA in this process, we request that you provide it to us by September 1.

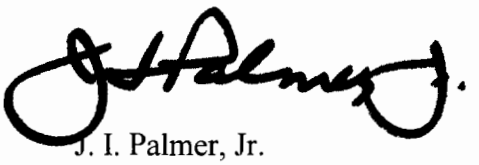
You will hear from us again in November when EPA takes the final step in the PM2.5 designation process and determines those areas that are in attainment and meet the fine particle standards and those areas that do not meet them. For areas in attainment, the challenge will be not only to maintain, but also to continue the progress you have made toward clean air. It is a commitment to no backsliding in your State's clean air status for fine particles. EPA will also issue a proposed fine particle implementation rule prior to final designations, which will allow you to proceed with planning to achieve clean air.

The Bush Administration is addressing fine particle pollution with a comprehensive national clean air strategy. This strategy includes EPA's recent rule to reduce pollution from nonroad diesel engines, and the proposed rule to reduce pollution from power plants in the

eastern U.S. These two rules are important components of EPA's efforts to help States and localities meet the more protective national fine-particle and 8-hour ozone air quality standards. Together these rules will help all areas of the country achieve cleaner air.

Should you or your staff have any questions, I invite you to contact Beverly H. Banister, Director, Air Pesticides and Toxics Management Division, at 404/562-9077, or Kay T. Prince, Chief, Air Planning Branch, at 404/562-9026. We look forward to a continued dialogue with you as we work together to implement the PM2.5 standards.

Sincerely,



J. I. Palmer, Jr.
Regional Administrator

Enclosure

cc: LaJuana Wilcher, KYDEP
John Lyons, KYDEP
Art Williams, Jefferson County

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LaJuana Wilcher, Secretary
Environmental and Public
Protection Cabinet
Capital Plaza Tower, 5th Floor
Frankfort, KY 40601

Dear Ms. Wilcher:

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Your Governor was sent a letter today notifying him that EPA is modifying the State's recommendation. This letter contains a more detailed enclosure containing a description of areas where EPA intends to modify your State recommendations, and the basis for such modification. Should you have additional information that you wish to be considered by EPA in this process, we request that you provide it to us by September 1, 2004.

You will hear from us again in November when EPA takes the final step in the PM2.5 designation process and determines those areas that are in attainment and meet the fine particle standards and those areas that do not meet them. For areas in attainment, the challenge will be not only to maintain, but also to continue the progress you have made toward clean air. It is a commitment to no backsliding in your State's clean air status for fine particles. EPA will also issue a proposed fine particle implementation rule prior to final designations, which will allow you to proceed with planning to achieve clean air.

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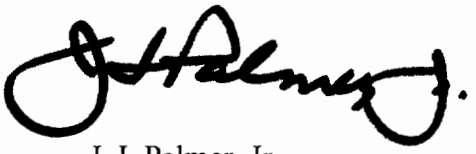

J. I. Palmer, Jr.
Regional Administrator

Enclosure

cc: John Lyons, KYDEP
Art Williams, Jefferson County

Enclosure for 120 Day Letter
Justification for Modification to State Recommendations
PM2.5 Nonattainment Areas
Commonwealth of Kentucky

An Explanation of EPA's 9-Factor Analysis:

Factor 1. Emissions in areas potentially included versus excluded from the nonattainment area:

The analysis for factor 1 looks at emissions of carbonaceous particles ("carbon"), inorganic particles ("crustal"), SO2 , and NOx. EPA computed a composite emission score for each county by multiplying the county's emissions as a fraction of the metropolitan area emissions for each of these pollutants times a corresponding air quality weighting factor. The air quality weighting factors for each area are given below and reflect the percentages of the total estimated "urban excess" value found as, respectively, carbonaceous particles, miscellaneous inorganic particles ("crustal material"), ammonium sulfate, and ammonium nitrate. These scores add to 100 for the metropolitan area counties. Composite scores were also calculated for counties adjacent to the metropolitan area. Tables presented under factor 1 present the emissions of carbonaceous particles, inorganic particles, SO2 , and NOx and the composite emission scores for the counties in the corresponding metropolitan area and adjacent counties. Metropolitan area counties are in bold. Emissions data indicate the potential for a county to contribute to observed violations, often making the emissions data the most important factor in assessing boundaries of nonattainment areas.

"Urban excess" values are derived by comparing urban monitored component concentrations against rural monitored component concentrations. Concentrations of the four PM2.5 components are obtained from local data if available (or, if necessary, from the nearest available urban site), and are compared to available rural concentrations. The monitoring sites used for this purpose are identified below. Although this information is air quality information, it is presented under Factor 1 due to its integration into the analysis of emissions information.

Factor 2. Air quality in potentially included versus excluded areas:

The air quality analysis looks at the annual averaged design value for each area based on data for 2001 to 2003.

Factor 3. Population density and degree of urbanization including commercial development in included versus excluded areas:

Tables presented under factor 3 show the 2003 population for each metropolitan area, as well as the population density for each county in that area. Population data indicate the likelihood of population-based emissions that might contribute to violations.

Factor 4. Traffic and commuting patterns:

The traffic and commuting analysis looks at the number of commuters in each county who drive to another county within the metropolitan area ("Number"), the percent of total commuters in each county who commute to other counties within the metropolitan area ("percent"), as well as the total Vehicle Miles Traveled (VMT) for each county in thousands of miles. A county with numerous commuters is generally an integral part of the area, and would be an appropriate part of the domain of some mobile source strategies, thus warranting inclusion in the nonattainment area.*

**Note that the percent of commuters traveling to counties within the metropolitan area is based on the total number of commuters from that county. This total includes commuters who may travel outside the metropolitan area from their county of origin.*

Factor 5. Expected growth:

The expected growth analysis looks at the percent growth for counties in each metropolitan area from 1990 to 2000.

Factor 6. Meteorology:

The meteorology analysis looks at wind data gathered over a ten year period by the National Weather Service. Tables presented under factor 6 list the year round average prevailing wind directions by quadrant for each county in the corresponding metropolitan area. These data show that annual average PM2.5 concentrations are influenced by emissions in any direction at various times, but these data may also suggest that emissions in some directions relative to the violation may be more prone to contribute than emissions in other directions.

Factor 7. Geography/topography:

The geography/topography analysis looks at physical features of the land that might have an effect on the airshed, and therefore, the distribution of particulate matter over an area. The Commonwealth has no such features that significantly influenced EPA's recommended nonattainment areas.

Factor 8. Jurisdictional boundaries:

The analysis of jurisdictional boundaries looks at the planning and organizational structure of an 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:

The level of control analysis looks at what controls are currently implemented in each

area.

PM 2.5 Nine Factor Analysis for
Cincinnati-Hamilton, OH-KY-IN MSA

The MSA contains the Kentucky Counties of Boone, Campbell, Kenton, Grant, Pendleton, Gallatin; the Ohio Counties of Hamilton, Clermont, Butler, Warren, Brown; and the Indiana Counties of Dearborn and Ohio.

The following counties are violating the PM2.5 standard: Hamilton County, Ohio; Butler County, Ohio; and Montgomery County, Ohio.

In February 2004, Kentucky recommended that all Kentucky counties in the Cincinnati-Hamilton MSA be designated attainment for the PM2.5 standard. EPA is modifying Kentucky's recommendation to include Boone, Campbell and Kenton Counties in the Cincinnati-Hamilton nonattainment area. Boone County has significant emissions, relatively high population growth, and a large (>10,000 tons per year SO2) power plant located in the County. Campbell and Kenton Counties have significant VMT, significant numbers of commuters into violating Hamilton County, and both counties part of the Cincinnati 1-hour ozone nonattainment area due to violating monitors. Kenton County also has monitoring data close to the standard. EPA agrees that the remaining KY MSA counties of Gallatin, Grant, and Pendleton should be designated as attainment/unclassifiable due to low emissions, very low population relative to the area, and very low numbers of commuters into the violating counties.

EPA agrees that the adjacent counties of Carroll and Mason should be designated attainment/classifiable for the PM2.5 standard, although they have significant emissions due to power plants. These counties have relatively low populations, low population growth, and low VMT . Further, their commuting patterns and distance from the violating monitors indicate that these counties do not contribute to the violations in the area. The other adjacent counties do not contribute and therefore, will be designated as attainment/unclassifiable.

Area	**EPA Recommendation**	**State Recommendation**
Cincinnati-Hamilton, OH-KY-IN	**Full counties:** **Boone County** **Campbell County** **Kenton County**	**Full counties:** ***none***

The following is a brief summary of the nine criteria for the Cincinnati-Hamilton, OH-KY-IN area. These analyses were based on existing available data.

Factor 1: Emissions in areas potentially included versus excluded from the

nonattainment area

The following table has the 2001 PM2.5, SOx, NOx, VOC, and ammonia emissions in tons and weighted emissions scores for the counties in the Cincinnati-Hamilton MSA and surrounding counties. (MSA counties are in bold; Kentucky MSA counties in *bold italics*.)

County	PM	SOx	NOx	VOC	Amm	Score	Cum. Score
Hamilton, OH	**7,601**	**88,053**	**58,398**	**47,014**	**2,422**	**30.3**	**30.3**
Clermont, OH	**6,443**	**84,599**	**45,618**	**7,638**	**326**	**20.0**	**50.3**
Dearborn, IN	**3581**	**56,773**	**31,138**	**3,732**	**246**	**11.4**	**61.7**
Butler, OH	**3,153**	**13,204**	**19,735**	**14,228**	**1,363**	**9.9**	**71.6**
Boone, KY	***1,946***	***14,717***	***15,794***	***6,644***	***256***	***7.7***	***79.3***
Warren, OH	**1,844**	**895**	**7,565**	**7,003**	**417**	**6.9**	**86.2**
Kenton, KY	***741***	***1,573***	***8,365***	***7,392***	***285***	***4.2***	***90.4***
Campbell, KY	***590***	***860***	***5,294***	***4,421***	***267***	***2.8***	***93.2***
Brown, OH	**748**	**395**	**2,927**	**1,995**	**294**	**2.0**	**95.2**
Grant, KY	**381**	**210**	**2,664**	**1,364**	**257**	**1.8**	**97.0**
Pendleton, KY	***363***	***597***	***3,396***	***900***	***186***	***1.5***	***98.5***
Gallatin, KY	***367***	***350***	***2,365***	***904***	***192***	***1.0***	***99.5***
Ohio, IN	**142**	**113**	**682**	**380**	**238**	**0.5**	**100.0**
Adams, OH	6,417	125,136	52,992	1,508	431	**19.4**	**N/A**
Montgomery, OH	2,542	11,214	24,177	28,598	1,170	**12.2**	**N/A**
Carroll, KY	3,547	53,086	26,269	3,249	159	**10.3**	**N/A**
Mason, KY	2,316	38,142	16,071	1,640	520	**7.0**	**N/A**
Greene, OH	1,516	1,895	8,841	5,827	538	**4.0**	**N/A**
Preble, OH	963	428	2,765	2,638	762	**2.2**	**N/A**
Ripley, IN	743	140	2,081	3,519	796	2.0	**N/A**
Scott, KY	627	260	3,629	6,041	481	2.0	N/A
Fayette, OH	883	309	2,136	2,100	310	1.9	N/A
Decatur, IN	922	154	2,525	3,876	1,538	1.8	N/A
Clinton, OH	788	375	2,490	2,572	329	1.8	N/A
Rush, IN	1,003	140	1,274	1,839	1,227	1.6	N/A

Highland, OH	687	242	1,756	2,089	373	1.6	N/A
Fayette, IN	561	150	1,426	2,609	387	1.4	N/A
Franklin, IN	491	92	1,335	1,634	664	1.3	N/A
Harrison, KY	354	290	1,786	1,158	303	1.1	N/A
Owen, KY	236	57	572	566	245	1.1	N/A
Switzerland, IN	257	251	1,554	776	364	1.0	N/A
Bracken, IN	174	52	570	479	134	0.7	N/A
Union, IN	343	58	548	705	266	0.6	N/A
Robertson, KY	74	12	112	107	65	0.3	N/A

Based on the analysis for this factor for Kentucky only, Boone, Carroll, and Mason Counties have significant emissions which could indicate a potential emissions contribution to the PM2.5 violations in the area. This factor is not significant for the remaining Kentucky counties listed in this table.

Factor 2: Air quality in potentially included versus excluded areas

The following table contains the design value for the MSA and adjacent counties that contain PM2.5 monitors. Design values followed by "a" indicate that the value is based on incomplete monitoring data. (MSA counties are in bold; Kentucky MSA counties in *bold italics*.)

County	2001-2003 design value
Hamilton, OH	**17.8**
Butler, OH	**16.2**
Kenton, KY	**15.0**
Campbell, KY	**14.5**
Montgomery, OH	15.2
Greene, OH	9.5a
Preble, OH	13.5a

Based on an analysis of this factor for Kentucky only, the Campbell and Kenton County monitors are attaining. The Kenton County monitor reading of 15.0 indicates that there may be a potential emissions contribution from the County to the area. This factor is not significant for the remaining Kentucky counties.

Factor 3: Population density and degree of urbanization including commercial development in included versus excluded areas

The following table has the populations for the counties in the Cincinnati-Hamilton MSA and some adjacent counties with violating monitors and those with significant emissions. The total MSA 2002 population is 2,009,679. (MSA counties are in bold; Kentucky MSA counties in *bold italics*.)

County	2002 Population	Percent of Population of MSA	2002 Population Density
Hamilton, OH	**833,721**	**41.49**	**2,048**
Clermont, OH	**183,352**	**9.12**	**406**
Dearborn, IN	**47,333**	**2.36**	**155**
Butler, OH	**340,543**	**16.95**	**729**
Boone, KY	***93,290***	***4.64***	***379***
Warren, OH	**175,133**	**8.71**	**438**
Kenton, KY	***152,164***	***7.57***	***934***
Campbell, KY	***88,604***	***4.41***	***583***
Brown, OH	**43,464**	**2.16**	**88**
Grant, KY	***23,620***	***1.18***	***91***
Pendleton, KY	***14,815***	***0.74***	***53***
Gallatin, KY	***7,836***	***0.39***	***79***
Ohio, IN	**5,804**	**0.29**	**67**
Adams, OH	27,804		48
Montgomery, OH	554,470		1,200
Carroll, KY	10,223		79
Mason, KY	16,916		70

Based on the analysis for this factor, the populations for the Kentucky counties are much smaller than those in the Ohio Counties of Hamilton, Butler, and Montgomery. The Kentucky Counties of Boone, Kenton, and Campbell have population values of some significance as compared to the much smaller MSA Kentucky Counties of Grant, Gallatin, and Pendleton. This factor is not significant for the remaining Kentucky counties in this table.

Factor 4: Traffic and commuting patterns

<u>Commuting Information</u>

Total number of workers in Boone County, KY: 44,507
Commuters in Boone County, KY who work in Boone County, KY: 23,589 (53%)
Commuters from Boone County, KY to Hamilton County, OH: 8,351 (19%)
Commuters from Boone County, KY to Butler County, OH: 641 (1%)

Total number of workers in Kenton County, KY: 76,169
Commuters in Kenton County, KY who work in Kenton County, KY: 30,771 (40%)
Commuters from Kenton County, KY to Boone County, KY: 17,053 (22%)
Commuters from Kenton County, KY to Hamilton County, OH: 20,200 (27%)
Commuters from Kenton County, KY to Butler County, OH: 908 (1%)

Total number of workers in Campbell County, KY: 42,820
Commuters in Campbell County, KY who work in Campbell County, KY: 15,474 (36%)
Commuters from Campbell County, KY to Boone County, KY: 4,062 (9%)
Commuters from Campbell County, KY to Hamilton County, OH: 14,946 (35%)
Commuters from Campbell County, KY to Butler County, OH: 652 (2%)

Total number of workers in Gallatin County, KY: 3,589
Commuters in Gallatin County, KY who work in Gallatin County, KY: 1,317 (37%)
Commuters from Gallatin County, KY to Boone County, KY: 1,038 (29%)
Commuters from Gallatin County, KY to Hamilton County, OH: 196 (5%)

Total number of workers in Grant County, KY: 10,262
Commuters in Grant County, KY who work in Grant County, KY: 4,181 (41%)
Commuters from Grant County, KY to Boone County, KY: 2,852 (28%)
Commuters from Grant County, KY to Hamilton County, OH: 716 (7%)

Total number of workers in Pendleton County, KY: 6,467
Commuters in Pendleton County, KY who work in Pendleton County, KY: 2,482 (38%)
Commuters from Pendleton County, KY to Boone County, KY: 789 (12%)
Commuters from Pendleton County, KY to Hamilton County, OH: 785 (12%)
Commuters from Pendleton County, KY to Butler County, OH: 101 (2%)

Total number of workers in Carroll County, KY: 4,466
Commuters in Carroll County, KY who work in Carroll County, KY: 3,475 (78%)
Commuters from Carroll County, KY to Boone County, KY: 54 (1%)
Commuters from Carroll County, KY to Hamilton County, OH: 48 (1%)

Total number of workers in Mason County, KY: 7,560
Commuters in Boone County, KY who work in Boone County, KY: 5,978 (79%)
Commuters from Mason County, KY to Hamilton County, OH: 95 (1%)

A notable number of commuters from Kenton and Campbell Counties commute into violating Hamilton County. Although these numbers are far less than the number of

commuters in Hamilton County, in conjunction with VMT data analyzed below, they indicate some potential for contributing to the mobile source emissions in the area.

Although 47% of Boone's 44,507 workers commute into other counties in the MSA, a relatively small number commute into the violating counties. In Carroll County, 78% of the 4,466 workers commute within the County. Similarly, in Mason County, 79% of the 7,560 workers commute within the County. Thus, onroad mobile source emissions from commuting patterns for Boone, Carroll, and Mason Counties do not appear to be contributing to violations in the area. This factor is not significant for the remaining Kentucky counties listed above.

Vehicle Miles Traveled:

The following table has the vehicle miles traveled (thousand miles) for the counties in the Cincinnati-Hamilton MSA and some adjacent counties with significant emissions. (MSA counties are in bold; Kentucky MSA counties in *bold italics*.)

County	2002 VMT (thousand miles/year)
Hamilton, OH	**8,420**
Clermont, OH	**1,649**
Dearborn, IN	**607**
Butler, OH	**2,610**
Boone, KY	***842***
Warren, OH	**1,354**
Kenton, KY	***1,816***
Campbell, KY	***1,097***
Brown, OH	**417**
Grant, KY	**379**
Pendleton, KY	***169***
Gallatin, KY	***254***
Ohio, IN	**56**
Adams, OH	283
Montgomery, OH	5,668
Carroll, KY	213
Mason, KY	178

Based on an analysis of this factor for Kentucky only, the VMT for Boone, Kenton, and Campbell Counties are in the relatively moderate to high range as compared to the counties listed above, with the exception of the the violating Ohio counties of Hamilton, Butler, and Montgomery. Boone, Kenton, and Campbell VMT data indicate some potential to contribute to the PM2.5 violations in the area. VMT values for Carroll and Mason are very low and do not indicate a potential contribution. This factor is not significant for the remaining Kentucky counties listed in this table.

Factor 5: Expected growth

The following table has the population and population growth figures for the Cincinnati-Hamilton MSA and some adjacent counties with significant emissions. (MSA counties are in bold; Kentucky MSA counties in *bold italics*.)

County	2002 Population	growth (90-00)	% growth (90-00)
Hamilton, OH	**833,721**	**-20,925**	**-2**
Clermont, OH	**183,352**	**27,790**	**19**
Dearborn, IN	**47,333**	**7,274**	**19**
Butler, OH	**340,543**	**41,328**	**14**
Boone, KY	***93,290***	***28,402***	***49***
Warren, OH	**175,133**	**44,474**	**39**
Kenton, KY	***152,164***	**9,433**	**7**
Campbell, KY	***88,604***	***4,750***	***6***
Brown, OH	**43,464**	**7,319**	**21**
Grant, KY	***23,620***	**6,647**	**42**
Pendleton, KY	***14,815***	***2,354***	***20***
Gallatin, KY	***7,836***	***2,477***	***46***
Ohio, IN	**5,804**	**308**	**6**
Adams, OH	27,804	1,959	8
Montgomery, OH	554,470	-14,747	-3
Carroll, KY	10,223	863	9
Mason, KY	16,916	134	1

While the Kentucky Counties of Boone, Grant, and Gallatin have the highest population growth rates from 1990-2000 than all of the counties in the MSA, only Boone County's resulting population increase of 28,402, (third highest increase in the MSA), is significant enough to indicate a potential to contribute to violations in the area. The population

growth rates of Carroll and Mason Counties are relatively very low and thus, do not indicate a potential to contribute to the area's violations. This factor is not significant for the remaining Kentucky counties listed in this table.

Factor 6: Meteorology

The following meteorological information was provided by Kentucky for the MSA Kentucky Counties of Boone, Campbell, Kenton, Gallatin, Pendleton, and Grant. (The figure referenced is a wind rose for April 1-October 31 for the 1988-1992 period that is provided in Kentucky's PM2.5 recommendations submittal.)

Meteorological Information
"Due to the close proximity of Cincinnati, Ohio, meteorological data from Cincinnati was used for this Kentucky area. Wind speed/wind direction information shows that the majority of the time for the period 1988–1992, the wind in the...County area came from the southwest and typically from 7- 10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86° F, the mean low was 66° F. The mean precipitation for the same period was 3.8 inches." *(Source: Kentucky PM2.5 submittal)*

Based on an analysis of this factor, the information provided is not sufficient to provide a compelling argument to exclude counties based on prevailing winds. This information was provided only for the summertime winds.

Factor 7: Geography/topography

Based on an analysis of this factor, there are no significant topographical issues associated with this MSA. For the adjacent Carroll and Mason Counties in Kentucky with significant emissions, both counties are two counties removed from the nearest county with a violating monitor (Hamilton, Ohio), with attaining monitors inbetween in Kenton and Campbell Counties in Kentucky.

Factor 8: Jurisdictional boundaries

The following MSA counties were designated nonattainment for the 8-hour ozone standard on April 15, 2004: the Kentucky Counties of Boone, Campbell, and Kenton; the Indiana County of Dearborn; and the Ohio Counties of Hamilton, Clermont, Butler, Warren, Montgomery, Greene, Clinton. This factor did not play a significant role in the decision-making process.

Factor 9: Level of control of emission sources

The following information was provided by Kentucky for Boone, Campbell, Kenton, Grant, Gallatin and Pendleton Counties.

"Point sources located within...County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS). Any controls imposed as a result of previous nonattainment designations are required to remain in...County."

For Boone County only:

"Additionally, substantial NOx reductions have occurred during the last year from East Bend Power Plant which would further lower the contribution of NOx emissions from Boone County."

This factor did not play a significant role in the decision-making process.

PM 2.5 Nine Factor Analysis for Louisville, KY-IN MSA

The Louisville MSA contains the Kentucky Counties of Jefferson, Bullitt, and Oldham; and the Indiana Counties of Floyd, Clark, Harrison, and Scott. Jefferson County, Kentucky and Clark County, Indiana are violating the PM2.5 standard. The adjacent Kentucky County of Carroll has relatively high emissions for the area, however, it was evaluated as part of the Cincinnati area.

In February 2004, Kentucky recommended that Jefferson County be designated nonattainment and that Bullitt and Oldham Counties be designated attainment for the PM2.5 standard for the Louisville MSA.

EPA agrees that the Kentucky MSA County of Oldham be designated attainment/unclassifiable due to low emissions and relatively low population. EPA agrees that Jefferson County be designated nonattainment due to four violating monitors in the County and is modifying Kentucky's recommendation to include Bullitt County in the Louisville nonattainment area due to a relatively high number of commuters into violating Jefferson County, a monitored PM2.5 value of 15.0 that is very close to the standard, and relatively high population growth.

EPA agrees that the adjacent counties should be designated as attainment/unclassifiable due to low population growth, a low percentage of workers commuting into the Louisville MSA, relatively low emissions, and large distance from the violating monitors in the area.

Area	EPA Recommendation for KY	State Recommendation
Louisville, KY	**Full counties:** Jefferson County Bullitt County	**Full counties:** Jefferson

The following is a brief summary of the nine criteria for the Louisville, KY area. These analyses were based on existing available data.

Factor 1: Emissions in areas potentially included versus excluded from the nonattainment area

The following table has the 2001 PM2.5, SOx, NOx, VOC, and ammonia emissions in tons and weighted emissions scores for the counties in the Louisville MSA and surrounding counties. (MSA counties are in **bold**; Kentucky MSA counties in ***bold italics***.)

County	PM	SOx	NOx	VOC	Amm	Score	Cum. Score
Jefferson, KY	***7,385***	***62,526***	***81,398***	***55,376***	***1,539***	***51.5***	***51.5***
Floyd, IN	**3,826**	**47,796**	**10,282**	**4,789**	**346**	**16.4**	**67.9**
Clark, IN	**1,612**	**484**	**4,960**	**7,125**	**498**	**12.2**	**80.1**
Bullitt, KY	***829***	***343***	***3,463***	***5,817***	***210***	***7.3***	***87.4***
Harrison, IN	**794**	**419**	**3,677**	**2,702**	**2,632**	**5.3**	**92.7**
Oldham, KY	***770***	***529***	***3,707***	***2,168***	***224***	***4.7***	***97.4***
Scott, IN	**397**	**100**	**1,515**	**2,426**	**318**	**2.6**	**100.0**
Carroll, KY	3,547	53,086	26,269	3,249	159	15.2	
Jefferson, IN	2,247	39,599	33,990	2,921	302	11.2	
Hardin, KY	1,207	1,774	7,695	6,713	1,114	9.1	
Lawrence, IN	1,544	4,330	5,707	3,330	543	6.5	
Jackson, IN	919	260	3,427	4,721	898	5.8	
Nelson, KY	781	497	2,134	7,923	1,147	5.0	
Trimble, KY	869	7,998	8,458	520	182	4.6	
Breckinridge, KY	566	321	2,592	1,273	757	4.4	
Grayson, KY	593	412	1,532	1,796	1,166	4.0	
Meade, KY	692	661	4,551	2,272	556	4.0	
Shelby, KY	699	397	2,906	2,778	842	4.0	
Franklin, KY	506	601	3,059	4,396	217	3.8	
Jennings, IN	640	233	1,589	2,274	256	3.5	
Perry, IN	518	789	3,102	2,018	403	3.4	
Hart, KY	391	162	1,839	1,499	662	3.2	
Washington, IN	580	136	1,452	2,448	3,468	3.1	
Taylor, KY	408	632	3,642	1,609	461	3.1	
Crawford, IN	319	536	3,842	1,237	192	2.9	
Orange, IN	475	86	2,017	2,599	313	2.9	
Anderson, KY	335	443	1,535	2,648	164	2.5	

Marion, KY	381	143	801	1,400	775	2.5	
Henry, KY	424	156	1,465	1,246	420	2.1	
Owen, KY	236	57	572	566	245	2.1	
Larue, KY	294	186	768	646	573	1.8	
Washington, KY	273	115	618	1,051	584	1.8	
Green, KY	261	104	507	586	331	1.7	
Spencer, KY	281	31	393	574	221	1.7	

Based on the analysis for this factor for Kentucky only, the Kentucky Counties of Jefferson and Carroll have significant emissions. Bullitt County has emissions with a potential to contribute to the PM2.5 violations in the area. This factor is not significant for the remaining Kentucky counties listed in this table.

Factor 2: Air quality in potentially included versus excluded areas

County	2001-2003 design value
Jefferson, KY	***16.9***
Floyd, IN	**14.9**
Clark, IN	**16.2**
Bullitt, KY	***15.0***
Franklin, KY	13.6
Hardin, KY	14.1

There are four counties in the MSA with PM2.5 monitors, two of which have violating design values (Jefferson County, Kentucky and Clark, Indiana). Bullitt County, Kentucky has an attaining monitor whose design value is close to the standard (15.0), which indicates that there is a potential to contribute to the PM2.5 violations in area. The adjacent Kentucky Counties of Hardin and Franklin are monitoring attainment and thus, do not indicate emissions contributions. This factor is not significant for the remaining Kentucky counties listed in this table.

Factor 3: Population density and degree of urbanization including commercial development in included versus excluded areas

The following table has the populations for the counties in the Louisville MSA and adjacent counties with significant emissions. The total MSA 2002 population is

1,039,599. (MSA counties are in **bold**; Kentucky MSA counties are in ***bold italics.***)

County	2002 Population	% of MSA Population (%)	Population Density
Jefferson, KY	***698,080***	***67.15***	***1,813***
Floyd, IN	**71,633**	**6.89**	**484**
Clark, IN	**98,198**	**9.45**	**262**
Bullitt, KY	***63,800***	***6.14***	***213***
Harrison, IN	**35,244**	**3.39**	**73**
Oldham, KY	***49,310***	***4.74***	***261***
Scott, IN	**23,334**	**2.24**	**123**
Hardin, KY	95,724	N/A	152

Based on the analysis for this factor for Kentucky only, Jefferson County's population of 698,080 is approximately 6-30 times higher than all the other MSA counties. Hardin County's population is the third largest of the counties analyzed, however, it is still relatively insignificant in comparison to Jefferson County's population. Thus, this factor is not significant for the Kentucky counties listed in this table with the exception of Jefferson County.

Factor 4: Traffic and commuting patterns

Commuting Information

Total number of workers in Jefferson County, KY: 329,091
Commuters in Jefferson County, KY who work in Jefferson County, KY: 303,624 (92%)
Commuters from Jefferson County, KY to Clark County, IN: 7,047 (2%)

Total number of workers in Bullitt County, KY: 30,648
Commuters in Bullitt County, KY who work in Bullitt County, KY: 8,419 (27%)
Commuters from Bullitt County, KY to Jefferson County, KY: 19,730 (64%)
Commuters from Bullitt County, KY to Clark County, IN: 418 (1%)

Total number of workers in Oldham County, KY: 27,716
Commuters in Oldham County, KY who work in Oldham County, KY: 7,207 (33%)
Commuters from Oldham County, KY to Jefferson County, KY: 12,684 (58%)
Commuters from Oldham County, KY to Clark County, IN: 326 (1%)

Total number of workers in Hardin County, KY: 44,815
Commuters in Hardin County, KY who work in Hardin County, KY: 36,030 (80%)
Commuters from Hardin County, KY to Jefferson County, KY: 5,347 (12%)

Based on the commuting data for the Kentucky counties listed above, there appears to be potentially significant on-road mobile source emissions contributions from Bullitt and Oldham to Jefferson County, which has over 300,000 resident commuters. A large percent (78%-80%) of the workers in Carroll and Hardin Counties, respectively, commute within their resident counties. Thus, with the exception of Bullitt, Jefferson, and Oldham Counties, this factor is not significant for the remaining Kentucky counties listed above.

Vehicle Miles Traveled (VMT):

The following table has the vehicle miles traveled (thousand miles) for the counties in the Louisville MSA and the adjacent county of Hardin due to its relatively high VMT and population. (MSA counties are in **bold;** Kentucky MSA counties are in ***bold italics***.)

County	2002 VMT (thousand miles/year)
Jefferson, KY	***7,149***
Floyd, IN	**843**
Clark, IN	**1,262**
Bullitt, KY	***849***
Harrison, IN	**528**
Oldham, KY	***507***
Scott, IN	**364**
Hardin, KY	1,333

Based on the analysis for this factor, the VMT for Jefferson County far exceeds the VMT of the MSA and surrounding counties. Although Hardin County has a relatively high VMT, 80% of its workers commute within the County, with an additional 12% commuting into Jefferson County, Kentucky. Based on the analysis for this factor, Hardin County does not appear to significantly contribute on-road mobile source emissions to Jefferson County. Thus, with the exception of Jefferson County, this factor is not significant for the remaining Kentucky counties listed in this table.

Factor 5: Expected growth

The following table has the population and population growth figures for the Louisville MSA and the adjacent Hardin County due to its relatively high VMT and population.

(MSA counties are in **bold**; Kentucky MSA counties are in ***bold italics***.)

County	2002 Population	growth (90-00)	% growth (90-00)
Jefferson, KY	***698,080***	***28,667***	***4***
Floyd, IN	**71,633**	**6,419**	**10**
Clark, IN	**98,198**	**8,695**	**10**
Bullitt, KY	***63,800***	***13,669***	***29***
Harrison, IN	**35,244**	**4,435**	**15**
Oldham, KY	**49,310**	**12,915**	**39**
Scott, IN	**23,334**	**1,969**	**9**
Hardin, KY	95,724	4,934	6

Based on the analysis for this factor for Kentucky only, the population growth in Bullitt and Oldham Counties indicate that these counties may contribute to the PM2.5 issues in Jefferson County. Although Jefferson County's growth rate is fairly low, the magnitude of its population increase is the highest in the MSA and is approximately twice that of the increases in Bullitt and Oldham. Although Hardin County's population is the third largest of the counties analyzed above, its population growth is relatively low.Thus, with the exception of Bullitt, Jefferson, and Oldham Counties, this factor is not significant for the remaining Kentucky counties listed in this table.

Factor 6: Meteorology

The following meteorological information was provided by Kentucky for Jefferson, Bullitt, and Oldham.

Wind speed/wind direction information shows that the majority of the time for the period 1988–1992, the wind in the...County area came from the south southwest and typically at 7-10 knots. The mean high temperature for July for the area from 1961 through 1990 was 87° F and the mean low was 70° F. The mean precipitation for the same period was 4.3 inches.

The information provided is not sufficient to provide a compelling argument to exclude counties based on prevailing winds. The information provided was based only on summertime winds.

Factor 7: Geography/topography

Based on an analysis of this factor, there are no significant geographical or topographical issues associated with this MSA. boundary.

Factor 8: Jurisdictional boundaries

The following MSA counties were designated nonattainment for the 8-hour ozone standard on April 15, 2004: the Kentucky Counties of Jefferson, Bullitt, and Oldham; and the Indiana Counties of Floyd, Clark, and Jackson. This factor did not play a significant role in the decision-making process for these counties.

Factor 9: Level of control of emission sources

The following information was provided by Kentucky for Bullitt, Oldham, and Jefferson Counties: "Point sources located within...County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guidelines Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS)." This factor did not play a significant role in the decision-making process for these counties.

PM2.5 Nine Factor Analysis for Lexington, KY MSA

The Lexington MSA contains the Counties of Fayette, Bourbon, Clark, Jessamine, Madison, Scott, and Woodford. Fayette County is violating the PM2.5 standard.

In February 2004, Kentucky recommended that Fayette County be designated attainment for the PM2.5 standard for the Lexington, KY MSA, and the remaining MSA counties be designated attainment. EPA agrees that Fayette County should be designated nonattainment for PM2.5 due to a violating monitor (South Limestone). EPA is modifying Kentucky's recommendation to include the MSA counties of Clark, Madison and Woodford and the adjacent county of Mercer in the Lexington nonattainment area. Clark and Madison Counties are included significant emissions. Madison County also has relatively high population and population growth, and relatively high VMT. Woodford County as nonattainment due to the level of emissions. We have included in our recommended nonattainment area Mercer County that is adjacent to the Lexington MSA with a violating monitor, that is generally rural in character, and that contains an identifiable large emitting facility (e.g., power plants) which we believe contributes to the nearby nonattainment problem. We have included this county in our initial recommendations in order to ensure that a sufficient portion of this county, including such a large facility, is included within the boundaries of the nonattainment area as part of the final designations. We invite you to submit to us a recommendation as to what portion of this adjacent county, encompassing the large facility, should be designated nonattainment. EPA agrees that the remaining MSA Counties of Bourbon, Jessamine, and Scott in Kentucky be designated attainment/unclassifiable due to their relatively low emissions, low populations, low VMT, low numbers of commuters into the violating counties, and small point sources.

EPA agrees that the adjacent county of Pulaski should be designated attainment/classifiable for the PM2.5 standard, although it has significant emissions due to a power plant. This county has relatively low population, low population growth, and low VMT . Further, the commuting patterns and distance from the violating monitors indicate that this county does not contribute to the violations in the area. The other adjacent counties do not contribute and therefore, will be designated as attainment/unclassifiable.

The recommendations of EPA and Kentucky are summarized in the table below.

Area	**EPA Recommendation**	**State Recommendation**
Lexington, KY	**Full counties:** Fayette County Clark County Madison County Mercer County Woodford County	**Full counties:** Fayette **Drop:** Bourbon, Clark, Madison, Jessamine, Woodford and Scott Counties

The following is a brief summary of the nine criteria for the Lexington, KY area. These analyses were based on existing available data.

Factor 1: Emissions in areas potentially included versus excluded from the nonattainment area

The following table has the 2001 PM2.5, SOx, NOx, VOC, and ammonia emissions in tons and Weighted Emissions Scores for the counties in the Lexington MSA and surrounding counties. (MSA counties in Kentucky are in **bold**.)

County	PM	SOx	NOx	VOC	Amm	Score	Cum. Score
Fayette (KY)	**1703**	**3925**	**13620**	**15720**	**606**	**31.4**	**31.4**
Clark (KY)	**1132**	**9647**	**6622**	**2374**	**398**	**25.7**	**57.1**
Madison (KY)	**867**	**1189**	**5512**	**4215**	**641**	**13.6**	**70.7**
Woodford (KY)	**559**	**2663**	**3530**	**2852**	**427**	**9.5**	**80.2**
Scott (KY)	**627**	**260**	**3629**	**6041**	**481**	**7.9**	**88.1**
Jessamine (KY)	**504**	**323**	**2189**	**2436**	**242**	**7.6**	**95.7**
Bourbon (KY)	**444**	**147**	**1424**	**1352**	**597**	**4.3**	**100.0**
Mercer (KY)	3136	49269	9145	1686	409	83.8	N/A
Pulaski (KY)	2403	25156	10996	3901	877	56.8	N/A
Laurel (KY)	770	1044	4564	3823	439	14.6	N/A
Nelson (KY)	781	497	2134	7923	1147	10.3	N/A

Based on the analysis for this factor, the following counties appear to have significant emissions (over 10,000 tons per year of any pollutant): Fayette, Mercer and Pulaski. Clark, Madison, and Woodford also have significant level of emissions. Although Pulaski County This factor did not appear significant for the remaining counties listed in this table.

Factor 2: Air quality in potentially included versus excluded areas

County	2001-2003 design value
Fayette (KY)	**15.7**
Madison (KY)	**13.5**
Laurel (KY)	12.6

Based on the analysis for this factor, only Fayette County's South Lomestone monitoring data exceeds the standard. The Newtown Pike monitor, also in Fayette County, is attaining at 14.9. Madison County and the adjacent county of Laurel have monitors with readings well below the standard. This factor is not significant for the remaining counties listed in the area.

Factor 3: Population density and degree of urbanization including commercial development in included versus excluded areas

The following table has the populations for the counties in the Lexington MSA and adjacent counties with significant emissions. The total MSA 2002 population is 489,717. (MSA counties are in **bold**.)

County	2002 Population	Percent of Total MSA Population	Population Density
Fayette (KY)	**263,618**	**53.83**	**925**
Clark (KY)	**33,726**	**6.89**	**133**
Madison (KY)	**73,334**	**14.97**	**166**
Woodford (KY)	**23,403**	**4.78**	**123**
Scott (KY)	**35,320**	**7.21**	**124**
Jessamine (KY)	**40,740**	**8.32**	**235**
Bourbon (KY)	**19,576**	**4.0**	**67**
Mercer (KY)	21,047		84
Laurel (KY)	54,313		125
Nelson (KY)	38,823		92

Fayette County's population is roughly 3-11 times higher than the other counties listed. Madison County has the second highest of the MSA counties and surrounding counties with significant weighted emissions scores. Based on an analysis of this factor, no other Kentucky counties, with the exception of Madison County, have populations significant to indicate a potential contribution to the PM2.5 violations in Fayette County.

Factor 4: Traffic and commuting patterns

Commuting Information

Total number of workers in Fayette County, KY: 136,793
Commuters in Fayette County, KY who work in Fayette County, KY: 117,584 (86%)

Total number of workers in Bourbon County, KY: 9,103
Commuters in Bourbon County, KY who work in Bourbon County, KY: 4,764 (52%)
Commuters from Bourbon County, KY to Fayette County, KY: 2,600 (29%)

Total number of workers in Clark County, KY: 15,487
Commuters in Clark County, KY who work in Clark County, KY: 8,492 (55%)
Commuters from Clark County, KY to Fayette County, KY: 4,777 (31%)

Total number of workers in Jessamine County, KY: 18,885

Commuters in Jessamine County, KY who work in Jessamine County, KY: 8,721 (46%)
Commuters from Jessamine County, KY to Fayette County, KY: 8,748 (46%)

Total number of workers in Madison County, KY: 34,494
Commuters in Madison County, KY who work in Madison County, KY: 24,061 (70%)
Commuters from Madison County, KY to Fayette County, KY: 6,870 (20%)

Total number of workers in Scott County, KY: 16,536
Commuters in Scott County, KY who work in Scott County, KY: 10,148 (61%)
Commuters from Scott County, KY to Fayette County, KY: 4,287 (26%)

Total number of workers in Woodford County, KY: 12,377
Commuters in Woodford County, KY who work in Woodford County, KY: 5,591 (45%)
Commuters from Woodford County, KY to Fayette County, KY: 4,308 (35%)

Total number of workers in Laurel County, KY: 21,180
Commuters in Laurel County, KY who work in Laurel County, KY: 16,286 (77%)

Total number of workers in Mercer County, KY: 9,610
Commuters in Mercer County, KY who work in Mercer County, KY: 5,235 (54%)
Commuters from Mercer County, KY to Fayette County, KY: 1,319 (14%)

Total number of workers in Nelson County, KY: 17,594
Commuters in Nelson County, KY who work in Nelson County, KY: 11,189 (64%)

Madison County has the largest number of workers commuting into Fayette County (6,870 commuters), which is relatively insignificant for such a large county as Fayette. Laurel and Nelson County workers do not commute into the Lexington MSA at all. Based on the analysis for this factor, there are no counties with commuting data showing a potential to contribute to the PM2.5 violations in Fayette County.

Vehicle Miles Traveled:

The following table has the vehicle miles traveled (thousand miles) for the counties in the Lexington MSA and adjacent counties with significant emissions. (Kentucky MSA counties are in **bold**.)

County	2002 VMT
Fayette (KY)	**2764**
Clark (KY)	**523**
Madison (KY)	**944**
Woodford (KY)	**311**
Scott (KY)	**645**
Jessamine (KY)	**362**

Bourbon (KY)	**204**
Mercer (KY)	224
Laurel (KY)	852
Nelson (KY)	427

Fayette County's VMT is substantially higher than the other MSA counties. Although Madison and Laurel Counties have the second and third highest VMT of the counties analyzed, commuting data do not indicate significant (or any) contributions to Fayette County. Further, Laurel County is a significant distance from Fayette County and does not contribute to Fayette County through its commuting patterns. Based on the analysis for this factor, no other Kentucky counties, with the exception of Madison County, have VMT and commuting data with a potential to contribute to the PM2.5 violations in Fayette County.

Factor 5: Expected growth

The following table has the population and population growth figures for the Lexington MSA and adjacent counties with significant emissions. (MSA counties are in **bold**.)

County	2002 Population	growth (90-00)	% growth (90-00)
Fayette (KY)	**263618**	**35,146**	**16**
Clark (KY)	**33726**	**3,648**	**12**
Madison (KY)	**73334**	**13,364**	**23**
Woodford (KY)	**23403**	**3,253**	**16**
Scott (KY)	**35320**	**9,194**	**39**
Jessamine (KY)	**40740**	**8,533**	**28**
Bourbon (KY)	**19576**	**124**	**1**
Mercer (KY)	21047	1,669	9
Laurel (KY)	54313	9,277	21
Nelson (KY)	38823	7,767	26

Fayette County's population is substantially higher than the MSA counties and adjacent counties with significant weighted emissions scores, and grew the most during the 1990-2000 time period. Madison County is the third fastest growing county in the MSA based on a percent growth rate with the second largest population and the second largest population increase. Thus, Madison County's population growth is significant enough to contribute to PM2.5 violations in Fayette County. None of the other MSA and adjacent counties listed above have population characteristics which appear to be contributing to the PM2.5 violations in Fayette County.

Factor 6: Meteorology

The following meteorological information was provided by Kentucky. The figure referenced is a wind rose for April 1-October 31 for the 1988-1992 period that is provided in Kentucky's PM2.5 recommendations submittal. The text below is the same for Fayette, Bourbon, Clark, Jessamine, Scott, and Woodford Counties.

> "Wind speed/wind direction information shows that the majority of the time for the period 1988–1992, the wind in the...County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86° F and the mean low was 66° F. The mean precipitation for the same period was 4.8 inches." *(Source: KY submittal)*

For Madison County, the following statement preceded the excerpted paragraph above:

> Due to the close proximity of Lexington, Kentucky, meteorological data from Lexington was used for the Madison county area."

This factor did not play a significant role in the decision making process. The submitted information was only for the summertime winds.

Factor 7: Geography/topography

Based on an analysis of this factor, there are no significant topographical issues associated with this MSA.

Factor 8: Jurisdictional boundaries

No county in the Lexington MSA was designated nonattainment for the 8-hour ozone standard on April 15, 2004. This factor did not play a significant role in the decision making process.

Factor 9: Level of control of emission sources

The following information was provided by Kentucky for Fayette, Bourbon, Clark, Jessamine, Madison, Scott, Woodford Counties.

"Point sources located within...County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS)." (Source: KY PM2.5 submittal)

This factor did not play a significant role in the decision making process.

PM 2.5 Nine Factor Analysis for Huntington-Ashland, WV-KY-OH MSA

The Huntington-Ashland MSA contains the Kentucky Counties of Boyd, Carter, and Greenup; the West Virginia Counties of Cabell and Wayne; and Lawrence County, Ohio. The following MSA and adjacent counties are violating the PM2.5 standard: Cabell County, West Virginia (MSA) and Lawrence (MSA) and Scioto (adjacent) Counties, Ohio.

In February 2004, Kentucky recommended that the PM2.5 designation for Boyd County be deferred and that Greenup and Carter Counties be designated attainment for the Huntington-Ashland MSA. EPA is modifying Kentucky's recommendeation to include Boyd County and Lawrence Counties in Kentucky in the Huntington-Ashland nonattainment area. The following factors played a significant role in this decision for Boyd County: attaining monitor reading of 15.0, at the standard; significant SOx, NOx, and PM emissions; proximity to the violating MSA counties; controls with anticipated, substantial SOx, NOx, and PM emission reductions will not be implemented until the end of 2005, well after designations are made. Lawrence County, Kentucky is included due to significant emissions of SOx and NOx from a power plant and its close proximity to the violating counties in the MSA. We have included in our recommended nonattainment area this County that is adjacent to the Huntington-Ashland MSA with a violating monitor, that is generally rural in character, and that contains an identifiable large emitting facility (e.g., power plant) which we believe contributes to the nearby nonattainment problem. We have included this county in our initial recommendations in order to ensure that a sufficient portion of this county, including such a large facility, is included within the boundaries of the nonattainment area as part of the final designations. We invite you to submit to us a recommendation as to what portion of this adjacent county, encompassing the large facility, should be designated nonattainment.

EPA agrees that Greenup and Carter Counties in Kentucky should be designated attainment/unclassifiable due to their relatively low emissions, low populations, low VMT, low numbers of commuters into the violating counties, and small point sources.

The recommendations of EPA and Kentucky are summarized in the table below.

Area	EPA Recommendation for KY	State Recommendation
Huntington-Ashland, WV-KY-OH	**Full counties:** Boyd County Lawrence County (adjacent)	**Full counties:** Boyd (Defer Designation)

The following is a brief summary of the nine criteria for the Kentucky portion of the Huntington-Ashland, WV-KY-OH area. These analyses were based on existing available data.

Factor 1: Emissions in areas potentially included versus excluded from the nonattainment area

The following table has the 2001 PM2.5, SOx, NOx, VOC, and ammonia emissions in tons per year and weighted emissions scores for the counties in the Huntington-Ashland MSA and surrounding counties. (MSA counties are in **bold**; Kentucky MSA counties are in ***bold italics***.)

County	PM	SOx	NOx	VOC	Amm	Score	Cum. Score
Cabell (WV)	**2,365**	**5,155**	**27,903**	**7,080**	**181**	**40.3**	**40.3**
Boyd (KY)	***2,314***	***11,740***	***13,478***	***8,620***	***467***	***25.2***	***65.5***
Wayne (WV)	**550**	**1,023**	**6,485**	**2,620**	**56**	**9.6**	**75.1**
Greenup (KY)	***477***	***2,519***	***4,336***	***1,795***	***156***	***9.5***	***84.6***
Lawrence (OH)	**770**	**841**	**4,399**	**4,366**	**207**	**8.6**	**93.2**
Carter (KY)	***506***	***237***	***2,615***	***1,996***	***223***	***6.8***	***100.0***
Gallia (OH)	10,010	164,984	61,079	1,839	300	141.4	
Adams (OH)	6,417	125,136	52,992	1,508	431	102.4	
Putnam (WV)	4,395	80,150	39,795	3,752	97	72.7	
Mason (WV)	3,610	70,053	31,327	2,831	264	60.0	
Lawrence (KY)	2,903	56,066	21,265	919	56	48.3	
Scioto (OH)	1,053	2,790	5,566	4,703	350	12.5	
Lewis (KY)	429	469	2,873	990	222	8.1	
Pike (OH)	425	4,203	2,081	1,311	149	6.8	
Rowan KY	336	313	1,691	1,535	91	5.7	
Mingo (WV)	437	281	2,842	1,379	150	5.5	
Jackson (OH)	404	461	1,320	1,717	165	4.7	
Martin (KY)	281	661	1,236	706	762	4.0	
Lincoln (WV)	259	67	1,314	1,128	37	4.0	
Elliott (KY)	164	115	393	313	42	3.1	

Based on the analysis for this factor, the following Kentucky counties appear to have significant emissions (over 10,000 tons per year of any pollutant): Boyd and Lawrence. This factor is not significant for the remaining Kentucky counties listed in this table.

Factor 2: Air quality in potentially included versus excluded areas

County	2001-2003 design value
Cabell (WV)	**16.6**
Boyd (KY)	***15.0***
Lawrence (OH)	**15.8**
Carter (KY)	***12.2***
Scioto (OH)	17.2

There are four monitors in the MSA, with two of them in the Kentucky Counties of Boyd and Carter. The Kentucky monitors are monitoring attainment. Three monitors in the MSA and surrounding counties are violating: Cabell County, West Virginia; Lawrence County, Ohio; and the adjacent Scioto County, Ohio. Based on the analysis for this factor for Kentucky only, Boyd County has attaining monitoring data very close to the standard, thus indicating a potential to contribute to the PM2.5 violations in the area. This factor is not significant for the remaining Kentucky counties.

Factor 3: Population density and degree of urbanization including commercial development in included versus excluded areas

The following table has the populations for the counties in the Huntington-Ashland MSA and adjacent counties with significant emissions. The total MSA 2002 population is 313,239. (MSA counties are in **bold**; Kentucky MSA counties are in ***bold italics***.)

County	2002 Population	Percent of Total MSA Population	2002 Population Density
Cabell (WV)	**95,266**	**30.41**	**338**
Boyd (KY)	***49,603***	***15.84***	***310***
Wayne (WV)	**42,382**	**13.53**	**84**
Greenup (KY)	***36,761***	***11.74***	***106***
Lawrence (OH)	**62,172**	**19.85**	**137**
Carter (KY)	***27,055***	***8.64***	***66***
Gallia (OH)	31,301		67
Adams (OH)	27,804		48
Putnam (WV)	52,230		151
Mason (WV)	26,004		60
Scioto (OH)	78,041		128

Based on the analysis for this factor for Kentucky only, Boyd County has the third largest population in the MSA and the second largest population density, indicating a potential to contribute to the PM2.5 violations in the area. This factor is not significant for the remaining Kentucky counties.

Factor 4: Traffic and commuting patterns

Commuting Information

Total number of workers in Boyd County, KY: 19,106
Commuters in Boyd County, KY who work in Boyd County, KY: 13,816 (72%)
Commuters from Boyd County, KY to Cabell County, WV: 1,157 (6%)
Commuters from Boyd County, KY to Lawrence County, OH: 540 (3%)

Total number of workers in Carter County, KY: 10,258
Commuters in Carter County, KY who work in Carter County, KY: 5,641 (55%)
Commuters from Carter County, KY to Boyd County, KY: 1,401 (14%)
Commuters from Carter County, KY to Cabell County, WV: 237 (2%)

Total number of workers in Greenup County, KY: 13,798
Commuters in Greenup County, KY who work in Greenup County, KY: 5,930 (43%)
Commuters from Greenup County, KY to Boyd County, KY: 4,147 (30%)
Commuters from Greenup County, KY to Cabell County, WV: 473 (3%)
Commuters from Greenup County, KY to Lawrence County, OH: 443 (3%)
Commuters from Greenup County, KY to Scioto County, KY: 1,252 (9%)

Total number of workers in Lawrence County, KY: 4,899
Commuters in Lawrence County, KY who work in Lawrence County, KY: 2,483 (51%)
Commuters from Lawrence County, KY to Boyd County, KY: 575 (12%)
Commuters from Lawrence County, KY to Cabell County, WV: 193 (4%)
Commuters from Lawrence County, KY to Lawrence and Scioto Counties, OH: 0 (0%)

Based on commuting data above, none of the Kentucky counties appear to be contributing a significant level of onroad mobile source emissions to the area.

Vehicle Miles Traveled:

The following table has the vehicle miles traveled (thousand miles) for the counties in the Huntington-Ashland MSA and some adjacent counties with significant emissions. (MSA counties are in **bold**; Kentucky MSA counties are in ***bold italics***.)

County	2002 VMT (thousand miles/year)
Cabell (WV)	**1,030**
Boyd (KY)	***411***
Wayne (WV)	**377**
Greenup (KY)	***264***
Lawrence (OH)	**796**

Carter (KY)	***665***
Gallia (OH)	266
Adams (OH)	283
Putnam (WV)	578
Mason (WV)	270
Scioto (OH)	633

Based on the total VMT of the Kentucky counties only, there appears to be a potential contribution of onroad mobile source emissions to the area from Boyd and Carter Counties. However, the analysis of the commuting data above shows that a low number of workers commute from these Kentucky counties into the violating counties. Thus, this factor is not significant for the Kentucky counties listed above when VMT and commuting data are analyzed together.

Factor 5: Expected growth

The following table has the population and population growth figures for the Huntington-Ashland MSA and adjacent counties with significant emissions. (MSA counties are in **bold**; Kentucky MSA counties are in ***bold italics***.)

County	2002 Population	growth (90-00)	% growth (90-00)
Cabell (WV)	**95,266**	**-43**	**-0**
Boyd (KY)	***49,603***	***-1,398***	***-3***
Wayne (WV)	**42,382**	**1,267**	**3**
Greenup (KY)	***36,761***	***149***	***0***
Lawrence (OH)	**62,172**	**485**	**1**
Carter (KY)	***27,055***	***2,549***	***10***
Gallia (OH)	31,301	115	0
Adams (OH)	27,804	1,959	8
Putnam (WV)	52,230	8,754	20
Mason (WV)	26,004	779	3
Scioto (OH)	78,041	-1,132	-1

Based on an analysis of this factor for Kentucky only, there appears to be relatively significant population growth in Carter County to indicate a potential air quality contribution. However, Carter County's population is low. Boyd and Greenup Counties have a negative or zero population growth rate. Thus, this factor is not significant for the Kentucky counties.

Factor 6: Meteorology

The following meteorological information was provided by Kentucky. The text below is

the same for Boyd, Carter, and Greenup Counties in Kentucky. The figure referenced is a wind rose for April 1-October 31 for the 1988-1992 period that is provided in Kentucky's PM2.5 recommendations submittal.

Meteorological Information

"Due to the close proximity of Huntington, West Virginia, meteorological data from Huntington was used for this Kentucky area. Wind speed/wind direction information shows that the majority of the time for the period 1988–1992, the wind in the Huntington-Ashland area came from the southwest and typically from 4-6 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 85° F and the mean low was 65° F. The mean precipitation for the same period was 4.5 inches." *(Source: Kentucky PM2.5 submittal)*

Based on an analysis of this factor, the information provided is not sufficient to provide a compelling argument to exclude counties based on prevailing winds. The information provided was for only the summertime winds.

Factor 7: Geography/topography

Based on an analysis of this factor, there are no significant topographical issues associated with this MSA.

Factor 8: Jurisdictional boundaries

The following MSA counties were designated nonattainment for the 8-hour ozone standard on April 15, 2004: Boyd County, Kentucky; the West Virginia Counties of Cabell, Wayne, and Putnam; and no counties in Ohio. This factor did not play a significant role in the decision-making process.

Factor 9: Level of control of emission sources

The following information was provided by Kentucky for Boyd, Carter, and Greenup Counties. "*Point sources located within...County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).*" This factor did not play a significant role in the decision-making process for these counties.

The following information was provided by Kentucky for Boyd County.

Kentucky anticipates that emissions of PM2.5, SOx, and NOx will decrease substantially within Boyd County over the next two years. These anticipated emission decreases are due to source modernization and new controls being implemented at two major

sources in Boyd County: the Marathon-Ashland Refinery and Calgon Carbon Corporation.

For the Marathon-Ashland Refinery, the facility modifications are anticipated to be completed by the end of 2005. According to Kentucky, based on 2002 emissions data, this would mean an approximate reduction of 1,571 tons per year of SO2, a 761 ton per year reduction in NOx, and a 32 ton per year reduction in particulate matter.

For Calgon Carbon Corporation, the May 2003 shutdown of two of their activator lines resulted in SO2 emissions being reduced from this facility by approximately 187 tons in 2003. Before these lines can be reactivated, scrubbers, with SO2 and PM control efficiencies of 90% will be required to be installed on these units. If brought back into operation, these units will have controls in place to reduce emissions of SO2 from these two lines to approximately 32 tons per year.

Based on an analysis of this factor, these controls will not be implemented in a timeframe early enough to influence the decision for Boyd County on PM2.5 designations.