



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

**JUN 29 2004**

The Honorable Ruth *Ann* Minner  
Governor of Delaware  
William Penn Street, Tatnall Building  
Dover, Delaware 19901

Dear Governor Minner:

Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. These tiny particles – about 1/30" 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 PM<sub>10</sub> pollution.

In February, your State submitted its recommended boundaries for PM<sub>10</sub> 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, the Environmental Protection Agency (EPA) agrees with your recommended nonattainment designations and boundaries for most counties, but intends to modify your recommended designations and boundaries for some counties, as described in the enclosure discussed below.

Your Environmental Commissioner will receive a copy of this letter with 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 PM<sub>2.5</sub> designation process and determines those areas that are in attainment (or unclassifiable) and those areas that are nonattainment. 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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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 United States. 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 our Regional Air Office. We look forward to a continued dialogue with you as we work together to implement the PM<sub>2.5</sub> standards.

Sincerely,



Donald S. Welsh  
Regional Administrator

. Enclosures

cc w/Enclosures: The Honorable John A. Hughes, Secretary, DNREC

## Delaware

### Enclosure A

The fourth column of the following table identifies the individual county within Delaware that EPA intends to designate as nonattainment.

<b>Area</b>	<b>Delaware Counties in 1999 Metropolitan Statistical Area</b>	<b>State of Delaware Recommendation</b>	<b>EPA Recommendation of Delaware Counties</b>
Philadelphia PA-NJ-DE-MD	New Castle	New Castle*	New Castle
Total Number of Counties	1	1	1

\* Delaware recommended New Castle County not be included as part of the Philadelphia CMSA

## **State Summary**

The State of Delaware, in a Governor Minner letter dated February, 17, 2004, recommended New Castle County as nonattainment. The state suggested that New Castle should be designated as a separate nonattainment area from the Philadelphia metropolitan area.

## **Philadelphia Area- New Castle County**

### **Discussion**

The Philadelphia Metropolitan Statistical Area (MSA) is comprised of five counties in Pennsylvania, New Castle county in Delaware, and additional counties in Maryland and New Jersey. The table below lists the counties in the MSA. Four counties in this MSA have monitored violations of the fine particulate (PM<sub>2.5</sub>) National Ambient Air Quality Standard (NAAQS) of 15.0 µg/m<sup>3</sup>. Based on the monitored violations, the Philadelphia MSA is considered a presumptive nonattainment area. New Castle County monitored a violation. Philadelphia County monitored 16.4 µg/m<sup>3</sup> for the time period 2001-2003. This value is being considered the Design Value for the Philadelphia nonattainment area.

The State of Delaware recommended New Castle County, part of the Philadelphia MSA, be designated as a separate nonattainment area.

EPA has reviewed the State's recommendations and intends, based on the national guidance and the information reviewed, to designate New Castle County as nonattainment with the Philadelphia nonattainment area.

### **Summary of Evaluation of the Philadelphia MSA**

The New Jersey counties have been evaluated and are discussed in a separate document prepared by Region 2. New Castle County, DE and Chester and Montgomery Counties in Pennsylvania have moderate to high emissions contribution to the area, based on the weighted emissions factor. Therefore, EPA has reviewed these counties based on the remaining 8 factors to determine the appropriate designation. The population density, growth and commuting patterns when compared to the core MSA counties in this area support including these counties in the nonattainment area. Existing EPA National Policy suggests retaining at least the MSA boundaries as the nonattainment area. The tables below summarize the data used to determine the designation status of New Castle County.

**PHILADELPHIA, PA MSA**

**Status of Counties: Alphabetical by State**

EPA Reg	ST	COUNTY	State Recommend PM <sub>2.5</sub> Designation	EPA Intent PM <sub>2.5</sub> Designation	Area - '99 C/MSA
3	DE	New Castle	Nonattainment	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
3	MD	Cecil	Attainment/unclassifiable	Attainment/unclassifiable	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Atlantic	Attainment/unclassifiable	Attainment/unclassifiable	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Burlington	Attainment/unclassifiable	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Camden	Attainment/unclassifiable	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Cape May	Attainment/unclassifiable	Attainment/unclassifiable	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Cumberland	Attainment/unclassifiable	Attainment/unclassifiable	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Gloucester	Attainment/unclassifiable	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2	NJ	Salem	Attainment/unclassifiable	Attainment/unclassifiable	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
3	PA	Bucks	Nonattainment	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
3	PA	Chester	Attainment/unclassifiable	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
3	PA	Delaware	Nonattainment	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
3	PA	Montgomery	Attainment/unclassifiable	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
3	PA	Philadelphia	Nonattainment	Nonattainment	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD

**SUMMARY OF FACTOR 1: EMISSIONS PHILADELPHIA, PA MSA**

**\*\* Counties Listed by Percent Contribution to area\*\***

EPA Reg	ST	COUNTY	Total Emissions, 2001 (tons)							Weighted Emissions	EPA Intent PM <sub>2.5</sub> Designation
			PM	SO <sub>2</sub>	NOX	VOC	Amm	Carbon	Crustal		
3	DE	New Castle	4,558	61,499	34,640	24,088	2,605	2,276	1,645	18.6	Nonattainment
3	PA	Philadelphia	3,944	16,861	55,011	50,439	3,506	2,116	1,200	14.0	Nonattainment
3	PA	Delaware	3,173	24,882	33,259	19,071	903	1,458	1,225	11.1	Nonattainment
3	PA	Montgomery	3,910	8,721	21,191	32,545	1,293	1,905	1,700	8.7	Nonattainment
3	PA	Chester	3,716	11,391	16,909	17,697	2,267	1,228	2,226	6.9	Nonattainment
3	PA	Bucks	3,100	6,870	16,852	23,024	1,124	1,443	1,444	6.8	Nonattainment
2	NJ	Gloucester	1,909	9,154	21,849	15,087	741	1,035	697	6.5	Nonattainment
2	NJ	Camden	2,151	4,120	17,025	20,904	887	1,286	727	5.9	Nonattainment
2	NJ	Burlington	2,298	2,330	15,113	18,139	913	1,326	836	5.6	Nonattainment
2	NJ	Cape May	2,157	14,578	7,894	11,886	206	938	1,044	5.5	Attainment/unclassifiable
2	NJ	Atlantic	1,404	1,905	8,676	11,906	437	773	563	3.3	Attainment/unclassifiable
2	NJ	Cumberland	1,374	1,941	7,054	9,279	423	638	669	2.8	Attainment/unclassifiable
2	NJ	Salem	1,243	4,485	5,457	8,229	534	487	653	2.6	Attainment/unclassifiable
3	MD	Cecil	950	948	5,502	4,441	505	401	518	1.8	Attainment/unclassifiable

**SUMMARY OF FACTOR 2: AIR QUALITY PHILADELPHIA MSA**

**\*\* Counties Listed by Highest DV \*\***

EPA Reg	ST	COUNTY	Design Values						Estimated Air Quality based		EPA Intent PM <sub>2.5</sub> Designation
			'01-'03	'00-'02	'99-'01	Maximum Estimate (inc. real)	# Estimated violating point/#total pts				
3	PA	Philadelphia	16.4	NA	16.8	NA	16.6	NA	16.8	3/5	Nonattainment
3	DE	New Castle	16.2	NA	16.5	NA	16.6	NA	16.5	6/12	Nonattainment
3	PA	Delaware	15.6	NA	15.7	NA	15.0	a	15.7	4/4	Nonattainment
3	PA	Chester	15.1	na	14.6	a			16.1	10/11	Nonattainment
2	NJ	Camden	14.6	a	14.8	a	14.6	a	15.0	0/4	Nonattainment
3	PA	Bucks	14.6	A	14.3	a	13.4	a	14.6	0/10	Nonattainment
3	PA	Montgomery	14.3	A	14.2	A	13.8	a	15.3	1/6	Nonattainment
2	NJ	Gloucester	13.8	a	14.2	A	14.3	a	14.7	0/6	Nonattainment
3	MD	Cecil	13.0	a	13.4	A	12.5	a	14.7	0/7	Attainment/unclassifiable
2	NJ	Atlantic	11.6	a	11.4	a	11.2	a	12.8	0/7	Attainment/unclassifiable
2	NJ	Burlington			No Monitor				14.4	0/13	Nonattainment
2	NJ	Cape May			No Monitor				12.4	0/3	Attainment/unclassifiable
2	NJ	Cumberland			No Monitor				13.8	0/8	Attainment/unclassifiable
2	NJ	Salem			No Monitor				15.1	1/5	Attainment/unclassifiable

**SUMMARY OF FACTOR 3: POPULATION**

**Counties Listed Highest to Lowest Population**

EPA Reg	ST	COUNTY	Population & Area			EPA Intent	PM <sub>2.5</sub> Designation
			2002	Area (sq miles)	Density '02		
3	PA	Philadelphia	1,492,231	135	11,054	Nonattainment	
3	PA	Montgomery	766,517	483	1,587	Nonattainment	
3	PA	Bucks	610,440	608	1,004	Nonattainment	
3	PA	Delaware	553,435	184	3,008	Nonattainment	
3	DE	New Castle	512,370	426	1,203	Nonattainment	
2	NJ	Camden	511,957	222	2,306	Nonattainment	
3	PA	Chester	450,160	756	595	Nonattainment	
2	NJ	Burlington	437,871	805	544	Nonattainment	
2	NJ	Gloucester	262,049	325	806	Nonattainment	
2	NJ	Atlantic	259,423	561	462	Attainment/unclassifiable	
2	NJ	Cumberland	147,768	489	302	Attainment/unclassifiable	
2	NJ	Cape May	102,013	255	400	Attainment/unclassifiable	
3	MD	Cecil	90,335	348	260	Attainment/unclassifiable	
2	NJ	Salem	64,438	338	191	Attainment/unclassifiable	

**SUMMARY OF FACTOR 3B POPULATION DENSITY**

**Counties Listed Highest to Lowest Population**

EPA Reg	ST	COUNTY	Population & Area			EPA Intent	PM <sub>2.5</sub> Designation
			2002	Area (sq miles)	Density '02		
3	PA	Philadelphia	1,492,231	135	11,054	Nonattainment	
3	PA	Montgomery	766,517	483	1,587	Nonattainment	
3	PA	Bucks	610,440	608	1,004	Nonattainment	
3	PA	Delaware	553,435	184	3,008	Nonattainment	
3	DE	New Castle	512,370	426	1,203	Nonattainment	
2	NJ	Camden	511,957	222	2,306	Nonattainment	
3	PA	Chester	450,160	756	595	Nonattainment	
2	NJ	Burlington	437,871	805	544	Nonattainment	
2	NJ	Gloucester	262,049	325	806	Nonattainment	
2	NJ	Atlantic	259,423	561	462	Attainment/unclassifiable	
2	NJ	Cumberland	147,768	489	302	Attainment/unclassifiable	
2	NJ	Cape May	102,013	255	400	Attainment/unclassifiable	
3	MD	Cecil	90,335	348	260	Attainment/unclassifiable	
2	NJ	Salem	64,438	338	191	Attainment/unclassifiable	

<b>SUMMARY FACTOR 4: VMT</b>					
<b>Counties Listed Highest to Lowest</b>					
EPA Reg	ST	COUNTY	VMT	Commuting to Other Metro	
			2002	Percent	Number
3	PA	Philadelphia	10,213	23	129,902
3	DE	New Castle	4,957	11	27,598
3	PA	Montgomery	4,677	32	120,472
2	NJ	Camden	4,332	43	98,432
3	PA	Bucks	3,830	31	93,563
2	NJ	Burlington	3,748	29	60,278
3	PA	Delaware	3,513	44	111,594
3	PA	Chester	3,128	32	70,486
2	NJ	Gloucester	2,312	51	62,141
2	NJ	Atlantic	2,236	13	14,237
3	MD	Cecil	1,340	39	16,195
2	NJ	Cumberland	1,166	22	12,911
2	NJ	Cape May	749	26	11,360
2	NJ	Salem	734	48	13,922

<b>SUMMARY FACTOR 4: Number of Commuters</b>					
<b>Sorted Highest to Lowest</b>					
EPA Reg	ST	COUNTY	VMT	Commuting to Other Metro	
			2002	Percent	Number
3	PA	Philadelphia	10,213	23	129,902
3	PA	Montgomery	4,677	32	120,472
3	PA	Delaware	3,513	44	111,594
2	NJ	Camden	4,332	43	98,432
3	PA	Bucks	3,830	31	93,563
3	PA	Chester	3,128	32	70,486
2	NJ	Gloucester	2,312	51	62,141
2	NJ	Burlington	3,748	29	60,278
3	DE	New Castle	4,957	11	27,598
3	MD	Cecil	1,340	39	16,195
2	NJ	Atlantic	2,236	13	14,237
2	NJ	Salem	734	48	13,922
2	NJ	Cumberland	1,166	22	12,911
2	NJ	Cape May	749	26	11,360

Factor 5 Growth Rate Sorted Highest to Lowest							
EPA Reg	ST	COUNTY	Population			VMT	
			2002	Growth '90-'00	Pct chng '90-'00	Growth '96-'02	Pct chng '96-'02
2	NJ	Atlantic	259,423	28,225	13	148	7
3	PA	Bucks	610,440	56,461	10	12	0
2	NJ	Burlington	437,871	28,328	7	449	14
2	NJ	Camden	511,957	6,108	1	261	6
2	NJ	Cape May	102,013	7,237	8	154	26
3	MD	Cecil	90,335	14,604	20	305	29
3	PA	Chester	450,160	57,105	15	23	1
2	NJ	Cumberland	147,768	8,385	6	158	16
3	PA	Delaware	553,435	3,213	1	-71	-2
2	NJ	Gloucester	262,049	24,591	11	257	13
3	PA	Montgomery	766,517	71,986	11	-141	-3
3	DE	New Castle	512,370	58,319	13	270	6
3	PA	Philadelphia	1,492,231	-68,027	-4	-207	-2
2	NJ	Salem	64,438	-1,009	-2	43	6

Factors 6 and 7 Meteorology and Geography/Topography												
EPA Reg	ST	COUNTY	Basic Weighted Emissions		WD & 1/x Weighted Emissions	LCC x	LCC y	Delta X	Delta Y	Dist	Quad	Freq
3	DE	New Castle	18.6	18.6	5.5	1185.660	61.032	-34.437	-46.344	57.7	SW	28
3	PA	Philadelphia	14.0	32.6	51.6	1220.700	110.607	0.604	3.231	3.3	NE	20
3	PA	Delaware	11.1	43.7	10.2	1201.619	100.159	-18.477	-7.217	19.8	SW	30
3	PA	Montgomery	8.7	52.4	5.6	1198.921	130.669	-21.175	23.293	31.5	NW	34
3	PA	Chester	6.9	59.3	2.4	1170.962	102.051	-49.135	-5.325	49.4	SW	29
3	PA	Bucks	6.8	66.1	3.4	1215.982	148.220	-4.114	40.844	41.1	NW	35
2	NJ	Gloucester	6.5	72.6	2.2	1225.453	81.681	5.356	-25.694	26.2	SE	15
2	NJ	Camden	5.9	78.5	2.2	1241.501	95.571	21.404	-11.804	24.4	SE	15
2	NJ	Burlington	5.6	84.1	1.3	1257.991	103.634	37.894	-3.741	38.1	SE	15
2	NJ	Cape May	5.5	89.6	0.6	1267.009	30.289	46.912	-77.087	90.2	SE	15
2	NJ	Atlantic	3.3	92.9	0.5	1267.103	65.461	47.007	-41.915	63.0	SE	15
2	NJ	Cumberland	2.8	95.7	0.4	1267.103	65.461	47.007	-41.915	63.0	SE	16
2	NJ	Salem	2.6	98.3	1.1	1215.503	66.402	-4.593273278	-40.97354826	41.23021	SW	29
3	MD	Cecil	1.8	100.1	0.4	1168.126	58.221	-51.97087792	-49.15422651	71.53398	SW	28

*Wind Direction and Distance Weighting; The weighted emissions ranking of counties considers the contribution of pollutants to the "urban excess" of the MSA on a speciated basis. The general form of the ranking considers each county in the same way, regardless of direction and distance from the violating monitor. To account for the effect of direction and distance in a simplistic way a modified emissions score was calculated as follows. For each county in and adjacent to the MSA the distance and general direction (expressed as a compass quadrant) of the county centroid to the MSA's design value monitor were determined. For each county a 10-year or longer average frequency of occurrence of the wind direction quadrant was derived. The county's weighted emissions score was modified by multiplying the score by the percentage of the wind direction from the county centroid to the design value monitor and divided by the distance in kilometers. For example, if the wind frequency was 25% and the distance was 50 kilometers, the emissions score would be modified by the fraction of 2550, or 0.5. The cumulative percentages were then calculated by normalizing by the sum of the modified emissions scores.*

**Factor 8 Jurisdictional Boundaries:** The Philadelphia MSA was designated Subpart (Basic) 1 nonattainment for the 8 hour ozone standard. Delaware has provided information supporting a designation as a separate area. Based on EPA guidance issued April 1, 2003, EPA intends to designate New Castle County with the Philadelphia MSA.

**Factor 9 Level of Control of emission sources:** There are many sources in the metropolitan area; the level of control of sources was not a significant issue.



## Enclosure C

### 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"), SO<sub>2</sub>, and NO<sub>x</sub>. 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, SO<sub>2</sub>, and NO<sub>x</sub> 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 PM<sub>2.5</sub> 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 average design value for each area based on data for 2001 to 2003. Counties without monitors are not listed.

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 annual average wind direction frequencies by quadrant for each county in the corresponding metropolitan area. These data show that annual average PM<sub>2.5</sub> 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. 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.