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Ruth Ann Minner
Governor

December 12, 2007

Air Protection Division (3AP21)

Mr. Donald S. Welsh (3RA00)
Regional Administrator
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA, 19103-2029

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DEC 19 2007

Division Director (3AP00)

Dear Mr. Welsh:

This letter fulfills Delaware's obligations under Section 107 of the Clean Air Act (CAA) for states to recommend attainment status designations for counties under the daily (24-hour) national ambient air quality standards (NAAQS) for fine particulate matter (PM_{2.5}). This PM_{2.5} NAAQS was promulgated by the EPA at 71 FR 61144, October 17, 2006. This letter also recommends the placement, with rationale, of New Castle County (the only county in Delaware monitoring non-attainment relative to the new PM_{2.5} NAAQS) in a non-attainment area.

Attainment Status – Daily Standard

The daily, or 24-hour based, PM_{2.5} NAAQS is 35 micrograms per cubic meter (µg/m³), calculated as the 3-year average of the 98th percentiles (i.e., the daily values out of a year of monitoring data below which 98 percent of all daily values fall), rounded to the nearest whole number.

For the purposes of attainment status designation recommendations for this NAAQS, the EPA has requested that States use 2004-2006 air monitoring data, with the understanding that that final area designations will be based on 2006-2008, or possibly 2007-2009 data when such data becomes available. The Delaware-monitored average 98th percentile daily values for 2004 through 2006 are 36 µg/m³, 32 µg/m³ and 34 µg/m³, for New Castle, Kent and Sussex, respectively.

Based on these values, Delaware recommends that New Castle County be designated non-attainment for the 24-hour NAAQS, and that Kent County and Sussex County be designated attainment.

Placement of New Castle County in a Non-attainment Area

Under the CAA, non-attainment area boundaries are to be set to encompass both the area violating the standard, and the area that includes sources that significantly contribute to that non-attainment. Delaware has analyzed in some detail the non-attainment situation within the Philadelphia Consolidated/Metropolitan Statistical Area (C/MSA), and based on this analysis recommends that the

Mr. Donald S. Welsh (3RA00)

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non-attainment area boundaries be the boundaries of New Castle County, Delaware. This analysis is detailed in the attachment to this letter. In summary:

- Of the ten counties that make up the Philadelphia C/MSA, only three are monitoring non-attainment: New Castle County, DE, Philadelphia County, PA, and Camden County, NJ. The violating monitor in New Castle County is separated from the violating monitors in Philadelphia and Camden County by monitors that indicate attainment in New Castle County, Delaware County, PA, and Gloucester County, NJ. This large area that is monitoring attainment clearly establishes that the boundaries of New Castle County encompass the full area that is violating the standard, and that other violating areas in the Philadelphia C/MSA are separate and distinct from New Castle County.
- Delaware has analyzed factors such as population density, traffic congestion, commercial development, industrial development, meteorological conditions, and pollution transport within the Philadelphia C/MSA. Based on this analysis Delaware concludes that non-attainment in the Philadelphia C/MSA is caused by a combination of emissions from the eastern half of the United States (i.e., an area much broader than the Philadelphia C/MSA boundaries), and by local sources near the non-attaining monitors. Further, Delaware has concluded that New Castle County emissions do not contribute significantly to any violation of the PM_{2.5} NAAQS in any part of the Philadelphia C/MSA.

Note that Delaware's recommendation that the boundaries of New Castle County, Delaware form the boundaries of a 24-hr PM_{2.5} NAAQS non-attainment area deviates from the current non-attainment boundaries for the annual PM_{2.5} NAAQS, which are the boundaries of the Philadelphia C/MSA. This deviation makes good sense, as it will focus our limited resources on the causes of the problem (i.e., national and local control strategies). Thank you for your consideration of these recommendations. If you have any questions concerning this submittal or would like to discuss it further, please contact John Hughes, DNREC Secretary, or Ali Mirzakhali, Administrator of the Air Quality Management Section at (302) 739-9402.

Sincerely,



Ruth Ann Minner
Governor

James D. Werner, DNREC AWM
Ali Mirzakhali, DNREC AQM
Judith Katz, EPA Region III
David Arnold, EPA Region III

Attachment 1

Delaware's Assessment of Fine Particulate Matter Non-attainment Within the Philadelphia Consolidated/Metropolitan Statistical Area (C/MSA)

Over the years the Delaware Department of Natural Resources and Environmental Control (DNREC) and Regional Planning Organizations have conducted many studies relative to visibility and fine particulate matter (PM_{2.5}) concerns.^{1,2,3,4} These studies reveal that the PM_{2.5} non-attainment status for both Delaware and the Philadelphia C/MSA is caused primarily by a combination of underlying long-range interstate transport of sulfate and nitrates from power plants, and local mobile emission sources.

This document considers these studies, analyzes nine specific factors⁵, and concludes that the non-attainment boundaries associated with the New Castle County, Delaware (NCC) fine particulate matter non-attainment problem should be the boundaries of NCC. Given that Delaware is currently part of the Philadelphia C/MSA based non-attainment area for the 24-hour PM_{2.5} NAAQS, to a large extent this conclusion is based on a comparison of NCC with other counties in the Philadelphia C/MSA.

1. Emissions in Areas Potentially Included Versus Excluded From the Non-Attainment Area

EPA recommends that states consider emissions potentially included versus excluded from the non-attainment area as one of the factors in determining appropriate non-attainment area boundaries. Note that regardless of the non-attainment boundaries, all NCC emissions will be under the non-attainment umbrella.

2002 emission data for NCC and other counties in the Philadelphia C/MSA are provided below. In addition to this 2002 emission data Delaware projected emissions for 2012, which is the attainment year. A comparison of this 2002 and 2012 emission data highlights and contrasts the significant emission reductions that Delaware has made over time when compared to other counties in the C/MSA.

¹ Contributions to Regional Haze in the Northeast and Mid-Atlantic United States Mid-Atlantic/Northeast Visibility Union (MANE-VU) Contribution Assessment, Prepared by NESCAUM for the Mid-Atlantic/Northeast Visibility Union (MANE-VU), August 2006

² *A Guide to Mid-Atlantic Regional Air Quality*, Mid-Atlantic Regional Air Management Association, October 2005

³ The Nature of the Fine Particle and Regional Haze Air Quality Problems in the MANE-VU Region: A Conceptual Description, by NESCAUM Boston, MA November 2, 2006

⁴ Philip K. Hopke and Eugene Kim, *Analysis of Speciation Trends Network Data Measured at the State of Delaware*, Center for Air Resources Engineering and Science Clarkson University, Potsdam, NY, January 20, 2005

⁵ The nine criteria analyzed are those specified in an EPA guidance document, "Designations for the Fine Particle National Ambient Air Quality Standards."

Table 1-1 shows that in 2002, NCC's emissions^{6,7} were almost double that of the next ranking county (i.e., Philadelphia County). However, Table 1-2 shows that, due to State and federal control programs, NCC is projected to fall to 2nd place ranking based on 2012 emission projections. Table 1-3 places the magnitude of the reductions made between 2002 and 2012 into full perspective. Between 2002 and 2012 Delaware will obtain 75% reductions in SO₂ (the predominant PM_{2.5} fraction), and 62% overall for the sum of NO_x, primary PM_{2.5}, and SO₂. Comparing these percent reductions to the other counties' percent reductions shows that Delaware has significantly mitigated any impact its emissions may have on other parts of the Philadelphia C/MSA.

Table 1-1 2002 Actual Emissions⁸

COUNTY	NO _x	PM _{2.5}	SO ₂	TOTAL
New Castle	30,748	3,420	50,237	84,405
Philadelphia	30,595	2,988	9,508	43,091
Delaware	23,699	2,292	16,028	42,018
Montgomery	25,686	3,642	5,171	34,499
Chester	18,476	3,075	5,507	27,058
Bucks	19,800	2,881	3,825	26,506
Burlington	17,832	2,102	3,429	23,364
Gloucester	14,106	1,411	7,169	22,685
Camden	14,785	1,461	1,909	18,154

Table 1-2 2012 Emissions Projection

COUNTY	NO _x	PM _{2.5}	SO ₂	TOTAL
Philadelphia	22,146	3,013	6,849	32,008
New Castle	16,164	2,881	12,654	31,699
Delaware	13,859	2,765	8,246	24,871
Montgomery	15,267	3,727	4,790	23,784
Chester	11,632	3,266	4,663	19,561
Bucks	12,307	2,976	3,559	18,842
Gloucester	8,454	1,544	3,309	13,307
Burlington	10,400	1,908	969	13,277
Camden	7,449	1,304	784	9,537

⁶ http://www.marama.org/visibility/EI_Projects/index.html

⁷ 2002 Base Year State Implementation Plan Emissions Inventory for PM_{2.5} and Precursors (Draft) Delaware Department of Natural Resources and Environmental Control, Air Quality Management Section, Dover, Delaware, September, 2007

⁸ EPA's guidance suggests using existing boundaries for annual standard, so Cecil County was excluded from this analysis.

Table 1-3 Changes in emissions between 2002 and 2012

COUNTY	NO _x	PM _{2.5}	SO ₂	TOTAL
New Castle	47%	16%	75%	62%
Camden	50%	11%	59%	47%
Burlington	42%	9%	72%	43%
Gloucester	40%	-9%	54%	41%
Delaware	42%	-21%	49%	41%
Montgomery	41%	-2%	7%	31%
Bucks	38%	-3%	7%	29%
Chester	37%	-6%	15%	28%
Philadelphia	28%	-1%	28%	26%

2. Air quality in potentially included versus excluded areas

EPA recommends that states consider the air quality in areas included versus excluded from the non-attainment area as one of the factors in determining appropriate non-attainment area boundaries. In this Section Delaware evaluates the air quality within NCC, in the area surrounding NCC, and in the Philadelphia C/MSA, and demonstrates that the NCC non-attainment problem is separate and distinct from any non-attainment problems in the C/MSA. Note that regardless of the non-attainment boundaries, all NCC emissions are recommended to be under the non-attainment umbrella.

2.1 Delaware

The Delaware-monitored average 98th percentile daily values and site information for 2004-2006 are provided in Table 2-1. Figure 2-1 shows the locations of the statewide monitoring network.

Table 2-1: PM_{2.5} 24-hour 98th Percentile Concentrations; NAAQS = 35 µg/m³, 3-year average

County	Site Name and ID Number	2004	2005	2006	3-year Average ⁹
New Castle	Bellefonte 10-003-1003	32.5	34.8	30.9	33
	MLK 10-003-2004	34.1	37.4	37.7	37
	Newark 10-003-1012	29.1	35.0	30.5	32
	Lums Pond 10-003-1007	30.8	36.2	28.0	32
Kent	Dover 10-001-0003	28.9	33.6	29.9	31
	Killens Pond 10-001-0002	31.0	34.6	30.7	32
Sussex	Seaford 10-005-1002	35.1	34.7	33.3	34

⁹ National Ambient Air Quality Standards for Particulate Matter, Federal Register: October 17, 2006 (Volume 71, Number 200)]

Figure 2-1 Delaware PM_{2.5} Air Monitoring Locations



Table 2-1 and Figure 2-1 show that there are four PM_{2.5} monitoring sites located in NCC. However, only the Martin Luther King Boulevard (MLK) monitor is monitoring PM_{2.5} concentrations that are above the daily NAAQS of 35 µg/m³. The MLK monitor is sited in downtown Wilmington, and the following significant mobile emissions sources are near the MLK monitor:

- MLK Boulevard. MLK Boulevard has an annual average daily traffic (AADT) of ~ 30,000 vehicles per day.¹⁰
- Interstate (I-95). I-95 has an AADT of ~ 90,000 vehicles per day.¹¹
- CSX/Norfolk Southern railroad.
- A large bus depot. The Delaware Administration for Regional Transit's (DART) central hub, which dispatches 250 buses.

The relatively short distances from the MLK monitor to these significant mobile sources are identified in Table 2-2, and pictured in Figure 2-2.

Table 2-2 Distance of mobile sources to MLK monitor

Mobile Source	Distance (yd)
CSX/Norfolk Southern Tracks:	38
Martin Luther King Blvd.	42
Dart Bus Depot:	312
I-95:	448

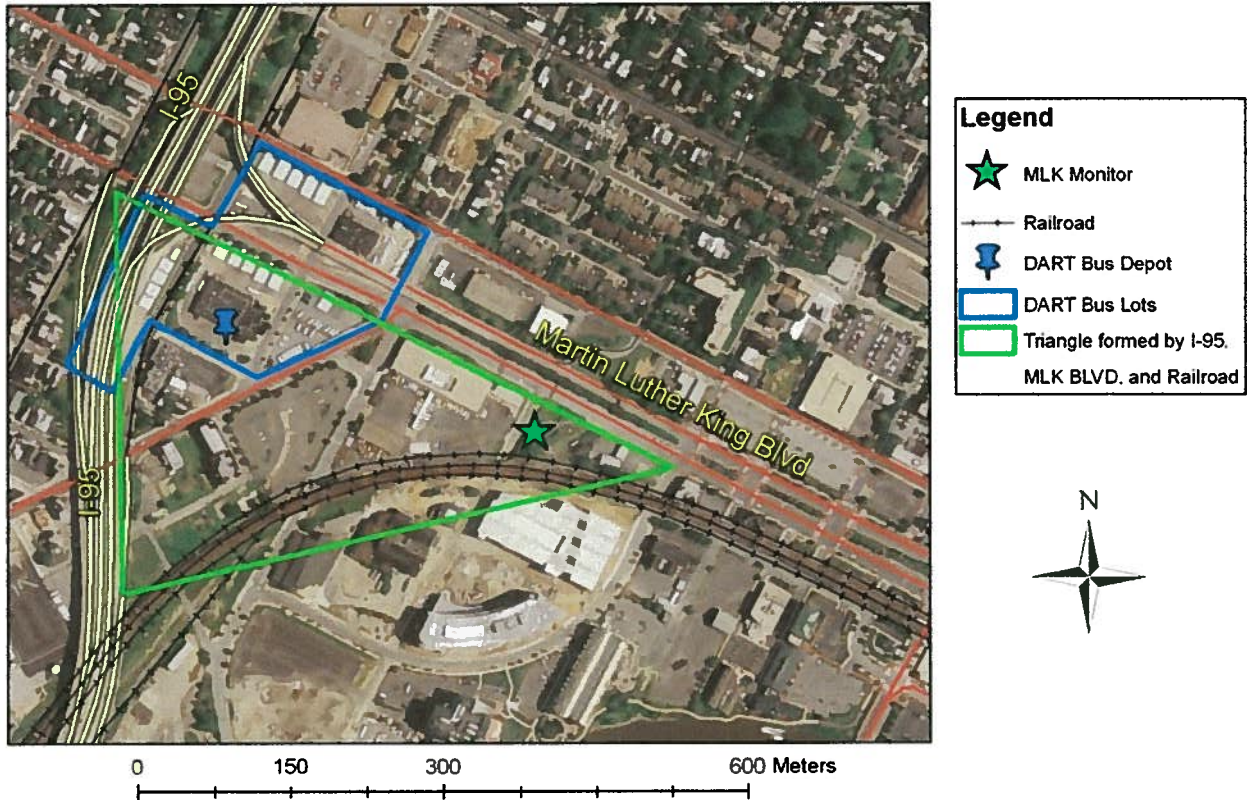
Based on Delaware's monitoring data which indicates that all Delaware monitoring sites are currently monitoring attainment of the PM_{2.5} NAAQS except for the MLK monitoring site (see Table 2-1), and given the significant impact of mobile sources on the MLK monitoring site, an important consideration in control measure planning (and boundary designations) is the impacts of local, mobile emission sources. Local mobile emission sources are evaluated as part of the transportation conformity process by DNREC, Delaware Department of Transportation (DELDOT), and Wilmington Area Planning Council (WILMAPCO).

¹⁰ Delaware Department of Transportation, Traffic Summary 2002, p. 31 (Maryland Ave.; Del 4)

¹¹ <http://www.aaroads.com/delaware/i-095.htm> (Exit 6 DE 48 Lancaster Avenue)

Figure 2-2 MLK Monitor Location and Nearby Sources

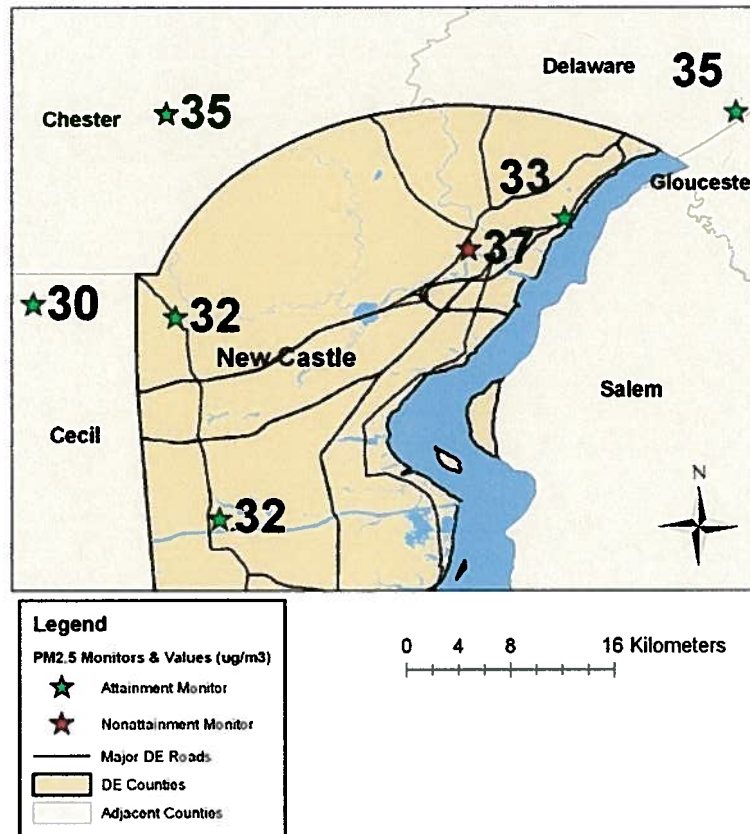
Aerial Photograph (2006) of MLK Monitor in Wilmington



The remaining monitors in NCC are monitoring attainment. They are in Newark, Bellefonte, and Lums Pond monitors, which are located to the west, northeast, and southwest of the MLK monitor, respectively. They have 2004-2006 design values of 32, 33, and 32 $\mu\text{g}/\text{m}^3$, respectively. See Figure 2-3. This indicates that the area that is not attaining the standard is relatively small, and fully encompassed within NCC.

Figure 2-3

PM2.5 Monitors & 24-Hr Values In and Around New Castle County



2.2 Delaware, Maryland, New Jersey and Pennsylvania Adjacent Counties

There are five (5) counties in four (4) states which encircle and are adjacent to NCC. Each of those Counties has 2004-2006 monitoring data which indicates the air quality in those counties is currently in attainment with the PM_{2.5} 24-hr NAAQS (see Table 2-3 and Figure 2-3).

Table 2-3 Adjacent County(s) Air Monitoring Data

County/State	Site Name and ID Number	Design Value
Cecil, MD	Fair Hill 24-015-0003	30
Gloucester, NJ	Gibbstown Municipal Bldg 34-015-5001	28
Chester, PA	New Garden Airport 42-029-0100	35
Delaware, PA	Front St & Norris St 420450002	35
Kent, DE	• Credit Union, East Water Street 10-001-0003	31
	• Killens Pond	32

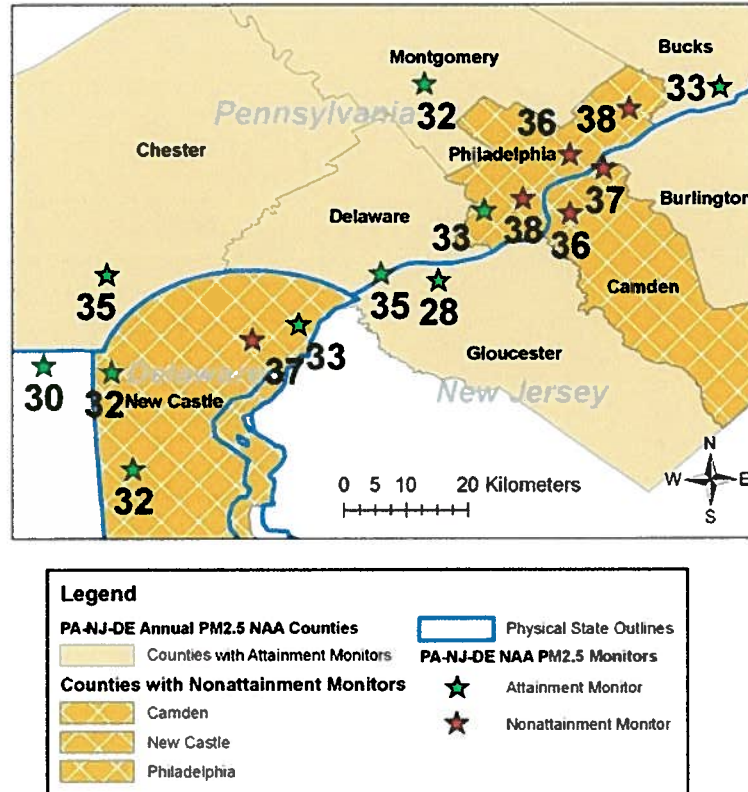
Based on the monitoring data in an around Wilmington (MLK), Delaware concludes that the NCC non-attainment problem is clearly limited to the boundaries of NCC.

2.3 *The Broader Picture: a separate Philadelphia- Camden nonattainment area*

Figure 2-4 shows that the only areas that are currently monitoring non-attainment for the 24-hour PM_{2.5} NAAQS in the Philadelphia C/MSA outside of Delaware are Philadelphia and Camden Counties. They are separated from NCC by a large area that is monitoring attainment for the 24-hour NAAQS. Similar to above, this indicates that the NCC non-attainment problem is separate and distinct from any other non-attainment problems within the Philadelphia C/MSA.

Figure 2.4

**24-hr Standard - Monitor Values
within Philadelphia - Wilmington, PA-NJ-DE
Annual PM_{2.5} Nonattainment Area**



2.4 Modeling and Other Studies

Modeling

EPA modeling and the Hopke report⁴ have shown that long-range interstate transport of sulfate from power plants is the most significant contributor to ambient PM_{2.5} concentrations in Delaware and the C/MSA. EPA issued a final rule entitled “Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule).” In this document EPA modeled the impacts of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) emissions from upwind States on downwind PM_{2.5} concentrations. The modeling and studies showed that:

- Delaware emissions in total (i.e., not just NCC) contribute little to the PM_{2.5} concentrations in other States, or to the Philadelphia C/MSA.¹²

¹² In fact, since the CAIR modeling showed Delaware and New Jersey contributing so little to downwind states, they were taken out of the original CAIR, in order to be “combined” as states in separate rulemaking. Only then would they be above the *significance* threshold of 0.2 ug/m³.

- The EPA modeling shows that emissions from the entire State of Delaware “*significantly impact*” only New York County, NY (with a maximum of 0.15 $\mu\text{g}/\text{m}^3$ to both Philadelphia, and Delaware County, PA). Note that Delaware County, PA is monitoring attainment based on 2004-2006 data. Also, note that Delaware has significantly reduced its emissions since 2002, as discussed in Section 1 of this document.
- Sulfates are transported to Delaware and the Philadelphia C/MSA from a large geographical area. The EPA modeling shows that SO_2 (sulfate) emissions from the states of Ohio, Indiana, Pennsylvania (mid- and western), Michigan, West Virginia, New York, Maryland, District of Columbia, New Jersey, North Carolina, and Illinois significantly impact Delaware and the Philadelphia C/MSA.
- Local mobile sources are the second largest source. The highest reading monitors in the C/MSA are located very near major highways, and/or principle arterioles. These mobile contributions are on the local level, and do not measurably impact other monitors in the C/MSA.

Receptor Modeling

In 2004, Dr. Phil Hopke conducted receptor modeling for Delaware’s two Speciated trends Network (STN) sites; Wilmington-MLK (urban) and Dover (rural) STN sites. The objectives of this project were to identify major sources of particulate matter, and estimate their contributions to $\text{PM}_{2.5}$ mass concentrations¹². The results of the MLK study are:

1. Sulfate had the highest source contribution to $\text{PM}_{2.5}$ mass concentrations, accounting for 38% (7.0 $\mu\text{g}/\text{m}^3$) of the $\text{PM}_{2.5}$ mass concentration. The elevated contributions were likely caused by the regional transport of secondary aerosols from Midwestern coal-fired power plants in the Ohio River Valley. Other potential source areas pathways that give rise to the high contribution to the Wilmington site are located in Mississippi, northern Alabama, Georgia, Tennessee, western South Carolina, and southern Kentucky.
2. The average PM mass contributions from gasoline vehicle, diesel emissions, bus depot, and railroad were 2.2 $\mu\text{g}/\text{m}^3$, 0.6 $\mu\text{g}/\text{m}^3$, 0.8 $\mu\text{g}/\text{m}^3$, and 1.1 $\mu\text{g}/\text{m}^3$ in Wilmington, respectively, for a total of 4.7 $\mu\text{g}/\text{m}^3$ due to local sources (29% of the 2001-2003 annual design value).

Nitrate was harder to attribute to a specific local vs. regional sources. It is likely that the ammonium nitrate arises from a combination of local mobile and regional ammonia emissions. The average contributions of nitrate to the PM mass concentrations were 17% (3.1 $\mu\text{g}/\text{m}^3$).

3. Oil fired power plants and/or Industrial/ Commercial/ Institutional (ICI) boilers contributed 1.5 $\mu\text{g}/\text{m}^3$ of the PM mass concentration in Wilmington. Directional plots of these sources point to the northeast and southeast, which are directionally correct for three power plants burning coal and/or residual oil (one in DE, two in NJ). Note that the

Delaware unit will make significant reductions in SO₂ and NO_x emission under Delaware Regulation No. 1146, EGU Multi-P regulation by 2009.

Note that the Hopke study supports the modeling and monitored data discussed above, i.e. long-range transport of sulfate, and local mobile sources dominate the MLK PM_{2.5} mass components.

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

EPA recommends that states consider the population density and the degree of urbanization in areas included versus excluded from the non-attainment area as one of the factors in determining appropriate non-attainment area boundaries.

Population densities in the Philadelphia C/MSA counties are presented in Table 3-1.

Table 3-1 Population densities

County	Sq Miles	2006 pop	Persons/Sq Mi
Philadelphia	135	1,448,394	10,729
Delaware	184	555,996	3,022
Camden	222	517,001	2,329
Montgomery	483	775,688	1,606
New Castle	426	525,587	1,234
Bucks	607	623,205	1,027
Gloucester	325	282,031	868
Chester	756	482,112	638
Burlington	805	450,627	560

The population density in Philadelphia County is almost nine (9) times greater than NCC (10,729 people/sq. mi versus 1,234 people/sq. mi.).

Note that the population density does not necessarily reflect ambient concentrations of PM_{2.5}. For instance, Philadelphia County has nearly over 8½ times the population density of NCC, yet one of its monitors in Philadelphia County is recording ambient PM_{2.5} concentrations of only 33 ug/m³. Similarly, Delaware and Montgomery Counties in PA have higher densities than NCC, yet they are currently monitoring attainment, while NCC is currently monitoring non-attainment. Consequently, Delaware believes this criteria for boundary considerations should be of low priority.

4. Traffic and commuting patterns

EPA recommends that states consider traffic and commuting patterns in areas included versus excluded from the non-attainment area as one of the factors in determining appropriate non-attainment area boundaries.

Commuting: Census Bureau (2000 census) data indicates that there are 660,050 *Residence County to Workplace County Flows* to Philadelphia, which is the only nonattaining County in PA.¹³ Of this 660,050, only 20,386 are from NCC, which indicates that residents from NCC represent less than one percent of commuters to Philadelphia (0.8%). Also, it is likely that a significant portion of the 20,386 commuters are using the Southeastern Pennsylvania Transportation Authority (SEPTA) electric rail and bus service, and are not using cars.

Commuting emission estimates: Table 4-1 estimates emissions from [20,386] NCC commuters in the Philadelphia C/MSA (*assumes a steady speed of 65 mph, a 60 mile round-trip and zero commuters using SEPTA - a worse case scenario*). The contributions from NO_x, PM and SO₂ combined represent less than one percent of C/MSA emissions.

Table 4-1 NCC emissions as a fraction of total C/MSA

2007 (VMT)	NO _x	PM _{2.5}	SO ₂	SUM (NO _x , SO ₂ & PM _{2.5})
Emissions (TPY)	2,988	40	29	3,057
% of C/MSA	1.53%	0.17%	0.03%	0.95

Traffic: Table 4-2 shows that NCC is ranked number three amongst Philadelphia C/MSA counties relative to vehicle miles traveled (VMT). However, three out of the four monitors in NCC are showing attainment (see discussion above). Therefore, if current levels of VMT can result in three out of four NCC monitors being in attainment, it makes it difficult to justify NCC VMT contributions of any significance to Philadelphia. Furthermore, Gloucester has a much higher VMT rate of increase, yet is well below the standard at 28 ug/m³.

Table 4-2 VMT

County	2005	2002	02-'05 % Increase
Gloucester	7,431	6,956	6.4%
Burlington	13,365	12,582	5.9%
New Castle	15,286	14,626	4.3%
Delaware	10,181	9,746	4.3%
Philadelphia	16,316	15,775	3.3%
Camden	10,855	10,543	2.9%
Montgomery	19,110	18,675	2.3%
Bucks	13,696	13,487	1.5%
Chester	11,832	11,653	1.5%

5. Expected growth (including extent, pattern and rate of growth)

EPA recommends that states consider expected growth in areas included versus excluded from the non-attainment area as one of the factors in determining appropriate non-attainment area boundaries.

¹³ <http://www.census.gov/population/www/cen2000/commuting.html>

Table 5-1 shows 2002 through 2006 growth rates for each county in the Philadelphia C/MSA. This indicates that NCC has a moderate growth rate, which is less than other counties in the C/MSA that are showing attainment (compare Gloucester to New Castle). This, and the 2012 emission projection data presented in Section 1 of this document indicate that NCC will not significantly contribute to any non-attainment in the Philadelphia C/MSA due to growth.

Table 5-1 2002-2006 Growth

County	2006 pop	Pop 02-06 (% change) ¹⁴	Design Value
Chester	482,112	11.2	35
Gloucester	282,031	10.3	28
Burlington	450,627	6.4	Na
New Castle	525,587	5.4	36
Bucks	623,205	4.3	33
Montgomery	775,688	3.6	32
Camden	517,001	1.8	36
Delaware	555,996	0.7	35
Philadelphia	1,448,394	-4.6	38

6. Meteorology (weather/transport patterns)

EPA recommends that states consider meteorology in areas included versus excluded from the non-attainment area as one of the factors in determining appropriate non-attainment area boundaries.

Delaware did an overlay of Figure 2-4 with wind rose data¹⁵ in order to illustrate the relative contributions from NCC to Philadelphia (see Figure 6-1). This data indicates that nine percent (9%) of the time, air impacting Philadelphia is coming from northern NCC. Most (~11%) of the Philadelphia's "upwind" air comes from the non-industrialized, rural areas south of the C & D Canal in New Castle County. The NCC Lums Pond monitor indicates this area of the state is meeting the NAAQS. An exception to the non-industrial area of lower New Castle is the refinery in Delaware City. However, table 2-4 shows the huge reductions in NCC emissions are projected (almost all taking place by 2007). Moreover, 93% of the SO₂ reductions in NCC come from the single, largest SO₂ source in the C/MSA (see Table 6-1).

This indicates that based on meteorology NCC does not significantly impact the Philadelphia C/MSA. In addition, it indicates that significant emission reductions from NCC are projected, and that any impact NCC does have on the C/MSA has been mitigated.

¹⁴ <http://quickfacts.census.gov/qfd/states/42/42101.html>

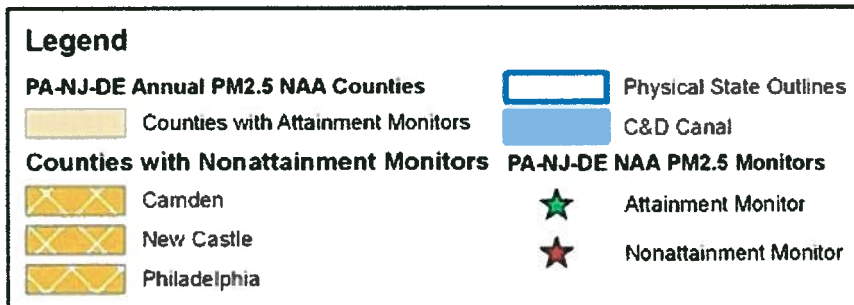
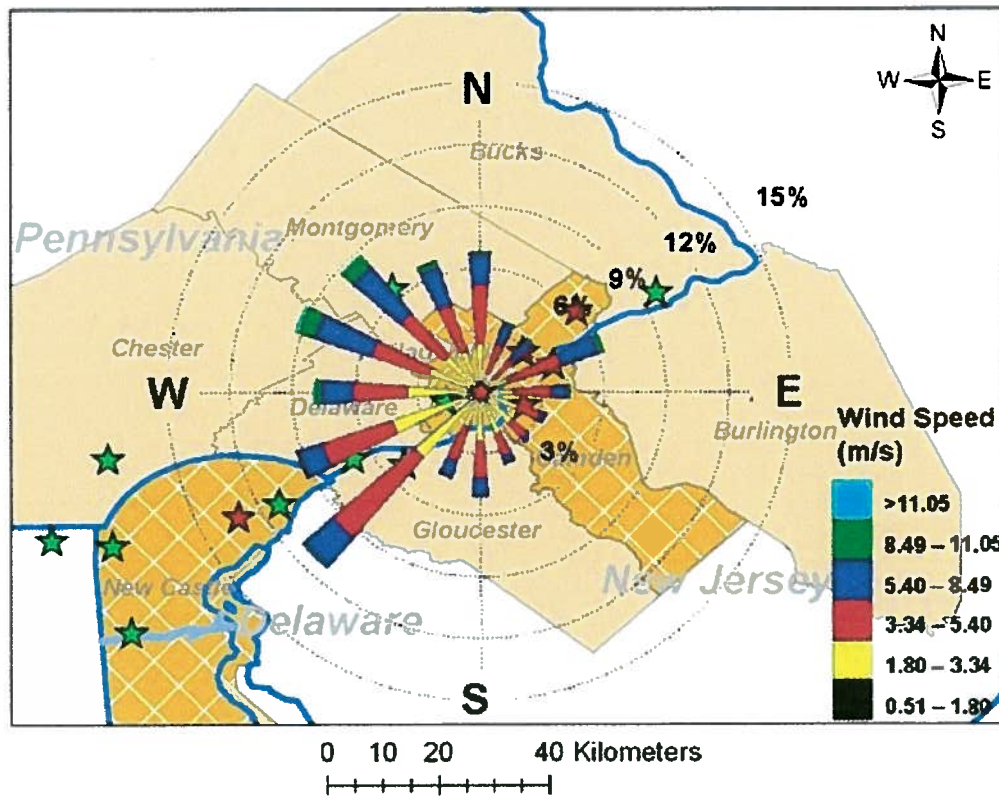
¹⁵ <http://climate.met.psu.edu/features/other/rose/roseindex.php>

Table 6-1 Premcor Refinery reductions

Year	NOx	SO2	PM _{2.5}	Total
2002	3,555	31,617	905	38,079
2012	2,761	2,171	577	7,521
% Reduction	22%	93%	36%	80%

Figure 6-1

Wind Rose Overlay of Hourly Philadelphia Wind Data From 1961 Through 1990



7. Geography/topography (mountain ranges or other air basin boundaries) Not applicable to Delaware. The terrain is relatively flat.

8. Jurisdictional boundaries

All of NCC is under the jurisdictional authority of the State of Delaware. Air quality issues are handled by a single agency, the Delaware Department of Natural Resources and Environmental Control.

Delaware does not participate as a member of Delaware Valley Regional Planning Commission, which serves PA and NJ mobile planning efforts. The one exception is to agree on regional mobile budgets after SIPs are submitted. As such, there have been no coordinated planning efforts for mobile control measures between Delaware, NJ and PA for PM_{2.5}. Mobile source controls are planned and implemented exclusively through DNREC, DELDOT and the Wilmington Area Planning Council. In addition, such coordination is not necessary, as discussed in Section 4 of this document.

Designating NCC as a stand alone non-attainment area, separate from the Philadelphia C/MSA, will continue to simplify administrative and legal authorities relative to non-attainment requirements. Delaware will continue to actively interact with EPA and the regional planning organizations (OTC, MANEVU).

9. Level of control of emission sources

Table 9-1 shows New Castle County ranked number one in the C/MSA for 2002 emissions. However, since then Delaware has implemented a wide-ranging strategy for Ozone and PM control measures, which placed it at the top of the tables for emission reductions (see Tables 9-2 and 1-5) through state and federal emission control regulations. Delaware (NCC) has achieved more than three times the reductions of any other county.

Delaware believes that it has eliminated what little impact it had on downwind concentrations in the Philadelphia C/MSA.

Table 9-1 TPY Reductions (2002- 2012)

COUNTY	NOX	PM _{2.5}	SO2	TOTAL
New Castle	14,584	539	37,584	52,707
Delaware	9,840	-473	7,781	17,148
Philadelphia	8,449	-25	2,660	11,084
Montgomery	10,419	-86	382	10,715
Burlington	7,432	195	2,460	10,087
Gloucester	5,651	-133	3,860	9,378
Camden	7,336	157	1,125	8,617
Bucks	7,493	-95	266	7,664
Chester	6,844	-191	844	7,497

Table 9-2 Percent Reductions

COUNTY	NOX	PM _{2.5}	SO2	TOTAL
New Castle	47	16	75	62
Camden	50	11	59	47
Burlington	42	9	72	43
Gloucester	40	-9	54	41
Delaware	42	-21	49	41
Montgomery	41	-2	7	31
Bucks	38	-3	7	29
Chester	37	-6	15	28
Philadelphia	28	-1	28	26

Table 9-3 Changes in emission density due to controls

COUNTY	NOX	PM _{2.5}	SO2	TOTAL
New Castle	47%	16%	75%	62%
Camden	50%	11%	59%	47%
Burlington	42%	9%	72%	43%
Gloucester	40%	-9%	54%	41%
Delaware	42%	-21%	49%	41%
Montgomery	41%	-2%	7%	31%
Bucks	38%	-3%	7%	29%
Chester	37%	-6%	15%	28%
Philadelphia	28%	-1%	28%	26%

SUMMARY:

In summary, the boundaries of New Castle County (NCC) encompass the full area (City of Wilmington) that is violating the standard, based on the MLK monitor. The MLK monitor in Wilmington is the only monitor in NCC showing nonattainment. All of the other monitors in Delaware and adjacent counties in Maryland, New Jersey and Pennsylvania (downwind and upwind) are monitoring attainment. In addition, Delaware emissions have been significantly reduced since 2002, and do not impact PM_{2.5} non-attainment in the Philadelphia C/MSA.

1. DNREC has found that the three NCC monitors outside the downtown area of the City of Wilmington, and the nearby monitors in Pennsylvania, Maryland and New Jersey indicate that, moving away from the downtown Wilmington area, the relatively high downtown concentrations drop off quickly to below the NAAQS within the boundaries of NCC, and adjacent monitors in Maryland, Pennsylvania and New Jersey are monitoring attainment.¹⁶ These other monitors are placed in areas which represent most of the compass, thereby “encircling” the MLK monitor with “clean” ones. Moreover, the closest monitor above the standard is in Center City Philadelphia (Broad Street), which is about 30 miles away from the MLK monitor.

2. EPA has indicated that there are no presumptive boundaries for the 24-hour standard, unlike the annual standard. EPA guidance states that, *EPA anticipates that the same boundaries established for implementing the annual PM_{2.5} standard may also be appropriate for implementing the 24-hour PM_{2.5} NAAQS in areas where both standards are violated. Adopting this approach may more easily facilitate overall air quality planning for attaining the suite of PM_{2.5} standards.* 2009 modeling for the annual standard shows attainment for all counties in the C/MSA. Since there were no joint air quality plans with PA and NJ for attaining the annual standard, we do not anticipate that attaining the 24-hour NAAQS through the “overall air quality planning” will be necessary either. More to the point, the Regional Planning Organizations which include DE, PA and NJ are already working together reducing SO₂, NO_x and PM under the regional visibility consultations. Joint efforts would actually increase the administrative burden, and would most likely be redundant.

3. Delaware County, PA adjoins NCC and is monitoring attainment of the standard. It also separates NCC from Philadelphia County, which has the only monitors in PA-Philadelphia C/MSA that are not attaining the standard (Philadelphia also has one attaining monitor). New Jersey’s Gloucester County adjoins NCC, and is also monitoring attainment of the standard with a very low design value of 28 ug/m³.

4. Commuters from NCC constitute less than one (1) percent of total commuters to Philadelphia.¹⁷ Many of these commuters likely use SEPTA, and thus not polluting by driving. Even assuming none of the commuters use SEPTA, the sum of NO_x, SO₂ and PM_{2.5} attributable to Delaware commuters is still less than one percent (1%) of the total C/MSA emissions.

¹⁶ There are four (4) attaining monitors in three (3) counties (New Castle, Delaware and Philadelphia) between the MLK monitor and the Broad Street monitor

¹⁷ <http://www.census.gov/population/www/cen2000/commuting.html>

5. Delaware emissions do not significantly impact any part of the Philadelphia C/MSA, based on EPA CAIR modeling.¹⁸ EPA CAIR modeling (Technical Support Document) indicates all of Delaware (not just NCC) contributes only 0.15 ug/m³, or less than one (1) percent [0.15/16.2] of the PM_{2.5} mass at Broad Street.

6. DNREC believes that the New Castle, Philadelphia and Camden Counties nonattaining monitors are not due to transport *within* the C/MSA, but rather long-range transport and/or local sources, e.g., based on EPA modeling emissions from a broad area encompassing the states of Ohio, Indiana, Pennsylvania, Michigan, West Virginia, New York, Maryland, District of Columbia, New Jersey, North Carolina, and Illinois impact Delaware (i.e., an area much broader than the Philadelphia C/MSA boundaries).

7. The wind rose shows most of Philadelphia's upwind sources to be coming from lower New Castle County (below the canal) and beyond. The one significant PM_{2.5} source (Valero) that is in lower NCC has recently been greatly controlled, which means that there are now insignificant emissions from Delaware to PA from that that wind direction.

¹⁸Air Quality Modeling Technical Support Document for the final CAIR, Docket No. EPA-HQ-OAR-2003-0053-2151