Commonwealth of Pennsylvania
Department of Environmental Protection

DESIGNATION RECOMMENDATIONS FOR THE 2012 ANNUAL FINE PARTICULATE MATTER ($PM_{2.5}$) NATIONAL AMBIENT AIR QUALITY STANDARD

DECEMBER 2013

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Designation Recommendations for the 2012 Annual PM2.5 NAAQS

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What is this document?

The federal Clean Air Act (CAA) provides a mechanism for states to make recommendations to the United States Environmental Protection Agency (EPA) on the designation of areas not meeting the health-based National Ambient Air Quality Standards (NAAQS).

In this document, the Commonwealth of Pennsylvania (Commonwealth) is making recommendations to EPA concerning the designation of attainment and nonattainment areas in Pennsylvania for the revised annual fine particulate matter NAAQS (78 FR 3086; Jan. 15, 2013). The Commonwealth's designation recommendations are based on air quality monitoring data for 2010-2012 and other available information, including particulate-forming emissions, meteorology, geography, topography, jurisdictional boundaries and demographics. Since EPA anticipates making final designations in December 2014 using air quality monitoring data for 2011-2013, the Department of Environmental Protection (DEP) will continue to work with EPA during the process leading to EPA's promulgation of the final designations.

What is fine particulate matter?

Particulate matter (PM) includes both solid and liquid particles suspended in the air. PM is chemically and physically diverse and originates from a variety of human and natural activities. PM is composed of particles in a wide range of sizes. Smaller particles pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as fine particulate matter ($PM_{2.5}$) and generally pose the largest health risks, because their small size allows for penetration deep into the lungs. $PM_{2.5}$ is primarily composed of sulfates, nitrates, organic carbon, elemental carbon and crustal material.

$PM_{2.5}$ may either be directly emitted from a source ("primary" particulate, also called "direct" emissions of particulate) or formed in the atmosphere by chemical reaction of gaseous precursors ("secondary" particulate). Precursors of $PM_{2.5}$ can include sulfur dioxide, nitrogen oxides (NO_X), volatile organic compounds (VOC), and ammonia (NH_3). $PM_{2.5}$ and its precursors result mainly from fuel combustion (motor vehicles, power plants and nonroad engines) and industrial processes.

$PM_{2.5}$ is a significant air pollution problem in parts of Pennsylvania. Reducing concentrations of $PM_{2.5}$ is important because levels above the health-based standard are a serious human health threat and also can cause or contribute to other negative environmental impacts.

What is the NAAQS for $PM_{2.5}$? The EPA sets NAAQS based on its review of existing scientific knowledge about the adverse health and welfare effects. The CAA requires EPA to review and update periodically, if necessary, every NAAQS to "protect public health with an adequate margin of safety" based on the latest, best-available science (CAA § 109(d), 42 U.S.C. § 7409(d)).

Prior to 1997, particulate standards had been based on total suspended particulates and then particles less than 10 micrometers in diameter (PM_{10}). In 1997, EPA revised the NAAQS to reflect the growing body of scientific knowledge that links serious health effects to fine particles. On July 18, 1997, EPA promulgated two new $PM_{2.5}$ standards – an annual average of 15 micrograms per cubic meter ($\mu g/m^3$), and a 24-hour daily average of 65 $\mu g/m^3$ (The PM_{10} standards were retained as an indicator for coarse PM; all areas of Pennsylvania meet this standard.). EPA designated attainment and nonattainment areas for the 1997 standards in December 2004 and published the designations in the *Federal Register* on January 5, 2005, effective on April 5, 2005 (70 FR 944).

On October 17, 2006, EPA published a revised 24-hour standard for $PM_{2.5}$, lowering the standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. EPA retained the annual standard for $PM_{2.5}$ of 15 $\mu g/m^3$. EPA also retained the daily standard for PM_{10} of 150 $\mu g/m^3$ but revoked the annual standard of 50 $\mu g/m^3$ (No area in Pennsylvania violates the PM_{10} standard.). On November 13, 2009, EPA published the $PM_{2.5}$ nonattainment areas designations for the 2006 $PM_{2.5}$ standards, with an effective date of December 14, 2009 (74 FR 58688).

On December 14, 2012, EPA revised the $PM_{2.5}$ NAAQS annual health-based standard (the "primary" standard), lowering the existing standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$, with an effective date of March 18, 2013 (78 FR 3086). EPA retained the $PM_{2.5}$ 24-hour standard of 35 $\mu g/m^3$, as well as the existing PM_{10} 24-hour standard of 150 $\mu g/m^3$. EPA retained the secondary annual standard of 15 $\mu g/m^3$ and the secondary 24-hour standard of 35 $\mu g/m^3$, though EPA revised the form of the secondary annual standard to remove the option for spatial averaging to be consistent with the primary annual standard. EPA had proposed to set a separate secondary 24-hour standard for PM-related visibility effects, but after further review, determined that the existing 24-hour secondary standard of 35 $\mu g/m^3$ provides adequate protection of public welfare with regard to visual air quality. EPA's new annual $PM_{2.5}$ standard is expected to provide significantly increased health and environmental protection.

Health Effects. Millions of Pennsylvanians live in areas where the $PM_{2.5}$ health-based standards are exceeded. Fine particles generally pose greater health risks than larger particles. Because of their small size (less than one-seventh the average width of a human hair), fine particles can lodge deeply into the lungs. Health studies have shown a significant association between exposure to $PM_{2.5}$ and premature mortality. Studies have also linked exposure to $PM_{2.5}$ with other significant health problems, including aggravation of respiratory and cardiovascular disease, lung disease, decreased lung function, asthma attacks, increases in respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, and certain cardiovascular problems such as heart attacks and cardiac arrhythmia. Individuals particularly sensitive to $PM_{2.5}$ exposure include older adults, people with heart and lung disease, and children.

Environmental Effects. Fine particles are the major cause of reduced visibility (haze) in certain parts of the United States, including many national parks. Fine particles cause visibility impairment by scattering and absorbing light before it reaches an observer. In the Eastern United States, haze has reduced the average visual range from approximately 90 miles in the absence of manmade pollution to 15 to 25 miles. In addition, components of $PM_{2.5}$, such as nitrates and sulfates, contribute to acid rain formation. Acid rain makes lakes, rivers, and streams unsuitable

for many fish, and erodes buildings, historical monuments, and paint on cars. $PM_{2.5}$ and its precursor pollutants can be carried over long distances by wind and then settle on ground or water. This changes the nutrient balance in coastal waters and large river basins, contributing to fish kills and algae blooms in sensitive waterways, such as the Chesapeake Bay. The settling of $PM_{2.5}$ also depletes the nutrients in soil, damages sensitive forests and farm crops, and affects the diversity of ecosystems. Soot, a type of $PM_{2.5}$, stains and damages stone and other materials.

What is the process for designating areas?

Section 107 (d)(1)(B) of the CAA requires EPA to designate areas after promulgating a new NAAQS (CAA § 107(d)(1)(B), 42 U.S.C. § 7407(d)(1)(B)). Following promulgation of new or revised air standards, Governors are given the opportunity to submit recommendations for attainment and nonattainment areas, supported by the most recent quality-assured monitoring data. EPA provides criteria for states' recommendations for designating areas.

Governors' designation recommendations for the revised $PM_{2.5}$ NAAQS must be submitted to EPA by December 13, 2013, within one year after the promulgation of the revised NAAQS. EPA may make modifications and promulgate all or part of a Governor's recommendations. If EPA determines that a modification to the recommendation is necessary, EPA will notify the state no later than 120 days prior to promulgating the designations. This provides an opportunity for the state to work with EPA, if the state believes EPA's decisions are not appropriate.

This document contains Pennsylvania's designation recommendations for the revised annual $PM_{2.5}$ health-based standard. The recommendations are based on 2010-2012 air quality monitoring data, because 2012 is the most recent full-year of quality-assured and quality-controlled data available. EPA is required to make final $PM_{2.5}$ designations by December 2014. EPA's final designations will most likely be based on 2011-2013 air quality monitoring data.

Section 189(a)(2)(B) of the CAA requires that the $PM_{2.5}$ attainment demonstration State Implementation Plan (SIP) revisions will be due to EPA in June 2016, 18 months after final designations are expected to be effective (CAA § 189(a)(2)(B), 42 U.S.C. § 7513a(a)(2)(B)). As provided in CAA § 188(c)(1), the attainment date for each nonattainment area classified moderate for the 2012 annual $PM_{2.5}$ NAAQS shall be as met as expeditiously as practicable, but no later than the end of the sixth calendar year after the area was designated nonattainment, or by December 2020 (42 U.S.C. § 7513(c)(1)). EPA has indicated that it will initially classify all nonattainment areas as 'moderate' nonattainment areas, consistent with CAA § 188(a), 42 U.S.C. § 7513(a).

The Department provided notice of a public comment period on the proposed designation recommendations in the *Pennsylvania Bulletin* on November 2, 2013 (43 *Pa. B.* 6598). The public comment period closed November 18, 2013. Comments were received from two commentators during the public comment period. A brief summary of the comments and the Department's responses can be found in the Comment and Response Document.

Designation Methodology

EPA Guidance for $PM_{2.5}$ Designation Boundaries. On April 16, 2013, EPA issued a guidance memorandum, *Initial Area Designations for the 2012 Revised Primary Annual Fine Particle National Ambient Air Quality Standard* (Designations Guidance). EPA explains in the Designations Guidance that nonattainment area boundaries will encompass the area(s) that violate(s) the standard and the nearby areas that contribute to the violations. EPA explains in the Designations Guidance that it intends to begin its analysis of what areas contribute to a violating area by considering those counties in the entire metropolitan area (for instance, the Core Based Statistical Area (CBSA) or Combined Statistical Areas (CSA)) in which the violating monitor(s) is (are) located; and to evaluate any adjacent counties to the CBSA or CSA that have the potential to contribute to the violations. EPA explains that it does not presume that the CBSA or CSA constitutes the nonattainment area boundary, however. EPA describes criteria that states should examine when recommending nonattainment area boundaries. The factors include air quality data, emissions and emissions related data, meteorology, geography, topography, and jurisdictional boundaries. Pennsylvania used this Designations Guidance, as described below, when developing designation recommendations for the 2012 annual $PM_{2.5}$ NAAQS.

The Department's Approach. The Department has strived to provide continuity of existing air quality planning efforts in its recommendations for the 2012 annual $PM_{2.5}$ NAAQS, wherever appropriate. In central and eastern Pennsylvania, previous designations generally followed county boundaries and, in part, the U.S. Office of Management and Budget's (OMB) boundaries for Metropolitan Statistical Areas (MSA) and CSAs. The OMB-defined areas are defined primarily by having a high degree of social and economic integration measured by commuting ties with outlying counties. Where EPA's designations did not follow these boundaries in the past, EPA tended to make the nonattainment area smaller than the MSA, CBSA or CSA. Pennsylvania's recommendations for the 2012 annual $PM_{2.5}$ NAAQS use existing nonattainment area boundaries, where appropriate.

The Department has also considered the five factors recommended by EPA in its Designations Guidance, and other sources of information relevant to $PM_{2.5}$ designations. In some cases, an analysis of these factors suggested that one or more counties in the MSA, CBSA or CSA should be recommended as attainment or unclassifiable/nonattainment.

Designation Recommendations for the 2012 Annual PM2.5 NAAQS

Attainment Areas
Of the 37 network monitors in Pennsylvania, 28 monitors in 19 counties did not show violations of the 2012 annual $PM_{2.5}$ NAAQS. The design values for each monitor in Pennsylvania are listed in Table 1. A design value for the 2012 annual $PM_{2.5}$ NAAQS is the 3-year average (in this case, 2010 to 2012) of the annual average concentration for each monitor.

Nonattainment Areas
There are 10 monitors in eight counties that are violating the 2012 annual $PM_{2.5}$ NAAQS: the counties are Allegheny, Cambria, Chester, Delaware, Lancaster, Northampton, Philadelphia and Westmoreland Counties. The design values for each monitor in Pennsylvania are listed in Table 1 below, with Appendix B, Figure B-1 showing a map of the 2012 $PM_{2.5}$ design values for all of the $PM_{2.5}$ monitors in Pennsylvania.

Unclassifiable/Attainment Areas
At this time, the Department is recommending that all other counties in Pennsylvania that do not have ambient air monitoring data be designated as unclassifiable/attainment.

Discussion of Related Factors
EPA recommends that states look at a number of factors in making their recommendations for the 2012 annual $PM_{2.5}$ NAAQS designations. In attachment 3 of EPA's Designations Guidance, EPA suggests using a five-factor approach, which includes the consideration of the following factors: (1) air quality data; (2) emission and emissions-related data; (3) meteorology; (4) geography and topography; and (5) jurisdictional boundaries. The Department has considered these factors and sources of information relevant to $PM_{2.5}$ designations, and provides a general discussion of this information as follows:

Air Quality Data. The Commonwealth's recommendations are based on the 2012 $PM_{2.5}$ design values (using the 2010, 2011 and 2012 monitored data). Table 1 (relating to design values by monitor) lists these design values by monitor site, in descending order of design value, including only the monitors with three full years of monitoring data. Information pertaining to monitors with design values exceeding the 2012 annual $PM_{2.5}$ NAAQS is identified in bold.

Table 1: Design Values by Monitor (2010 – 2012)

County	Site Name	AIRS Code	Design Value (in µg/m^3)
Allegheny	**Liberty**	**42-003-0064**	***14.8***
Philadelphia	**AMS Laboratory**	**42-101-0004**	***13.4***
Allegheny	**Avalon**	**42-003-0002**	***13.4***
Northampton	**Freemansburg**	**42-095-0025**	***13.2***
Delaware	**Chester**	**42-045-0002**	***13.1***
Westmoreland	**Greensburg**	**42-129-0008**	***12.6***
Allegheny	**North Braddock**	**42-003-1301**	***12.5***
Chester	**New Garden**	**42-029-0100**	***12.3***
Cambria	**Johnstown**	**42-021-0011**	***12.3***
Lancaster	**Lancaster**	**42-071-0007**	***12.1***
Beaver	Beaver Falls	42-007-0014	*12.0*
Dauphin	Harrisburg	42-043-0401	*11.9*
Washington	Charleroi	42-125-0005	*11.9*
York	York	42-133-0008	*11.7*
Allegheny	Harrison 2	42-003-1008	*11.7*
Armstrong	Kittanning	42-005-0001	*11.7*
Adams	Arendtsville	42-001-0001	*11.6*
Erie	Erie	42-049-0003	*11.3*
Allegheny	Lawrenceville	42-003-0008	*11.1*
Washington	Washington	42-125-0200	*11.1*
Philadelphia	Ritner	42-101-0055	*11.0*
Cumberland	Carlisle	42-041-0101	*11.0*
Bucks	Bristol	42-017-0012	*10.9*
Philadelphia	CHS (Broad St)	42-101-0047	*10.9*
Berks	Reading Airport	42-011-0011	*10.9*
Allegheny	Clairton	42-003-3007	*10.9*
Philadelphia	FAB (Spring Garden St)	42-101-0057	*10.8*
Northampton	Lehigh Valley	42-095-0027	*10.6*
Mercer	Farrell	42-085-0100	*10.6*
Allegheny	South Fayette	42-003-0067	*10.5*
Montgomery	Norristown	42-091-0013	*9.8*
Blair	Altoona	42-013-0801	*9.8*
Centre	State College	42-027-0100	*9.5*
Allegheny	North Park	42-003-0093	*9.4*
Lackawanna	Scranton	42-069-2006	*9.1*
Monroe	Swiftwater	42-089-0002	*8.0*
Washington	Florence	42-125-5001	*7.2*

Most of the monitors exceeding the annual $PM_{2.5}$ standard are in the southwest and southeast areas of the Commonwealth. Specifically, they are in Allegheny, Cambria, Chester, Delaware, Lancaster, Northampton, Philadelphia and Westmoreland counties.

A map showing the 2012 annual $PM_{2.5}$ design values across Pennsylvania is attached in Appendix B, Figure B-1. The monitors exceeding the 12 $\mu g/m^3$ standard are displayed in red (with rounding, design values of 12.05 are considered to be exceeding the standard). The Commonwealth is recommending that all of these areas be designated nonattainment for the 2012 annual $PM_{2.5}$ NAAQS.

Emissions and Emissions Related Data.

Stationary Point Sources. The Department prepares an emission inventory for all criteria pollutants from all sectors every three years. Only stationary source data is available every year; the most recent full inventory was for the year 2011, and was submitted to EPA for review and input for the 2011 National Emissions Inventory (NEI). Figures B-2 through B-5 in Appendix B show the $PM_{2.5}$ precursor emissions per square mile for stationary point sources, which are sources for which the Department collects individual emissions-related information. Stationary point sources include major manufacturing operations and power plants. Figures B-11 through B-14 show similar information for specific point sources.

Area Sources. Figures B-6 through B-10 (Emission Density for Area Sources) in Appendix B show $PM_{2.5}$ precursor emissions per square mile, including emissions resulting from:

- Stationary area sources, which are the industrial, commercial, and residential sources too small or too numerous to be handled individually, such as commercial and residential open burning, architectural and industrial maintenance coatings application and clean-up, consumer product use, and vehicle refueling at service stations.

- Highway vehicles, which include passenger cars and light-duty trucks, other trucks, buses and motorcycles; and

- Nonroad sources, which consist of a diverse collection of engines, including engines in outdoor power equipment, recreational vehicles, farm and construction machinery, lawn and garden equipment, industrial equipment, recreational marine vessels, commercial marine vessels, locomotives, ships, aircraft and many other such sources.

Stationary area source emissions of NH_3 are primarily concentrated in the areas with high concentrations of agriculture, including areas of animal and crop operations. Stationary area source emissions of the other $PM_{2.5}$ precursors tend to be more concentrated in populated areas as a result of vehicle traffic or combustion sources.

Highway and nonroad emissions of NO_X, direct $PM_{2.5}$ and VOC have been declining and will continue to do so, as national and state controls on new highway vehicles, nonroad equipment and motor vehicle fuels come into effect, and older vehicles are replaced.

Population, urbanization, traffic, commuting, and growth factors are the primary determinates of the OMB's designation of metropolitan and micropolitan statistical areas and were used extensively by Pennsylvania in its recommendations, and to a lesser extent, by EPA in its final designations, for the 1997 $PM_{2.5}$ standard. For the 2006 24-hour standard, EPA explicitly stated that these area boundaries would no longer be presumed to define nonattainment areas. The Commonwealth, however, has emphasized continuity of planning for attainment of the 2012 annual $PM_{2.5}$ NAAQS. Consequently, the Commonwealth's recommended boundaries take these factors into account. Figure B15 shows population density by county and Figure B16 shows population growth between 2000 and 2010.

Meteorology, Geography and Topography. Many regions across the Commonwealth have weather that is influenced by topography. There are many areas of river valleys and higher terrain across western Pennsylvania that influence the way wind flows across the region. Topography also enhances the strength of morning inversions when they form. Morning inversions are a key meteorological feature that contributes to higher daily levels of $PM_{2.5}$ across a region. Various areas contend with the influences of the Appalachian Mountains, as well. The changes in local elevation become less drastic in southcentral and southeastern portions of the Commonwealth. The Philadelphia area, by contrast, has relatively few topographic features that restrict airflow.

Wind direction and speed are important meteorological factors to consider. Wind can weaken or improve air quality conditions. Strong winds can transport PM emissions or their precursors regionally, while weak winds can lead to the accumulation of emissions on a local basis. Figures 1 and 2, below, show wind roses for the western and eastern portions of Pennsylvania, respectively. These images are taken from the EPA PM online tool (http://geoplatform2.epa.gov/PM_Map/), which shows wind data averaged over the 2009-2012 time period in the form of wind roses, from National Weather Service sites. Figure 1 shows a map of wind roses in western Pennsylvania. The wind roses in this area indicate that the wind primarily comes from the west or southwest. Figure 2 shows a map of wind roses in eastern Pennsylvania. The wind roses in this area indicate that the wind primarily comes from the west and northwest.

Figure 1: Wind Roses for Western Pennsylvania

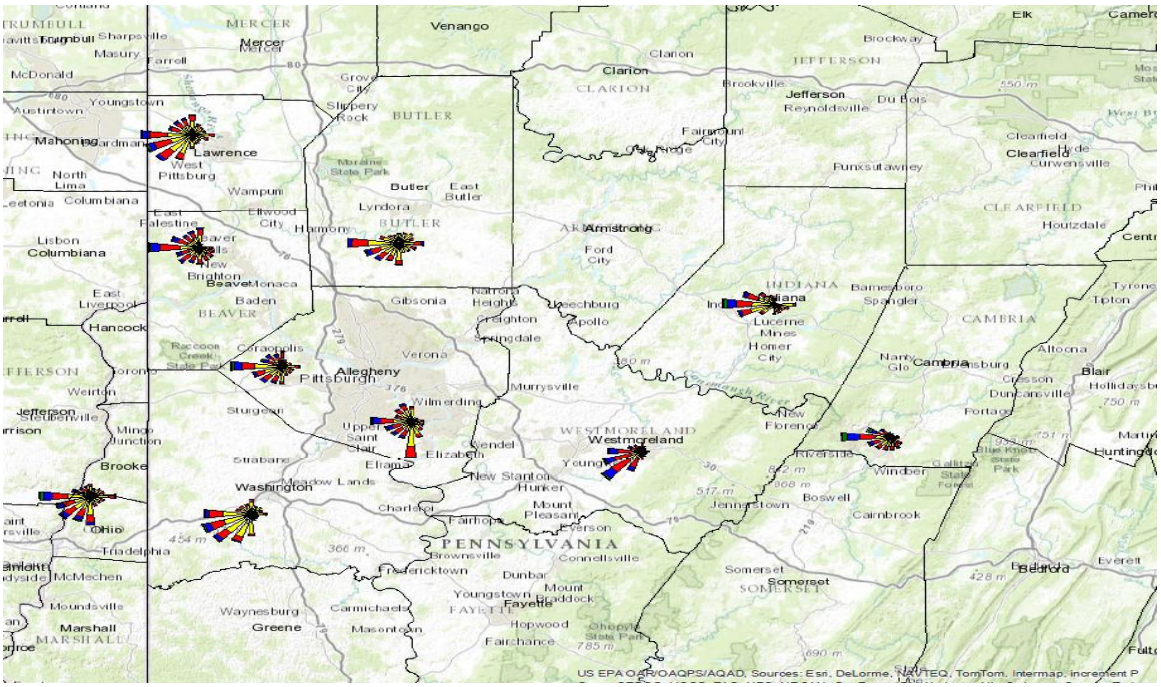
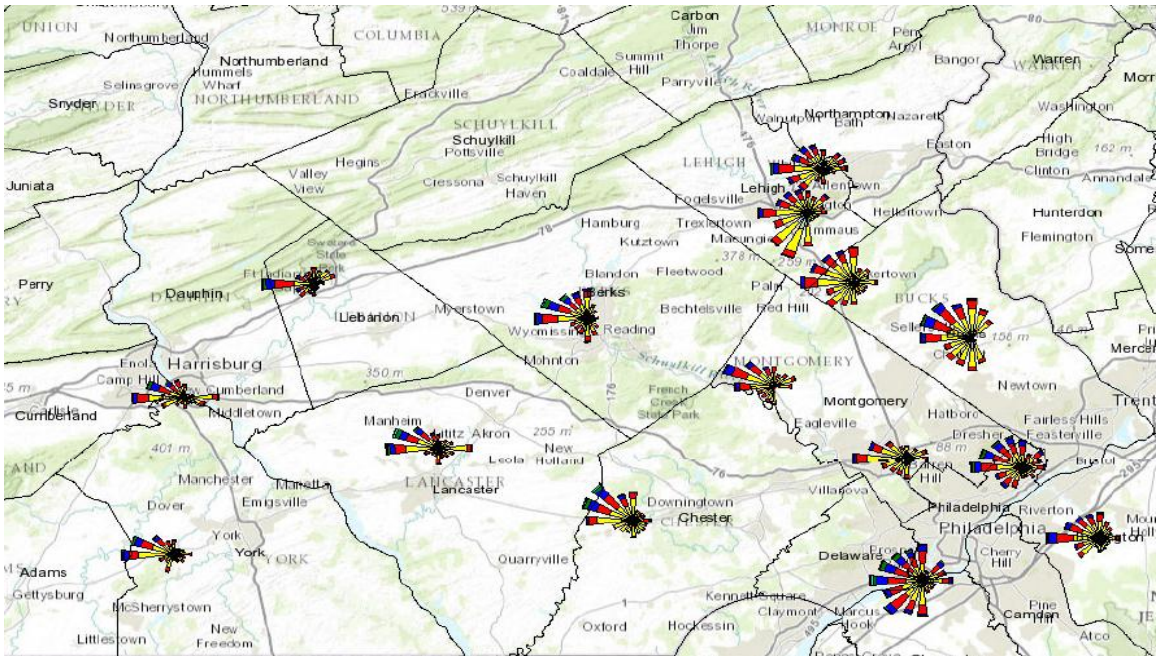


Figure 2: Wind Roses for Eastern Pennsylvania



The Department has conducted meteorological, geographical and topographical analysis for the monitors in the recommended nonattainment areas. These analyses are contained in Appendix C (relating to Meteorological, Geographical and Topographical Analysis for Recommended Nonattainment Areas).

Jurisdictional Boundaries. The Department recommends the use of county boundaries because these are the same boundaries used by the Commonwealth's regional transportation planning organizations (which are also often economic planning organizations as well). Inventory data for nonpoint sources is also more accurate and available on the county level, which is useful in meeting the requirements in nonattainment areas for emission inventory information and for reasonable further progress (incremental emission reductions). While EPA does not presume that the CBSA or CSA should be the nonattainment boundary for the areas, EPA considers the CBSA or CSA as a reasonable starting point for analysis of what nearby areas may be contributing to the violation of the NAAQS at a given monitor. Having considered the relevant data, the Department is recommending that the boundaries of nonattainment areas associated with monitors violating the annual $PM_{2.5}$ standard primarily follow the county boundaries. In some cases, the nonattainment area is being recommended to be limited to one partial county or one whole county, while in other cases the nonattainment areas are recommended as a small multi-county area combining two or three counties within a regional transportation planning organization.

Discussion of Designation Recommendations

Recommended Nonattainment Areas

The Commonwealth is recommending the following 2012 annual $PM_{2.5}$ NAAQS nonattainment area designations based upon air quality monitoring data for 2010-2012, the other information described above regarding the factors in EPA's Designations Guidance, and any additional information described below and in the applicable Appendix C. Each of the following descriptions for a recommended area references a corresponding Appendix C that contains a more detailed analysis of the recommended nonattainment area.

Eastern Pennsylvania:

Greater Philadelphia Nonattainment Area: The Commonwealth is recommending that Chester, Delaware and Philadelphia counties be designated as a 2012 annual $PM_{2.5}$ NAAQS nonattainment area. Bucks and Montgomery counties make insignificant contributions to the nonattaining monitors in the traditional five-county Philadelphia area and are excluded from the recommended nonattainment area. Details can be found in Appendix C-1.

Northampton County Nonattainment Area: The Commonwealth is recommending that Northampton County be designated as a 2012 annual $PM_{2.5}$ NAAQS nonattainment area. The Freemansburg monitor in Northampton County is violating the annual standard, while the Lehigh Valley monitor, situated to the northwest of the Freemansburg monitor, shows attainment of the

standard. The Freemansburg monitor had a 2012 design value of 13.2 $\mu g/m^3$, while the Lehigh Valley monitor had a 2012 design value of 10.6 $\mu g/m^3$. Other Pennsylvania counties in this region make insignificant contributions to the nonattainment problem at the Freemansburg monitor. The problem at the Freemansburg monitor appears to be a localized, rather than regional, issue. Details can be found in Appendix C-2.

Southcentral Pennsylvania:

Lancaster County Nonattainment Area: The Commonwealth recommends that Lancaster County be designated as a nonattainment area for the 2012 annual $PM_{2.5}$ NAAQS. Lancaster County is served by a single-county transportation planning agency based on economic, political and commuting patterns. The nonattainment area contains the Lancaster air basin, which defines a common set of sulfur compound controls (25 *Pa Code* § 121.1 and 123.22). Sulfur compounds are an important $PM_{2.5}$ precursor. Lancaster County was designated as a single-county nonattainment area for the 2006 24-hour $PM_{2.5}$ standard and the 1997 and 2008 8-hour ozone standards. Details can be found in Appendix C-3.

Southwest Pennsylvania:

Cambria County Nonattainment Area: The Commonwealth recommends that Cambria County, which includes the City of Johnstown, be designated as a nonattainment area for the 2012 annual $PM_{2.5}$ NAAQS. The nonattainment area contains the Johnstown air basin, which defines a common set of sulfur compound controls (25 *Pa Code* § 121.1 and 123.22). Sulfur compounds are an important $PM_{2.5}$ precursor. Other Pennsylvania counties in this region make insignificant contributions to the nonattainment problem at the Johnstown monitor. The problem at the Johnstown monitor appears to be a localized, rather than regional, issue. Details can be found in Appendix C-4.

Greater Pittsburgh Nonattainment Area: The Commonwealth recommends that Westmoreland and Allegheny counties (with the exception of the Liberty-Clairton area in Allegheny County) be designated as a 2012 annual $PM_{2.5}$ NAAQS nonattainment area. The Liberty-Clairton area of Allegheny County is being recommended as a separate partial-county nonattainment area, as described below. Other Pennsylvania counties in this region make insignificant contributions to the nonattainment problem. Details of the Greater Pittsburgh nonattainment area recommendation can be found in Appendix C-5.

Liberty-Clairton Nonattainment Area: The Commonwealth recommends that the City of Clairton, and boroughs of Glassport, Liberty, Lincoln and Port View be designated as the Liberty-Clairton nonattainment area for the 2012 annual $PM_{2.5}$ NAAQS. The Liberty-Clairton area of Allegheny County has significant differences from the surrounding areas in the county due to local sources and topography. Details can be found in Appendix C-6.

Recommended Attainment Areas

The Commonwealth recommends that EPA designate the following counties as attainment areas, because they have monitors showing attainment of the 2012 annual $PM_{2.5}$ standard and they are not contributing to nonattainment of the standard in another area: Adams, Armstrong, Beaver, Berks, Blair, Bucks, Centre, Cumberland, Dauphin, Erie, Lackawanna, Mercer, Monroe, Montgomery, Washington and York counties.

Recommended Unclassifiable/Attainment Areas

The Commonwealth recommends that EPA designate the counties set forth below as unclassifiable/attainment areas, because they have do not have monitors showing attainment or nonattainment of the 2012 annual $PM_{2.5}$ standard. Additionally, they have not been determined to be contributing to nonattainment of the standard in another area.

The recommended "unclassifiable/attainment areas" counties are provided as follows: Bedford, Bradford, Butler, Cameron, Carbon, Clarion, Clearfield, Clinton, Columbia, Crawford, Elk, Fayette, Forest, Franklin, Fulton, Greene, Huntingdon, Indiana, Jefferson, Juniata, Lawrence, Lebanon, Lehigh, Luzerne, Lycoming, McKean, Mifflin, Montour, Northumberland, Perry, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Venango, Warren, Wayne and Wyoming.

Available Data

Appendix A includes a table that lists the recommendations for annual $PM_{2.5}$ areas, as well as a map showing the Commonwealth's recommendations for the 2012 annual $PM_{2.5}$ nonattainment areas. Appendix B includes documenting material that addresses EPA's designation criteria pertaining to air quality, emissions, and jurisdictional boundaries. Appendix C includes additional designation criteria relating to meteorology, geography and topography.

Conclusions / Summary

In this document, the DEP is making recommendations to EPA, on behalf of the Commonwealth, concerning the designation of attainment, unclassifiable/attainment and nonattainment areas in Pennsylvania for the 2012 annual $PM_{2.5}$ NAAQS. The designation recommendations are based primarily on air quality monitoring data for 2010-2012.

Monitors in the following eight counties are violating the annual NAAQS using 2010-2012 monitoring data: Allegheny, Cambria, Chester, Delaware, Lancaster, Northampton, Philadelphia and Westmoreland counties. The Department is recommending that these counties be designated as nonattainment, and grouped in nonattainment areas as previously discussed and described in Appendix C. In addition, the Department recommends that the Liberty-Clairton area of

Allegheny County be designated as a separate nonattainment area from the Greater Pittsburgh Area for the reasons described in Appendix C-6.

The Department is recommending that counties monitoring attainment of the 2012 annual $PM_{2.5}$ NAAQS be designated as attainment. The Department is recommending that all other counties in Pennsylvania be designated as unclassifiable/attainment. A complete breakdown of designation recommendations for the Commonwealth of Pennsylvania can be found in Appendix A, Table A-1.

ACRONYMS AND TERMS

CAA	Clean Air Act
CBSA	Core Based Statistical Area
CSA	Combined Statistical Area
DEP	Department of Environmental Protection (Pennsylvania)
EPA	Environmental Protection Agency (United States)
FR	Federal Register
$\mu g/m^3$	micrograms per cubic meter (of air)
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NH_3	chemical formula for ammonia
NO_X	oxides of nitrogen
OMB	Office of Management and Budget (United States)
PM	particulate matter
$PM_{2.5}$	particulate matter under 2.5 microns in size
PM_{10}	particulate matter under 10 microns in size
SIP	State Implementation Plan
SO_2	sulfur dioxide
USDOT	United States Department of Transportation
U.S.C.	United States Code
VOC	volatile organic compounds