



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECRETARY

October 3, 2016

Mr. Shawn M. Garvin
Regional Administrator
U.S. Environmental Protection Agency, Region III
1650 Arch Street, (Mail Code: 3RA00)
Philadelphia, PA 19103-2029

Dear Mr. Garvin:

Pursuant to Section 107 of the Clean Air Act (CAA), enclosed please find the Commonwealth of Pennsylvania's designation recommendations pertinent to the 2015 National Ambient Air Quality Standards for ozone, 70 parts per billion as set by the U.S. Environmental Protection Agency (EPA) on October 1, 2015 and published in the *Federal Register* on October 26, 2015 (80 FR 65292). The recommended geographical boundaries for ozone unclassifiable/attainment and nonattainment areas within the Commonwealth's borders were determined in accordance with the guidance set forth in the EPA memorandum issued by Janet McCabe on February 25, 2016 pertaining to the "Area Designations for the 2015 Revised Ozone National Ambient Air Quality Standards."

Prior to finalizing the Commonwealth's ozone designation recommendations, notice announcing three public meetings and an opportunity for public comment were published by the Pennsylvania Department of Environmental Protection (DEP) in the *Pennsylvania Bulletin* on August 20, 2016 (46 Pa.B. 5162). The public meetings on the proposed recommendations were held in Pittsburgh, Harrisburg, and Philadelphia on August 24, 25, and 26, 2016, respectively. A 13-day public comment period was held from August 20 to September 2, 2016. A summary of comments received and DEP's responses are included with the recommendations.

We understand that EPA will provide notice of any modifications to our ozone designation recommendations at least 120 days prior to issuing the final designations in accordance with Section 107(d)(B)(ii) of the CAA (42 U.S.C.A. § 7407(d)(B)(ii)). We fully intend to take advantage of the opportunities prescribed under the CAA to comment on any proposed modifications to our recommendations. We look forward to collaborating with your staff during the development of final eight-hour ozone designations for the Commonwealth.

Thank you in advance for your favorable consideration of Pennsylvania's ozone designation recommendations. Should you have any questions or need additional information during the ozone designation process, please contact Krishnan Ramamurthy, Acting Director, Bureau of Air Quality, by e-mail at kramamurth@pa.gov or by telephone at 717.787.9702.

Sincerely,

Patrick McDonnell
Acting Secretary

Commonwealth of Pennsylvania



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

FINAL
DESIGNATION RECOMMENDATIONS
FOR THE 2015 EIGHT-HOUR OZONE
NATIONAL AMBIENT AIR QUALITY STANDARDS

OCTOBER 2016

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Acting Secretary

Tom Wolf
Governor

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**Designation Recommendations
For the 2015 Eight-Hour Ozone
National Ambient Air Quality Standards**

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What is this document?

Section 107 of the Clean Air Act (CAA), 42 U.S.C. § 7407, provides a mechanism for states to make recommendations to the United States Environmental Protection Agency (EPA) on the designation of areas attaining and not attaining the National Ambient Air Quality Standards (NAAQS).

In this document, the Commonwealth of Pennsylvania (Commonwealth) is making recommendations to EPA concerning the designation of Unclassifiable/Attainment and Nonattainment areas in Pennsylvania for the primary and secondary 8-hour ozone NAAQS revised by EPA on October 1, 2015 (80 FR 65292; October 26, 2015). The designation recommendations for the 2015 ozone NAAQS are based on air quality monitoring data for 2013-2015 and other available information, including ozone-forming emissions and emissions-related data, meteorological data, geography and topography and jurisdictional boundaries. In addition, the Commonwealth may use other factors as part of a weight-of-evidence approach in recommending attainment and nonattainment areas. A full list of the recommendations by area and county and a map are contained in Appendix A.

Since EPA anticipates making final designations by October 1, 2017, using air quality monitoring data that may include 2016, the Pennsylvania Department of Environmental Protection (DEP) will continue to work with EPA during the designation process leading to the promulgation of the final designations.

What is ground-level ozone?

Ozone is not emitted directly to the atmosphere, but is formed by photochemical reactions between volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) in the presence of sunlight. The long, hot, humid days of summer are particularly conducive to ozone formation, so ozone levels are of concern primarily during the months of April through September.

The primary sources of anthropogenic VOCs and NO_x, the ozone precursors, are the evaporation of fuels and solvents (gasoline and consumer products), the combustion of fuels (motor vehicles, power plants and non-road engines), and industrial processes. Biogenic sources of emissions also contribute to ozone formation.

Health effects. Repeated exposure to ozone pollution may cause permanent damage to the lungs. Even when ozone is present in low levels, inhaling it triggers a variety of health problems including chest pains, coughing, nausea, throat irritation, and congestion. Exposure to ozone can also worsen symptoms of bronchitis, heart disease, emphysema, and asthma, and reduce lung capacity. Asthma is a significant and growing health threat to children and adults. Ozone can aggravate asthma, causing more asthma attacks, increased use of medication, more medical treatment and more frequent visits to hospital emergency clinics.

Healthy people also experience difficulty in breathing when exposed to ozone pollution. Because ozone pollution usually forms in hot weather, normally healthy individuals who spend time outdoors in the summer may be affected, particularly children, mature adults, considered individuals older than 64 years of age, outdoor workers and people exercising. Children are most at risk from exposure to ozone because they are active outside, playing and exercising, during the summertime, when ozone concentrations are at their highest. Several million Pennsylvanians live in areas and near areas where the ozone health-based standards are exceeded.

EPA estimates that revising the primary NAAQS for ozone will yield national public health benefits valued between \$2.9 billion and \$5.9 billion versus an estimated cost to comply with the regulation of \$1.4 billion. These national benefits and costs exclude the State of California. Benefits include preventing cases of bronchitis, aggravated asthma, hospital and emergency room visits, nonfatal heart attacks and premature death, among others.

Welfare effects. Ground-level ozone damages plant life and is responsible for hundreds of millions of dollars in reduced crop production in the United States each year. Ozone interferes with the ability of plants to produce and store food, making them more susceptible to disease, insects, other pollutants, and harsh weather. It also damages the foliage of trees and other plants, ruining the landscape of cities, parks and forests, and recreation areas. One of the key components of ozone, NO_x, contributes to fish kills and algae blooms in sensitive waterways, such as the Chesapeake Bay.

What is the NAAQS for ozone?

EPA sets the primary and secondary NAAQS based on its review of existing scientific knowledge about the adverse health and welfare effects of a pollutant. Section 109(d) of the CAA (42 U.S.C. § 7409(d)) requires EPA to review and periodically update, if necessary, the NAAQS to “protect public health with an adequate margin of safety” based on the latest, best-available science.

An ozone standard averaged over eight hours (8-hour standard) was first established in 1997, replacing a 1-hour standard established in 1979 to account for health impacts over longer periods of daily ozone exposure (62 FR 38856, July 18, 1997). The 1997 standard, set at 0.08 parts per million (ppm), effectively became 0.084 ppm because of rounding methods. In 2008, the EPA revised the primary and secondary ozone NAAQS to 0.075 ppm or equivalent to 75 parts per billion (ppb) (73 FR 16436, March 27, 2008).

After evaluating the results of scientific studies available for the 2015 ozone NAAQS review, which included epidemiological, controlled human exposure, and animal toxicological studies, EPA concluded that ozone causes adverse health effects at levels below the primary 2008 ozone NAAQS. Moreover, the human exposure studies were performed with healthy individuals, which means those with existing respiratory illness are even more affected by higher levels of ozone. The more protective primary (health-

based) 2015 NAAQS is set at 0.070 ppm or 70 ppb. EPA also strengthened the secondary (welfare-based) 2015 ozone NAAQS to the level of 70 ppb, making it identical in all respects to the revised primary ozone standard.

What is the process for designating areas?

Section 107(d)(1)(B) of the CAA (42 U.S.C. § 7407 (d)(1)(B)) requires EPA to designate areas as nonattainment, attainment or unclassifiable after promulgating a new or revised NAAQS under Section 109 of the CAA (42 U.S.C. § 7409). Following promulgation of new or revised air NAAQS, governors are given the opportunity under Section 107(d)(1)(A) of the CAA, 42 U.S.C. § 7407(d)(1)(A), to submit recommendations for the designation of attainment and nonattainment areas, supported by the most recent quality-assured monitoring data. EPA provides criteria for states' recommendations for designating areas.

EPA has requested that governors' recommendations for ozone attainment and nonattainment designations be submitted by October 1, 2016, one year after the promulgation of the revised primary and secondary 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 designation, and must give the state an opportunity to demonstrate why the potential modification is inappropriate.

The CAA in section 107(d)(1)(B), 42 U.S.C. § 7407(d)(1)(B), requires EPA to make final ozone designations within two years of promulgation of a new or revised NAAQS unless there is insufficient information. Therefore, EPA anticipates promulgating designations by October 1, 2017, based on the most recent quality-assured data available at the time.

The anticipated schedule for the recommendations of designation and development of SIPs is as follows:

| | |
|-------------------|--|
| September 2, 2016 | Close comment period on ozone designation recommendations |
| October 1, 2016 | State recommendations due to EPA |
| June 3, 2017 | EPA notifies Pennsylvania if EPA intends to modify recommendations |
| July 3, 2017 | EPA public comment period on draft designations |
| August 2, 2017 | Deadline for states to submit additional information |
| October 1, 2017 | EPA's final designations |

The DEP held public informational meetings in the DEP regional offices in Harrisburg on August 24, 2016 in Harrisburg, in Norristown on August 25, 2016 and in Pittsburgh on August 25, 2016 to explain the proposed ozone designation recommendations. DEP accepted public comment on the proposed ozone designation recommendations through September 2, 2016. Notice of the public meetings and the opportunity for public comment was published in the Pennsylvania Bulletin on August 19, 2016.

Five commentators submitted twenty four comments that the Department considered when finalizing its recommendations (See Appendix E). The changes from proposed to final are detailed in the section *Pennsylvania's Ozone Designation Recommendations*.

The ozone State Implementation Plan (SIP) revisions, outlining how each nonattainment area will reduce pollution to meet the 2015 8-hour ozone NAAQS, will be due to the EPA in October 1, 2020, three years after final designations are expected to be effective. The EPA is expected to classify areas in accordance with CAA § 181(a)(1) at the same time it makes final designations; requirements and attainment dates may vary based on the severity of the problem in the area, as indicated by the area's classification.

What would be the effects of designation as nonattainment?

The CAA contains different regulatory requirements for new or modified stationary sources in areas designated as nonattainment for a NAAQS. In addition, the “conformity” provisions of the CAA apply only in nonattainment and maintenance areas; transportation plans and federally funded actions and projects must conform to the SIP in order not to interfere with NAAQS attainment and maintenance.

However, because ground-level ozone and ozone precursor emissions are pervasive and easily transported, Congress established an Ozone Transport Region (OTR), consisting of 13 states and the District of Columbia, stretching from Northern Virginia to Maine. Section 184 of the CAA, 42 U.S.C. § 7511c(a). As a result of Pennsylvania's inclusion in the OTR, the entire Commonwealth is considered a “moderate” nonattainment area for purposes of regulating stationary sources and for the specific requirements in the OTR-related portions of the CAA. Pennsylvania has already fulfilled these requirements in its development of the SIPs for the 1979 1-hour ozone NAAQS and the 1997 8-hour ozone NAAQS. Pennsylvania has also adopted many regulations that are in effect at both the local and state level that ensure attainment and maintenance both within its borders and to help reduce its contribution to ozone pollution in downwind areas. The Commonwealth is also included in the Cross State Air Pollution Rule (CSAPR) currently being administered by EPA. According to EPA, CSAPR will reduce emissions of ozone precursors by 54 percent from 2005 levels in the eastern United States. The EPA has approved redesignation requests (to attainment status) and maintenance plans for most of those counties that were designated as nonattainment under the 1997 primary and secondary ozone NAAQS; these maintenance plans include specific permanent and enforceable control measures. Most measures in effect in an area previously designated as nonattainment of a prior ozone NAAQS will continue to stay in effect even if the area has attained the prior ozone NAAQS or is designated as attainment for the 2015 ozone NAAQS. For the 2008 ozone NAAQS, five areas (Figure A-2) in the Commonwealth were designated nonattainment. Three of those areas have received clean data determinations for the 2008 ozone NAAQS from EPA, while two areas, the Pittsburgh-Beaver Valley Area and the Philadelphia Area, have received 1-year extensions to attain the NAAQS.

To the extent additional state measures are required to attain the revised primary and secondary 2015 8-hour ozone NAAQS, new measures will be developed by Pennsylvania through a public process. The Commonwealth will also work with states in areas that affect and are affected by Pennsylvania's air quality to develop cost-effective measures that will not disadvantage Pennsylvania economically.

Pennsylvania's Ozone Designation Recommendations

EPA guidance for ozone designation boundaries. On February 25, 2016, Janet McCabe, Acting Assistant Administrator for the EPA's Office of Air Radiation, issued a general guidance memorandum entitled, "Area Designations for the 2015 Ozone National Ambient Air Quality Standards." (Designation Guidance.) The Designation Guidance describes criteria that EPA suggests states should examine when determining their recommended nonattainment area boundaries.

EPA recommends that a state use the statistical areas defined by the U.S. Office of Management and Budget (OMB) as a starting point for its recommendations. In addition, EPA recommends analysis of five factors for area-specific recommendations (some of which are similar to the criteria OMB uses to establish statistical areas), particularly if the state is recommending deviations from the boundaries of the statistical areas. The five factors are:

- Air quality data
- Emissions data and emissions-related data
- Meteorology
- Geography and topography
- Jurisdictional boundaries, including political boundaries, transportation planning organizations and existing nonattainment areas

The EPA recommended nine factors for the 2008 ozone NAAQS designations. The four factors previously recommended by EPA that have not been included as part of the five factors for the 2015 ozone NAAQS are population density and degree of urbanization, traffic and commuting patterns, population growth rates and patterns, and level of control on emissions sources. EPA still includes population and degree of urbanization and traffic commuting patterns under one of the five factors: emissions and emissions-related data. States may still consider other relevant data to determine nonattainment boundaries for the 2015 8-hour ozone NAAQS designations. Pennsylvania will still consider other factors outside of the five factors.

Pennsylvania will consider population growth rates, population density, emissions density and other factors in addition to the five factors given by EPA in order to establish similarities and differences between neighboring counties and multi-county areas. This will allow Pennsylvania to determine the appropriateness of including a county or area with another area for the purpose of developing recommendations for ozone designations.

Discussion about statistical areas. Section 107(d)(1) of the CAA defines an area as nonattainment if it is violating the NAAQS or if it is contributing to a violation in a

nearby area. 42 U.S.C. § 7407(d)(1). Ozone and ozone precursors are readily transported, so EPA believes it is important to examine emissions across a relatively broad geographic area. EPA recommends using the Core-Based Statistical Area (CBSA) where appropriate or Combined Statistical Area (CSA) (which includes two or more adjacent CBSAs) associated with the violating monitor(s) as a starting point. A CBSA consists of a county or counties containing at least one urban core plus adjacent counties that have a high degree of social and economic integration with the urban core as measured by commuting ties. If a violating monitor is not located in a CBSA or CSA, EPA recommends using the boundary of the county as the starting point for defining a nonattainment area. EPA used the same conceptual approach in the designation process for the 1997 and 2008 ozone NAAQS.

The OMB defines statistical areas. The criteria on which statistical areas are based are contained in a notice of decision, *Standards for Defining Metropolitan and Micropolitan Statistical Areas* (75 FR 37246; June 28, 2010). DEP based its nonattainment area boundary recommendations in this document on OMB Bulletin No. 13-01 (February 2013), *Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance and Uses of These Areas*, containing the lists of counties in each statistical area. The updated list of statistical areas is available at the following website: <http://www.census.gov/population/metro/>.

A metropolitan statistical area is a CBSA that has an urban area with a population of at least 50,000. It may or may not include outlying counties. A micropolitan statistical area is a CBSA that has an urban area with a population of at least 10,000, but less than 50,000 (with or without outlying counties). A map of relevant CBSAs can be found in Appendix B, Figure B-6. CSAs are formed automatically if two or more adjacent CBSAs have an employment interchange of 25 percent. A map of relevant CSAs can be found in Appendix B, Figure B-7. If the employment interchange is between 15 percent and 25 percent between two or more adjacent CBSAs, a CSA could be formed if local opinion favors the idea. Counties or groups of counties form metropolitan divisions if they have a core population of at least 2.5 million and have commuting ties to adjacent counties.

A county may appear in only one CBSA. If a county is a central county in one CBSA and an outlying county in another, it falls within the CBSA where it is a central county. If a county is an outlying county in two or more CBSAs, the county falls in the CBSA where it has the greatest employment interchange measure.

Example of a Pennsylvania statistical area. The Harrisburg-York-Lebanon CSA is comprised of four metropolitan statistical areas (MSA). Dauphin, Cumberland, and Perry counties comprise one MSA, Harrisburg-Carlisle. All three counties have very strong economic and commuting links with each other so that the area comprises both an MSA and a CBSA. Lebanon County is also one MSA. It is a stand-alone adjacent county that has a core and a separate CBSA. Lebanon County is not as integrated with Dauphin, Cumberland, and Perry Counties as those three counties are with each other. Also, York-Hanover is an MSA within the Harrisburg-York-Lebanon CSA. The Gettysburg MSA is

the fourth MSA in the Harrisburg-York-Lebanon CSA. A map of the OMB core-based statistical areas is provided as Figure B-6 in Appendix B.

Discussion by factor. DEP, on behalf of the Commonwealth, and per EPA guidance, has considered these five factors in order to determine Pennsylvania’s designation recommendations for the 2015 ozone NAAQS:

Air Quality

The Commonwealth’s recommendations are based on the 2015 ozone design values (using the 2013, 2014, and 2015 quality assured ozone monitor data). Figure B-1 in Appendix B is a map of the 2015 ozone design values for all of the ozone monitors. The monitors exceeding the 70 ppb standard are displayed in red. Two areas that were designated nonattainment for the 2008 ozone NAAQS in 2010, specifically the Pittsburgh-Beaver Valley Area and the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Area, have monitors that still exceed the revised 2015 ozone NAAQS. The Allentown-Bethlehem-Easton Area, Lancaster Area, and the Reading Area were designated nonattainment for the 2008 ozone NAAQS, but are now monitoring attainment for the 2015 ozone NAAQS. The Harrisburg-York-Lebanon Area was designated attainment for the 2008 ozone NAAQS, but a portion of this area is monitoring nonattainment for the 2015 ozone NAAQS. Counties in which the ozone monitors do not exceed the 2015 ozone NAAQS are Adams, Beaver, Berks, Blair, Bradford, Cambria, Centre, Clearfield, Dauphin, Elk, Erie, Franklin, Greene, Lackawanna, Lancaster, Lawrence, Lehigh, Lycoming, Luzerne, Mercer, Monroe, Northampton, Somerset, Tioga, Washington, Westmoreland, and York,.

Emissions and Emissions-Related Data

An emissions inventory is an estimate of the emissions from sources in a particular area. The inventory consists of sources in five sectors: stationary point sources, stationary area sources, highway vehicle sources, nonroad sources and biogenic sources.

Table 2 in Appendix B shows the ozone precursor emissions of NO_x and VOC by county. Figures B-2, B-3 and Table 2 in Appendix B show the tons of emissions of NO_x and VOC emitted per square mile. These emissions come from the following sources:

- “Stationary sources” (or “point” sources), which are sources for which the DEP collects individual emissions-related information. Generally, stationary sources are “major” stationary sources for purposes of permitting, but may also include some smaller stationary sources.
- “Stationary area sources,” which are 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.
- “Nonroad sources,” which include a diverse collection of engines and vehicles, including 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 engines and vehicles.
- “Biogenic Source,” include mostly VOC emissions from natural sources such as plants, crops, and trees.

As recommended by EPA in its Designation Guidance, these emissions are based on the last complete three-year National Emissions Inventory (NEI) available, which is the 2011 NEI version 2. Emissions for the 2014 NEI version 1, which was submitted by Pennsylvania to EPA in December 2015 and under EPA review, are significantly less than the emissions in the 2011 NEI version 2.

Population, Urbanization, Traffic, Commuting, and Growth

Population, urbanization, traffic, commuting, and growth are related factors that are the primary determinates of the OMB’s designation of metropolitan and micropolitan statistical areas; therefore, consideration of the statistical area boundary associated with the violating monitor as a starting point for the nonattainment area boundary inherently includes consideration of these factors. This approach is consistent with EPA’s Designation Guidance and with the approach used in the designation process for the ozone standard.

Although the factor of population growth is considered in this analysis, a high rate of growth does not necessarily mean a high absolute increase in emissions. For example, while Pike County has a high rate of growth, its population is small when compared to the New York City area and, therefore, emissions from Pike County are expected to remain an insignificant contribution to the New York City area. Therefore, Pike County should be designated Unclassifiable/Attainment.

Commuting patterns were obtained from the U.S. Census, U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2014). In a county-by-county breakdown, the commuting patterns data indicate both the percentage of people who reside inside a specified county who commute to another county and what percentage of the people who reside outside a specified county commute to the specified county. Updated commuting patterns were examined to determine the relative strength of the commuting patterns between counties within a MSA or CSA.

Meteorology

Ozone is a photochemical pollutant, which means sunlight is needed in order to start the chemical transformation of VOCs and NO_x into ozone. For this reason, meteorology plays a very important factor in the formation of ozone. Significant reductions in the monitored ozone values have occurred from when the 1997 8-hour ozone designations were made in 2004 until today. This reduction in ozone levels is due to many factors which include the reduction in transport of NO_x emissions from upwind point sources, and lower sulfur levels in transportation fuels along with better emission controls on highway vehicles and nonroad equipment. This region-wide reduction in NO_x has helped to limit the level of NO_x transported into the Commonwealth from other states. This can be seen in monitoring data recorded at the Methodist Hill and Tioga monitors (high elevation monitors), which measure ozone values well below the 2015 revised ozone standard. However, ozone transport from other states is still occurring (see the 24-hour Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) back trajectories) at the monitors in the Pittsburgh-Beaver Valley area, Indiana County, Lebanon County and Philadelphia area. General wind flow through the entire Commonwealth is from west to east. Wind flow across the eastern portion of the Commonwealth is generally from southwest to northeast. Therefore, the Commonwealth continues to see transport of ozone and its precursors primarily from states to Pennsylvania's south and west.

Topography and Geography

Pennsylvania contains numerous topographically and geographically distinct regions, most of which form a series of curved bands that run from the northeastern to the southwestern portion of the state. Starting from the eastern part of the state, a narrow coastal zone belt that is slightly above sea level occupies the southeastern portion of the state. Next, a zone of rolling hills defines the Piedmont Plateau. Going west, some of the regions are the Great Valley, Pocono Plateau, Appalachian Mountains, Allegheny High Plateau, and the Erie Plain. Intermixed within these regions, a few small topographical regions exist. All of these regions exert its own specific influence on the formation of ozone. The topography of the region will be considered when metropolitan and micropolitan statistical areas are combined to form one ozone Unclassifiable/Attainment or Nonattainment Areas. A discussion of the topography and geography will be included in each recommendation.

Jurisdictional Boundaries Including Political Boundaries, Transportation Planning Organizations and Existing Nonattainment Areas

Following county boundaries has a natural advantage in that county boundaries are also used by the Commonwealth's regional transportation planning organizations (which are often economic planning organizations, as well). Inventory data for non-point sources is more readily available on the county level and is more accurate because county populations are easily obtained and estimated. When a monitor is not located in a CBSA or CSA, the EPA intends to review relevant information associated with the county containing the monitor and, if appropriate, other adjacent nearby counties. The EPA

indicates that it will determine the nonattainment area boundaries through a weight-of-evidence analysis for the area based on the five-factor analysis. Regional transportation planning organizations (metropolitan and rural planning organizations) established in Pennsylvania often, but do not always, follow OMB's statistical area framework. Continuity of planning for ozone nonattainment areas may provide an important factor for planning, but keeping nonattainment areas constant is probably less important currently since the Commonwealth has no maintenance plans for the 2008 ozone NAAQS, the 1997 ozone NAAQS is now almost 20 years old and second 10-year maintenance plans for the 1997 ozone NAAQS will not be required to be submitted to EPA. This will increase flexibility for the Commonwealth to form new nonattainment areas that correspond to relevant criteria associated with current transport of ozone precursors and other data examined in the five factor analysis.

Other Factors that Pennsylvania Will Consider

Because of the pervasive nature of ozone and the effects of transport of ozone and its precursors into and out of the Commonwealth, Pennsylvania will consider the current level of emission controls, which will likely keep some areas attaining the 2015 revised ozone NAAQS. Most emission controls in Pennsylvania have been adopted for areas larger than single nonattainment areas. There are exceptions, though, primarily for the Pittsburgh-Beaver Valley Nonattainment Area¹ and the Philadelphia Nonattainment Area². Level of emission control is a factor for recommending nonattainment boundaries primarily in those two areas.

Highway and nonroad emissions of NO_x and VOC have been declining and will continue to decline as national and state controls on new highway vehicles, and national controls on nonroad equipment and motor vehicle fuels, come into effect, and as older vehicles are replaced.

Starting in 1997, Pennsylvania and other states adopted regional NO_x control programs in the form of regulations for large industrial boilers, internal combustion engines, electric generating units, and cement plants. The federal CSAPR Program governs large electric generating units in the Commonwealth. CSAPR requires reductions in NO_x emissions from these electric generating units. The federal and state New Source Review programs and standards for hazardous air pollutants also reduce emissions to provide continued improvements. Pennsylvania has also adopted statewide controls for emissions of VOCs from sources such as consumer products, adhesives, solvent degreasing, printing, large appliances and metal furniture finishing, and architectural and industrial maintenance coatings. Finally, the low cost of natural gas has provided incentive for utility companies to shutdown older, more polluting, coal-fired power plants.

Additional discussion of the five factors is included below.

¹ Recommended to include Allegheny, Armstrong, Beaver, Butler, Fayette, Washington and Westmoreland counties.

² Recommended to include Bucks, Chester, Delaware, Montgomery and Philadelphia Counties.

Discussion by Area.

Recommended Nonattainment Areas

The Commonwealth is making the following ozone nonattainment area designation recommendations based upon air quality monitoring data for 2013-2015, the other information described above regarding the five factors in the EPA's Designation Guidance, and the additional information described below. Please see Appendix A, Figure A-1, for a full list of designation recommendations for each Pennsylvania county for the 2015 ozone NAAQS.

Southwest Pennsylvania:

This region of Pennsylvania is dominated by relatively high terrain cut by numerous river valleys. These valleys tend to trap the precursor pollutants necessary to form ozone. During an ozone generating event, the sun begins to heat the surface in the late morning. With an abundance of NO_x and VOC due to the local traffic and regional source production, the sun reacts well with the air mass over the region to form ozone.

Pittsburgh-Beaver Valley Nonattainment Area:

The Pittsburgh-Beaver Valley Nonattainment Area for the 2008 ozone NAAQS consists of Allegheny, Armstrong, Beaver, Butler, Fayette, Washington and Westmoreland Counties. Two monitors in the Pittsburgh-Beaver Valley Area have monitored a 2015 design value above the 2015 ozone NAAQS level of 70 ppb. These monitors are Harrison in Allegheny County, at 72 ppb and Kittanning in Armstrong County, at 73 ppb.

These seven counties have historically been part of the same MSA as they are today. The seven counties have been grouped together for the purposes of air quality planning, emission control programs, state implementation plans, and area designations for many years. The relatively low population growth and types of economic activity that the seven counties experience are similar (Appendix B, Figures B-4 and B-5). In addition, commuting patterns shown in Appendix D indicate that between 35 to 40 percent of commuters in the six counties surrounding Allegheny County travel to workplace destinations inside the seven county area. Finally, in the Pittsburgh-Beaver Valley Area and in nearby upwind states, natural gas prices have either led to the shutdown of coal-fired power plants or the conversion of these power plants to natural gas. Consequently, ozone forming pollutants and ozone concentrations have been greatly reduced in the area and beyond.

The 24-hour HYSPLIT trajectory analysis for the Pittsburgh-Beaver Valley Area, Appendix D, for the calendar years 2013 through 2015 years shows that the same problems affect the area as was the case a decade ago, such as ozone transport, although transport is not coming from as far away on average. Also, exceedances of the ozone standards for 2013 through 2015 occur less often when compared to ozone exceedances from 2003 through 2005. Regional transport of pollution from states to the south and west of Pennsylvania into the Pittsburgh-Beaver Valley Area still occurs. Slightly over half of the ozone exceedances resulted from regional transport during calendar years

2013 through 2015. The rest of the ozone exceedances appear to be a result of more local sources.

All of these elements taken together indicate why it is appropriate to designate the 7-county Pittsburgh-Beaver Valley Area as one nonattainment area.

Indiana County Nonattainment Area:

DEP recommends that Indiana County be designated as a stand-alone nonattainment area for the 2015 ozone NAAQS. Twelve years ago, Indiana County was designated as a nonattainment area with Clearfield County for the 1997 ozone NAAQS, but Indiana County was designated as Unclassifiable/Attainment for the 2008 ozone NAAQS. Indiana County is a single county micropolitan statistical area in Pennsylvania included in the Pittsburgh-New Castle-Weirton PA-OH-WV, CSA. It is adjacent to the 7-county Pittsburgh-Beaver Valley MSA. The ozone monitor located in Strongstown, Indiana County, measures a 2015 design value of 71 ppb. Indiana County does not share some important factors with the Pittsburgh-Beaver Valley area. For instance, only about 25 percent of all Indiana County residents commute to the 7-county Pittsburgh-Beaver Valley area while upward of 40 percent of residents in counties in the 7-county Pittsburgh-Beaver Valley area commute to other counties in the area. In addition, Indiana County has never been included in the Pittsburgh-Beaver Valley nonattainment area and, thus, has never been included in the larger region for air quality planning or regional emission control planning.

One factor could indicate that Indiana County should be grouped with the Pittsburgh-Beaver Valley area. The HYSPLIT back trajectories, which can represent wind speed and direction before an ozone exceedance, indicate that 7 out of 10 24-hour HYSPLIT scenarios analyzed local pollution sources in the 7-county Pittsburgh-Beaver Valley area probably had a role in affecting air quality in Indiana County. The 7 back trajectories indicate that the ozone transport started closer to Indiana County from either within the 7-county Pittsburgh-Beaver Valley area or just across the border in Ohio, West Virginia, or Maryland, but because the DEP is recommending that both Indiana County and the Pittsburgh-Beaver Valley areas be designated nonattainment, the DEP sees no reason or air quality benefit to include Indiana County in the larger Pittsburgh-Beaver Valley Area.

All of these elements taken together indicate that it is appropriate to designate Indiana County as a single nonattainment area.

Southcentral Pennsylvania:

This region of Pennsylvania is comprised of the Piedmont Plateau and the Great Valley. The region lies south of Blue Mountain, a mountain that marks the southern border of the Allegheny Mountains. This physical boundary influences regional wind patterns and often poses a barrier to maritime air masses originating from the Atlantic Ocean. Several broad valleys stretch across the region comprising the topography feature called the Great Valley, mainly aligned from east to west. These valleys are separated by a mountain range to the north and west. Population, population density and population growth are

higher than in other areas in the Commonwealth and relatively consistent across the region.

Lebanon Nonattainment Area:

All monitors in the southcentral region, except the Lebanon monitor, are meeting the ozone standard. The 2015 ozone design value for the Lebanon monitor is 71 ppb. The DEP recommends that Lebanon County be designated as a single nonattainment area for the 2015 ozone NAAQS.

Cumberland, Dauphin, Perry, and Lebanon Counties were designated as one nonattainment area for the 1997 ozone NAAQS and EPA has redesignated the area to attainment and approved a maintenance plan for the area for the 1997 ozone NAAQS. All four of these counties were designated Unclassifiable/Attainment for the 2008 NAAQS. Circumstances have changed since the designations for the 1997 and 2008 ozone NAAQS in that most, but not all, of the area is meeting the revised 2015 ozone NAAQS consistently.

Cumberland, Dauphin, and Perry Counties comprise the Harrisburg-Carlisle MSA. Lebanon County by itself comprises the Lebanon MSA. York County comprises the York-Hanover MSA. Adams County comprises the Gettysburg MSA. These four MSAs comprise the Harrisburg-York-Lebanon CSA.

The 24-hour HYSPLIT back trajectories shown in Appendix C indicate that the wind patterns at 500 meters altitude transport pollution toward the Lebanon monitor from all directions.

Consequently, DEP recommends that Lebanon County be designated as a nonattainment area for the 2015 ozone NAAQS.

Cumberland, Dauphin, and Perry Counties:

The Commonwealth recommends that Cumberland, Dauphin and Perry Counties be designated Unclassifiable/Attainment. Although Cumberland County does not have an ozone monitor, the county is surrounded by other counties (Adams, Franklin, Dauphin and York) that do have ozone monitors, and all of those monitors are meeting the 2015 ozone NAAQS. The examination of commuting patterns in Appendix D illustrates that Cumberland County does not have many commuters who travel to Lebanon County for work. Unlike Cumberland County, Dauphin County has two ozone monitors, each of which is attaining the 2015 ozone NAAQS. As with Cumberland County, a small percentage (about 2%) of Dauphin County residents travels to Lebanon County for work. Perry County neither contains any significant sources of industrial emissions nor produces much in the way of highway emissions that contribute to ozone concentrations at the Lebanon monitor. Vehicles in Perry County contribute a very small percentage of the vehicle miles travelled within its MSA: about 7 percent. In addition, commuting volumes, found in Appendix D, indicate that vehicle traffic between Perry County and

the other five counties in the CSA are low. For these reasons, the Commonwealth recommends that Cumberland, Dauphin and Perry Counties be designated Unclassifiable/Attainment.

York County:

The Commonwealth recommends that York County be designated Unclassifiable/Attainment. York County is considered part of the Harrisburg-York-Lebanon CSA because these counties have established economic and commuting ties with each other. Regardless, York County has two ozone monitors, each of which is meeting the 2015 ozone NAAQS. All of these counties have higher population growth rates (See Figure B-5) on average than most other areas of the Commonwealth and similar population densities (Figure B-4). Although York County has the highest NO_x emission density of any county in the Harrisburg-York-Lebanon CSA, NO_x emissions within York County are anticipated to continue to decline greatly over the next several years. Pennsylvania's implementation of the Reasonably Available Control Technology for Major Sources of NO_x and VOCs rule (25 Pa. Code § 129.96) will greatly lower emissions from large sources of emissions in York County and across the Commonwealth. Also, with the changing landscape in the price of fossil fuels (currently, it is cheaper to produce electricity by combusting natural gas than coal), the forecast is for electric utilities to use natural gas, which produces less NO_x than coal; a major NO_x emitter in York County, Talen Energy's Brunner Island, is expected to produce much less NO_x. In addition, commuting patterns, illustrated in Appendix D, show that only slightly more than 2 percent of York County residents travel to Lebanon County for work. The same patterns hold for those commuters traveling from Lebanon County to York County.

Adams County:

The Commonwealth recommends that Adams County be designated Unclassifiable /Attainment. Adams County is part of the Harrisburg-York-Lebanon CSA and the Gettysburg MSA, but Adams County's economic association with other counties in the Harrisburg-York-Lebanon CSA has always been the weakest of all of the counties in the CSA. Furthermore, the NO_x emissions density (Figure B-2) of Adams County is lower than that of all the other counties in the region. Also, population density and population growth are lower than the other counties in the CSA (Figure B-4 and B-5). In addition, ozone monitors in Adams County measure design values of 51 ppb and 65 ppb and no major industrial sources of pollution exist in Adams County. For these reasons, the Commonwealth recommends that Adams County be designated Unclassifiable /Attainment.

Eastern Pennsylvania

Philadelphia Nonattainment Area:

The Pennsylvania portion of the nonattainment area for the 2008 ozone NAAQS consists of Bucks, Chester, Delaware, Montgomery and Philadelphia Counties. The Commonwealth is recommending that these five counties be designated as nonattainment for the 2015 ozone NAAQS, as well. The monitor with the highest design value in the 5-county area is located in Bucks County and has a 2015 design value of 75 ppb.

There are no major topographic features to restrict airflow present in this region of the state as this region of the state is in a band of coastal zone. Some small hills separate this region from the Lehigh Valley area to the north. Emissions and population density are, with the exception of Philadelphia County, relatively uniform across the 5-county area and eastward into New Jersey.

All of these five counties are included in the interstate Philadelphia-Reading-Camden CSA. The transportation planning agency for the area covers the five Pennsylvania counties as well as a number of counties in New Jersey. The nonattainment area includes the Southeast Pennsylvania air basin, as defined in *25 Pa. Code* § 121.1. These five counties have been included in a Philadelphia multi-state nonattainment area since ozone designations were first made under the CAA. The Commonwealth has no objection to these five counties being included in the same interstate nonattainment area as in the past.

Population density throughout the 5-county area is high but shows a relatively homogenous growth increase within the five counties that ranges from 0.9 percent to 2.7 percent between the years 2010 and 2015. Philadelphia has reversed a long-term trend of losing population to become the fastest growing county in the 5-county area. As indicated by the area's MSA status, commuting and economic ties throughout the area are strong. According to U.S. Census data, Appendix D, about one-third of all commuters from these counties travel from their home county to another county within the 5-county area.

There are a number of emission control strategies that differentiate the 5-county area from other surrounding nonattainment areas, including Berks and Lancaster Counties. These primarily arise from the area's former designation as "severe" under the 1979 1-hour ozone standard and include:

- a more stringent major source definition for new source review and permitting;
- a requirement for federal reformulated gasoline, as mandated by federal statute;
- a requirement for Stage II gasoline pumps;
- requirements for NO_x controls on smaller sources not required in other areas; and
- a more stringent vehicle emission inspection/maintenance program

Additional Areas Recommended As Unclassifiable/Attainment

Pike County:

The area does not have a monitor, but is part of the New York City CSA. Historically, the county has not been included as part of the New York City nonattainment area. While population in Pike County is growing, population is still very low. Pike County is now, and is likely to remain, an insignificant contributor to New York City ozone nonattainment. The Commonwealth, therefore, recommends that Pike County remain designated as Unclassifiable/Attainment and not be included in any designation of the New York City area as nonattainment for the revised 2015 ozone NAAQS.

Scranton-Wilkes-Barre Area:

The Commonwealth is recommending designation of Lackawanna, Luzerne, and Wyoming Counties as Unclassifiable/Attainment for the 2015 ozone NAAQS. The Scranton-Wilkes-Barre metropolitan area consists of Lackawanna, Luzerne, and Wyoming Counties. The three monitors in these counties are measuring ozone levels that meet the 2015 ozone NAAQS at design values of 63, 64 and 65 ppb.

Allentown-Bethlehem-Easton Area:

The Commonwealth recommends designating Carbon, Lehigh and Northampton Counties as Unclassifiable/Attainment for the 2015 ozone NAAQS. The highest design value monitored in the area is 68 ppb. The Allentown-Bethlehem-Easton area historically has strong planning and economic ties and is designated by OMB as an MSA.

The region shares a common topography and geography. The region is bounded on the north by Blue Mountain, providing a significant physical barrier. A broad valley runs from east to west connecting both Lehigh and Northampton Counties.

Lehigh and Northampton Counties are covered by a single metropolitan transportation planning organization, while Carbon County is part of a 5-county rural planning organization.

The Allentown, Bethlehem, Easton air basin defined in *25 Pa. Code* § 121.1 covers portions of Lehigh and Northampton Counties.

Lancaster County:

The Commonwealth recommends that Lancaster County be designated Unclassifiable/Attainment for the 2015 ozone NAAQS. Monitors in the Lancaster Area are measuring attainment for the 2015 ozone NAAQS with the highest design value of any monitor certified at 67 ppb. Although the HYSPLIT back trajectories show that ozone plumes travel over western Lancaster County on their way to the Lebanon monitor, Lancaster County has a lower NO_x emission density than surrounding counties and no

major point sources of NO_x emissions that can contribute significantly to ozone exceedances at the Lebanon monitor. In addition, Lancaster County is not part of the Harrisburg-York-Lebanon MSA, has traditionally been separate from all other surrounding MSAs and has remained its own distinct area. While there are some commuting ties to other MSAs in Southcentral Pennsylvania, Lancaster County has a political and cultural identity of its own.

Lawrence County:

The Commonwealth recommends designating Lawrence County Unclassifiable/Attainment and not including Lawrence County in the Pittsburgh-Beaver Valley nonattainment area (discussed above). Although included in the larger Pittsburgh-New Castle CSA, Lawrence County is a single county micropolitan statistical area. Lawrence County has traditionally been a stand-alone planning area. The monitor located in New Castle indicates ambient air quality that attains the standard with a design value of 68 ppb, and Lawrence County's micropolitan statistical area status indicates a lower level of social and economic ties to the Pittsburgh metropolitan area counties than the ties of the counties included in the MSA.

Reading Nonattainment Area:

The Commonwealth recommends that Berks County be designated as an Unclassifiable/Attainment area for the 2015 ozone NAAQS based on current ozone monitoring data.

The OMB defines a Reading MSA that consists of only Berks County. Although the OMB added Berks County to the Philadelphia CSA in 2006 because of increasing commuting ties to the larger area, Berks traditionally has its own planning functions, including its own metropolitan planning organization. In addition, the Reading air basin is defined in *25 Pa. Code* §121.1 as including portions of Berks County and no other county.

Berks County has a lower VOC and NO_x emissions density than any of the other five counties in the Philadelphia area. As shown in Figures B-4 and B-5, Berks County has a relatively lower population density and lower population growth than the five counties in the Philadelphia area. In addition, Berks County commuting patterns, shown in Appendix D, with the Philadelphia area are not as linked as the commuting patterns in the counties within the 5-county Philadelphia region.

Finally, Berks County was designated as a single nonattainment area for the 2008 ozone NAAQS; it subsequently attained the standard, and currently, the highest design for an ozone monitor in Berks County is below the 2015 standard at 69 ppb.

Additional Information

Appendix A includes a table and a map that describe the recommendations for the 2015 ozone NAAQS nonattainment areas, and a map of the designations for the 2008 ozone NAAQS. The list of nonattainment and unclassifiable/attainment areas in Table 1 includes all 67 Pennsylvania counties.

Appendices B and C include documenting data and material that address the EPA's five factor designation criteria pertaining to air quality, emissions and population factors, a map of the OMB statistical areas in Pennsylvania, and the HYSPLIT back trajectories.

Appendix D includes commuting patterns of residents in counties relevant to this analysis.

Appendix E is a summary of comments received by the Department during the public comment period and the Department's responses to those comments.

ACRONYMS AND TERMS

| | |
|-----------------|---|
| CAA | Clean Air Act |
| CSA | Combined Statistical Area |
| CSAPR | Cross State Air Pollution Rule |
| DEP | Department of Environmental Protection (Pennsylvania) |
| EPA | Environmental Protection Agency (United States) |
| HYSPLIT | Hybrid Single-Particle Lagrangian Integrated Trajectory |
| NAAQS | National Ambient Air Quality Standards |
| NEI | National Emission Inventory |
| NO _x | oxides of nitrogen |
| OMB | Office of Management and Budget (United States) |
| PM | particulate matter |
| ppb | parts per billion |
| ppm | parts per million |
| SIP | State Implementation Plan |
| VOC | volatile organic compounds |

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ARCGIS, ArcMap, 10.2.2 for Desktop, Copyright © 1995-2014, Esri Inc.

APPENDIX A

Area Designations

Table 1: Recommended Area Designations for the 2015 Ozone Standards

Figure A-1: Recommended Area Designations for the 2015 Ozone Standards

Figure A-2: Final Area Designations for the 2008 Ozone Standards

Table 1. Recommended Area Designations for the 2015
Ozone Standards

| Pennsylvania Areas | County Design Values (2015) | Recommended Designation |
|--|-----------------------------------|----------------------------|
| DEP's Southeast Region | | |
| Philadelphia-Reading-Camden PA-NJ-DE-MD Combined Statistical Area | | |
| Philadelphia-Camden-Wilmington PA-NJ- DE-MD Metropolitan Statistical Area | | |
| Bucks County | 75 ppb | Nonattainment |
| Chester County | 69 ppb | Nonattainment |
| Delaware County | 72 ppb | Nonattainment |
| Montgomery County | 71 ppb | Nonattainment |
| Philadelphia County | 73 ppb | Nonattainment |
| Reading Metropolitan Statistical Area | | |
| Berks County (Part of DEP's Southcentral Region) | 69 ppb | Unclassifiable/Attainment |
| | | |
| DEP's Southcentral Region | | |
| Altoona Metropolitan Statistical Area | | |
| Blair County | 64 ppb | Unclassifiable/Attainment |
| | | |
| Harrisburg-York-Lebanon Combined Statistical Area | | |
| Harrisburg-Carlisle Metropolitan Statistical Area | | |
| Cumberland County | No monitor | Unclassifiable/Attainment |
| Dauphin County | 66 ppb | Unclassifiable/Attainment |
| Perry County | No monitor | Unclassifiable/Attainment |
| York-Hanover Statistical Area | | |
| York County | 68 ppb | Unclassifiable/Attainment |
| Lebanon Metropolitan Statistical Area | | |
| Lebanon County | 71 ppb | Nonattainment |
| Gettysburg Metropolitan Statistical Area | | |
| Adams County | 65 ppb | Unclassifiable/Attainment |
| | | |
| Lancaster Metropolitan Statistical Area | | |
| Lancaster County | 67 ppb | Unclassifiable/Attainment |
| | | |

Table 1. Recommended Area Designations for the 2015
Ozone Standards

| Pennsylvania Areas | County Design Values (2015) | Recommended Designation |
|---|-----------------------------------|----------------------------|
| Washington-Baltimore-Arlington, DC-MD-VA-WV-PA Combined Statistical Area | | |
| Chambersburg-Waynesboro Metropolitan Statistical Area | | |
| Franklin County | 64 ppb | Unclassifiable/Attainment |
| Huntingdon Micropolitan Statistical Area | | |
| Huntingdon County | No monitor | Unclassifiable/Attainment |
| Lewistown Micropolitan Statistical Area | | |
| Mifflin County | No monitor | Unclassifiable/Attainment |
| Remaining Counties in DEP's Southcentral Region | | |
| Bedford County | No monitor | Unclassifiable/Attainment |
| Fulton County | No monitor | Unclassifiable/Attainment |
| Juniata County | No monitor | Unclassifiable/Attainment |
| DEP's Southwest Region | | |
| Pittsburgh-New Castle-Weirton PA-OH-WV Combined Statistical Area | | |
| Pittsburgh Metropolitan Statistical Area | | |
| Allegheny County | 73 ppb | Nonattainment |
| Armstrong County | 72 ppb | Nonattainment |
| Beaver County | 70 ppb | Nonattainment |
| Butler County (Part of DEP's Northwest Region) | No monitor | Nonattainment |
| Fayette County | No monitor | Nonattainment |
| Washington County | 68 ppb | Nonattainment |
| Westmoreland County | 67 ppb | Nonattainment |
| Indiana Micropolitan Statistical Area | | |
| Indiana County | 71 ppb | Nonattainment |

**Table 1. Recommended Area Designations for the 2015
Ozone Standards**

| Pennsylvania Areas | County Design Values (2015) | Recommended Designation |
|---|--|------------------------------------|
| New Castle Micropolitan Statistical Area | | |
| Lawrence County (Part of DEP's Northwest Region) | 68 ppb | Unclassifiable/Attainment |
| | | |
| Johnstown-Somerset Combined Statistical Area | | |
| Johnstown Metropolitan Statistical Area | | |
| Cambria County | 63 ppb | Unclassifiable/Attainment |
| Somerset Micropolitan Statistical Area | | |
| Somerset County | 60 ppb | Unclassifiable/Attainment |
| | | |
| Remaining Counties in DEP's Southwest Region | | |
| Greene County | 67 ppb | Unclassifiable/Attainment |
| | | |
| DEPs Northwest Region | | |
| Erie-Meadville Combined Statistical Area | | |
| Erie Metropolitan Statistical Area | | |
| Erie County | 66 ppb | Unclassifiable/Attainment |
| Meadville Micropolitan Statistical Area | | |
| Crawford County | No monitor | Unclassifiable/Attainment |
| | | |
| Youngstown-Warren, OH-PA Combined Statistical Area | | |
| Youngstown-Warren-Boardman Metropolitan Statistical Area | | |
| Mercer County | 68 ppb | Unclassifiable/Attainment |
| | | |
| St. Mary's Micropolitan Statistical Area | | |
| Elk County | No monitor | Unclassifiable/Attainment |
| | | |
| Bradford Micropolitan Statistical Area | | |
| McKean County | No monitor | Unclassifiable/Attainment |

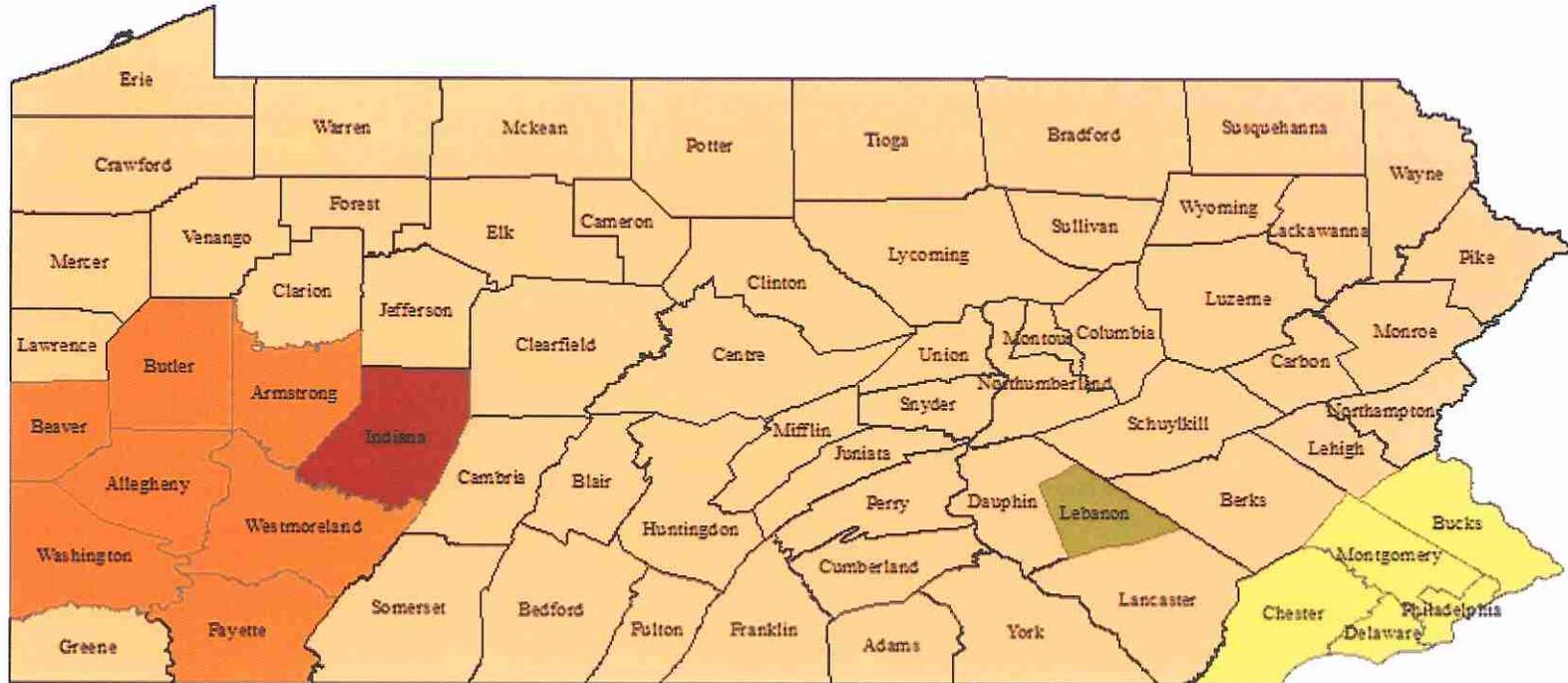
Table 1. Recommended Area Designations for the 2015
Ozone Standards

| Pennsylvania Areas | County Design Values (2015) | Recommended Designation |
|--|-----------------------------------|----------------------------|
| Oil City Micropolitan Statistical Area | | |
| Venango County | No monitor | Unclassifiable/Attainment |
| Warren Micropolitan Statistical Area | | |
| Warren County | No monitor | Unclassifiable/Attainment |
| Remaining Counties in DEP's Northwest Region | | |
| Clarion County | No monitor | Unclassifiable/Attainment |
| Jefferson County | No monitor | Unclassifiable/Attainment |
| Forest County | No monitor | Unclassifiable/Attainment |
| DEP's Northcentral Region | | |
| State College-DuBois Combined Statistical Area | | |
| State College Metropolitan Statistical Area | | |
| Centre County | 65 ppb | Unclassifiable/Attainment |
| DuBois Micropolitan Statistical Area | | |
| Clearfield County | 65 ppb | Unclassifiable/Attainment |
| Williamsport-Lock Haven Combined Statistical Area | | |
| Williamsport Metropolitan Statistical Area | | |
| Lycoming County | 64 ppb | Unclassifiable/Attainment |
| Lock Haven Micropolitan Statistical Area | | |
| Clinton County | No monitor | Unclassifiable/Attainment |
| Bloomsburg-Berwick-Sunbury Combined Metropolitan Statistical Area | | |
| Bloomsburg-Berwick Metropolitan Statistical Area | | |
| Columbia County | No monitor | Unclassifiable/Attainment |
| Montour County | No monitor | Unclassifiable/Attainment |
| Lewisburg Micropolitan Statistical Area | | |
| Union County | No monitor | Unclassifiable/Attainment |
| Selinsgrove Micropolitan Statistical Area | | |
| Snyder County | No monitor | Unclassifiable/Attainment |
| Sunbury Micropolitan Statistical Area | | |
| Northumberland County | No monitor | Unclassifiable/Attainment |

Table 1. Recommended Area Designations for the 2015
Ozone Standards

| Pennsylvania Areas | County Design Values | Recommended Designation |
|---|----------------------|---------------------------|
| Sayre Micropolitan Statistical Area | | |
| Bradford County | No monitor | Unclassifiable/Attainment |
| Remaining Counties in Northcentral Region | | |
| Cameron County | No monitor | Unclassifiable/Attainment |
| Potter County | No monitor | Unclassifiable/Attainment |
| Sullivan County | No monitor | Unclassifiable/Attainment |
| Tioga County | 63 ppb | Unclassifiable/Attainment |
| DEP's Northeast Region | | |
| New York-Newark, NY-NJ-CT-PA Combined Statistical Area | | |
| Allentown-Bethlehem-Easton PA-NJ Metropolitan Statistical Area | | |
| Carbon County | No monitor | Unclassifiable/Attainment |
| Lehigh County | 68 ppb | Unclassifiable/Attainment |
| Northampton County | 67 ppb | Unclassifiable/Attainment |
| Scranton-Wilkes-Barre-Hazleton Metropolitan Statistical Area | | |
| Lackawanna County | 65 ppb | Unclassifiable/Attainment |
| Luzerne County | 63 ppb | Unclassifiable/Attainment |
| Wyoming | No monitor | Unclassifiable/Attainment |
| East Stroudsburg Metropolitan Statistical Area | | |
| Monroe County | 63 ppb | Unclassifiable/Attainment |
| Remaining Counties in Northeast Region | | |
| New York-Newark-Edison Metropolitan Statistical Area | | |
| Pike County | No monitor | Unclassifiable/Attainment |
| Schuylkill County | | |
| Schuylkill County | No monitor | Unclassifiable/Attainment |
| Susquehanna County | | |
| Susquehanna County | No monitor | Unclassifiable/Attainment |
| Wayne County | | |
| Wayne County | No monitor | Unclassifiable/Attainment |

Figure A-1: Recommended Area Designations for the 2015 Ozone Standards



- | | |
|--|---|
|  Harrisburg-York-Lebanon, PA |  Pittsburgh-New Castle-Weirton, PA-OH-WV |
|  Indiana, PA |  Unclassifiable/Attainment |
|  Philadelphia-Reading-Camden, PA-NJ-DE-MD | |

Figure A-2: Final Area Designations for the 2008 Ozone Standards



- | | |
|---|--|
|  Lancaster Marginal Nonattainment Area |  Pittsburgh-Beaver Valley Area Marginal Nonattainment Area |
|  Lehigh Valley Marginal Nonattainment Area |  Reading Marginal Nonattainment Area |
|  Philadelphia Area Marginal Nonattainment Area |  Unclassifiable/Attainment |

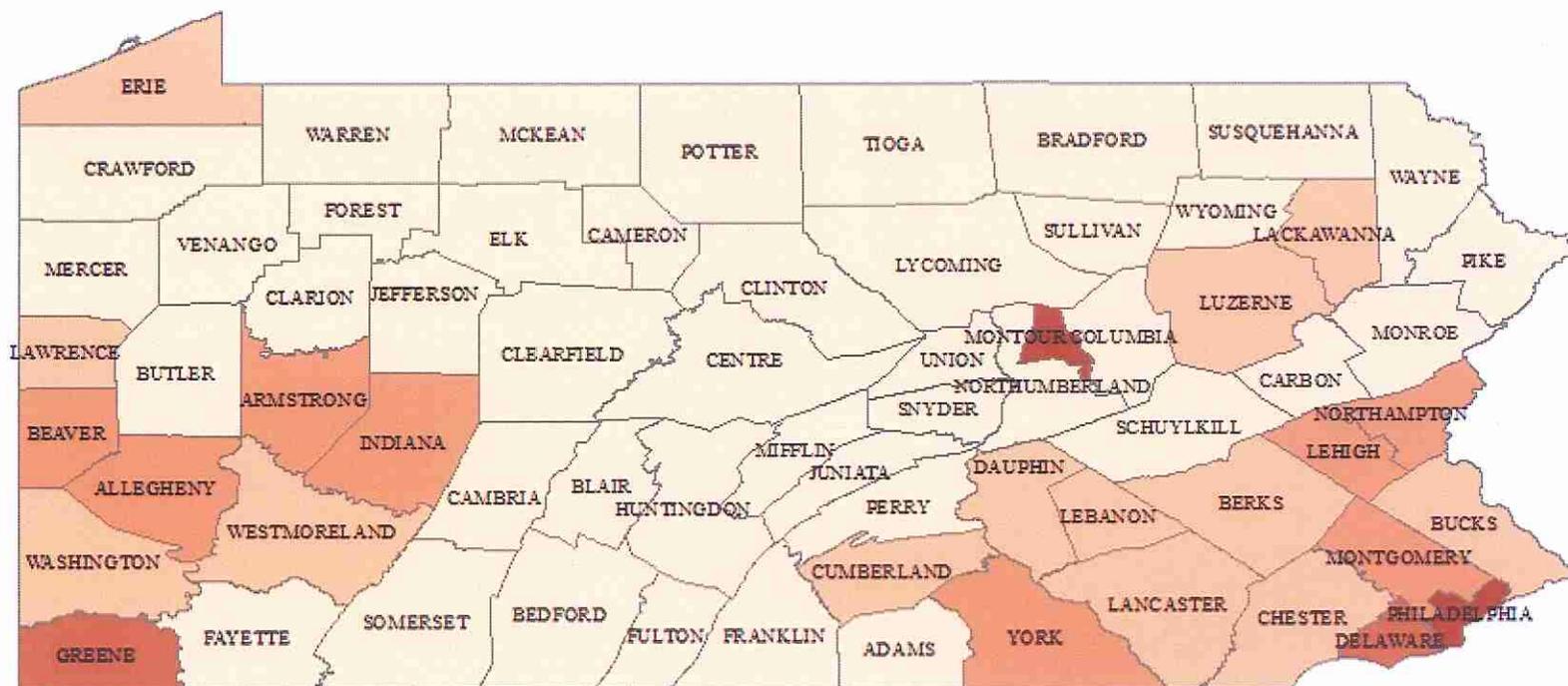
APPENDIX B

Supporting Documentation

- Figure B-1: Pennsylvania's 2015 Ozone Design Values
- Figure B-2: NO_x Emissions Density by County
- Figure B-3: VOC Emissions Density by County
- Figure B-4: Population Density by County
- Figure B-5: Population Growth by County
- Figure B-6: Pennsylvania's Core-Based Statistical Areas
- Figure B-7: Combined Statistical Areas
- Table 2: 2011 Annual Emissions and Emission Densities by County

Figure B-2: NOx Emissions Density by County

Emissions Based on 2011 NEI Data



NOx Emissions Density (tons per year per square mile)

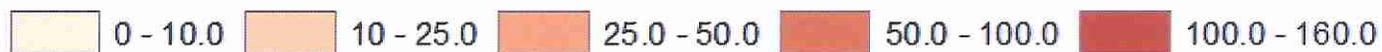
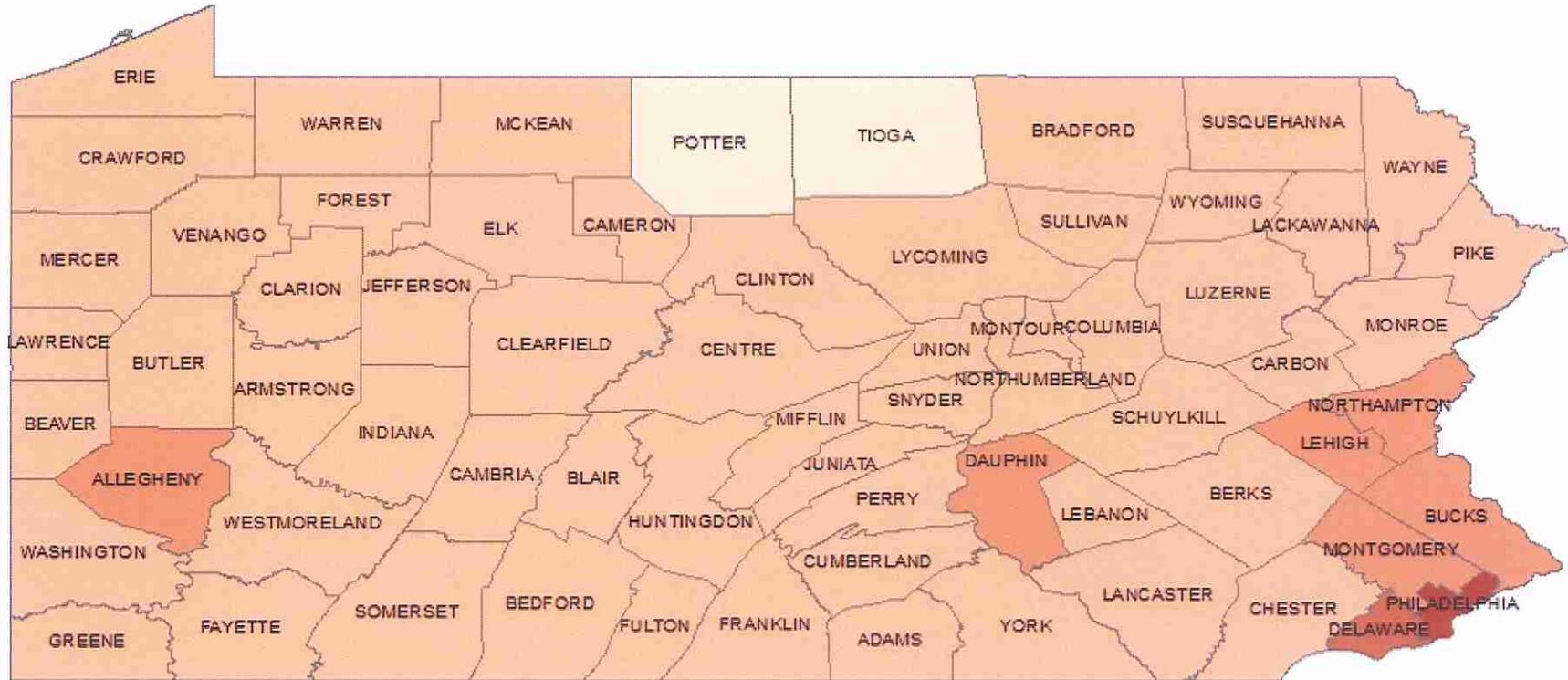


Figure B-3: VOC Emission Density by County

Emissions Based on 2011 NEI Data

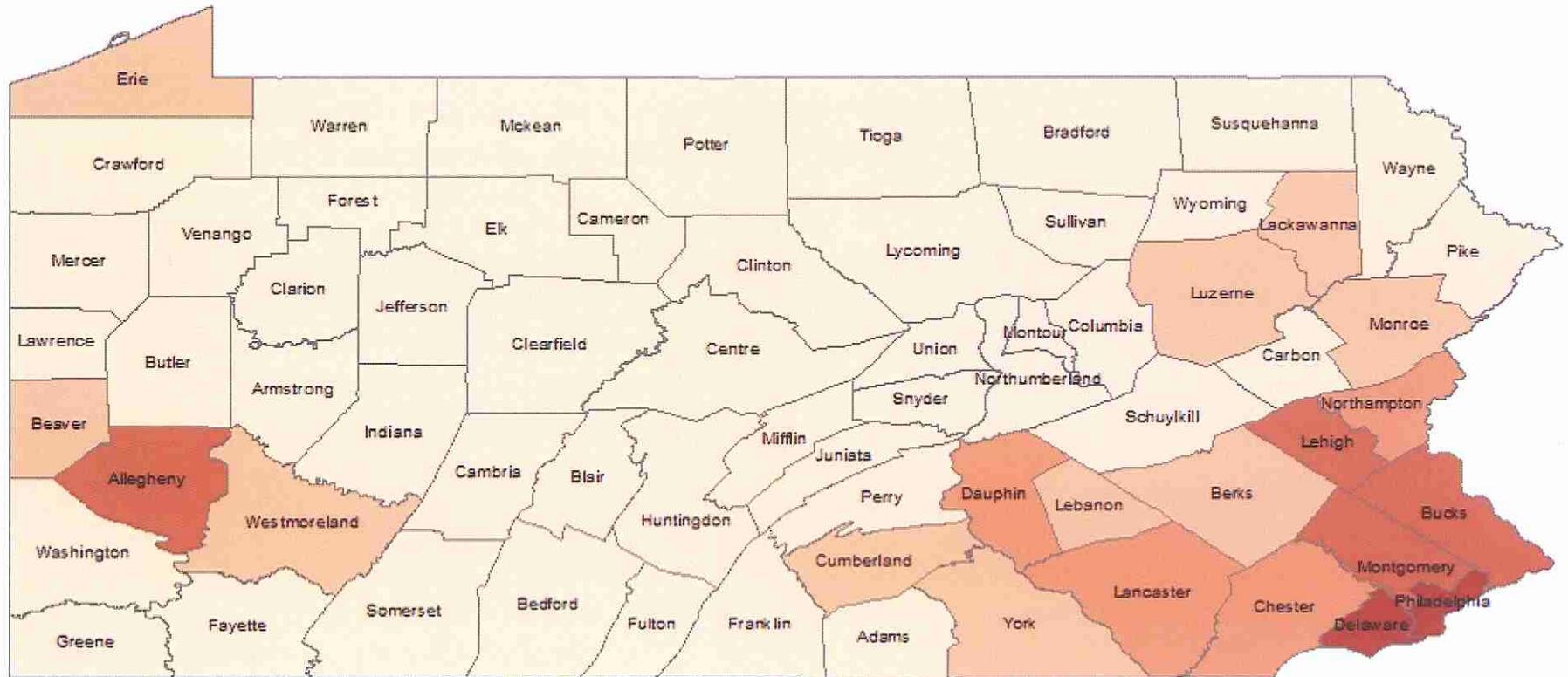


VOC Emissions Density (tons per year per square mile)



Fig B-4: Population Density by County

Population Based on 2015 US Census Estimates



Population Density (Persons per Square Mile)

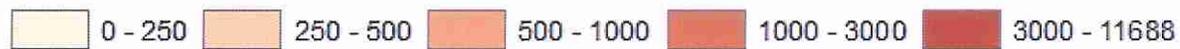
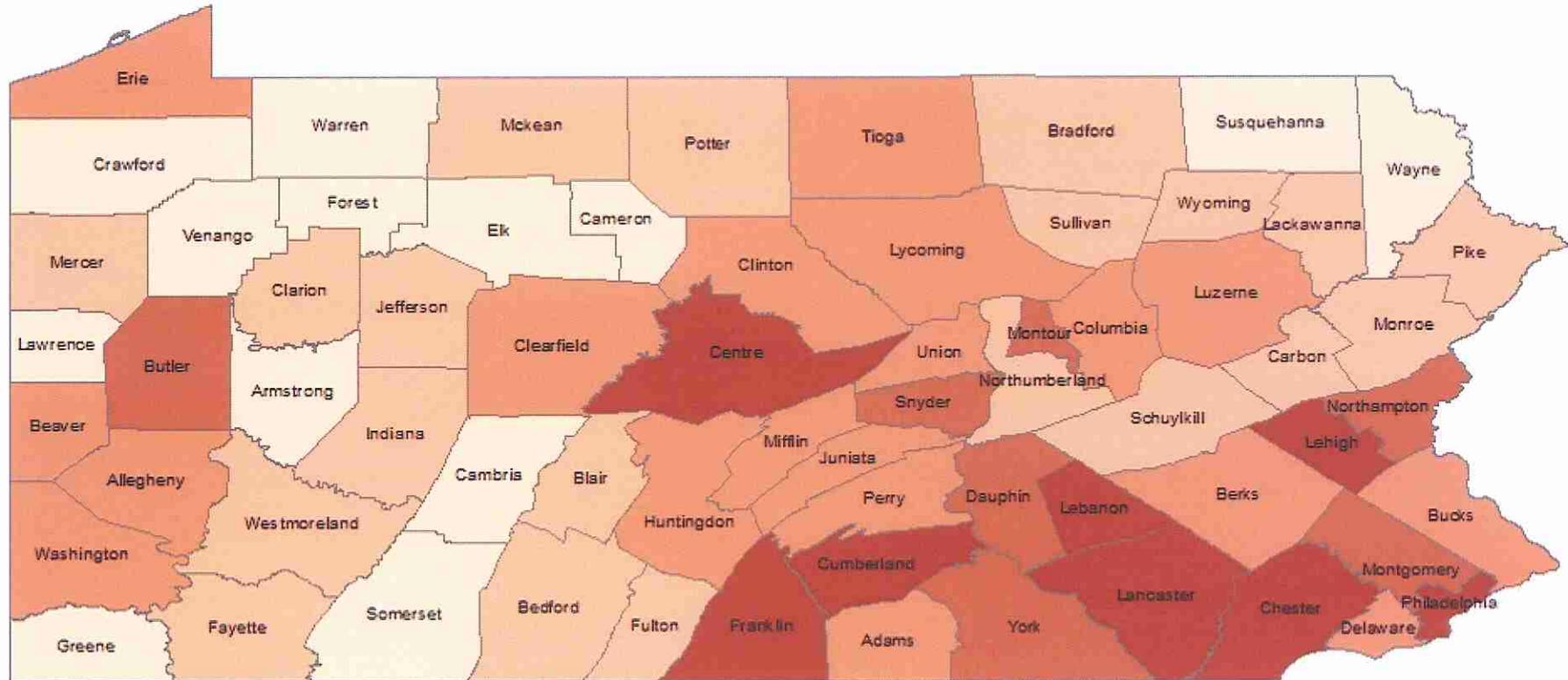


Figure B-5: Population Growth by County

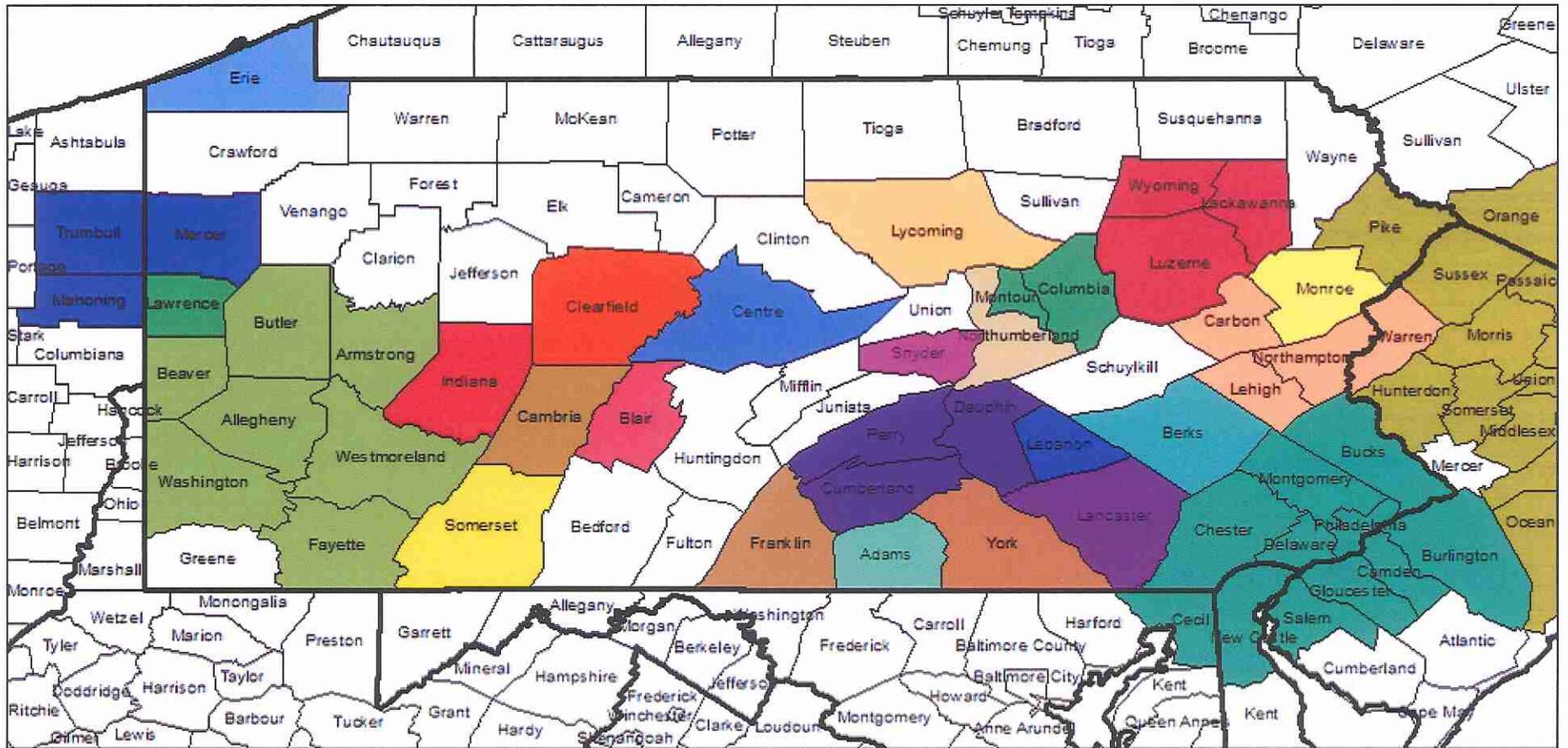
Population Trends Based on 2010 and 2015 US Census Results



Population Growth (% Change: 2010 to 2015)



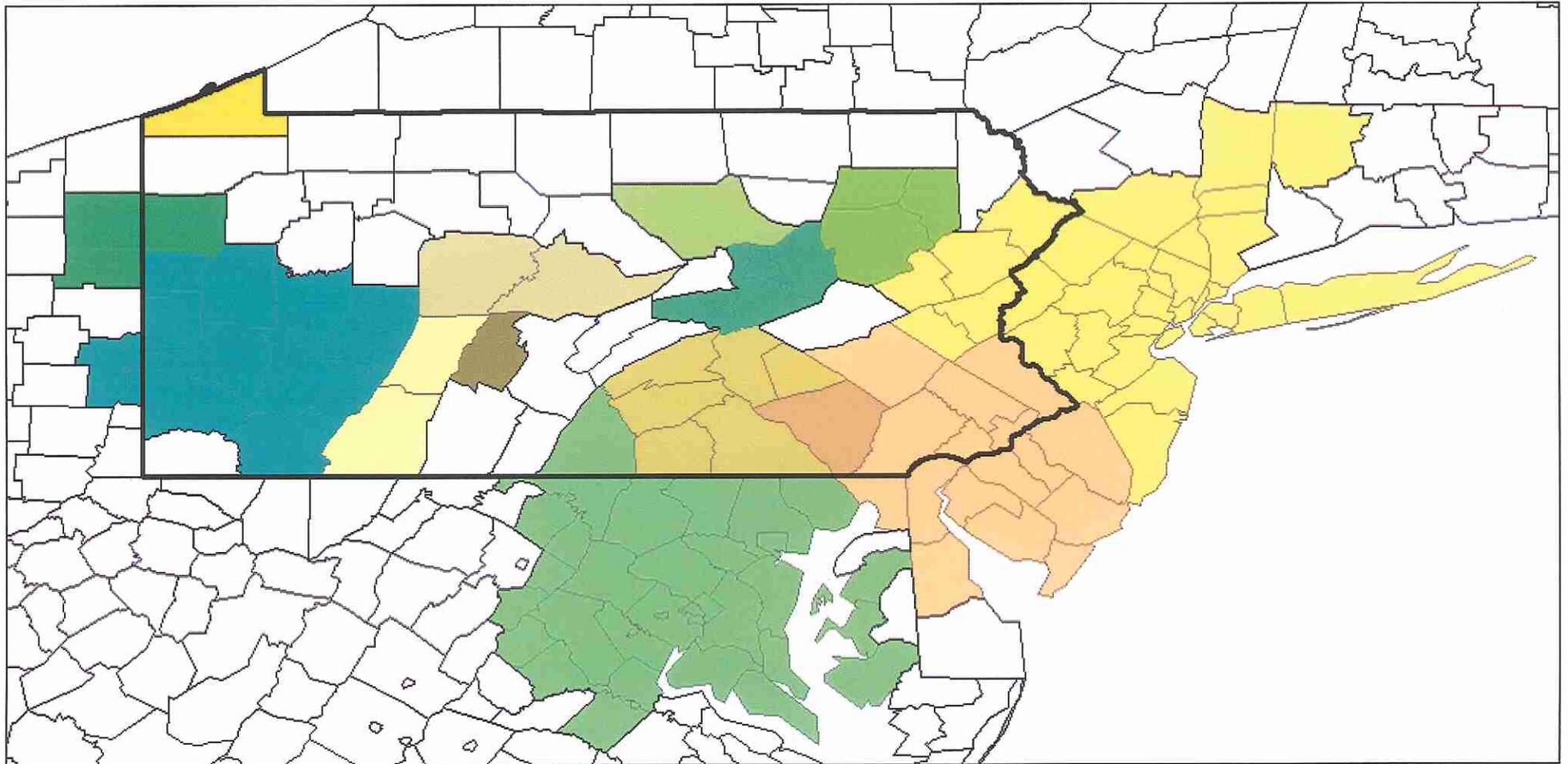
Figure B-6: Pennsylvania's Core-Based Statistical Areas



- | | | | |
|-----------------------------------|-------------------------|---|-----------------------------------|
| Allentown-Bethlehem-Easton, PA-NJ | Gettysburg, PA | New York-Newark-Jersey City, NY-NJ-PA | State College, PA |
| Altoona, PA | Harrisburg-Carlisle, PA | Philadelphia-Camden-Wilmington, PA-NJ-DE-MD | Sunbury, PA |
| Bloomsburg-Berwick, PA | Indiana, PA | Pittsburgh, PA | Williamsport, PA |
| Chambersburg-Waynesboro, PA | Johnstown, PA | Reading, PA | York-Hanover, PA |
| DuBois, PA | Lancaster, PA | Scranton-Wilkes-Barre-Hazleton, PA | Youngstown-Warren-Boardman, OH-PA |
| East Stroudsburg, PA | Lebanon, PA | Selinsgrove, PA | |
| Erie, PA | New Castle, PA | Somerset, PA | |

Figure B-7: Combined Statistical Areas

Office of Management and Budget, 2010



- | | | |
|--------------------------------|--|--|
| Altoona, PA | Lancaster, PA | State College-DuBois, PA |
| Bloomsburg-Berwick-Sunbury, PA | New York-Newark, NY-NJ-CT-PA | Washington-Baltimore-Arlington, DC-MD-VA-WV-PA |
| Erie-Meadville, PA | Philadelphia-Reading-Camden, PA-NJ-DE-MD | Williamsport-Lock Haven, PA |
| Harrisburg-York-Lebanon, PA | Pittsburgh-New Castle-Weirton, PA-OH-WV | Youngstown-Warren, OH-PA |
| Johnstown-Somerset, PA | Scranton--Wilkes-Barre--Hazleton, PA | |

Table 2. 2011 Annual Emissions and Emission Densities by County

| COUNTY | VOC EMISSIONS (tons per year) | NO _x EMISSIONS (tons per year) | LAND AREA (square miles) | NO _x Emissions Density (tons per square mile per year) | VOC Emissions Density (tons per square mile per year) |
|------------|-------------------------------|---|--------------------------|---|---|
| Adams | 9654.48 | 3345.34 | 518.67 | 6.45 | 18.61 |
| Allegheny | 29972.96 | 35455.11 | 730.08 | 48.56 | 41.05 |
| Armstrong | 9429.85 | 29517.69 | 653.20 | 45.19 | 14.44 |
| Beaver | 8556.56 | 21166.68 | 434.71 | 48.69 | 19.68 |
| Bedford | 14678.76 | 2841.60 | 1012.30 | 2.81 | 14.50 |
| Berks | 20059.17 | 14403.92 | 856.51 | 16.82 | 23.42 |
| Blair | 10715.38 | 4851.27 | 525.80 | 9.23 | 20.38 |
| Bradford | 12338.87 | 5310.53 | 1147.40 | 4.63 | 10.75 |
| Bucks | 20381.56 | 12925.42 | 604.31 | 21.39 | 33.73 |
| Butler | 13233.76 | 6617.13 | 788.60 | 8.39 | 16.78 |
| Cambria | 10147.11 | 6243.75 | 688.35 | 9.07 | 14.74 |
| Cameron | 7082.60 | 380.33 | 396.23 | 0.96 | 17.87 |
| Carbon | 8631.36 | 2817.42 | 381.46 | 7.39 | 22.63 |
| Centre | 19058.50 | 6743.25 | 1109.92 | 6.08 | 17.17 |
| Chester | 17579.34 | 12031.82 | 750.51 | 16.03 | 23.42 |
| Clarion | 8413.73 | 4001.87 | 600.83 | 6.66 | 14.00 |
| Clearfield | 15158.80 | 9789.46 | 1144.72 | 8.55 | 13.24 |
| Clinton | 15890.55 | 3381.46 | 887.98 | 3.81 | 17.90 |
| Columbia | 8245.08 | 2747.46 | 483.11 | 5.69 | 17.07 |
| Crawford | 11818.85 | 6058.58 | 1012.30 | 5.98 | 11.68 |
| Cumberland | 13561.34 | 13243.86 | 545.46 | 24.28 | 24.86 |
| Dauphin | 15609.40 | 9715.01 | 525.05 | 18.50 | 29.73 |
| Delaware | 13451.12 | 17306.44 | 183.84 | 94.14 | 73.17 |
| Elk | 9365.78 | 3206.12 | 827.36 | 3.88 | 11.32 |
| Erie | 15001.84 | 11373.23 | 799.15 | 14.23 | 18.77 |
| Fayette | 12430.46 | 5775.22 | 790.34 | 7.31 | 15.73 |
| Forest | 7784.27 | 912.56 | 427.19 | 2.14 | 18.22 |
| Franklin | 11984.25 | 4970.71 | 772.22 | 6.44 | 15.52 |
| Fulton | 8138.25 | 1174.52 | 437.55 | 2.68 | 18.60 |
| Greene | 7893.87 | 30873.94 | 575.95 | 53.61 | 13.71 |
| Huntingdon | 14216.07 | 2287.11 | 874.64 | 2.61 | 16.25 |
| Indiana | 11466.01 | 36017.65 | 827.03 | 43.55 | 13.86 |
| Jefferson | 8427.49 | 5591.84 | 652.43 | 8.57 | 12.92 |
| Juniata | 7238.10 | 1847.57 | 391.35 | 4.72 | 18.50 |
| Lackawanna | 10584.77 | 5839.90 | 459.08 | 12.72 | 23.06 |
| Lancaster | 23579.50 | 13810.48 | 943.81 | 14.63 | 24.98 |
| Lawrence | 6238.99 | 4423.39 | 358.18 | 12.35 | 17.42 |

Table 2. 2011 Annual Emissions and Emission Densities by County

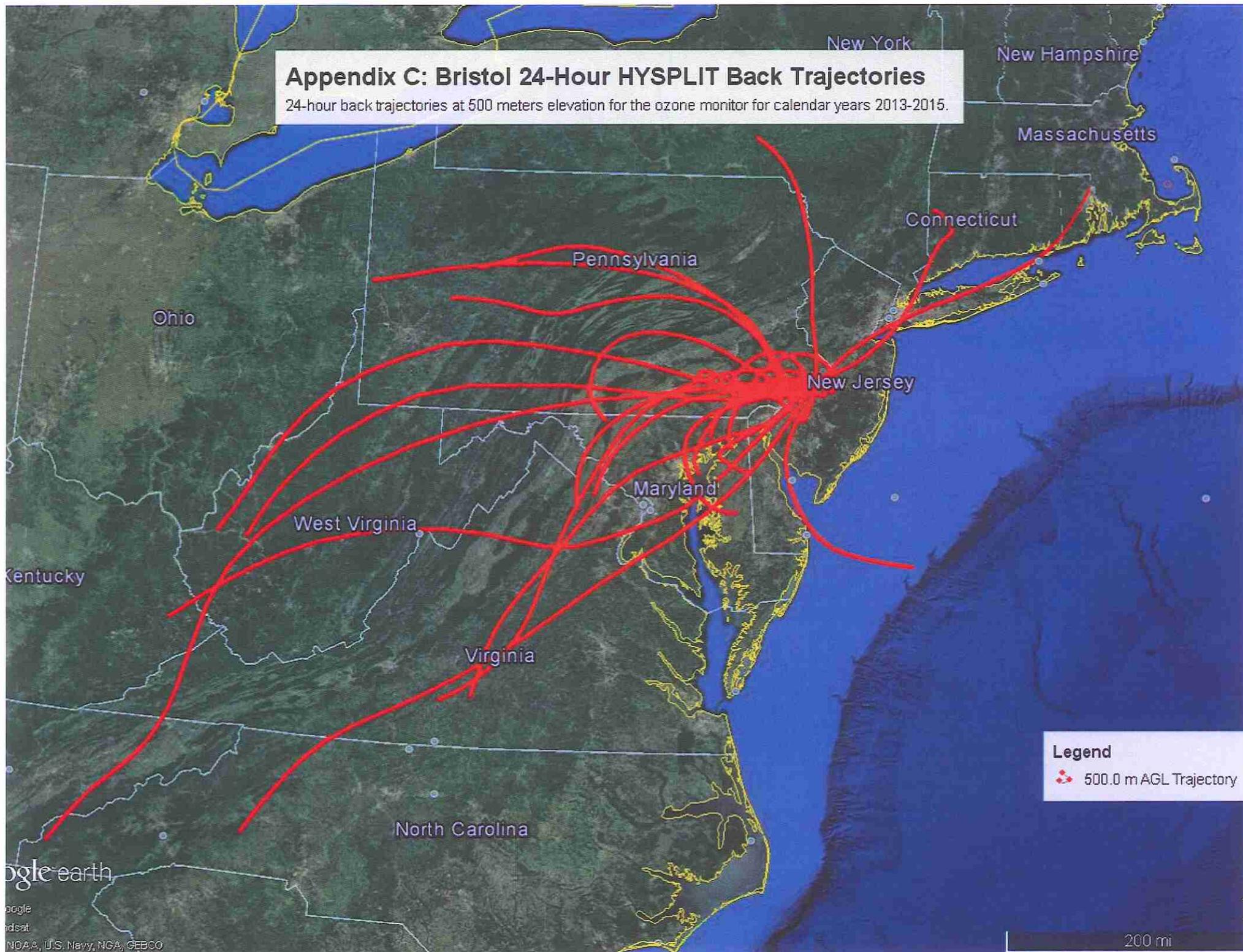
| | | | | | |
|-----------------------|----------|----------|---------|--------|--------|
| Lebanon | 8156.48 | 5116.34 | 361.83 | 14.14 | 22.54 |
| Lehigh | 12764.82 | 8694.80 | 345.17 | 25.19 | 36.98 |
| Luzerne | 19325.78 | 9134.50 | 890.33 | 10.26 | 21.71 |
| Lycoming | 18582.84 | 5458.60 | 1228.59 | 4.44 | 15.13 |
| McKean | 9841.46 | 4090.39 | 979.20 | 4.18 | 10.05 |
| Mercer | 10789.76 | 6398.93 | 672.58 | 9.51 | 16.04 |
| Mifflin | 8489.99 | 2061.74 | 411.03 | 5.02 | 20.66 |
| Monroe | 13244.53 | 5236.00 | 608.29 | 8.61 | 21.77 |
| Montgomery | 22710.07 | 16546.00 | 483.04 | 34.25 | 47.01 |
| Montour | 3244.87 | 13952.98 | 130.24 | 107.13 | 24.91 |
| Northampton | 10741.36 | 14071.76 | 369.67 | 38.07 | 29.06 |
| Northumberland | 8202.80 | 3582.07 | 458.37 | 7.81 | 17.90 |
| Perry | 9887.61 | 2454.40 | 551.45 | 4.45 | 17.93 |
| Philadelphia | 22045.18 | 21064.62 | 134.10 | 157.08 | 164.39 |
| Pike | 11826.15 | 2225.94 | 544.96 | 4.08 | 21.70 |
| Potter | 8875.26 | 1883.71 | 1081.32 | 1.74 | 8.21 |
| Schuylkill | 16405.10 | 5967.22 | 778.63 | 7.66 | 21.07 |
| Snyder | 5924.59 | 3055.46 | 328.71 | 9.30 | 18.02 |
| Somerset | 12642.56 | 3452.80 | 1074.37 | 3.21 | 11.77 |
| Sullivan | 6012.39 | 610.94 | 449.94 | 1.36 | 13.36 |
| Susquehanna | 8432.27 | 4746.72 | 823.44 | 5.76 | 10.24 |
| Tioga | 11209.98 | 4094.38 | 1133.79 | 3.61 | 9.89 |
| Union | 6085.94 | 1958.20 | 315.98 | 6.20 | 19.26 |
| Venango | 10779.01 | 3885.06 | 674.28 | 5.76 | 15.99 |
| Warren | 11475.06 | 3722.89 | 884.14 | 4.21 | 12.98 |
| Washington | 11552.93 | 10067.33 | 856.99 | 11.75 | 13.48 |
| Wayne | 9607.42 | 1776.37 | 725.60 | 2.45 | 13.24 |
| Westmoreland | 17391.75 | 12939.02 | 1027.55 | 12.59 | 16.93 |
| Wyoming | 6177.44 | 2343.01 | 397.32 | 5.90 | 15.55 |
| York | 22085.76 | 33738.79 | 904.18 | 37.31 | 24.43 |

APPENDIX C

24-Hour HYSPLIT Back Trajectories for
Exceedances of the 70 ppb Standard at Ozone Monitors
for Calendar Years 2013-2015

Appendix C: Bristol 24-Hour HYSPLIT Back Trajectories

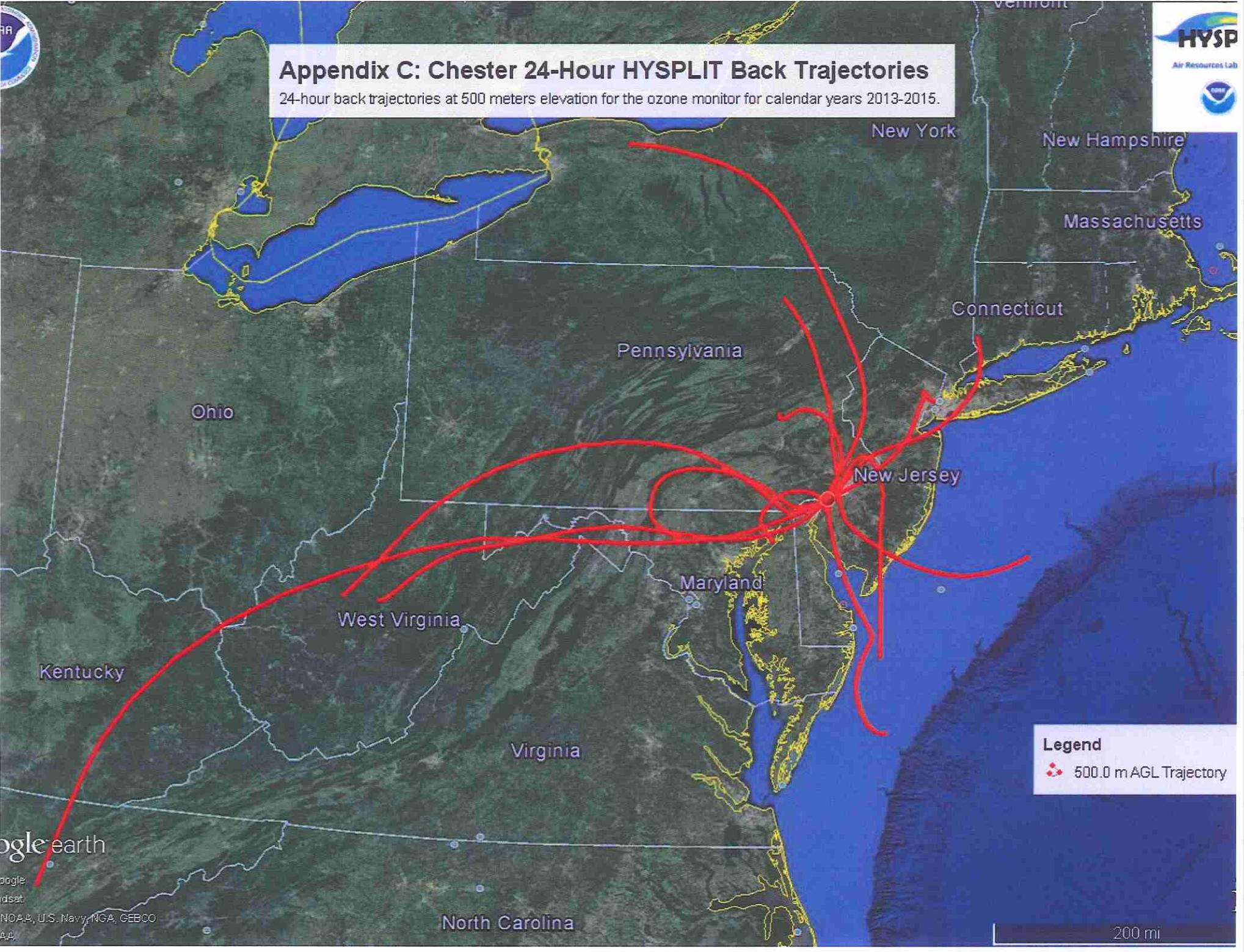
24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.





Appendix C: Chester 24-Hour HYSPLIT Back Trajectories

24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.

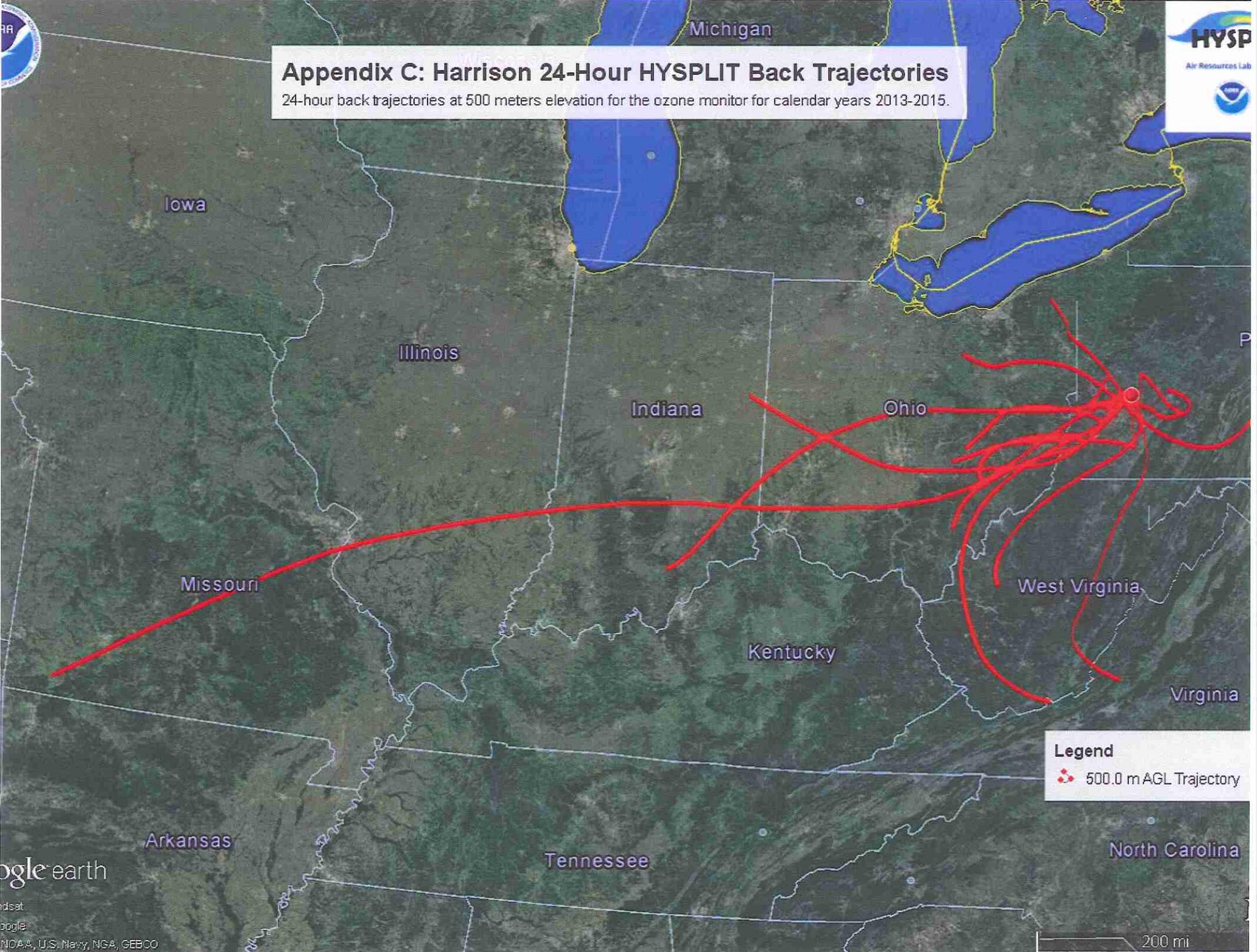


Legend
500.0 m AGL Trajectory

200 mi



Appendix C: Harrison 24-Hour HYSPLIT Back Trajectories
 24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.



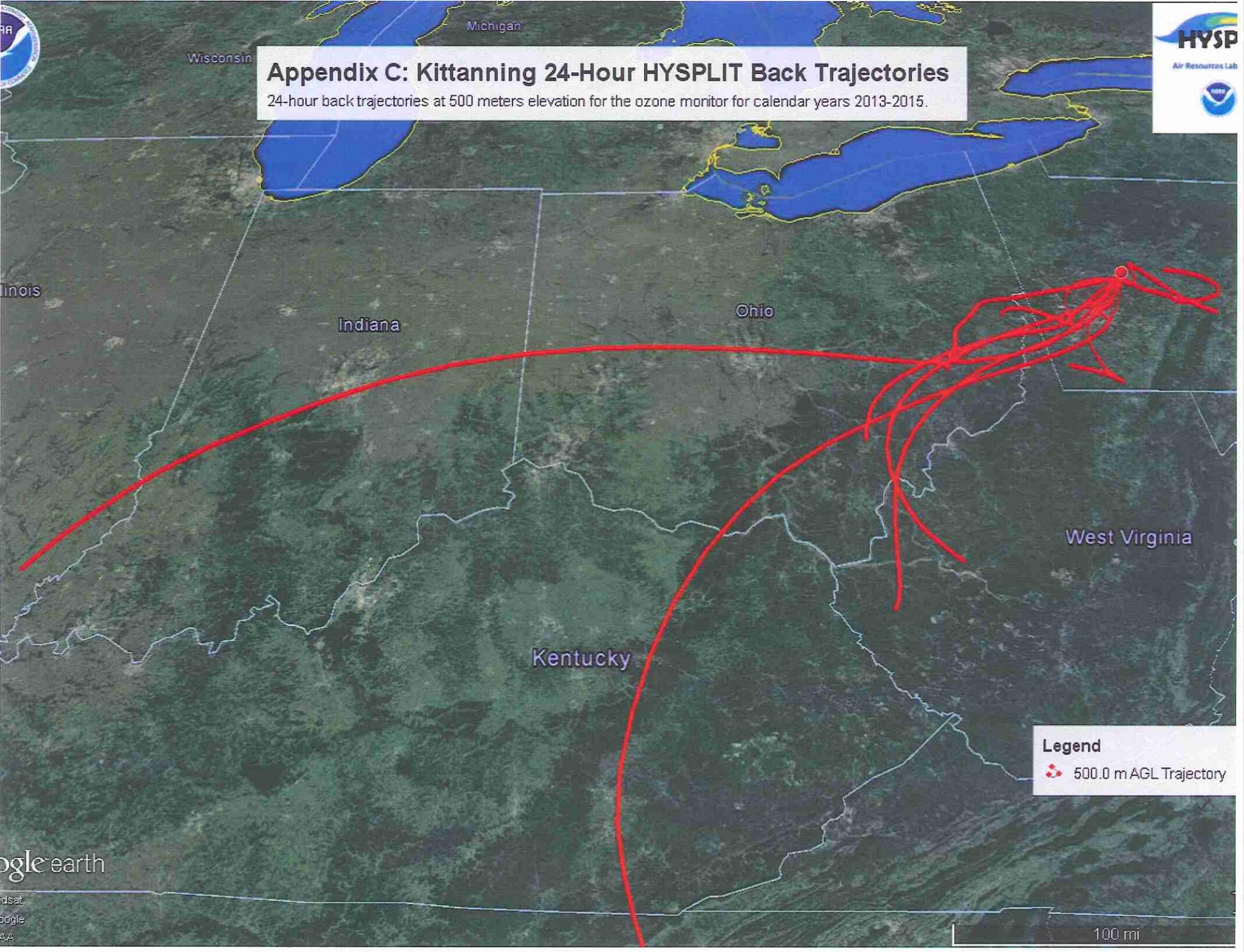
Legend
 500.0 m AGL Trajectory

200 mi



Appendix C: Kittanning 24-Hour HYSPLIT Back Trajectories

24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.



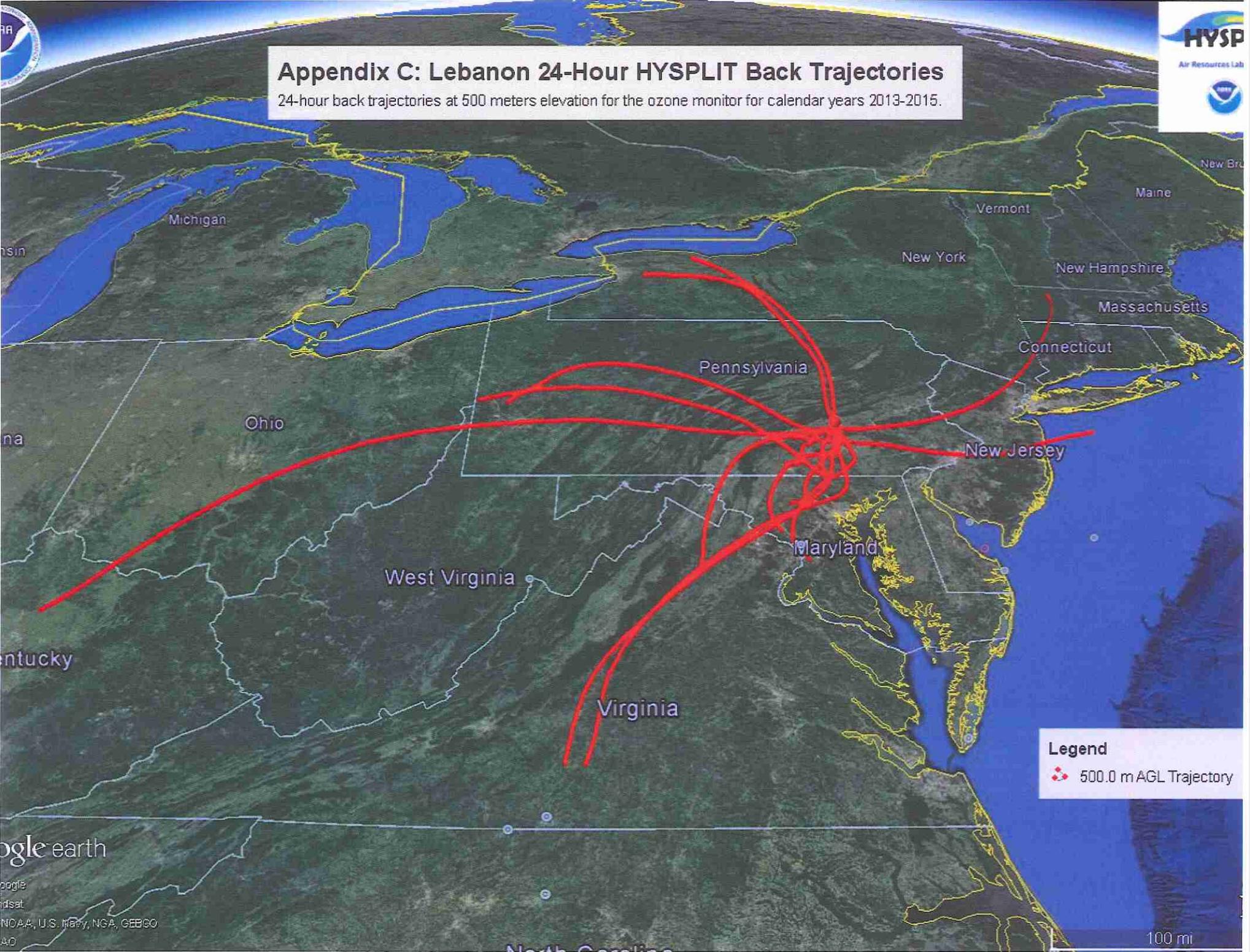
Legend
 500.0 m AGL Trajectory

100 mi



Appendix C: Lebanon 24-Hour HYSPLIT Back Trajectories

24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.

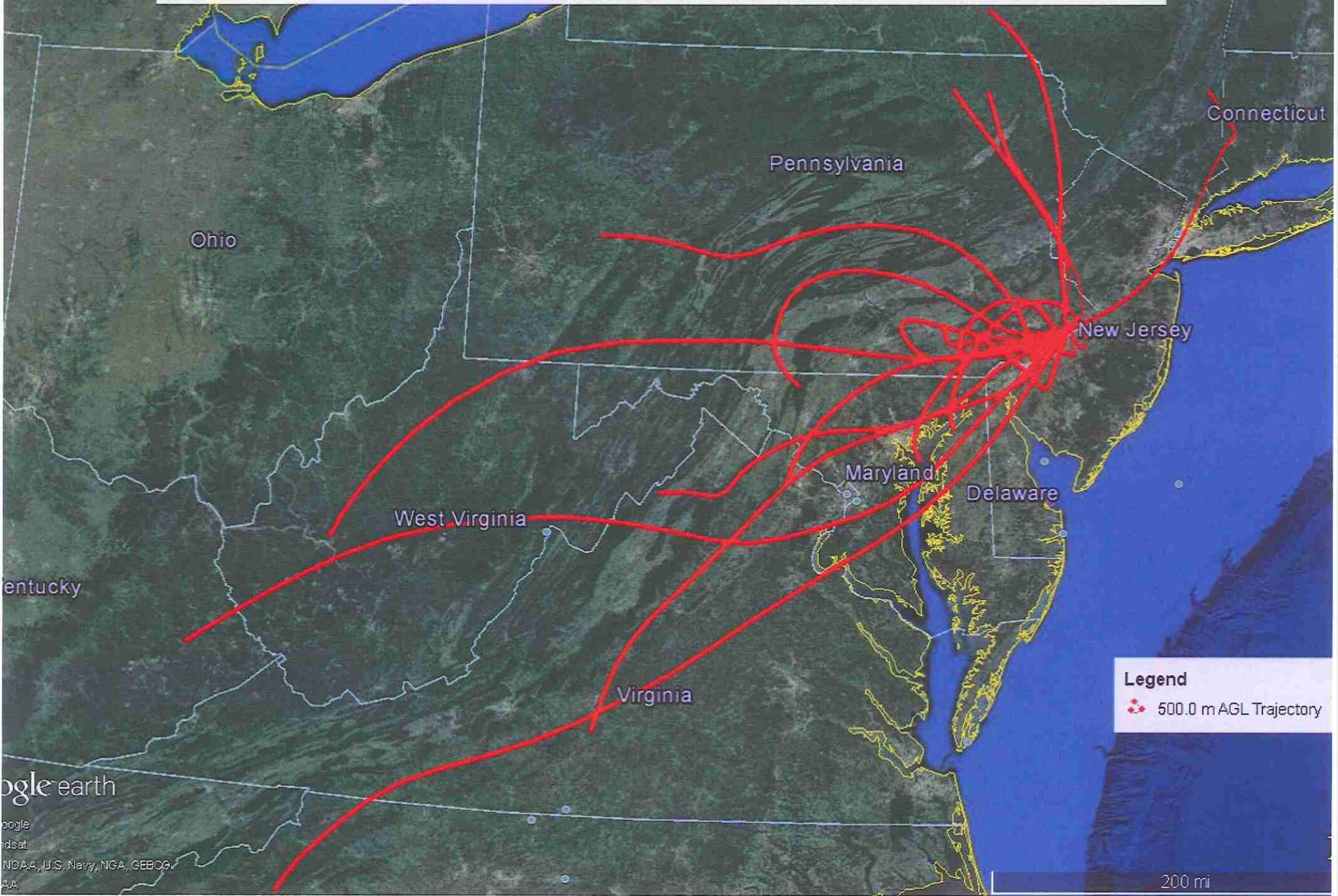


Legend
500.0 m AGL Trajectory

100 mi

Appendix C: Philadelphia Northeast Airport 24-Hour HYSPLIT Back Trajectories

24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.



Legend
500.0 m AGL Trajectory

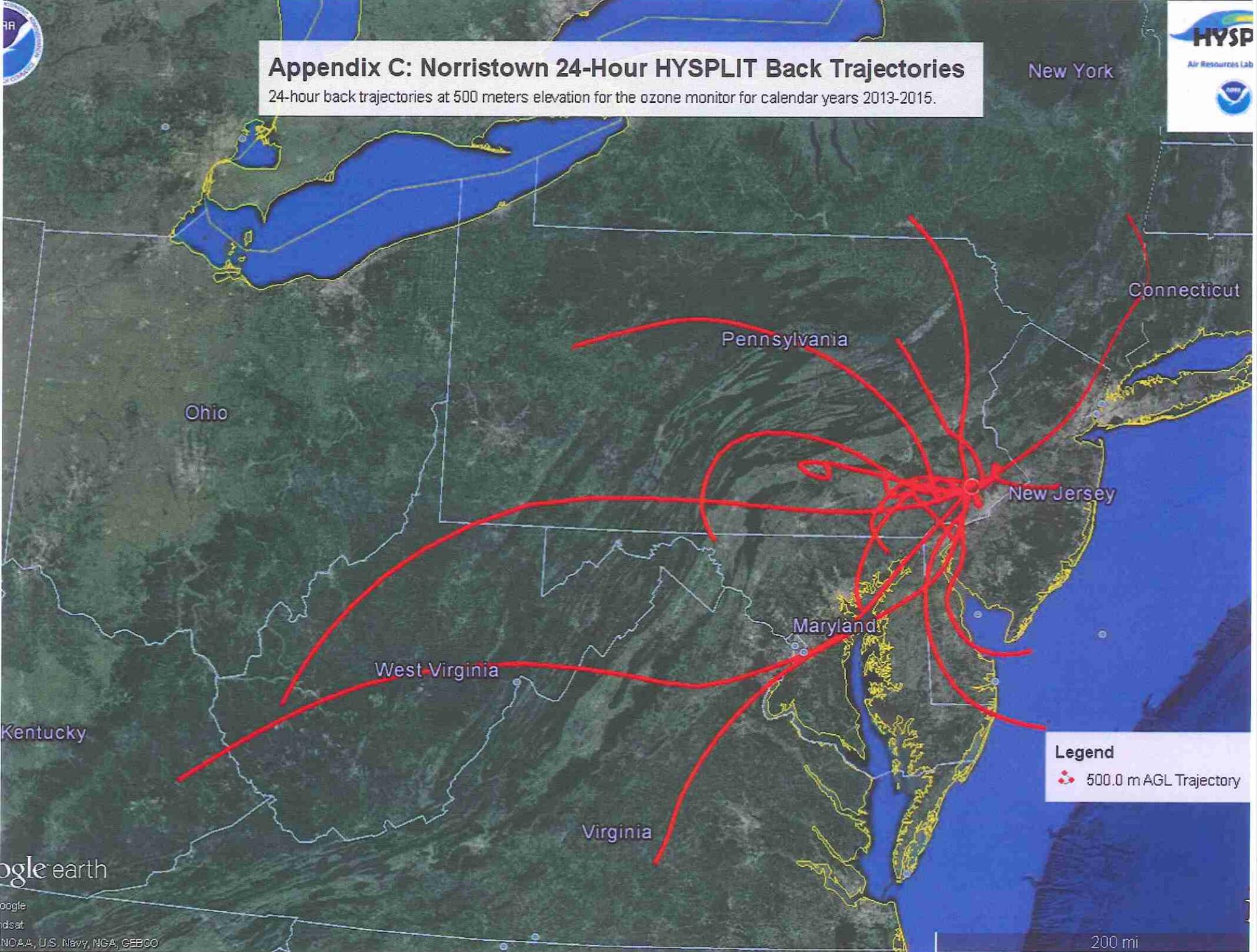
200 mi

Google earth
Google
Landsat
NOAA, U.S. Navy, NGA, GEBCO



Appendix C: Norristown 24-Hour HYSPLIT Back Trajectories

24-hour back trajectories at 500 meters elevation for the ozone monitor for calendar years 2013-2015.

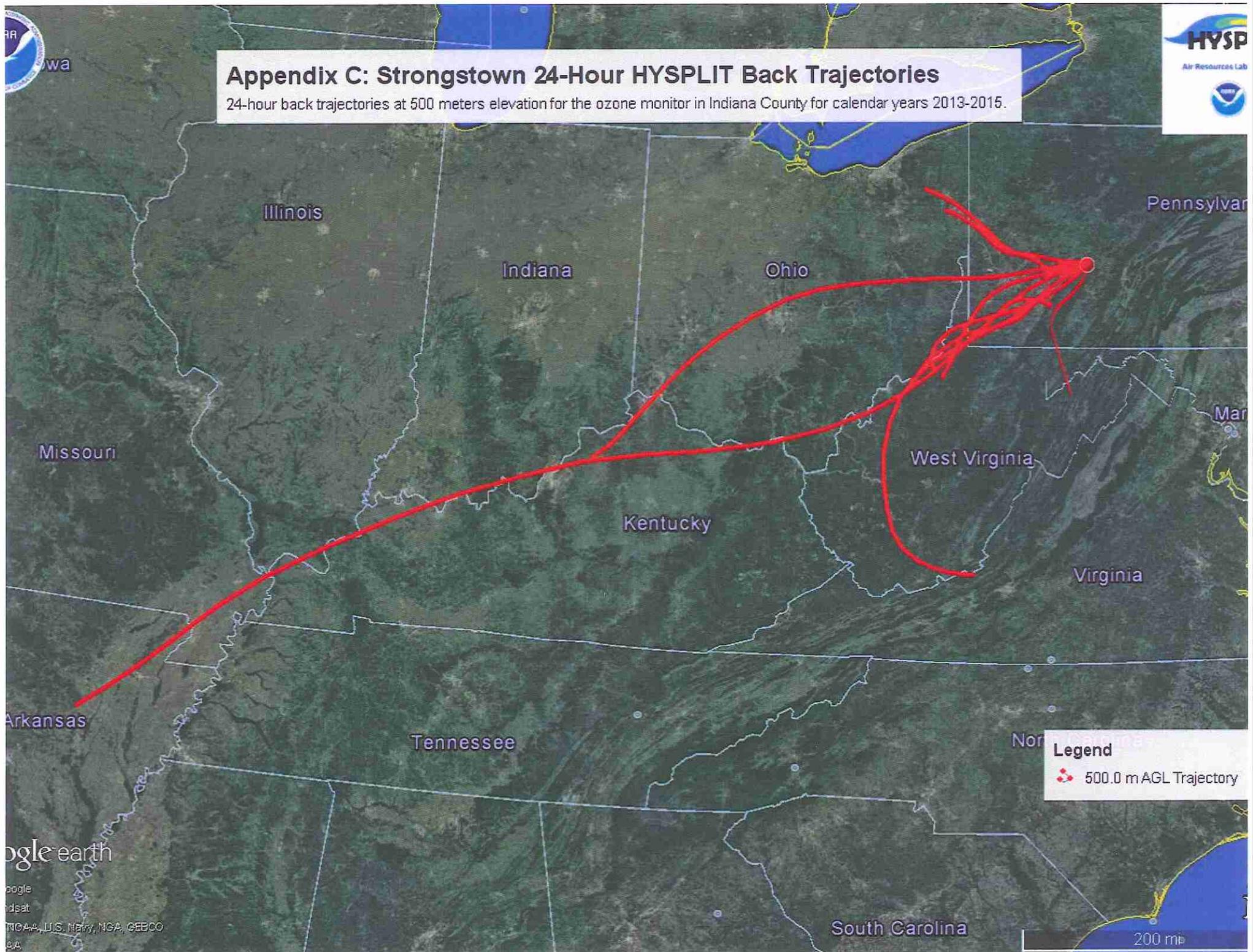


Legend
500.0 m AGL Trajectory

200 mi

Appendix C: Strongstown 24-Hour HYSPLIT Back Trajectories

24-hour back trajectories at 500 meters elevation for the ozone monitor in Indiana County for calendar years 2013-2015.



APPENDIX D

Commuting Patterns for Selected Counties within Metropolitan Statistical Areas

Allegheny County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Allegheny County, PA | 445,081 | 80.90% | Allegheny County, PA | 445,081 | 66.90% |
| Westmoreland County, PA | 18,534 | 3.40% | Westmoreland County, PA | 53,125 | 8.00% |
| Washington County, PA | 17,703 | 3.20% | Washington County, PA | 30,630 | 4.60% |
| Butler County, PA | 13,970 | 2.50% | Butler County, PA | 26,128 | 3.90% |
| Beaver County, PA | 7,081 | 1.30% | Beaver County, PA | 25,538 | 3.80% |
| Philadelphia County, PA | 3,065 | 0.60% | Armstrong County, PA | 6,586 | 1.00% |
| Montgomery County, PA | 2,632 | 0.50% | Fayette County, PA | 6,080 | 0.90% |
| Cumberland County, PA | 2,169 | 0.40% | Lawrence County, PA | 4,470 | 0.70% |
| Dauphin County, PA | 2,000 | 0.40% | Erie County, PA | 3,575 | 0.50% |
| Erie County, PA | 1,927 | 0.40% | Indiana County, PA | 3,276 | 0.50% |
| Fayette County, PA | 1,742 | 0.30% | Mercer County, PA | 2,950 | 0.40% |
| Lawrence County, PA | 1,594 | 0.30% | Cambria County, PA | 2,723 | 0.40% |
| Mercer County, PA | 1,470 | 0.30% | Philadelphia County, PA | 2,398 | 0.40% |
| Cambria County, PA | 1,302 | 0.20% | Hancock County, WV | 2,257 | 0.30% |
| Indiana County, PA | 1,278 | 0.20% | Montgomery County, PA | 2,222 | 0.30% |
| Armstrong County, PA | 1,086 | 0.20% | Greene County, PA | 2,059 | 0.30% |
| Blair County, PA | 1,049 | 0.20% | Blair County, PA | 1,761 | 0.30% |
| Lancaster County, PA | 1,019 | 0.20% | Chester County, PA | 1,634 | 0.20% |
| York County, PA | 998 | 0.20% | York County, PA | 1,548 | 0.20% |
| Delaware County, PA | 994 | 0.20% | Somerset County, PA | 1,541 | 0.20% |
| Chester County, PA | 979 | 0.20% | Bucks County, PA | 1,531 | 0.20% |
| Centre County, PA | 856 | 0.20% | Dauphin County, PA | 1,461 | 0.20% |
| Bucks County, PA | 818 | 0.10% | Lancaster County, PA | 1,432 | 0.20% |
| Lehigh County, PA | 752 | 0.10% | Columbiana County, OH | 1,387 | 0.20% |
| Greene County, PA | 692 | 0.10% | Cumberland County, PA | 1,273 | 0.20% |
| All Other Locations | 19,426 | 3.50% | All Other Locations | 32,368 | 4.90% |

Armstrong County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Armstrong County, PA | 8,741 | 29.60% | Armstrong County, PA | 8,741 | 53.30% |
| Allegheny County, PA | 6,586 | 22.30% | Westmoreland County, PA | 1,594 | 9.70% |
| Westmoreland County, PA | 3,632 | 12.30% | Butler County, PA | 1,483 | 9.00% |
| Butler County, PA | 3,320 | 11.30% | Allegheny County, PA | 1,086 | 6.60% |
| Indiana County, PA | 1,655 | 5.60% | Indiana County, PA | 915 | 5.60% |
| Clarion County, PA | 847 | 2.90% | Clarion County, PA | 449 | 2.70% |
| Jefferson County, PA | 399 | 1.40% | Clearfield County, PA | 174 | 1.10% |
| Cambria County, PA | 388 | 1.30% | Cambria County, PA | 160 | 1.00% |
| Washington County, PA | 290 | 1.00% | Venango County, PA | 157 | 1.00% |
| Clearfield County, PA | 257 | 0.90% | Jefferson County, PA | 151 | 0.90% |
| Blair County, PA | 231 | 0.80% | Washington County, PA | 109 | 0.70% |
| Cumberland County, PA | 213 | 0.70% | Beaver County, PA | 96 | 0.60% |
| Beaver County, PA | 195 | 0.70% | Erie County, PA | 94 | 0.60% |
| Erie County, PA | 154 | 0.50% | Mercer County, PA | 86 | 0.50% |
| Fayette County, PA | 150 | 0.50% | Somerset County, PA | 81 | 0.50% |
| Dauphin County, PA | 142 | 0.50% | Fayette County, PA | 74 | 0.50% |
| Somerset County, PA | 124 | 0.40% | Blair County, PA | 61 | 0.40% |
| Mercer County, PA | 118 | 0.40% | Lawrence County, PA | 60 | 0.40% |
| Centre County, PA | 116 | 0.40% | Crawford County, PA | 35 | 0.20% |
| Venango County, PA | 115 | 0.40% | Centre County, PA | 31 | 0.20% |
| Lancaster County, PA | 96 | 0.30% | Elk County, PA | 30 | 0.20% |
| Lycoming County, PA | 79 | 0.30% | Bedford County, PA | 28 | 0.20% |
| York County, PA | 79 | 0.30% | Huntingdon County, PA | 27 | 0.20% |
| Greene County, PA | 75 | 0.30% | McKean County, PA | 26 | 0.20% |
| Montgomery County, PA | 70 | 0.20% | Potter County, PA | 18 | 0.10% |
| All Other Locations | 1,436 | 4.90% | All Other Locations | 644 | 3.90% |

Beaver County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Beaver County, PA | 28,705 | 39.30% | Beaver County, PA | 28,705 | 55.00% |
| Allegheny County, PA | 25,538 | 34.90% | Allegheny County, PA | 7,081 | 13.60% |
| Butler County, PA | 5,826 | 8.00% | Lawrence County, PA | 3,193 | 6.10% |
| Lawrence County, PA | 2,032 | 2.80% | Butler County, PA | 2,720 | 5.20% |
| Washington County, PA | 1,325 | 1.80% | Columbiana County, OH | 2,090 | 4.00% |
| Westmoreland County, PA | 1,113 | 1.50% | Westmoreland County, PA | 1,200 | 2.30% |
| Erie County, PA | 531 | 0.70% | Washington County, PA | 1,047 | 2.00% |
| Mercer County, PA | 527 | 0.70% | Hancock County, WV | 625 | 1.20% |
| Cumberland County, PA | 497 | 0.70% | Mercer County, PA | 392 | 0.80% |
| Columbiana County, OH | 365 | 0.50% | Fayette County, PA | 380 | 0.70% |
| Philadelphia County, PA | 342 | 0.50% | Erie County, PA | 343 | 0.70% |
| Montgomery County, PA | 316 | 0.40% | Mahoning County, OH | 254 | 0.50% |
| Dauphin County, PA | 305 | 0.40% | Indiana County, PA | 211 | 0.40% |
| Indiana County, PA | 232 | 0.30% | Armstrong County, PA | 195 | 0.40% |
| Hancock County, WV | 227 | 0.30% | Trumbull County, OH | 169 | 0.30% |
| Mahoning County, OH | 222 | 0.30% | Ohio County, WV | 146 | 0.30% |
| Fayette County, PA | 218 | 0.30% | Jefferson County, OH | 137 | 0.30% |
| Blair County, PA | 198 | 0.30% | Venango County, PA | 133 | 0.30% |
| Cambria County, PA | 193 | 0.30% | Brooke County, WV | 125 | 0.20% |
| Delaware County, PA | 157 | 0.20% | Cambria County, PA | 121 | 0.20% |
| Centre County, PA | 153 | 0.20% | Crawford County, PA | 112 | 0.20% |
| York County, PA | 148 | 0.20% | Clarion County, PA | 106 | 0.20% |
| Crawford County, PA | 142 | 0.20% | York County, PA | 103 | 0.20% |
| Clearfield County, PA | 137 | 0.20% | Berks County, PA | 100 | 0.20% |
| Venango County, PA | 133 | 0.20% | Clearfield County, PA | 98 | 0.20% |
| All Other Locations | 3,502 | 4.80% | All Other Locations | 2,445 | 4.70% |

Butler County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Butler County, PA | 35,525 | 44.20% | Butler County, PA | 35,525 | 45.90% |
| Allegheny County, PA | 26,128 | 32.50% | Allegheny County, PA | 13,970 | 18.00% |
| Beaver County, PA | 2,720 | 3.40% | Beaver County, PA | 5,826 | 7.50% |
| Westmoreland County, PA | 1,948 | 2.40% | Armstrong County, PA | 3,320 | 4.30% |
| Mercer County, PA | 1,857 | 2.30% | Lawrence County, PA | 3,271 | 4.20% |
| Armstrong County, PA | 1,483 | 1.80% | Westmoreland County, PA | 3,097 | 4.00% |
| Lawrence County, PA | 1,445 | 1.80% | Mercer County, PA | 1,559 | 2.00% |
| Washington County, PA | 1,071 | 1.30% | Washington County, PA | 1,074 | 1.40% |
| Erie County, PA | 581 | 0.70% | Clarion County, PA | 1,038 | 1.30% |
| Cumberland County, PA | 535 | 0.70% | Venango County, PA | 786 | 1.00% |
| Venango County, PA | 464 | 0.60% | Indiana County, PA | 726 | 0.90% |
| Montgomery County, PA | 382 | 0.50% | Erie County, PA | 646 | 0.80% |
| Clarion County, PA | 377 | 0.50% | Fayette County, PA | 427 | 0.60% |
| Philadelphia County, PA | 374 | 0.50% | Crawford County, PA | 310 | 0.40% |
| Indiana County, PA | 305 | 0.40% | Cambria County, PA | 262 | 0.30% |
| Dauphin County, PA | 289 | 0.40% | Mahoning County, OH | 234 | 0.30% |
| Fayette County, PA | 237 | 0.30% | York County, PA | 219 | 0.30% |
| Cambria County, PA | 214 | 0.30% | Clearfield County, PA | 217 | 0.30% |
| Blair County, PA | 206 | 0.30% | Bucks County, PA | 183 | 0.20% |
| Centre County, PA | 206 | 0.30% | Trumbull County, OH | 172 | 0.20% |
| Crawford County, PA | 204 | 0.30% | Columbiana County, OH | 171 | 0.20% |
| Cuyahoga County, OH | 173 | 0.20% | Lancaster County, PA | 169 | 0.20% |
| York County, PA | 166 | 0.20% | Blair County, PA | 157 | 0.20% |
| Delaware County, PA | 165 | 0.20% | Somerset County, PA | 143 | 0.20% |
| Bucks County, PA | 132 | 0.20% | Dauphin County, PA | 138 | 0.20% |
| All Other Locations | 3,246 | 4.00% | All Other Locations | 3,799 | 4.90% |

Fayette County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Fayette County, PA | 22,091 | 43.40% | Fayette County, PA | 22,091 | 62.60% |
| Westmoreland County, PA | 7,172 | 14.10% | Westmoreland County, PA | 3,304 | 9.40% |
| Allegheny County, PA | 6,080 | 12.00% | Washington County, PA | 1,840 | 5.20% |
| Washington County, PA | 3,786 | 7.40% | Allegheny County, PA | 1,742 | 4.90% |
| Monongalia County, WV | 2,619 | 5.10% | Greene County, PA | 756 | 2.10% |
| Greene County, PA | 1,859 | 3.70% | Somerset County, PA | 596 | 1.70% |
| Somerset County, PA | 611 | 1.20% | Monongalia County, WV | 368 | 1.00% |
| Butler County, PA | 427 | 0.80% | Cambria County, PA | 314 | 0.90% |
| Beaver County, PA | 380 | 0.70% | Butler County, PA | 237 | 0.70% |
| Cambria County, PA | 358 | 0.70% | Blair County, PA | 230 | 0.70% |
| Indiana County, PA | 341 | 0.70% | Beaver County, PA | 218 | 0.60% |
| Cumberland County, PA | 301 | 0.60% | Indiana County, PA | 189 | 0.50% |
| Dauphin County, PA | 251 | 0.50% | Clearfield County, PA | 161 | 0.50% |
| Blair County, PA | 248 | 0.50% | Preston County, WV | 161 | 0.50% |
| Philadelphia County, PA | 216 | 0.40% | Erie County, PA | 159 | 0.50% |
| Erie County, PA | 195 | 0.40% | Armstrong County, PA | 150 | 0.40% |
| Montgomery County, PA | 187 | 0.40% | York County, PA | 112 | 0.30% |
| Mercer County, PA | 168 | 0.30% | Lawrence County, PA | 96 | 0.30% |
| Preston County, WV | 166 | 0.30% | Ohio County, WV | 95 | 0.30% |
| Centre County, PA | 150 | 0.30% | Mercer County, PA | 84 | 0.20% |
| Clearfield County, PA | 148 | 0.30% | Jefferson County, PA | 83 | 0.20% |
| York County, PA | 133 | 0.30% | Venango County, PA | 77 | 0.20% |
| Garrett County, MD | 108 | 0.20% | Garrett County, MD | 76 | 0.20% |
| Lancaster County, PA | 106 | 0.20% | Lancaster County, PA | 71 | 0.20% |
| Lawrence County, PA | 104 | 0.20% | Centre County, PA | 64 | 0.20% |
| All Other Locations | 2,659 | 5.20% | All Other Locations | 2,027 | 5.70% |

Washington County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Washington County, PA | 38,445 | 43.50% | Washington County, PA | 38,445 | 47.50% |
| Allegheny County, PA | 30,630 | 34.60% | Allegheny County, PA | 17,703 | 21.90% |
| Westmoreland County, PA | 3,152 | 3.60% | Westmoreland County, PA | 4,713 | 5.80% |
| Greene County, PA | 1,845 | 2.10% | Fayette County, PA | 3,786 | 4.70% |
| Fayette County, PA | 1,840 | 2.10% | Greene County, PA | 2,422 | 3.00% |
| Butler County, PA | 1,074 | 1.20% | Beaver County, PA | 1,325 | 1.60% |
| Beaver County, PA | 1,047 | 1.20% | Butler County, PA | 1,071 | 1.30% |
| Philadelphia County, PA | 735 | 0.80% | Ohio County, WV | 806 | 1.00% |
| Ohio County, WV | 714 | 0.80% | Brooke County, WV | 586 | 0.70% |
| Monongalia County, WV | 587 | 0.70% | Hancock County, WV | 548 | 0.70% |
| Montgomery County, PA | 457 | 0.50% | Jefferson County, OH | 547 | 0.70% |
| Cumberland County, PA | 425 | 0.50% | Belmont County, OH | 494 | 0.60% |
| Indiana County, PA | 326 | 0.40% | Erie County, PA | 397 | 0.50% |
| Dauphin County, PA | 317 | 0.40% | Lawrence County, PA | 392 | 0.50% |
| Erie County, PA | 313 | 0.40% | Marshall County, WV | 366 | 0.50% |
| Marshall County, WV | 259 | 0.30% | Indiana County, PA | 351 | 0.40% |
| Hancock County, WV | 248 | 0.30% | Mercer County, PA | 315 | 0.40% |
| Mercer County, PA | 245 | 0.30% | Armstrong County, PA | 290 | 0.40% |
| Cambria County, PA | 236 | 0.30% | Cambria County, PA | 277 | 0.30% |
| Jefferson County, OH | 221 | 0.20% | Monongalia County, WV | 276 | 0.30% |
| Brooke County, WV | 215 | 0.20% | York County, PA | 203 | 0.30% |
| Lawrence County, PA | 208 | 0.20% | Columbiana County, OH | 193 | 0.20% |
| Belmont County, OH | 199 | 0.20% | Clearfield County, PA | 190 | 0.20% |
| Chester County, PA | 185 | 0.20% | Blair County, PA | 184 | 0.20% |
| Blair County, PA | 178 | 0.20% | Venango County, PA | 167 | 0.20% |
| All Other Locations | 4,338 | 4.90% | All Other Locations | 4,869 | 6.00% |

Westmoreland County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Westmoreland County, PA | 72,003 | 45.70% | Westmoreland County, PA | 72,003 | 57.20% |
| Allegheny County, PA | 53,125 | 33.70% | Allegheny County, PA | 18,534 | 14.70% |
| Washington County, PA | 4,713 | 3.00% | Fayette County, PA | 7,172 | 5.70% |
| Fayette County, PA | 3,304 | 2.10% | Armstrong County, PA | 3,632 | 2.90% |
| Butler County, PA | 3,097 | 2.00% | Washington County, PA | 3,152 | 2.50% |
| Indiana County, PA | 2,712 | 1.70% | Indiana County, PA | 3,146 | 2.50% |
| Cambria County, PA | 1,748 | 1.10% | Butler County, PA | 1,948 | 1.50% |
| Armstrong County, PA | 1,594 | 1.00% | Cambria County, PA | 1,729 | 1.40% |
| Beaver County, PA | 1,200 | 0.80% | Somerset County, PA | 1,443 | 1.10% |
| Somerset County, PA | 889 | 0.60% | Beaver County, PA | 1,113 | 0.90% |
| Cumberland County, PA | 765 | 0.50% | Blair County, PA | 632 | 0.50% |
| Blair County, PA | 720 | 0.50% | Erie County, PA | 616 | 0.50% |
| Dauphin County, PA | 677 | 0.40% | Lawrence County, PA | 501 | 0.40% |
| Philadelphia County, PA | 533 | 0.30% | Greene County, PA | 500 | 0.40% |
| Erie County, PA | 514 | 0.30% | Clearfield County, PA | 488 | 0.40% |
| Centre County, PA | 477 | 0.30% | Mercer County, PA | 474 | 0.40% |
| Montgomery County, PA | 457 | 0.30% | York County, PA | 372 | 0.30% |
| Mercer County, PA | 409 | 0.30% | Venango County, PA | 335 | 0.30% |
| York County, PA | 382 | 0.20% | Berks County, PA | 296 | 0.20% |
| Greene County, PA | 379 | 0.20% | Lancaster County, PA | 289 | 0.20% |
| Clearfield County, PA | 374 | 0.20% | Centre County, PA | 278 | 0.20% |
| Lancaster County, PA | 354 | 0.20% | Bedford County, PA | 260 | 0.20% |
| Chester County, PA | 293 | 0.20% | Dauphin County, PA | 255 | 0.20% |
| Lawrence County, PA | 287 | 0.20% | Jefferson County, PA | 253 | 0.20% |
| Bedford County, PA | 260 | 0.20% | Cumberland County, PA | 244 | 0.20% |
| All Other Locations | 6,292 | 4.00% | All Other Locations | 6,192 | 4.90% |

Lawrence County

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Lawrence County, PA | 16,198 | 43.60% | Lawrence County, PA | 16,198 | 57.40% |
| Allegheny County, PA | 4,470 | 12.00% | Mercer County, PA | 2,522 | 8.90% |
| Butler County, PA | 3,271 | 8.80% | Beaver County, PA | 2,032 | 7.20% |
| Beaver County, PA | 3,193 | 8.60% | Allegheny County, PA | 1,594 | 5.60% |
| Mercer County, PA | 3,092 | 8.30% | Butler County, PA | 1,445 | 5.10% |
| Mahoning County, OH | 1,532 | 4.10% | Mahoning County, OH | 746 | 2.60% |
| Westmoreland County, PA | 501 | 1.30% | Trumbull County, OH | 502 | 1.80% |
| Trumbull County, OH | 407 | 1.10% | Westmoreland County, PA | 287 | 1.00% |
| Washington County, PA | 392 | 1.10% | Erie County, PA | 258 | 0.90% |
| Erie County, PA | 265 | 0.70% | Washington County, PA | 208 | 0.70% |
| Cumberland County, PA | 253 | 0.70% | Columbiana County, OH | 200 | 0.70% |
| Columbiana County, OH | 205 | 0.60% | Crawford County, PA | 174 | 0.60% |
| Philadelphia County, PA | 200 | 0.50% | Venango County, PA | 113 | 0.40% |
| Montgomery County, PA | 181 | 0.50% | Fayette County, PA | 104 | 0.40% |
| Dauphin County, PA | 151 | 0.40% | Indiana County, PA | 95 | 0.30% |
| Venango County, PA | 148 | 0.40% | Clarion County, PA | 79 | 0.30% |
| Indiana County, PA | 145 | 0.40% | Clearfield County, PA | 76 | 0.30% |
| Crawford County, PA | 140 | 0.40% | Warren County, PA | 67 | 0.20% |
| Cambria County, PA | 103 | 0.30% | Cambria County, PA | 65 | 0.20% |
| Blair County, PA | 100 | 0.30% | Armstrong County, PA | 61 | 0.20% |
| Fayette County, PA | 96 | 0.30% | York County, PA | 51 | 0.20% |
| Centre County, PA | 94 | 0.30% | Blair County, PA | 49 | 0.20% |
| Cuyahoga County, OH | 83 | 0.20% | Dauphin County, PA | 45 | 0.20% |
| York County, PA | 82 | 0.20% | Cumberland County, PA | 43 | 0.20% |
| Delaware County, PA | 80 | 0.20% | Jefferson County, PA | 43 | 0.20% |
| All Other Locations | 1,786 | 4.80% | All Other Locations | 1,156 | 4.10% |

Indiana County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Indiana County, PA | 15,425 | 48.00% | Indiana County, PA | 15,425 | 49.10% |
| Allegheny County, PA | 3,276 | 10.20% | Westmoreland County, PA | 2,712 | 8.60% |
| Westmoreland County, PA | 3,146 | 9.80% | Cambria County, PA | 2,479 | 7.90% |
| Cambria County, PA | 2,060 | 6.40% | Armstrong County, PA | 1,655 | 5.30% |
| Armstrong County, PA | 915 | 2.80% | Allegheny County, PA | 1,278 | 4.10% |
| Jefferson County, PA | 818 | 2.50% | Clearfield County, PA | 945 | 3.00% |
| Butler County, PA | 726 | 2.30% | Jefferson County, PA | 834 | 2.70% |
| Clearfield County, PA | 505 | 1.60% | Somerset County, PA | 482 | 1.50% |
| Washington County, PA | 351 | 1.10% | Fayette County, PA | 341 | 1.10% |
| Blair County, PA | 315 | 1.00% | Blair County, PA | 327 | 1.00% |
| Cumberland County, PA | 297 | 0.90% | Washington County, PA | 326 | 1.00% |
| Clarion County, PA | 273 | 0.80% | Butler County, PA | 305 | 1.00% |
| Somerset County, PA | 254 | 0.80% | Erie County, PA | 254 | 0.80% |
| Erie County, PA | 220 | 0.70% | Beaver County, PA | 232 | 0.70% |
| Dauphin County, PA | 215 | 0.70% | Venango County, PA | 184 | 0.60% |
| Beaver County, PA | 211 | 0.70% | Centre County, PA | 183 | 0.60% |
| Fayette County, PA | 189 | 0.60% | Mercer County, PA | 181 | 0.60% |
| Centre County, PA | 170 | 0.50% | Clarion County, PA | 163 | 0.50% |
| Mercer County, PA | 163 | 0.50% | Lawrence County, PA | 145 | 0.50% |
| Venango County, PA | 134 | 0.40% | York County, PA | 145 | 0.50% |
| York County, PA | 112 | 0.30% | Bedford County, PA | 137 | 0.40% |
| Lancaster County, PA | 97 | 0.30% | Berks County, PA | 107 | 0.30% |
| Lawrence County, PA | 95 | 0.30% | Lancaster County, PA | 107 | 0.30% |
| Berks County, PA | 89 | 0.30% | Greene County, PA | 94 | 0.30% |
| Lycoming County, PA | 89 | 0.30% | Huntingdon County, PA | 94 | 0.30% |
| All Other Locations | 1,999 | 6.20% | All Other Locations | 2,287 | 7.30% |

Cumberland County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Cumberland County, PA | 47,524 | 46.40% | Cumberland County, PA | 47,524 | 36.30% |
| Dauphin County, PA | 22,356 | 21.80% | Dauphin County, PA | 17,279 | 13.20% |
| York County, PA | 6,355 | 6.20% | York County, PA | 12,958 | 9.90% |
| Franklin County, PA | 3,402 | 3.30% | Perry County, PA | 5,622 | 4.30% |
| Lancaster County, PA | 2,437 | 2.40% | Franklin County, PA | 4,314 | 3.30% |
| Montgomery County, PA | 1,649 | 1.60% | Lancaster County, PA | 3,976 | 3.00% |
| Philadelphia County, PA | 1,409 | 1.40% | Adams County, PA | 2,681 | 2.00% |
| Allegheny County, PA | 1,273 | 1.20% | Allegheny County, PA | 2,169 | 1.70% |
| Berks County, PA | 1,153 | 1.10% | Lebanon County, PA | 1,875 | 1.40% |
| Adams County, PA | 1,084 | 1.10% | Bucks County, PA | 1,779 | 1.40% |
| Chester County, PA | 994 | 1.00% | Berks County, PA | 1,698 | 1.30% |
| Lehigh County, PA | 972 | 0.90% | Montgomery County, PA | 1,686 | 1.30% |
| Perry County, PA | 857 | 0.80% | Chester County, PA | 1,435 | 1.10% |
| Lebanon County, PA | 840 | 0.80% | Philadelphia County, PA | 1,241 | 0.90% |
| Delaware County, PA | 700 | 0.70% | Lehigh County, PA | 1,088 | 0.80% |
| Bucks County, PA | 667 | 0.70% | Luzerne County, PA | 1,084 | 0.80% |
| Centre County, PA | 655 | 0.60% | Northampton County, PA | 922 | 0.70% |
| Luzerne County, PA | 620 | 0.60% | Juniata County, PA | 881 | 0.70% |
| Lycoming County, PA | 361 | 0.40% | Schuylkill County, PA | 858 | 0.70% |
| Northampton County, PA | 354 | 0.30% | Delaware County, PA | 793 | 0.60% |
| Schuylkill County, PA | 336 | 0.30% | Westmoreland County, PA | 765 | 0.60% |
| Blair County, PA | 298 | 0.30% | Mifflin County, PA | 762 | 0.60% |
| Lackawanna County, PA | 271 | 0.30% | Lackawanna County, PA | 754 | 0.60% |
| Mifflin County, PA | 244 | 0.20% | Northumberland County, PA | 707 | 0.50% |
| Westmoreland County, PA | 244 | 0.20% | Centre County, PA | 677 | 0.50% |
| All Other Locations | 5,311 | 5.20% | All Other Locations | 15,266 | 11.70% |

Dauphin County, PA

Live in County - Work Locations

Work In County - Home Locations

| | Job Count | Share | | Job Count | Share |
|---------------------------|-----------|---------------|---------------------------|-----------|---------------|
| Dauphin County, PA | 63,736 | 54.90% | Dauphin County, PA | 63,736 | 37.70% |
| Cumberland County, PA | 17,279 | 14.90% | Cumberland County, PA | 22,356 | 13.20% |
| York County, PA | 4,971 | 4.30% | York County, PA | 12,537 | 7.40% |
| Lancaster County, PA | 4,867 | 4.20% | Lebanon County, PA | 12,165 | 7.20% |
| Lebanon County, PA | 2,939 | 2.50% | Lancaster County, PA | 10,874 | 6.40% |
| Montgomery County, PA | 1,925 | 1.70% | Perry County, PA | 5,166 | 3.10% |
| Philadelphia County, PA | 1,613 | 1.40% | Schuylkill County, PA | 2,757 | 1.60% |
| Berks County, PA | 1,575 | 1.40% | Berks County, PA | 2,531 | 1.50% |
| Allegheny County, PA | 1,461 | 1.30% | Philadelphia County, PA | 2,355 | 1.40% |
| Chester County, PA | 1,078 | 0.90% | Montgomery County, PA | 2,030 | 1.20% |
| Schuylkill County, PA | 1,060 | 0.90% | Allegheny County, PA | 2,000 | 1.20% |
| Lehigh County, PA | 998 | 0.90% | Luzerne County, PA | 1,618 | 1.00% |
| Centre County, PA | 851 | 0.70% | Chester County, PA | 1,592 | 0.90% |
| Delaware County, PA | 784 | 0.70% | Northumberland County, PA | 1,551 | 0.90% |
| Bucks County, PA | 760 | 0.70% | Juniata County, PA | 1,462 | 0.90% |
| Luzerne County, PA | 743 | 0.60% | Franklin County, PA | 1,437 | 0.80% |
| Perry County, PA | 713 | 0.60% | Bucks County, PA | 1,275 | 0.80% |
| Franklin County, PA | 651 | 0.60% | Lehigh County, PA | 1,231 | 0.70% |
| Northumberland County, PA | 519 | 0.40% | Adams County, PA | 1,175 | 0.70% |
| Lycoming County, PA | 409 | 0.40% | Delaware County, PA | 1,147 | 0.70% |
| Northampton County, PA | 394 | 0.30% | Lackawanna County, PA | 1,060 | 0.60% |
| Blair County, PA | 299 | 0.30% | Northampton County, PA | 1,040 | 0.60% |
| Lackawanna County, PA | 282 | 0.20% | Centre County, PA | 1,026 | 0.60% |
| Snyder County, PA | 282 | 0.20% | Mifflin County, PA | 950 | 0.60% |
| Adams County, PA | 278 | 0.20% | Snyder County, PA | 905 | 0.50% |
| All Other Locations | 5,556 | 4.80% | All Other Locations | 13,250 | 7.80% |

Lebanon County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Lebanon County, PA | 24,504 | 41.20% | Lebanon County, PA | 24,504 | 53.30% |
| Dauphin County, PA | 12,165 | 20.40% | Lancaster County, PA | 4,751 | 10.30% |
| Lancaster County, PA | 6,762 | 11.40% | Berks County, PA | 3,450 | 7.50% |
| Berks County, PA | 3,423 | 5.70% | Dauphin County, PA | 2,939 | 6.40% |
| Cumberland County, PA | 1,875 | 3.10% | Schuylkill County, PA | 1,659 | 3.60% |
| York County, PA | 1,255 | 2.10% | York County, PA | 1,102 | 2.40% |
| Montgomery County, PA | 946 | 1.60% | Cumberland County, PA | 840 | 1.80% |
| Philadelphia County, PA | 770 | 1.30% | Philadelphia County, PA | 448 | 1.00% |
| Allegheny County, PA | 730 | 1.20% | Montgomery County, PA | 415 | 0.90% |
| Chester County, PA | 655 | 1.10% | Chester County, PA | 386 | 0.80% |
| Schuylkill County, PA | 545 | 0.90% | Luzerne County, PA | 325 | 0.70% |
| Lehigh County, PA | 515 | 0.90% | Lehigh County, PA | 264 | 0.60% |
| Luzerne County, PA | 374 | 0.60% | Franklin County, PA | 246 | 0.50% |
| Delaware County, PA | 365 | 0.60% | Bucks County, PA | 239 | 0.50% |
| Bucks County, PA | 356 | 0.60% | Perry County, PA | 217 | 0.50% |
| Centre County, PA | 274 | 0.50% | Lackawanna County, PA | 214 | 0.50% |
| Franklin County, PA | 214 | 0.40% | Northumberland County, PA | 209 | 0.50% |
| Northampton County, PA | 210 | 0.40% | Northampton County, PA | 205 | 0.40% |
| Blair County, PA | 164 | 0.30% | Mifflin County, PA | 195 | 0.40% |
| Adams County, PA | 163 | 0.30% | Delaware County, PA | 188 | 0.40% |
| Lycoming County, PA | 156 | 0.30% | Adams County, PA | 169 | 0.40% |
| Northumberland County, PA | 152 | 0.30% | Allegheny County, PA | 143 | 0.30% |
| Lackawanna County, PA | 150 | 0.30% | Juniata County, PA | 136 | 0.30% |
| Westmoreland County, PA | 127 | 0.20% | Snyder County, PA | 136 | 0.30% |
| Monroe County, PA | 91 | 0.20% | Monroe County, PA | 130 | 0.30% |
| All Other Locations | 2,598 | 4.40% | All Other Locations | 2,454 | 5.30% |

Cumberland County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|--------------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Cumberland County, PA | 5,622 | 27.50% | Perry County, PA | 3,688 | 48.90% |
| Dauphin County, PA | 5,166 | 25.20% | Cumberland County, PA | 857 | 11.40% |
| Perry County, PA | 3,688 | 18.00% | Dauphin County, PA | 713 | 9.50% |
| York County, PA | 932 | 4.60% | Juniata County, PA | 381 | 5.10% |
| Lancaster County, PA | 468 | 2.30% | York County, PA | 241 | 3.20% |
| Montgomery County, PA | 316 | 1.50% | Lancaster County, PA | 139 | 1.80% |
| Franklin County, PA | 310 | 1.50% | Snyder County, PA | 124 | 1.60% |
| Juniata County, PA | 301 | 1.50% | Mifflin County, PA | 107 | 1.40% |
| Philadelphia County, PA | 289 | 1.40% | Lebanon County, PA | 82 | 1.10% |
| Allegheny County, PA | 224 | 1.10% | Union County, PA | 73 | 1.00% |
| Berks County, PA | 224 | 1.10% | Bucks County, PA | 62 | 0.80% |
| Lebanon County, PA | 217 | 1.10% | Franklin County, PA | 62 | 0.80% |
| Lehigh County, PA | 210 | 1.00% | Centre County, PA | 55 | 0.70% |
| Chester County, PA | 179 | 0.90% | Northumberland County, PA | 50 | 0.70% |
| Mifflin County, PA | 160 | 0.80% | Adams County, PA | 47 | 0.60% |
| Luzerne County, PA | 152 | 0.70% | Berks County, PA | 46 | 0.60% |
| Centre County, PA | 143 | 0.70% | Luzerne County, PA | 45 | 0.60% |
| Adams County, PA | 127 | 0.60% | Schuylkill County, PA | 44 | 0.60% |
| Delaware County, PA | 126 | 0.60% | Lycoming County, PA | 43 | 0.60% |
| Bucks County, PA | 114 | 0.60% | Blair County, PA | 31 | 0.40% |
| Snyder County, PA | 86 | 0.40% | Huntingdon County, PA | 30 | 0.40% |
| Schuylkill County, PA | 81 | 0.40% | Westmoreland County, PA | 30 | 0.40% |
| Lycoming County, PA | 72 | 0.40% | Cambria County, PA | 27 | 0.40% |
| Northumberland County, PA | 64 | 0.30% | Allegheny County, PA | 24 | 0.30% |
| Northampton County, PA | 63 | 0.30% | Clinton County, PA | 22 | 0.30% |
| All Other Locations | 1,132 | 5.50% | All Other Locations | 520 | 6.90% |

York County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| York County, PA | 105,693 | 52.90% | York County, PA | 105,693 | 63.90% |
| Cumberland County, PA | 12,958 | 6.50% | Adams County, PA | 10,285 | 6.20% |
| Dauphin County, PA | 12,537 | 6.30% | Lancaster County, PA | 9,270 | 5.60% |
| Lancaster County, PA | 11,115 | 5.60% | Cumberland County, PA | 6,355 | 3.80% |
| Baltimore County, MD | 10,582 | 5.30% | Dauphin County, PA | 4,971 | 3.00% |
| Adams County, PA | 6,296 | 3.20% | Berks County, PA | 1,786 | 1.10% |
| Baltimore city, MD | 4,028 | 2.00% | Franklin County, PA | 1,710 | 1.00% |
| Carroll County, MD | 2,656 | 1.30% | Philadelphia County, PA | 1,316 | 0.80% |
| Harford County, MD | 2,545 | 1.30% | Montgomery County, PA | 1,265 | 0.80% |
| Montgomery County, PA | 2,147 | 1.10% | Chester County, PA | 1,264 | 0.80% |
| Berks County, PA | 1,989 | 1.00% | Lebanon County, PA | 1,255 | 0.80% |
| Philadelphia County, PA | 1,754 | 0.90% | Baltimore County, MD | 1,115 | 0.70% |
| Chester County, PA | 1,617 | 0.80% | Allegheny County, PA | 998 | 0.60% |
| Allegheny County, PA | 1,548 | 0.80% | Perry County, PA | 932 | 0.60% |
| Anne Arundel County, MD | 1,398 | 0.70% | Lehigh County, PA | 911 | 0.60% |
| Franklin County, PA | 1,248 | 0.60% | Bucks County, PA | 903 | 0.50% |
| Lehigh County, PA | 1,159 | 0.60% | Carroll County, MD | 777 | 0.50% |
| Montgomery County, MD | 1,112 | 0.60% | Delaware County, PA | 754 | 0.50% |
| Lebanon County, PA | 1,102 | 0.60% | Northampton County, PA | 731 | 0.40% |
| Bucks County, PA | 1,007 | 0.50% | Schuylkill County, PA | 700 | 0.40% |
| Howard County, MD | 973 | 0.50% | Luzerne County, PA | 695 | 0.40% |
| Delaware County, PA | 931 | 0.50% | Harford County, MD | 512 | 0.30% |
| Prince George's County, MD | 747 | 0.40% | Lackawanna County, PA | 464 | 0.30% |
| Centre County, PA | 745 | 0.40% | Centre County, PA | 436 | 0.30% |
| Luzerne County, PA | 671 | 0.30% | Cambria County, PA | 423 | 0.30% |
| All Other Locations | 11,201 | 5.60% | All Other Locations | 9,841 | 6.00% |

Bucks County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Bucks County, PA | 120,791 | 40.70% | Bucks County, PA | 120,791 | 50.60% |
| Montgomery County, PA | 51,513 | 17.30% | Montgomery County, PA | 32,075 | 13.40% |
| Philadelphia County, PA | 35,096 | 11.80% | Philadelphia County, PA | 30,451 | 12.80% |
| Mercer County, NJ | 19,261 | 6.50% | Lehigh County, PA | 5,781 | 2.40% |
| Chester County, PA | 6,944 | 2.30% | Burlington County, NJ | 5,024 | 2.10% |
| Lehigh County, PA | 6,795 | 2.30% | Delaware County, PA | 4,855 | 2.00% |
| Delaware County, PA | 5,757 | 1.90% | Mercer County, NJ | 4,290 | 1.80% |
| Burlington County, NJ | 5,663 | 1.90% | Chester County, PA | 4,043 | 1.70% |
| Middlesex County, NJ | 4,226 | 1.40% | Northampton County, PA | 3,786 | 1.60% |
| Northampton County, PA | 3,394 | 1.10% | Berks County, PA | 2,711 | 1.10% |
| Somerset County, NJ | 2,861 | 1.00% | Camden County, NJ | 2,154 | 0.90% |
| Camden County, NJ | 2,359 | 0.80% | Lancaster County, PA | 1,607 | 0.70% |
| New York County, NY | 2,236 | 0.80% | Hunterdon County, NJ | 1,122 | 0.50% |
| Hunterdon County, NJ | 2,162 | 0.70% | York County, PA | 1,007 | 0.40% |
| Berks County, PA | 2,106 | 0.70% | Luzerne County, PA | 972 | 0.40% |
| Cumberland County, PA | 1,779 | 0.60% | Gloucester County, NJ | 905 | 0.40% |
| Allegheny County, PA | 1,531 | 0.50% | Allegheny County, PA | 818 | 0.30% |
| Lancaster County, PA | 1,442 | 0.50% | Dauphin County, PA | 760 | 0.30% |
| Dauphin County, PA | 1,275 | 0.40% | Lackawanna County, PA | 681 | 0.30% |
| Essex County, NJ | 1,158 | 0.40% | Schuylkill County, PA | 671 | 0.30% |
| Morris County, NJ | 1,101 | 0.40% | Cumberland County, PA | 667 | 0.30% |
| Union County, NJ | 985 | 0.30% | Monroe County, PA | 647 | 0.30% |
| Monmouth County, NJ | 979 | 0.30% | New Castle County, DE | 605 | 0.30% |
| Luzerne County, PA | 927 | 0.30% | Carbon County, PA | 576 | 0.20% |
| Bergen County, NJ | 921 | 0.30% | Middlesex County, NJ | 543 | 0.20% |
| All Other Locations | 13,826 | 4.70% | All Other Locations | 11,115 | 4.70% |

Chester County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Chester County, PA | 104,908 | 45.40% | Chester County, PA | 104,908 | 45.50% |
| Montgomery County, PA | 33,874 | 14.70% | Montgomery County, PA | 31,028 | 13.50% |
| Delaware County, PA | 22,149 | 9.60% | Delaware County, PA | 21,750 | 9.40% |
| Philadelphia County, PA | 16,592 | 7.20% | Philadelphia County, PA | 11,107 | 4.80% |
| New Castle County, DE | 15,536 | 6.70% | Lancaster County, PA | 9,869 | 4.30% |
| Lancaster County, PA | 5,311 | 2.30% | Berks County, PA | 9,319 | 4.00% |
| Berks County, PA | 4,270 | 1.80% | New Castle County, DE | 7,384 | 3.20% |
| Bucks County, PA | 4,043 | 1.80% | Bucks County, PA | 6,944 | 3.00% |
| Lehigh County, PA | 1,828 | 0.80% | Lehigh County, PA | 2,136 | 0.90% |
| Allegheny County, PA | 1,634 | 0.70% | York County, PA | 1,617 | 0.70% |
| Dauphin County, PA | 1,592 | 0.70% | Northampton County, PA | 1,570 | 0.70% |
| Cumberland County, PA | 1,435 | 0.60% | Gloucester County, NJ | 1,358 | 0.60% |
| York County, PA | 1,264 | 0.50% | Cecil County, MD | 1,312 | 0.60% |
| Cecil County, MD | 1,238 | 0.50% | Camden County, NJ | 1,210 | 0.50% |
| New York County, NY | 871 | 0.40% | Dauphin County, PA | 1,078 | 0.50% |
| Northampton County, PA | 852 | 0.40% | Cumberland County, PA | 994 | 0.40% |
| Luzerne County, PA | 652 | 0.30% | Allegheny County, PA | 979 | 0.40% |
| Lackawanna County, PA | 506 | 0.20% | Burlington County, NJ | 883 | 0.40% |
| Camden County, NJ | 494 | 0.20% | Luzerne County, PA | 817 | 0.40% |
| Gloucester County, NJ | 480 | 0.20% | Lebanon County, PA | 655 | 0.30% |
| Burlington County, NJ | 395 | 0.20% | Monroe County, PA | 635 | 0.30% |
| Lebanon County, PA | 386 | 0.20% | Schuylkill County, PA | 618 | 0.30% |
| Mercer County, NJ | 352 | 0.20% | Lackawanna County, PA | 557 | 0.20% |
| Centre County, PA | 346 | 0.10% | Salem County, NJ | 474 | 0.20% |
| Middlesex County, NJ | 342 | 0.10% | Carbon County, PA | 394 | 0.20% |
| All Other Locations | 9,665 | 4.20% | All Other Locations | 10,779 | 4.70% |

Delaware County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Delaware County, PA | 95,676 | 38.90% | Delaware County, PA | 95,676 | 45.00% |
| Philadelphia County, PA | 55,683 | 22.60% | Philadelphia County, PA | 28,804 | 13.50% |
| Montgomery County, PA | 32,019 | 13.00% | Chester County, PA | 22,149 | 10.40% |
| Chester County, PA | 21,750 | 8.80% | Montgomery County, PA | 18,198 | 8.60% |
| New Castle County, DE | 10,703 | 4.40% | New Castle County, DE | 8,954 | 4.20% |
| Bucks County, PA | 4,855 | 2.00% | Bucks County, PA | 5,757 | 2.70% |
| Camden County, NJ | 2,254 | 0.90% | Gloucester County, NJ | 4,420 | 2.10% |
| Gloucester County, NJ | 1,998 | 0.80% | Camden County, NJ | 3,247 | 1.50% |
| Berks County, PA | 1,259 | 0.50% | Lancaster County, PA | 2,718 | 1.30% |
| Lehigh County, PA | 1,228 | 0.50% | Berks County, PA | 2,057 | 1.00% |
| Allegheny County, PA | 1,165 | 0.50% | Lehigh County, PA | 1,512 | 0.70% |
| Dauphin County, PA | 1,147 | 0.50% | Burlington County, NJ | 1,485 | 0.70% |
| Burlington County, NJ | 1,146 | 0.50% | Northampton County, PA | 1,163 | 0.50% |
| Lancaster County, PA | 1,141 | 0.50% | Allegheny County, PA | 994 | 0.50% |
| New York County, NY | 921 | 0.40% | Salem County, NJ | 956 | 0.40% |
| Cumberland County, PA | 793 | 0.30% | York County, PA | 931 | 0.40% |
| York County, PA | 754 | 0.30% | Dauphin County, PA | 784 | 0.40% |
| Northampton County, PA | 623 | 0.30% | Cumberland County, PA | 700 | 0.30% |
| Luzerne County, PA | 533 | 0.20% | Luzerne County, PA | 648 | 0.30% |
| Mercer County, NJ | 481 | 0.20% | Cecil County, MD | 444 | 0.20% |
| Middlesex County, NJ | 450 | 0.20% | Lackawanna County, PA | 442 | 0.20% |
| Lackawanna County, PA | 325 | 0.10% | Schuylkill County, PA | 420 | 0.20% |
| Salem County, NJ | 319 | 0.10% | Lebanon County, PA | 365 | 0.20% |
| Kent County, DE | 281 | 0.10% | Carbon County, PA | 303 | 0.10% |
| Bergen County, NJ | 256 | 0.10% | Mercer County, NJ | 296 | 0.10% |
| All Other Locations | 8,239 | 3.30% | All Other Locations | 9,387 | 4.40% |

Montgomery County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Montgomery County, PA | 181,224 | 47.80% | Montgomery County, PA | 181,224 | 40.00% |
| Philadelphia County, PA | 65,316 | 17.20% | Philadelphia County, PA | 67,007 | 14.80% |
| Bucks County, PA | 32,075 | 8.50% | Bucks County, PA | 51,513 | 11.40% |
| Chester County, PA | 31,028 | 8.20% | Chester County, PA | 33,874 | 7.50% |
| Delaware County, PA | 18,198 | 4.80% | Delaware County, PA | 32,019 | 7.10% |
| Berks County, PA | 7,396 | 2.00% | Berks County, PA | 16,689 | 3.70% |
| Lehigh County, PA | 5,691 | 1.50% | Lehigh County, PA | 8,625 | 1.90% |
| Lancaster County, PA | 2,270 | 0.60% | Lancaster County, PA | 4,948 | 1.10% |
| Allegheny County, PA | 2,222 | 0.60% | Northampton County, PA | 4,568 | 1.00% |
| Northampton County, PA | 2,155 | 0.60% | Burlington County, NJ | 4,263 | 0.90% |
| Camden County, NJ | 2,059 | 0.50% | Camden County, NJ | 4,155 | 0.90% |
| Dauphin County, PA | 2,030 | 0.50% | New Castle County, DE | 2,768 | 0.60% |
| Burlington County, NJ | 1,965 | 0.50% | Allegheny County, PA | 2,632 | 0.60% |
| New Castle County, DE | 1,925 | 0.50% | Gloucester County, NJ | 2,583 | 0.60% |
| Cumberland County, PA | 1,686 | 0.40% | Luzerne County, PA | 2,278 | 0.50% |
| Mercer County, NJ | 1,662 | 0.40% | York County, PA | 2,147 | 0.50% |
| New York County, NY | 1,637 | 0.40% | Dauphin County, PA | 1,925 | 0.40% |
| York County, PA | 1,265 | 0.30% | Cumberland County, PA | 1,649 | 0.40% |
| Luzerne County, PA | 1,043 | 0.30% | Lackawanna County, PA | 1,540 | 0.30% |
| Middlesex County, NJ | 1,014 | 0.30% | Monroe County, PA | 1,515 | 0.30% |
| Lackawanna County, PA | 686 | 0.20% | Schuylkill County, PA | 1,356 | 0.30% |
| Somerset County, NJ | 574 | 0.20% | Mercer County, NJ | 1,232 | 0.30% |
| Gloucester County, NJ | 553 | 0.10% | Carbon County, PA | 1,149 | 0.30% |
| Monroe County, PA | 551 | 0.10% | Lebanon County, PA | 946 | 0.20% |
| Schuylkill County, PA | 524 | 0.10% | Franklin County, PA | 707 | 0.20% |
| All Other Locations | 12,165 | 3.20% | All Other Locations | 20,223 | 4.50% |

Philadelphia County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Philadelphia County, PA | 322,240 | 61.10% | Philadelphia County, PA | 322,240 | 52.30% |
| Montgomery County, PA | 67,007 | 12.70% | Montgomery County, PA | 65,316 | 10.60% |
| Bucks County, PA | 30,451 | 5.80% | Delaware County, PA | 55,683 | 9.00% |
| Delaware County, PA | 28,804 | 5.50% | Bucks County, PA | 35,096 | 5.70% |
| Chester County, PA | 11,107 | 2.10% | Camden County, NJ | 28,198 | 4.60% |
| Camden County, NJ | 9,999 | 1.90% | Burlington County, NJ | 17,707 | 2.90% |
| Burlington County, NJ | 7,038 | 1.30% | Chester County, PA | 16,592 | 2.70% |
| New Castle County, DE | 3,340 | 0.60% | Gloucester County, NJ | 14,310 | 2.30% |
| Lehigh County, PA | 2,812 | 0.50% | New Castle County, DE | 6,482 | 1.10% |
| Gloucester County, NJ | 2,810 | 0.50% | Lehigh County, PA | 3,687 | 0.60% |
| Mercer County, NJ | 2,611 | 0.50% | Lancaster County, PA | 3,138 | 0.50% |
| New York County, NY | 2,550 | 0.50% | Allegheny County, PA | 3,065 | 0.50% |
| Allegheny County, PA | 2,398 | 0.50% | Berks County, PA | 2,824 | 0.50% |
| Dauphin County, PA | 2,355 | 0.40% | Northampton County, PA | 2,709 | 0.40% |
| Berks County, PA | 2,195 | 0.40% | York County, PA | 1,754 | 0.30% |
| Lancaster County, PA | 1,842 | 0.30% | Mercer County, NJ | 1,738 | 0.30% |
| Middlesex County, NJ | 1,496 | 0.30% | Luzerne County, PA | 1,717 | 0.30% |
| Northampton County, PA | 1,480 | 0.30% | Dauphin County, PA | 1,613 | 0.30% |
| York County, PA | 1,316 | 0.20% | Salem County, NJ | 1,433 | 0.20% |
| Luzerne County, PA | 1,256 | 0.20% | Cumberland County, PA | 1,409 | 0.20% |
| Cumberland County, PA | 1,241 | 0.20% | Atlantic County, NJ | 1,351 | 0.20% |
| Lackawanna County, PA | 758 | 0.10% | Lackawanna County, PA | 1,158 | 0.20% |
| Bergen County, NJ | 738 | 0.10% | Schuylkill County, PA | 1,004 | 0.20% |
| Essex County, NJ | 686 | 0.10% | New York County, NY | 835 | 0.10% |
| Kings County, NY | 640 | 0.10% | Middlesex County, NJ | 791 | 0.10% |
| All Other Locations | 18,319 | 3.50% | All Other Locations | 24,541 | 4.00% |

Berks County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|---------------|---------------------------------|-----------|---------------|
| County | Job Count | Share | County | Job Count | Share |
| Berks County, PA | 104,622 | 57.20% | Berks County, PA | 104,622 | 63.70% |
| Montgomery County, PA | 16,689 | 9.10% | Lancaster County, PA | 7,532 | 4.60% |
| Lehigh County, PA | 9,837 | 5.40% | Montgomery County, PA | 7,396 | 4.50% |
| Chester County, PA | 9,319 | 5.10% | Schuylkill County, PA | 6,282 | 3.80% |
| Lancaster County, PA | 8,703 | 4.80% | Lehigh County, PA | 5,191 | 3.20% |
| Lebanon County, PA | 3,450 | 1.90% | Chester County, PA | 4,270 | 2.60% |
| Philadelphia County, PA | 2,824 | 1.50% | Lebanon County, PA | 3,423 | 2.10% |
| Bucks County, PA | 2,711 | 1.50% | Philadelphia County, PA | 2,195 | 1.30% |
| Dauphin County, PA | 2,531 | 1.40% | Bucks County, PA | 2,106 | 1.30% |
| Delaware County, PA | 2,057 | 1.10% | York County, PA | 1,989 | 1.20% |
| Northampton County, PA | 1,956 | 1.10% | Northampton County, PA | 1,914 | 1.20% |
| Schuylkill County, PA | 1,954 | 1.10% | Dauphin County, PA | 1,575 | 1.00% |
| York County, PA | 1,786 | 1.00% | Luzerne County, PA | 1,291 | 0.80% |
| Cumberland County, PA | 1,698 | 0.90% | Delaware County, PA | 1,259 | 0.80% |
| Luzerne County, PA | 1,271 | 0.70% | Cumberland County, PA | 1,153 | 0.70% |
| Allegheny County, PA | 953 | 0.50% | Carbon County, PA | 763 | 0.50% |
| Lackawanna County, PA | 634 | 0.30% | Lackawanna County, PA | 763 | 0.50% |
| Centre County, PA | 580 | 0.30% | Monroe County, PA | 681 | 0.40% |
| Monroe County, PA | 481 | 0.30% | Northumberland County, PA | 524 | 0.30% |
| New York County, NY | 406 | 0.20% | Allegheny County, PA | 424 | 0.30% |
| Franklin County, PA | 333 | 0.20% | Franklin County, PA | 409 | 0.20% |
| Northumberland County, PA | 308 | 0.20% | Lycoming County, PA | 407 | 0.20% |
| Lycoming County, PA | 299 | 0.20% | Columbia County, PA | 393 | 0.20% |
| Westmoreland County, PA | 296 | 0.20% | Adams County, PA | 276 | 0.20% |
| Carbon County, PA | 264 | 0.10% | Centre County, PA | 252 | 0.20% |
| All Other Locations | 6,811 | 3.70% | All Other Locations | 7,033 | 4.30% |

Lancaster County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Lancaster County, PA | 150,729 | 66.20% | Lancaster County, PA | 150,729 | 69.70% |
| Dauphin County, PA | 10,874 | 4.80% | York County, PA | 11,115 | 5.10% |
| Chester County, PA | 9,869 | 4.30% | Berks County, PA | 8,703 | 4.00% |
| York County, PA | 9,270 | 4.10% | Lebanon County, PA | 6,762 | 3.10% |
| Berks County, PA | 7,532 | 3.30% | Chester County, PA | 5,311 | 2.50% |
| Montgomery County, PA | 4,948 | 2.20% | Dauphin County, PA | 4,867 | 2.20% |
| Lebanon County, PA | 4,751 | 2.10% | Cumberland County, PA | 2,437 | 1.10% |
| Cumberland County, PA | 3,976 | 1.70% | Montgomery County, PA | 2,270 | 1.00% |
| Philadelphia County, PA | 3,138 | 1.40% | Philadelphia County, PA | 1,842 | 0.90% |
| Delaware County, PA | 2,718 | 1.20% | Bucks County, PA | 1,442 | 0.70% |
| Lehigh County, PA | 1,953 | 0.90% | Lehigh County, PA | 1,264 | 0.60% |
| Bucks County, PA | 1,607 | 0.70% | Delaware County, PA | 1,141 | 0.50% |
| Allegheny County, PA | 1,432 | 0.60% | Northampton County, PA | 1,055 | 0.50% |
| Luzerne County, PA | 842 | 0.40% | Schuylkill County, PA | 1,033 | 0.50% |
| New Castle County, DE | 771 | 0.30% | Allegheny County, PA | 1,019 | 0.50% |
| Northampton County, PA | 681 | 0.30% | Luzerne County, PA | 953 | 0.40% |
| Franklin County, PA | 569 | 0.20% | Franklin County, PA | 845 | 0.40% |
| Schuylkill County, PA | 508 | 0.20% | Adams County, PA | 683 | 0.30% |
| Centre County, PA | 496 | 0.20% | Northumberland County, PA | 606 | 0.30% |
| Lycoming County, PA | 402 | 0.20% | Lackawanna County, PA | 592 | 0.30% |
| Lackawanna County, PA | 384 | 0.20% | Monroe County, PA | 559 | 0.30% |
| Cecil County, MD | 369 | 0.20% | Lycoming County, PA | 539 | 0.20% |
| Baltimore County, MD | 367 | 0.20% | Centre County, PA | 533 | 0.20% |
| New York County, NY | 345 | 0.20% | Perry County, PA | 468 | 0.20% |
| Monroe County, PA | 331 | 0.10% | Westmoreland County, PA | 354 | 0.20% |
| All Other Locations | 8,849 | 3.90% | All Other Locations | 9,238 | 4.30% |

Cumberland County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Cumberland County, PA | 47,524 | 46.40% | Cumberland County, PA | 47,524 | 36.30% |
| Dauphin County, PA | 22,356 | 21.80% | Dauphin County, PA | 17,279 | 13.20% |
| York County, PA | 6,355 | 6.20% | York County, PA | 12,958 | 9.90% |
| Franklin County, PA | 3,402 | 3.30% | Perry County, PA | 5,622 | 4.30% |
| Lancaster County, PA | 2,437 | 2.40% | Franklin County, PA | 4,314 | 3.30% |
| Montgomery County, PA | 1,649 | 1.60% | Lancaster County, PA | 3,976 | 3.00% |
| Philadelphia County, PA | 1,409 | 1.40% | Adams County, PA | 2,681 | 2.00% |
| Allegheny County, PA | 1,273 | 1.20% | Allegheny County, PA | 2,169 | 1.70% |
| Berks County, PA | 1,153 | 1.10% | Lebanon County, PA | 1,875 | 1.40% |
| Adams County, PA | 1,084 | 1.10% | Bucks County, PA | 1,779 | 1.40% |
| Chester County, PA | 994 | 1.00% | Berks County, PA | 1,698 | 1.30% |
| Lehigh County, PA | 972 | 0.90% | Montgomery County, PA | 1,686 | 1.30% |
| Perry County, PA | 857 | 0.80% | Chester County, PA | 1,435 | 1.10% |
| Lebanon County, PA | 840 | 0.80% | Philadelphia County, PA | 1,241 | 0.90% |
| Delaware County, PA | 700 | 0.70% | Lehigh County, PA | 1,088 | 0.80% |
| Bucks County, PA | 667 | 0.70% | Luzerne County, PA | 1,084 | 0.80% |
| Centre County, PA | 655 | 0.60% | Northampton County, PA | 922 | 0.70% |
| Luzerne County, PA | 620 | 0.60% | Juniata County, PA | 881 | 0.70% |
| Lycoming County, PA | 361 | 0.40% | Schuylkill County, PA | 858 | 0.70% |
| Northampton County, PA | 354 | 0.30% | Delaware County, PA | 793 | 0.60% |
| Schuylkill County, PA | 336 | 0.30% | Westmoreland County, PA | 765 | 0.60% |
| Blair County, PA | 298 | 0.30% | Mifflin County, PA | 762 | 0.60% |
| Lackawanna County, PA | 271 | 0.30% | Lackawanna County, PA | 754 | 0.60% |
| Mifflin County, PA | 244 | 0.20% | Northumberland County, PA | 707 | 0.50% |
| Westmoreland County, PA | 244 | 0.20% | Centre County, PA | 677 | 0.50% |
| All Other Locations | 5,311 | 5.20% | All Other Locations | 15,266 | 11.70% |

Dauphin County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Dauphin County, PA | 63,736 | 54.90% | Dauphin County, PA | 63,736 | 37.70% |
| Cumberland County, PA | 17,279 | 14.90% | Cumberland County, PA | 22,356 | 13.20% |
| York County, PA | 4,971 | 4.30% | York County, PA | 12,537 | 7.40% |
| Lancaster County, PA | 4,867 | 4.20% | Lebanon County, PA | 12,165 | 7.20% |
| Lebanon County, PA | 2,939 | 2.50% | Lancaster County, PA | 10,874 | 6.40% |
| Montgomery County, PA | 1,925 | 1.70% | Perry County, PA | 5,166 | 3.10% |
| Philadelphia County, PA | 1,613 | 1.40% | Schuylkill County, PA | 2,757 | 1.60% |
| Berks County, PA | 1,575 | 1.40% | Berks County, PA | 2,531 | 1.50% |
| Allegheny County, PA | 1,461 | 1.30% | Philadelphia County, PA | 2,355 | 1.40% |
| Chester County, PA | 1,078 | 0.90% | Montgomery County, PA | 2,030 | 1.20% |
| Schuylkill County, PA | 1,060 | 0.90% | Allegheny County, PA | 2,000 | 1.20% |
| Lehigh County, PA | 998 | 0.90% | Luzerne County, PA | 1,618 | 1.00% |
| Centre County, PA | 851 | 0.70% | Chester County, PA | 1,592 | 0.90% |
| Delaware County, PA | 784 | 0.70% | Northumberland County, PA | 1,551 | 0.90% |
| Bucks County, PA | 760 | 0.70% | Juniata County, PA | 1,462 | 0.90% |
| Luzerne County, PA | 743 | 0.60% | Franklin County, PA | 1,437 | 0.80% |
| Perry County, PA | 713 | 0.60% | Bucks County, PA | 1,275 | 0.80% |
| Franklin County, PA | 651 | 0.60% | Lehigh County, PA | 1,231 | 0.70% |
| Northumberland County, PA | 519 | 0.40% | Adams County, PA | 1,175 | 0.70% |
| Lycoming County, PA | 409 | 0.40% | Delaware County, PA | 1,147 | 0.70% |
| Northampton County, PA | 394 | 0.30% | Lackawanna County, PA | 1,060 | 0.60% |
| Blair County, PA | 299 | 0.30% | Northampton County, PA | 1,040 | 0.60% |
| Lackawanna County, PA | 282 | 0.20% | Centre County, PA | 1,026 | 0.60% |
| Snyder County, PA | 282 | 0.20% | Mifflin County, PA | 950 | 0.60% |
| Adams County, PA | 278 | 0.20% | Snyder County, PA | 905 | 0.50% |
| All Other Locations | 5,556 | 4.80% | All Other Locations | 13,250 | 7.80% |

Lebanon County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Lebanon County, PA | 24,504 | 41.20% | Lebanon County, PA | 24,504 | 53.30% |
| Dauphin County, PA | 12,165 | 20.40% | Lancaster County, PA | 4,751 | 10.30% |
| Lancaster County, PA | 6,762 | 11.40% | Berks County, PA | 3,450 | 7.50% |
| Berks County, PA | 3,423 | 5.70% | Dauphin County, PA | 2,939 | 6.40% |
| Cumberland County, PA | 1,875 | 3.10% | Schuylkill County, PA | 1,659 | 3.60% |
| York County, PA | 1,255 | 2.10% | York County, PA | 1,102 | 2.40% |
| Montgomery County, PA | 946 | 1.60% | Cumberland County, PA | 840 | 1.80% |
| Philadelphia County, PA | 770 | 1.30% | Philadelphia County, PA | 448 | 1.00% |
| Allegheny County, PA | 730 | 1.20% | Montgomery County, PA | 415 | 0.90% |
| Chester County, PA | 655 | 1.10% | Chester County, PA | 386 | 0.80% |
| Schuylkill County, PA | 545 | 0.90% | Luzerne County, PA | 325 | 0.70% |
| Lehigh County, PA | 515 | 0.90% | Lehigh County, PA | 264 | 0.60% |
| Luzerne County, PA | 374 | 0.60% | Franklin County, PA | 246 | 0.50% |
| Delaware County, PA | 365 | 0.60% | Bucks County, PA | 239 | 0.50% |
| Bucks County, PA | 356 | 0.60% | Perry County, PA | 217 | 0.50% |
| Centre County, PA | 274 | 0.50% | Lackawanna County, PA | 214 | 0.50% |
| Franklin County, PA | 214 | 0.40% | Northumberland County, PA | 209 | 0.50% |
| Northampton County, PA | 210 | 0.40% | Northampton County, PA | 205 | 0.40% |
| Blair County, PA | 164 | 0.30% | Mifflin County, PA | 195 | 0.40% |
| Adams County, PA | 163 | 0.30% | Delaware County, PA | 188 | 0.40% |
| Lycoming County, PA | 156 | 0.30% | Adams County, PA | 169 | 0.40% |
| Northumberland County, PA | 152 | 0.30% | Allegheny County, PA | 143 | 0.30% |
| Lackawanna County, PA | 150 | 0.30% | Juniata County, PA | 136 | 0.30% |
| Westmoreland County, PA | 127 | 0.20% | Snyder County, PA | 136 | 0.30% |
| Monroe County, PA | 91 | 0.20% | Monroe County, PA | 130 | 0.30% |
| All Other Locations | 2,598 | 4.40% | All Other Locations | 2,454 | 5.30% |

Cumberland County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|--------------|---------------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| Cumberland County, PA | 5,622 | 27.50% | Perry County, PA | 3,688 | 48.90% |
| Dauphin County, PA | 5,166 | 25.20% | Cumberland County, PA | 857 | 11.40% |
| Perry County, PA | 3,688 | 18.00% | Dauphin County, PA | 713 | 9.50% |
| York County, PA | 932 | 4.60% | Juniata County, PA | 381 | 5.10% |
| Lancaster County, PA | 468 | 2.30% | York County, PA | 241 | 3.20% |
| Montgomery County, PA | 316 | 1.50% | Lancaster County, PA | 139 | 1.80% |
| Franklin County, PA | 310 | 1.50% | Snyder County, PA | 124 | 1.60% |
| Juniata County, PA | 301 | 1.50% | Mifflin County, PA | 107 | 1.40% |
| Philadelphia County, PA | 289 | 1.40% | Lebanon County, PA | 82 | 1.10% |
| Allegheny County, PA | 224 | 1.10% | Union County, PA | 73 | 1.00% |
| Berks County, PA | 224 | 1.10% | Bucks County, PA | 62 | 0.80% |
| Lebanon County, PA | 217 | 1.10% | Franklin County, PA | 62 | 0.80% |
| Lehigh County, PA | 210 | 1.00% | Centre County, PA | 55 | 0.70% |
| Chester County, PA | 179 | 0.90% | Northumberland County, PA | 50 | 0.70% |
| Mifflin County, PA | 160 | 0.80% | Adams County, PA | 47 | 0.60% |
| Luzerne County, PA | 152 | 0.70% | Berks County, PA | 46 | 0.60% |
| Centre County, PA | 143 | 0.70% | Luzerne County, PA | 45 | 0.60% |
| Adams County, PA | 127 | 0.60% | Schuylkill County, PA | 44 | 0.60% |
| Delaware County, PA | 126 | 0.60% | Lycoming County, PA | 43 | 0.60% |
| Bucks County, PA | 114 | 0.60% | Blair County, PA | 31 | 0.40% |
| Snyder County, PA | 86 | 0.40% | Huntingdon County, PA | 30 | 0.40% |
| Schuylkill County, PA | 81 | 0.40% | Westmoreland County, PA | 30 | 0.40% |
| Lycoming County, PA | 72 | 0.40% | Cambria County, PA | 27 | 0.40% |
| Northumberland County, PA | 64 | 0.30% | Allegheny County, PA | 24 | 0.30% |
| Northampton County, PA | 63 | 0.30% | Clinton County, PA | 22 | 0.30% |
| All Other Locations | 1,132 | 5.50% | All Other Locations | 520 | 6.90% |

York County, PA

| Live in County - Work Locations | | | Work In County - Home Locations | | |
|---------------------------------|-----------|--------|---------------------------------|-----------|--------|
| County | Job Count | Share | County | Job Count | Share |
| York County, PA | 105,693 | 52.90% | York County, PA | 105,693 | 63.90% |
| Cumberland County, PA | 12,958 | 6.50% | Adams County, PA | 10,285 | 6.20% |
| Dauphin County, PA | 12,537 | 6.30% | Lancaster County, PA | 9,270 | 5.60% |
| Lancaster County, PA | 11,115 | 5.60% | Cumberland County, PA | 6,355 | 3.80% |
| Baltimore County, MD | 10,582 | 5.30% | Dauphin County, PA | 4,971 | 3.00% |
| Adams County, PA | 6,296 | 3.20% | Berks County, PA | 1,786 | 1.10% |
| Baltimore city, MD | 4,028 | 2.00% | Franklin County, PA | 1,710 | 1.00% |
| Carroll County, MD | 2,656 | 1.30% | Philadelphia County, PA | 1,316 | 0.80% |
| Harford County, MD | 2,545 | 1.30% | Montgomery County, PA | 1,265 | 0.80% |
| Montgomery County, PA | 2,147 | 1.10% | Chester County, PA | 1,264 | 0.80% |
| Berks County, PA | 1,989 | 1.00% | Lebanon County, PA | 1,255 | 0.80% |
| Philadelphia County, PA | 1,754 | 0.90% | Baltimore County, MD | 1,115 | 0.70% |
| Chester County, PA | 1,617 | 0.80% | Allegheny County, PA | 998 | 0.60% |
| Allegheny County, PA | 1,548 | 0.80% | Perry County, PA | 932 | 0.60% |
| Anne Arundel County, MD | 1,398 | 0.70% | Lehigh County, PA | 911 | 0.60% |
| Franklin County, PA | 1,248 | 0.60% | Bucks County, PA | 903 | 0.50% |
| Lehigh County, PA | 1,159 | 0.60% | Carroll County, MD | 777 | 0.50% |
| Montgomery County, MD | 1,112 | 0.60% | Delaware County, PA | 754 | 0.50% |
| Lebanon County, PA | 1,102 | 0.60% | Northampton County, PA | 731 | 0.40% |
| Bucks County, PA | 1,007 | 0.50% | Schuylkill County, PA | 700 | 0.40% |
| Howard County, MD | 973 | 0.50% | Luzerne County, PA | 695 | 0.40% |
| Delaware County, PA | 931 | 0.50% | Harford County, MD | 512 | 0.30% |
| Prince George's County, MD | 747 | 0.40% | Lackawanna County, PA | 464 | 0.30% |
| Centre County, PA | 745 | 0.40% | Centre County, PA | 436 | 0.30% |
| Luzerne County, PA | 671 | 0.30% | Cambria County, PA | 423 | 0.30% |
| All Other Locations | 11,201 | 5.60% | All Other Locations | 9,841 | 6.00% |

APPENDIX E
Comment and Response Documents

- Document E-1: *Pennsylvania Bulletin* Notice for Public
Comment Period and Public Meetings
Document E-2: Comment and Response Document

NOTICES

Proposed Designation Recommendations for the 2015 Ozone Standards; Public Meetings

[46 Pa.B. 5162]

[Saturday, August 20, 2016]

Ground-level ozone concentrations above the Federal health-based standard are a serious threat to human health. Ozone also causes damage to crops, forests and wildlife. On October 1, 2015, the United States Environmental Protection Agency (EPA) promulgated revised primary and secondary National Ambient Air Quality Standards (NAAQS) for ozone, which were published at 80 FR 65292 (October 26, 2015). The revised primary ozone NAAQS of 70 parts per billion (ppb) will provide increased protection of public health when compared to the 2008 primary NAAQS of 75 ppb. The revised secondary 8-hour ozone NAAQS of 70 ppb is also expected to provide increased protection of forests, crop yield, plants and wildlife when compared to the 2008 secondary 8-hour NAAQS of 75 ppb.

In accordance with section 107(d)(1) of the Clean Air Act (CAA) (42 U.S.C.A. § 7407 (d)(1)), the governor of each state must now submit designation recommendations to the EPA by October 1, 2016, within 1 year of the promulgation of a new or revised NAAQS for any pollutant under section 109 of the CAA (42 U.S.C.A. § 7409). The Commonwealth's designation recommendations for the 2015 8-hour ozone NAAQS are based on air quality monitoring data for 2013—2015, demographic information and other criteria, as recommended by the EPA in its February 25, 2016, memorandum pertaining to "Area Designations for the 2015 Revised Ozone National Ambient Air Quality Standards." The EPA expects to make final designations by October 1, 2017.

The Department of Environmental Protection (Department) is seeking public input on the proposed designation recommendations for the 2015 ozone NAAQS. Based on air quality, demographic information and political boundary factors, the Department is proposing to recommend that:

- Allegheny, Armstrong, Beaver, Butler, Washington, Fayette and Westmoreland Counties be designated as a multicounty nonattainment area.
- Indiana County be designated as a single county nonattainment area.
- Lebanon County be designated as a single county nonattainment area.
- Bucks, Chester, Delaware, Montgomery and Philadelphia Counties be designated as a multicounty interstate nonattainment area.

The Department is proposing to recommend that the remainder of this Commonwealth be designated as unclassifiable/attainment as described in the EPA guidance.

This proposal is available on the Department's web site at <http://www.dep.pa.gov/> or through the following list of contact persons. The Department will hold public informational meetings as follows:

| | | |
|---------------------|----------------------|---------------------|
| August 24, 2016 | August 25, 2016 | August 26, 2016 |
| 11 a.m. | 11 a.m. | 11 a.m. |
| Juniata River Room | Waterfront A | Delaware River Room |
| 909 Elmerton Avenue | 500 Waterfront Drive | 2 East Main Street |
| Harrisburg, PA | Pittsburgh, PA | Norristown, PA |

For more information on the public meetings, contact Roma Monteiro at (717) 787-9702 or rmonteiro@pa.gov. Persons with disabilities who wish to attend a meeting and require an auxiliary aid, service or other accommodation to participate in the proceeding should also contact Roma Monteiro. TDD users may contact the Pennsylvania AT&T Relay Service at (800) 654-5984 to discuss how the Department can best accommodate their needs.

The Department must receive all comments on or by Friday, September 2, 2016. Electronic comments should be submitted using the Department's eComment site at www.ahs.dep.pa.gov/eComment. Written comments can be submitted by e-mail to ecomment@pa.gov or by mail to the Policy Office, Department of Environmental Protection, Rachel Carson State Office Building, P.O. Box 2063, Harrisburg, PA 17105-2063.

PATRICK McDONNELL,
Acting Secretary

[Pa.B. Doc. No. 16-1438. Filed for public inspection August 19, 2016, 9:00 a.m.]

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

COMMENT AND RESPONSE DOCUMENT
CONCERNING

Designation Recommendations
for the 2015 Eight-Hour Ozone National Ambient Air Quality Standards
September 2016

On August 20, 2016, the Pennsylvania Department of Environmental Protection (“DEP” or “Department”) requested public comment on its proposed designation recommendations for Nonattainment/Attainment Areas for the revised primary and secondary 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS). (46 Pa. B. 5162). EPA published the 2015 ozone NAAQS on October 26, 2015. (80 FR 65292). The Department has developed designation recommendations in accordance with section 107(d)(1) of the Clean Air Act (CAA), 42 U.S.C. § 7407(d)(1). The public comment period on the proposed designation recommendations closed on September 2, 2016. The DEP held three public informational meetings as follows:

August 24, 2016
11:00 am

Department of Environmental Protection
Juniata River Room
909 Elmerton Avenue
Harrisburg, PA 17110

August 25, 2016
11:00 am

Department of Environmental Protection
Waterfront A
500 Waterfront Drive
Pittsburgh, PA 15222

August 26, 2016
11:00 am

Department of Environmental Protection
Delaware River Room
2 East Main Street
Norristown, PA 19401

This Comment and Response Document summarizes the comments received from the public during the public comment period. Each comment is listed with its corresponding commentator number. The list of commentators, including name and affiliation, can be found below.

COMMENTATORS:

1. Vincent Brisini
Director of Environmental Affairs
Olympus Power, LLC
67 Park Place East

Morristown, NJ 07960

2. Kevin Sunday
Director, Government Affairs
PA Chamber of Business and Industry
417 Walnut Street
Harrisburg, PA 17101
3. Dennis Yablonsky
Greater Pittsburgh Chamber of Commerce
11 Stanwix Street, 17th Floor
Pittsburgh, PA 15222-1312
4. John Shimshock
Sr. Air Environmental Specialist
NRG Energy
121 Champion Way
Canonsburg, PA 15317
5. Judy Morgan
Philadelphia Neighborhood Networks Environmental Committee
121 South Broad Street
Suite 800
Philadelphia, PA 19107

COMMENTS AND RESPONSES

1. **COMMENT:** The proposed classifications of the majority of Pennsylvania are flawed because of the measured design values of the three year 2013-2015 period. The “vast majority” of monitors in this period measured attainment of the 2015 ozone NAAQS and were measured prior to the 2017 implementation of the Pennsylvania Reasonable Available Control Technology II (RACT II) regulation and the introduction of federal Tier 3 gasoline. (1)

RESPONSE: The Department disagrees with the commentator's assertion that the recommendations are flawed because the measured design values in the three year period from 2013 to 2015 were used. Section 107(d)(1) of the CAA, 42 U.S.C. § 7407(d)(1), requires the EPA to designate an area as “nonattainment” if it is violating the NAAQS or if it is contributing to a violation of a NAAQS in a nearby area. Monitor design values are the numerical values used for determining compliance with the NAAQS. There is no legal provision for the EPA to designate an area as attainment if only a “vast majority”, but not all, of the monitors in the area show no violation of the NAAQS or no contribution to a violation of the NAAQS. EPA explained in its guidance issued February 25, 2016 by Janet McCabe, Acting Assistant Administrator for the EPA’s Office of Air Radiation, entitled “Area Designations for the 2015 Ozone National Ambient Air Quality Standards,” (hereinafter “Designation Guidance”) that States should base their recommendations on air quality data from the three most recent years of quality assured, certified monitoring data available at the time. Designation Guidance, pp. 2, 3. For Pennsylvania’s recommendations, the Department has used monitoring data collected from EPA Federal Equivalent Method (FEM) monitors for 2013 to 2015, and certified in accordance with federal regulations (40 C.F.R. § 58.15).

Pennsylvania’s RACT II and EPA’s Tier 3 gasoline programs will not take effect until 2017. EPA indicates in its Designation Guidance that it intends to promulgate final ozone area designations for the 2015 ozone NAAQS by October 1, 2017. Designation Guidance, p. 3. This deadline would preclude the inclusion of monitoring data from 2017 for the purposes of designation. The EPA Designation Guidance indicates that EPA will use “the most recent complete three consecutive calendar years of quality assured, *certified* air quality data” (emphasis added) in making their designations. As complete 2017 monitoring data would not be available until after January 1, 2018, EPA would be unable to use monitoring data reflecting these potential benefits. EPA expects promulgation of final designations no later than October 1, 2017. However, any emissions benefits achieved from the programs identified by the commentator, while not likely to influence area designations, will nonetheless help the areas attain and maintain the NAAQS, and may be reflected in later State Implementation Plan (SIP) revisions, such as attainment plans and maintenance plans, for Pennsylvania’s ozone nonattainment areas.

2. **COMMENT:** The Department should not propose that Allegheny, Armstrong, Beaver, Butler, Washington, Fayette, and Westmoreland Counties be designated as a multi-county nonattainment area because only one Allegheny monitor and the Armstrong

County monitor have design values greater than the 2015 eight-hour ozone NAAQS. (1,2)

RESPONSE: The Department disagrees with the comment to not recommend the designation of the seven county Pittsburgh-Beaver Valley area as in nonattainment of the 2015 ozone NAAQS.

As described in the proposed recommendations, the Department used a multi-factor analysis consistent with the EPA Designation Guidance. That guidance states that EPA will consider five factors in designating new areas under the 2015 ozone NAAQS: 1) Air quality data; 2) Emissions data and emissions-related data; 3) Meteorology; 4) Geography and topography; and 5) Jurisdictional boundaries, including political boundaries, transportation planning organizations and existing nonattainment areas.

In addition to air quality data indicating two monitors with design values greater than the 2015 ozone NAAQS, a large part of the Department's recommendation is based upon the seven counties being part of a Core Based Statistical Area (CBSA) that includes both Metropolitan and Micropolitan Statistical Areas with a high degree of both historic and current social and economic integration. This is evidenced by commuting patterns between the outlying counties surrounding the core of the City of Pittsburgh in Allegheny County. Furthermore, other factors described in the proposal, including monitoring, emissions and meteorological data, topography, jurisdictional boundaries and past designation history, were considered to make the final recommendation.

HYSPLIT trajectory analysis, showing contributions of transport into the seven-county area and provided in Appendices C & D of the proposal, further support the Department's recommendation to designate the seven-county Pittsburgh-Beaver Valley area as nonattainment for the 2015 Ozone NAAQS. Section 107(d)(1) of the Clean Air Act requires that the EPA designate an area as "nonattainment" if it is violating the NAAQS *or if it is contributing to a violation of a NAAQS in a nearby area* (emphasis added).

3. **COMMENT:** Linking counties into a single multi-county nonattainment area results in the entire area remaining classified as nonattainment, even if only one monitor in one county is actually measuring nonattainment of the standard. (1)

RESPONSE: The commentator appears concerned that counties, once linked together as a nonattainment area, will remain that way for future NAAQS revisions. While the Department is sensitive to this concern, the Department has developed the Pennsylvania recommendations based on the CAA and EPA guidance. When making designation recommendations for the 2015 ozone NAAQS and determining whether to link counties into a single county nonattainment area, EPA indicates in its Designation Guidance that it will consider five factors: 1) Air quality data; 2) Emissions data and emissions-related data; 3) Meteorology; 4) Geography and topography; and 5) Jurisdictional boundaries, including political boundaries, transportation planning organizations and existing nonattainment areas.

4. **COMMENT:** Because the Commonwealth is located in a Clean Air Act defined Ozone Transport Region (OTR), it is not necessary for the Department to create separate

“internal ozone transport regions” by recommending multi-county areas for EPA designation as nonattainment. (1)

RESPONSE: The Department disagrees with the commentator’s premise that recommending a multi-county area for designation as nonattainment creates an “internal ozone transport region”, or that the Department’s recommendation of a multi-county area is unnecessary.

The OTR was created by operation of law in Section 184 of the CAA, 42 U.S.C. § 7511c(a), to facilitate the coordinated control of interstate ozone transport. It is already the Department’s responsibility under the CAA, Pennsylvania Air Pollution Control Act (APCA), 35 P.S. §§ 4001 *et seq.*, and regulations adopted under APCA (25 Pa. Code §§121-145) to regulate intrastate transport of pollution. Furthermore, the APCA mandates in Section 4(1) that the Department implement the CAA in Pennsylvania. 35 P.S. § 4004(1).

Consistent with Section 107 of the CAA, and applying the EPA Designation Guidance, the Department is recommending a multi-county nonattainment area in the five county Philadelphia area (Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties), as the specified factors indicate that intrastate emissions likely contribute significantly to the exceedances at a monitor within the multi-county area. This approach is consistent with Section 107 of the CAA, prior Department designation recommendations, previous and current EPA NAAQS designation guidance, and final EPA designations for previous ozone NAAQS.

5. **COMMENT:** It is ultimately in the best interests of businesses to be located in areas which have a formal county specific designation of attainment. (1)

RESPONSE: The Department agrees, since there are fewer restrictions on businesses in areas that are not designated nonattainment. That is not, however, a primary factor in making area designation recommendations. The Department is following the CAA and EPA’s Designation Guidance, which are designed to ensure that all areas in the United States attain the 2015 ozone NAAQS, in making its recommendations. It is in the best interest of all Pennsylvanians to breathe air that attains the human health and welfare based NAAQS. Residents in areas of Pennsylvania that attain the NAAQS will enjoy both reduced hospital admissions and other long-term health benefits. Areas with clean air that meets ambient health and welfare standards are generally more attractive places to live and visit, thus encouraging economic growth in sectors related to that development.

6. **COMMENT:** An ultimate classification by EPA of attainment of the 2015 ozone NAAQS would show that reductions that have already been achieved have resulted in attainment of the NAAQS which is important to be shared with citizens of the state. (1)

RESPONSE: The Department agrees. EPA’s final designations for the 2015 ozone NAAQS should reflect the progress already made by Pennsylvania in achieving attainment of the previous ozone NAAQS.

7. **COMMENT:** A county specific designation of attainment over a multi-county designation would have no negative effect on the availability and use of Emissions Reduction Credits (ERCs) necessary for the operation of new or modified sources major sources of ozone precursors and each county would only be obligated to obtain ERCs at a ratio that is consistent with the county specific classification rather than at a higher level of nonattainment designation that could be made for an entire multi-county nonattainment area due to the ozone concentrations measured in a different county. (1)

RESPONSE: The Department appreciates the commentator's concern, but the Department has developed its recommendations consistent with the CAA and EPA's Designation Guidance, which lead to the conclusion that the Pittsburgh–Beaver Valley area should include the seven listed counties in Pennsylvania's final designation recommendations.

8. **COMMENT:** Designating individual counties based upon the measured design values could be quite important in the very near future, because if the PA RACT II and the Tier 3 gasoline implementation result in measured attainment of the 2015 ozone NAAQS in all counties, then the current PA RACT II regulation could be determined to be adequate for Pennsylvania and no revision to that regulation would be required. (1)

RESPONSE: The RACT II regulations in Pennsylvania will take effect in 2017. RACT II was ultimately developed as a requirement to consider RACT as a result of the 2008 8-hr ozone NAAQS. (46 *Pa. B.* 2036-2064; April 23, 2016). Section 182 of the CAA (42 U.S.C. § 7511a) requires a state to develop and implement a program that requires owners and operators of sources in ozone nonattainment areas to implement RACT for sources that are subject to Control Techniques Guidelines (CTG) issued by EPA and for "major sources" of VOC and NO_x, which are precursors to ozone.

After EPA promulgates its final designations for the 2015 ozone NAAQS in 2017, the Department is legally obligated to evaluate existing RACT requirements to either certify that the existing RACT II regulation presumptively meets the requirements of RACT under the new 2015 ozone NAAQS, or, after evaluation, require owners and operators of sources in nonattainment areas to implement additional RACT.

According to EPA's preamble to its final rule establishing the 2015 ozone NAAQS, EPA intends to promulgate a 2015 ozone NAAQS implementation rule that will address RACT for major sources and RACT VOC CTGs. (80 FR 65292, 65437; October 26, 2015.) EPA has indicated that the implementation rule will be similar to the 2008 ozone NAAQS implementation rule (80 FR 12264; March 6, 2015). Following receipt of the anticipated implementation rule for the 2015 ozone NAAQS and following EPA's determination of final area designations for the 2015 ozone NAAQS in 2017, the Department will determine if the existing RACT II regulation will need to be evaluated to determine if it meets the requirements to be considered presumptive RACT for the 2015 ozone NAAQS.

See also the response to Comment #2.

9. **COMMENT:** If the design values for the 2014-2016 ozone season period show measured attainment of the 2015 ozone NAAQS for those monitors that currently show violations for the 2013-2015 ozone season period, then the designation for those counties should be revised to attainment of the 2015 ozone NAAQS prior to EPA finalizing the designations on October 1, 2017. (1,2,3,4)

RESPONSE: The Department will revise its recommendations if the 2014-2016 quality assured, certified monitoring data demonstrates attainment of the NAAQS in accordance with 40 C.F.R. § 50.19 and EPA's implementing guidance for demonstrating attainment of the NAAQS, in time for EPA's final determinations. In EPA's Designation Guidance, the EPA has anticipated notifying Pennsylvania of its intended modifications to the Department's recommendations by June 2, 2017. EPA has stated that it will allow states sixty (60) days from the date of the EPA letter's issuance to submit additional information, including 2016 certified monitoring data, for EPA's consideration in making its final designations. Given the existing EPA requirement to provide certified monitoring data for 2016 no later than May 1, 2017, the Department anticipates that certified 2016 monitoring data will be available for EPA to use in determining if areas initially recommended for nonattainment would actually be in attainment of the 2015 ozone NAAQS.

10. **COMMENT:** Chester County should not be designated as a nonattainment area or as part of a Bucks, Chester, Delaware, Montgomery and Philadelphia multi-county nonattainment area. The monitor located in that county has a measured design value for the 2013-2015 time period that demonstrates attainment of the 2015 ozone NAAQS. Further, the PA RACT II regulation and Tier 3 gasoline will result in additional significant reductions in ozone precursors further reducing the ambient ozone concentrations at that location. (1)

RESPONSE: The Department disagrees. Chester County is included in the interstate Philadelphia-Reading-Camden Combined Statistical Area (CSA) and is included in the Southeast Pennsylvania air basin as defined in 25 Pa. Code § 121.1. The area's transportation planning organization includes the five counties and all five counties have been part of the multi-state ozone nonattainment area since the first ozone designations were made under the federal CAA. Because of this historic inclusion as part of a five county nonattainment area, Chester County already shares a number of air pollution control strategies reflecting the area nature of ozone formation and transport.

Section 107(d)(1) of the Clean Air Act requires that the EPA designate an area as "nonattainment" if it is violating the NAAQS or if it is contributing to a violation of a NAAQS in a nearby area. As indicated in Appendix D of the Department's proposed and final designation recommendations, the inter-county commuting ties remain strong and further reinforce the five county nonattainment area recommendation. Importantly, the entire five-county area relies heavily on the U.S. Interstate 95 corridor and the corridor's interconnecting network of feeder highways. The I-95 corridor has often been cited as one of the leading contributing factors to regional ozone nonattainment in the nation.

See also the response to Comment #2.

- 11. COMMENT:** Indiana and Lebanon Counties should initially be designated as individual county nonattainment areas of the 2015 ozone NAAQS, however, if the design values for the 2014-2016 ozone season period show measured attainment of the 2015 ozone NAAQS in either or both of those counties, then the designation for either or both of those counties should be revised to attainment of the 2015 ozone NAAQS prior to EPA finalizing the designations on October 1, 2017. (1)

RESPONSE: The Department agrees. See also response to Comment #9.

- 12. COMMENT:** PADEP should not designate the bulk of Pennsylvania as unclassifiable/attainment. The remainder of the state should be designated as being in attainment of the 2015 ozone NAAQS. (1)

RESPONSE: The Department can submit a recommendation that areas be classified as “attainment” as opposed to the historical designation category of “unclassifiable/attainment”. However, EPA indicates in the Designation Guidance that the agency likely will continue to use the “unclassifiable/attainment” designation. This would be done to recognize the difference between an area that has demonstrated attainment with area specific monitoring (“attainment”) and those areas without monitors that EPA believes are likely in attainment and do not contribute to nearby violations (“unclassifiable”).

- 13. COMMENT:** Given the economic ramifications of the increased regulatory burden that will fall on sources located within counties designated as non-attainment for criteria pollutants, the commentator recommends DEP pursue standalone county non-attainment designation recommendations to the greatest extent possible, in part by contemplating the additional reductions expected from the implementation of various federal and state air quality regulations. (2)

RESPONSE: The Department has recommended both Indiana and Lebanon Counties for stand-alone county designation as nonattainment. However, the Department cannot recommend attainment based on future emissions control programs (for example, federal Tier 3 rules or Pennsylvania RACT II regulations) as EPA designations must be based on certified monitored ozone data in accordance with the CAA.

See also the responses to Comment #1 and Comment #8 regarding the inclusion of future emissions control programs in designations by EPA.

See also the response to Comment #2.

- 14. COMMENT:** DEP should have provided more time for public comment on this matter of significant public policy. It is imperative that DEP allow for a sufficient comment

period on matters of great interest to the regulated community and stakeholders writ large. The comment period on this matter was announced on August 20 and will close September 2. Ten business days is an inadequate amount of time to gather meaningful stakeholder input. The implementation of the newly revised ozone NAAQS has significant implications for businesses and industries and a robust public comment period and stakeholder involvement is necessary. (2)

RESPONSE: The Department appreciates the concern but disagrees that inadequate time was provided for public input. The comment period and the three public meetings held during that period were sufficient to gather public input on the Department's recommendations to EPA for designations under the 2015 ozone NAAQS. It is EPA that has the authority to make the area designations under the Section 107(d) of the CAA. EPA states on page 3 of its Designation Guidance that it plans to provide a thirty (30) day public comment period when it publishes notice of its modifications, if any, to states' recommended designations.

It is important to note that, unlike the legal requirement for public comment for regulatory and State Implementation Plan (SIP) actions by the Department, neither states nor the EPA are required to provide a public comment period or public meetings as part of the area designation process.

An EPA designation begins a process of planning by a state to bring the nonattainment areas into attainment of the NAAQS by a set date. As regulations and/or revisions to the state's SIP are developed, they are subject to statutorily-required public comment periods and additional public outreach across the state. The public will have ample opportunity to review and comment on Department actions in this regard.

15. **COMMENT:** The proposed designations were not discussed in any great detail with the Air Quality Technical Advisory Committee (AQTAC), whose meetings have on numerous occasions been cancelled this year. (2)

RESPONSE: The Department disagrees. Both the 2008 and 2015 ozone NAAQS and the then-current ozone monitoring design values were presented at the December 10, 2015 meeting of AQTAC. The implications of the monitors with design values greater than the 2015 ozone NAAQS were presented. In addition, the Department's proposed recommendations for nonattainment areas were stated in the Regulatory and SIP Update presentation at the August 4, 2016 AQTAC meeting. The AQTAC members held a brief discussion on the proposed recommendations. The Department explained the public comment process the Department would undertake prior to submitting the final designation recommendations.

However, recognizing that AQTAC meetings in April and June 2016 were canceled due to resource and scheduling limitations, the Department believes that even had meetings been scheduled, the time constraints for submittal of the recommendations to EPA would have precluded a presentation of final draft recommendations to AQTAC.

The final designation recommendations will be presented to AQTAC as committee scheduling allow.

- 16. COMMENT:** EPA's guidance on designation suggests states group counties based on Core-Based or Combined Statistical Areas. However, as DEP makes clear in its discussion of designating Indiana and Lebanon Counties, there is the option afforded to states to recommend individual county designations. For these reasons, DEP should recommend a non-attainment designation only for counties in which a monitor is demonstrating ozone values (for years 2013-15) of greater than 70 ppb, and DEP should also ensure that EPA recognize monitoring data from 2016 as soon as it is available before finalizing nonattainment designations next year. (2)

RESPONSE: As stated above, a monitor's design value is an important factor in considering whether an area is in nonattainment, but it is only one of several factors that DEP and EPA must consider to meet the requirements of the Clean Air Act.

See also the responses to Comments #2, #3, #8, #10, #11 and #13.

- 17. COMMENT:** Both DEP and EPA should set a course with respect to securing statewide attainment of the 2015 ozone standard in a manner that does not result in further job loss and economic disadvantage to the state. (2)

RESPONSE: The Department agrees with this goal and is mindful of it when developing plans to attain a NAAQS. The document under review at the moment, however, is the area designation recommendations, and not the methods that will be used to bring areas into attainment.

The Department's planning actions are guided in part by the Declaration of Policy in Section 2 of Pennsylvania's Air Pollution Control Act. That provision calls for the Commonwealth to balance the protection of Pennsylvania's air resources to the degree necessary for protection of public health, safety and well-being of its citizens with, among other factors, the development, attraction and expansion of industry, commerce and agriculture. (35 P.S. § 4002)

The 2015 ozone NAAQS, while estimated to cost \$1.4 billion nationally (except California), is estimated to result in \$2.9 to \$5.9 billion in health benefits nationally (except California). In California, the standard is estimated to cost \$0.8 billion with a \$1.2 to \$2.1 billion health benefit. In Pennsylvania, the health benefits will be more pronounced in the most densely populated areas already affected negatively by ambient ozone levels.

- 18. COMMENT:** While the Pittsburgh region continues to deal with the challenges of transport and the typical emissions associated with a thriving urban economy, the steady reduction in average ozone levels as well as incidences of exceeding standards indicate that existing emission control strategies are working. As evidence of our improving air quality, the ozone monitor in Harrison, historically Pittsburgh's highest reading location,

has shown a decrease in design values of nearly 11 percent over just the past four years and 16 percent in the past decade. Over the same period of time, ozone exceedances in Allegheny County have dropped from 19 in 2012, to just 2 in 2015. (3)

RESPONSE: The Department agrees that the historical downward trend of average ozone levels and number of exceedance days in the Pittsburgh-Beaver Valley area demonstrate the effectiveness of Pennsylvania's long-time efforts to improve ambient air quality.

HYSPLIT trajectory analysis, which shows contributions of transport into the seven-county area as provided in Appendices C and D of the proposal, indicate that long-range transport of ozone and ozone precursors, while still significant, is becoming more regional in nature, further supporting the efficacy of existing plans.

- 19. COMMENT:** We are optimistic that both DEP and EPA will acknowledge the air quality improvements that have resulted from existing control measures and will allow the current strategies to continue in the Pittsburgh region without adding additional unnecessary regulatory actions prematurely. (3)

RESPONSE: The Department has long acknowledged the effectiveness of existing air quality management and pollution control programs in reducing ambient concentrations of unhealthful criteria pollutants. The Department will consider and implement new regulatory initiatives for further reducing air pollution in the Commonwealth, as necessary and appropriate, consistent with legal requirements of the CAA, the APCA and the regulations thereunder and DEP's existing policy to ensure that any new program is necessary and effective.

- 20. COMMENT:** The Pittsburgh region has made tremendous strides in improving all measures of air quality, including ozone. Previously implemented measures are resulting in better air quality for everyone and will continue to do so. We look forward to working with DEP on this issue as it progresses and urge the Department to allow for appropriate public comment periods and engagement opportunities. (3)

RESPONSE: The Department recognizes the efforts and progress made by the Pittsburgh-Beaver Valley area in improving air quality. DEP will continue to provide appropriate opportunities for input in the development of, and comment on, proposed Department actions.

- 21. COMMENT:** The ozone design values ultimately calculated from the air quality monitoring data for 2014-2016 may be less than the 70 ppbv (part per billion by volume) ozone NAAQS, perhaps due in part of the significant decrease in nitrogen oxide (NOx) emissions. According to the National Emissions Inventory 2012-2014, NOx emissions in PA from the top three source categories decreased from 2012 to 2014 calendar years (CY) as follows:

| | State-Wide NOx Emissions (1000 tons) |
|--|--------------------------------------|
|--|--------------------------------------|

| Source Category * | CY 2012 | CY 2013 | CY 2014 |
|------------------------------------|---------|---------|---------|
| Highway Vehicles | 188.40 | 172.73 | 157.06 |
| Fuel Combustion Electric Utilities | 122.36 | 130.40 | 118.99 |
| Off-Highway | 71.63 | 66.86 | 62.09 |

Likewise NOx emissions from the electric utility industry as reported to the US EPA

| State | Year | NOx Emissions (1000 tons) | Heat Input (MMBtu) | Gross Load (MW-h) | Average NOx Emission Rate (lb/MMBtu) | Average NOx Emission Rate (lb/MW-h) |
|-------|--------------|---------------------------|--------------------|-------------------|--------------------------------------|-------------------------------------|
| PA | 2013 | 133.82 | 1.28E+09 | 1.34E+08 | 0.21 | 1.99 |
| | 2014 | 122.70 | 1.21E+09 | 1.26E+08 | 0.20 | 1.95 |
| | 2015 | 96.82 | 1.13E+09 | 1.18E+08 | 0.17 | 1.64 |
| | 2016 Jan-Jun | 39.15 | 4.92E+08 | 5.05E+07 | 0.16 | 1.55 |

Clean Air Markets Division show a similar trend. (4)

RESPONSE: The Department agrees that certified 2014-2016 monitoring may indicate attainment for monitors where 2013-2015 monitoring does not. Further, the Department agrees that a potential reduction in overall 2016 NOx emissions, among other factors, may contribute to an ultimate lowering of 2016 monitored design values. See also the response to Comment #9.

22. COMMENT: Additional statewide NOx emission reductions are expected beginning in 2017 in response to both the EPA Tier 3 Vehicle Emission and Fuel Standards Program and the Department's NOx and VOC RACT II rule. (4)

RESPONSE: The Department agrees that both the EPA Tier 3 and Pennsylvania RACT II rule will provide NOx reductions following their implementation in 2017. The reductions are described in the programs' respective rulemaking documents.

See also the responses to Comment #1 and Comment #8.

23. COMMENT: Commentator supports the designation of Philadelphia County as a nonattainment area as Philadelphia has exceptionally high rates of asthma, especially among minorities and the poor. (5)

RESPONSE: The Department thanks the commentator for the support of its recommendation and recognizes the challenges faced by urban centers such as Philadelphia.

24. COMMENT: We urge the DEP to request of EPA a further lowering of the ozone standard, dropping it from 70 to 65 ppb or lower, to provide additional protection from the harmful effects of ozone. (5)

RESPONSE: The Department will continue to participate in the periodic EPA review and update process of all NAAQS, in accordance with the CAA. This process ensures that EPA uses the latest available scientific data to determine whether a new or revised NAAQS is needed.