Commonwealth of Pennsylvania
Department of Environmental Protection

STATE IMPLEMENTATION PLAN REVISION:
MAINTENANCE PLAN AND
BASE YEAR INVENTORY

SCRANTON/WILKES-BARRE
EIGHT-HOUR OZONE NONATTAINMENT AREA

JUNE 2007

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TABLE OF CONTENTS

TABLES

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INTRODUCTION AND OVERVIEW

Maintaining concentrations of ground-level ozone below the health-based ambient air quality standard is important because ozone is a serious human health threat, and also can cause damage to important food crops, forests, and wildlife.

Repeated exposure to ozone pollution may cause a variety of adverse health effects for both healthy people and those with existing conditions including difficulty in breathing, chest pains, coughing, nausea, throat irritation, and congestion. It can exacerbate bronchitis, heart disease, emphysema, and asthma, and reduce lung capacity. Asthma is a significant and growing 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. Because ozone pollution usually forms in hot weather, anyone who spends time outdoors in the summer may be affected, particularly children, the elderly, 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 levels are highest.

Ozone is one of the most pervasive and detrimental pollutants known to affect vegetation, causing more injury to trees and crops than any other air pollutant in the United States. Ozone interferes with photosynthesis, the process by which plants convert water and sunlight to food. Ozone makes plants more susceptible to disease, insects, other pollutants and harsh weather. It damages the foliage of trees and other plants, ruining the landscapes of cities, parks and forests, and recreation areas. Research has shown that current ozone concentrations result in reductions in wood growth in forests of the Northeast of over 10 percent. There is strong scientific evidence showing that current levels of ozone are reducing crop yields, particularly in sensitive species - soybean, cotton, and peanuts. Annual crop loss from ozone for soybeans alone in Illinois, Indiana and Ohio has been calculated to fall between $199 million and $346 million. The U.S. Environmental Protection Agency (EPA) has estimated national crop yield losses due to ozone in excess of $1 billion annually. One of the key components of ozone, oxides of nitrogen, contributes to fish kills and algae blooms in sensitive waterways, such as the Chesapeake Bay.

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 May through September. The primary sources of man-made VOCs and NO_x, the ozone precursors, are the evaporation of fuels and solvents (gasoline and consumer products), combustion of fuels (motor vehicles, power plants and non-road engines), and industrial processes.

EPA has established the maximum limit for ozone pollution allowed in the ambient air. EPA's National Ambient Air Quality Standard (NAAQS) for ozone is 0.08 parts per million (ppm) averaged over eight hours.

In 2004, EPA designated the Scranton/Wilkes-Barre area (Scranton Area) as nonattainment for the eight-hour ozone standard based on data from 2001-2003. This nonattainment area consists

of Lackawanna, Luzerne, Monroe and Wyoming counties. The Scranton Area was one of seventeen areas in Pennsylvania designated as eight-hour ozone nonattainment areas. These eight-hour ozone nonattainment areas took effect in 37 counties in Pennsylvania, as well as certain counties in portions of the States of Delaware, New Jersey, Maryland and Ohio in June 2004.

The redesignation request submitted concurrently with this Maintenance Plan indicates that the Scranton Area has attained the NAAQS and that attainment was due to permanent and enforceable control measures. The Maintenance Plan describes all measures that have been previously adopted; it neither changes existing measures nor adopts additional ones. The Clean Air Act (CAA) prohibits backsliding from existing State Implementation Plan (SIP) requirements. The Maintenance Plan also demonstrates that the Commonwealth has met all its regulatory and planning requirements under the CAA for the Scranton Area that were due before the date of this redesignation request.

Section 107(d)(3)(E) of the CAA requires that a Maintenance Plan be fully approved by the EPA before an area can be redesignated as attainment. The Maintenance Plan is considered a SIP revision under Section 110 of the CAA. The Plan must provide for maintenance of the NAAQS for at least 10 years after redesignation. A state may submit both the redesignation request and the maintenance plan at the same time and federal rulemaking on both may proceed on a parallel track.

EPA requires the following to ensure maintenance of the NAAQS:

- The state must continue to operate an appropriate air quality monitoring network in order to verify the area's attainment status; (addressed in Section 1 of this Plan)

- The state must develop an emissions inventory to identify the level of emissions sufficient to attain the NAAQS. This "attainment year inventory" was developed for 2004, the mid-year of the three-year monitoring period for which the NAAQS was met; (addressed in Section 2 of this Plan and the redesignation request)

- The state must show that the future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory over at least 10 years following redesignation, taking economic growth into account. The Department has developed emission inventories for 2018 and for 2009, an interim year between the attainment year and the maintenance year; (addressed in Section 3 of this Plan)

- The state must show that it has the legal authority to implement and enforce all measures necessary to attain and maintain the NAAQS, and indicate how maintenance plan progress will be tracked (addressed in Section 3 of this Plan and the redesignation request); and

- The state must identify measures that would be available to promptly correct any NAAQS violation (addressed in Section 4 of this Plan).

This document describes how the Commonwealth will meet those criteria.

The Maintenance Plan shows that the eight-hour ozone NAAQS will be maintained for at least 10 years after redesignation. In accordance with EPA guidance, the Maintenance Plan shows that emission levels over the 10 years following redesignation will remain below the emissions level in 2004, while allowing for growth in population and vehicle miles traveled. The following state and federal programs will ensure the continuing decline of VOC and NOx emissions:

- Clean Air Interstate Rule (CAIR)
- Interstate Pollution Transport Reduction
- Portable Fuel Containers
- Consumer Products
- Architectural and Industrial Maintenance (AIM) coatings
- Federal Motor Vehicle Control Programs (light-duty and heavy-duty)
- Vehicle emission inspection/maintenance program
- Cleaner gasoline (federal program)
- Cleaner highway diesel (federal program)
- Cleaner nonroad diesel (federal program)
- Pennsylvania Clean Vehicles Program
- Pennsylvania Heavy-Duty Diesel Emissions Control Program
- Federal programs for nonroad engines

The Pennsylvania Department of Environmental Protection (the Department) has provided assurances that it will continue to operate the ambient air quality monitoring network in order to track maintenance of the standard and to evaluate emissions inventories periodically compared to the projections provided in the plan. The Department has also provided a list of potential contingency measures that it would consider to correct any violation of the NAAQS that occurs after redesignation of the area.

Eight years following redesignation, the Department will submit a revised plan that ensures attainment through 2028.

Requirements for a public comment process are set forth in Section 110(a)(2) of the CAA and 40 CFR Section 51.102(d). A public hearing on the Maintenance Plan, 2002 base year inventory and the request to redesignate the Scranton Area to attainment for the eight-hour ozone standard was held on Wednesday, May 23, 2007. Notice of the hearing was published in the *Pennsylvania Bulletin* and in the *Scranton Times Tribune* and *The Times Leader* newspapers at least 30 days prior to the date of the hearing. The public comment period closed on May 25, 2007. No comments were received.

SECTION 1

BASE YEAR (2002) AND ATTAINMENT YEAR (2004) INVENTORIES

Information on the manmade sources of ozone precursors, VOC and NOx, is compiled for:

- "Stationary sources" (or "point" sources), which refer to those sources for which the Department collects individual emissions-related information. Generally they represent major stationary sources but may be smaller.

- "Stationary area sources", which are industrial/commercial/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. Where there is overlap between stationary point sources and stationary area sources, the area source values are adjusted to remove any double counting.

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

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

A. BASE YEAR (2002) EMISSION INVENTORY

An emissions inventory for the base year, 2002, was developed for ozone precursors in accordance with EPA guidance. This year represents the emissions present when the Scranton Area did not meet the ozone standard. Additional information is contained in the technical appendices.

Table 1-1
2002 EMISSIONS
tons per summer day

	VOC	NOx
Stationary Point Sources[1]	4.6	8.4
Stationary Area Sources	36.0	3.8
Highway Vehicles	36.6	74.4
Nonroad Engines/Vehicles	19.0	11.3
TOTAL	**96.2**	**97.9**

1 This does not include emission reduction credits described in the Technical Appendix A.

Stationary Point Sources. The Department requires owners and operators of larger facilities to submit annual production figures and emission calculations each year. Throughput data are multiplied by emission factors from Factor Information Retrieval (FIRE) Data System and EPA's publication series AP-42 and are based on Source Classification Code (SCC). Each process has at least one SCC assigned to it. If the owners and operators of facilities provide more accurate emission data based upon other factors, these emission estimates supersede those calculated using SCC codes.

Stationary Area Sources. Area source emissions are generally estimated by multiplying an emission factor by some known indicator or collective activity for each area source category at the county level. Pennsylvania estimates emissions from area sources using emission factors and SCC codes in a method similar to that used for Stationary Point Sources. Emission factors may also be derived from research and guidance documents if those documents are more accurate than FIRE and AP-42 factors. Throughput estimates are derived from county-level activity data, by apportioning national or statewide activity data to counties, from census numbers, and from county employee numbers. County employee numbers are based upon North American Industry Classification System (NAICS) codes to establish that those numbers are specific to the industry covered. More specific information on the procedure used for each industry type is contained in Pennsylvania 2002 Area Source Criteria Air Pollutant Emission Estimation Methods, (E.H. Pechan & Associates, Inc., February 2004) which is contained in the Technical Appendix B.

Highway Vehicle Sources. The Department employs an emissions estimation methodology that uses the current EPA-approved highway vehicle emission model, MOBILE 6.2, to estimate highway vehicle emissions. The Scranton Area highway vehicle emissions in 2004 were estimated using MOBILE6.2 and PENNDOT estimates of vehicle miles traveled (VMT) by vehicle type and roadway type. More information on highway methods is available in the Technical Appendices (Appendix C). The estimate used information specific to the Scranton Area where appropriate.

Nonroad Sources. The 2002 emissions for the majority of nonroad emission source categories were estimated using the EPA NONROAD 2005 model. The NONROAD model estimates emissions for diesel, gasoline, liquefied petroleum gasoline, and compressed natural gas-fueled nonroad equipment types and includes growth factors. The NONROAD model does not estimate emissions from aircraft or locomotives. For 2002 locomotive emissions, the Department projected emissions from a 1999 survey using national fuel consumption information and EPA emission and conversion factors. Emissions from commercial aircraft for 2002 are estimated using the EPA-approved Emissions & Dispersion Modeling System (EDMS) 4.20, the latest version available at the time the inventory was developed. Commercial aircraft operations were significant in the Scranton Area and were modeled by the EDMS model directly. The Scranton/Wilkes-Barre International Airport (AVP) accounts for all commercial operations in the area. Small aircraft emissions were calculated by using small airport operation statistics, which can be found at www.airnav.com and the Federal Aviation Administration's (FAA) APO Terminal Area Forecast Detailed Report. See Technical Appendix D.

B. ATTAINMENT YEAR (2004) INVENTORY

An inventory of 2004 VOC and NOx emissions for the Scranton Area identifies ozone precursor emissions during the period when the Scranton Area demonstrated that it did attain the ozone standard. VOC emissions decreased by 6.8 percent from 2002 to 2004 and NOx emissions decreased by 10.2 percent from 2002 to 2004 due to permanent and enforceable control measures.

Table 1-2
2004 EMISSIONS
tons per summer day

	VOC	NOX
Stationary Point Sources[2]	3.8	7.0
Stationary Area Sources	35.3	3.9
Highway Vehicles	31.6	66.1
Nonroad Engines/Vehicles	18.9	10.9
TOTAL	**89.6**	**87.9**

The Technical Appendices contain more detailed information for each sector listed in Table 1-2 above. Totals may vary due to rounding.

The following provides an overview of the emission estimation techniques for stationary, area, highway vehicle and nonroad emission sources.

Stationary Point Sources. Emissions have been compiled from the submissions described in the previous section made by the facilities for calendar year 2004.

Stationary Area Sources. Area sources emissions were projected from the 2002 inventory. The factors used for the temporal allocation of projections to 2004 from the 2002 baseline inventory were provided by the Mid-Atlantic Regional Air Management Association (MARAMA), which is performing air quality modeling for the Northeast and Mid-Atlantic states. The factors were in the form of Sparse Matrix Operator Kernel Emissions (SMOKE) v2.2 input files[3]. A temporal allocation was then performed to generate tons per summer day[4]. Area source temporal cross-reference codes were selected, based on Source Category Codes (SCC), from files named ATREF (Area Temporal Reference) and PTREF (Point Temporal Reference), respectively. Once a cross-reference code was obtained, the actual temporal profile weights were obtained from files named ATPRO (Area Temporal Profile) and PTPRO (Point Temporal Profile).

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2 This does not include banked emission reduction credits described in the Technical Appendix.
3 For additional information on the SMOKE file formats, please refer to the SMOKE v2.2 Users Manual, available from the Center for Environmental Modeling for Policy Development (CEMPD) at http://cf.unc.edu/cep/empd/products/smoke/index.cfm#Documentation.
4 Consistent with its prior SIP submissions, the PADEP did not attempt to calculate weekday vs. weekend emissions for area sources. Reliable allocation factors for such a calculation were not readily available, and it would be unlikely to result in significant differences for SIP purposes.

Once the necessary weighting factors were obtained, the following formula was used to convert annual emissions to daily emissions:

$$Emissions_{Daily} = \frac{\left(\frac{TW_{July}}{TW_{Total}}\right) \times Emissions_{Annual}}{31}$$

Where:

TW_{July} is the Temporal weight for July from the appropriate file named TPRO
TW_{Total} is the total of temporal weights for the entire year.

A table of growth factors for 2009, 2012, and 2018 was provided by MARAMA. For each state, county and SCC, this table includes state growth factors derived from the Energy Information Administration (EIA) Annual Energy Outlook, 2005; and/or factors extracted from the Economic Growth Analysis System (EGAS). Where more than one factor was available, the first choice was the EIA factor followed by the EGAS factor.

$$Emissions_{\Pr ojected} = Emissions_{Baseline} \times Growth\ Factor_{year}$$

Data for 2004 area sources is a linear interpolation of the 2002 Baseline and the 2009 Projected inventories using the following formula:

$$Emissions_{2004} = Emissions_{2002} + \left(\frac{Emissions_{2009} - Emissions_{2002}}{7}\right) \times 2$$

MARAMA also supplied tables of control factors, rule effectiveness factors, and rule penetrations factors for any control measures applicable to these sources.

For the area sources, these factors were available by SCC and pollutant. There may be more than one generic control factor that applies to a given SCC and pollutant. In cases where there was more than one applicable factor, the following formula may have been applied recursively to generate reductions that are a composite of those factors.

$$Emissions_{Controlled} = Emissions - \left((CF \times RE \times RP) \times Emissions\right)$$

Where

CF is the control factor
RE is the rule effectiveness factor
RP is the rule penetration factor

Highway Vehicle Sources. The Department employs an emissions estimation methodology that uses the current EPA-approved highway vehicle emission model, MOBILE 6.2, to estimate highway vehicle emissions. In addition, Pennsylvania uses a MOBILE pre- and

post-processing software package called PPSUITE to process and compile Pennsylvania's robust highway network and detailed highway vehicle data. The Pennsylvania methodology is consistent with the January 2002 guidance published by EPA's Office of Transportation and Air Quality (OTAQ) entitled "Technical Guidance on the Use of MOBILE6 for Emissions Inventory Preparation." Pennsylvania Department of Transportation (PENNDOT) supplied estimates of vehicle miles traveled (VMT) by vehicle type and roadway type. The Scranton Area highway vehicle emissions in 2004 were estimated using MOBILE6.2 and PENNDOT estimates of vehicle miles traveled (VMT) by vehicle type and roadway type. More information on highway methods is available in the Technical Appendices (Appendix C). The estimate used information specific to the Scranton Area where appropriate.

Nonroad Sources. The 2004 emissions for the majority of nonroad emission source categories were estimated using the EPA NONROAD 2005 model. The NONROAD model estimates emissions for diesel, gasoline, liquefied petroleum gasoline, and compressed natural gas-fueled nonroad equipment types and includes growth factors. The NONROAD model does not estimate emissions from aircraft or locomotives.

For 2004 locomotive emissions, the Department projected emissions from a 1999 survey using national fuel consumption information and EPA emission and conversion factors.

Emissions from commercial aircraft are estimated using the EPA-approved Emissions & Dispersion Modeling System (EDMS). Growth was estimated using estimates of future operations at AVP from the FAA APO Terminal Area Forecast Detailed Report. Small aircraft emissions were calculated by using small airport operation statistics, which can be found at www.airnav.com, and the FAA APO Terminal Area Forecast Detailed Report. See Technical Appendix D.

SECTION 2

DEMONSTRATION AND TRACKING OF MAINTENANCE: MAINTENANCE YEAR INVENTORIES (2009 and 2018) AND OTHER INFORMATION

EPA guidance indicates that a state can demonstrate that future emissions over the 10-year period of analysis will not lead to any exceedances of the standard by showing that emissions during the 10-year maintenance period are no more than those for the attainment year.

Emission estimates for 2009 and 2018 have been developed for this purpose. The Maintenance Plan year is 2018. The year 2009 is an intermediate year that is being used for regional ozone modeling studies, and serves as a checkpoint for maintenance plan evaluation. NO_x and VOC emission levels are expected to continue to decline from attainment year levels despite growth in population, economic output, and VMT. The Maintenance Plan end year and the interim year were selected in consultation with EPA Region 3 staff.

A. GROWTH PROJECTION METHODOLOGIES: 2009 and 2018

This section describes the data, methods, and assumptions utilized in developing estimates of emissions changes between 2004 and the two projection years, 2009 and 2018.

1. Stationary Point Sources

The methodology for projecting emissions to 2009 and 2018 is the same as the methodology described in Section 1 for stationary point sources. Projections were made from 2002 (not 2004) emissions. Additional information about these projected methodologies can also be found in Appendix E.

There is one variation from Appendix E, however. The methodology in Appendix E used EPA's IPM modeling to predict the emissions of the electric generating units (EGUs) that are subject to the federal CAIR regulation. The Scranton Area has five CAIR-affected EGUs. The Department has decided to project future emissions of the following five facilities by using growth factors (as described in Section 2 of Appendix E) from the Economic Growth Analysis System (EGAS): Pennsylvania Power and Light (PPL) Martins Creek Harwood Station, PPL Martins Creek Jenkins Station, Reliant Energy Mid-Atlantic Shawnee facility, UGI Development Company/Hunlock Power Station, and PEI Power Corporation/Archbald Facility. These projections are consistent with the approach used for other stationary sources in the Scranton Area plan. While the IPM model is effective in predicting future regional emissions, it is not necessarily accurate on an individual boiler basis. The Department has determined that EGAS is a more accurate prediction of expected future NOx emission levels for the subject boilers. Appendix F contains all of the CAIR-affected EGU facilities in the Commonwealth and their projected emissions using growth factors for years 2009 and 2018.

2. Stationary Area Sources

The methodology for projecting emissions to 2009 and 2018 is the same as the methodology described in Section 1 for stationary area sources for the attainment year. Projections were made using 2002 as the base year. Additional information about these projected methodologies can also be found in Appendix E.

3. Highway Vehicle Sources

The Scranton Area highway vehicle emissions were estimated using MOBILE6.2 and PENNDOT estimates of vehicle miles traveled (VMT) by vehicle type and roadway type. More information on highway methods is available in the Technical Appendices (Appendix C). The estimate used information specific to the Scranton Area where appropriate. The emissions do not include the conformity safety margin discussed below and in Subsection E.

Table 2-1
VMT and Emissions

YEAR	*VMT*	*VOC (tpsd)*	*NOX (tpsd)*
2009	22,461,416	23.3	46.9

2018	25,622,332	14.3	21.6

4. Nonroad Sources

Emissions for 2009 and 2018 were calculated with the same methodology as described in Section 1 for nonroad sources.

B. 2009 and 2018 MAINTENANCE YEAR EMISSIONS INVENTORIES

Table 2-2 presents a comparison of VOC and NO_x emissions by major source category for 2004, 2009, and 2018 and shows that emissions throughout the maintenance period continue to decline after the attainment year, 2004.

A small portion of the difference between attainment and maintenance emissions has been set aside as a transportation conformity safety margin to accommodate unanticipated growth in highway vehicles. The highway vehicle emissions reflect inclusion of those safety margins as described in Section E: Motor Vehicle Emission Budgets for Transportation Conformity.

Detailed information on emissions in each source category is contained in the Technical Appendices to the Plan. Stationary point emissions do not include banked emission reduction credits described in Appendix A.

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Table 2-2
VOC and NO_x Emissions Summary: 2004, 2009 and 2018

	VOC Emissions (tons per summer day)		
MAJOR SOURCE CATEGORY	**2004**	**2009**	**2018**
Stationary Point Sources	3.8	4.6	5.9
Stationary Area Sources	35.3	33.7	36.3
Highway Vehicles	31.6	25.2	16.9
Nonroad Engines/Vehicles	18.9	16.5	13.2
TOTAL	**89.6**	**80.0**	**72.3**

	NOx Emissions (tons per summer day)		
MAJOR SOURCE CATEGORY	**2004**	**2009**	**2018**
Stationary Point Sources	7.0	9.3	10.4
Stationary Area Sources	3.9	4.1	4.4
Highway Vehicles	66.1	48.3	23.7
Nonroad Engines/Vehicles	10.9	8.9	5.6
TOTAL	**87.9**	**70.6**	**44.1**

Totals may vary due to rounding. See Appendices.

C. PERMANENT AND ENFORCEABLE CONTROL MEASURES FOR MAINTENANCE

This section describes the federal and state measures that will be in place to ensure emissions during the maintenance period are equal to or less than the emissions in the attainment year.

1. Stationary Point Sources

Clean Air Interstate Rule (CAIR) -- The federal CAIR (70 FR 25162, May 12, 2005), covering 28 states and the District of Columbia, provides a regulatory approach for electric generating units (EGUs) to transition from the NOx SIP Call regulations in 2009. The CAIR requirements will continue to ensure that large electric generation facilities upwind of the area will maintain background emissions at or below 2002 levels while any new EGUs locating within the area will be required to obtain both emission offsets and NOx allowances that will ensure ambient equivalence with regard to ozone production potential. Pennsylvania and other nearby states are required to adopt a regulation implementing the CAIR requirements or an equivalent program. On April 28, 2006, EPA promulgated a Federal Implementation Plan (FIP) to reduce the interstate transport of NOx and sulfur dioxides that contribute significantly to nonattainment of the 8-hour ozone and PM2.5 NAAQS. The EGUs in the CAIR-covered States will be regulated under the FIP until EPA approves revisions to SIPs for the implementation of the CAIR. See 71 FR 25328 (April, 28, 2006). As described in Section A-1, the Department has estimated the emissions from CAIR-affected units with EGAS.

Interstate Pollution Transport Reduction -- In response to the Federal NOx SIP call rule, Pennsylvania and other covered states adopted NOx control regulations for large industrial boilers and internal combustion engines, electric generating units, and cement plants. The regulation covering industrial boilers and electric generators required emission reductions to commence May 1, 2003, while the regulation covering large internal combustion engines and cement plants required emission reductions to commence May 1, 2005. While there are no affected units located in the Scranton Area, upwind NOx reductions from affected sources in Pennsylvania and other states assisted in bringing the area into attainment.

2. Stationary Area Sources

Portable Fuel Containers. The Department adopted a portable fuel container regulation, 25 *Pa. Code* Chapter 130, Subchapter A, to address VOC loss resulting from permeation through portable gasoline containers, evaporative loss through container openings, and from spillage during the filling of small tanks on machines such as lawn mowers, chain saws, jet skis and the like. This regulation requires that portable fuel containers manufactured after January 1, 2003 for sale in Pennsylvania meet certain requirements. (A "sell-through" provision allowed the sale during 2003 of containers manufactured before January 1, 2003.) The Department predicted, as part of the one-hour ozone SIP demonstration for the Southeast Pennsylvania area, that the portable fuel container regulation would be fully phased in over a 10-year period, i.e. approximately 10 percent of the existing containers would be replaced each year. Emission reduction estimates for the program reflect this phased-in replacement of the containers. The

regulation was submitted to EPA as a SIP revision on March 26, 2003 and approved on December 8, 2004 (69 FR 70893).

Consumer Products. This regulation applies statewide to any person who sells, supplies, offers for sale, or manufactures certain consumer products on or after January 1, 2005, for use in the Commonwealth. The Consumer Products regulation includes general provisions, VOC standards, provisions for exemptions, provisions for innovative products, administrative requirements, reporting requirements, provisions for variances, test methods, and provisions for alternative control plans for consumer products. The regulation is codified in 25 *Pa. Code* Chapter 130, Subchapter B. The final-form regulation was submitted to EPA as a SIP revision on March 26, 2003 and approved on December 8, 2004 (69 FR 70895).

Architectural and Industrial Maintenance Coatings. The Pennsylvania AIM Coatings regulation applies statewide to any person who supplies, sells, offers for sale, or manufactures, blends or repackages an AIM coating for use within the Commonwealth, as well as a person who applies or solicits the application of an AIM coating within the Commonwealth. The regulation does not apply to the following: (1) Any AIM coating that is sold or manufactured for use outside the Commonwealth or for shipment to other manufacturers for reformulation or repackaging; (2) any aerosol coating product; or (3) any AIM coating that is sold in a container with a volume of one liter (1.057 quarts) or less. The AIM Coatings regulation sets specific VOC content limits, in grams per liter, for AIM coatings categories with a compliance date of January 1, 2005. Manufacturers ensure compliance with the limits by reformulating coatings and substituting coatings with compliant coatings that are already in the market. The regulation contains VOC content requirements for a wide variety of field-applied coatings, including graphic arts coatings, lacquers, primers and stains. The regulation also contains provisions for a variance from the VOC content limits, which can be issued only after public hearing and with conditions for achieving timely compliance. In addition, the regulation contains administrative requirements for labeling and reporting. There are a number of test methods that would be used to demonstrate compliance with the AIM Coatings regulation. Some of these test methods include those promulgated by EPA and South Coast Air Quality Management District of California. The methods used to test coatings must be the most current approved method at the time testing is performed.

The AIM coating program requirements are specified in 25 *Pa. Code* Chapter 130, Subchapter C. The final-form regulation was submitted to EPA as a SIP revision on December 3, 2003, with a supplement submitted on October 19, 2004. EPA approved the provisions as an element of the SIP on November 23, 2004 (69 FR 69080).

3. Highway Vehicle Sources

Even with increases in VMT that occur from 2004 through 2018, highway vehicle emissions of both VOC and NOx will continue to decrease. As more vehicles subject to cleaner new car standards replace older vehicles subject to less stringent new vehicle standards, the fleet as a whole emits fewer emissions, compensating for the increase in vehicle miles traveled. These decreases can be attributed to the programs described below.

Federal Motor Vehicle Control Programs (FMVCP) for passenger vehicles and light-duty trucks and cleaner gasoline. In 2009 and 2018, vehicles manufactured to meet federal standards through Tier 0, 1 and 2 will still be in Pennsylvania's fleet.

Tier 1 tailpipe standards established by the CAA Amendments of 1990 include NOx and VOC limits for light-duty gasoline vehicles (LDGVs) and light-duty gasoline trucks (LDGTs). These standards began to be phased in starting in 1994. Evaporative VOC emissions were also reduced in gasoline-powered cars starting with model year 1998.

In 1998, under the authority of section 177 of the CAA, the Department adopted the Pennsylvania Clean Vehicles Program. (28 Pa. B. 5873, Dec. 5, 1998.) The Pennsylvania Clean Vehicles Program incorporates certain California Low Emission Vehicle emission standards emission standards for passenger cars and light-duty trucks by reference. As required under Section 177 of the CAA, these provisions are identical to the low emission standards adopted by California, except that the regulation does not incorporate by reference the California zero emissions vehicle (ZEV) or emissions control warranty systems statement provisions.

In the same rulemaking, the Department adopted the NLEV program as a compliance alternative to the Pennsylvania Clean Vehicles Program. The NLEV program became effective in the Ozone Transport Region in 1999. Pennsylvania's New Motor Vehicle Control Program regulations (25 *Pa. Code* Subchapter 126.401-126.441) allowed automobile manufacturers to comply with NLEV instead of the California Low Emission Vehicle (CA LEV) program through model year (MY) 2005. These regulations affected vehicles 6,000 pounds and less and were the regulations in effect for new motor vehicles in the baseline year, 2002.

In 1999, EPA promulgated regulations more stringent than NLEV (Tier 2), starting with the 2004 model year. However, in order to participate in NLEV, Pennsylvania was required to adopt language that extended its "commitment" to NLEV until MY 2006. In practical terms, the NLEV program was replaced for MY 2004 and later by the more stringent Federal "Tier 2" vehicle emissions regulations, 65 F.R. 6698 (Feb. 10, 2000), and vehicle manufacturers operating under the NLEV program became subject to the Tier 2 requirements. Therefore, this plan assumes that the federal Tier 2 program governs new vehicles sold in Pennsylvania in the attainment year, 2004. The incorporated CA LEV requirements are applicable in this Commonwealth for MY 2006 and each model year thereafter.

The same EPA regulation required the reduction of sulfur in gasoline beginning in 2004. In the first year of the program, sulfur levels are capped at 300 parts per million (ppm) and annual refinery corporate averages must be no more than 120 ppm. This analysis uses the default assumptions provided in MOBILE6 for all gasoline parameters for conventional fuel sold in the Scranton Area.

Pennsylvania Clean Vehicles Program for passenger vehicles and light-duty trucks. The New Motor Vehicle Control Program (which includes the Pennsylvania Clean Vehicles Program) incorporated the California Low Emission Vehicle Program (CA LEV II) by reference allowed automakers to comply with the NLEV program as an alternative to this Pennsylvania

program until MY 2006. Under the existing program, compliance with the CA LEV II requirements was required as of MY 2006. The Pennsylvania Clean Vehicles Program was recently amended to postpone compliance from MY 2006 to MY 2008. 36 *Pa B.* 7424 (December 9, 2006). Emissions for all maintenance plan milestone years were estimated based on compliance with the Pennsylvania Clean Vehicles Program according to the methodology described in section 7.4.1 of the "Technical Guidance on the Use of MOBILE6.2 for Emissions Inventory Preparation" published by EPA's Office of Transportation and Air Quality (OTAQ) in January 2002. This methodology is further explained in Appendix C. In order to provide conservative estimates of emissions, the Department is assuming in its MOBILE modeling that the federal Tier 2 program applies to subject vehicles sold in Pennsylvania from MY 2004 through MY 2007 and the Pennsylvania Clean Vehicles Program applies to subject vehicles sold in model year 2008 and beyond.

Heavy-Duty Diesel Control Programs. EPA promulgated more stringent national regulations for heavy-duty engines and vehicles (over 14,000 pounds) starting with model year 2004. In addition, a consent decree with the major heavy-duty engine manufacturers required, among other terms, that diesel engines made by these companies comply with these 2004 standards two model years early, in model year 2002. Pennsylvania includes these programs as provided in the MOBILE model.

In 2002, the Department adopted the Heavy-Duty Diesel Emissions Control Program for model years starting after May 2004. The program incorporates California standards by reference and requires model year 2005 and subsequent new heavy-duty diesel highway engines to be those certified by California. California standards are more stringent than federal standards for the two model years between expiration of the consent decree discussed above and the implementation of more stringent federal standards affecting model year 2007 and beyond. However, EPA's MOBILE model already assumes that the engines would comply with consent decree standards, even without an enforcement mechanism. The Department has used MOBILE defaults to calculate emissions from model year 2005 and 2006 highway engines.

EPA adopted new emission standards for heavy-duty engines and vehicles for model year 2007 and subsequent. For diesel engines, the standards will be phased in from 2007 to 2010 for NOx and VOCs. For gasoline engines, the standards will be phased in during model years 2008 and 2009. Federal and California standards are virtually identical for model year 2007 and beyond; therefore, the emission estimates use assumptions of the federal rule for these years.

Because the new engine standards are adversely affected by sulfur in fuel, EPA has required since the fall of 2006 that most highway diesel fuel to contain no more than 15 parts per million (ppm) of sulfur. There is a temporary compliance option allowing refiners to continue to produce up to 20 percent of their highway diesel fuel at 500 ppm fuel until 2010. Pennsylvania uses MOBILE defaults to estimate the effects of the phase-in provision.

Vehicle Emission Inspection/Maintenance Program. In early 2004, Pennsylvania expanded its Vehicle Emission Inspection/Maintenance (I/M) Program into the Scranton Area. A vehicle emissions inspection program is not required in Monroe or Wyoming counties. (See the following section on Vehicle Safety Inspection Program that applies to those two counties.) For

Lackawanna and Luzerne counties, the program applies to gasoline-powered vehicles 9,000 pounds and under, model years 1975 and newer. The program consists of an annual visual inspection of pollution control devices to ensure they are present, connected and the proper type for the vehicle and a gas cap pressure test. These regulations can be found in 67 *Pa. Code* Chapter 177. Pennsylvania submitted the expanded emissions program as a SIP revision on December 1, 2003. EPA approved the SIP revision on October 6, 2005 (70 FR 58313).

Changes to Vehicle Safety Inspection Program. In November 2003, Pennsylvania amended its vehicle safety inspection program to include a visual inspection of certain pollution control components in the 42 counties, which includes Monroe and Wyoming counties, for which a separate vehicle emissions inspection program is not required. These regulations can be found in 67 *Pa. Code* Chapter 175. Pennsylvania submitted that portion of the amended safety inspection program as a revision to its State Implementation Plan on December 1, 2003. EPA approved the SIP revision on October 6, 2005 (70 FR 58313).

Nonroad Sources. EPA has adopted a series of regulations affecting new diesel-powered ("compression ignition") and gasoline-powered ("spark ignition") nonroad engines of various sizes (horsepower) and applications. Information on these federal rules, including their implementation dates, can be found at www.epa.gov/nonroad. The Department used the assumptions built into the nonroad model (NONROAD2005) to estimate emissions for all milestone years.

No new national or international regulations are expected to be applicable to aircraft during the maintenance period. While EPA has published a notice of proposed rulemaking for more stringent standards for locomotives and large commercial marine diesel engines, the agency has not finalized any new standards.

EPA will also require diesel fuel used in most nonroad applications to contain less sulfur. The sulfur will prevent damage to the more advanced emission control systems needed to meet the engine standards; it will also reduce fine particulate emissions from diesel engines. In 2007, fuel sulfur levels will be limited to 500 parts per million (ppm) for nonroad applications other than ocean-going marine vessels. In 2010, fuel sulfur levels will be reduced to the same sulfur concentration as in highway fuel, 15 ppm; this requirement applies in 2012 to locomotive and marine diesel fuel.

D. MODELING ANALYSIS

Modeling results for the EPA's Clean Air Interstate Rule (CAIR) were examined to determine if the model results support redesignating the Scranton Area to attainment. EPA outlined model results in its technical support document (TSD) for CAIR (TSD for Final CAIR, Air Quality Modeling, March 2005). Results for the Scranton Area ozone monitors (located only in Lackawanna and Luzerne counties) indicate modeled ozone concentrations will be below the eight-hour ozone standard. According to Appendix E of the TSD, Lackawanna and Luzerne counties modeled ozone concentrations are between 72 and 74 ppb for both the 2010 Base run

and the 2010 CAIR run. These results also support redesignating the Scranton Area to attainment and demonstrate that the area will continue to attain the eight-hour ozone standard.

E. MOTOR VEHICLE EMISSION BUDGETS FOR TRANSPORTATION CONFORMITY

Section 176 of the CAA provides a mechanism by which federally funded or approved highway and transit plans, programs, and projects are determined not to produce new air quality violations, worsen existing violations, or delay timely attainment of national air quality standards. EPA regulations issued to implement transportation conformity provide that motor vehicle emission "budgets" establish caps of these emissions that cannot be exceeded by the predicted transportation system emissions in the future. Transportation agencies in Pennsylvania are responsible for making timely transportation conformity determinations. The responsible agencies in the Scranton Area are the Lackawanna-Luzerne Transportation Study (LLTS), the Northeastern Pennsylvania Alliance (NEPA) for Monroe County, and the Northern Tier Rural Planning Organization (NTRPO) for Wyoming County. These transportation agencies are the designated Metropolitan Planning Organizations (MPO) under the federal transportation planning requirements.

The Department proposes to establish budgets for highway emissions in order to ensure that transportation emissions do not impede clean air goals in the next decade and beyond. The information in Table 2-3, once EPA approves this SIP revision for purposes of conformity, will establish transportation conformity budgets in the four counties included in the Scranton Area.

Table 2-3
Motor Vehicle Emission Budgets in Kilograms/Summer Day

	Pollutant	
Calendar Year	**VOCs**	**NO_x**
2009 Predicted	21,162 kilograms/summer day (23.3 tons/summer day)	42,570 kilograms/summer day (46.9 tons/summer day)
Safety Margin	1,676 kilograms/summer day (1.85 tons/summer day)	1,236 kilograms/summer day (1.4 tons/summer day)
2009 Budget	**22,838 kilograms/summer day** (25.2 tons/summer day)	**43,806 kilograms/summer day** (48.3 tons/summer day)
2018 Predicted	13,008 kilograms/summer day (14.3 tons/summer day)	19,644 kilograms/summer day (21.6 tons/summer day)
Safety Margin	2,396 kilograms/summer day (2.6 tons/summer day)	1,895 kilograms/summer day (2.1 tons/summer day)
2018 Budget	**15,404 kilograms/summer day** (16.9 tons/summer day)	**21,539 kilograms/summer day** (23.7 tons/summer day)

SECTION 3

AMBIENT AIR QUALITY MONITORING NETWORK

The Department will continue to operate the air monitoring network in accordance with 40 CFR Part 58 to verify the attainment status of the area, with no reductions in the number of sites from those in the existing network unless pre-approved by EPA.

The Commonwealth has concurrently submitted a request for redesignation of the Scranton nonattainment area that contains analysis of ambient air quality data and related factors.

SECTION 4

VERIFICATION OF CONTINUED ATTAINMENT

The Department will track the attainment status of the eight-hour ozone NAAQS in the area by reviewing air quality and emissions data during the maintenance period. The Department will perform an annual evaluation of two key factors, VMT data and emissions reported from stationary sources, and compare them to the assumptions about these factors used in this plan. The Department will also evaluate the periodic (every three years) emission inventories prepared under EPA's Consolidated Emission Reporting Regulation (40 CRF 51 Subpart A) to see if they exceed the attainment year inventory (2004) by more than 10 percent. Based on these evaluations, the Department will consider whether any further emission control measures should be implemented.

SECTION 5

CONTINGENCY MEASURES

Implementation of contingency measures would be in accordance with the following paragraphs of this section 5 of this maintenance plan, if necessary. The commitment to operate the air quality monitoring network in accordance with 40 CFR Part 58 is set forth in Section 3 of this Maintenance Plan.

Contingency measures would be considered if for two consecutive years the fourth highest eight-hour ozone concentrations at a Scranton Area monitor are above 84 ppb. If this trigger point occurs, the Department will evaluate whether additional local emission control measures should be implemented in order to prevent a violation of the air quality standard. The Department will analyze the conditions leading to the excessive ozone levels and evaluate what measures might be most effective in correcting the excessive ozone levels. The Department will also analyze the potential emissions effect of federal, state and local measures that have been adopted but not yet implemented at the time the excessive ozone levels occurred. The Department will then begin

the process of implementing any selected measures so that in the event of a violation, the measures can be implemented as expeditiously as practicable after the violation.

If a violation occurs, the Department will adopt additional necessary emission reduction measures as expeditiously as practicable in accordance with the implementation schedule in this section and the Pennsylvania Air Pollution Control Act in order to return the area to attainment with the standard.

Additional emission reduction measures to be considered for adoption would be based on criteria including:

- air quality analysis indicating nature of violation [cause, location, source];
- emission reduction potential, including extent to which emission generating sources occur in the nonattainment area;
- timeliness of implementation in terms of the potential to return the area to attainment as expeditiously as practicable; and
- costs, equity and cost-effectiveness.

Additional measures to be considered for adoption in the Scranton Area will include, but not be limited to:

Non-regulatory measures:

- Voluntary diesel engine "chip reflash" (installation software to correct the defeat device option on certain heavy-duty diesel engines).
- Diesel retrofit (including replacement, repowering or alternative fuel use) for public or private local onroad or offroad fleets.
- Idling reduction technology for Class 2 yard locomotives.
- Idling reduction technologies or strategies for truck stops, warehouses and other freight-handling facilities.
- Accelerated turnover of lawn and garden equipment, especially commercial equipment, including promotion of electric equipment.
- Additional promotion of alternative fuel (e.g. biodiesel) for home heating and agricultural use.

The regulatory measures below were included in the suite of measures considered potential cost-effective and timely control strategies by the regional planning organizations (Ozone Transport Commission, Mid-Atlantic Regional Air Management Association and Mid-Atlantic/Northeast Visibility Union) during their 2005-2006 ozone attainment deliberations.

- VOC reductions from consumer products
- VOC reductions from portable fuel containers

In the event that additional emission reductions are necessary, the Department will propose and pursue adoption of additional emission reduction measures to attain and maintain the ozone NAAQS in accordance with the requirements of the Clean Air Act, the Air Pollution Control

Act, other applicable Pennsylvania statutory requirements, and the Department's Policy for Approval and Distribution of Regulations.

If the measure is non-regulatory, implementation would take place as expeditiously as practicable with the following milestones:

Within 2 months: Identify stakeholders for potential non-regulatory measures for further development.

Within 3 months: If funding is necessary, identify potential sources of funding and the timeframe under which funds would be available. In addition to non-Title V Clean Air funds, the following programs may be able to provide a funding stream:

- for transportation projects, federal Congestion Mitigation and Air Quality funds from the Federal Highway Administration, as allocated to the Scranton Area MPO. Discussions will be held with PENNDOT and the Scranton Area MPO to ensure that emission credits could be allocated for attainment purposes, rather than for transportation conformity.

- for projects which also have an energy efficiency co-benefit, the Pennsylvania Energy Harvest program.

- for projects which would be undertaken by small business and are pollution prevention projects, the Small Business Advantage Grant and Small Business Pollution Prevention Loan programs;

- for projects which involve alternative fuels for vehicles/refueling operations, the Alternative Fuel Incentive Grant program.

- for projects involving diesel emissions, federal Energy Policy Act diesel reduction funds allocated to Pennsylvania or for which Pennsylvania or project sponsors may apply under a competitive process.

Within 6 months: Work with the Scranton Area Planning Commission to identify land use planning strategies and projects with quantifiable and timely emission benefits. Work with the Pennsylvania Department of Community and Economic Development and other state agencies to assist these measures.

Within 9 months: If state loans or grants are involved, enter into agreements with implementing organization (business, local government, transit companies, non-profit entities, etc.). Quantify projected emission benefits.

Within 12 months: Submit revised SIP to EPA.

Within 12-24 months: Implement strategies and projects.

If the measure is regulatory, the rulemaking process will proceed according to the following anticipated timetable. Timeframes are measured from the event triggering the need for additional control measures.

Within 1 month of triggering event: Submit request to begin regulatory development process.

Within 3 months of triggering event: Review by Air Quality Technical Advisory Committee (AQTAC), Citizens Advisory Council and other advisory committees[5] as appropriate.

Within 6 months of triggering event: Environmental Quality Board (EQB) meeting/action.

Within 8 months of triggering event: Publish in the Pennsylvania Bulletin for comment as proposed rulemaking.

Within 10 months of triggering event: Public hearing takes place and comment period on proposed rule closes.

Within 11 months of triggering event: House and Senate Standing Committees and Independent Regulatory Review Commission (IRRC) comment on proposed rule.

Within 13 months of triggering event: AQTAC, Citizens Advisory Council and other committee review responses to comments and draft final rulemaking.

Within 16 months of triggering event: EQB meeting/action.

Within 17 months of triggering event: Independent Regulatory Review Commission action on final rulemaking.

Within 18 months of triggering event: Attorney General's review/action.

Within 19 months of triggering event: Publish in the Pennsylvania Bulletin as final rulemaking and submit to EPA as a SIP revision. The regulation would become effective upon publication in the Pennsylvania Bulletin.

5 Other committees could include the Small Business Compliance Advisory Committee, and Agriculture Advisory Committee.

ACRONYMS AND ABBREVIATIONS

AIM	Architectural and Industrial Maintenance
AQTAC	Air Quality Technical Advisory Committee
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CA LEV	California Low Emission Vehicle (program)
EDMS	Emissions and Dispersion Modeling System
EGAS	Economic Growth Analysis System
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FIRE	Factor Information Retrieval
FMVCP	Federal Motor Vehicle Control Program
ICI	Industrial, Commercial and Institutional
IC	Internal Combustion
I/M	Inspection and Maintenance
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standard
NLEV	National Low Emission Vehicle (program)
NO_x	Oxides of Nitrogen
NSR	New Source Review
PENNDOT	Pennsylvania Department of Transportation
ppb	parts per billion
ppm	parts per million
RACT	Reasonably Available Control Technology
SCC	Source Classification Code
SIP	State Implementation Plan
SMOKE	Sparse Matrix Operator Kernel Emissions
TSD	Technical Support Document
tpsd	tons per summer day
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound