

**Commonwealth of Pennsylvania
Department of Environmental Protection**



**PROPOSED
STATE IMPLEMENTATION PLAN REVISION:
EIGHT-HOUR OZONE MAINTENANCE PLAN AND
BASE YEAR 2002 INVENTORY
LAWRENCE COUNTY ATTAINMENT AREA**

OCTOBER 2007

Bureau of Air Quality
Pennsylvania Department of Environmental Protection
P.O. Box 8468
Harrisburg, PA 17105-8468
717-787-9495

www.depweb.state.pa.us

Kathleen A. McGinty
Secretary

Edward G. Rendell
Governor

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**Lawrence County Attainment Area
Eight-Hour Ozone Maintenance Plan**

TABLE OF CONTENTS

Section 1	<u>Introduction and Overview</u>	1
Section 2	<u>Air Quality Monitoring Information</u>	4
Section 3	<u>Emission Inventories</u>	
	A. Base Year Inventory	5
	B. Projected Inventories	7
Section 4	<u>Permanent and Enforceable Control Measures</u>	11
Section 5	<u>Ambient Air Quality Monitoring Network</u>	16
Section 6	<u>Verification of Continued Attainment</u>	16
Section 7	<u>Contingency Measures</u>	16
Acronyms and Abbreviations	20

TABLES

Table 2-1	Design Values	4
Table 3-1	2002 Base Year Emissions	5
Table 3-2	Vehicle Miles Traveled	9
Table 3-3	VOC Emissions Summary: 2002, 2009, 2018	10
Table 3-4	NOx Emissions Summary: 2002, 2009, 2018	10

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SECTION 1

INTRODUCTION AND OVERVIEW

Lawrence County Attainment Area Eight-Hour Ozone Maintenance Plan

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 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, forests, and recreation areas. Research has shown that current ozone concentrations result in reductions of more than 10 percent in Northeast forest wood growth. 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.

It is the responsibility of EPA to establish the maximum limit for ozone pollution allowed in the ambient air. In 1979, EPA established the National Ambient Air Quality Standard (NAAQS) for ozone at 0.12 parts per million (ppm) averaged over one hour. Lawrence County was designated

as nonattainment under this standard. The Clean Air Act was amended on November 15, 1990. The amended section 107(d)(1)(C) provided that designations occurred by operation of law for areas that had been formally designated nonattainment before enactment of the Clean Air Act Amendments of 1990. The statute provided an opportunity for states to provide evidence to change that statutory designation. While the Department recommended that Lawrence County not be designated as nonattainment based on monitored air quality, EPA disagreed and included Lawrence County on the final list of nonattainment areas for the one-hour ozone standard. Lawrence County was classified as an incomplete data one-hour nonattainment area

In 1997, after extensive review of health and environmental evidence on adverse effects of ozone, EPA revised the NAAQS and established a new health-based standard at 0.08 ppm averaged over eight hours. In 2004, EPA designated 37 counties in Pennsylvania as nonattainment for the eight-hour standard, which included interstate areas covering certain areas in the states of Ohio, New Jersey, Delaware and Maryland. In this Commonwealth, Lawrence County was designated by EPA as an unclassifiable/attainment area for the eight-hour ozone standard based on air quality data from 2001-2003. See 40 CFR 81.339. Lawrence County is still attaining the ozone standard based on air quality from 2004-2006. See Section 2 for additional air quality information.

EPA specified that even though the one-hour ozone standard had been revoked as of April 30, 2004, (69 *FR* 23951), the one-hour ozone NAAQS designations and classification statuses were retained as of the effective date of designation for the eight-hour NAAQS for purposes of anti-backsliding regulations (40 CFR 51.905). Anti-backsliding regulations apply even after revocation of the one-hour ozone NAAQS.

EPA's Phase 1 Implementation Rule (69 *FR* 23951, 23998 (April 30, 2004)) for the eight-hour ozone standard requires at 40 CFR 51.905(a)(iii) that states submit an eight-hour maintenance plan to EPA for those one-hour nonattainment areas that had not been previously redesignated to attainment/maintenance for the one-hour standard. The maintenance plan needs to demonstrate that the area will maintain the standard for 10 years after designation in accordance with Section 110(a)(1) of the CAA.

To demonstrate maintenance of the eight-hour ozone standard for this area, Pennsylvania must show that the future emissions of a pollutant or its precursors will not exceed the level of the base year inventory for at least 10 years, taking economic, population and travel growth into account. This maintenance plan contains a base year inventory for 2002 and demonstrates that emissions will not be greater than the base year in 2009 and 2018. The plan describes measures that have been previously adopted; it neither changes existing measures nor adopts additional ones. The plan indicates how maintenance plan progress will be tracked and identifies measures that would be available to promptly correct any NAAQS violation.

The following permanent and enforceable control measures are included in the plan:

- Clean Air Interstate Rule (CAIR)
- Interstate Pollution Transport Reduction
- Portable Fuel Containers

- Consumer Products
- Architectural and Industrial Maintenance coatings
- Federal Motor Vehicle Control Programs (light-duty and heavy-duty)
- Visual inspection of pollution control components in annual vehicle safety inspection
- Cleaner gasoline (federal program)
- Cleaner highway diesel (federal program)
- Cleaner nonroad diesel (federal program)
- Pennsylvania Clean Vehicle Program
- Pennsylvania Heavy-Duty Diesel Emissions Control Program
- Federal programs for nonroad engines

The Department has provided assurances that it will continue to operate the ambient air quality monitoring network in the Commonwealth 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 should violations of the NAAQS occur.

Requirements for a public comment process are set forth in Section 110(a)(2) of the CAA and 40 CFR Section 51.102(d). The Department will hold a public hearing to receive comments on the proposals on November 13, 2007. The comment period will end on November 16, 2007.

SECTION 2

AIR QUALITY INFORMATION

Lawrence County was designated as an unclassifiable/attainment area based on air-quality monitoring data for 2001, 2002 and 2003. The most current design value for Lawrence County based on data from 2004, 2005, and 2006 is 71 parts per billion (ppb). A design value below 85 ppb is considered to be attainment. Concentrations are expected to remain below this level over the next decade.

The ambient air-quality analysis is based on ozone data measured at site number 42-073-0015 in Lawrence County. The ambient air-quality data analysis for ozone was completed using the appropriate regulations and guidance documents. Monitoring procedures were determined in accordance with 40 CFR, Part 58. Eight-hour ozone design values were calculated in accordance with EPA's *Guideline on Data Handling Conventions for the Eight-Hour Ozone NAAQS* (1998).

This is the only monitor located in Lawrence County. The monitor has been operated continuously since 1974. Table 1-1 lists Lawrence County's eight-hour ozone design values from 1997 through 2006. Design values have fallen significantly over this time period.

Table 2-1
Lawrence County: New Castle Monitor
Eight-Hour Ozone Statistics

Year	% VALID DAYS	DESIGN VALUE	4TH HIGH (PPM)	EXCEEDANCE DAYS
1997	98.6%	0.084	0.086	4
1998	97.2%	0.082	0.077	2
1999	98.6%	0.083	0.088	5
2000	99.1%	0.078	0.069	0
2001	98.1%	0.078	0.078	1
2002	99.1%	0.078	0.087	6
2003	99.5%	0.08	0.077	2
2004	99.1%	0.077	0.068	0
2005	99.1%	0.073	0.075	1
2006	98.1%	0.071	0.07	0

SECTION 3

BASE YEAR (2002) AND PROJECTED INVENTORIES

Information on the manmade sources of ozone precursors, VOC and NO_x, 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.

Note that totals in the tables below may not add exactly because of rounding. See Appendices for additional information.

A. BASE YEAR (2002) EMISSION INVENTORY

An emissions inventory for the base year, 2002, was developed for ozone precursors in accordance with EPA guidance.

Table 3-1
2002 EMISSIONS
TONS PER SUMMER DAY

Major Source Category	VOC	NO_x
Stationary Point Sources	1.07	21.47
Stationary Area Sources	4.61	0.55
Highway Vehicles	4.51	7.78
Nonroad Sources	1.85	2.98
TOTAL	12.04	32.78

Stationary Point Sources. The Department requires owners and operators of larger facilities to submit production figures and emission calculations annually. Throughput data are multiplied by emission factors from the Factor Information Retrieval (FIRE) Data System and EPA's publication series AP-42 and are based on Source Classification Codes (SCC). Each process has at least one assigned SCC code. 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. The Department 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.

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. 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 Lawrence County where appropriate.

Nonroad Sources. The 2002 emissions for the majority of nonroad emission source categories were estimated using the EPA NONROAD2005 model. The NONROAD model estimates emissions for diesel, gasoline, liquefied petroleum gasoline, and compressed natural gas-fueled nonroad equipment types and includes growth factors. NONROAD 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. There are no commercial aircraft operations in Lawrence County. For 2002 aircraft emissions, the Department estimated emissions using small airport operation statistics from www.airnav.com, and emission factors and operational characteristics in the EPA-approved model, Emissions and Dispersion Modeling System (EDMS).

Annual emissions information and information for carbon monoxide for the 2002 base year are included in the appendices for each sector.

B. PROJECTED INVENTORIES

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 projected emissions during the 10-year maintenance period are no more than those for the base year.

Emission estimates for 2009 and 2018 have been developed for this purpose. Because the maintenance year for the nonattainment areas in Pennsylvania is 2018, that year is included in the maintenance plan for Lawrence County. 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 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. The Technical Appendices contain more detailed information for each sector. The following provides an overview of the emission estimation techniques for stationary, area, highway vehicle and nonroad emission sources.

1. Growth Methodology

Stationary Point Sources. The methodology for projecting stationary point sources is the same as the methodology described below for stationary area sources. Additional information about these projected methodologies can also be found in the Technical Appendices. Projections were made from 2002 emissions.

There is one variation from Appendix E, however. Appendix E used EPA's IPM modeling to predict the results of the federal CAIR regulation at electric generating units (EGUs). However, the Department has decided to project future EGU emissions by using a growth factor from the Economic Growth Analysis System (EGAS). This projection methodology is consistent with the approach used for other stationary sources in the plan and is presented in Section 2 of Appendix E. The Department has determined that while EGAS predicts higher overall NO_x emissions than IPM, that it is the best estimate of future emission levels for the subject EGUs.

Stationary Area Sources. Area sources were projected from the 2002 inventory. The factors used for the temporal allocation of projections 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 files¹. A temporal allocation was then performed to generate tons per summer day². Area source temporal cross-reference codes

1 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>.

2 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.

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).

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 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.

$$Emissions_{Projected} = Emissions_{Baseline} \times Growth\ Factor_{year}$$

MARAMA also supplied tables of control factors, rule effectiveness factors, and rule penetration 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.

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

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, the Department 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 Department's 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. Lawrence County projected 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 Lawrence County where appropriate.

**Table 3-2
VMT and Emissions**

YEAR	VMT
2002	2,394,250
2009	2,489,035
2018	2,637,680

Nonroad Sources. The projected emissions for the majority of nonroad emission source categories were estimated using the EPA NONROAD2005 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 locomotive emissions, the Department projected emissions from a 1999 survey using national fuel consumption information and EPA emission and conversion factors.

There are no commercial aircraft operations in Lawrence County. For aircraft emissions, the Department estimated emissions using small airport operation statistics from www.airnav.com, and emission factors and operational characteristics in the EPA-approved model, Emissions and Dispersion Modeling System (EDMS). Growth was calculated using estimates of small airport activity from the Federal Aviation Administration (FAA)’s APO terminal area forecast detailed report.

2. Projected Emissions

Detailed information on emissions in each source category is contained in the Technical Appendices to the plan.

Table 3-3
VOC Emissions Summary: 2002, 2009 and 2018
(tons per summer day)

Major Source Category	2002	2009	2018
Stationary Point Sources	1.07	0.91	1.09
Stationary Area Sources	4.61	4.31	4.58
Highway Vehicles	4.51	2.39	1.35
Nonroad Sources	1.85	1.75	1.38
TOTAL	12.04	9.36	8.40

Table 3-4
NO_x Emissions Summary: 2002, 2009 and 2018
(tons per summer day)

Major Source Category	2002	2009	2018
Stationary Point Sources	21.47	15.24	18.10
Stationary Area Sources	0.55	0.59	0.61
Highway Vehicles	7.78	4.09	1.73
Nonroad Sources	2.98	2.32	1.69
TOTAL	32.78	22.24	22.13

SECTION 4

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.

A. Stationary Point Sources

Clean Air Interstate Rule (CAIR) -- The federal CAIR regulations (70 *FR* 25162, May 12, 2005) will transition from the NO_x SIP Call electric generating unit regulations in 2009 and continue to ensure that large electric generation facilities upwind of the area will maintain background emissions at or below 2002 levels while any new facilities locating within the area will be required to obtain both offsets and 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 requirements of the CAIR or an equivalent program. On April 28, 2006, EPA promulgated Federal Implementation Plans (FIPs) to reduce the interstate transport of NO_x and sulfur dioxides that contribute significantly to nonattainment and interferes with maintenance of the 8-hour ozone and PM_{2.5} NAAQS. The EGUs in the CAIR-covered States will be regulated under the FIPs until EPA approves revisions to SIPs for the implementation of the CAIR requirements. See 71 *FR* 25328 (April, 28, 2006). As discussed earlier, the Department has decided to project future EGU emissions by using growth factors from the Economic Growth Analysis System (EGAS).

Interstate Pollution Transport Reduction -- In response to the Federal NO_x SIP call rule, Pennsylvania and other covered states adopted NO_x 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.

B. 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 ozone SIP determinations 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 rule 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 program is contained in *25 Pa. Code* Chapter 130, Subchapter B. It 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 (AIM) 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, Subpart 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).

C. Highway Vehicle Sources

Even with increases in VMT that occur from 2002 through 2018, highway vehicle emissions of both VOC and NO_x 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) and Pennsylvania Clean Vehicle Program for passenger vehicles and light-duty trucks and cleaner gasoline. Tier 1 tailpipe

standards established by the CAA Amendments of 1990 include NO_x and VOC limits for light-duty gasoline vehicles (LDGVs) and light-duty gasoline trucks (LDGTs). These standards began to be phased in starting with model year 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 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 National Low Emission Vehicle (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 Emissions 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 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 MY 2004. In order to participate in NLEV, Pennsylvania had been 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.

Pennsylvania amended the former New Motor Vehicle Control Program (which included the Pennsylvania Clean Vehicles Program) in 2006. The Clean Vehicles Program continues to incorporate the California Low Emission Vehicle Program (CA LEV II) by reference. As amended, the program affects MY 2008 and newer passenger cars and light-duty trucks vehicles less than 8,500 lbs gross vehicle weight rating. 36 *Pa B.* 7424 (December 9, 2006).

Emissions for 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 E. 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 MY 2004. In addition,

consent decrees with seven of the largest 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 MY 2002. The Department 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 MY 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 decrees discussed above and the implementation of more stringent federal standards affecting MY 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 MY 2005 and 2006 highway engines.

EPA adopted new emission standards for heavy-duty engines and vehicles for MY 2007 and subsequent. For diesel engines, the standards will be phased in from 2007 to 2010 for NO_x and VOCs. For gasoline engines, the standards will be phased in during MYs 2008 and 2009. Federal and California standards are virtually identical for MY 2007. For MY 2008, California adopted requirements for anti-idling engine programming which will be required in Pennsylvania by virtue of Pennsylvania's incorporation by reference. However, there is no EPA-approved methodology to estimate emission reductions from this requirement. Therefore, the emission estimates use assumptions from the federal rule for these years.

Because the new engine standards are adversely affected by sulfur in fuel, EPA also required most highway diesel fuel to contain no more than 15 parts per million (ppm) of sulfur, as of the fall of 2006. 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. The Department uses MOBILE defaults to estimate the effects of the phase-in provision.

Changes to Vehicle Safety Inspection Program. In November 2003, PennDOT amended its vehicle safety inspection program to include a visual inspection of certain pollution control components in the 42 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).

D. 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 an advance notice of proposed rulemaking

indicating their consideration of 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.

SECTION 5

AMBIENT AIR QUALITY MONITORING NETWORK

The Department will continue to operate the air monitoring network in the Commonwealth 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.

SECTION 6

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 CFR 51 Subpart A) for any unanticipated increases. Based on these evaluations, the Department will consider whether any further emission control measures should be implemented.

SECTION 7

CONTINGENCY MEASURES

Contingency measures would be considered if for two consecutive years the fourth highest eight-hour ozone concentrations are above 84 ppb. If this trigger point occurs, the Department will evaluate whether additional local emission control measures should be implemented in Lawrence County 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 will include, but not be limited to:

Non-regulatory measures:

- 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.
- 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 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.

- Additional controls on consumer products
- Additional controls on portable fuel containers

In the event that additional emission reductions are necessary, the Department will propose and adopt 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 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:

- transportation projects, federal Congestion Mitigation and Air Quality funds from the Federal Highway Administration, as allocated to the Northern Tier RPO. Discussions will be held with PENNDOT and the Northern Tier RPO 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 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 committees³ as appropriate.

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

³ Other committees could include the Small Business Compliance Advisory Committee and Agriculture Advisory Committee.

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*.

**Lawrence County Attainment Area
Eight-Hour Ozone Maintenance Plan**

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