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pennsylvania

DEPARTMENT OF ENVIRONMENTAL
PROTECTION

PROPOSED

VOLUME II: Technical Support Document
**State Implementation Plan Revision: NO_x Motor
Vehicle Emission Budget Revisions Based on the
MOVES2010a Model**

**Allentown-Bethlehem-Easton (ABE)
1997 Eight-Hour Ozone Maintenance Area**

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Introduction

This Technical Support Document, prepared by the Pennsylvania Department of Environmental Protection (Department), provides detailed information on the categories of point, area, nonroad, and highway sources of oxides of nitrogen (NO_x) emission estimates and assumptions. Certain data shown in this document were used in the *State Implementation Plan Revision: Maintenance Plan and Base Year Inventory – Allentown-Bethlehem-Easton (ABE) Eight-Hour Ozone Nonattainment Area*, which is hereafter referred to as the ABE Ozone Maintenance Plan. Other data and assumptions outlined in the Technical Support Document are used in this proposed State Implementation Plan (SIP) revision to the ABE Ozone Maintenance Plan, entitled, *State Implementation Plan Revision: NO_x Motor Vehicle Emission Budget Revisions Based on the MOVES2010a Model Allentown-Bethlehem-Easton (ABE) 1997 Eight-Hour Ozone Maintenance Area*, hereafter referred to as the proposed SIP revision. The proposed SIP revision demonstrates that replacing highway emissions estimates using the MOVES2010 model instead of using the MOBILE6.2 model to generate highway emissions estimates will not cause emissions from all sources in the maintenance year to exceed all emissions in the attainment year. This Technical Support Document will describe how emission estimates and emission growth rates that were used in both the ABE Ozone Maintenance Plan and this proposed SIP revision were developed for all source categories (point, area, nonroad, and highway).

Point Source Category Emissions

Point sources include emissions from large commercial, institutional, and industrial facilities such as chemical manufacturing facilities, large waste disposal sites, and large heating and electric generating units (EGUs). Emission projections used in the ABE Ozone Maintenance Plan were prepared for the point source sector for 11 states, including Pennsylvania, and the District of Columbia, for the Mid-Atlantic Regional Air Management Association (MARAMA) by MACTEC Federal Programs, Inc. Future year projections were developed by MACTEC so that states could use the projections as inventories in their SIP revisions. Estimates were prepared for years 2009 and 2018, and took into consideration both growth in economic activity and additional controls.

For the purpose of projecting emissions into the future for all of the states' ozone maintenance plans, the point source inventory of emissions is divided into two subsectors – the EGU sector and the non-EGU sector. Different projection methods are used for those two sectors. The ABE Area has six EGU emission sources and many non-EGU point sources. For the non-EGU point source sector, growth factors were developed by using the U.S. Environmental Protection Agency's (EPA) Economic Growth Analysis System (EGAS) Version 5.0. The U.S. Department of Energy fuel consumption forecasts were used to replace default values for combustion sources in EGAS 5.0. Also, state-supplied population, employment, and other emission projection data were used if either EGAS 5.0 values did not exist or if the state-supplied data was deemed better than default values given by EGAS 5.0.

Point Source Category 2009 Emissions

Table 1 provides totals of NO_x emissions for both 2009 projected point source emissions in the ABE Ozone Maintenance Plan and the actual 2009 ABE Area point source emissions reported to the Department by the point source operators after the ABE Ozone Maintenance Plan was developed.¹ Table 1 demonstrates that point source emissions in the ABE Ozone Maintenance Plan for 2009 were overestimated for NO_x. Table 2 lists the actual 2009 NO_x emissions from the individual facilities in the ABE Area. The annual emissions were divided by 365 days in a year to obtain daily emissions.

Actual Emissions for 2009

Table 1: Point Source Emissions for 2009 - SIP Estimated versus Actual

Emissions for 2009	NO_x (tons/day)
Emissions in Maintenance Plan	58.3
Actual Emissions (actual reported annual emissions in Table 2 divided by 365 days)	27.0

Table 2: Actual 2009 Annual NO_x Point Source Inventory for the ABE Ozone Maintenance Area by Facility Source

EPA AFS Number	Facility Name	NO_x (tons/year)
420250001	ALTADIS USA INC/MCADOO PLT	42.6
420250013	HORSEHEAD CORP/PALMERTON	117.4
420250023	PANTHER CREEK PARTNERS/NESQUEHONING PLT	531.4
420770003	GEO SPECIALTY CHEM/TRIMET PROD GROUP	31.0
420770011	PA DPW/ALLENTOWN STATE HOSP	21.5
420770019	LAFARGE CORP/WHITEHALL PLT	496.4
420770035	NESTLE PURINA/PETCARE PLT	7.7

¹ Air Information Management System Submittal, Pennsylvania Department of Environmental Protection, 2009

EPA AFS Number	Facility Name	NO_x (tons/year)
420770052	SAMUEL ADAMS PA BREWERY CO/BREINIGSVILLE	13.9
420770065	KRAFT FOODS NORTH AMER INC/ALLENTOWN	8.5
420770208	MUHLENBERG COLL/PHYSICAL PLT	6.3
420770562	ST LUKES HOSP/MAIN BOILER PLT	7.0
420770565	LEHIGH VALLEY HOSP/17TH & CHEW STS	35.4
420770589	AIR PROD & CHEM INC/TREXLERTOWN PLT	10.2
420770590	HAMILTON TEK PARTNERS/BREINIGSVILLE PLT	6.7
420770671	LEHIGH VALLEY HOSP/S CEDAR CREST	11.7
420950006	HERCULES CEMENT CO LP/STOCKERTOWN	1,557.0
420950010	PPL MARTINS CREEK LLC/MARTINS CREEK	814.7
420950011	GENON REMA LLC/PORTLAND GENERATING STA	3,070.0
420950012	KEYSTONE PORTLAND CEMENT/EAST ALLEN	856.1
420950020	LAFAYETTE COLLEGE/EASTON	6.5
420950035	ROCKWOOD PIGMENTS/EASTON	12.0
420950045	ESSROC/NAZARETH LOWER CEMENT PLT 1	1,564.4
420950057	LEHIGH UNIV/PACKER & MOUNTAINTOP CAMPUSES	15.9
420950110	LEHIGH HEAVY FORGE CORP/BETHLEHEM	31.3
420950232	IESI PA BETHLEHEM LD/BETHLEHEM FACILITY	7.4
420950254	CONECTIV BETHLEHEM LLC/BETHLEHEM	42.2
420950255	GREEN KNIGHT/PLAINFIELD LANDFILL GAS	45.3
420950256	LOWER MT BETHEL ENERGY LLC/BANGOR	83.6
420950536	NORTHAMPTON GEN CO/NORTHAMPTON	389.5
420950568	NORTHAMPTON CNTY/GRACEDALE CNTY HOME BOILER PLT	7.0
420950930	CHRIN BROS SANI LDFL/CHRIN LDFL	15.9
	POINT SOURCE TOTAL	9,866.1

Point Source Category 2018 Emissions

Ideally, emissions growth could be compared between what was assumed in the ABE Ozone Maintenance Plan and recently revised assumptions for emissions growth. Both sets of assumptions are valid because the EPA requires that assumptions in growth be updated with each revision to the maintenance plan. If the revised assumptions for growth are less than those assumed in the ABE Ozone Maintenance Plan, then it can be easily shown that emissions in the maintenance years are still below the emissions in the attainment year. However, when revised growth in some types of point sources is higher, and in some types, the growth is lower, emissions growth cannot be compared to show the new assumptions still maintain the ozone standard. In that situation, a projected emissions inventory needs to be developed and compared. For the ABE Area, a projected inventory for the maintenance year 2018 needed to be developed to show maintenance with the standard.

The 2018 point source inventory for the ABE Ozone Maintenance Plan was developed for MARAMA by MACTEC. More recently, an emissions inventory of all emission source categories (point, area, nonroad, and highway) was developed by MARAMA and MACTEC for a regional modeling effort. Table 3 and Table 4 compare total emissions of NO_x produced by point sources in the ABE Area with the recently developed inventories. During the last year, MARAMA developed inventories for the baseline year of 2007 and projected years of 2013, 2017, 2020, and 2025.² The difference in the inventory years for the inventory used in the ABE Ozone Maintenance Plan and new MARAMA/MACTEC inventory development efforts did not allow for easy comparison of growth factors used for projecting emissions. Projected emissions in 2018 were estimated for this proposed SIP revision using straight-line interpolation between the 2007 MARAMA baseline inventory and the 2020 MARAMA projected year inventory using the following equation:

$$\mathbf{2018\ Emissions = 2007\ Emissions + ((2020\ Emissions - 2007\ Emissions) * (2018 - 2007) \div (2020 - 2007))}$$

Emission projections of point sources in the ABE Ozone Maintenance Plan were overestimated for the year 2018 when compared to newer emissions data derived by MARAMA. See Tables 3 and 4.

Table 3: ABE Ozone Maintenance Plan – Emission Estimates for 2018

Year	NO_x Emissions (tons/year)	NO_x Emissions (tons/day)
2018	24,771	66.6

² MARAMA 2007, 2017, and 2020 Baseline and Projected Inventories, Version 3, Julie McDill, Mid-Atlantic Regional Management Association, Towson, MD, January 2012.

Table 4: Proposed SIP Revision – Revised Emissions Estimates of Point Sources for 2018 (MARAMA 2007 Baseline and 2020 Projected Inventories)

Year	NO_x Emissions (tons/year)	NO_x Emissions (tons/day)
2007 (Baseline)	14,432.7	39.5
2020 (Projected)	8,621.1	23.6
2018 (Interpolated)	9,515.2	26.1

Table 5 shows actual 2007 and projected 2020 facility emissions of NO_x for point sources in the ABE Area.

Table 5: MARAMA 2007 Annual Baseline and 2020 Projected NO_x Point Source Inventories for the ABE Ozone Maintenance Area by Facility Source

EPA AFS Number	Facility Name	2007 Baseline NO_x Emissions (tons/year)	2020 Projected NO_x Emissions (tons/year)
420250001	ALTADIS USA INC/MCADOO PLT	42.3	38.9
420250013	HORSEHEAD CORP/PALMERTON	134.3	136.2
420250023	PANTHER CREEK PARTNERS/NESQUEHONING PLT	509.6	647.3
420770003	GEO SPECIALTY CHEM/TRIMET PROD GROUP	47.3	25.1
420770011	PA DPW/ALLENTOWN STATE HOSP	17.0	24.1
420770019	LAFARGE CORP/WHITEHALL PLT	753.4	346.0
420770035	NESTLE PURINA/PETCARE PLT	7.5	10.6
420770052	SAMUEL ADAMS PA BREWERY CO/BREINIGSVILLE	7.4	9.4
420770065	KRAFT FOODS NORTH AMER INC/ALLENTOWN	9.8	13.9
420770208	MUHLENBERG COLL/PHYSICAL PLT	6.4	9.1
420770562	ST LUKES HOSP/MAIN BOILER PLT	12.3	17.5
420770565	LEHIGH VALLEY HOSP/17TH & CHEW STS	4.4	6.2

EPA AFS Number	Facility Name	2007 Baseline NO_x Emissions (tons/year)	2020 Projected NO_x Emissions (tons/year)
420770589	AIR PROD & CHEM INC/TREXLERTOWN PLT	11.5	11.7
420770590	HAMILTON TEK PARTNERS/BREINIGSVILLE PLT	4.8	6.8
420770671	LEHIGH VALLEY HOSP/S CEDAR CREST	10.9	15.5
420950006	HERCULES CEMENT CO LP/STOCKERTOWN	1,877.2	366.4
420950010	PPL MARTINS CREEK LLC/MARTINS CREEK	3,677.4	1,858.1
420950011	GENON REMA LLC/PORTLAND GENERATING STA	3,643.9	3,359.6
420950012	KEYSTONE PORTLAND CEMENT/EAST ALLEN	946.0	412.8
420950020	LAFAYETTE COLLEGE/EASTON	18.0	19.6
420950035	ROCKWOOD PIGMENTS/EASTON	21.5	20.7
420950045	ESSROC/NAZARETH LOWER CEMENT PLT 1	1,951.4	580.0
420950057	LEHIGH UNIV/PACKER & MOUNTAINTOP CAMPUSES	37.0	20.1
420950110	LEHIGH HEAVY FORGE CORP/BETHLEHEM	39.4	29.9
420950232	IESI PA BETHLEHEM LD/BETHLEHEM FACILITY	55.1	58.2
420950254	CONECTIV BETHLEHEM LLC/BETHLEHEM	70.1	113.9
420950255	GREEN KNIGHT/PLAINFIELD LANDFILL GAS	52.1	26.1
420950256	LOWER MT BETHEL ENERGY LLC/BANGOR	61.2	61.2
420950536	NORTHAMPTON GEN CO/NORTHAMPTON	384.3	356.4
420950568	NORTHAMPTON CNTY/GRACEDALE CNTY HOME BOILER PLT	7.5	7.5
420950930	CHRIN BROS SANI LDFL/CHRIN LDFL	11.7	12.3
	TOTALS	14,432.7	8,621.1

Area Source Category Emissions

The area source category includes emissions from sources such as surface coating, solvent use, residential and commercial heating, and other sources that emit small amounts of emissions on a per use basis but have a large number of users. The ABE Ozone Maintenance Plan relied on a number of socioeconomic indicators to estimate emissions, and projections of emissions, such as: population, industrial employment, employment, and industry specific growth factors. In the ABE Ozone Maintenance Plan, a baseline area source inventory of 2002 was grown using socioeconomic factors of expected population and employment growth. For some sources, such as coal-, distillate-, or natural gas-fired boilers, data from the 2005 Annual Energy Outlook or the EGAS model was used to predict future growth and emissions. For other area source categories, state-specific industry growth estimates supplied by the Department were used.

Area Source Category 2009 Emissions

Table 6 shows a recent estimate of actual socioeconomic indicators. Actual growth that occurred from 2002 to 2009 was derived from data published by the U.S. Department of Commerce, Bureau of Census^{3,4,5} and the Energy Information Administration, U.S. Department of Energy⁶. The actual growth is compared side-by-side with the predicted growth from the ABE Ozone Maintenance Plan. The ABE Ozone Maintenance Plan over-predicted growth for most area sources for the 2002 to 2009 timeframe. In two categories in the maintenance plan, actual growth was slightly higher than predicted growth: population and natural gas consumption in boilers.

³ U.S. Department of Commerce, Bureau of the Census, "Population Estimates Program," T1. Population Estimates Data Set: 2008 Population Estimates, available from <http://www.census.gov/popest/counties/CO-EST2009-01.html>, accessed October 2011.

⁴ U.S. Department of Commerce, Bureau of the Census, Housing Unit Estimates, Data Set 2002 and 2009 Population Estimates, Note: For information on errors stemming from model error, sampling error, and non-sampling error, see: <http://www.census.gov/popest/topics/methodology>, accessed October 2011.

⁵ Employee and establishment numbers: U.S. Census Bureau, County Business Patterns, <http://factfinder.census.gov/econ/cbp/index.html>

⁶ Energy Information Administration, U.S. Department of Energy, State Energy Data System - Consumption, Physical Units, 1960-2006, available from: http://www.eia.gov/state/seds/seds-states.cfm?q_state_a=PA&q_state=Pennsylvania

Table 6: Revised Socioeconomic Data for the ABE Ozone Maintenance Area Relative to Projected Growth in the ABE Area Maintenance Plan (2002-2009)

Surrogate Indicator for Growth	Actual Use 2002	Actual Use 2009	Actual Growth 2002-2009	Maintenance Plan Growth (2002-2009)
Population	649,366	706,374	1.0878	1.0490
Total Employees	256,524	259,135	1.0102	1.0256
Total Coal Consumption (Short Tons)	483,144	320,624	0.6636	1.0481
Total Natural Gas Consumption (Million Cubic Ft.)	28,158	30,663	1.0890	1.0106
Natural Gas Boilers	-----	-----	-----	1.0106
Natural Gas, Residential	-----	-----	-----	1.0841
Total Heating Oil Consumption (Barrels)	3,065,516	3,055,657	0.9968	1.0731

Area Source Category 2018 Emissions

The ABE Ozone Maintenance Plan estimated area source sector growth using a baseline inventory from 2002 and growing emissions to the maintenance years of 2009 and 2018, based on the growth of socioeconomic activity.⁷ Data used to revise growth estimates in this proposed SIP revision was obtained from the same MARAMA inventory effort described in the point source section above. The MARAMA effort used a baseline inventory of 2007 and maintenance year inventories of 2017, 2020, and 2025.⁸ Just as in the point source emissions, these inventory years made a direct comparison of emissions and growth rates difficult because the MARAMA baseline years and projected inventory years were too dissimilar from what was included in the ABE Ozone Maintenance Plan. Therefore, projected emissions growth between 2009 and 2018 in this proposed SIP revision was determined through linear interpolation by using emission estimates for 2007 and 2020 from the new MARAMA inventory. Projected growth between 2009 and 2018 in the ABE Ozone Maintenance Plan was estimated using the 2009 and 2018 emission estimates. The revised growth projections for this proposed SIP revision are set forth in Table 7.

⁷ State Implementation Plan Revision: Maintenance Plan and Base Year Inventory Lancaster Eight-Hour Ozone Nonattainment Area, September 2006, Appendix B-1, Area Source Methodology, p.2.

⁸ Mid-Atlantic Regional Air Management Association (MARAMA), Technical Support Document for the Development of the 2017/2020 Emissions Inventories for Regional Air Quality Modeling in the Northeast/Mid-Atlantic Region, Version 3.3, January 23, 2012, MARAMA Contract Agreement FY2011-004

The growth rate predicted in the ABE Ozone Maintenance Plan from 2009 to 2018 is derived by the following formula:

$$\text{Growth Factor}_{(2009-2018)} = \frac{((\text{Growth Factor}_{(2002-2018)} - \text{Growth Factor}_{(2002-2009)})}{\div \text{Growth Factor}_{(2002-2009)} + 1}$$

A straight line interpolation between the 2007 MARAMA baseline emissions and the 2020 MARAMA projected emissions was used to calculate emissions for the years 2009 and 2018. From these interpolated emissions (see equations 1 and 2 below), the projected growth between 2009 and 2018 was calculated (see equation 3 below). Fossil fuel combustion surrogates in Table 7 represent most emissions of NO_x, while “population” and “employees” represent the best surrogates for many source categories that produce VOC emissions. The surrogates for growth shown in Table 7 are used to predict revised growth for a large majority of emissions from area source categories in this proposed SIP revision.

$$(1) \text{ 2009 Emissions} = \text{2007 Emissions} + (\text{2020 Emissions} - \text{2007 Emissions}) * ((\text{2009} - \text{2007}) \div (\text{2020} - \text{2007}))$$

$$(2) \text{ 2018 Emissions} = \text{2007 Emissions} + (\text{2020 Emissions} - \text{2007 Emissions}) * ((\text{2018} - \text{2007}) \div (\text{2020} - \text{2007}))$$

$$(3) \text{ Emissions Growth}_{(2009-2018)} = \frac{((\text{2018 Emission} - \text{2009 Emissions})}{\div \text{2009 Emissions}) + 1}$$

Table 7: Revised Socioeconomic Data for the ABE Ozone Maintenance Area Relative to the Projected Growth in the ABE Area Maintenance Plan (2009-2018)

Indicator for Growth	Revised Growth In MARAMA Inventory (2009-2018)	Maintenance Plan Growth (2009-2018)
Population	1.0373	1.0595
Employees	1.0319	1.0335
Anthracite Coal, Industrial	0.9136	0.9983
Anthracite Coal, Commercial	0.0000	0.9865
All Combuster Types, Distillate Oil, Residential	0.8226	0.9598

Indicator for Growth	Revised Growth In MARAMA Inventory (2009-2018)	Maintenance Plan Growth (2009-2018)
Boilers and Internal Combustion Engines, Natural Gas, Commercial	1.0687	1.0521
Combuster Types, Natural Gas, Residential	1.0188	1.0181

Table 7 shows that, for the most part, growth in the ABE Ozone Maintenance Plan is comparable to new assumptions developed by the MARAMA inventory effort. It deserves mentioning that the two sets of employee growth that are compared in Table 7 were estimated using two different methods. The MARAMA inventory estimated growth in employment based on statewide North American Industry Classification System (NAICS) codes. The NAICS codes proved too cumbersome to establish employment growth on the county level. Employment growth in Table 7 was derived from U.S Census Bureau industrial employment data and was not developed by MARAMA. It is safe to assume that, due to the severe economic downturn experienced from 2007 to 2009, employee growth does not approach what was predicted in the ABE Ozone Maintenance Plan. Emissions of NO_x from area sources are dominated by fossil fuel combustion. While two categories, commercial natural gas consumption and residential natural gas consumption, show that the maintenance plan predicts less fossil fuel growth than current growth assumptions in the MARAMA inventory, the difference in these two categories is small enough to demonstrate that the emissions growth for 2018 is over-predicted in the maintenance plan. In Table 7, the growth rate for the Commercial Anthracite Coal category is listed as zero. This reflects an error in the ABE Ozone Maintenance Plan where this category was counted in both the area and point source inventories. When actual emissions for 2009 were reviewed, the area source value became zero after subtracting out point sources using EPA's inventory development methodology.

Nonroad Source Category Emissions

Emissions from the nonroad category are produced by many different types of vehicles and equipment. The EPA's NONROAD Model estimates emissions for over 200 types of equipment, engines and vehicles. Nonroad engines and vehicles can be used for such applications as construction, lawn and garden care, farming, and commercial and industrial applications. In addition, emissions from three types of activities (aircraft, locomotives, and commercial marine vessels) are not estimated in the NONROAD Model but are still included in the nonroad category. The aircraft, rail, and commercial marine emissions are estimated outside of the NONROAD model. In the approved ABE Ozone Maintenance Plan, the NONROAD2005 model was used to estimate nonroad emissions. The model went through one major revision since it was used for the maintenance plan. NONROAD2008a is the latest version of this model.

This new version of the model incorporated two reduction strategies that affect engines and vehicles in the nonroad sector:

- Diesel recreational marine standards in the 2008 final rule on locomotive and marine engines (73 FR 25098); and
- The October 2008 small spark ignition and spark ignition and recreational marine rule (73 FR 59034).

For the ABE Ozone Maintenance Plan, the Department modified files in the NONROAD Model, when state specific data was available for emission categories such as residential lawn and garden.

Emissions from nonroad sources have decreased since the submittal of the ABE Ozone Maintenance Plan, as a result of the additional controls mentioned in the bullet points above and other controls that have been phased in with fleet turnover since 2004. The fleet turnover that occurs as older, more polluting nonroad equipment and vehicles are replaced by newer equipment and vehicles that meet more stringent emission standards has continued to lower emissions in the nonroad sector since the late 1990s and will continue to do so for the next 10 years. Emission reductions occurred across all segments of the nonroad category, including construction equipment, farming equipment, locomotives, and lawn and garden equipment. Modeling runs were not completed for the nonroad emission source categories. The Department will treat nonroad emissions in the ABE Area as non-changing from their 2004 levels for the purpose of this proposed SIP revision, even though full scale modeling runs using the NONROAD2008a would show nonroad emissions in a decline.

Highway Source Category Emissions

Highway emissions were estimated by Michael Baker, Jr., Inc., a consultant to the Pennsylvania Department of Transportation. The methodology for estimating emissions of highway vehicles is greatly different than what was used in the ABE Ozone Maintenance Plan because an entirely new highway emissions model is being used. Highway emissions are being estimated using the MOVES2010 model instead of the MOBILE6.2 model. With this change, a new set of inputs was used in the MOVES2010 model. The method for forecasting traffic growth or vehicle miles travelled remains the same as what was used in the ABE Ozone Maintenance Plan. Both this proposed SIP revision and the ABE Ozone Maintenance Plan used the *Statistical Evaluation of Projected Traffic Growth*.⁹ Revisions to Appendix C, entitled *Appendix C, Maintenance Plan Update for the Allentown-Bethlehem-Easton 1997 Eight-Hour Ozone Maintenance Area: Motor Vehicle Emission Budget Revisions Using MOVES2010a*, is attached. Appendix C of this proposed SIP revision replaces Appendix C in the ABE Ozone Maintenance Plan in its entirety. Appendix C of this proposed SIP revision combines sections C3 and C4, and deletes section C5

⁹ Statistical Evaluation of Projected Traffic Growth: Transportation Research, Education, and Technology Transfer ITQ, Contract Purchase Order No. 030219, Task 5, Final Report; March 14, 2005; Michael Baker Jr. Inc.

of Appendix C in the ABE Ozone Maintenance Plan. Included in the revised Appendix C is Appendix C-1, Mobile Source Highway Emissions Inventory – An Explanation of Methodology.

The MOVES2010 model estimates that highway vehicle emissions increase greatly for NO_x for the 2009 and 2018 maintenance years, when compared to the highway vehicle emission estimates included in the ABE Ozone Maintenance Plan for those same years (See Table 8). MOVES2010 also increases the emission estimates of the 2004 attainment year. Despite the emissions increases in the attainment and maintenance years, MOVES2010-modeled emissions of highway vehicles, like MOBILE6.2-modeled emissions of highway vehicles, still show a large decrease in emissions between 2004 and 2009 and between 2004 and 2018.

Table 8: Revised Motor Vehicle Emissions Using MOVES2010a

Pollutant	Original MOBILE6.2 Emissions (tons/summer day)			Revised MOVES2010a Emissions (tons/summer day)		
	2004	2009	2018	2004	2009	2018
NO_x	48.33	33.89	14.44	59.38	44.08	21.95
VOC	30.54	22.8	13.28	N/A*	N/A	N/A

*VOC emissions are not being revised in this SIP revision. VOC MVEBs developed using MOBILE6.2 are sufficient and will be used for transportation conformity.