APPENDIX D

EMISSIONS PROJECTIONS

Bureau of Air Quality
Department of Environmental Protection

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APPENDIX D-1

DEVELOPMENT OF EMISSION PROJECTIONS FOR 2009, 2012, AND 2018 FOR NONEGU POINT, AREA, AND NONROAD SOURCES IN THE MANE-VU REGION*

Bureau of Air Quality
Department of Environmental Protection

*Disclaimer: It is not the intention of the Pennsylvania Department of Environmental Protection for any data presented in this document specific to other states or agencies to be considered an official submission of emission information for the other states or agencies.

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Mid-Atlantic Regional Air Management Association

Development of Emission Projections For 2009, 2012, and 2018 For NonEGU Point, Area, and Nonroad Sources In the MANE-VU Region

Final Report

February, 2007









About MARAMA

The Mid-Atlantic Regional Air Management Association is an association of ten state and local air pollution control agencies. MARAMA's mission is to strengthen the skills and capabilities of member agencies and to help them work together to prevent and reduce air pollution impacts in the Mid-Atlantic Region.

MARAMA provides cost-effective approaches to regional collaboration by pooling resources to develop and analyze data, share ideas, and train staff to implement common requirements.

The following State and Local governments are MARAMA members: Delaware, the District of Columbia, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia, Philadelphia, and Allegheny County, Pennsylvania.

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About MACTEC Federal Programs, Inc.

MACTEC, Inc. is a leader in the engineering, environmental and remedial construction industries. MACTEC provides premier management, technical, and professional services to help clients successfully manage complex businesses, projects, and facilities. MACTEC Federal Programs, Inc. is a division of MACTEC that provides these same services tailored to meet the unique needs of government agencies, including state/local agencies and federal agencies.

Development of Emission Projections for 2009, 2012, and 2018 for NonEGU Point, Area, and Nonroad Sources in the MANE-VU Region

Final Technical Support Document

Prepared for:

Mid-Atlantic Regional Air Management Association (MARAMA)

Prepared by:

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February 28, 2007

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Acronyms and Abbreviations

Acronym	Description
AEO	Annual Energy Outlook
BOTW	Beyond-on-the-Way emission controls
CAIR	Clean Air Interstate Rule
EGAS 5.0	Economic Growth Analysis System Version 5.0
EGU	Electric Generating Unit
EIA	Energy Information Agency
EPA	U.S. Environmental Protection Agency
IDA	Inventory Data Analyzer (data format used by SMOKE modeling system)
IPM	Integrated Planning Model
MANE-VU	Mid-Atlantic/Northeast Visibility Union
MARAMA	Mid-Atlantic Regional Air Management Association
MOBILE6	U.S. EPA's emission model for onroad sources
NESCAUM	Northeast States for Coordinated Air Use Management
NH3	Ammonia
NIF3.0	National Emission Inventory Input Format Version 3.0
NMIM	National Mobile Inventory Model
NONROAD	U.S. EPA's emission model for certain types of nonroad equipment
NOx	Oxides of nitrogen
OTB/OTW	On-the-Books/On-the-Way
OTC	Ozone Transport Commission
PM10-PRI	Particulate matter less than or equal to 10 microns in diameter that includes both the filterable and condensable components of particulate matter
PM25-PRI	Particulate matter less than or equal to 2.5 microns in diameter that includes both the filterable and condensable components of particulate matter
SIC	Standard Industrial Classification code
SIP	State Implementation Plan
SCC	Source Classification Code
SMOKE	Sparse Matrix Operator Kernel Emissions Modeling System
SO2	Sulfur dioxide
VOC	Volatile organic compounds

1.0 EXECUTIVE SUMMARY

This report was prepared for the Mid-Atlantic Regional Air Management Association (MARAMA) as part of an effort to assist states in developing State Implementation Plans (SIPs) for ozone, fine particles, and regional haze. It describes the data sources, methods, and results for emission forecasts for three years, three emission sectors, two emission control scenarios; seven pollutants, and 11 states plus the District of Columbia. The following is a summary of the future year inventories that were developed:

- The three projection years are 2009, 2012, and 2018.
- The three source sectors are non-Electric Generating Units (non-EGUs), area sources, and nonroad mobile sources. (Note: under separate efforts, MANE-VU prepared EGU projections using the Integrated Planning Model {IPM} and onroad mobile source projections using the SMOKE emission modeling system).
- The two emission control scenarios are: a) a combined "on-the-books/on-the-way" (OTB/W) control strategy accounting for emission control regulations already in place as well as emission control regulations that are not yet finalized but are likely to achieve additional reductions by 2009; and b) a "beyond-on-the-way" (BOTW) scenarios to account for controls from potential new regulations that may be necessary to meet attainment and other regional air quality goals.
- The seven pollutants are sulfur dioxide (SO2), oxides of nitrogen (NOx), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter less than or equal to 10 microns in diameter that includes both the filterable and condensable components of particulate matter (PM10-PRI), particulate matter less than or equal to 2.5 microns in diameter that includes both the filterable and condensable components of particulate matter (PM25-PRI), and ammonia (NH3).
- The states are those that comprise the Mid-Atlantic/Northeast Visibility Union (MANE-VU) region. In addition to the District of Columbia, the 11 MANE-VU states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

The results of the emission projections are summarized in Table 1-1 and Figures 1-1 to 1-7.

Section 2 of this report describes how the nonEGU OTB/W emission projections were made. Section 3 describes the methods for the area source emission projections. Section 4 describes the methods for the nonroad section, including sources accounted for by the NONROAD model as well as aircraft, locomotives, and marine vessels. Section 5 describes the development of the BOTW emission projections.

Table 1-1 Summary of MANE-VU Area, NonEGU, and Nonroad Emission Inventory by Pollutant, Sector, and Year Annual Emissions (tons per year)

Pollutant	Sector	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CO	Area	1,326,796	1,283,959	1,283,959	1,260,627	1,260,627	1,211,727	1,211,727
	NonEGU	295,577	328,546	328,546	346,090	346,090	412,723	412,723
	Nonroad	4,553,124	4,969,925	4,969,925	5,099,538	5,099,538	5,401,353	5,401,353
		6,175,497	6,582,430	6,582,430	6,706,255	6,706,255	7,025,803	7,025,803
NH3	Area	249,795	294,934	294,934	312,419	312,419	341,746	341,746
	NonEGU	3,916	4,301	4,301	4,448	4,448	4,986	4,986
	Nonroad	287	317	317	337	337	369	369
		253,998	299,552	299,552	317,204	317,204	347,101	347,101
NOx	Area	265,400	278,038	265,925	281,659	261,057	284,535	263,030
	NonEGU	207,048	210,522	185,658	218,137	184,527	237,802	199,732
	Nonroad	431,631	354,850	354,850	321,935	321,935	271,185	271,185
		904,079	843,410	806,433	821,731	767,519	793,522	733,947
PM10	Area	1,452,309	1,527,586	1,527,586	1,556,316	1,550,400	1,614,476	1,607,602
	NonEGU	51,280	55,869	55,869	57,848	57,624	63,757	63,524
	Nonroad	40,114	34,453	34,453	32,445	32,445	27,059	27,059
		1,543,703	1,617,908	1,617,908	1,646,609	1,640,469	1,705,292	1,698,185
PM2.5	Area	332,521	340,049	340,049	341,875	336,779	345,419	339,461
	NonEGU	33,077	36,497	36,497	37,625	37,444	41,220	41,029
	Nonroad	36,084	30,791	30,791	28,922	28,922	23,938	23,938
		401,682	407,337	407,337	408,422	403,145	410,577	404,428
SO2	Area	286,921	304,018	304,018	305,339	202,058	305,437	190,431
	NonEGU	264,377	249,658	249,658	255,596	253,638	270,433	268,330
	Nonroad	57,257	15,651	15,651	8,731	8,731	8,643	8,643
		608,555	569,327	569,327	569,666	464,427	584,513	467,404
VOC	Area	1,528,269	1,398,982	1,363,278	1,382,803	1,339,851	1,387,882	1,334,039
	NonEGU	91,278	92,279	91,718	96,887	96,260	110,524	109,762
	Nonroad	572,751	460,922	460,922	424,257	424,257	380,080	380,080
		2,192,298	1,952,183	1,915,918	1,903,947	1,860,368	1,878,486	1,823,881

OTB/W – on-the-books/way scenario; BOTW – beyond-on-the-way scenario

Figure 1-1 2002 Base Year, OTB/OTW AND BOTW Annual CO Emissions (tons per year)

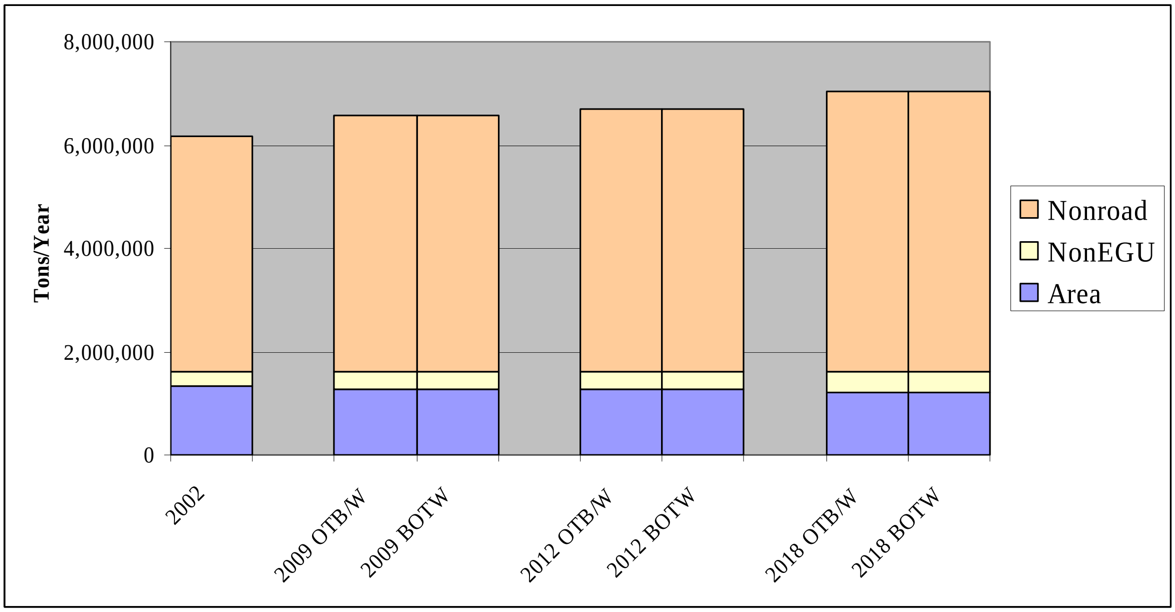


Figure 1-2 2002 Base Year, OTB/OTW AND BOTW Annual NH3 Emissions (tons per year)

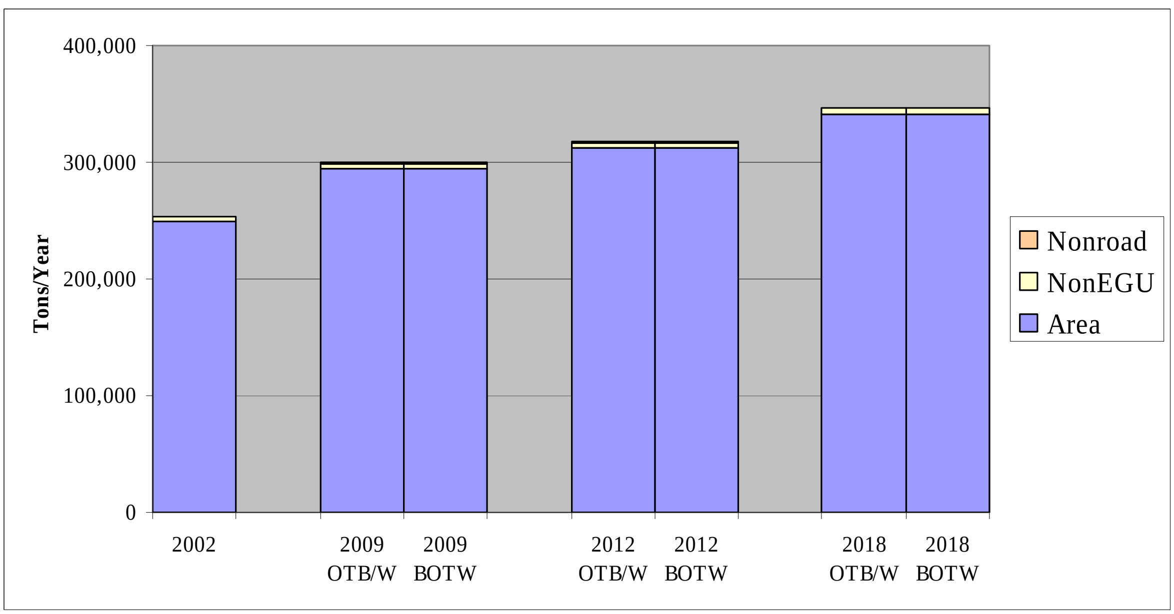


Figure 1-3 2002 Base Year, OTB/OTW AND BOTW Annual NOx Emissions (tons per year)

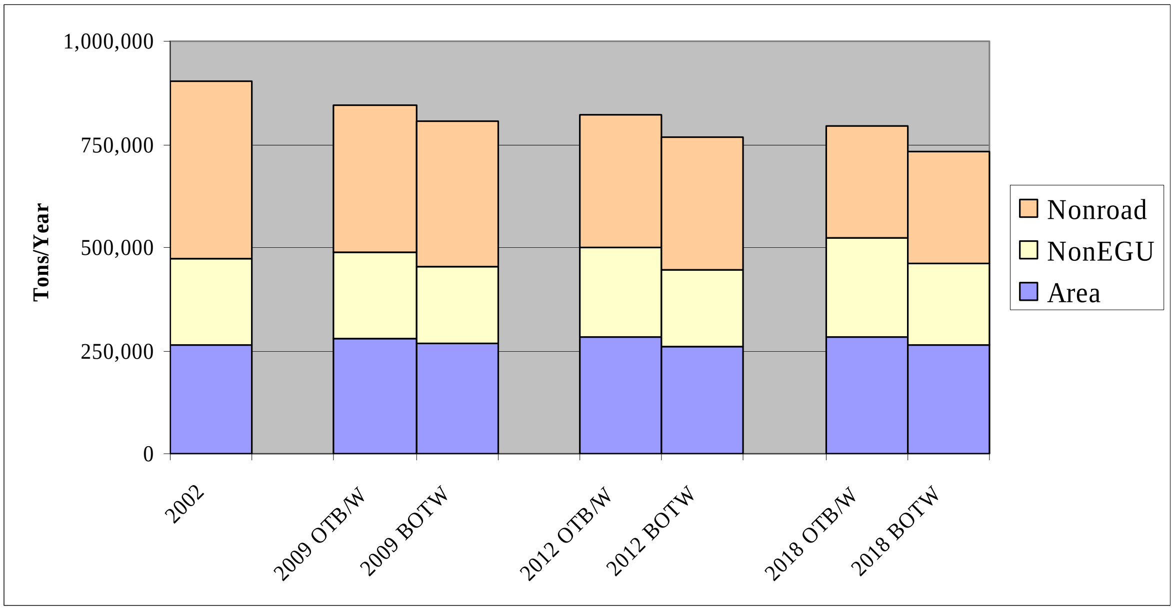


Figure 1-4 2002 Base Year, OTB/OTW AND BOTW Annual SO2 Emissions (tons per year)

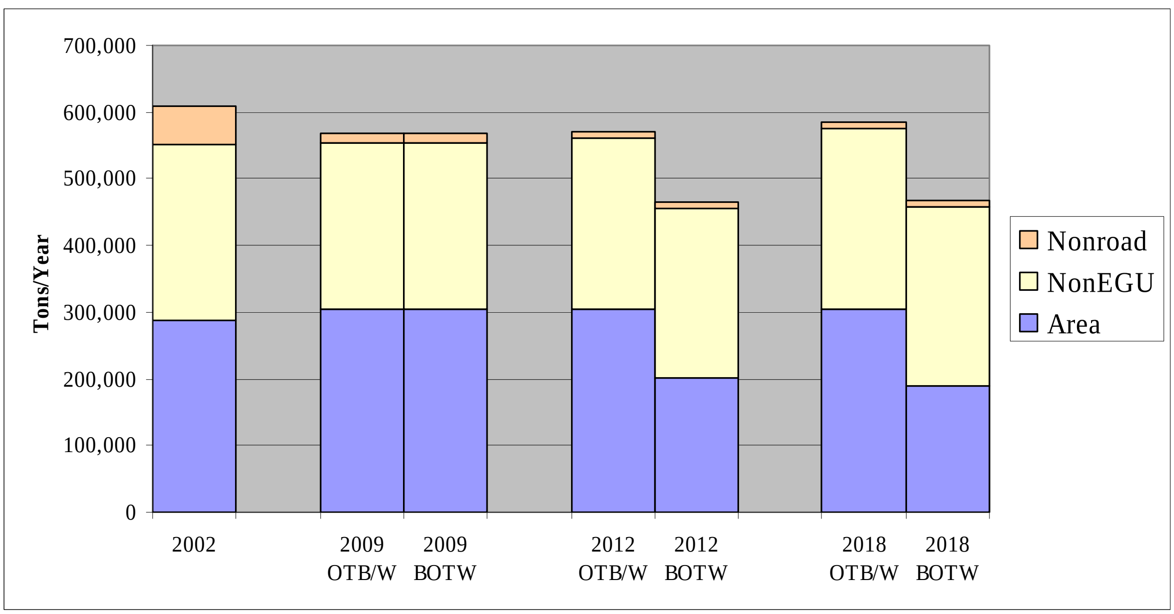


Figure 1-5 2002 Base Year, OTB/OTW AND BOTW Annual PM10 Emissions (tons per year)

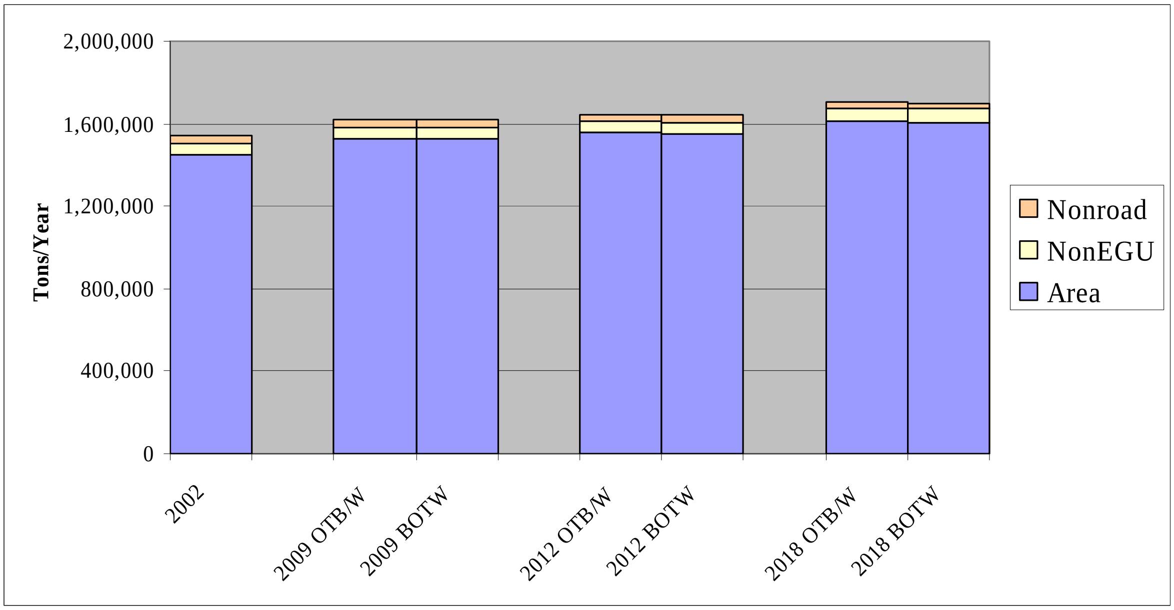


Figure 1-6 2002 Base Year, OTB/OTW AND BOTW Annual PM2.5 Emissions (tons per year)

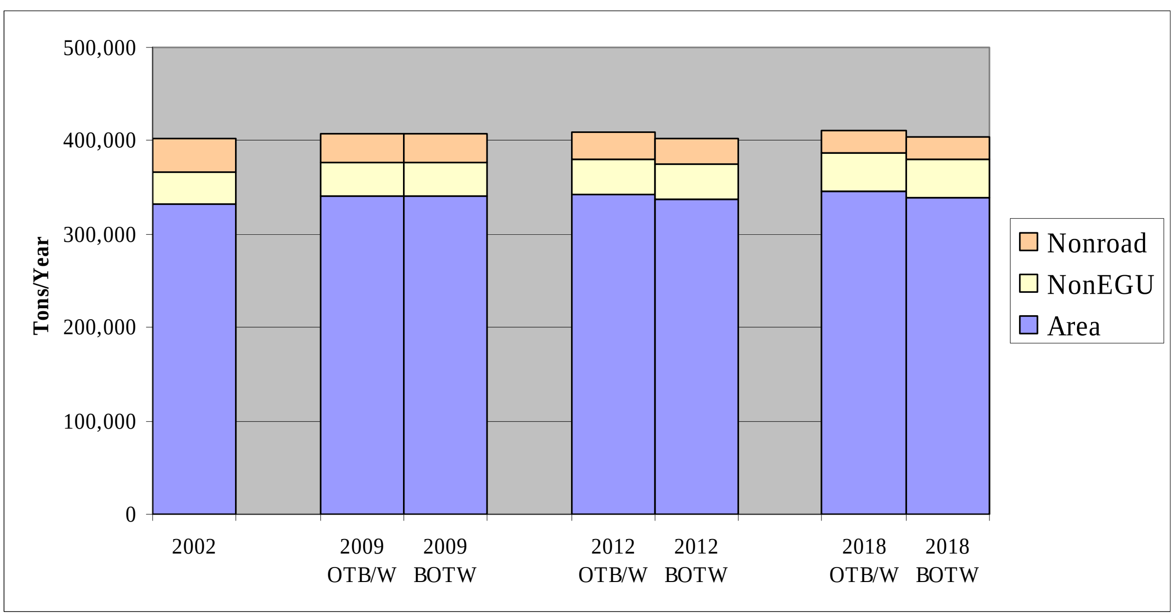
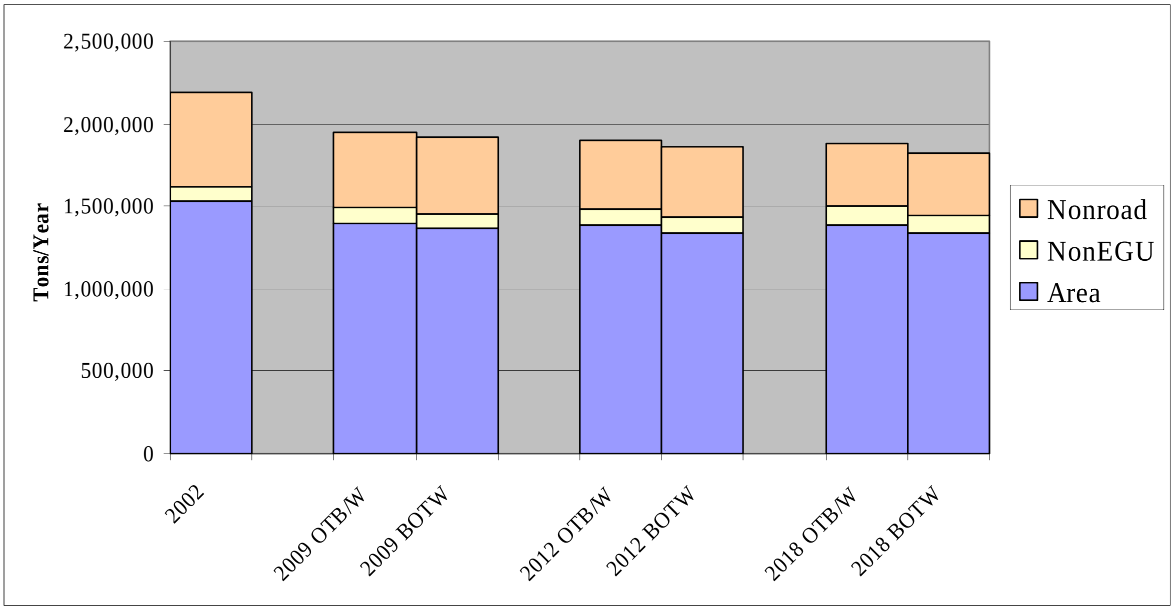


Figure 1-7 2002 Base Year, OTB/OTW AND BOTW Annual VOC Emissions (tons per year)



2.0 NONEGU POINT SOURCES

Under ideal circumstances, all stationary sources would be considered point sources for purposes of emission inventories. In practical applications, however, only sources that emit more than a specified cutoff level of pollutant are considered point sources. In general, the MANE-VU point source inventory includes only major sources (i.e., those required to obtain a Title V operating permit). Some states may include additional stationary sources that emit below the major source thresholds.

For emission projection purposes, the point source inventory is divided into two sub-sectors – the Electric Generating Unit (EGU) sector and the non-EGU sector – because different projections methods are used for these two sectors. For EGUs, MANE-VU used the Integrated Planning Model (IPM) to project future generation as well as to calculate the impact of future control programs on future emission levels.

The procedures for projecting emissions for non-EGUs are described in this section. We started with the MANE-VU 2002 point source emission inventory, which contains data for both EGUs and nonEGUs. We implemented a procedure to split the 2002 point source inventory into two components – and EGU inventory for those units accounted for in IPM, and a nonEGU inventory for those point sources not accounted for in IPM. For the nonEGU sources, we first applied growth factors to account for changes in economic activity. Next, we applied control factors to account for future emission reductions from on-the-books (OTB) control regulations and on-the-way (OTW) control regulations. The OTB control scenario accounts for post-2002 emission reductions from promulgated federal, State, local, and site-specific control programs as of June 15, 2005. The OTW control scenario accounts for proposed (but not final) control programs that are reasonably anticipated to result in post-2002 emission reductions. We then conducted a series of quality assurance steps to ensure the development of complete, accurate, and consistent emission inventories. We provided the inventories in three formats – the National Emission Inventory Input Format (NIF), SMOKE Inventory Data Analyzer (IDA) format, and SMOKE growth/control packets. We also prepared emission summary tables by state and pollutant. Each of these activities is discussed in this section.

2.1 INITIAL 2002 POINT SOURCE EMISSION INVENTORY

The starting point for the nonEGU projections was Version 3 of the MANE-VU 2002 point source emission inventory (MANE-VU_2002_Pt_Version 3_040706.MDB). Since this file contains both EGUs and nonEGU point sources, and EGU emissions are projected using the IPM, it was necessary to split the 2002 point source file into two components.

The first component contains those emission units accounted for in the IPM forecasts. The second component contains all other point sources not accounted for in IPM.

The MANE-VU 2002 point source inventory contains a cross-reference table (xwalk {MANE-VU}) that matches IPM emission unit identifiers (ORISPL plant code and BLRID emission unit code) to MANE-VU NIF emission unit identifiers (FIPSST state code, FIPSCNTY county code, State Plant ID, State Point ID). Initially, we used this cross-reference table to split the point source file into the EGU and nonEGU components. When there was a match between the IPM ORISPL/BLRID and the MANE-VU emission unit ID, the unit was assigned to the EGU inventory; all other emission units were assigned to the nonEGU inventory. The exception to this rule was for the State of New York. The cross-reference table only contained matches at the plant level, not the emission unit level. So for New York EGUs accounted for in IPM, all emission units at a plant were assigned to the MANE-VU EGU file (including ancillary emission units not accounted for in IPM).

After performing this initial splitting of the MANE-VU point source inventory into EGU and nonEGU components, we prepared several ad-hoc QA/QC queries to verify that there was no double-counting of emissions in the EGU and nonEGU inventories:

- We reviewed the IPM parsed files {VISTASII_PC_1f_AllUnits_2009 (To Client).xls and VISTASII_PC_1f_AllUnits_2018 (To Client).xls} to identify EGUs accounted for in IPM. We compared this list of emission units to the nonEGU inventory derived from the MANE-VU cross-reference table to verify that units accounted for in IPM were not double-counted in the nonEGU inventory. As a result of this comparison, we made a few adjustments in the cross-reference table to add emission units for four plants to ensure these units accounted for in IPM were moved to the EGU inventory.

- We reviewed the nonEGU inventory to identify remaining emission units with an Standard Industrial Classification (SIC) code of “4911 Electrical Services” or Source Classification Code of “1-01-xxx-xx External Combustion Boiler, Electric Generation”. We compared the list of sources meeting these selection criteria to the IPM parsed file to ensure that these units were not double-counted.

- We compared the number of records for each NIF table in the original 2002 point source file to the 2002 EGU and 2002 nonEGU files. We determined that the sum of the number of records in the EGU file and the number of records in the nonEGU file equaled the number of records in the original 2002 point source file.

- We compared the emissions by pollutant and state in the original 2002 point source file to the 2002 EGU file and 2002 nonEGU files. We determined that the sum of the emissions in the EGU file and the emissions in the nonEGU file equaled the emissions in the original 2002 point source file.

As a result of this procedure, we created separate sets of NIF tables for 2002 for EGUs (i.e., units accounted for in IPM) and nonEGUs. The nonEGU set of 2002 NIF tables were used in all subsequent projections for 2009/2012/2018.

After release of Version 3 of the MANE-VU 2002 inventory, New Jersey discovered that fugitive emissions from petroleum refineries were missing from Version 3. New Jersey supplied MACTEC with the emission unit identifiers for the fugitive releases, and the appropriate records were added to the 2002 NIF files.. MACTEC used these revised fugitive estimates for projecting emissions to 2009/2012/2018.

2.2 NONEGU POINT SOURCE GROWTH FACTORS

The nonEGU growth factors were developed using three sets of data:

- The U.S. EPA's Economic Growth and Analysis System Version 5.0 (EGAS 5.0) using the default SCC configuration. EGAS 5.0 generates growth factors from REMI's 53 Sector Policy Insight Model Version 5.5, the U.S. Department of Energy (DOE) Annual Energy Outlook 2004 (AEO2004) fuel use projections, and national vehicle mile travel projections from EPA's MOBILE 4.1 Fuel Combustion Model;

- The DOE's Annual Energy Outlook 2005 (AEO2005) fuel consumption forecasts were used to replace the AEO2004 forecasts that are used as the default values in EGAS 5.0; and

- State-supplied population, employment, and other emission projection data.

The priority for applying these growth factors was to first use the state-supplied projection data (if available). If no state-supplied data are available, then we used the AEO2005 projection factors for fuel consumption sources. If data from these two sources were not available, we used the EGAS 5.0 default SCC configuration. Appendix A lists the nonEGU point source growth factors used for this study.

2.2.1 EGAS 5.0 Growth Factors

EGAS is an EPA-developed economic and activity forecast tool that provides credible growth factors for developing emission inventory projections. Growth factors are generated using national- and regional-economic forecasts. For nonEGUs, the primary economic activity data sets in EGAS 5.0 are:

- State-specific growth rates from the Regional Economic Model, Inc. (REMI) Policy Insight® model, version 5.5. The REMI socioeconomic data (output by industry sector, population, farm sector value added, and gasoline and oil expenditures) are available by 4-digit SIC code at the State level.
- Energy consumption data from the DOE's Energy Information Administration's (EIA) *Annual Energy Outlook 2004, with Projections through 2025* for use in generating growth factors for non-EGU fuel combustion sources. These data include regional or national fuel-use forecast data that were mapped to specific SCCs for the non-EGU fuel use sectors (e.g., commercial coal, industrial natural gas). Growth factors are reported at the Census division level. These Census divisions represent a group of States (e.g., the South Atlantic division includes Delaware, the District of Columbia, and Maryland; the Middle Atlantic division includes New Jersey, New York, and Pennsylvania; the New England division includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont). Although one might expect different growth rates in each of these States due to unique demographic and socioeconomic trends, all States within each division received the same growth rate.

EGAS uses these economic activity datasets and a set of cross-reference files to generate growth factors by Standard Industrial Classification (SIC) code, Source Classification Code (SCC), or Maximum Achievable Control Technology (MACT) codes. Growth factors for 2009, 2012, and 2018 were calculated using 2002 as the base year at the State and SCC level. County-specific growth factors are not available in EGAS 5.0.

There were several SCCs in the MANE-VU 2002 inventory that are not included in the EGAS 5.0 files. As a result, EGAS did not generate growth factors for those SCCs. MACTEC assigned growth factors for the missing SCCs by assigning a surrogate SCC that best represented the missing SCC.

2.2.2 AEO2005 Growth Factors

The default version of EGAS 5.0 uses the DOE's AEO2004 forecasts. We replaced these data with the more recent AEO2005 forecasts to improve the emissions growth factors produced. Using ACCESS, we created a copy of the "DOE EGAS 5" dataset. The dataset includes three tables. One table contains the projection data values from 2001-2025. The other two tables are the MACT and SCC crosswalk tables. The crosswalk tables are linked to the projection table via a "model code". Using the copy of AEO2004 data, we updated the corresponding projection tables with data from the AEO2005 located at: http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html . Using the data and descriptions from the new tables, we matched the projection data to the appropriate model codes and then built a table identical to the DOE EGAS 5 dataset with the new 2005 AEO data. The resulting ACCESS dataset contains a projection data table with the exact same structure as the original except with the new data. The SCC and MACT crosswalks did not require any updates since the model code assignments were not changed in the new data table.

2.2.3 State Specific Growth Factors

In addition to the growth data described above, we received growth projections from several MANE-VU states to be used instead of the default EGAS or AEO2005 growth factors. The following paragraphs describe the growth factors used for each state.

2.2.3.1 Connecticut

Connecticut provided state-level employment-based growth factors for various SIC categories derived from CT Department of Labor (CTDOL) projections. For many manufacturing sectors, employment is projected to decline, indicating the likelihood of reduced activity levels and emissions for those sectors. Associated growth factors are less than one. To ensure consistency within a facility, CTDEP indicated that the employment-based growth factors be used wherever possible, as matched by SIC. MACTEC used the growth factors by SIC code for all sources in CT, including those fuel combustion sources that would otherwise have been projected using the AEO2005 forecasts.

2.2.3.2 Delaware

Delaware provided state-level employment data from the Department of Labor by NAICS codes for 2002 and 2012. We used these data to calculate the growth factor from 2002 to 2012 and interpolated these data to derive growth factors for 2009 and 2018. We matched these industry NAICS groupings to SCC codes in order to create SCC specific growth factors for non-EGU point sources.

2.2.3.3 District of Columbia

DC indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.4 Maine

Maine indicated that it preferred to use the EGAS 5.0 growth factors and the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.5 Maryland

Maryland provided growth factors by SCC for all counties in the State. These growth factors were derived from a variety source sources, including the MWCOG Cooperative Forecast 7.0, the BMC Round 6A Cooperative Forecast (prepared by the MD Dept. of Planning, May 2004), and EGAS 5.0.

2.2.3.6 Massachusetts

Massachusetts also provided a link to employment projections for 2000-2010 for very narrow occupational categories that are not directly correlated with SIC or SCC codes. Since we could not match the occupational titles in the Massachusetts employment projections with SIC or SCC codes, MACTEC used the EGAS 5.0 growth factors (with the AEO2005 enhancement for combustion sources) for projecting emissions from nonEGU sources.

2.2.3.7 New Hampshire

New Hampshire indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.8 New Jersey

New Jersey indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.2.3.9 New York

New York provided county-level employment data for 12 counties in the New York City metro area for 2002, 2009, 2012, and 2018. The employment projections are for broad industry categories not directly correlated with SIC or SCC codes. Since we could not match the 12-county employment projections with SIC or SCC codes, MACTEC used the EGAS 5.0 growth factors (with the AEO2005 enhancement for combustion sources) for projecting emissions from nonEGU sources for both the 12-county area and all other counties in the state.

2.2.3.10 Pennsylvania

Pennsylvania provided total employment projections for a subset of counties. These employment projections do not have enough detail regarding specific industrial groupings to be correlated with SIC or SCC codes. MACTEC used the EGAS 5.0 growth factors (with the AEO2005 enhancement for combustion sources) for projecting emissions from nonEGU sources

2.2.3.11 Rhode Island

Rhode Island provided state-level employment data from the Department of Labor and Training by 3-digit NAICS codes for 2002 and 2012. We used these data to calculate the growth factor from 2002 to 2012 and interpolated these data to derive growth factors for 2009 and 2018. We matched these industry NAICS groupings to SCC codes in order to create SCC specific growth factors for non-EGU point sources.

2.2.3.12 Vermont

Vermont indicated that it preferred to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

2.3 NONEGU POINT SOURCE CONTROL FACTORS

The following sections document how the OTB/OTW control factors were developed for the MANE-VU future year inventories. We developed control factors to estimate emission reductions that will result from on-the-books regulations that will result in post-2002 emission reductions and proposed regulations or actions that will result in post-2002 emission reductions. Control factors were developed for the following national, regional, or state control measures:

- NOx SIP Call Phase I (NOx Budget Trading Program)
- NOx SIP Call Phase II
- NOx RACT in 1-hour Ozone SIPs
- NOx OTC 2001 Model Rule for ICI Boilers
- 2-, 4-, 7-, and 10-year MACT Standards
- Combustion Turbine and RICE MACT
- Industrial Boiler/Process Heater MACT
- Refinery Enforcement Initiative
- Source Shutdowns

In addition, states provided specific control measure information about specific sources or regulatory programs in their state. We used the state-specific data to the extent it was available.

2.3.1 NOx SIP Call Phase I

Compliance with the NOx SIP Call in the Ozone Transport Commission (OTC) states was scheduled for May 1, 2003. The requirements applied to all MANE-VU states except Maine, New Hampshire, and Vermont. While the program applies primarily to electric generating units (EGUs), the NOx SIP Call applies to non-EGUs such as large industrial boilers and turbines. The NOx SIP Call did not mandate which sources must reduce emissions; rather, it required states to meet an overall emission budget and gave them flexibility to develop control strategies to meet that budget. All states in the MANE-VU region affected by the NOx SIP Call chose to meet their NOx SIP Call requirements by participating in the NOx Budget Trading Program. We reviewed the available state rules and guidance documents to determine the affected nonEGU sources and ozone season NOx allowances for each source. Future year emissions for non-EGU boilers/turbines were capped at the allowance levels. Since the allowances are given in terms of tons per ozone season (5 months May to September), we calculated annual emissions by multiplying the ozone season allowances by a factor of 12 (annual) / 5 (ozone season). Table B-1 identifies those units included in the NOx SIP Call Phase I budget program.

Cement kilns were also included in Phase I of the NO_x SIP call. There is a cement kiln in Maine, but it is not subject to the NOx SIP call. For the cement kilns in Maryland and New York, a default control efficiency value of 25 percent was applied. For the cement kilns in Pennsylvania, the state provided their best estimates of the actual control efficiency expected for each kiln after the NOx SIP Call. Table B-2 identifies the cement kilns affected by the NOx SIP Call.

2.3.2 NOx SIP Call Phase II

The final Phase II NOx SIP Call rule was promulgated on April 21, 2004. States had until April 21, 2005, to submit SIPs meeting the Phase II NOx budget requirements. The Phase II rule applies to large IC engines, which are primarily used in pipeline transmission service at compressor stations. We have identified affected units using the same methodology as was used by EPA in the proposed Phase II rule (i.e., a large IC engine is one that emitted, on average, more than 1 ton per day during 2002). The final rule reflects a control level of 82 percent for natural gas-fired IC engines and 90 percent for diesel or dual fuel categories. Pennsylvania identified large IC engines affected by the rule. Table B-3 identifies those units included in the NOx SIP Call Phase II.

2.3.3 NOx RACT in 1-hour Ozone SIPs

Emission reductions requirements from NOx reasonably available control technology (RACT) requirements in 1-hour Ozone SIP areas were implemented in or prior to 2002.

These reductions should already be accounted for in the MANE-VU 2002 inventory since the 2002 inventory was based on 2002 actual emissions which includes any reductions due to NOx RACT.

2.3.4 NOx OTC 2001 Model Rule for ICI Boilers

The Ozone Transport Commission (OTC) developed control measures for industrial, commercial, and institutional (ICI) boilers in 2001. Information about the proposed OTC NOx emission limits by fuel type and size range was obtained from Table III-1 of *Control Measure Development Support Analysis of Ozone Transport Commission Model Rules* (E.H. Pechan & Associates, Inc., March 31, 2001). Information about the emission limits contained in the existing state rules (prior to adoption of the OTC 2001 model rule) were obtained from Tables III-2 through III-9 of the Pechan document. Information about the emission limits contained in the current state rules (as they existed in June 2006) were obtained from the individual states regulations. The percent reduction for ICI boilers was estimated by state, fuel type, and size range by comparing the current state emission limits (as they existed in June 2006) with the state emission limits as they existed in 2001. Pennsylvania adopted the OTC 2001 model rule in five southeastern counties (Bucks, Chester, Delaware, Montgomery, and Philadelphia) for boilers in the 100 to 250 million Btu/hour range. New Jersey adopted the OTC 2001 model rule for natural gas-fired boilers with a maximum heat rate of at least 100 million Btu/hour. For other states, it did not appear that the emission limits in 2006 had changed from the emission limits in 2001.

2.3.5 2-, 4-, 7-, and 10-year MACT Standards

Maximum achievable control technology (MACT) requirements were also applied, as documented in the report entitled *Control Packet Development and Data Sources*, dated July 14, 2004 (available at http://www.epa.gov/air/interstateairquality/pdfs/Non-EGU_nonpoint_Control_Development.pdf). The point source MACTs and associated emission reductions were designed from Federal Register (FR) notices and discussions with EPA's Emission Standards Division (ESD) staff. These MACT requirements apply only to units located at a major source of hazardous air pollutants (HAP). We did not apply reductions for MACT standards with an initial compliance date of 2002 or earlier, assuming that the effects of these controls are already accounted for in the inventories supplied by the States. Emission reductions were applied only for MACT standards with an initial compliance date of 2003 or greater.

Because the MANE-VU inventory does not identify HAP major sources, the reductions from post-2002 MACT standards were applied on a more general scale to all sources with certain SCCs. Every source with an SCC determined to be affected by a post-2002 MACT standard was assigned an incremental percent reduction for the applicable MACT standard. Table B-4 shows the SCCs affected and the incremental control efficiencies applied for post-2002 MACT standards.

2.3.6 Combustion Turbine and RICE MACT

The MANE-VU projection inventory does not include the NOx co-benefit effects of the MACT regulations for Gas Turbines or stationary Reciprocating Internal Combustion Engines, which EPA estimates to be small compared to the overall inventory.

2.3.7 Industrial Boiler/Process Heater MACT

EPA anticipates ancillary reductions in PM and SO2 as a result of the Industrial Boiler/Process Heater MACT standard. The MACT applies to industrial, commercial, and institutional units firing solid fuel (coal, wood, waste, biomass) which have a design capacity greater than 10 mmBtu/hr and are located at a major source of hazardous air pollutants (HAP). The boiler design capacity field in many cases was missing from the MANE-VU emission inventory. In lieu of boiler design capacity, we identified boilers with the following SCCs that emitted greater than 10 tons/year of either SO2 or PM10

- 1-02-001-xx Industrial, Anthracite Coal
- 1-02-002-xx Industrial, Bituminous/subbituminous Coal
- 1-02-008-xx Industrial, Petroleum Coke
- 1-02-009-xx Industrial, Wood/Bark Waste
- 1-03-001-xx Commercial/Institutional, Anthracite Coal
- 1-03-002-xx Commercial/Institutional, Bituminous/subbituminous Coal
- 1-03-009-xx Commercial/Institutional, Wood/Bark Waste
- 3-90-002-89 In-Process Fuel Use, Bituminous Coal
- 3-90-002-99 In-Process Fuel Use, Bituminous Coal
- 3-90-008-89 In-Process Fuel Use, Coke
- 3-90-008-99 In-Process Fuel Use, Coke
- 3-90-009-99 In-Process Fuel Use, Wood

For these sources, we applied the average MACT control efficiencies of 4% for SO2 and 40% for PM.

2.3.8 Refinery Enforcement Initiative

Both EPA and State/local agencies have negotiated (or are in the process of negotiating) Consent Decrees that will require significant investment in pollution control technology and will result in significant emission reductions in the future. There are eight refineries in the MANE-VU inventory impacted by the settlements. The five major refinery processes that are affected by the judicial settlements are:

- Fluid Catalytic Cracking Units (FCCUs) and Fluid Coking Units (FCUs)
- Process Heaters and Boilers
- Flare Gas Recovery
- Leak Detection and Repair
- Benzene/Wastewater

As part of the development of the *Assessment of Control Technology Options for Petroleum Refineries in the Mid-Atlantic Region* (Draft Final, October 2006), MACTEC coordinated with State and local agencies to develop estimates of future year emissions based upon the settlements and recent permits that implement the provisions of those settlements.

For FCCUs/FCUs, the Consent Decree control requirements generally require the installation of wet gas scrubbers for SO2 control. Some of the units have already been permitted to include the control requirements. In those cases, specific emission limits for SO2 have already been established and were used as the best estimate of emission in 2009. In cases where specific emission limitation have not yet been specified in permits, a 90 percent SO2 control efficiency was assumed as a conservative estimate of the SO2 reductions from the installation of a wet gas scrubber.

For NOx control at FCCUs/FCUs, the Consent Decrees require selective catalytic reduction (SCR), selective non-catalytic reduction (SCNR), or optimization studies to reduce NOx emissions. Some of the units have already been permitted to include the control requirements. In those cases, specific emission limits for NOx have already been established and were used as the best estimate of emission in 2009. In cases where specific emission limitation have not yet been specified in permits, a 90 percent NOx control efficiency was assumed for SCR, and a 60 percent reduction was assumed from the installation of SNCR.

For SO2 emissions from boilers/heaters, the control requirements generally require the elimination of burning solid/liquid fuels. We identified all boilers and heaters at the eight affected refineries that burn solid or liquid fuels. For these units, we set the SO2 emissions to zero in the future year inventories.

For NOx emissions from boilers/heaters, control requirements generally apply to units greater than 40 million British thermal units (MMBtu) per hour capacity or larger. In many cases, the consent decrees establish NO_x emission reduction objectives across a number of refineries that are owned by the same firm. Therefore, the companies have some discretion in deciding which individual boilers/heaters to control as well as the control techniques to apply. Also, the consent decrees have various phase-in dates which make it difficult to determine the exact date when the reductions will be fully realized. As part of the development of the *Assessment of Control Technology Options for Petroleum Refineries in the Mid-Atlantic Region* (Draft Final, October 2006), MACTEC coordinated with State and local agencies to develop estimates of future year emissions based upon the settlements and recent permits that implement the provisions of those settlements. Heater/boiler NOx controls for the units to which they are applied were determined to be equivalent to meeting a 0.04 lbs per million Btu NOx emission rate. Meeting this emission reduction requirement is expected to provide an average NOx emission reduction of 50 percent from 2002 levels in 2009.

The Consent Decrees also included enhanced LDAR programs (e.g., reducing the defined leak concentration, increasing the monitoring frequency, other requirements. Our best estimate is a 50% reduction in VOC emissions as a result of implementing enhanced LDAR programs similar to those required in the recent Consent Decrees. This is based on a study (http://www.rti.org/pubs/ertc_enviro_2002_final1.pdf) that estimated an enhanced LDAR program could result in a 50% reduction in fugitive VOCs.

The settlements are expected to produce additional SO2, NOx, and VOC emission reductions for flare gas recovery and wastewater operations. These emission reductions were not quantified as they are expected to produce less significant changes in the MANE-VU inventory because of the magnitude and uncertainty associated with the emissions from these units in the 2002 MANE-VU inventory.

2.3.9 Source Shutdowns

A few states indicated that significant source shutdowns have occurred since 2002 and that emissions from these sources should not be included in the future year inventories. These sources are identified in Table B-5.

2.3.10 State Specific Control Factors

Delaware provided reductions expected from the Maritrans lightering operation. VOC emissions are projected to be reduced by 34.8% by 2009, 69.3% by 2012, and 79.2% by 2018.

2.4 NONEGU POINT SOURCE QA/QC REVIEW

Throughout the inventory development process, quality assurance steps were performed to ensure that no double counting of emissions occurred, and to ensure that a full and complete inventory was developed. Quality assurance was an important component to the inventory development process and MACTEC performed the following QA steps on the nonEGU point source component of the MANE-VU future year inventories:

1. State agencies reviewed the draft growth and control factors in the summer of 2005. Changes based on these comments were implemented in the files.
2. Compared, at the emission unit-level, emissions from the IPM parsed files and the MANE-VU NIF files to verify that the splitting of the MANE-VU point source inventory into the EGU and nonEGU sectors did not result in any double county of emissions or cause units to be missing from both inventories.
3. SCC level emission summaries were prepared and evaluated to ensure that emissions were consistent and that there were no missing sources. Tier comparisons (by pollutant) were developed between the revised 2002 base year inventory and the 2009/2012/2018 projection inventories.
4. State level emission summaries were prepared and evaluated to ensure that emissions were consistent and reasonable. The summaries included base year 2002 emissions, 2009/2012/2018 projected emissions accounting only for growth, 2009/2012/2018 projected emissions accounting for both growth and emission reductions from OTB and OTW controls.
5. Emission inventory files in NIF format were provided for state agency review and comment. Changes based on these comments were implemented.
6. All final files were run through EPA's Format and Content checking software.
7. Version numbering was used for all inventory files developed. The version numbering process used a decimal system to track major and minor changes. For example, a major change would result in a version going from 1.0 to 2.0 for example. A minor change would cause a version number to go from 1.0 to 1.1. Minor changes resulting from largely editorial changes would result in a change from 1.00 to 1.01 for example.

Final QA checks were run on the revised projection inventory data set to ensure that all corrections provided by the S/L agencies and stakeholders were correctly incorporated into the S/L inventories and that there were no remaining QA issues that could be addressed during the duration of the project. After exporting the inventory to ASCII text files in NIF 3.0, the EPA QA program was run on the ASCII files and the QA output was reviewed to verify that all QA issues that could be addressed were resolved

2.5 NONEGU POINT SOURCE NIF AND SMOKE FILES

The Version 3 file names and descriptions delivered to MARAMA are shown in Table 2-1.

2.6 NONEGU POINT SOURCE EMISSION SUMMARIES

Emission summaries by state, year, and pollutant are presented in Tables 2-2 through 2-8 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 2-1 NonEGU Point Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_OTB2009_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2009 OTB NonEGU source NIF inventory
MANEVU_OTB2012_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2012 OTB NonEGU source NIF inventory
MANEVU_OTB2018_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2018 OTB NonEGU source NIF inventory
MANEVU_OTB2009_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2009 OTB NonEGU source inventory in SMOKE IDA format
MANEVU_OTB2012_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2012 OTB NonEGU source inventory in SMOKE IDA format
MANEVU_OTB2018_NonEGU_IDA3V_2.txt	Nov. 22, 2006	Version 3.1 of 2018 OTB NonEGU source inventory in SMOKE IDA format
MANEVU OTB BOTW NonEGU V3_1 State Summary.xls	Nov. 22, 2006	Spreadsheet with state totals by pollutant for all NonEGU sources
MANEVU OTB BOTW NonEGU V3_1 State SCC Summary.xls	Dec. 4, 2006	Spreadsheet with SCC totals by state and pollutant for all NonEGU sources.

**Table 2-2 NonEGU Point Sources
OTB/OTW Annual CO Emission Projections
(tons per year)**

State	2002	2009	2012	2018
CT	2,157	2,251	2,306	2,415
DE	8,812	9,037	8,748	8,651
DC	247	283	299	327
ME	9,043	10,147	10,467	11,433
MD	94,536	104,012	111,174	141,342
MA	10,793	12,027	12,552	13,426
NH	774	858	871	907
NJ	8,209	10,076	10,806	12,244
NY	53,259	61,411	65,541	78,876
PA	105,815	116,430	121,251	140,909
RI	1,712	1,764	1,821	1,927
VT	220	250	254	267
Total	**295,577**	**328,546**	**346,090**	**412,724**

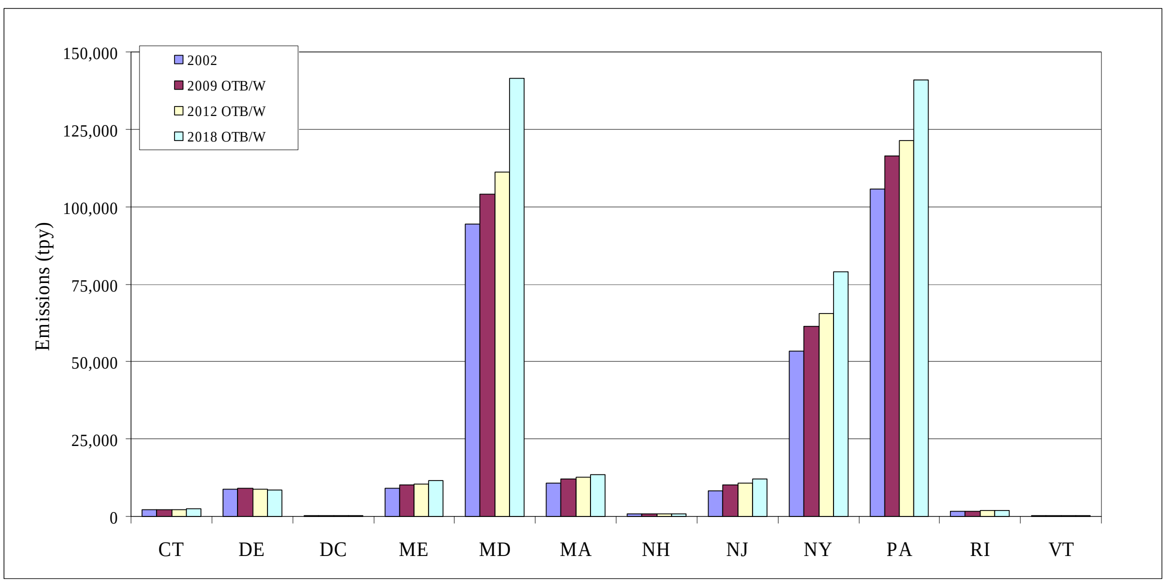


Table 2-3 NonEGU Point Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	0	0	0	0
DE	153	145	138	134
DC	4	5	5	5
ME	700	796	809	859
MD	305	347	366	410
MA	462	510	521	563
NH	37	46	50	60
NJ	0	0	0	0
NY	1,027	1,081	1,128	1,296
PA	1,170	1,307	1,363	1,591
RI	58	64	68	68
VT	0	0	0	0
Total	**3,916**	**4,301**	**4,448**	**4,986**

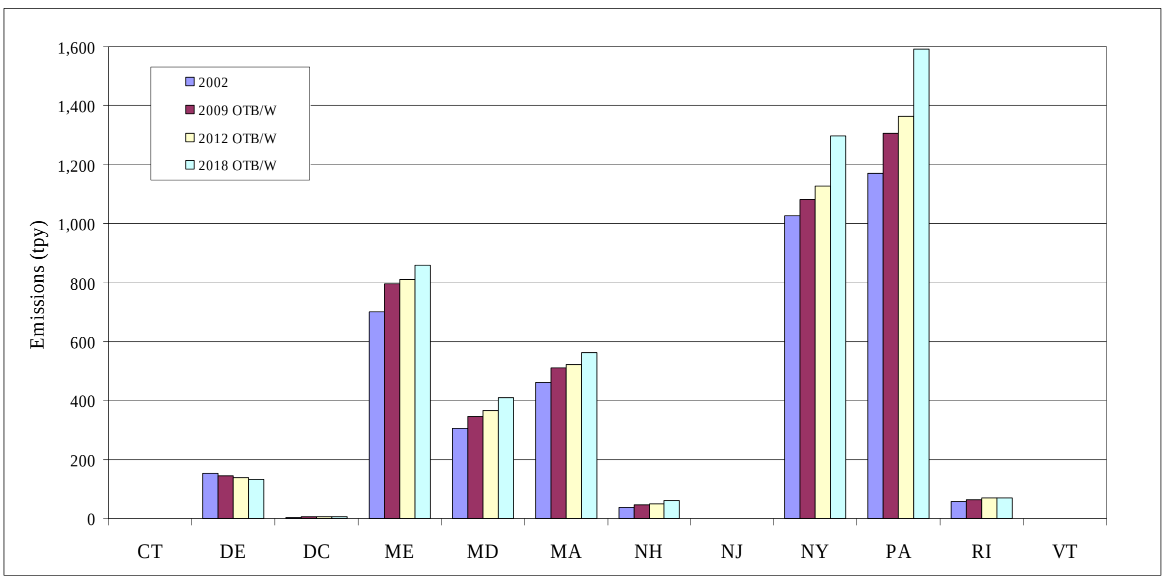


Table 2-4 NonEGU Point Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	6,773	7,236	7,465	7,921
DE	4,372	4,076	4,135	4,246
DC	480	548	577	627
ME	12,108	14,285	14,661	15,753
MD	21,940	19,401	20,399	22,797
MA	18,292	20,603	21,372	23,040
NH	1,188	1,384	1,394	1,435
NJ	15,812	16,498	17,091	18,805
NY	34,253	33,648	34,586	37,133
PA	89,136	89,932	93,526	103,137
RI	2,308	2,449	2,471	2,442
VT	386	462	460	466
Total	**207,048**	**210,522**	**218,137**	**237,802**

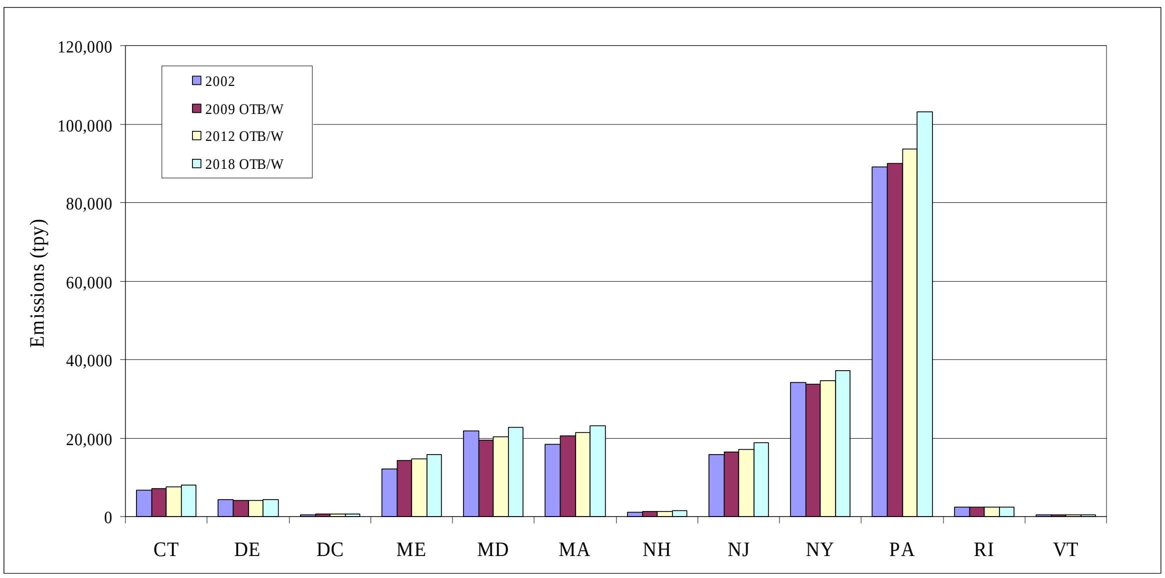


**Table 2-5 NonEGU Point Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)**

State	2002	2009	2012	2018
CT	990	1,035	1,058	1,106
DE	1,820	1,486	1,475	1,487
DC	157	178	186	198
ME	6,120	7,088	7,133	7,496
MD	4,739	4,797	5,040	5,828
MA	4,212	5,006	5,088	5,314
NH	918	1,084	1,097	1,129
NJ	3,439	4,205	4,417	4,959
NY	5,072	5,221	5,444	6,098
PA	23,282	25,169	26,307	29,516
RI	296	333	331	330
VT	235	267	272	296
Total	**51,280**	**55,869**	**57,848**	**63,757**

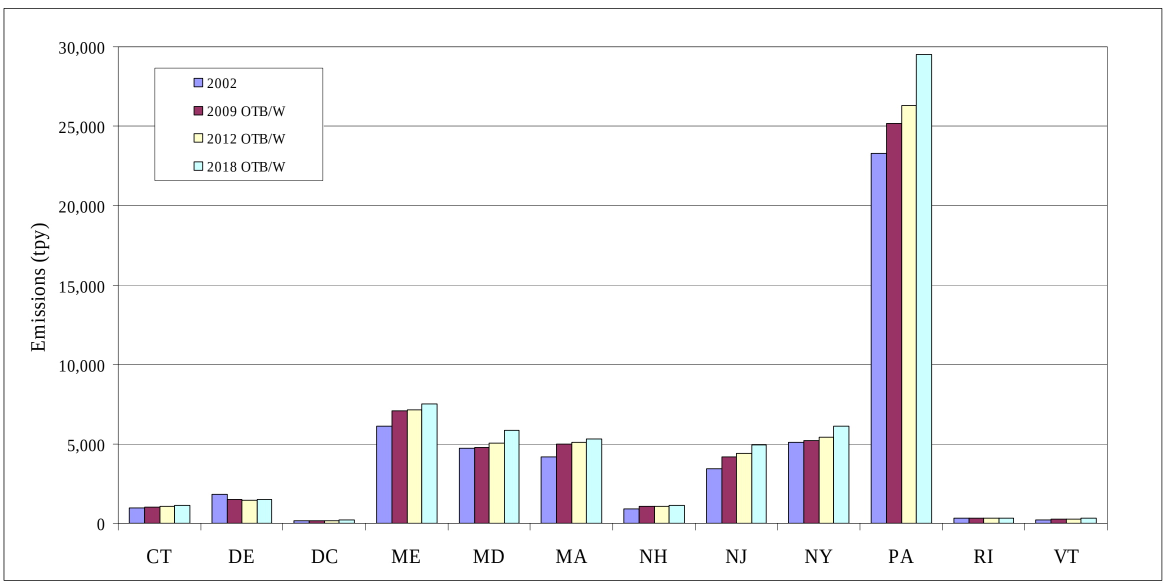


Table 2-6 NonEGU Point Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	822	871	894	939
DE	1,606	1,256	1,245	1,254
DC	128	145	152	164
ME	4,899	5,675	5,690	5,935
MD	2,772	2,861	3,011	3,503
MA	2,953	3,554	3,574	3,660
NH	857	1,008	1,021	1,052
NJ	2,947	3,588	3,764	4,234
NY	3,355	3,535	3,688	4,161
PA	12,360	13,578	14,159	15,878
RI	180	200	198	194
VT	198	226	229	246
Total	**33,077**	**36,497**	**37,625**	**41,220**

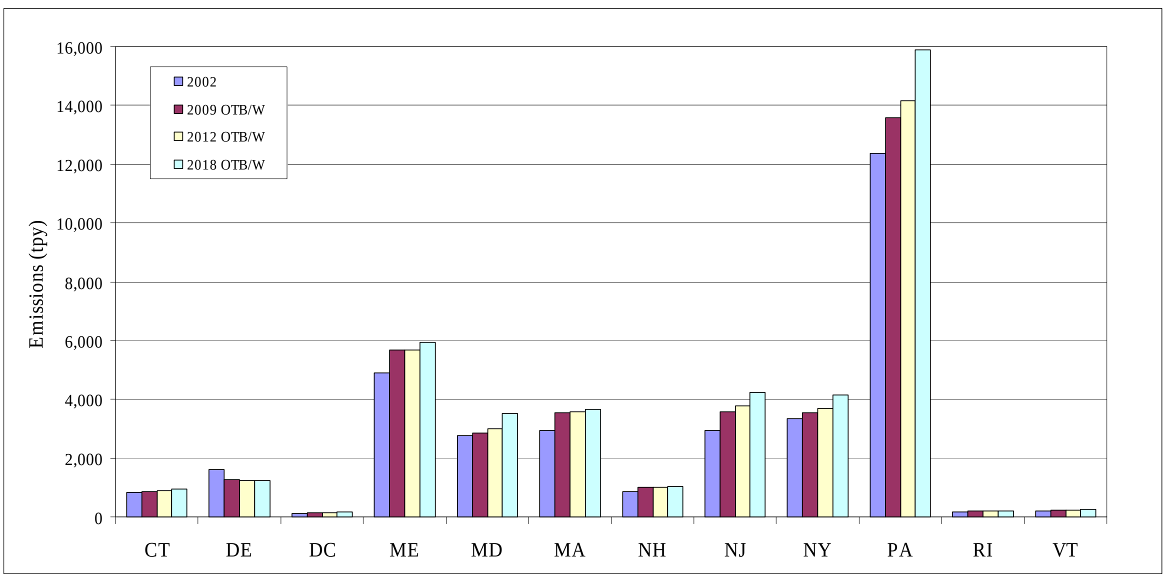


Table 2-7 NonEGU Point Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	2,438	2,528	2,567	2,644
DE	35,706	7,117	7,401	7,610
DC	618	707	735	780
ME	14,412	18,656	18,492	18,794
MD	34,193	34,223	35,373	38,921
MA	14,766	18,185	18,442	18,955
NH	2,436	3,099	3,098	3,114
NJ	9,797	7,141	7,234	7,856
NY	58,227	62,922	64,484	67,545
PA	88,259	90,735	93,441	99,924
RI	2,651	3,163	3,182	3,164
VT	874	1,182	1,147	1,127
Total	**264,377**	**249,658**	**255,596**	**270,434**

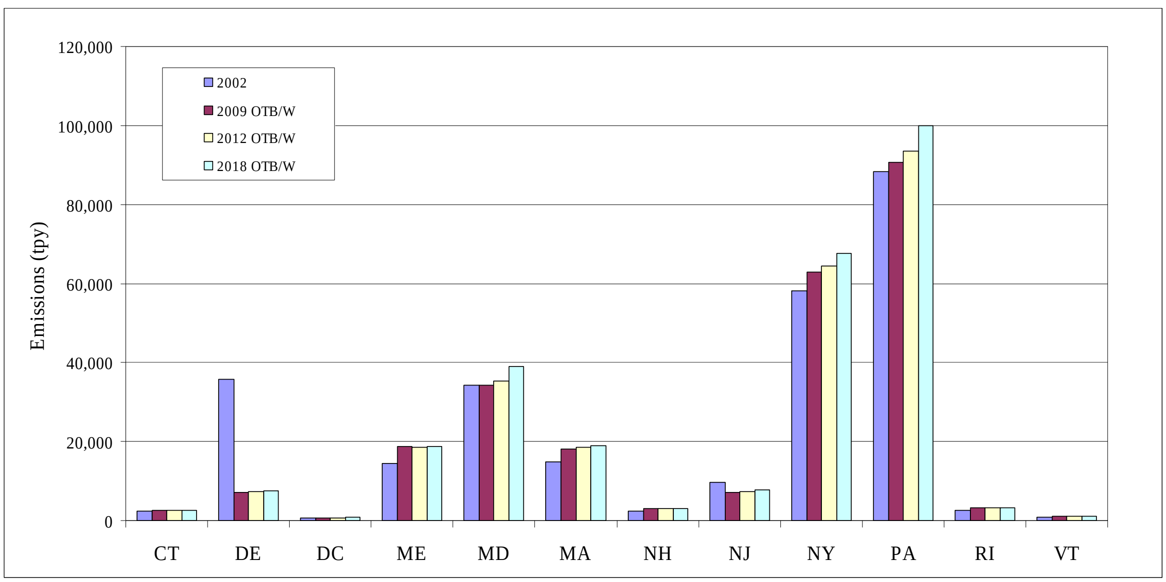
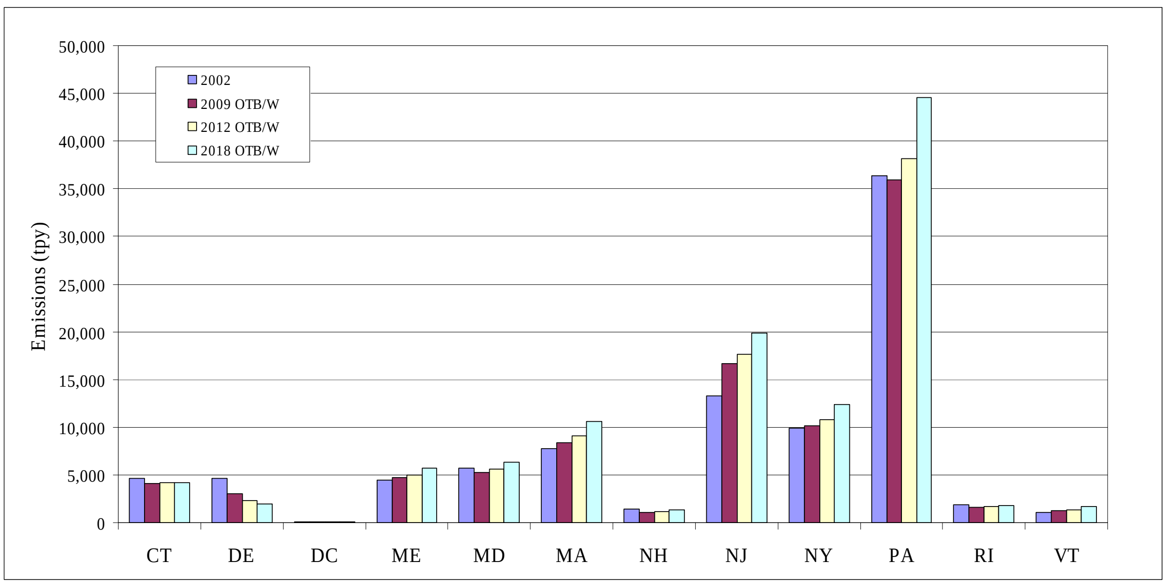


Table 2-8 NonEGU Point Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	4,604	4,114	4,152	4,230
DE	4,645	2,987	2,311	1,993
DC	69	72	75	85
ME	4,477	4,740	4,985	5,709
MD	5,676	5,297	5,578	6,301
MA	7,794	8,381	9,061	10,564
NH	1,459	1,060	1,132	1,294
NJ	13,318	16,702	17,621	19,915
NY	9,933	10,157	10,750	12,354
PA	36,326	35,875	38,162	44,537
RI	1,898	1,640	1,695	1,812
VT	1,079	1,254	1,365	1,730
Total	**91,278**	**92,279**	**96,887**	**110,524**



3.0 AREA SOURCES

The area source sector is comprised of stationary sources that are small and numerous, and that have not been inventoried individually as specific point, mobile, or biogenic sources. Individual sources are typically grouped with other like sources into area source categories and the emissions are calculated on a county-by-county basis. Area source categories include residential/commercial/industrial fuel combustion; small industrial processes; solvent utilization (such as architectural coatings and consumer products); petroleum product storage and transport (such as gasoline service stations); waste disposal; and agricultural activities.

The procedures for projecting emissions for area sources are described in this section. We started with the MANE-VU 2002 area source emission inventory. We first applied growth factors to account for changes in population and economic activity. Next, we applied control factors to account for future emission reductions from on-the-books (OTB) control regulations and on-the-way (OTW) control regulations. The OTB control scenario accounts for post-2002 emission reductions from promulgated federal, State, local, and site-specific control programs as of June 15, 2005. The OTW control scenario accounts for proposed (but not final) control programs that are reasonably anticipated to result in post-2002 emission reductions. We then conducted a series of quality assurance steps to ensure the development of complete, accurate, and consistent emission inventories. We provided the inventories in three formats – the National Emission Inventory Input Format (NIF), SMOKE Inventory Data Analyzer (IDA) format, and SMOKE growth/control packets. We also prepared emission summary tables by state and pollutant. Each of these activities is discussed in this section.

3.1 INITIAL 2002 AREA SOURCE EMISSION INVENTORY

The starting point for the area source projections was Version 3 of the MANE-VU 2002 area source emission inventory (MANE-VU_2002_Area_040606.MDB). There were two updates to this version of the 2002 inventory in response to requests from the District of Columbia and Massachusetts. These changes, described in the following paragraphs, were used in preparing the 2009/2012/2018 projections.

After release of Version 3 of the MANE-VU 2002 inventory, the District of Columbia discovered a gross error in the 2002 residential, non-residential and roadway construction. They requested that the following values be used for the 2002 base year and as the basis for the 2009/2012/2018 projections:

SCC	Pollutant Code	2002 Annual Emissions (tpy)
2311010000	PM10-PRI	8.2933
	PM25-PRI	1.6587
2311020000	PM10-PRI	486.1951
	PM25-PRI	97.239
2311030000	PM10-PRI	289.8579
	PM25-PRI	57.9716

After release of Version 3 of the MANE-VU 2002 inventory, Massachusetts revised their inventory of area source heating oil emissions due to two changes: (1) SO2 emission factors were adjusted for the sulfur content from 1.0 to 0.03; and (2) use of the latest DOE-EIA 2002 fuel use data instead of the previous version used 2001. These two changes significantly altered the 2002 SO2 emissions for area source heating oil combustion. Massachusetts provided revised 2002 PE and EM tables, which MACTEC used in preparing the 2009/2012/2018 projection inventories.

3.2 AREA SOURCE GROWTH FACTORS

The area source growth factors were developed using three sets of data:

- The U.S. EPA's Economic Growth and Analysis System Version 5.0 (EGAS 5.0) using the default SCC configuration. EGAS 5.0 generates growth factors from REMI's 53 Sector Policy Insight Model Version 5.5, the U.S. Department of Energy (DOE) Annual Energy Outlook 2004 (AEO2004) fuel use projections, and national vehicle mile travel projections from EPA's MOBILE 4.1 Fuel Combustion Model;
- The DOE's Annual Energy Outlook 2005 (AEO2005) fuel consumption forecasts were used to replace the AEO2004 forecasts that are used as the default values in EGAS 5.0; and
- State-supplied population, employment, and other emission projection data.

The priority for applying these growth factors was to first use the state-supplied projection data (if available). If no state-supplied data are available, then we used the AEO2005 projection factors for fuel consumption sources. If data from these two sources were not available, we used the EGAS 5.0 default SCC configuration. Appendix C lists the area source growth factors used for this study.

3.2.1 EGAS 5.0 Growth Factors

EGAS is an EPA-developed economic and activity forecast tool that provides credible growth factors for developing emission inventory projections. Growth factors are generated using national- and regional-economic forecasts. For nonEGUs, the primary economic activity data sets in EGAS 5.0 are:

- State-specific growth rates from the Regional Economic Model, Inc. (REMI) Policy Insight® model, version 5.5. The REMI socioeconomic data (output by industry sector, population, farm sector value added, and gasoline and oil expenditures) are available by 4-digit SIC code at the State level.

- Energy consumption data from the DOE's Energy Information Administration's (EIA) *Annual Energy Outlook 2004, with Projections through 2025* for use in generating growth factors for non-EGU fuel combustion sources. These data include regional or national fuel-use forecast data that were mapped to specific SCCs for the non-EGU fuel use sectors (e.g., commercial coal, industrial natural gas). Growth factors are reported at the Census division level. These Census divisions represent a group of States (e.g., the South Atlantic division includes Delaware, the District of Columbia, and Maryland; the Middle Atlantic division includes New Jersey, New York, and Pennsylvania; the New England division includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont). Although one might expect different growth rates in each of these States due to unique demographic and socioeconomic trends, all States within each division received the same growth rate.

EGAS uses these economic activity datasets and a set of cross-reference files to generate growth factors by Standard Industrial Classification (SIC) code, Source Classification Code (SCC), or Maximum Achievable Control Technology (MACT) codes. Growth factors for 2009, 2012, and 2018 were calculated using 2002 as the base year at the State and SCC level. County-specific growth factors are not available in EGAS 5.0.

There were several SCCs in the MANE-VU 2002 inventory that are not included in the EGAS 5.0 files. As a result, EGAS did not generate growth factors for those SCCs. MACTEC assigned growth factors for the missing SCCs by assigning a surrogate SCC that best represented the missing SCC.

3.2.2 AEO2005 Growth Factors

The default version of EGAS 5.0 uses the DOE's AEO2004 forecasts. We replaced these data with the more recent AEO2005 forecasts to improve the emissions growth factors produced. Using ACCESS, we created a copy of the "DOE EGAS 5" dataset. The dataset includes three tables. One table contains the projection data values from 2001-2025. The other two tables are the MACT and SCC crosswalk tables. The crosswalk tables are linked to the projection table via a "model code". Using the copy of AEO2004 data, we updated the corresponding projection tables with data from the AEO2005 located at: http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html . Using the data and descriptions from the new tables, we matched the projection data to the appropriate model codes and then built a table identical to the DOE EGAS 5 dataset with the new 2005 AEO data. The resulting ACCESS dataset contains a projection data table with the exact same structure as the original except with the new data. The SCC and MACT crosswalks did not require any updates since the model code assignments were not changed in the new data table.

3.2.3 State Specific Growth Factors

In addition to the growth data described above, we received growth projections from several MANE-VU states to be used instead of the default EGAS or AEO2005 growth factors. The following paragraphs describe the area source growth factors used for each state.

3.2.3.1 Connecticut

Connecticut provided state-level population projections for 2009, 2012, and 2018. We created growth factors for those SCCs that are population based using the state-supplied data. Connecticut also provided state-level employment projections for industry categories analogous to 2-digit SIC codes. Projections were provided for 2009, 2012, and 2018. We matched these industry groupings to SCC codes in order to create SCC specific growth factors for area sources. Emissions from area source fuel combustion were projected using the AEO2005 forecasts.

3.2.3.2 Delaware

Delaware provided county-level population projections (*Delaware Population Consortium Annual Population Projections,* Oct 18, 2001 Version 2001.0) for 2000, 2005, 2010, 2015, and 2020. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Delaware also provided state-level employment data by NAICS codes for 2002 and 2012. We interpolated values for 2009 and 2018. We matched these industry groupings to SCC codes in order to create SCC specific growth factors for selected area sources. Emissions from area source fuel combustion were projected using the AEO2005 forecasts.

3.2.3.3 District of Columbia

DC provided local growth factors for projecting emissions from 2002 to 2009, 2012, and 2018 for all area source SCCs except fuel combustion sources. Emissions from area source fuel combustion were projected using the AEO2005 forecasts.

3.2.3.4 Maine

Maine indicated that it preferred to use the EGAS 5.0 growth factors and the DOE's 2005 Annual Energy Outlook data for combustion sources.

3.2.3.5 Maryland

Maryland provided growth factors by SCC for all counties in the State. These growth factors were derived from a variety source sources, including the MWCOG Cooperative Forecast 7.0, the BMC Round 6A Cooperative Forecast (prepared by the MD Dept. of Planning, May 2004), and EGAS 5.0.

3.2.3.6 Massachusetts

Massachusetts provided county-level population data for the years 2000, 2010, and 2020. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Massachusetts also provided growth factors for several SCCs based on employment data for the years 2000 and 2010. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018. Massachusetts agreed on the use of the AEO2005 forecasts for projecting emissions from area source fuel combustion.

3.2.3.7 New Hampshire

New Hampshire agreed to use the EGAS 5.0 growth factors, with the enhancement of using the DOE's 2005 Annual Energy Outlook data for combustion sources.

3.2.3.8 New Jersey

New Jersey provided growth factors for most SCCs for all counties in the State. When state-specific growth factors were not available, we used the AEO2005 forecasts for projecting emissions from area source fuel combustion and EGAS default factors for any remaining categories.

3.2.3.9 New York

New York provided county-level population data for 2002 and projections/growth factors for 2009, 2012, and 2018. We used these growth factors for those SCCs that are population based. We used the AEO2005 forecasts for projecting emissions from area source fuel combustion and EGAS default factors for any remaining categories.

3.2.3.10 Pennsylvania

Pennsylvania provided county-level population data for 2000 and projections for 2010 and 2020. We interpolated these data to get growth factors for projecting from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Pennsylvania also provided general employment data for 21 counties or area for 2000 and projections for 2010 and 2020. We interpolated these data to get growth factors for projecting from 2002 to 2009, 2012, and 2018 for nine area source categories identified by Pennsylvania. For all other area source categories, we used the AEO2005 forecasts for projecting emissions from area source fuel combustion and EGAS default factors for any remaining categories.

3.2.3.11 Rhode Island

Rhode Island provided county-level population projections for 2000, 2005, 2010, 2015, and 2020. We interpolated these data to get growth factors for projection from 2002 to 2009, 2012, and 2018 for those SCCs that are population based. Rhode Island provided state-level employment data from the Department of Labor and Training by 3-digit NAICS codes for 2002 and 2012. We used these data to calculate the growth factor from 2002 to 2012 and interpolated these data to derive growth factors for 2009 and 2018. We matched these industry NAICS groupings to SCC codes in order to create SCC specific growth factors for area sources. Rhode Island agreed on the use of the AEO2005 forecasts for projecting emissions from area source fuel combustion.

3.2.3.12 Vermont

Vermont agreed to use the EGAS 5.0 growth factors, with the enhancement of using the DOE’s 2005 Annual Energy Outlook data for combustion sources.

3.3 AREA SOURCE CONTROL FACTORS

We developed control factors to estimate emission reductions that will result from on-the-books regulations that will result in post-2002 emission reductions and proposed regulations or actions that will result in post-2002 reductions. Control factors were developed for the following national or regional control measures:

- OTC VOC Model Rules
- Federal On-board Vapor Recovery
- New Jersey Post-2002 Area Source Controls
- Residential Woodstove NSPS

3.3.1 OTC 2001 VOC Model Rules

Most of the MANE-VU States have adopted (or will soon adopt) the Ozone Transport Commission (OTC) model rules for five area source VOC categories: consumer products, architectural and industrial maintenance (AIM) coatings, portable fuel containers, mobile equipment repair and refinishing (MERR), and solvent cleaning. Information on the percent reduction anticipated by each model rule was obtained from Table II-6 of *Control Measure Development Support Analysis of Ozone Transport Commission Model Rules* (E.H. Pechan & Associates, Inc., March 31, 2001). This set of model rules will be referred to as the "OTC 2001 model rules" in this document. Information as to whether a particular state has adopted (or will soon adopt) a particular measure was obtained form the Status Report on OTC States' Efforts to Promulgate Regulations Based on OTC Model Rules (As of June 1, 2005, as posted on the OTC web site). For all categories, except portable fuel containers (see discussion below), we assumed that the rules would be fully implemented by all states by 2009. Some states had already adopted some the OTC 2001 Model Rules in 2002 or already had similar rules in place in 2002. The 2002 emission inventory for those states already reflected the emission reductions expected from the OTC 2001 Model Rule level of control. For those states and categories, no incremental reductions were applied for to the future year projections, as indicated Table 3-1.

For consumer products, the 2001 OTC model rule was estimated to provide a 14.2 percent VOC emissions reductions from the Federal Part 59 rule. Most, but not all, states in the OTR have adopted the OTC 2001 model rule for consumer products. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009. Thus, the 14.2 percent control factor was applied uniformly to all states in the 2009, 2012, and 2018 projection inventories.

For AIM coatings, the 2001 OTC model rule was estimated to provide a 31 percent VOC emissions reduction from the Federal Part 59 rule. Most, but not all, states in the OTR have adopted the OTC 2001 model rule for AIM coatings. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009. Thus, this control factor was applied uniformly to all states, with one exception. Maine adopted the OTC model rule with an alternative VOC content limit for varnishes and interior wood clear and semitransparent wood stains. As a result, Maine estimated that reductions from AIM coatings should be modeled using a 29.5 percent control factor instead of the 31 percent estimated for the OTC 2001 model rule.

For portable fuel containers, the 2001 OTC model rule was estimated to provide a 75 percent reduction in VOC emissions at the end of an assumed 10-year phase-in period as

Table 3-1 Adoption Matrix for 2001 OTC Model Rules

State	Consumer Products	AIM Coatings	Portable Fuel Containers	Mobile Equipment Repair and Refinishing	Solvent Cleaning
CT	Yes	Yes	Yes	Yes	Yes
DE	Yes	Yes	Yes	Yes	No
DC	Yes	Yes	Yes	Yes	No
ME	Yes	Yes	Yes	Yes	Yes
MD	Yes	Yes	Yes	No	No
MA	Yes	Yes	Yes	No	* (7%)
NH	Yes	Yes	Yes	Yes	Yes
NJ	Yes	Yes	Yes	Yes	** (17%)
NY	Yes	Yes	Yes	Yes	Yes
PA	Yes	Yes	Yes	No	No
RI	Yes	Yes	Yes	Yes	Yes
VT	Yes	Yes	Yes	Yes	No

Yes – apply incremental reductions in future years
No – OTC Model Rule reductions already accounted for in 2002 inventory; no incremental reductions applied to future years.
* MA is amending its existing Solvent/Degreasing rule and anticipates a 7% reduction from 2002 levels.
** NJ amended its existing Solvent/Degreasing rule and anticipates a 17% reduction from 2002 levels

older non-compliant containers are replaced with new compliant containers. The rule penetration (RP) depends on the assumed PFC estimated useful life and how quickly old non-compliant containers are replaced with new compliant containers. For the 2001 OTC model rule, the turnover from old to new containers is expected to be 10 percent per year. The MANEVU states have adopted the OTC 2001 model rule at different times, so the rule penetration will vary by State depending upon when the rule became effective in a given state. For example, compliant containers were required in Pennsylvania beginning on January 1, 2003. By the 2009 ozone season, there will be a 6.5 year turnover period for compliant PFCs in Pennsylvania. By contrast, compliant containers in New Jersey were not required until January 1, 2005. Thus, by the 2009 ozone season, there will be a 4.5 year turnover period for compliant PFCs. Table 3.2 shows the effective date for compliant containers by state, along with the rule penetration factors and overall control efficiency. There are different rule penetration factors for the three inventory years because of the increased penetration of compliant containers into the marketplace. By 2018, 100 percent compliance is assumed.

Table 3-2 Rule Penetration and Control Efficiency Values for 2001 OTC Model Rule for PFCs

Rule Compliance Date	States with this Compliance Date	Control Efficiency (%)	Rule Penetration (%)	Overall Control Efficiency (%)
Control Factor for 2009 Inventory				
2003	MD, NY, PA	75	65	48.8
2004	CT, DE, DC, ME	75	55	41.3
2005	NJ	75	45	33.8
2006	NH	75	35	26.3
2007*	MA, RI, VT	75	25	18.8
Control Factor for 2012 Inventory				
2003	MD, NY, PA	75	95	71.3
2004	CT, DE, DC, ME	75	85	63.8
2005	NJ	75	75	56.3
2006	NH	75	65	48.8
2007*	MA, RI, VT	75	55	41.3
Control Factor for 2018 Inventory				
2003	MD, NY, PA	75	100	75.0
2004	CT, DE, DC, ME	75	100	75.0
2005	NJ	75	100	75.0
2006	NH	75	100	75.0
2007*	MA, RI, VT	75	100	75.0

* The 2001 OTC model rule is not yet effective. It was assumed to become effective January 1, 2007 for the MANEVU modeling inventory. Massachusetts' rule actually will not become effective until 2009 and is based only on the OTC 2006 model rule; Massachusetts will not adopt the OTC 2001 model rule.

The emission reductions from the 2001 OTC PFC model rule were calculated only for the emissions accounted for in the area source inventory. Additional benefits (not estimated for this report) would be expected from equipment refueling vapor displacement and spillage that is accounted for in the nonroad inventory.

For mobile equipment repair and refinishing, the 2001 OTC model rule was estimated to provide a 38 percent VOC emissions reductions from the Federal Part 59 rule (35% for paint application and 3% for cleaning operations). Most, but not all, states in the OTR have adopted the OTC 2001 model rule for MERR or already had similar rules in effect in

2002. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009 or have similar rules in effect. For those states (MD, MA, PA) that had similar rules in effect in 2002 or earlier, no incremental reductions were applied since it was assumed that the effects of the state rule were already accounted for in the 2002 inventory. New Jersey indicated that a 19 percent control factor should be used for VOC emissions from MERR in New Jersey. For all other states, the OTC 2001 Model Rule control factor of 38 percent was applied.

For solvent cleaning, the 2001 OTC model rule was estimated to provide a 66 percent VOC emissions reductions. Most, but not all, states in the OTR have adopted the OTC 2001 model rule for solvent cleaning or already had similar rules in effect in 2002. For this inventory, it was assumed that all OTC states would adopt the 2001 OTC model rule prior to 2009 or have similar rules in effect. For those states (DE, DC, MD, PA, VT) that had similar rules in effect in 2002 or earlier, no incremental reductions were applied since it was assumed that the effects of the state rule were already accounted for in the 2002 inventory. Massachusetts indicated that some portion of the reductions resulting from the OTC 2001 model rule were already accounted for in their 2002 emissions, but that the state anticipated an additional 7 percent reduction from anticipated amendments. New Jersey indicated that a 17 percent control factor should be used for VOC emissions from solvent cleaning in New Jersey. For all other states (CT, ME, NH, NY, RI), the OTC 2001 Model Rule control factor of 66 percent was applied.

Table D-1 in Appendix D shows the anticipated percent reductions by state, SCC, and year from implementation of the OTC 2001 VOC Model Rules.

3.3.2 On-Board Vapor Recovery

The U.S. EPA issued regulations requiring onboard vapor recovery (ORVR) standards for the control of vehicle refueling emissions in 1994. ORVR works by routing refueling vapors to a carbon canister on the vehicle and are expected to achieve from 95-98 percent reduction in VOC emissions for those vehicles equipped with ORVR. ORVR is required to be installed on some new light-duty gasoline vehicles in 1998, and all new light-and medium-duty automobiles and trucks will be required to have ORVR installed by 2006.

For the Lake Michigan Air Directors Consortium, E.H. Pechan made estimates of emission reductions as they grow over time due to increased rule penetration. The following discussion describes how the on-board vapor recovery control factors were developed (email from Maureen Mullen, E.H. Pechan):

> "Onroad refueling control factors were calculated based on the percentage difference between the projection year (2007, 2008, 2009, 2012, and 2018) MOBILE6 refueling emission factors and the 2002 MOBILE6 refueling emission factors.
>
> MOBILE6 emission factors were calculated at January and July temperature and fuel conditions. July emission factors were used as the surrogate for the five-month ozone season (May through September) and the January emission factors were used as the surrogates for the remaining seven months. Temperatures modeled were the January and July average daily monthly maximum and minimum temperatures for each State, based on 30-year average temperature data, as used in EPA's second Section 812 Prospective analysis. Within a State, MOBILE6 input files were created for each unique combination of: January and July RVP, RFG, oxygenated fuel, and Stage II control programs. Fuel data was based on 2002 data, also as used in the Section 812 analysis. Information on Stage II control programs and control efficiencies were provided by EPA, as included in the draft 2002 NEI. Using these same temperature inputs, fuel inputs, and Stage II control inputs (where applicable), Pechan calculated MOBILE6 emission factors for calendar years 2002, 2007, 2008, 2009, 2012, and 2018.
>
> The resulting MOBILE6 emission factors were first weighted according to the default MOBILE6 VMT mix to determine the weighted average refueling emission factor for all gasoline vehicle types. The resulting January and July emission factors were weighted together according to the number of days in the seven-month season (212 days) and the five-month ozone season (153). After this was done for all of the modeled years and State or sub-State areas, the overall control efficiency for refueling, due to fleet turnover, was calculated based on the percentage difference between the 2002 and corresponding projection year emission factors. These control efficiencies were then assigned to individual counties, based on the mapping of fuel and Stage II control parameters to those modeled in the MOBILE6 files."

These projections were made on a county-by-county basis. Table D-2 shows the anticipated percent reductions by county, SCC, and year.

3.3.3 Post-2002 Area Source Controls in New Jersey

New Jersey made gasoline transfer provision amendments at N.J.A.C. 7:27-16.3. The Stage I portion of the amendments are expected to result in emissions reductions of 23.2 percent from the 2002 baseline. This is based on a control efficiency of 29 percent and a rule effectiveness of 80 percent. The State II portion of the amendments are already incorporated into the inventory through the MOBILE6 inputs.

New Jersey also made amendments to ICI boiler provisions at N.J.A.C. The amendments require any ICI boiler has a maximum gross heat input rate of at least 5 mmBTU/hour, whether or not it is located at a major NO_x facility, to conduct annual tune-ups. In the support documentation for this rule amendment, New Jersey estimated that the tune-ups would result in a 25 percent reduction in NOx emissions.

3.3.4 Residential Wood Combustion

Control factors were evaluated to account for the replacement of retired woodstoves that emit at pre-new source performance standard (NSPS) levels. We used EPA's latest methodology provided by Marc Houyoux of EPA/OAQPS. This methodology uses a combination growth and control factor and is based on activity not pollutant. The growth and control are accounted for in a single factor the SCCs split out the controlled and uncontrolled equipment. The control is indirectly incorporated based on which stove is used. The combined growth and control rates are as follows:

- Fireplaces increase 1%/yr
- Old woodstoves (non-EPA certified) decrease 2%/yr
- New woodstoves (EPA certified) increase 2%/yr

The data to support these rates were collected as part of the woodstove change-out program development in OAQPS. Table D-3 shows the anticipated percent changes by SCC and year.

3.4 AREA SOURCE QA/QC REVIEW

Throughout the inventory development process, quality assurance steps were performed to ensure that no double counting of emissions occurred, to ensure that a full and complete inventory was developed for MANE-VU, and to make sure that projection calculations were working correctly. Quality assurance was an important component to the inventory development process and MACTEC performed the following QA steps on the area source components of the 2009/2012/2018 projection inventories:

1. State agencies reviewed the draft growth and control factors in the summer of 2005. Changes based on these comments were implemented in the files.
2. SCC level emission summaries were prepared and evaluated to ensure that emissions were consistent and that there were no missing sources. Tier comparisons (by pollutant) were developed between the revised 2002 base year inventory and the 2009/2012/2018 projection inventories.
3. Emission inventory files in NIF format were provided for state agency review and comment. Changes based on these comments were implemented.
4. All final files were run through EPA's Format and Content checking software.

3.5 AREA SOURCE NIF, SMOKE AND SUMMARY FILES

The Version 3 file names and descriptions delivered to MARAMA are shown in Table 3-3.

3.6 AREA SOURCE EMISSION SUMMARIES

Emission summaries by state, year, and pollutant are presented in Tables 3-4 through 3-10 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 3-3 Area Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_OTB2009_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2009 OTB area source NIF inventory
MANEVU_OTB2012_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2012 OTB area source NIF inventory
MANEVU_OTB2018_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2018 OTB area source NIF inventory
MANEVU_OTB2009_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2009 OTB area source inventory in SMOKE IDA format
MANEVU_OTB2012_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2012 OTB area source inventory in SMOKE IDA format
MANEVU_OTB2018_Area_IDA3V_2.txt	Nov. 20, 2006	Version 3.2 of 2018 OTB area source inventory in SMOKE IDA format
MANEVU OTB BOTW Area V3_2 State Summary.xls	Nov. 8, 2006	Spreadsheet with state totals by pollutant for all area sources
MANEVU OTB BOTW Area V3_2 State SCC Summary.xls	Nov. 8, 2006	Spreadsheet with SCC totals by state and pollutant for all area sources.

Table 3-4 Area Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	70,198	65,865	63,874	59,797
DE	14,052	15,395	15,233	14,864
DC	2,300	2,417	2,460	2,512
ME	109,223	102,743	99,877	94,181
MD	141,178	143,653	144,233	144,649
MA	137,496	132,797	130,255	125,205
NH	79,647	76,504	75,319	73,038
NJ	97,657	90,432	88,048	83,119
NY	356,254	336,576	327,118	307,659
PA	266,935	266,887	264,012	257,396
RI	8,007	8,007	8,026	8,024
VT	43,849	42,683	42,172	41,283
Total	**1,326,796**	**1,283,959**	**1,260,627**	**1,211,727**

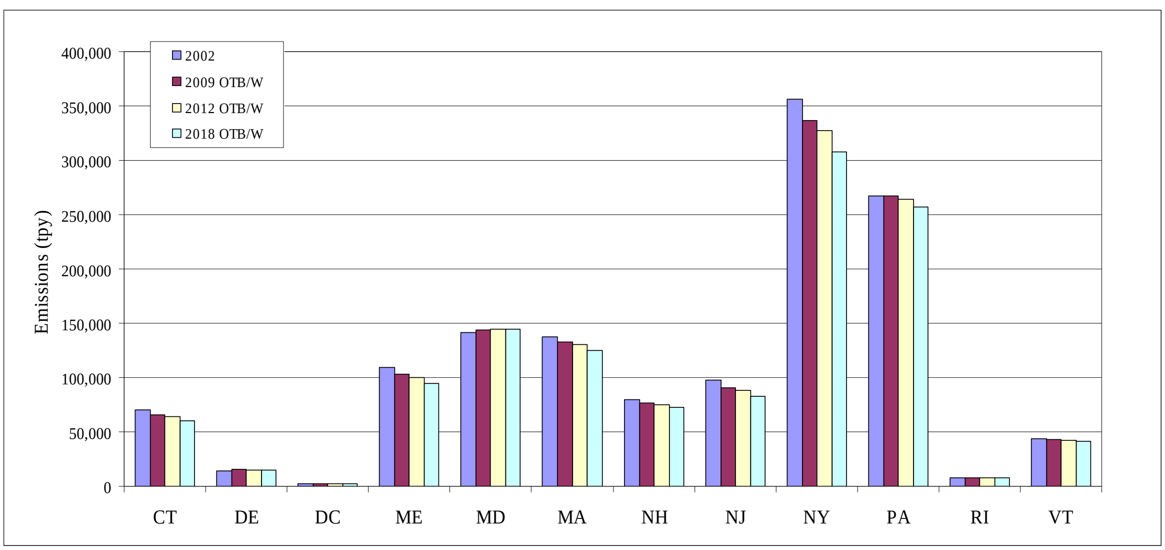


Table 3-5 Area Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	5,318	5,208	5,156	5,061
DE	13,279	13,316	13,328	13,342
DC	14	16	16	17
ME	8,747	10,453	11,116	12,312
MD	25,834	31,879	34,222	38,155
MA	18,809	19,131	19,275	19,552
NH	2,158	2,466	2,584	2,789
NJ	17,572	19,457	20,154	21,435
NY	67,422	81,626	87,116	96,078
PA	79,911	98,281	105,418	117,400
RI	883	945	972	1,025
VT	9,848	12,156	13,062	14,580
Total	**249,795**	**294,934**	**312,419**	**341,746**

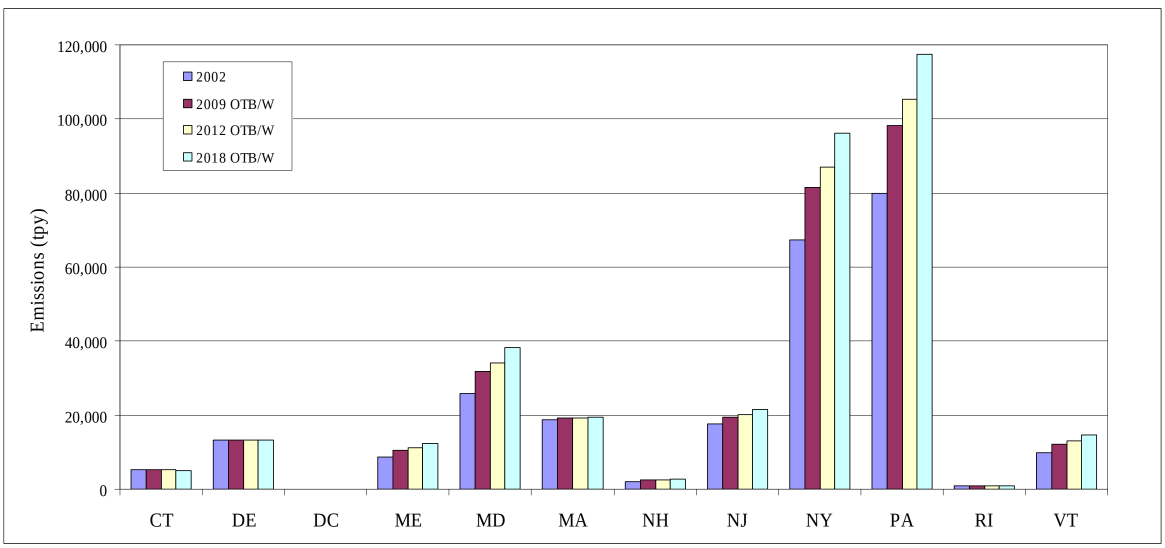


Table 3-6 Area Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	12,689	13,173	13,342	13,388
DE	2,608	2,821	2,913	3,014
DC	1,644	1,961	2,081	2,259
ME	7,360	7,477	7,486	7,424
MD	15,678	16,858	17,315	18,073
MA	34,281	35,732	36,331	37,187
NH	10,960	11,879	12,055	12,430
NJ	26,692	24,032	23,981	23,660
NY	98,803	106,375	107,673	108,444
PA	47,591	50,162	50,793	50,829
RI	3,886	4,149	4,260	4,397
VT	3,208	3,419	3,429	3,430
Total	**265,400**	**278,038**	**281,659**	**284,535**

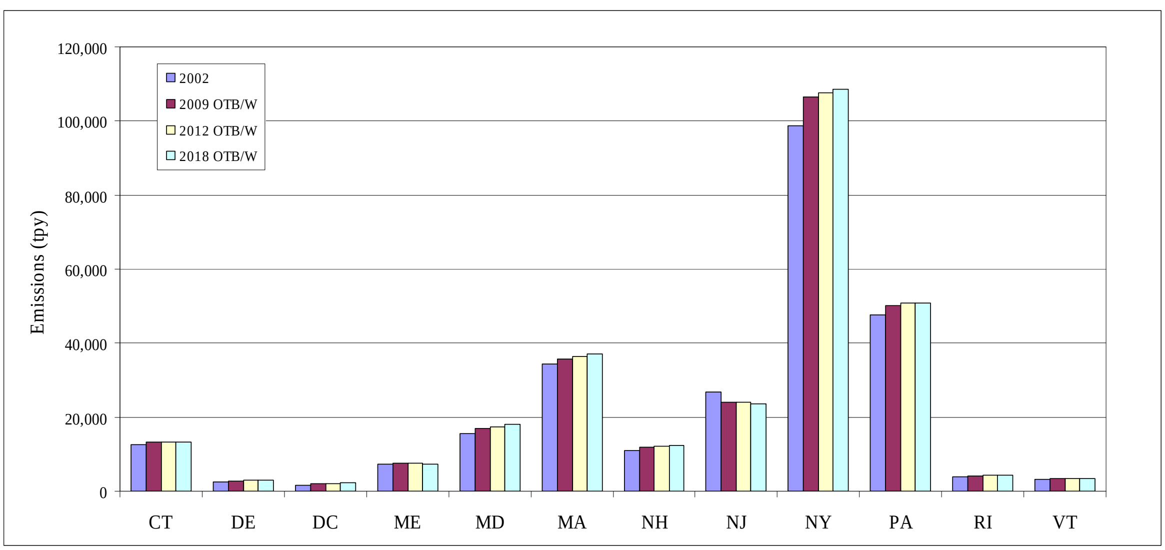


Table 3-7 Area Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	48,281	48,970	49,004	49,479
DE	13,039	13,928	14,236	14,844
DC	3,269	3,511	3,605	3,825
ME	168,953	175,979	179,689	189,619
MD	95,060	105,944	110,141	117,396
MA	192,860	198,668	200,692	204,922
NH	43,328	46,060	47,187	49,801
NJ	61,601	61,684	61,284	60,880
NY	369,595	382,124	385,925	392,027
PA	391,897	421,235	432,844	454,970
RI	8,295	8,962	9,244	9,797
VT	56,131	60,521	62,465	66,916
Total	**1,452,309**	**1,527,586**	**1,556,316**	**1,614,476**

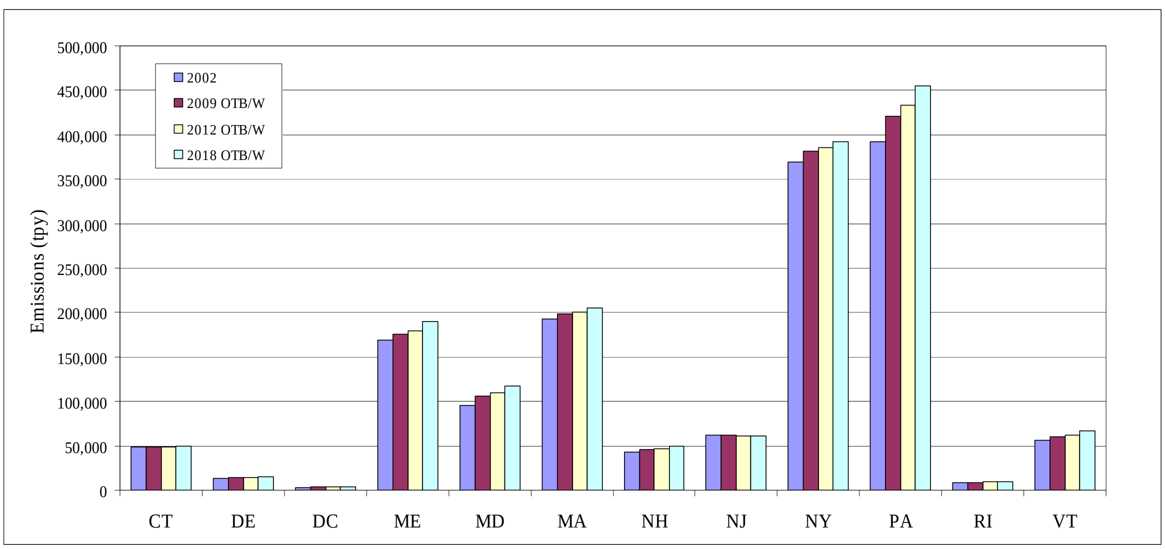


**Table 3-8 Area Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)**

State	2002	2009	2012	2018
CT	14,247	13,766	13,517	13,033
DE	3,204	3,387	3,403	3,426
DC	805	860	879	917
ME	32,774	33,026	33,189	33,820
MD	27,318	28,923	29,508	30,449
MA	42,083	43,121	43,186	43,438
NH	17,532	17,965	18,050	18,316
NJ	19,350	18,590	18,271	17,653
NY	87,154	87,576	87,260	86,422
PA	74,925	79,169	80,728	83,570
RI	2,064	2,184	2,232	2,316
VT	11,065	11,482	11,652	12,059
Total	**332,521**	**340,049**	**341,875**	**345,419**

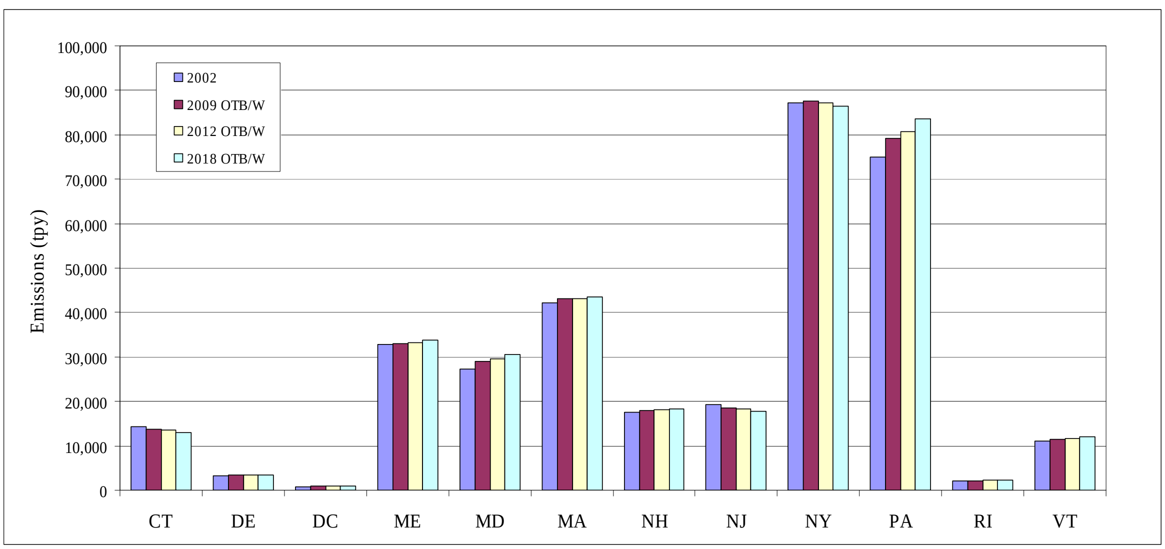


Table 3-9 Area Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	12,418	12,581	12,604	12,184
DE	1,588	1,599	1,602	1,545
DC	1,337	1,487	1,541	1,632
ME	13,149	13,776	13,846	13,901
MD	12,393	13,685	14,074	14,741
MA	25,488	25,961	26,029	25,570
NH	7,072	7,463	7,470	7,421
NJ	10,744	10,672	10,697	10,510
NY	130,409	139,589	140,154	141,408
PA	63,679	67,535	67,446	66,363
RI	4,557	5,024	5,189	5,398
VT	4,087	4,646	4,687	4,764
Total	**286,921**	**304,018**	**305,339**	**305,437**

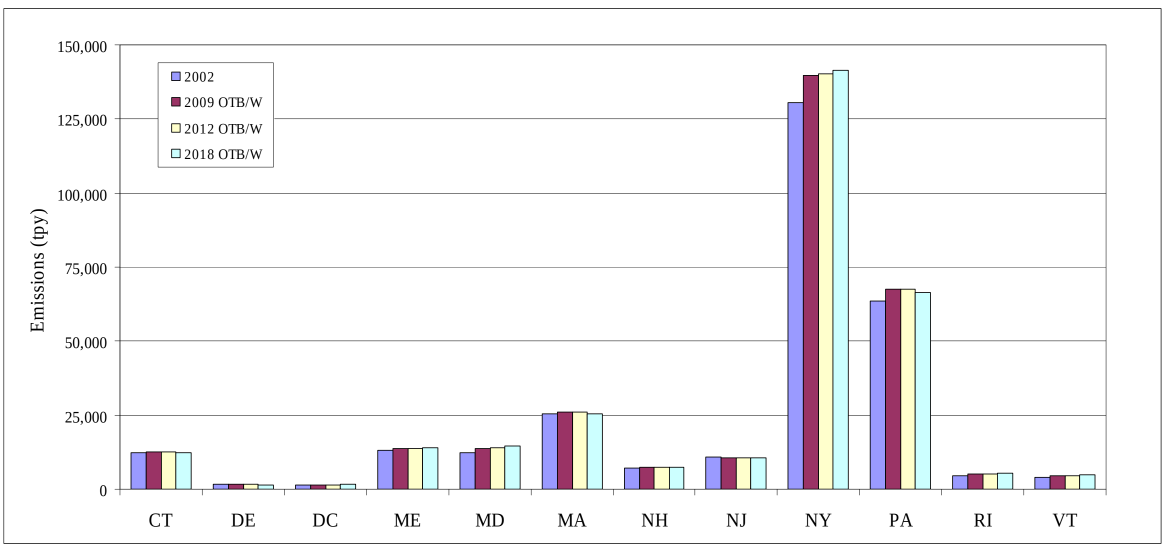
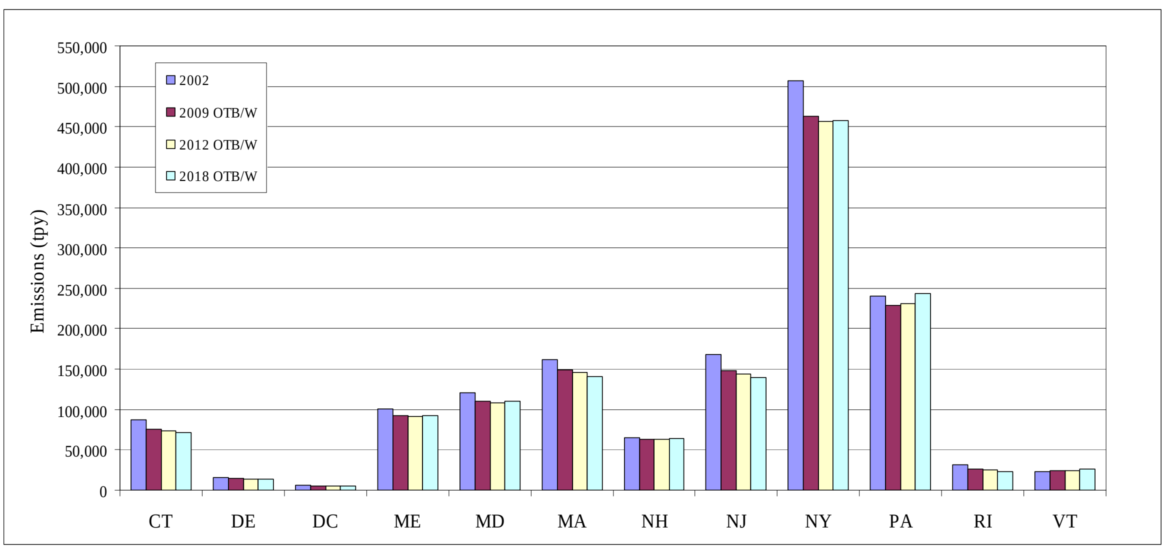


Table 3-10 Area Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	87,302	75,693	73,560	71,274
DE	15,519	14,245	13,943	13,744
DC	6,432	5,420	5,352	5,255
ME	100,621	91,910	91,667	92,410
MD	120,254	110,385	108,067	110,046
MA	162,145	148,625	145,674	140,558
NH	65,370	63,069	63,356	64,368
NJ	167,882	147,617	143,752	139,626
NY	507,292	462,811	456,856	457,421
PA	240,785	228,444	230,393	243,421
RI	31,402	26,695	25,548	23,561
VT	23,265	24,068	24,635	26,198
Total	**1,528,269**	**1,398,982**	**1,382,803**	**1,387,882**



4.0 NONROAD SOURCES

The nonroad source sector is comprised of nonroad engines included in EPA's NONROAD model, as well as other nonroad engines not accounted for in the NONROAD model, including aircraft, commercial marine vessels, and locomotive engines. The sections that follow describe the projection process used to develop 2009/2012/2018 nonroad projection estimates for sources found in the NONROAD model and those sources estimated outside of the model (locomotives, airplanes and commercial marine vessels).

4.1 NONROAD MODEL SOURCES

NONROAD model source categories include equipment such as recreational boats and watercraft; recreational vehicles; farm, industrial, mining, and construction machinery; and lawn and garden equipment. Also included are aircraft ground support equipment and rail maintenance equipment. These equipment types are powered by engines using diesel, gasoline, compressed natural gas (CNG), and liquefied petroleum gas (LPG).

EPA released a revised version of NONROAD during December 2005 called NONROAD 2005. EPA's National Mobile Inventory Model (NMIM) is a consolidated modeling system that incorporates the NONROAD and MOBILE models, along with a county database of inputs. EPA also released an updated version of NMIM called NMIM2005, which incorporates the NONROAD2005 model.

MACTEC utilized the NMIM2005 model to develop projections for nonroad engines included in the NONROAD2005 model. Projected emission estimates were calculated using NMIM default data. Prior to starting the NMIM2005 runs, MACTEC confirmed with U.S. EPA's Office of Transportation and Air Quality (OTAQ) that the database used for fuel sulfur content, gas Reid Vapor Pressure (RVP) values and reformulated fuel programs was current and up to date for the MANE-VU region. The information received from OTAQ indicated that these values were the most current.

NMIM2005 runs were then developed for each projection year. These included 2009, 2012 and 2018. Emission calculations were made at the monthly level and consolidated to provide annual values. This enabled monthly temperatures and changes in reformulated gas to be captured by the program.

The NMIM/NONROAD2005 results in NIF 3.0, and ran EPA's QA checker program to verify that the NIF 3.0 files were properly constructed.

4.2 AIRCRAFT, COMMERCIAL MARINE, AND LOCOMOTIVES

Since aircraft, commercial marine vessels, and locomotives are not included in the NONROAD model, emission projections for these sources were developed separately. The starting point for the emission projections was Version 3 of the MANE-VU 2002 Nonroad emission inventory (*Documentation of the MANE-VU 2002 Nonroad Sector Emission Inventory, Version 3, Draft Technical Memorandum*, March 2006).

MACTEC's approach to developing emission projections for these sources was to use combined growth and control factors developed from emission projections for U.S. EPA's Clean Air Interstate Rule (CAIR) development effort. MACTEC obtained emission projections developed for the CAIR rule. We then calculated the combined growth and control factors by determining the ratio of emissions between 2002 and each of the MANE-VU projection years (2009, 2012, and 2018). The CAIR emissions were available for 2001, 2010, 2015 and 2020. Thus, we developed intermediate year estimates using linear interpolation between the actual CAIR years and the MANE-VU years.

Using this approach we developed State/county/SCC/pollutant growth/control factors for use in projecting the MANE-VU base year data to the year of interest. These values were then used to multiply times the base year value to obtain the projected values. Since the development of the CAIR factors included both growth and controls, no separate control factors were developed for these sources except where exceptions to this method were used for States that requested alternative growth/control methods (see below).

Once the CAIR factors were developed, MACTEC compared the SCCs contained in the CAIR inventory with those used in MANE-VU. In some cases there were differences. In cases where a similar SCC in the CAIR inventory could be assigned to the SCC in the MANE-VU inventory the State/County/SCC/pollutant growth and control factor for the substitute was assigned to the MANE-VU SCC. If no corresponding county SCC substitution could be found, a State or MANE-VU regional average value for the substitute SCC was developed and assigned for use in projecting emissions. The substitution scheme was to use State values first, then MANE-VU regional values if the State value couldn't be used.

This projection method was used with three exceptions. These exceptions were: 1) Maryland sources, 2) DC locomotive growth and controls and 3) Logan (Boston) airport. Each of these sources used alternative growth and/or controls provided by the States or developed from current Federal rules for these sources (applies to controls only). Each of these is discussed below.

4.2.1 Maryland Non-NONROAD Source Emissions

Maryland indicated that they would prefer to use EGAS growth factors coupled with Federal controls to determine projected emissions for these source categories. Maryland provided EGAS growth factors for use with these categories. Control values were developed based on Federal rules that were on the books.

For CMV, controls were developed based on data contained in Table 1.1-2 of the document "Final Regulatory Support Document: Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder," EPA420-R-03-004, January 2003. Values in that table were interpolated to develop emission estimates with and without controls for the MANE-VU years (and base year) and then control factors were calculated for those values. Only Category 3 marine engines were identified in the Maryland inventory and thus only NOx controls for those engines were developed.

For locomotives, control factors for different types of locomotives were developed using Tables 6-2 through 6-5 of the document "Locomotive Emission Standards: Regulatory Support Document," United States Environmental Protection Agency, Office of Mobile Sources, April 1998. Since these tables only showed PM controls, we assumed the same level of control for both PM-10 and PM-2.5. Controls for VOC, NOx and PM were developed using these tables.

In addition to engine specification controls for both CMV and locomotives, we also developed control factors resulting from changes to diesel fuel sulfur contents. The diesel fuel sulfur regulations were utilized to develop controls for SO2 and PM due solely to changing fuel sulfur requirements. Data from Tables 3.1-6a and 3.4-8a of the document "Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines," EPA420-R-04-007, May 2004 were used to develop control levels created due to changes in fuel sulfur content. In cases where there were controls due to both engine technology and fuel sulfur reduction, we added the control efficiencies together to create a combined control efficiency. All control values are considered to be "additive". In other words, the controls applied are above those found in the base year. Thus the controls were used on the base year emission values without back-calculation to determine uncontrolled levels since the controls are in addition to those controls.

The control values were then applied along with the growth factors to the base year emissions for Maryland to produce the required emission projections.

4.2.2 DC Locomotive Emissions

The District of Columbia emission contact provided MACTEC with alternative growth factors for locomotive emissions. The growth factors provided were:

2002-2009	6.9%
2002-2012	9.9%
2002-2018	13.7%

Since the CAIR factors were combined growth and controls, the control factors developed for locomotives for Maryland (based on Federal control programs) were used to apply controls to the DC locomotive emissions. As was the case for Maryland, the control factors were “additive” and were used on the base year emission without back-calculating uncontrolled emissions since the control levels were relative to controls in place for 2002.

4.2.3 Logan (Boston) Airport Emissions

Massachusetts supplied historic and future year projections of operations at Logan Airport. The data covered the period 2000-2010. Since only one year of the period required for MANE-VU projections was included in that interval (2009), MACTEC developed estimates for 2012 and 2018 from those data by linear interpolation. Two linear interpolations were developed. The first used the entire data set (2000-2010) to develop a linear projection for 2012 and 2018 and a second using just the 2002-2010 data. For the final growth factors, MACTEC used the average of the two. These growth factors were then applied to commercial aircraft operations for Suffolk County (FIPS = 25025). The growth factors developed were:

2002-2009	1.184
2002-2012	1.22
2002-2018	1.33

No controls that would come on board for aircraft for the projection years were identified from a review of Federal programs.

4.3 NONROAD QA/QC REVIEW

Throughout the inventory development process, quality assurance steps were performed to ensure that no double counting of emissions occurred, to ensure that a full and complete inventory was developed for MANE-VU, and to make sure that projection calculations were working correctly. MACTEC performed the following QA steps on nonroad source projection inventories: (1) All final files (NONROAD only) were run through EPA’s Format and Content checking software; SCC level emission summaries were prepared and evaluated to ensure that emissions were consistent with the 2002 projections and that there were no missing source categories or geographical areas.

4.4 NONROAD NIF, SMOKE, AND SUMMARY FILES

The Version 3.1 files delivered to MARAMA are shown in Table 4-1.

4.5 NONROAD EMISSION SUMMARIES

Table 4-2a shows the CO emissions by state and year for the entire nonroad sector. Table 4-2b presents the CO emission results for NONROAD model equipment only. Table 4-2c presents the CO emission results for only the aircraft, commercial marine vessel, and locomotive categories. Tables 4-3 to 4-8 present the emission results for the other criteria pollutants of interest.

Table 4-1 Nonroad Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_OTB2009_NR_NIFV3_1.mdb	Oct. 23, 2006	Version 3.1 of 2009 nonroad source NIF inventory
MANEVU_OTB2012_NR_NIFV3_1.mdb	Oct. 23, 2006	Version 3.1 of 2012 nonroad source NIF inventory
MANEVU_OTB2018_NR_NIFV3_1.mdb	Oct. 23, 2006	Version 3.1 of 2018 nonroad source NIF inventory
MANEVU_OTB2009_NR_IDAV3_1.txt	Oct. 26, 2006	Version 3.1 of 2009 nonroad source inventory in SMOKE IDA format
MANEVU_OTB2012_NR_IDAV3_1.txt	Oct. 26, 2006	Version 3.1 of 2012 nonroad source inventory in SMOKE IDA format
MANEVU_OTB2018_NR_IDA3V_1.txt	Oct. 26, 2006	Version 3.1 of 2018 nonroad source inventory in SMOKE IDA format
MANEVU OTB Nonroad V3_1 State Summary.xls	Oct. 23, 2006	Spreadsheet with state totals by pollutant for all nonroad sources, NONROAD model sources, and aircraft, locomotives, and commercial marine vessels
MANEVU OTB Nonroad V3_1 State SCC Summary.xls	Oct. 23, 2006	Spreadsheet with SCC totals by state and pollutant for all nonroad sources, NONROAD model sources

Table 4-2a All Nonroad Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	276,773	282,788	288,061	303,764
DE	68,782	74,856	76,491	80,646
DC	18,845	20,746	21,306	22,429
ME	153,424	163,782	165,273	166,679
MD	437,400	497,276	513,737	550,795
MA	461,514	504,400	516,019	546,373
NH	130,782	142,318	143,804	147,544
NJ	704,396	753,916	777,069	831,880
NY	1,233,968	1,349,439	1,388,406	1,474,727
PA	931,978	1,031,816	1,058,256	1,119,247
RI	73,013	80,228	82,113	87,195
VT	62,248	68,360	69,003	70,074
Total	**4,553,124**	**4,969,925**	**5,099,538**	**5,401,353**

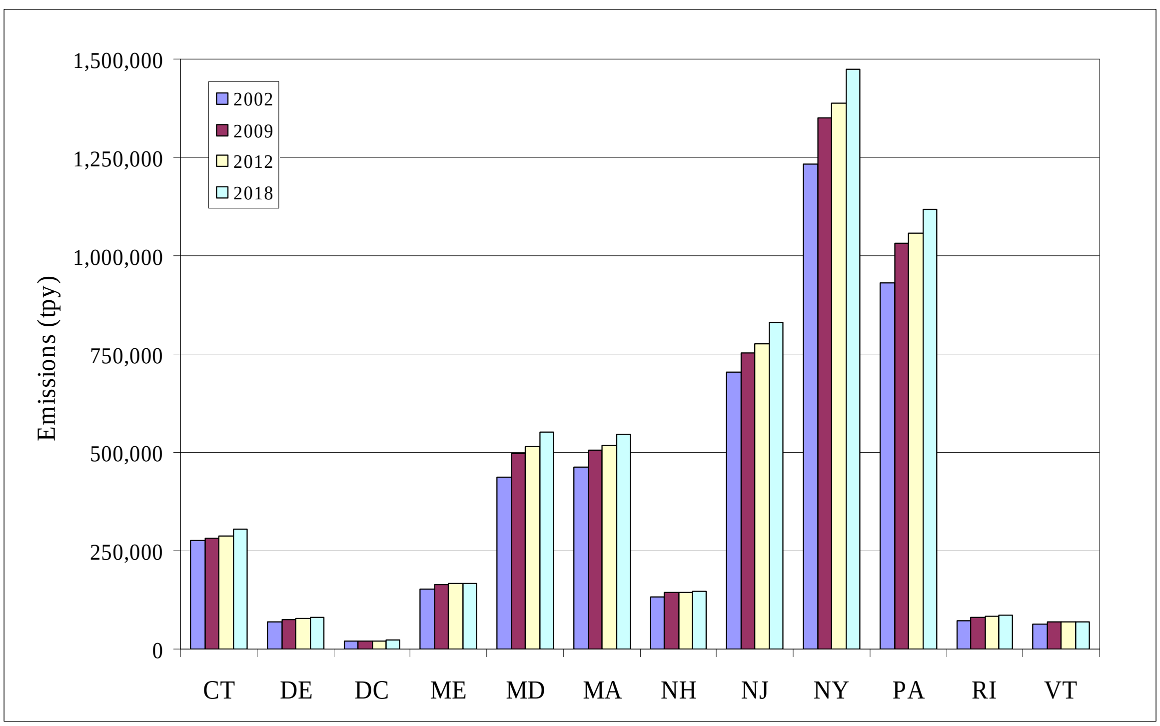


Table 4-2b NONROAD Model Sources
OTB/OTW Annual CO Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	274,388	280,253	285,415	300,931
DE	65,954	71,877	73,397	77,356
DC	18,775	20,671	21,229	22,350
ME	148,555	158,715	160,043	161,215
MD	424,777	482,312	497,806	532,970
MA	448,399	490,895	501,684	530,686
NH	128,572	139,288	140,655	144,191
NJ	692,548	741,792	764,424	818,519
NY	1,219,309	1,333,923	1,372,164	1,457,277
PA	903,168	1,003,480	1,029,045	1,088,614
RI	71,573	78,764	80,607	85,618
VT	61,732	67,802	68,421	69,456
Total	**4,457,748**	**4,869,771**	**4,994,890**	**5,289,186**

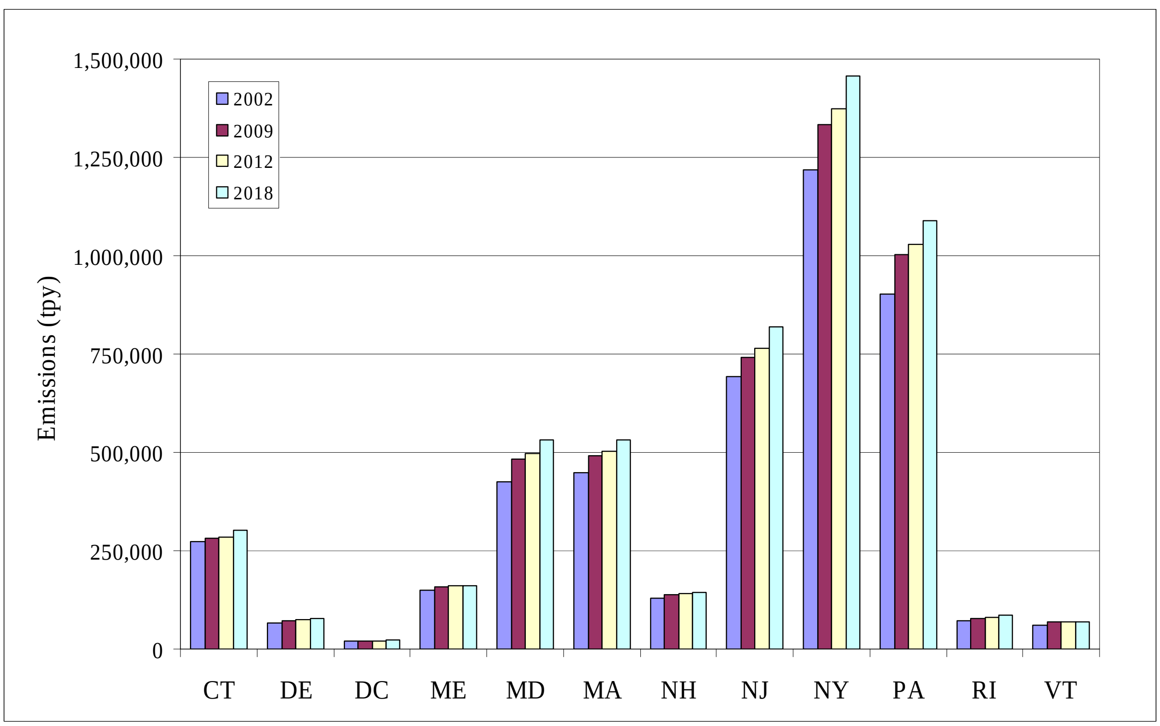


Table 4-2c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual CO Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	2,385	2,535	2,646	2,833
DE	2,828	2,979	3,094	3,290
DC	70	75	77	79
ME	4,868	5,067	5,230	5,464
MD	12,624	14,964	15,931	17,825
MA	13,116	13,505	14,335	15,687
NH	2,211	3,030	3,149	3,353
NJ	11,849	12,124	12,645	13,361
NY	14,660	15,516	16,242	17,450
PA	28,810	28,336	29,211	30,633
RI	1,440	1,464	1,506	1,577
VT	516	558	582	618
Total	**95,375**	**100,154**	**104,648**	**112,167**

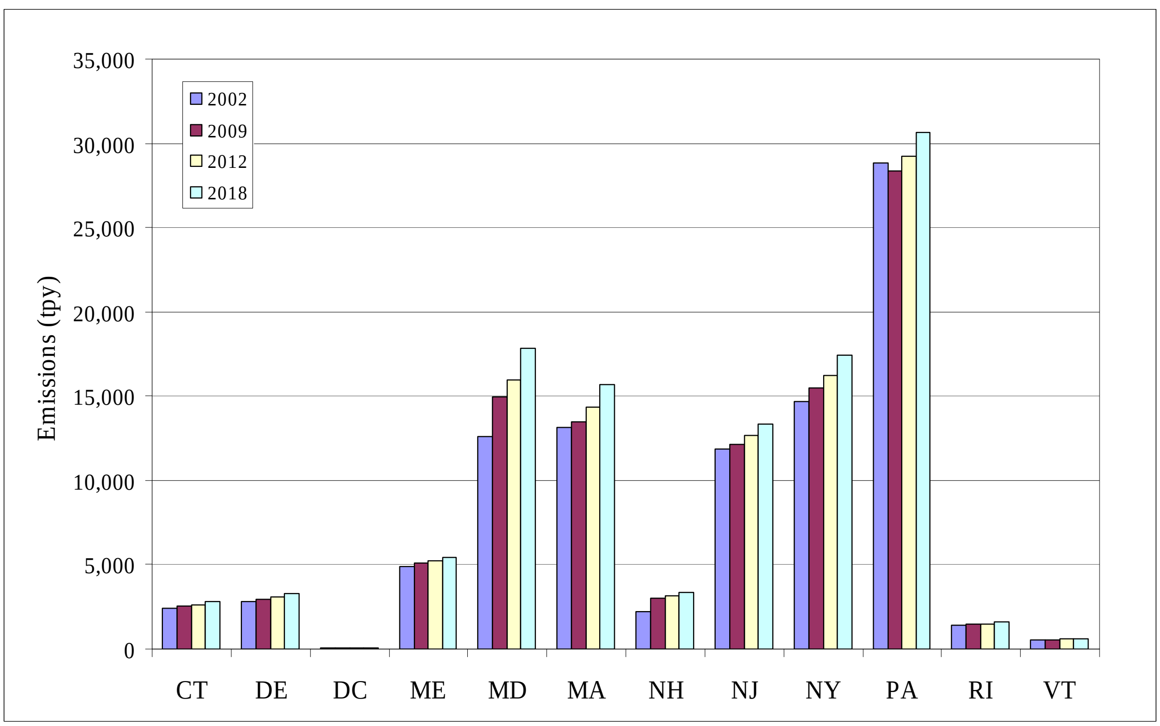


Table 4-3a All Nonroad Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	17	18	19	21
DE	5	6	6	7
DC	2	3	3	3
ME	11	13	14	15
MD	28	31	33	36
MA	28	31	33	36
NH	9	10	11	12
NJ	43	45	47	52
NY	79	89	94	103
PA	55	62	66	73
RI	4	4	5	5
VT	5	5	6	6
Total	**287**	**317**	**337**	**369**

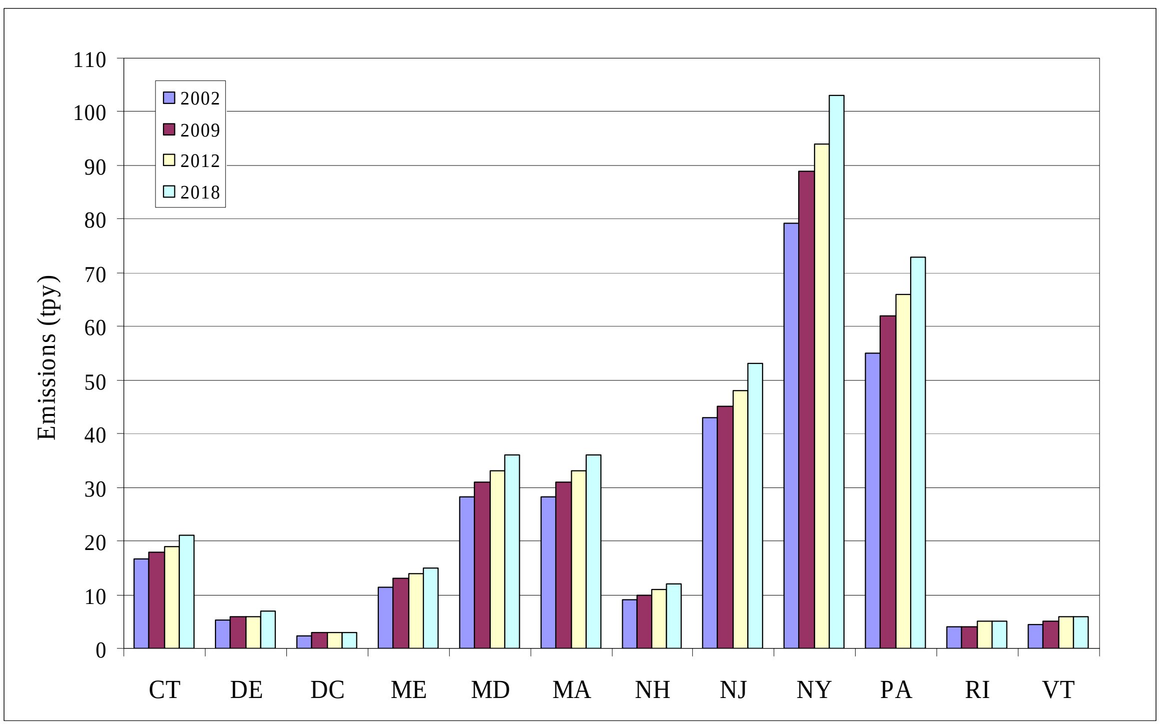


Table 4-3b NONROAD Model Sources
OTB/OTW Annual NH3 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	17	18	19	21
DE	5	6	6	6
DC	2	3	3	3
ME	11	13	14	15
MD	28	31	33	36
MA	28	31	33	36
NH	9	10	11	12
NJ	43	45	47	52
NY	79	89	94	103
PA	55	62	66	73
RI	4	4	5	5
VT	5	5	6	6
Total	**287**	**318**	**335**	**369**

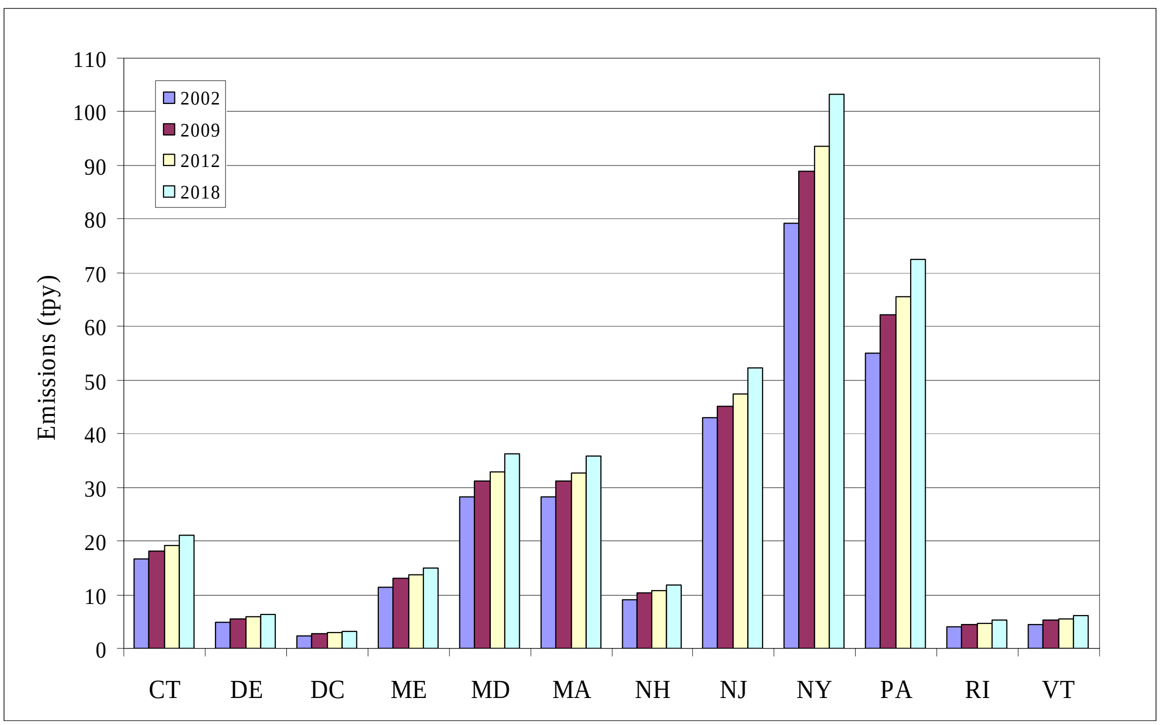


Table 4-3c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual NH3 Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	0	0	0	0
DE	0	0	0	0
DC	0	0	0	0
ME	0	0	0	0
MD	0	0	0	0
MA	0	0	0	0
NH	0	0	0	0
NJ	0	0	0	0
NY	0	0	0	0
PA	0	0	0	0
RI	0	0	0	0
VT	0	0	0	0
Total	**<1**	**<1**	**<1**	**<1**

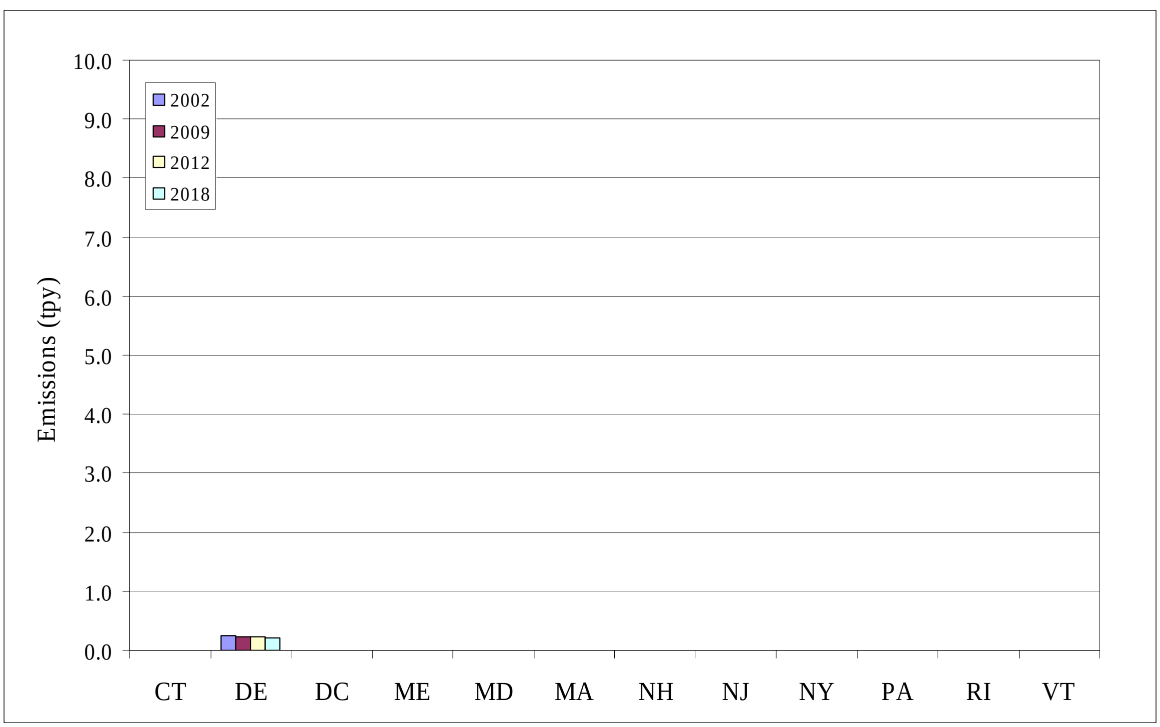


Table 4-4a All Nonroad Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	25,460	21,512	19,316	16,233
DE	16,227	15,439	15,081	14,631
DC	3,571	2,981	2,620	1,815
ME	9,820	8,500	7,752	6,543
MD	37,472	31,762	29,058	24,257
MA	42,769	35,703	32,118	27,040
NH	9,912	8,485	7,624	6,344
NJ	63,479	52,703	48,234	41,166
NY	109,878	94,186	85,852	72,400
PA	103,824	76,105	67,818	55,771
RI	5,002	4,022	3,470	2,723
VT	4,217	3,452	2,992	2,262
Total	**431,631**	**354,850**	**321,935**	**271,185**

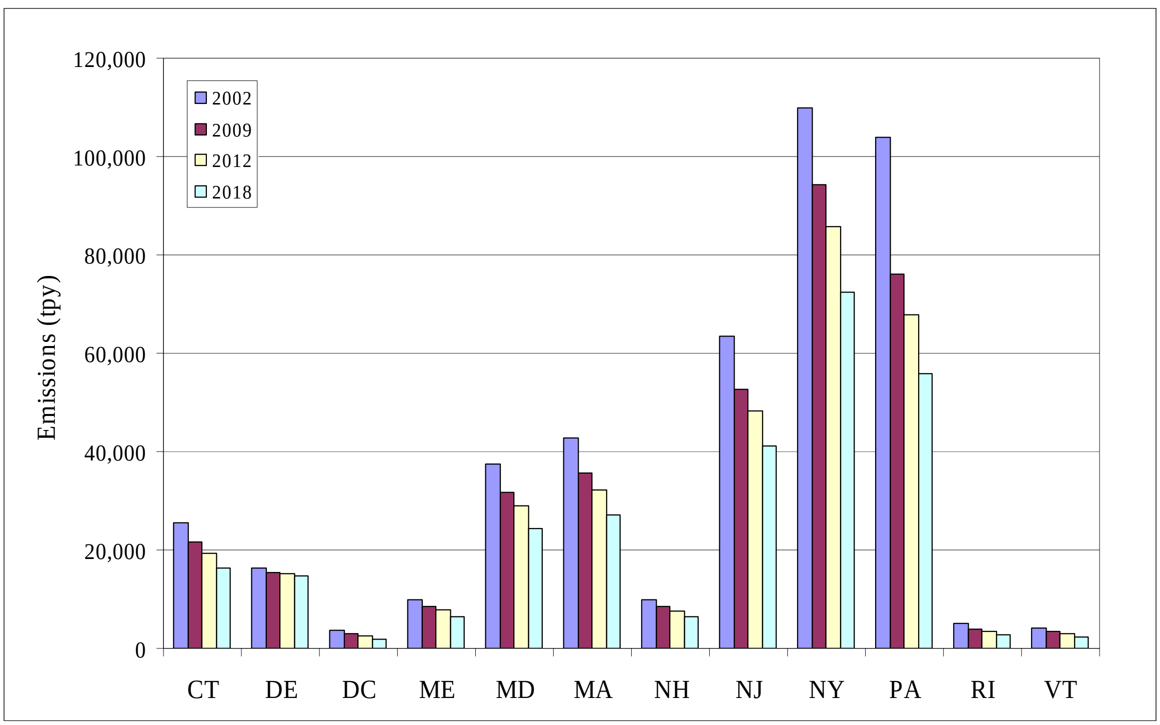


Table 4-4b NONROAD Model Sources
OTB/OTW Annual NOx Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	17,897	14,849	12,811	9,784
DE	5,798	4,755	4,108	2,966
DC	3,066	2,561	2,221	1,444
ME	8,229	6,957	6,211	4,970
MD	27,789	23,431	20,839	15,745
MA	30,047	24,606	21,274	16,096
NH	8,150	6,749	5,893	4,583
NJ	43,515	34,447	30,416	23,594
NY	78,648	66,645	58,900	45,400
PA	62,265	49,982	42,571	30,797
RI	4,564	3,624	3,066	2,294
VT	4,170	3,403	2,941	2,205
Total	**294,138**	**242,009**	**211,252**	**159,877**

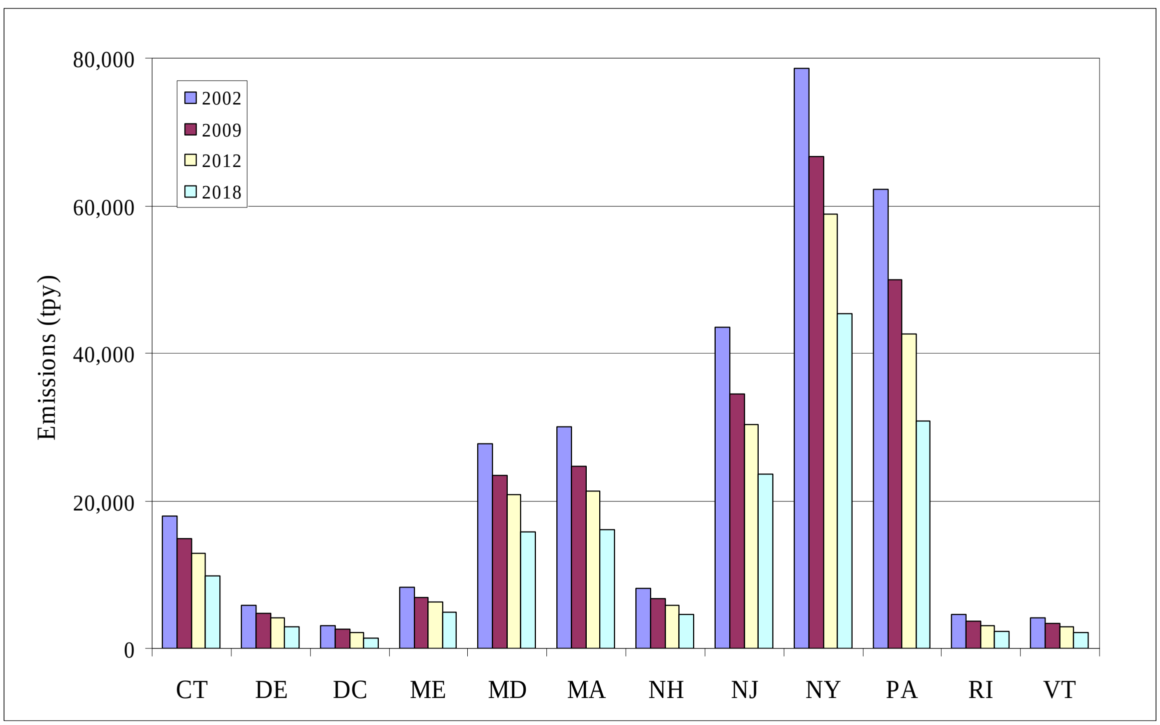


Table 4-4c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual NOx Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	7,563	6,663	6,505	6,449
DE	10,428	10,684	10,973	11,665
DC	505	420	399	371
ME	1,592	1,543	1,541	1,573
MD	9,683	8,331	8,219	8,512
MA	12,722	11,097	10,844	10,944
NH	1,763	1,736	1,731	1,761
NJ	19,964	18,256	17,818	17,572
NY	31,230	27,541	26,952	27,000
PA	41,559	26,123	25,247	24,974
RI	438	398	404	429
VT	47	49	51	57
Total	**137,493**	**112,841**	**110,683**	**111,308**

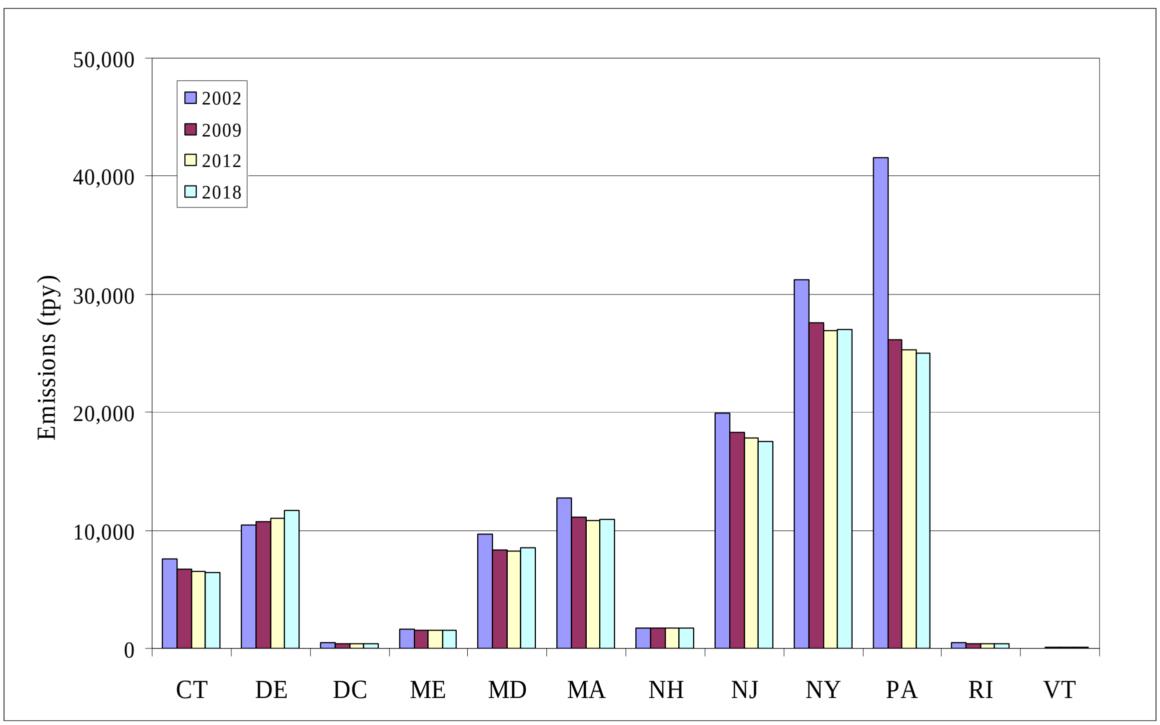


Table 4-5a All Nonroad Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,952	1,642	1,532	1,236
DE	1,021	947	940	897
DC	310	235	209	135
ME	1,437	1,367	1,301	1,086
MD	4,936	4,353	4,191	3,814
MA	3,531	2,964	2,768	2,246
NH	1,058	944	881	698
NJ	5,495	4,539	4,233	3,489
NY	9,605	8,050	7,425	5,830
PA	9,738	8,501	8,112	6,949
RI	500	435	414	348
VT	530	476	439	331
Total	**40,114**	**34,453**	**32,445**	**27,059**

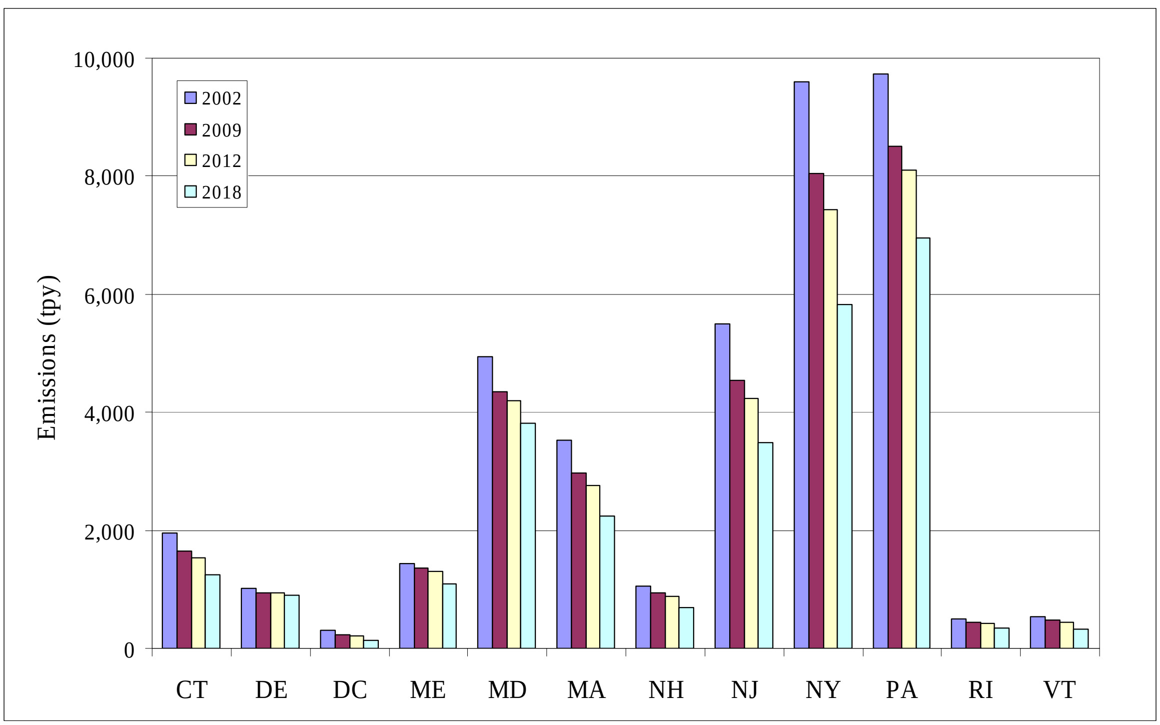


Table 4-5b NONROAD Model Sources
OTB/OTW Annual PM10-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,713	1,407	1,295	987
DE	570	456	414	301
DC	298	226	200	127
ME	1,204	1,119	1,039	797
MD	3,119	2,534	2,321	1,782
MA	2,887	2,370	2,176	1,640
NH	947	834	769	581
NJ	4,285	3,424	3,143	2,411
NY	8,339	6,871	6,248	4,624
PA	6,282	5,282	4,839	3,574
RI	403	337	314	244
VT	518	462	425	316
Total	**30,565**	**25,321**	**23,182**	**17,385**

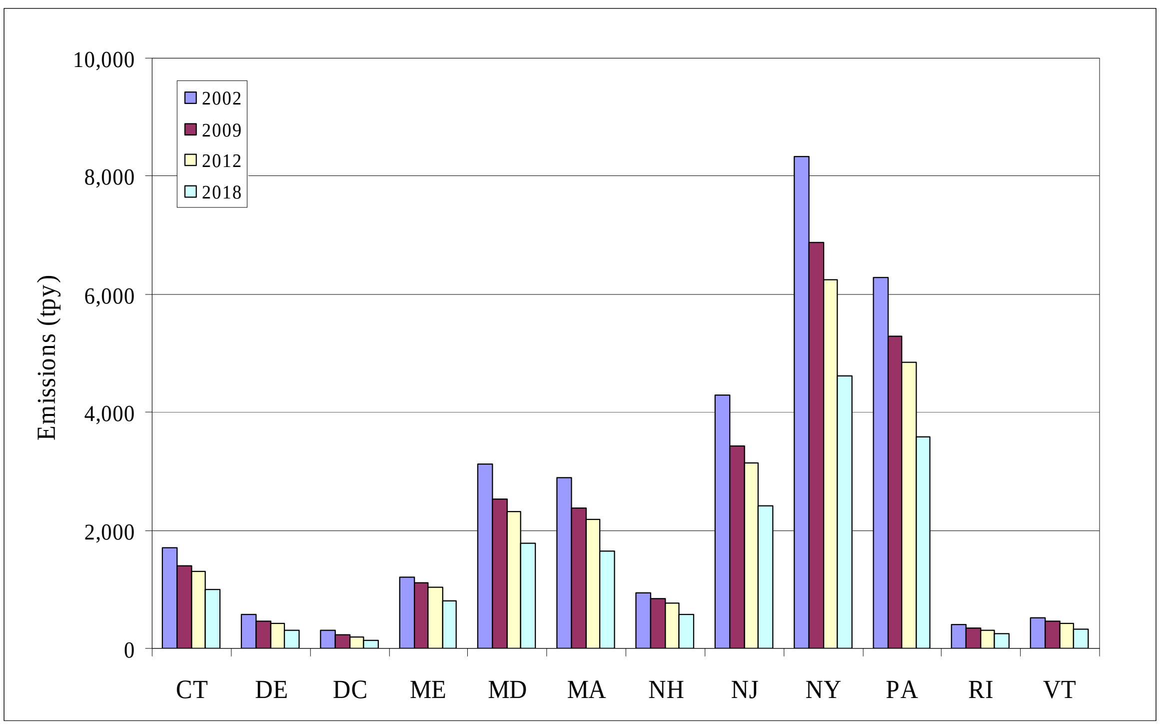


Table 4-5c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual PM10-PRI Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	239	235	237	249
DE	451	491	526	596
DC	12	9	9	8
ME	233	248	262	289
MD	1,817	1,819	1,870	2,032
MA	644	594	592	606
NH	111	110	112	117
NJ	1,210	1,115	1,090	1,078
NY	1,266	1,179	1,177	1,206
PA	3,456	3,219	3,273	3,375
RI	97	98	100	104
VT	12	14	14	15
Total	**9,549**	**9,132**	**9,263**	**9,674**

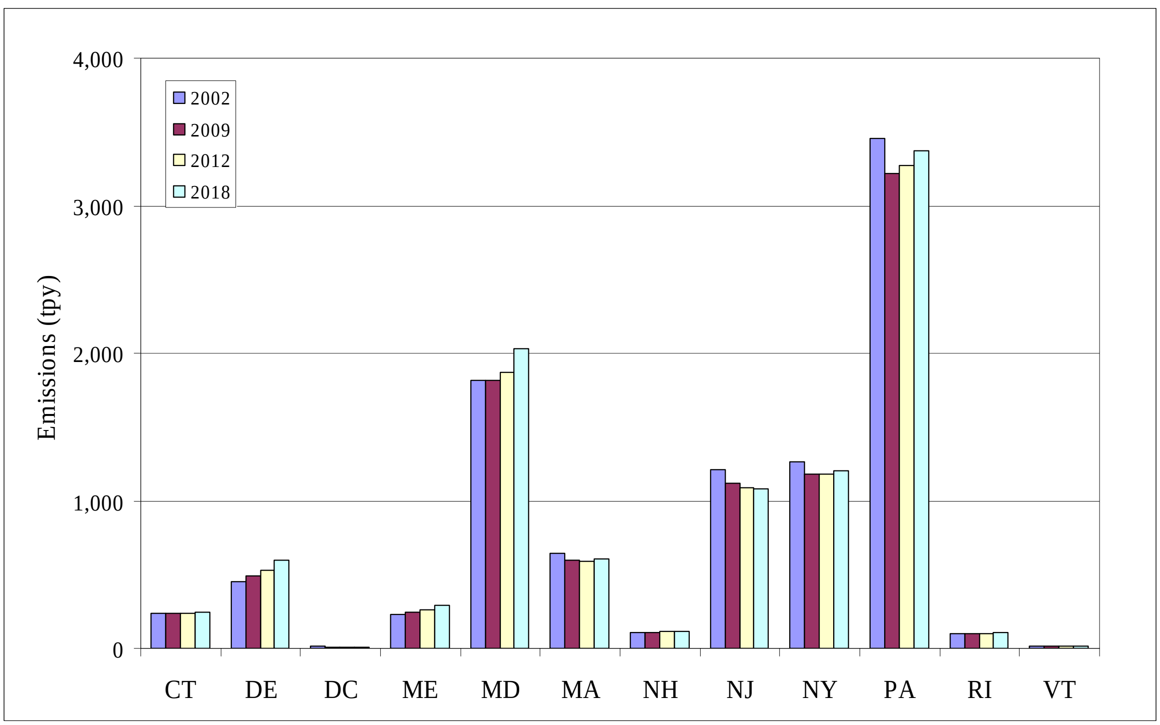


Table 4-6a All Nonroad Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,794	1,508	1,408	1,135
DE	926	856	849	808
DC	299	216	192	124
ME	1,329	1,238	1,177	978
MD	4,357	3,806	3,653	3,301
MA	3,226	2,710	2,531	2,052
NH	965	861	802	634
NJ	4,997	4,113	3,829	3,143
NY	8,821	7,390	6,815	5,349
PA	8,440	7,274	6,900	5,808
RI	443	383	364	303
VT	486	436	402	303
Total	**36,084**	**30,791**	**28,922**	**23,938**

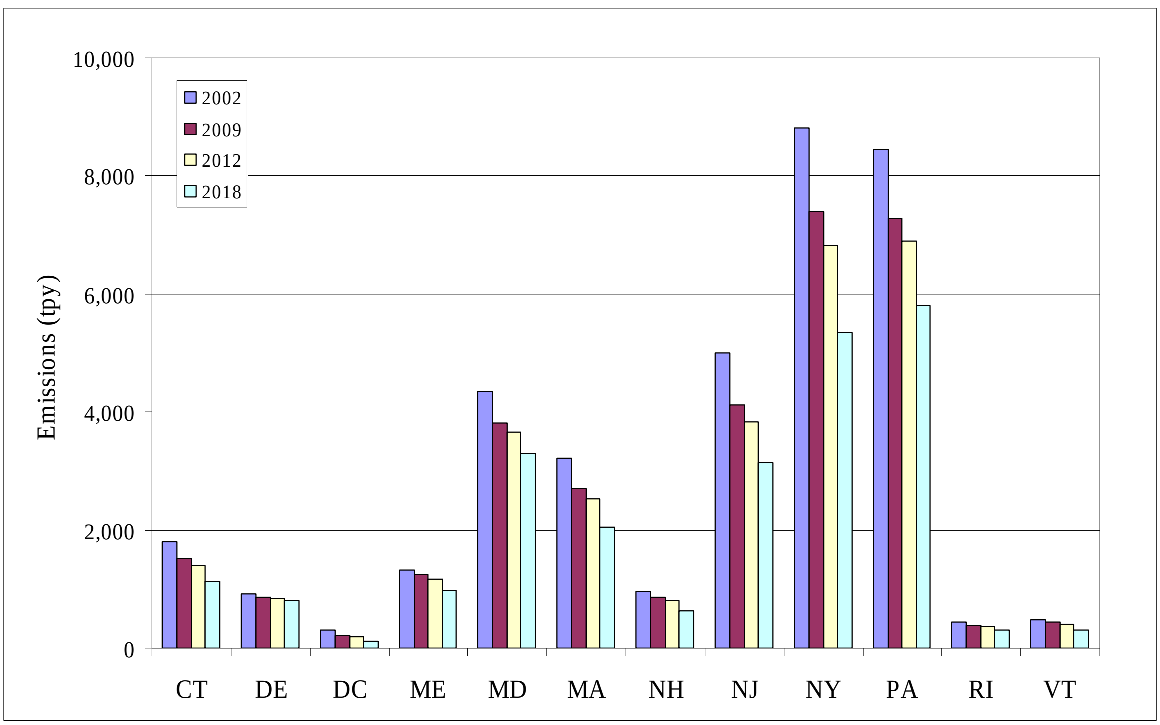


Table 4-6b NONROAD Model Sources
OTB/OTW Annual PM25-PRI Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,578	1,296	1,193	911
DE	525	420	381	277
DC	288	208	184	117
ME	1,135	1,030	956	734
MD	2,870	2,333	2,137	1,641
MA	2,659	2,184	2,005	1,512
NH	872	768	708	536
NJ	3,951	3,154	2,896	2,223
NY	7,677	6,327	5,755	4,262
PA	5,784	4,866	4,459	3,296
RI	371	311	290	226
VT	477	426	391	292
Total	**28,186**	**23,321**	**21,356**	**16,027**

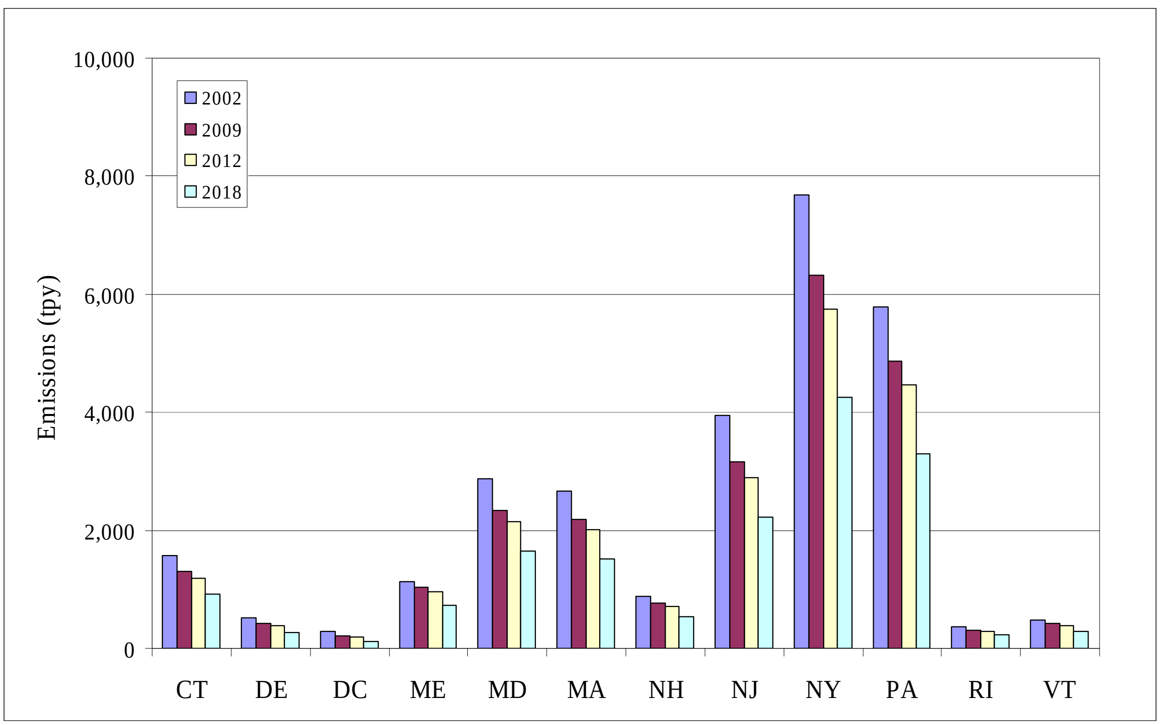


Table 4-6c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual PM25-PRI Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	216	212	215	224
DE	401	436	468	531
DC	11	8	8	7
ME	194	208	221	244
MD	1,487	1,473	1,516	1,660
MA	568	526	526	540
NH	94	93	94	98
NJ	1,047	959	933	920
NY	1,144	1,063	1,060	1,087
PA	2,656	2,408	2,441	2,512
RI	72	72	74	77
VT	9	10	11	11
Total	**7,898**	**7,470**	**7,566**	**7,911**

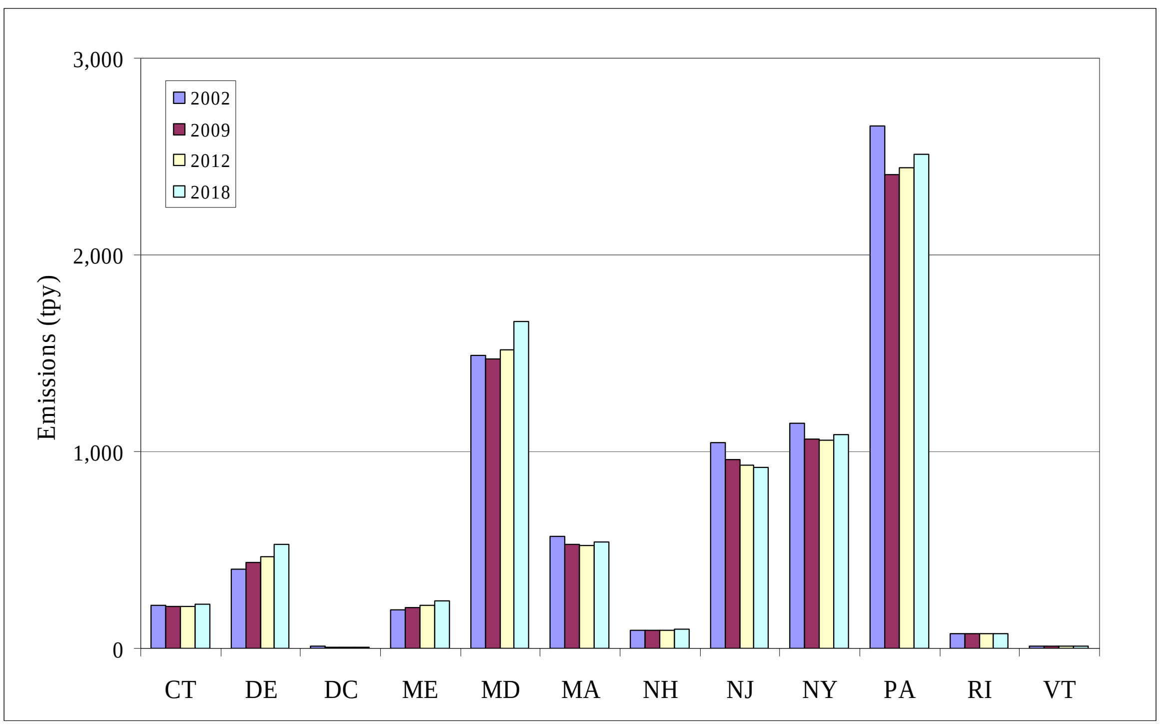


Table 4-7a All Nonroad Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	2,087	887	711	815
DE	3,983	2,851	2,834	3,296
DC	375	66	9	5
ME	917	201	82	82
MD	7,942	1,638	706	577
MA	3,791	983	470	442
NH	891	310	218	246
NJ	15,686	3,508	1,253	832
NY	12,920	3,387	1,724	1,686
PA	7,915	1,659	667	607
RI	377	93	42	42
VT	372	68	15	13
Total	**57,257**	**15,651**	**8,731**	**8,643**

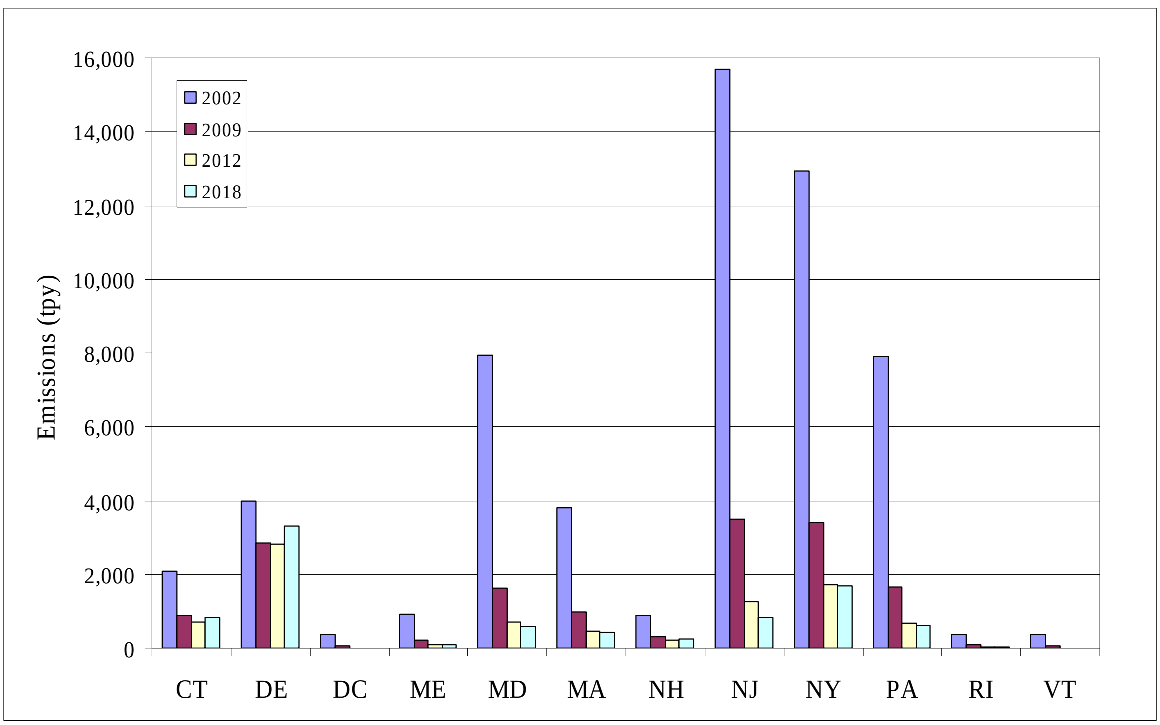


Table 4-7b NONROAD Model Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	1,377	249	39	28
DE	513	90	12	8
DC	341	59	6	3
ME	772	132	24	19
MD	2,569	452	63	42
MA	2,428	429	66	47
NH	673	119	20	16
NJ	3,525	607	93	67
NY	6,966	1,208	182	130
PA	5,292	917	135	92
RI	336	60	10	7
VT	368	64	10	8
Total	**25,159**	**4,387**	**661**	**467**

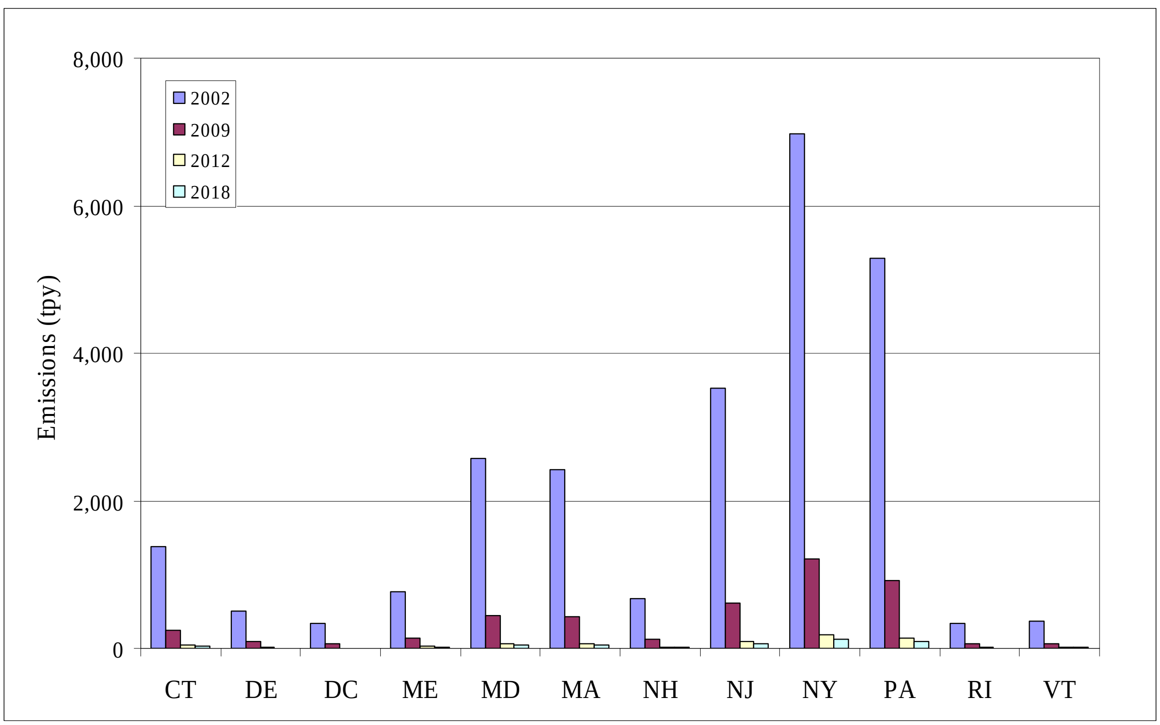


Table 4-7c Aircraft, Locomotive, and Commercial Marine Sources
OTB/OTW Annual SO2 Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	711	638	672	787
DE	3,470	2,761	2,822	3,288
DC	34	7	3	2
ME	145	69	58	63
MD	5,372	1,186	643	535
MA	1,363	554	404	395
NH	218	191	198	230
NJ	12,161	2,901	1,160	765
NY	5,953	2,179	1,542	1,556
PA	2,623	742	532	515
RI	42	33	32	35
VT	5	4	5	5
Total	**32,097**	**11,264**	**8,070**	**8,176**

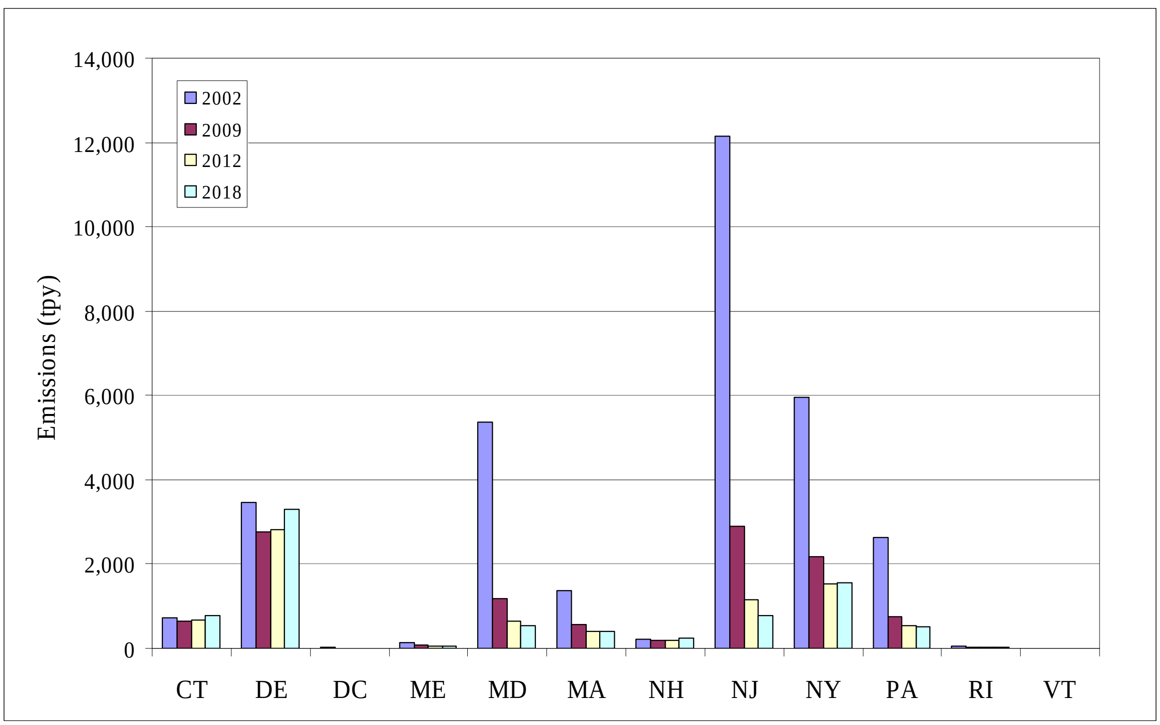


Table 4-8a All Nonroad Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	33,880	24,910	22,657	20,694
DE	8,010	6,440	6,044	5,653
DC	2,073	1,559	1,438	1,369
ME	31,144	29,445	27,093	21,988
MD	56,330	43,260	40,266	37,969
MA	56,749	43,429	39,713	36,306
NH	22,377	19,651	17,933	15,003
NJ	83,919	62,920	57,769	53,625
NY	157,612	128,421	117,770	104,562
PA	102,331	84,744	78,630	69,956
RI	7,780	6,038	5,640	5,389
VT	10,548	10,105	9,304	7,566
Total	**572,751**	**460,922**	**424,257**	**380,080**

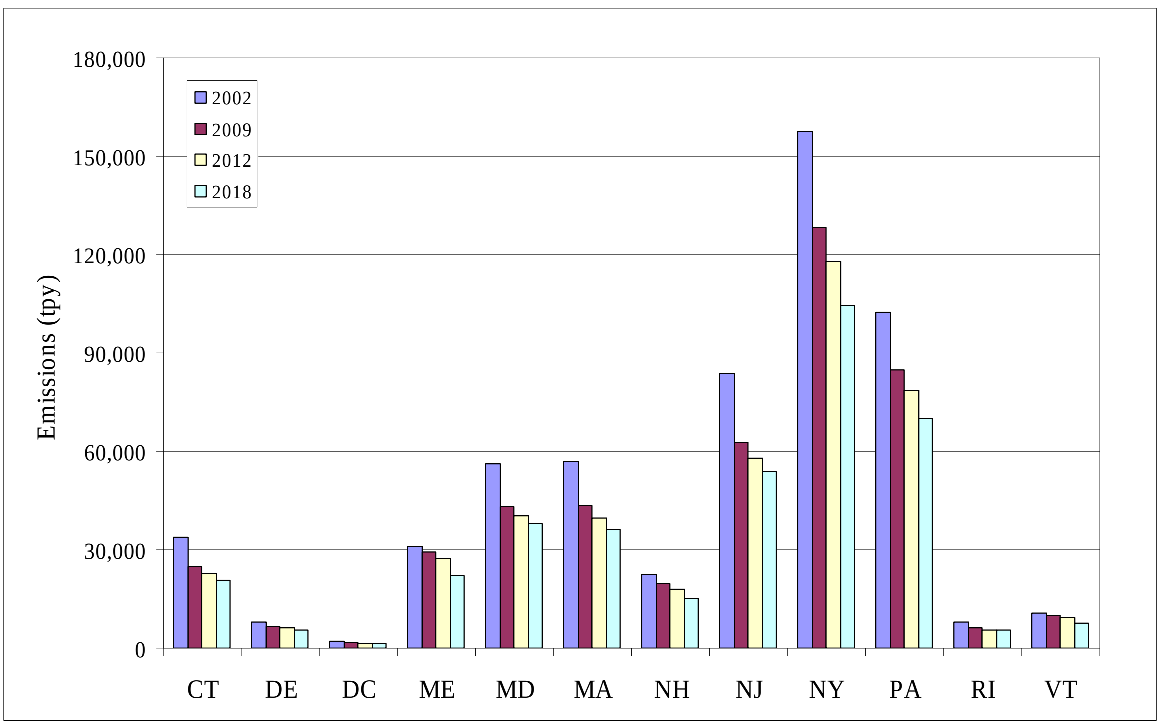


Table 4-8b NONROAD Model Sources
OTB/OTW Annual VOC Emission Projections
(tons per year)

State	2002	2009	2012	2018
CT	33,519	24,546	22,286	20,308
DE	7,531	5,943	5,533	5,115
DC	2,053	1,540	1,419	1,351
ME	30,741	29,030	26,669	21,547
MD	53,035	39,731	36,638	34,106
MA	54,836	41,473	37,706	34,185
NH	22,238	19,476	17,752	14,810
NJ	81,900	60,878	55,682	51,451
NY	155,475	126,265	115,553	102,224
PA	99,241	82,094	75,941	67,186
RI	7,699	5,956	5,556	5,302
VT	10,520	10,076	9,273	7,533
Total	**558,788**	**447,006**	**410,009**	**365,117**

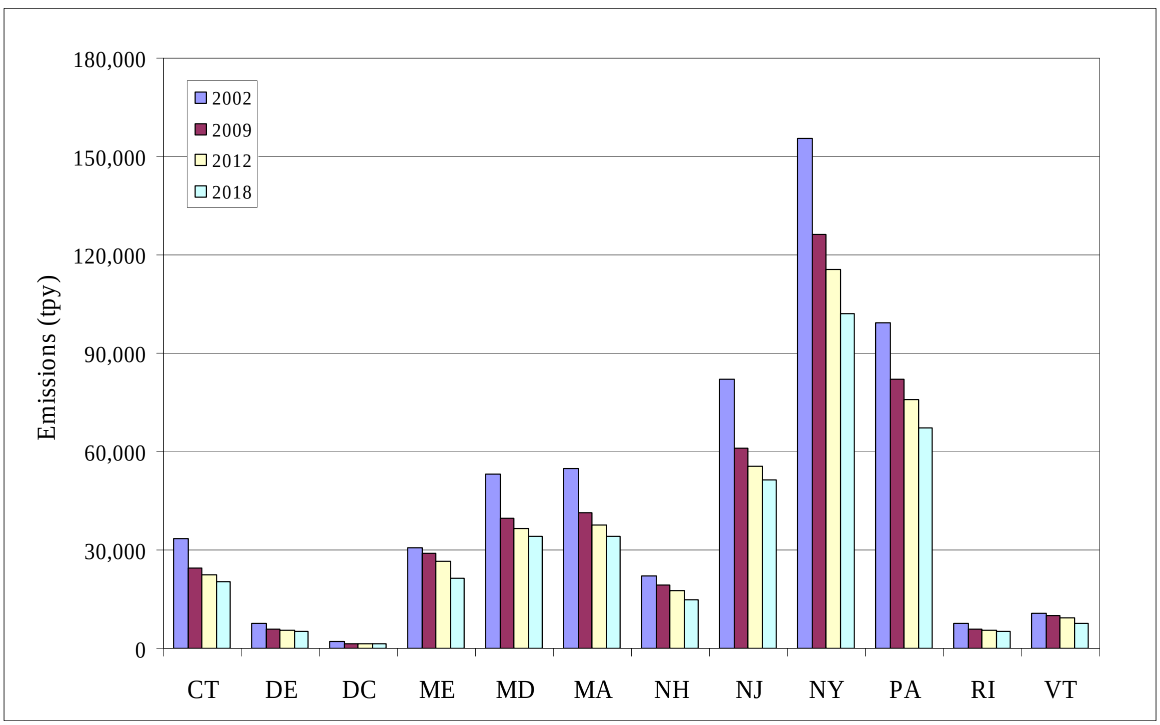
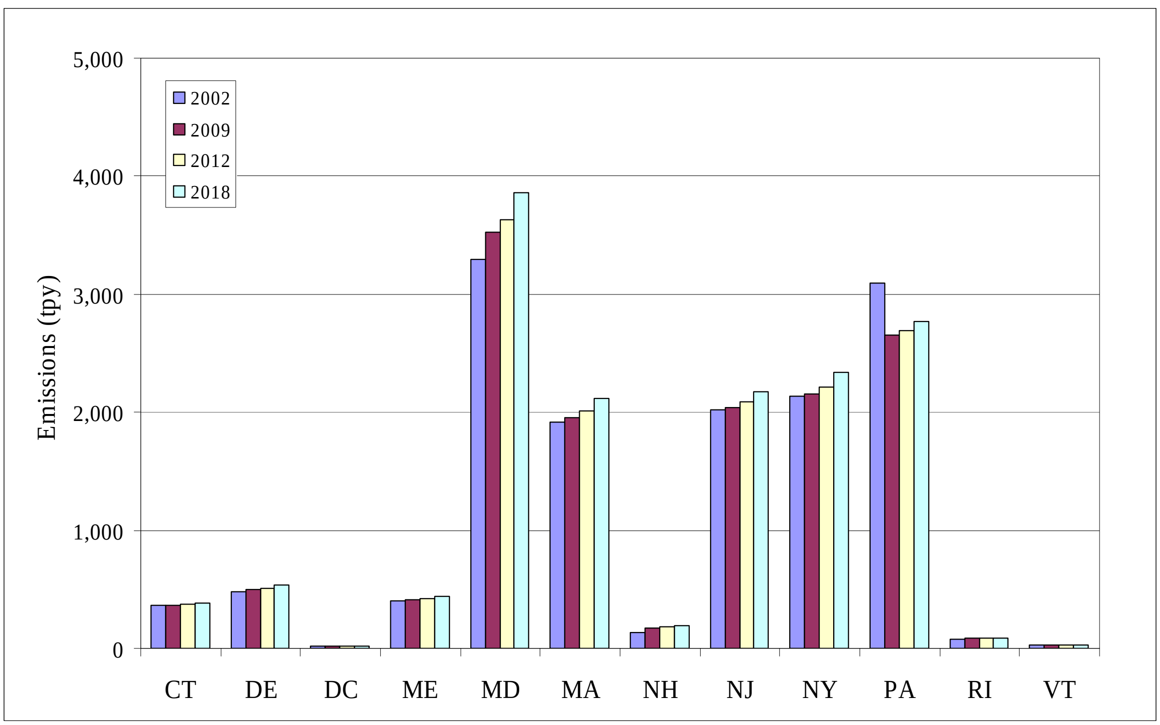


Table 4-8c Aircraft, Locomotive, and Commercial Marine Sources OTB/OTW Annual VOC Emission Projections (tons per year)

State	2002	2009	2012	2018
CT	361	364	371	386
DE	480	497	511	538
DC	20	19	19	18
ME	403	415	424	441
MD	3,295	3,529	3,628	3,863
MA	1,913	1,956	2,007	2,121
NH	139	175	181	193
NJ	2,019	2,042	2,087	2,174
NY	2,137	2,156	2,217	2,338
PA	3,090	2,650	2,689	2,770
RI	81	82	84	87
VT	27	29	31	33
Total	**13,964**	**13,916**	**14,248**	**14,963**



5.0 BEYOND-ON-THE-WAY EMISSION INVENTORY

The States are considering additional control measures as part of their planning to achieve regional haze goals and to attain the ozone and PM2.5 National Ambient Air Quality Standards (NAAQS). To accomplish this, many of the states will need to implement additional measures to reduce emissions. As such, the Ozone Transport Commission (OTC) undertook an exercise to identify a suite of additional control measures that could be used by the states in the Ozone Transport Region (OTR) in attaining their air quality goals.

Based on the analyses conducted by various OTC Workgroups, the OTC Commissioners made several recommendations at the Commissioner's meeting in Boston on June 7, 2006:

- *Memorandum of Understanding Among the States of the Ozone Transport Commission on a Regional Strategy Concerning the Integrated Control of Ozone Precursors from Various Sources*
- *Resolution 06-02 of the Ozone Transport Commission Concerning Coordination and Implementation of Regional Ozone Control Strategies for Certain Source Categories*
- *Statement of the Ozone Transport Commission Concerning Multi-Pollutant Emission Control of Electric Generating Units*
- *Resolution 06-03 of the Ozone Transport Commission Concerning Federal Guidance and Rulemaking for Nationally-Relevant Ozone Control Measures*

The Commissioners recommended that States consider emission reductions from the following source categories:

- Consumer Products
- Portable Fuel Containers
- Adhesives and Sealants Application
- Diesel Engine Chip Reflash
- Cutback and Emulsified Asphalt Paving
- Asphalt Production Plants
- Cement Kilns
- Glass Furnaces
- Industrial, Commercial, and Institutional (ICI) Boilers
- Regional Fuels
- Electric Generating Units (EGUs)

This suite of controls for the above source categories constitutes a "beyond-on-the-way" (BOTW) scenario to be used in modeling ozone, fine particles, and regional haze in the OTR and MANE-VU regions.

For the MANE-VU modeling inventory, each state was asked to complete a matrix to identify which of the above source category control measures to include and in which years the control measure should be applied. This section documents the emission reductions anticipated to result from the implementation of the above control measures based on the state recommendations for measures to include for each state, source category, and projection year. There are five subsections discussing the control measure and emission reductions for the five source category sectors: nonEGU point sources, area sources, EGUs, onroad mobile sources, and nonroad mobile sources.

5.1 NONEGU POINT SOURCES

This Section describes the analysis of the control measures to reduce emissions from non-EGU point sources. The control measures included in this analysis reduce emissions for the following pollutants and nonEGU point source categories:

- NOx measures: asphalt production plants; cement kilns; glass and fiberglass furnaces; low sulfur heating oil for commercial and institutional units; and ICI boilers (natural gas, #2 fuel oil, #4/#6 fuel oil, and coal);
- Primary PM10 and PM2.5 measure: commercial heating oil;
- SO2 measures: commercial heating oil and ICI boilers (#2 fuel oil, #4/#6 fuel oil, and coal); and
- VOC measure: adhesives and sealants application;

For the MANE-VU modeling inventory, each state was asked to complete a matrix to identify which nonEGU control measures to include and in which years the control measure should be applied. Table 5.1 summarizes the staff recommendations for NOx control measures to include in the BOTW regional modeling inventory for non-EGU source categories (except ICI boilers). Table 5.2 summarizes the staff recommendations for NOx emission reductions for ICI boilers. Tables 5.3 and 5.4 summarize the staff recommendations for control measures to include in the BOTW regional modeling inventory for SO2 and VOC emissions, respectively. The following subsections describe the emission reductions anticipated for each of the control measures.

Table 5.1 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – NOx Emissions from NonEGU Point Sources

	Asphalt Production Plants			Cement Kilns			Glass and Fiberglass Furnaces			Commercial & Institutional Heating Oil		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
DE	No	No	No	N/A	N/A	N/A	N/A	N/A	N/A	No	No	No
DC	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	No	Yes	Yes
ME	No	No	No	Yes	Yes	Yes	N/A	N/A	N/A	No	Yes	Yes
MD	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
MA	No	No	No	N/A	N/A	N/A	Yes	Yes	Yes	No	Yes	Yes
NH	No	No	No	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
NJ	No	Yes	Yes	N/A	N/A	N/A	No	Yes[2]	Yes[2]	No	Yes	Yes
NY	Yes	Yes	Yes	Yes[1]	Yes[1]	Yes[1]	Yes[2]	Yes[3]	Yes[3]	No	Yes	Yes
PA	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
RI	No	No	No	N/A	N/A	N/A	No	No	No	No	Yes	Yes
VT	No	No	No	N/A	N/A	N/A	N/A	N/A	N/A	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory
N/A – No facilities of this type located in the state

1) New York specified that a 40 percent NOx reduction from cement kilns should be used.
2) New Jersey specified a 20 percent NOx reduction from glass furnaces in 2012 and a 35 percent reduction in 2018.
3) New York specified a 70 percent NOx reduction from glass furnaces beginning in 2009.

Table 5.2 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – NOx Emissions from ICI Boilers

	ICI Boilers < 25 mmBTU/hour			ICI Boilers 25-50 mmBtu/hour			ICI Boilers 50-100 mmBtu/hour			ICI Boilers 100-250 mmBtu/hour			ICI Boilers >250 mmBtu/hour (see note 7)		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	No	No	No
DE	No	No	No	No	No	No	No	No	No	Yes[4]	Yes[4]	Yes[4]	No	No	No
DC	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
ME	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
MD	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No
MA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
NH	No	No	No	Yes[5]	Yes[5]	Yes[5]	Yes	Yes	Yes	Yes[5]	Yes[5]	Yes[5]	No	No	No
NJ	Yes[2]	Yes[2]	Yes[2]	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No
NY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
PA	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[3]	No[6]	No[6]	No[6]	No	No	No
RI	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
VT	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory
N/A – No facilities of this type located in the state
1) Connecticut is now pursuing adoption of model rule for boilers of all sizes at major and non-major sources
2) New Jersey specified a 5 percent reduction in 2009, 10 percent in 2012, and 10 percent in 2018
3) Pennsylvania specified no reductions since sources already covered by statewide NOx RACT regulation
4) Delaware is developing regulation for ICI boilers greater than 200 mmBtu/hour – no plans for regulating smaller units
5) New Hampshire specified a 40 percent reduction for 25-50 mmBtu/hour boilers, and a 10 percent reduction for natural gas-fired 100-250 mmBtu/hour boilers
6) Pennsylvania specified no reductions since sources in the 5-county Philadelphia area are already covered by the Small Sources of NOx regulation and do not plan on expanding the regulation outside of the corridor at this time
7) Resolution 06-02 specified the reduction for > 250mmBtu/hour boilers to be the "same as EGUs of similar size." The OTC Commissioners have not yet recommended an emission rate or percent reduction for EGUs. As a result, no reductions for ICI boilers > 250 mmBtu/hour were included in the BOTW inventory.

Table 5.3 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – SO2 Emissions from NonEGU Point Sources

	Commercial & Institutional Heating Oil			ICI Boilers (low sulfur fuel)		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	No	No	Yes	No	No	No
DE	No	No	No	No	No	No
DC	No	Yes	Yes	No	No	No
ME	No	Yes	Yes	No	No	No
MD	No	Yes	Yes	No	No	No
MA	No	Yes	Yes	No	No	No
NH	No	No	Yes	No	No	No
NJ	No	Yes	Yes	No	No	No
NY	No	Yes	Yes	No	No	No
PA	No	Yes	Yes	No	No	No
RI	No	Yes	Yes	No	No	No
VT	No	No	No	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory

Table 5.4 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – VOC Emissions from NonEGU Point Sources

	Adhesives and Sealants Application		
State	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes
DE	Yes	Yes	Yes
DC	Yes	Yes	Yes
ME	Yes	Yes	Yes
MD	Yes	Yes	Yes
MA	Yes	Yes	Yes
NH	No	Yes	Yes
NJ	No[1]	No[1]	No[1]
NY	Yes	Yes	Yes
PA	Yes	Yes	Yes
RI	Yes	Yes	Yes
VT	No	No	No

Yes - Include emission reductions from control measure in modeling inventory
No - Do not include emission reduction from control measure in modeling inventory
1) New Jersey indicated that the reductions from the adhesives and sealants application control measure should only apply to area source - no reductions for point sources (SCC 4-02-007-xx) were included due to inventory double-counting issues, not due to rule change issues.

5.1.1 Adhesives and Sealants Application

The OTC 2006 model rule for adhesives and sealants is based on the reasonably available control technology (RACT) and best available retrofit control technology (BARCT) determination by the California Air Resources Board (CARB) developed in 1998. Adhesive and sealant emission sources are classified as both point sources and area sources. About 96 percent of adhesive and sealant VOC emissions in the OTC states fall into the area source category. The remaining four percent of the VOC emissions are included in the point source inventory.

The emission reduction benefit estimation methodology is based on information developed and used by CARB for their RACT/BARCT determination in 1998. For point sources, we first identified those sources that were applying adhesives and sealants (using the source classification code of 4-02-007-xx, adhesives application). Next, we reviewed the MANEVU inventory to determine whether these sources had existing capture and control systems. Most of the sources did not have control information in the NIF database. However, several sources reported capture and destruction efficiencies in the 70 to 99 percent range, with a few sources reporting capture and destruction efficiencies of 99+ percent. Sources with existing control systems that exceeded an 85 percent overall capture and destruction efficiency would comply with the OTC 2006 model rule provision for add-on air pollution control equipment; therefore, no additional reductions were calculated for these sources. For point sources without add-on control equipment, we used the 64.4 percent reduction based on the CARB determination.

5.1.2 Asphalt Production Plants

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies that would result in about a 35 percent reduction in NOx emissions. The reductions estimated for this category only include emissions included in the MANE-VU point source emission inventory. Only emissions from major point sources are typically included in the MANE-VU point source database. Emissions from non-major sources are not explicitly contained in the area source inventory; rather, the emissions from non-major asphalt plants are likely lumped together in the general area source industrial and commercial fuel use category. Therefore, there is some uncertainty regarding the actual reductions that will occur as since minor sources are not specifically identified in the MANE-VU inventory.

5.1.3 Cement Kilns

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies that would result in about a 60 percent reduction in NOx emissions from uncontrolled levels. Cement kilns were already included in Phase I of the NO_x SIP call. Emission reductions resulting from the NOx SIP call were accounted for in the 2009 OTB inventory. For the cement kilns in Maryland and New York, a default control efficiency value of 25 percent was applied to account for the reductions expected from the NOx SIP call. For the cement kilns in Pennsylvania, the state provided their best estimates of the actual control efficiency expected for each kiln after the NOx SIP Call. There is a cement kiln in Maine, but it is not subject to the NOx SIP call. To calculate the additional reductions from the OTC 2006 Control Measure, MACTEC back calculated uncontrolled emissions from the 2009 base year inventory based on the controls applied to account for the NOx SIP Call. Once the uncontrolled emissions were calculated, MACTEC applied the 60 percent emission reduction guideline recommended by the OTC Commissioners, except for the kilns in New York. Staff from New York indicated that a 40 percent emission reduction should be used for modeling purposes.

5.1.4 Glass and Fiberglass Furnaces

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies that would result in about an 85 percent reduction in NOx emissions from uncontrolled levels. The NOx emission reduction benefit was calculated by applying an 85 percent reduction to the projected 2009 base inventory, except in New Jersey and New York. New Jersey specified a 20 percent NOx reduction from glass furnaces in 2012 and a 35 percent reduction in 2018. New York specified a 70 percent NOx reduction from glass furnaces beginning in 2009. The estimated 85% reductions does not take into account existing controls at the facilities. The OTC states are currently working with the glass industry to obtain additional data to better identify the controls already in place. This will allow for a better calculation of the emission reduction benefits.

5.1.5 Industrial, Commercial, and Institutional Boilers

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies for ICI boilers based on guidelines that varied by boiler size and fuel type. Specifically, the following guidelines were provided:

	NOx Reduction from 2009 Base Emissions by Fuel Type			
Boiler Size (mmBtu/hour)	**Natural Gas**	**#2 Fuel Oil**	**#4/#6 Fuel Oil**	**Coal**
< 25	10	10	10	10
25 to 50	50	50	50	50*
50 to 100	10	10	10	10*
100 to 250	75	40	40	40*
>250	**	**	**	**

* Resolution 06-02 did not specify a percent reduction for coal; for modeling purposes, the same percent reduction specified for #4/#6 fuel oil was used for coal

** Resolution 06-02 specified the reduction for > 250mmBtu/hour boilers to be the "same as EGUs of similar size." The OTC Commissioners have not yet recommended an emission rate or percent reduction for EGUs. As a result, no reductions for ICI boilers > 250 mmBtu/hour were included in the BOTW inventory.

Since the above guidelines vary by boiler size and fuel type, the specific percent reduction applied to an individual source depends on the SCC and design capacity of the source. The SCC identifies the fuel type, while the design capacity identifies the boiler size. In many cases, the design capacities in the MANE-VU NIF database were missing. MACTEC used the following hierarchy in filling in gaps where design capacities were missing.

- Use the design capacity field from the NIF EU table, if available;
- Use the design capacities provided by State/local agencies to fill in the data gaps (Allegheny County, District of Columbia, Maryland, New Jersey, Philadephia County);
- Use design capacity as reported either the Unit Description field in the NIF EU table or the Process Description field from the NIF EP table, if available;
- Use design capacity from the source's Title V permit, if the Title V permit was on-line;
- Use the SCC description to determine the design capacity (for example, SCC 1-02-006-01 describes a >100 mmBtu/hr natural gas-fired boiler, SCC 1-02-006-02 describes a 10-100 mmBtu/hr natural gas-fired boiler)

After performing this gap-filling exercise, MACTEC was able to assign over 97 percent of the NOx emissions to a specific boiler size range. For the remaining sources where MACTEC could not determine the boiler size (which accounted for only 3 percent of the NOx emissions), MACTEC assumed that these boilers were < 25 mmBtu/hr.

5.1.6 Commercial and Institutional Heating Oil

The BOTW control measure for heating oil is based on NESCAUM's report entitled "Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues." NESCAUM estimates that reducing the sulfur content of heating oil from 2,500 ppm to 500 ppm lowers SO2 emissions by 75 percent, PM emissions by 80 percent, NOx emissions by 10 percent. The 500 ppm sulfur heating oil is not expected to available on a widespread basis until 2012 at the earliest. These percent reductions were applied to commercial distillate oil category (SCC 1-03-005-xx and 1-05-002-05). These percent reductions were applied based on the state's recommendations in the matrix which identifies control measures to include and in which years the control measure should be accounted for in the modeling inventory.

5.1.7 BOTW NonEGU Point Source NIF, SMOKE, and Summary Files

The Version 3.1 file names and descriptions delivered to MARAMA are shown in Table 5-5.

Table E-1 shows the anticipated percent reductions by SCC and year for the nonEGU point source BOTW control measures.

5.1.8 BOTW NonEGU Point Source Emission Summaries

Emission summaries by state, year, and pollutant are presented in Tables 5-6 through 5-12 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 5-5 BOTW NonEGU Point Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_BOTW2009_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2009 BOTW nonEGU source NIF inventory
MANEVU_BOTW2012_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2012 BOTW nonEGU source NIF inventory
MANEVU_BOTW2018_NonEGU_NIFV3_1.mdb	Dec. 4, 2006	Version 3.1 of 2018 BOTW nonEGU source NIF inventory
MANEVU_BOTW2009_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2009 BOTW nonEGU source inventory in SMOKE IDA format
MANEVU_BOTW2012_NonEGU_IDAV3_1.txt	Nov. 22, 2006	Version 3.1 of 2012 BOTW nonEGU source inventory in SMOKE IDA format
MANEVU_BOTW2018_NonEGU_IDA3V_1.txt	Nov. 22, 2006	Version 3.1 of 2018 BOTW nonEGU source inventory in SMOKE IDA format
MANEVU OTB BOTW NonEGU V3_1 State Summary.xls	Nov. 22, 2006	Spreadsheet with state totals by pollutant for all nonEGU sources
MANEVU OTB BOTW NonEGU V3_1 State SCC Summary.xls	Dec. 4, 2006	Spreadsheet with SCC totals by state and pollutant for all nonEGU sources.

Table 5-6 NonEGU Point Sources
OTB/OTW and BOTW Annual CO Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	2,157	2,251	2,251	2,306	2,306	2,415	2,415
DE	8,812	9,037	9,037	8,748	8,748	8,651	8,651
DC	247	283	283	299	299	327	327
ME	9,043	10,147	10,147	10,467	10,467	11,433	11,433
MD	94,536	104,012	104,012	111,174	111,174	141,342	141,342
MA	10,793	12,027	12,027	12,552	12,552	13,426	13,426
NH	774	858	858	871	871	907	907
NJ	8,209	10,076	10,076	10,806	10,806	12,244	12,244
NY	53,259	61,411	61,411	65,541	65,541	78,876	78,876
PA	105,815	116,430	116,430	121,251	121,251	140,908	140,908
RI	1,712	1,764	1,764	1,821	1,821	1,927	1,927
VT	220	250	250	254	254	267	267
Total	**295,577**	**328,546**	**328,546**	**346,090**	**346,090**	**412,723**	**412,723**

No BOTW controls were considered for CO.

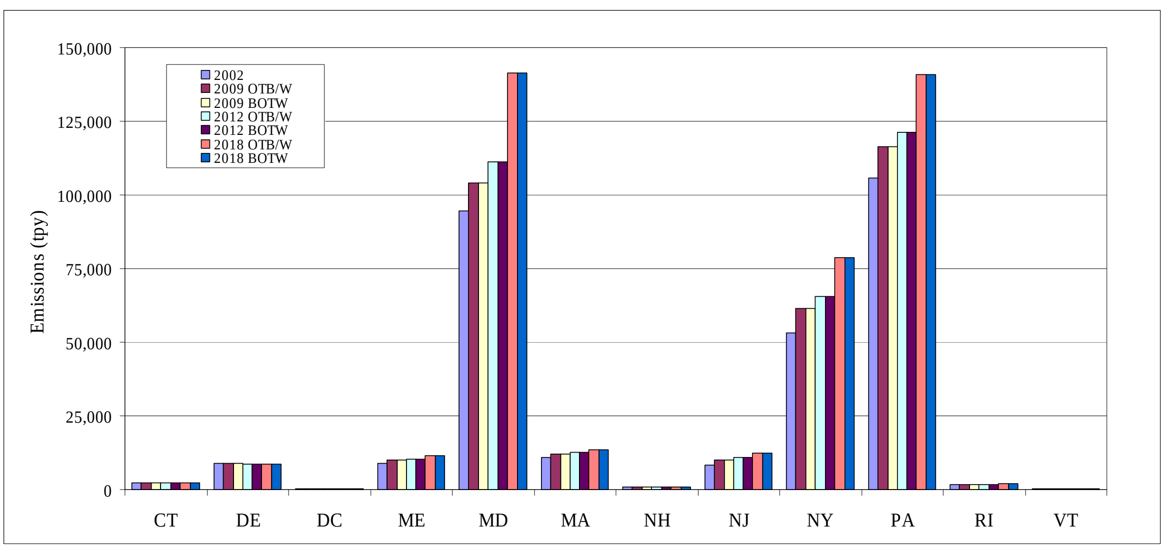


Table 5-7 NonEGU Point Sources
OTB/OTW and BOTW Annual NH3 Emission Projections
(tons per year)

	2002	**2009 OTB/W**	**2009 BOTW**	**2012 OTB/W**	**2012 BOTW**	**2018 OTB/W**	**2018 BOTW**
CT	0	0	0	0	0	0	0
DE	153	145	145	138	138	134	134
DC	4	5	5	5	5	5	5
ME	700	796	796	809	809	859	859
MD	305	347	347	366	366	410	410
MA	462	510	510	521	521	563	563
NH	37	46	46	50	50	60	60
NJ	0	0	0	0	0	0	0
NY	1,027	1,081	1,081	1,128	1,128	1,296	1,296
PA	1,170	1,307	1,307	1,363	1,363	1,591	1,591
RI	58	64	64	68	68	68	68
VT	0	0	0	0	0	0	0
Total	**3,916**	**4,301**	**4,301**	**4,448**	**4,448**	**4,986**	**4,986**

No BOTW controls were considered for NH3.

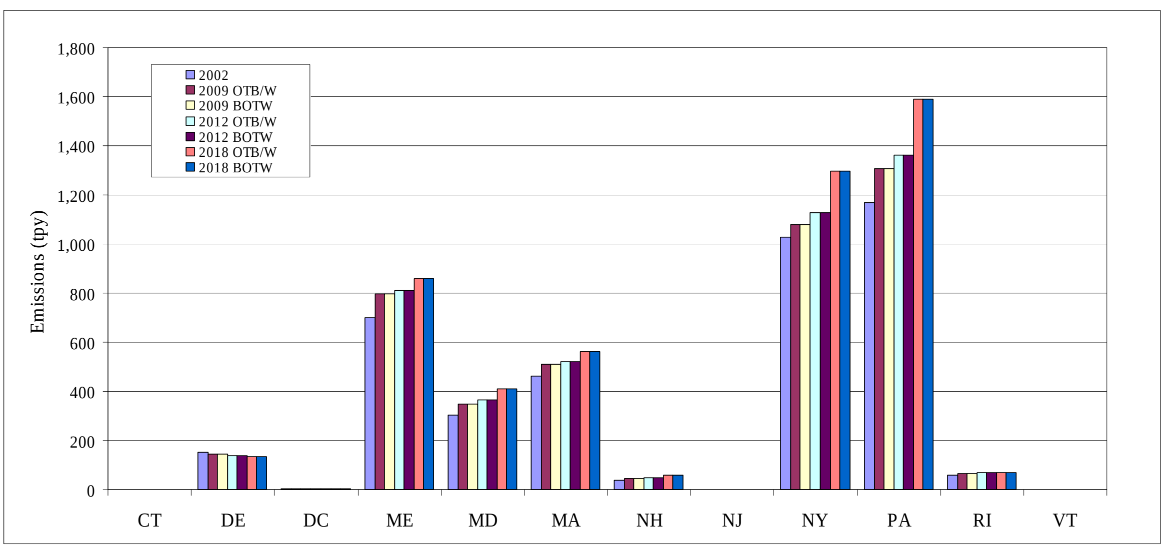


**Table 5-8 NonEGU Point Sources
OTB/OTW and BOTW Annual NOx Emission Projections
(tons per year)**

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	6,773	7,236	6,820	7,465	7,047	7,921	7,501
DE	4,372	4,076	4,076	4,135	4,135	4,246	4,246
DC	480	548	548	577	577	627	627
ME	12,108	14,285	12,914	14,661	13,183	15,753	14,137
MD	21,940	19,401	16,015	20,399	16,819	22,797	18,888
MA	18,292	20,603	20,047	21,372	20,768	23,040	22,301
NH	1,188	1,384	1,120	1,394	1,131	1,435	1,169
NJ	15,812	16,498	16,463	17,091	15,901	18,805	17,464
NY	34,253	33,648	28,529	34,586	29,256	37,133	31,305
PA	89,136	89,932	76,215	93,526	72,779	103,137	79,186
RI	2,308	2,449	2,449	2,471	2,471	2,442	2,442
VT	386	462	462	460	460	466	466
Total	**207,048**	**210,522**	**185,658**	**218,137**	**184,527**	**237,802**	**199,732**

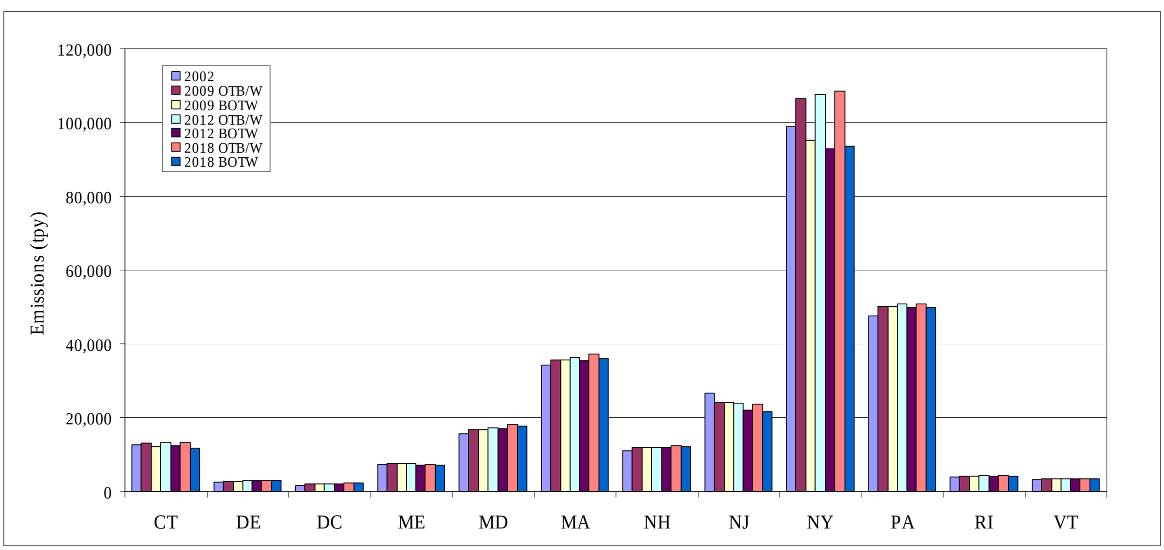


Table 5-9 NonEGU Point Sources
OTB/OTW and BOTW Annual PM10-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	990	1,035	1,035	1,058	1,058	1,106	1,104
DE	1,820	1,486	1,486	1,475	1,475	1,487	1,487
DC	157	178	178	186	182	198	194
ME	6,120	7,088	7,088	7,133	7,114	7,496	7,477
MD	4,739	4,797	4,797	5,040	5,039	5,828	5,827
MA	4,212	5,006	5,006	5,088	5,004	5,314	5,227
NH	918	1,084	1,084	1,097	1,097	1,129	1,129
NJ	3,439	4,205	4,205	4,417	4,412	4,959	4,953
NY	5,072	5,221	5,221	5,444	5,395	6,098	6,048
PA	23,282	25,169	25,169	26,307	26,258	29,516	29,466
RI	296	333	333	331	318	330	316
VT	235	267	267	272	272	296	296
Total	**51,280**	**55,869**	**55,869**	**57,848**	**57,624**	**63,757**	**63,524**

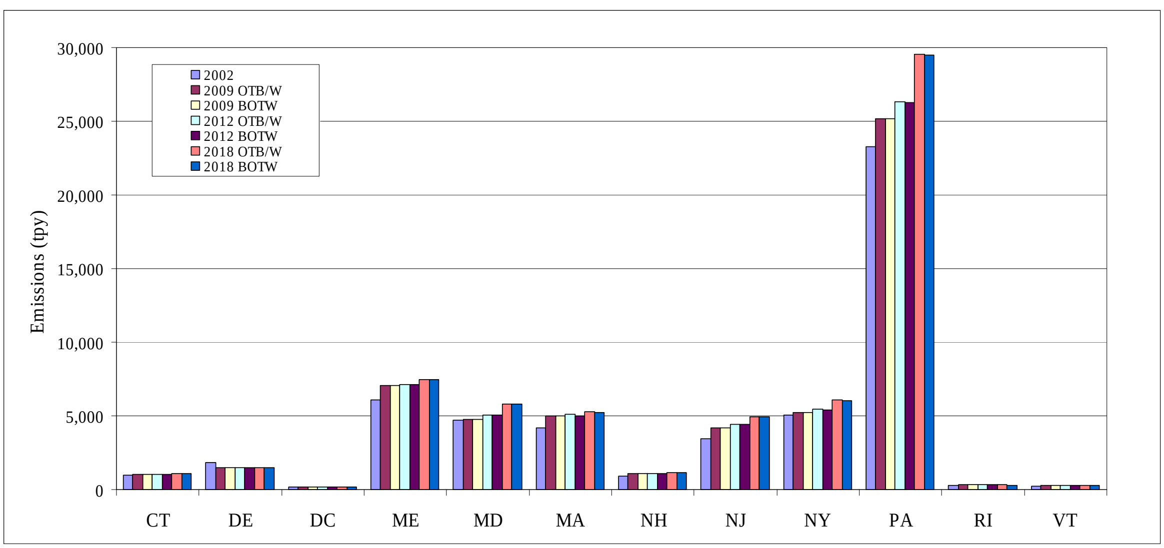


Table 5-10 NonEGU Point Sources
OTB/OTW and BOTW Annual PM25-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	822	871	871	894	894	939	937
DE	1,606	1,256	1,256	1,245	1,245	1,254	1,254
DC	128	145	145	152	149	164	161
ME	4,899	5,675	5,675	5,690	5,678	5,935	5,922
MD	2,772	2,861	2,861	3,011	3,010	3,503	3,501
MA	2,953	3,554	3,554	3,574	3,510	3,660	3,594
NH	857	1,008	1,008	1,021	1,021	1,052	1,052
NJ	2,947	3,588	3,588	3,764	3,760	4,234	4,230
NY	3,355	3,535	3,535	3,688	3,646	4,161	4,117
PA	12,360	13,578	13,578	14,159	14,114	15,878	15,831
RI	180	200	200	198	188	194	184
VT	198	226	226	229	229	246	246
Total	**33,077**	**36,497**	**36,497**	**37,625**	**37,444**	**41,220**	**41,029**

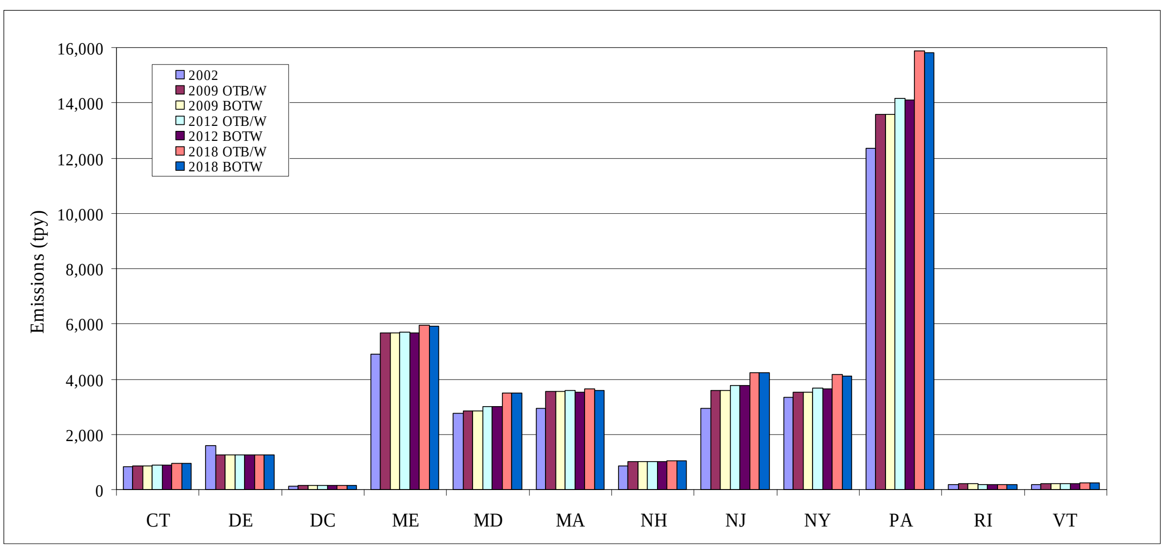


Table 5-11 NonEGU Point Sources
OTB/OTW and BOTW Annual SO2 Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	2,438	2,528	2,528	2,567	2,567	2,644	2,596
DE	35,706	7,117	7,117	7,401	7,401	7,610	7,610
DC	618	707	707	735	533	780	554
ME	14,412	18,656	18,656	18,492	18,393	18,794	18,692
MD	34,193	34,223	34,223	35,373	35,342	38,921	38,886
MA	14,766	18,185	18,185	18,442	17,305	18,955	17,778
NH	2,436	3,099	3,099	3,098	3,098	3,114	3,099
NJ	9,797	7,141	7,141	7,234	7,196	7,855	7,816
NY	58,227	62,922	62,922	64,484	64,432	67,545	67,491
PA	88,259	90,735	90,735	93,441	93,206	99,924	99,681
RI	2,651	3,163	3,163	3,182	3,018	3,164	3,000
VT	874	1,182	1,182	1,147	1,147	1,127	1,127
Total	**264,377**	**249,658**	**249,658**	**255,596**	**253,638**	**270,433**	**268,330**

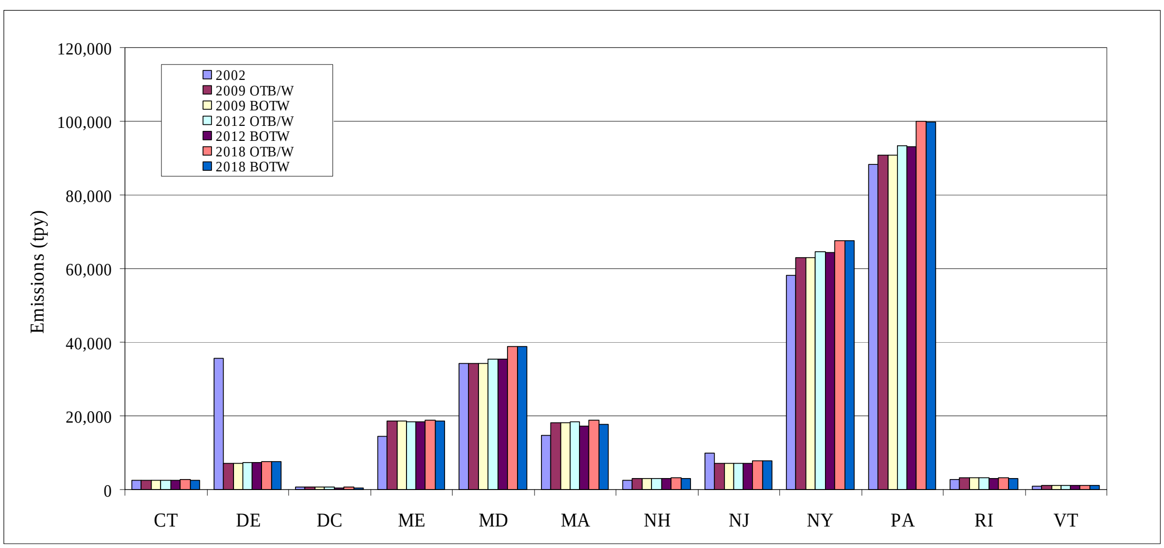
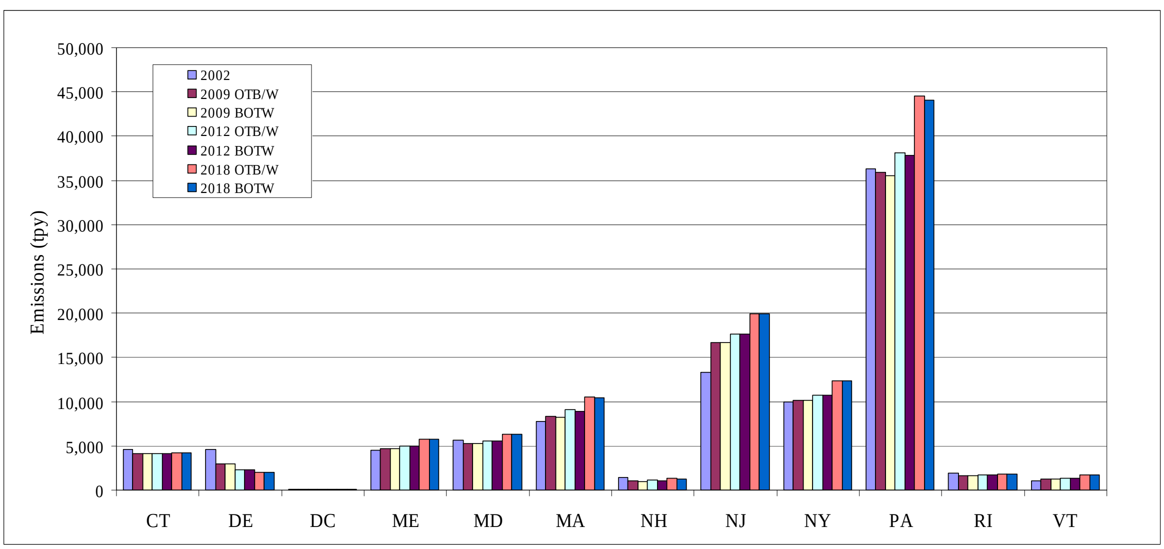


Table 5-12 NonEGU Point Sources
OTB/OTW and BOTW Annual VOC Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	4,604	4,114	4,111	4,152	4,149	4,230	4,227
DE	4,645	2,987	2,981	2,311	2,305	1,993	1,987
DC	69	72	72	75	75	85	85
ME	4,477	4,740	4,740	4,985	4,985	5,709	5,708
MD	5,676	5,297	5,279	5,578	5,559	6,301	6,279
MA	7,794	8,381	8,273	9,061	8,940	10,564	10,418
NH	1,459	1,060	1,005	1,132	1,069	1,294	1,219
NJ	13,318	16,702	16,702	17,621	17,621	19,915	19,915
NY	9,933	10,157	10,141	10,750	10,732	12,354	12,333
PA	36,326	35,875	35,548	38,162	37,795	44,537	44,085
RI	1,898	1,640	1,628	1,695	1,683	1,812	1,799
VT	1,079	1,254	1,238	1,365	1,347	1,730	1,707
Total	**91,278**	**92,279**	**91,718**	**96,887**	**96,260**	**110,524**	**109,762**



5.2 AREA SOURCES

This Section describes the analysis of the OTC and MANE-VU control measures to reduce emissions from area sources. The control measures included in this analysis reduce emissions for the following pollutants and area source categories:

- NOx measures: ICI boilers (natural gas, #2 fuel oil, #4/#6 fuel oil, and coal) and residential and commercial home heating oil;
- Primary PM10 and PM2.5 measures: residential and commercial home heating oil;
- SO2 measures: residential and commercial home heating oil, and ICI boilers (distillate oil).
- VOC measures: adhesives and sealants, emulsified and cutback asphalt paving, consumer products, and portable fuel containers;

For the MANE-VU modeling inventory, each state was asked to complete a matrix identify which control measures to include and in which years the control measure should be applied. Tables 5.13, 5.14, and 5.15 summarize the staff recommendations for control measures to include in the BOTW regional modeling inventory for NOx, SO2, and VOC respectively. The following subsections describe the emission reductions anticipated for each of the area source control measures.

5.2.1 Adhesives and Sealants

The OTC 2006 model rule for adhesives and sealants is based on the reasonably available control technology (RACT) and best available retrofit control technology (BARCT) determination by the California Air Resources Board (CARB) developed in 1998. Adhesive and sealant emission sources are classified as both point sources and area sources. About 96 percent of adhesive and sealant VOC emissions in the OTC states fall into the area source category. The remaining four percent of the VOC emissions are included in the point source inventory.

The emission reduction benefit estimation methodology for area sources is based on information developed and used by CARB for their RACT/BARCT determination in 1998. CARB estimates that the total industrial adhesive and sealant emissions in California to be about 45 tons per day (tpd). Solvent-based adhesive and sealant emissions are estimated to be about 35 tpd of VOC and water-based adhesive and sealant emissions are about 10 tpd of VOC.

Table 5.13 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – NOx Area Sources

	ICI Boilers < 25 mmBTU/hour			ICI Boilers 25-50 mmBtu/hour			ICI Boilers 50-100 mmBtu/hour			Residential and Commercial Home Heating Oil		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
DE	No	No	No	No	No	No	No	No	No	No	No	No
DC	No	No	No	No	No	No	No	No	No	No	Yes	Yes
ME	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MD	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
NH	No	No	No	No	No	No	No	No	No	No	No	Yes
NJ	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
NY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
PA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
RI	No	No	No	No	No	No	No	No	No	No	Yes	Yes
VT[1]	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from OTC 2006 control measure in modeling inventory
No - Do not include emission reduction from OTC 2006 control measure in modeling inventory

Table 5.14 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – SO2 Area Sources

	ICI Boilers < 25 mmBTU/hour			ICI Boilers 25-50 mmBtu/hour			ICI Boilers 50-100 mmBtu/hour			Residential Home Heating Oil		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	No	No	No	No	No	No	No	No	No	No	No	Yes
DE	No	No	No	No	No	No	No	No	No	No	No	No
DC	No	No	No	No	No	No	No	No	No	No	Yes	Yes
ME	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MD	No	No	No	No	No	No	No	No	No	No	Yes	Yes
MA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
NH	No	No	No	No	No	No	No	No	No	No	No	Yes
NJ	No	No	No	No	No	No	No	No	No	No	Yes	Yes
NY	No	No	No	No	No	No	No	No	No	No	Yes	Yes
PA	No	No	No	No	No	No	No	No	No	No	Yes	Yes
RI	No	No	No	No	No	No	No	No	No	No	Yes	Yes
VT[1]	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from OTC 2006 control measure in modeling inventory
No - Do not include emission reduction from OTC 2006 control measure in modeling inventory

Table 5.15 State Staff Recommendations for Control Measures to Include in BOTW Regional Modeling – VOC Area Sources

	Adhesives and Sealants			Emulsified and Cutback Asphalt Paving			Consumer Products			Portable Fuel Containers		
State	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
CT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DE	Yes	Yes	Yes	No[2]	No[2]	No[2]	Yes	Yes	Yes	Yes	Yes	Yes
DC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ME	Yes	Yes	Yes	No[3]	No[3]	No[3]	Yes	Yes	Yes	Yes	Yes	Yes
MD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
NH	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NJ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PA	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VT[1]	No	No	No	No	No	No	No	No	No	No	No	No

Yes - Include emission reductions from OTC 2006 control measure in modeling inventory
No - Do not include emission reduction from OTC 2006 control measure in modeling inventory

1) Vermont indicated that the modeling inventory should not reflect anything beyond the 2002 OTC control level for these source categories in Vermont.
2) Delaware's existing asphalt paving regulations are more stringent than the OTC 2006 control measure.
3) Maine has not yet determined whether to include emission reductions from the OTC 2006 control measure for asphalt paving. Maine's inventory includes emissions only from cutback asphalt; no emissions are reported for emulsified asphalt.

CARB estimated that emission reductions achieved by statewide compliance with the VOC limits in the RACT/BARCT determination will range from approximately 29 to 35 tpd (CARB 1998, pg. 18). These emission reductions correspond to a 64.4 to 77.8 percent reduction from uncontrolled levels. For OTC modeling purposes, we used the lower end of this range (i.e., 64.4 percent reduction) to estimate the emission benefit for area sources due to the OTC 2006 model rule.

5.2.2 Asphalt Paving

The OTC current guideline for asphalt paving calls for a complete ban on the use of cutback asphalt during the ozone season and limits the VOC content of emulsified asphalt to two percent or less. The proposal is still under evaluation. A 20 percent reduction in emissions from emulsified asphalt was assumed for the modeling inventory.

The current regulations in all MANE-VU states generally ban the use of cutback asphalt during the ozone season. In some states, there are a few exemptions from the ban that allow for the use of cutback during the ozone season. It has not yet been determined whether states will modify their cutback asphalt rules to eliminate the exemptions. Since the VOC emissions from the use of cutback asphalt during the ozone season are generally very small, MACTEC assumed that there will be no additional emission reductions from the use of cutback asphalt during the ozone season.

The emission reductions resulting from the two percent VOC content limit on emulsified asphalt depend on the baseline VOC content of emulsified asphalt. The baseline VOC content may range from 0 to 12 percent. New Jersey used a VOC content of 8 percent in their baseline emission calculations (based on the 8 percent limit in their current rule). Reducing the VOC content to 2 percent in New Jersey will result in a 75 percent reduction. Delaware already bans the use of emulsified asphalt that contains any VOC, so there is no reduction in Delaware. Several other states used an average VOC content of 2.5 percent when developing their emission inventory. Thus, reducing the average VOC content from 2.5 percent to 2.0 percent results in a 20 percent reduction in VOC emissions. For States that did not supply a baseline VOC content for asphalt paving, we used the 20 percent reduction in VOC emissions from emulsified asphalt paving during the ozone season.

5.2.3 Consumer Products

The OTC 2006 model rule will modify the OTC 2001 model rule based on amendments adopted by CARB in July 2005. The emission reduction benefit estimation methodology is based on information developed by CARB. CARB estimates 6.05 tons per day of VOC reduced from their July 2005 amendments (CARB 2004, pg. 8), excluding the benefits from the two products (anti-static products and shaving gels) with compliance dates in 2008 or 2009. This equates to about 2,208 tons per year. The population of California as of July 1, 2005 is 36,132,147 (Census 2006). On a per capita basis, the emission reduction from the CARB July 2005 amendments equals 0.122 lbs/capita.

Since the OTC's 2006 control measure is very similar to the CARB July 2005 amendments (with the exclusion of the anti-static products and shaving gel 2008/2009 limits), the per capita emission reductions are expected to be the same in the OTR. The per capita factor after the implementation of the OTC 2001 model rule is 6.06 lbs/capita (Pechan 2001, pg. 8). The percentage reduction from the OTC's 2006 control measure was computed as shown below:

Current OTC Emission Factor	=	6.06 lbs/capita
Benefit from CARB 2005 amendments	=	0.122 lbs/capita
Percent Reduction	=	100%*(1 - (6.06 – 0.122)/6.06)
	=	2.0%

The 2.0% reduction will be applied to all states except Vermont, which indicated that they do not want the modeling inventory to reflect anything beyond the 2002 OTC control level for consumer products in Vermont.

5.2.4 Portable Fuel Containers

The OTC 2006 model rule will modify the OTC 2001 model rule based on amendments adopted by CARB in 2006. Estimated emission reductions were based on information compiled by CARB to support their recent amendments. CARB estimated that PFC emissions in 2015 will be 31.9 tpd in California with no additional controls or amendments to the 2000 PFC rules. CARB further estimates that the 2006 amendment will reduce emission from PFCs by 18.4 tpd in 2015 in California compared to the 2000 PFC regulations. Thus, at full implementation, the expected incremental reduction is approximately 58 percent, after an estimated 75 percent reduction from the original 2000 rule (CARB later adjusted the reduction to 65 percent due to unanticipated problems with spillage from the new cans).

The OTC calculations assume that States will adopt the rule by July 2007 and will provide manufacturers one year from the date of the rule to comply. Thus, new compliant PFCs will not be on the market until July 2008. Assuming a 10-year turnover to compliant cans, only 10 percent of the existing inventory of PFCs will comply with the new requirements in the summer of 2009. Therefore, only 10 percent of the full emission benefit estimated by CARB will occur by 2009 – the incremental reduction will be about 5.8 percent in

2009. In 2012, there will be a 40 percent turnover to compliant cans, resulting in an incremental reductions of about 23.2 percent. By 2018, the will be 100 percent penetration to compliant PFCs, resulting in an incremental reduction of 58 percent in 2018.

The emission reductions from the 2006 OTC PFC model rule were calculated only for the emissions accounted for in the area source inventory. Additional benefits (not estimated for this report) would be expected from equipment refueling vapor displacement and spillage that is accounted for in the nonroad inventory.

5.2.5 Industrial/Commercial/Institutional Boilers

In Resolution 06-02, the OTC Commissioners recommended that OTC member states pursue as necessary and appropriate state-specific rulemakings or other implementation methods to establish emission reduction percentages, emission rates or technologies for ICI boilers based on guidelines that varied by boiler size and fuel type. Specifically, the following guidelines were provided:

	NOx Reduction from 2009 Base Emissions by Fuel Type			
Boiler Size (mmBtu/hour)	**Natural Gas**	**#2 Fuel Oil**	**#4/#6 Fuel Oil**	**Coal**
< 25	10	10	10	10
25 to 50	50	50	50	50*
50 to 100	10	10	10	10*
100 to 250	75	40	40	40*
>250	**	**	**	**

* Resolution 06-02 did not specify a percent reduction for coal; for modeling purposes, the same percent reduction specified for #4/#6 fuel oil was used for coal

** Resolution 06-02 specified the reduction for > 250mmBtu/hour boilers to be the "same as EGUs of similar size." The OTC Commissioners have not yet recommended an emission rate or percent reduction for EGUs. As a result, no reductions for ICI boilers > 250 mmBtu/hour were included in the BOTW inventory.

Since the above guidelines vary by boiler size and fuel type, the specific percent reduction applied to an area source category depends on the SCC and design capacity of the source. The SCC identifies the fuel type (for example, SCC 21-02-004-xxx describes distillate oil-fired industrial boilers, SCC 21-02-006-xxx describes natural gas-fired industrial boilers). The area source inventory does not contain any information on the sizes of the units included in the inventories. To apportion area source emissions to the boiler size ranges listed above, MACTEC used data from the *Characterization of the U.S. Industrial/Commercial Boiler Population* (May 2005, Oak Ridge National Laboratory). We used the national estimates of boiler capacity by size from Table ES-1 of the Oak

Ridge report to calculate the percentage of total boiler capacity in each size range. Since the Oak Ridge report distinguished between industrial boilers and commercial/institutional boilers, we developed separate profiles for industrial boilers and for commercial/institutional boilers. We used these boiler size profiles to calculate weighted average percent reductions industrial boilers by fuel type and commercial/institutional boilers by fuel type.

5.2.6 Residential and Commercial Heating Oil

The BOTW control measure for heating oil is based on NESCAUM's report entitled "Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues." NESCAUM estimates that reducing the sulfur content of heating oil from 2,000 ppm to 500 ppm lowers SO2 emissions by 75 percent, PM emissions by 80 percent, NOx emissions by 10 percent. The 500 ppm sulfur heating oil is not expected to available on a widespread basis until 2012 at the earliest. These percent reductions were applied to residential distillate oil category (SCC 21-04-004-xxx) and commercial distillate oil category (SCC 21-03-004-xxx). These percent reductions were applied based on the state's recommendations in the matrix which identifies control measures to include and in which years the control measure should be accounted for in the modeling inventory.

5.2.7 BOTW Area Source NIF, SMOKE, and Summary Files

The Version 3 file names and descriptions delivered to MARAMA are shown in Table 5-16.

Table E-1 shows the anticipated percent reductions by SCC and year for the nonEGU point source BOTW control measures.

5.2.8 BOTW Area Source Emission Summaries

Emission summaries by state, year, and pollutant are presented in Tables 5-17 through 5-23 for CO, NH3, NOx, PM10-PRI, PM25-PRI, SO2, and VOC, respectively.

Table 5-16 BOTW Area Source NIF, IDA, and Summary File Names

File Name	Date	Description
MANEVU_BOTW2009_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2009 BOTW area source NIF inventory
MANEVU_BOTW2012_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2012 BOTW area source NIF inventory
MANEVU_BOTW2018_Area_NIFV3_2.mdb	Nov. 9, 2006	Version 3.2 of 2018 BOTW area source NIF inventory
MANEVU_BOTW2009_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2009 BOTW area source inventory in SMOKE IDA format
MANEVU_BOTW2012_Area_IDAV3_2.txt	Nov. 20, 2006	Version 3.2 of 2012 BOTW area source inventory in SMOKE IDA format
MANEVU_BOTW2018_Area_IDA3V_2.txt	Nov. 20, 2006	Version 3.2 of 2018 BOTW area source inventory in SMOKE IDA format
MANEVU OTB BOTW Area V3_2 State Summary.xls	Nov. 8, 2006	Spreadsheet with state totals by pollutant for all area sources
MANEVU OTB BOTW Area V3_2 State SCC Summary.xls	Nov. 8, 2006	Spreadsheet with SCC totals by state and pollutant for all area sources.

Table 5-17 Area Sources
OTB/OTW and BOTW Annual CO Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	70,198	65,865	65,865	63,874	63,874	59,797	59,797
DE	14,052	15,395	15,395	15,233	15,233	14,864	14,864
DC	2,300	2,417	2,417	2,460	2,460	2,512	2,512
ME	109,223	102,743	102,743	99,877	99,877	94,181	94,181
MD	141,178	143,653	143,653	144,233	144,233	144,649	144,649
MA	137,496	132,797	132,797	130,255	130,255	125,205	125,205
NH	79,647	76,504	76,504	75,319	75,319	73,038	73,038
NJ	97,657	90,432	90,432	88,048	88,048	83,119	83,119
NY	356,254	336,576	336,576	327,118	327,118	307,659	307,659
PA	266,935	266,887	266,887	264,012	264,012	257,396	257,396
RI	8,007	8,007	8,007	8,026	8,026	8,024	8,024
VT	43,849	42,683	42,683	42,172	42,172	41,283	41,283
Total	**1,326,796**	**1,283,959**	**1,283,959**	**1,260,627**	**1,260,627**	**1,211,727**	**1,211,727**

No BOTW controls were considered for CO.

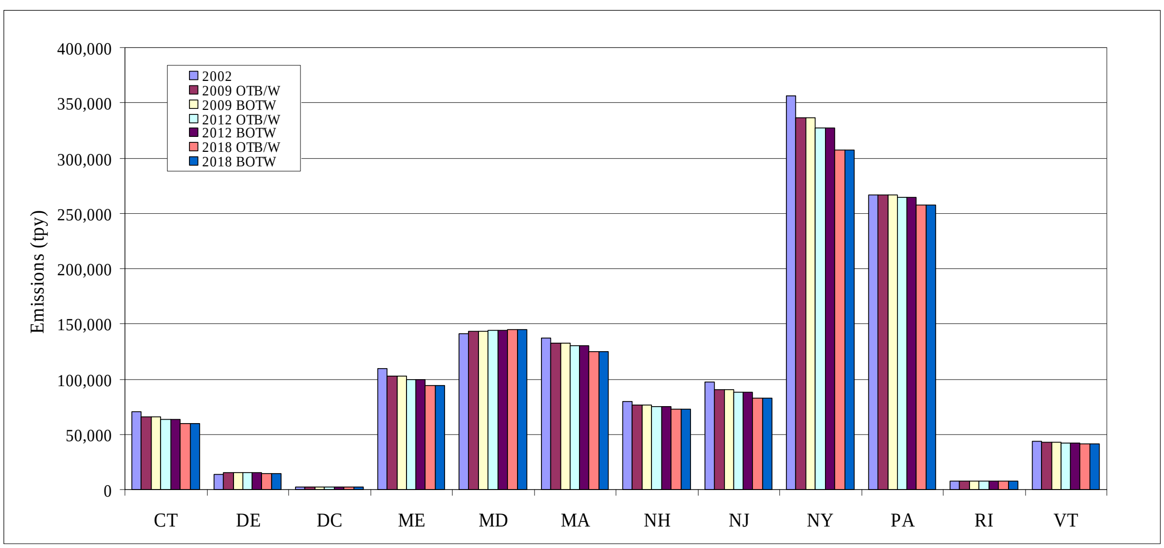


**Table 5-18 Area Sources
OTB/OTW and BOTW Annual NH3 Emission Projections
(tons per year)**

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	5,318	5,208	5,208	5,156	5,156	5,061	5,061
DE	13,279	13,316	13,316	13,328	13,328	13,342	13,342
DC	14	16	16	16	16	17	17
ME	8,747	10,453	10,453	11,116	11,116	12,312	12,312
MD	25,834	31,879	31,879	34,222	34,222	38,155	38,155
MA	18,809	19,131	19,131	19,275	19,275	19,552	19,552
NH	2,158	2,466	2,466	2,584	2,584	2,789	2,789
NJ	17,572	19,457	19,457	20,154	20,154	21,435	21,435
NY	67,422	81,626	81,626	87,116	87,116	96,078	96,078
PA	79,911	98,281	98,281	105,418	105,418	117,400	117,400
RI	883	945	945	972	972	1,025	1,025
VT	9,848	12,156	12,156	13,062	13,062	14,580	14,580
Total	**249,795**	**294,934**	**294,934**	**312,419**	**312,419**	**341,746**	**341,746**

No BOTW controls were considered for NH3.

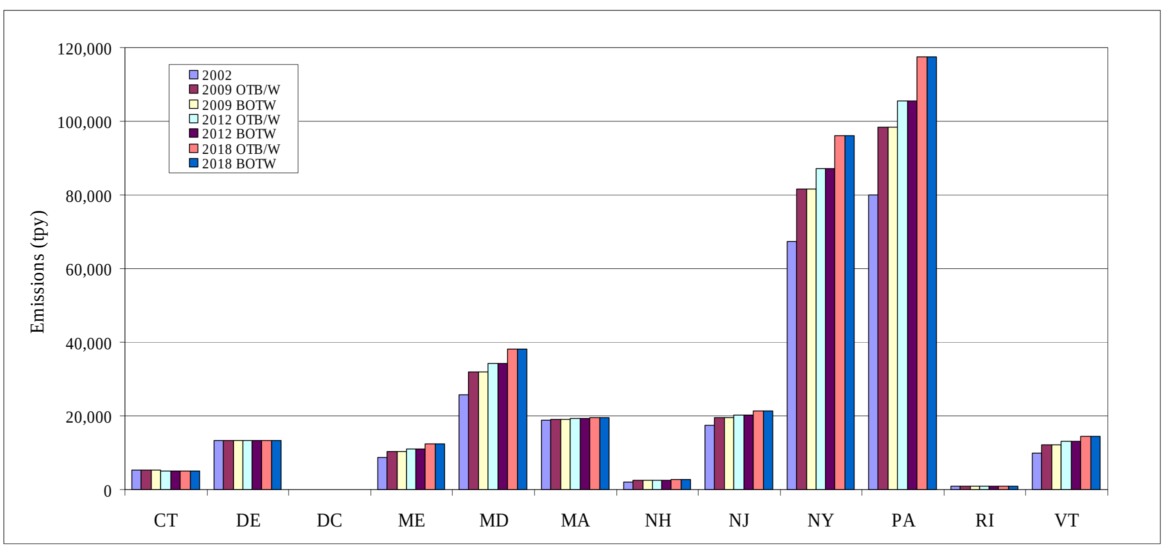


Table 5-19 Area Sources
OTB/OTW and BOTW Annual NOx Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	12,689	13,173	12,245	13,342	12,389	13,388	11,795
DE	2,608	2,821	2,821	2,913	2,913	3,014	3,014
DC	1,644	1,961	1,961	2,081	2,052	2,259	2,229
ME	7,360	7,477	7,477	7,486	7,095	7,424	7,036
MD	15,678	16,858	16,858	17,315	17,007	18,073	17,746
MA	34,281	35,732	35,732	36,331	35,321	37,187	36,199
NH	10,960	11,879	11,879	12,055	12,055	12,430	12,180
NJ	26,692	24,032	24,032	23,981	21,976	23,660	21,684
NY	98,803	106,375	95,190	107,673	92,935	108,444	93,639
PA	47,591	50,162	50,162	50,793	49,773	50,829	49,829
RI	3,886	4,149	4,149	4,260	4,112	4,397	4,249
VT	3,208	3,419	3,419	3,429	3,429	3,430	3,430
Total	**265,400**	**278,038**	**265,925**	**281,659**	**261,057**	**284,535**	**263,030**

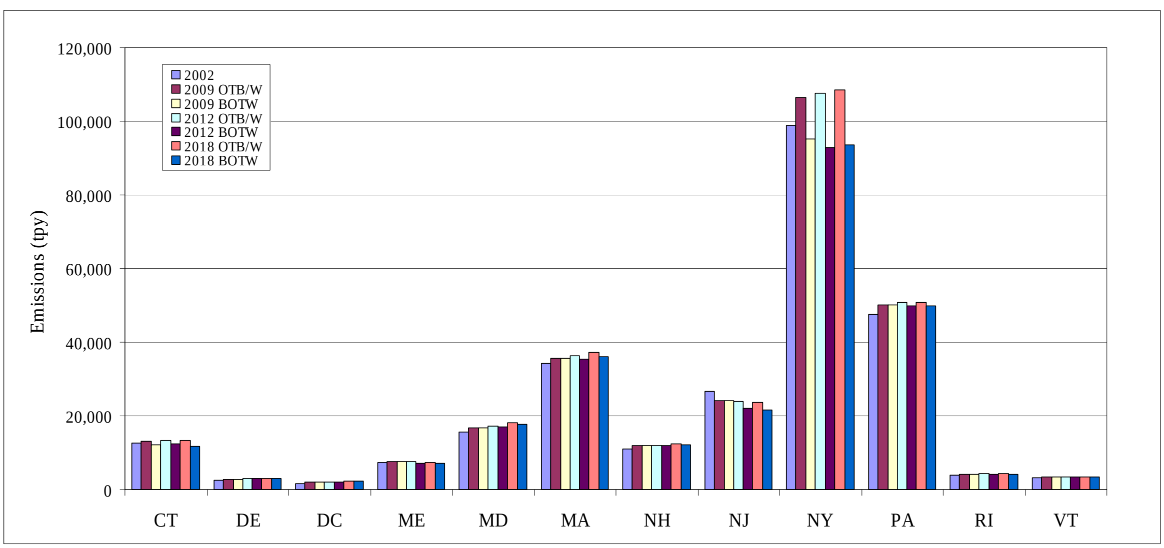


Table 5-20 Area Sources
OTB/OTW and BOTW Annual PM10-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	48,281	48,970	48,970	49,004	49,004	49,479	48,734
DE	13,039	13,928	13,928	14,236	14,236	14,844	14,844
DC	3,269	3,511	3,511	3,605	3,547	3,825	3,762
ME	168,953	175,979	175,979	179,689	179,004	189,619	188,928
MD	95,060	105,944	105,944	110,141	109,829	117,396	117,066
MA	192,860	198,668	198,668	200,692	200,215	204,922	204,456
NH	43,328	46,060	46,060	47,187	47,187	49,801	49,544
NJ	61,601	61,684	61,684	61,284	60,916	60,880	60,519
NY	369,595	382,124	382,124	385,925	383,234	392,027	389,385
PA	391,897	421,235	421,235	432,844	431,787	454,970	453,934
RI	8,295	8,962	8,962	9,244	8,976	9,797	9,514
VT	56,131	60,521	60,521	62,465	62,465	66,916	66,916
Total	**1,452,309**	**1,527,586**	**1,527,586**	**1,556,316**	**1,550,400**	**1,614,476**	**1,607,602**

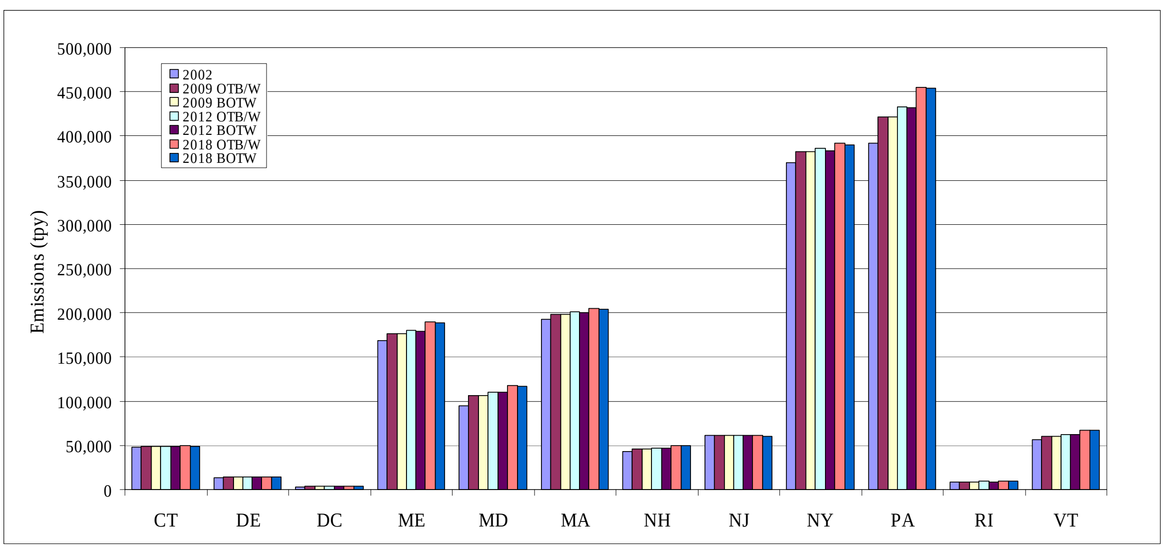


Table 5-21 Area Sources
OTB/OTW and BOTW Annual PM25-PRI Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	14,247	13,766	13,766	13,517	13,517	13,033	12,366
DE	3,204	3,387	3,387	3,403	3,403	3,426	3,426
DC	805	860	860	879	827	917	860
ME	32,774	33,026	33,026	33,189	32,576	33,820	33,201
MD	27,318	28,923	28,923	29,508	29,228	30,449	30,153
MA	42,083	43,121	43,121	43,186	42,820	43,438	43,080
NH	17,532	17,965	17,965	18,050	18,050	18,316	18,087
NJ	19,350	18,590	18,590	18,271	17,924	17,653	17,313
NY	87,154	87,576	87,576	87,260	85,011	86,422	84,211
PA	74,925	79,169	79,169	80,728	79,775	83,570	82,637
RI	2,064	2,184	2,184	2,232	1,996	2,316	2,068
VT	11,065	11,482	11,482	11,652	11,652	12,059	12,059
Total	**332,521**	**340,049**	**340,049**	**341,875**	**336,779**	**345,419**	**339,461**

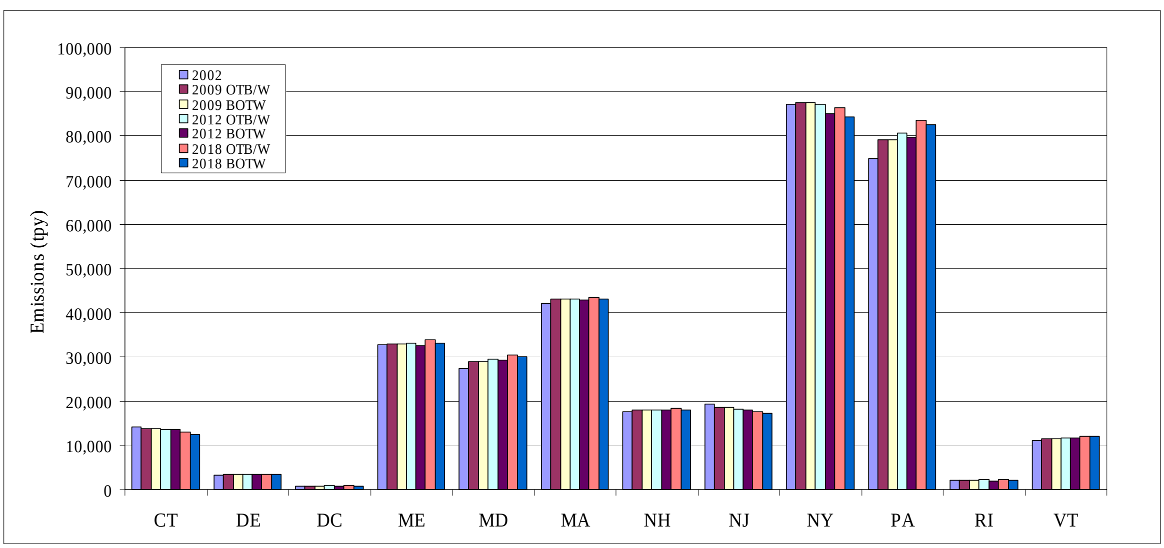


Table 5-22 Area Sources
OTB/OTW and BOTW Annual SO2 Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	12,418	12,581	12,581	12,604	12,604	12,184	3,398
DE	1,588	1,599	1,599	1,602	1,602	1,545	1,545
DC	1,337	1,487	1,487	1,541	499	1,632	522
ME	13,149	13,776	13,776	13,846	4,897	13,901	4,940
MD	12,393	13,685	13,685	14,074	8,762	14,741	9,118
MA	25,488	25,961	25,961	26,029	8,414	25,570	8,357
NH	7,072	7,463	7,463	7,470	7,470	7,421	3,118
NJ	10,744	10,672	10,672	10,697	4,435	10,510	4,374
NY	130,409	139,589	139,589	140,154	98,160	141,408	100,452
PA	63,679	67,535	67,535	67,446	49,212	66,363	48,475
RI	4,557	5,024	5,024	5,189	1,316	5,398	1,368
VT	4,087	4,646	4,646	4,687	4,687	4,764	4,764
Total	**286,921**	**304,018**	**304,018**	**305,339**	**202,058**	**305,437**	**190,431**

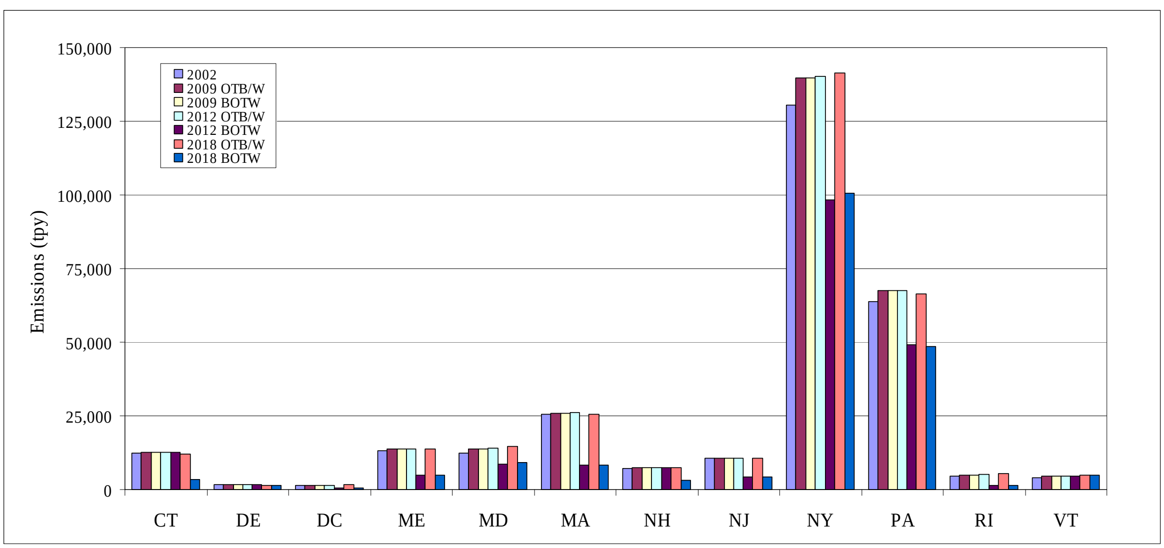
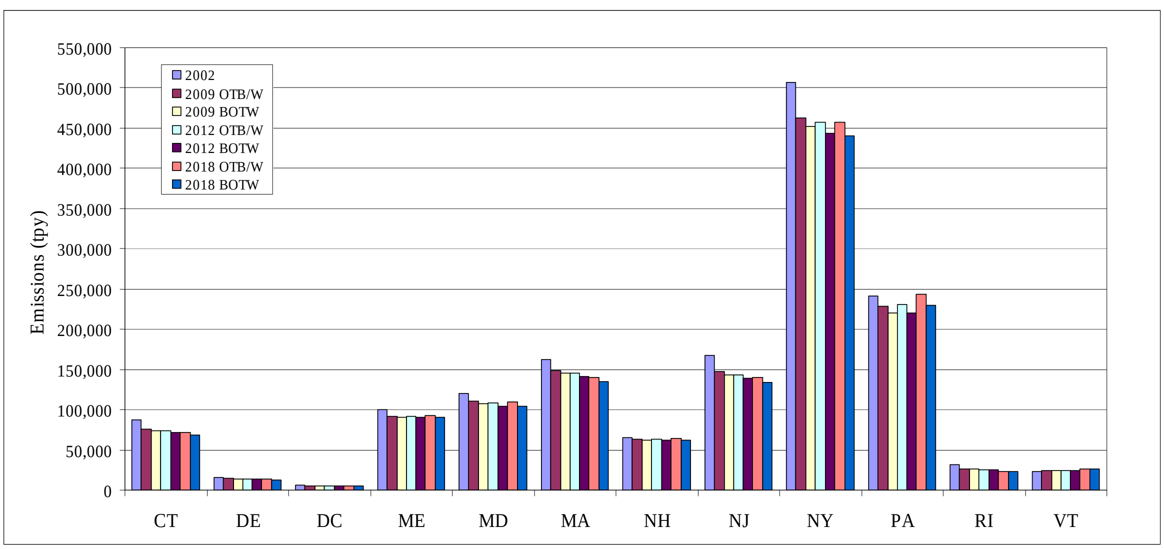


Table 5-23 Area Sources
OTB/OTW and BOTW Annual VOC Emission Projections
(tons per year)

	2002	2009 OTB/W	2009 BOTW	2012 OTB/W	2012 BOTW	2018 OTB/W	2018 BOTW
CT	87,302	75,693	73,738	73,560	71,249	71,274	68,395
DE	15,519	14,245	13,794	13,943	13,408	13,744	13,066
DC	6,432	5,420	5,300	5,352	5,144	5,255	4,991
ME	100,621	91,910	90,869	91,667	90,457	92,410	90,866
MD	120,254	110,385	107,527	108,067	104,400	110,046	104,615
MA	162,145	148,625	145,059	145,674	140,848	140,558	134,963
NH	65,370	63,069	61,860	63,356	61,913	64,368	62,649
NJ	167,882	147,617	143,089	143,752	138,646	139,626	134,089
NY	507,292	462,811	451,669	456,856	443,940	457,421	440,892
PA	240,785	228,444	219,733	230,393	219,897	243,421	230,011
RI	31,402	26,695	26,572	25,548	25,315	23,561	23,305
VT	23,265	24,068	24,068	24,635	24,634	26,198	26,197
Total	**1,528,269**	**1,398,982**	**1,363,278**	**1,382,803**	**1,339,851**	**1,387,882**	**1,334,039**



5.3 Nonroad Mobile Sources

In the June 2007 MOU, the OTC Commissioners recommended that states pursue state-specific rulemakings for one nonroad source categories – portable fuel containers. The OTC 2006 control measure for portable fuel containers will result in addition VOC emission reduction from the refueling of nonroad equipment. However, these reductions could not be estimated due to resource and time constraints.

5.4 Electric Generating Units

In the June 2008 Statement on EGUs, the OTC Commissioners directed OTC staff to complete an evaluation and recommendations for a program beyond CAIR that includes strategies to address the base, intermediate and peak load emissions. No specific emission reduction targets were identified. States specified that no additional reductions from EGUs be included in the BOTW inventory.

5.5 Onroad Mobile Sources

In Resolution 06-02, the OTC Commissioners recommended that the OTC member states pursue a region fuel program consistent with the Energy Act of 2005. No specific emission reduction targets were identified. States specified that no additional reductions from onroad mobile sources be included in the BOTW inventory.

In the June 2007 MOU, the OTC Commissioners recommended that states pursue state-specific rulemakings to implement a mandatory diesel engine chip reflash program. It is our understanding that the emission reductions from the diesel engine chip reflash program are already accounted for in MANE-VU's OTB emission inventory.

Appendix A – NonEGU Point Source Growth Factors

Table A-1 Connecticut Growth Factors by SIC Code

SIC	GF_02_09	GF_02_12	GF_02_18	CTDOL_CAT
0181	1.0019	1.0027	1.0042	Agricultural, Crop Production
1422	0.9400	0.9143	0.8629	Mining
1429	0.9400	0.9143	0.8629	Mining
2051	0.9355	0.9079	0.8526	Manufacturing, Food
2096	0.9355	0.9079	0.8526	Manufacturing, Food
2261	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2262	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2284	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2298	0.9254	0.8934	0.8295	Manufacturing, Textile Product Mills
2434	1.0679	1.0969	1.1551	Manufacturing, Wood Products
2522	1.0435	1.0621	1.0994	Manufacturing, Furniture & Related
2541	1.0679	1.0969	1.1551	Manufacturing, Wood Products
2621	0.8706	0.8152	0.7043	Manufacturing, Paper
2631	0.8706	0.8152	0.7043	Manufacturing, Paper
2652	0.8706	0.8152	0.7043	Manufacturing, Paper
2653	0.8706	0.8152	0.7043	Manufacturing, Paper
2672	0.8706	0.8152	0.7043	Manufacturing, Paper
2673	0.8706	0.8152	0.7043	Manufacturing, Paper
2711	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2752	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2754	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2759	0.8386	0.7695	0.6312	Manufacturing, Printing & Related Activ
2821	1.1024	1.1464	1.2342	Manufacturing, Chemical
2833	1.1024	1.1464	1.2342	Manufacturing, Chemical
2869	1.1024	1.1464	1.2342	Manufacturing, Chemical
2875	1.1024	1.1464	1.2342	Manufacturing, Chemical
3052	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3069	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3081	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3086	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3087	0.9591	0.9416	0.9066	Manufacturing, Plastic & Rubber Product
3272	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
3312	0.8713	0.8162	0.7059	Manufacturing, Primary Metal
3351	0.8713	0.8162	0.7059	Manufacturing, Primary Metal
3357	0.8713	0.8162	0.7059	Manufacturing, Primary Metal
3423	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3429	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3444	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3469	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3471	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3479	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3497	0.9150	0.8786	0.8057	Manufacturing, Fabricated Metal
3562	0.8778	0.8254	0.7206	Manufacturing, Machinery

SIC	GF_02_09	GF_02_12	GF_02_18	CTDOL_CAT
3569	0.8778	0.8254	0.7206	Manufacturing, Machinery
3579	0.8452	0.7788	0.6461	Manufacturing, Computer & Electronic Eq
3634	0.9149	0.8784	0.8054	Manufacturing, Electrical Equipment, Ap
3675	0.9149	0.8784	0.8054	Manufacturing, Electrical Equipment, Ap
3714	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3721	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3724	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3728	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3731	0.9705	0.9578	0.9326	Manufacturing, Transportation Equipment
3827	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
3949	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
3951	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
4226	1.0921	1.1316	1.2106	Transportation & Warehousing, Warehousi
4911	0.9550	0.9358	0.8972	Utilities
4922	0.9550	0.9358	0.8972	Utilities
4924	0.9550	0.9358	0.8972	Utilities
4931	1.1439	1.2056	1.3290	Waste Management & Remediation Services
4952	1.1439	1.2056	1.3290	Waste Management & Remediation Services
4953	1.1439	1.2056	1.3290	Waste Management & Remediation Services
4961	0.9550	0.9358	0.8972	Utilities
5171	1.0605	1.0864	1.1382	Wholesale Trade, Nondurable Goods
6036	1.0569	1.0814	1.1302	Finance & Insurance
6512	1.0197	1.0282	1.0451	Real Estate & Rental & Leasing
6513	1.0197	1.0282	1.0451	Real Estate & Rental & Leasing
7389	1.0569	1.0814	1.1302	Finance & Insurance
8051	1.0824	1.1177	1.1883	Health Care & Social Assistance, Nursin
8062	1.0583	1.0833	1.1334	Health Care & Social Assistance, Hospit
8063	1.0583	1.0833	1.1334	Health Care & Social Assistance, Hospit
8211	1.0642	1.0918	1.1468	Educational Services
8221	1.0642	1.0918	1.1468	Educational Services
8631	1.0642	1.0918	1.1468	Educational Services
8734	1.1189	1.1699	1.2718	Professional, Scientific, and Technical
9223	1.0185	1.0264	1.0423	Government
9511	1.0185	1.0264	1.0423	Government
9621	1.0185	1.0264	1.0423	Government
9711	1.0185	1.0264	1.0423	Government
3900	0.9841	0.9772	0.9636	Manufacturing, Miscellaneous
5093	1.0527	1.0754	1.1206	Wholesale Trade, Durable Goods
4200	0.9871	0.9815	0.9705	Transportation & Warehousing, Truck Tra

Table A-2 Non-EGU Point Source Growth Factors by SCC Code

See Electronic File: MANE-VU_NonEGU_gf_scc.xls

This table contains 12,791 records with NonEGU point source growth factors by county and SCC. The format for the tables is as follows:

Column A – County FIPS code

Column B – Source Classification Code (SCC)

Column C – EGAS_02_09 this is the EGAS 5.0 factor for projecting from 2002 to 2009

Column D – AEO5_02_09 this is the DOE AEO 2005 factor for projecting from 2002 to 2009

Column E – ST_02_09 this is the state-supplied factor for projecting from 2002 to 2009

Column F – GF_02_09 this is the final factor actually used for projecting from 2002 to 2009 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column G – EGAS_02_12 this is the EGAS 5.0 factor for projecting from 2002 to 2012

Column H – AEO5_02_12 this is the DOE AEO 2005 factor for projecting from 2002 to 2012

Column I – ST_02_12 this is the state-supplied factor for projecting from 2002 to 2012

Column J – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column K – EGAS_02_18 this is the EGAS 5.0 factor for projecting from 2002 to 2018

Column J – AEO5_02_18 this is the DOE AEO 2005 factor for projecting from 2002 to 2018

Column M– ST_02_18 this is the state-supplied factor for projecting from 2002 to 2018

Column N – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column O – SCC description

Appendix B – NonEGU Point Source Control Factors

Table B-1 NonEGU Emission Units Affected by the NOx SIP Call Phase I

FIPS	SITE ID	Facility Name	EU ID	Ozone Season Allowance (tpy)	Prorated Annual Emissions (tpy)	Unit Description
09003	1509	PRATT & WHITNEY DIV UTC	P0049	11	26	FT-8 COGENERATION GAS TURBINE
09011	0604	PFIZER INC	P0001	33	79	BLR B&W FM140-97 #8
09011	0604	PFIZER INC	R0012	31	74	BLR CE #5 (101-4)
09011	3102	SPRAGUE PAPERBOARD INC	R0003	75	180	BLR B&W PFI-22-0 #1
24001	001-0011	WESTVACO FINE PAPERS	1	500	1200	001-0011-3-0018
24001	001-0011	WESTVACO FINE PAPERS	2	440	1056	001-0011-3-0019
25009	1190138	GENERAL ELECTRIC AIRCRAFT	03	29	68	BOILER #3-BABCOCK+WILCOX PPL-2897 DUAL FUEL EV99-3
25009	1190138	GENERAL ELECTRIC AIRCRAFT	05	24	58	TURBINE #1-GE G5301 DUAL FUEL BLDG 99-8
25017	1191844	MIT	02	132	317	TURBINE #1-ABB GT10 DUEL FUEL(EXHAUST TO HRSG)
25025	1190507	TRIGEN BOSTON ENERGY	01	47	113	BOILER #1-BABCOCK+WILCOX HSB8477A DUAL FUEL
25025	1190507	TRIGEN BOSTON ENERGY	02	47	113	BOILER #2-BABCOCK+WILCOX JSB8477B DUAL FUEL
25025	1190507	TRIGEN BOSTON ENERGY	03	47	113	BOILER #3-FOSTER+WHEELER SC DUAL FUEL
25025	1190507	TRIGEN BOSTON ENERGY	04	47	113	BOILER #4-BABCOCK+WILCOX HSB8608A DUAL FUEL
36031	5154800008	INTERNATIONAL PAPER TICONDEROG	POWERH	227	545	EMISSION UNIT
36055	8261400205	KODAK PARK DIVISION	U00015	1721	4130	EMISSION UNIT
36091	5412600007	INTERNATIONAL PAPER HUDSON RIV	UBOILR	124	298	EMISSION UNIT
42003	4200300022	SHENANGO INC.	005	13	31	BOILER #9, NATURAL GAS
42017	420170306	EXELON GENERATION CO/FAIRLESS	043	2	5	POWER HOUSE BOILER NO. 3

FIPS	SITE ID	Facility Name	EU ID	Ozone Season Allowance (tpy)	Prorated Annual Emissions (tpy)	Unit Description
42017	420170306	EXELON GENERATION CO/FAIRLESS	044	73	175	POWER HOUSE BOILER NO. 4
42017	420170306	EXELON GENERATION CO/FAIRLESS	045	61	146	POWER HOUSE BOILER NO. 5
42045	420450016	KIMBERLY CLARK PA LLC/CHESTER	034	2	5	
42045	420450220	FPL ENERGY MH50 LP/MARCUS HOOK	031	82	197	COGENERATION UNIT - ABB TYPE B
42047	420470005	WEYERHAEUSER/JOHNSONBURG MILL	040	85	204	BOILER #81
42047	420470005	WEYERHAEUSER/JOHNSONBURG MILL	041	86	206	BOILER #82
42091	420910028	MERCK & CO/WEST POINT	039	101	242	COGEN II GAS TURBINE
42101	4210101551	SUNOCO CHEMICALS (FORMER ALLIE	052	86	206	BL-703: BOILER #3
42131	421310009	PROCTER & GAMBLE PAPER PROD CO	035	203	482	WESTINGHOUSE 251B12
42133	421330016	PH GLATFELTER CO/SPRING GROVE	034	146	350	#4 POWER BOILER

Table B-2 Cement Kilns Affected by the NOx SIP Call Phase I

FIPS	SITE ID	Facility Name	EU ID	Control Factor	Unit Description
24013	013-0012	LEHIGH PORTLAND CEMENT	39	25.00	013-0012-6-0256 013-0012-6-0256
24021	021-0013	ESSROC CEMENT	21	25.00	021-0013-6-0465 021-0013-6-0465
24021	021-0013	ESSROC CEMENT	22	25.00	021-0013-6-0466 021-0013-6-0466
24043	043-0008	INDEPENDENT CEMENT/ST. LAWEREN	24	25.00	043-0008-6-0495 043-0008-6-0495
36001	4012400001	LAFARGE BUILDING MATERIALS INC	041000	25.00	EMISSION UNIT
36039	4192600021	ST LAWRENCE CEMENT CORP-CATSKI	U00K18	25.00	EMISSION UNIT
36113	5520500013	GLENS FALLS LEHIGH CEMENT	0UKILN	25.00	EMISSION UNIT
42011	420110039	LEHIGH CEMENT CO /EVANSVILLE	121	70.00	PORTLAND CEMENT KILN #1
42011	420110039	LEHIGH CEMENT CO /EVANSVILLE	122	70.00	PORTLAND CEMENT KILN #2
42019	420190024	ARMSTRONG CEMENT & SUPPLY	101	16.00	NO.1 KILN
42019	420190024	ARMSTRONG CEMENT & SUPPLY	121	16.00	NO.2 KILN
42073	420730024	CEMEX INC/WAMPUM CEMENT PLT	226	12.50	
42073	420730024	CEMEX INC/WAMPUM CEMENT PLT	227	0.00	
42073	420730024	CEMEX INC/WAMPUM CEMENT PLT	228	12.70	
42073	420730026	ESSROC/BESSEMER	501	8.00	
42073	420730026	ESSROC/BESSEMER	502	8.00	
42077	420770019	LAFARGE CORP/WHITEHALL PLT	101	12.28	K-2 KILN
42077	420770019	LAFARGE CORP/WHITEHALL PLT	114	100.00	K-3 KILN
42095	420950006	HERCULES CEMENT CO LP/STOCKERT	102	6.88	NO. 1 CEMENT KILN
42095	420950006	HERCULES CEMENT CO LP/STOCKERT	122	6.88	NO. 3 CEMENT KILN
42095	420950012	KEYSTONE PORTLAND CEMENT/EAST	101	27.00	CEMENT KILN NO. 1
42095	420950012	KEYSTONE PORTLAND CEMENT/EAST	102	27.00	CEMENT KILN NO. 2
42095	420950045	ESSROC/NAZARETH LOWER CEMENT	142	41.00	
42095	420950045	ESSROC/NAZARETH LOWER CEMENT	143	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	101	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	102	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	103	41.00	
42095	420950127	ESSROC/NAZARETH CEMENT PLT 3	104	41.00	
42133	421330060	LEHIGH CEMENT CO/YORK OPERATION	200	27.00	

Table B-3 Large IC Engines Affected by the NOx SIP Call Phase II

FIPS	SITE ID	Facility Name	EU ID	Control Factor	Unit Description
24027	027-0223	TRANSCONTINENTAL GAS PIPE LINE	1	80.00	027-0223-5-0054 boiler
42005	420050015	DOMINION TRANS INC/SOUTH BEND	101	80.00	ENGINE #1 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	102	80.00	ENGINE #2 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	103	80.00	ENGINE #3 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	104	80.00	ENGINE #4 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	105	80.00	ENGINE #5 (2000 BHP)
42005	420050015	DOMINION TRANS INC/SOUTH BEND	106	80.00	ENGINE #6 (2000 BHP)
42029	420290047	TRANSCONTINENTAL GAS/FRAZER ST	741	80.00	#11 I-C GAS COMPRESSOR ENGINE
42029	420290047	TRANSCONTINENTAL GAS/FRAZER ST	742	80.00	#12 I-C GAS COMPRESSOR ENGINE
42029	420290047	TRANSCONTINENTAL GAS/FRAZER ST	743	80.00	#13 I-C GAS COMPRESSOR ENGINE
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	101	90.00	COOPER-BESSEMER ENGINE #1
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	102	90.00	COOPER-BESSEMER ENGINE #2
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	103	90.00	COOPER-BESSEMER ENGINE #3
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42063	420630018	PA STATE SYS OF HIGHER ED/INDI	104	90.00	COOPER-BESSEMER ENGINE #4
42105	421050005	TENNESSEE GAS PIPELINE CO/313	P111	80.00	3,000HP KVT-512 ENGINE
42105	421050005	TENNESSEE GAS PIPELINE CO/313	P112	80.00	2,000HP GMVH-10C ENGINE
42133	421330053	TRANSCONTINENTAL GAS/STATION 1	036	80.00	COOPER-BESSEMER ENGINE #4
42133	421330053	TRANSCONTINENTAL GAS/STATION 1	037	80.00	COOPER-BESSEMER ENGINE #5

B-4 NonEGU Control Factors for Post-2002 MACT Categories

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
20100102	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100202	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100702	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100802	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20100902	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200102	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200104	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200202	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200204	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200301	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200501	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200702	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200706	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20200902	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201001	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201002	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201012	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201014	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201602	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20201702	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20300101	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
20300301	NOX	17.000	ZZZZ	Reciprocating Internal Combustion Engines
30400101	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400102	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400103	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400104	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400105	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400106	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400107	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400108	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400109	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400110	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400111	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400112	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400113	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400114	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400115	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400116	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400117	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400118	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400120	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400121	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400130	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400131	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400132	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400133	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400150	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400160	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30400199	PM10-PRI	90.000	RRR	Secondary Aluminum Production
30500301	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30500302	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500303	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500304	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500305	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500306	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500307	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500308	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500309	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500310	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500311	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500312	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500313	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500314	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500315	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500316	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500317	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500318	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500319	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500321	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500322	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500330	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500331	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500332	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500333	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500334	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500335	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500340	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500342	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500350	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500351	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500355	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500360	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500361	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500370	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500397	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500398	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30500399	PM10-PRI	45.100	JJJJJ	Brick and Structural Clay
30501601	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501602	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501603	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501604	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501605	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501606	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501607	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501608	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501609	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501610	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501611	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501612	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501613	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501614	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501615	PM10-PRI	28.000	AAAAA	Lime Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30501616	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501617	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501618	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501619	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501620	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501621	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501622	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501623	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501624	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501625	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501626	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501627	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501628	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501629	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501630	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501631	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501632	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501633	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501640	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501650	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501660	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30501699	PM10-PRI	28.000	AAAAA	Lime Manufacturing
30400101	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400102	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400103	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400104	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400105	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400106	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400107	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400108	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400109	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400110	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400111	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400112	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400113	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400114	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400115	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400116	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400117	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400118	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400120	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400121	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400130	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400131	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400132	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400133	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400150	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400160	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30400199	PM25-PRI	90.000	RRR	Secondary Aluminum Production
30500301	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500302	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500303	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30500304	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500305	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500306	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500307	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500308	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500309	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500310	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500311	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500312	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500313	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500314	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500315	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500316	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500317	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500318	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500319	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500321	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500322	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500330	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500331	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500332	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500333	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500334	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500335	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500340	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500342	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500350	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500351	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500355	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500360	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500361	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500370	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500397	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500398	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30500399	PM25-PRI	45.100	JJJJJ	Brick and Structural Clay
30501601	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501602	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501603	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501604	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501605	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501606	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501607	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501608	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501609	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501610	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501611	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501612	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501613	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501614	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501615	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501616	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501617	PM25-PRI	28.000	AAAAA	Lime Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30501618	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501619	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501620	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501621	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501622	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501623	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501624	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501625	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501626	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501627	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501628	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501629	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501630	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501631	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501632	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501633	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501640	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501650	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501660	PM25-PRI	28.000	AAAAA	Lime Manufacturing
30501699	PM25-PRI	28.000	AAAAA	Lime Manufacturing
20100101	VOC	0.250	YYYY	Stationary Combustion Turbines
20100102	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100201	VOC	0.250	YYYY	Stationary Combustion Turbines
20100202	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100702	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100802	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20100902	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200101	VOC	0.250	YYYY	Stationary Combustion Turbines
20200102	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200103	VOC	0.250	YYYY	Stationary Combustion Turbines
20200104	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200201	VOC	0.250	YYYY	Stationary Combustion Turbines
20200202	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200203	VOC	0.250	YYYY	Stationary Combustion Turbines
20200204	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200209	VOC	0.250	YYYY	Stationary Combustion Turbines
20200301	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200501	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200702	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200706	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20200902	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201001	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201002	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201012	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201014	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201602	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20201702	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20300101	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20300102	VOC	0.250	YYYY	Stationary Combustion Turbines
20300109	VOC	0.250	YYYY	Stationary Combustion Turbines
20300202	VOC	0.250	YYYY	Stationary Combustion Turbines
20300203	VOC	0.250	YYYY	Stationary Combustion Turbines

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
20300209	VOC	0.250	YYYY	Stationary Combustion Turbines
20300301	VOC	40.000	ZZZZ	Reciprocating Internal Combustion Engines
20300701	VOC	0.250	YYYY	Stationary Combustion Turbines
30100501	VOC	26.100	YY	Generic MACT (Carbon Black)
30100502	VOC	26.100	YY	Generic MACT (Carbon Black)
30100503	VOC	26.100	YY	Generic MACT (Carbon Black)
30100504	VOC	26.100	YY	Generic MACT (Carbon Black)
30100506	VOC	26.100	YY	Generic MACT (Carbon Black)
30100507	VOC	26.100	YY	Generic MACT (Carbon Black)
30100508	VOC	26.100	YY	Generic MACT (Carbon Black)
30100509	VOC	26.100	YY	Generic MACT (Carbon Black)
30100510	VOC	26.100	YY	Generic MACT (Carbon Black)
30100599	VOC	26.100	YY	Generic MACT (Carbon Black)
30101005	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101013	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101014	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101027	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101028	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101033	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101034	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101035	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101036	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101037	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101045	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101046	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101047	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101054	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101055	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101061	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101062	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101063	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101064	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101073	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101074	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101075	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101076	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101077	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30101080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101085	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101086	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101087	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101099	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101827	VOC	55.700	OOO	Polymers and Resins III
30101837	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30101880	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101881	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101882	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101883	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101884	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101885	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101890	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101891	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101892	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101893	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101894	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30101899	VOC	67.400	MMMMM	Flexible Polyurethane Foam Fabrication Ope
30103201	VOC	87.400	UUU	Petroleum Refineries
30103202	VOC	87.400	UUU	Petroleum Refineries
30103203	VOC	87.400	UUU	Petroleum Refineries
30103204	VOC	87.400	UUU	Petroleum Refineries
30103205	VOC	87.400	UUU	Petroleum Refineries
30103299	VOC	87.400	UUU	Petroleum Refineries
30103301	VOC	64.820	MMM	Pesticide Active Ingredient
30103311	VOC	64.820	MMM	Pesticide Active Ingredient
30103312	VOC	64.820	MMM	Pesticide Active Ingredient
30103399	VOC	64.820	MMM	Pesticide Active Ingredient
30103901	VOC	44.500	YY	Generic MACT (Cyanide)
30103902	VOC	44.500	YY	Generic MACT (Cyanide)
30103903	VOC	44.500	YY	Generic MACT (Cyanide)
30105001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105105	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105108	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105110	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105112	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105114	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105116	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105118	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105120	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105122	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105124	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30105130	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110003	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110004	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110005	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30110099	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30111103	VOC	43.900	QQQQQ	Friction Products Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30111199	VOC	43.900	QQQQQ	Friction Products Manufacturing
30113001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113003	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113004	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113005	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113006	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30113007	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
30201901	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201902	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201903	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201904	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201905	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201906	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201907	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201908	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201909	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201911	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201912	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201913	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201914	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201915	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201916	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201917	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201918	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201919	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201920	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201921	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201923	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201925	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201926	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201927	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201930	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201931	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201932	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201933	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201935	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201939	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201941	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201942	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201945	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201949	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201950	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201960	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201997	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201998	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30201999	VOC	38.690	GGGG	Solvent Extraction for Vegetable Oil Produ
30203404	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203405	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203406	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203407	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203410	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203415	VOC	12.500	CCCC	Manufacturing Nutritional Yeast

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30203420	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203421	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203422	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203423	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203424	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203504	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203505	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203506	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203507	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203510	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203530	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203531	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203532	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203533	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203534	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203535	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203536	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30203540	VOC	12.500	CCCC	Manufacturing Nutritional Yeast
30300303	VOC	50.000	CCCCC	Coke Ovens: Pushing, Quenching, Battery St
30300304	VOC	50.000	CCCCC	Coke Ovens: Pushing, Quenching, Battery St
30400301	VOC	40.000	EEEEE	Iron and Steel Foundries
30400302	VOC	40.000	EEEEE	Iron and Steel Foundries
30400303	VOC	40.000	EEEEE	Iron and Steel Foundries
30400304	VOC	40.000	EEEEE	Iron and Steel Foundries
30400305	VOC	40.000	EEEEE	Iron and Steel Foundries
30400310	VOC	40.000	EEEEE	Iron and Steel Foundries
30400314	VOC	40.000	EEEEE	Iron and Steel Foundries
30400315	VOC	40.000	EEEEE	Iron and Steel Foundries
30400316	VOC	40.000	EEEEE	Iron and Steel Foundries
30400317	VOC	40.000	EEEEE	Iron and Steel Foundries
30400318	VOC	40.000	EEEEE	Iron and Steel Foundries
30400319	VOC	40.000	EEEEE	Iron and Steel Foundries
30400320	VOC	40.000	EEEEE	Iron and Steel Foundries
30400321	VOC	40.000	EEEEE	Iron and Steel Foundries
30400322	VOC	40.000	EEEEE	Iron and Steel Foundries
30400325	VOC	40.000	EEEEE	Iron and Steel Foundries
30400330	VOC	40.000	EEEEE	Iron and Steel Foundries
30400331	VOC	40.000	EEEEE	Iron and Steel Foundries
30400332	VOC	40.000	EEEEE	Iron and Steel Foundries
30400333	VOC	40.000	EEEEE	Iron and Steel Foundries
30400340	VOC	40.000	EEEEE	Iron and Steel Foundries
30400341	VOC	40.000	EEEEE	Iron and Steel Foundries
30400342	VOC	40.000	EEEEE	Iron and Steel Foundries
30400350	VOC	40.000	EEEEE	Iron and Steel Foundries
30400351	VOC	40.000	EEEEE	Iron and Steel Foundries
30400352	VOC	40.000	EEEEE	Iron and Steel Foundries
30400353	VOC	40.000	EEEEE	Iron and Steel Foundries
30400354	VOC	40.000	EEEEE	Iron and Steel Foundries
30400355	VOC	40.000	EEEEE	Iron and Steel Foundries
30400356	VOC	40.000	EEEEE	Iron and Steel Foundries
30400357	VOC	40.000	EEEEE	Iron and Steel Foundries
30400358	VOC	40.000	EEEEE	Iron and Steel Foundries

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30400360	VOC	40.000	EEEEE	Iron and Steel Foundries
30400370	VOC	40.000	EEEEE	Iron and Steel Foundries
30400371	VOC	40.000	EEEEE	Iron and Steel Foundries
30400398	VOC	40.000	EEEEE	Iron and Steel Foundries
30400399	VOC	40.000	EEEEE	Iron and Steel Foundries
30500101	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500102	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500103	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500104	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500105	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500106	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500107	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500108	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500110	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500111	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500112	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500113	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500114	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500115	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500116	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500117	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500118	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500119	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500120	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500121	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500130	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500131	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500132	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500133	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500134	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500135	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500140	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500141	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500142	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500143	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500144	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500145	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500146	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500147	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500150	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500151	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500152	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500153	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500154	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500198	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30500199	VOC	28.000	LLLLL	Asphalt Process and Asphalt Roofing
30501201	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501202	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501203	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501204	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501205	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501206	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30501207	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501208	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501209	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501211	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501212	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501213	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501214	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501215	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501221	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501222	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501223	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501224	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30501299	VOC	74.000	HHHH	Wet Formed Fiberglass Mat Production
30600201	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600202	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600301	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600402	VOC	87.400	UUU	Petroleum Refineries (FCC)
30600901	VOC	65.630	UUU	Petroleum Refineries
30600902	VOC	65.630	UUU	Petroleum Refineries
30600903	VOC	65.630	UUU	Petroleum Refineries
30600904	VOC	65.630	UUU	Petroleum Refineries
30600905	VOC	65.630	UUU	Petroleum Refineries
30600906	VOC	65.630	UUU	Petroleum Refineries
30600999	VOC	65.630	UUU	Petroleum Refineries
30601001	VOC	65.630	UUU	Petroleum Refineries
30601101	VOC	65.630	UUU	Petroleum Refineries
30601201	VOC	65.630	UUU	Petroleum Refineries
30601301	VOC	65.630	UUU	Petroleum Refineries
30601401	VOC	65.630	UUU	Petroleum Refineries
30609901	VOC	65.630	UUU	Petroleum Refineries
30609902	VOC	65.630	UUU	Petroleum Refineries
30609903	VOC	65.630	UUU	Petroleum Refineries
30609904	VOC	65.630	UUU	Petroleum Refineries
30609905	VOC	65.630	UUU	Petroleum Refineries
30610001	VOC	65.630	UUU	Petroleum Refineries
30688801	VOC	87.400	UUU	Petroleum Refineries
30688802	VOC	87.400	UUU	Petroleum Refineries
30688803	VOC	87.400	UUU	Petroleum Refineries
30688804	VOC	87.400	UUU	Petroleum Refineries
30688805	VOC	87.400	UUU	Petroleum Refineries
30700103	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700104	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700106	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700110	VOC	7.020	MM	Comustion Sources at Kraft, Soda, and Sulf
30700602	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700604	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700606	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700607	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700608	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700610	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700611	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700621	VOC	41.200	DDDD	Plywood and Composite Wood Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30700625	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700626	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700628	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700629	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700630	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700631	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700632	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700635	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700640	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700651	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700655	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700661	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700701	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700702	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700703	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700704	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700705	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700706	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700707	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700708	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700709	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700710	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700711	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700712	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700713	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700714	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700715	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700716	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700717	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700718	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700720	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700725	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700727	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700730	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700734	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700735	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700736	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700737	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700740	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700744	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700746	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700747	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700750	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700752	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700753	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700756	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700757	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700760	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700762	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700763	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700766	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700767	VOC	41.200	DDDD	Plywood and Composite Wood Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30700769	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700770	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700771	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700780	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700781	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700783	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700785	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700788	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700789	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700790	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700791	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700792	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700793	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700798	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700799	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700921	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700923	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700925	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700927	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700931	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700932	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700933	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700934	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700935	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700936	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700937	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700939	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700940	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700950	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700960	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700971	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700980	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700981	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700982	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700983	VOC	41.200	DDDD	Plywood and Composite Wood Products
30700984	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701001	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701008	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701009	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701010	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701015	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701020	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701030	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701040	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701053	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701054	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701055	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701057	VOC	41.200	DDDD	Plywood and Composite Wood Products
30701199	VOC	82.050	JJJJ	Paper and Other Web Coating
30800101	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800102	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800103	VOC	47.600	XXXX	Rubber Tire Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
30800104	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800105	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800106	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800107	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800108	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800109	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800110	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800111	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800112	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800113	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800114	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800115	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800116	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800117	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800120	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800121	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800122	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800123	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800124	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800125	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800126	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800127	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800128	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800129	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800130	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800131	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800132	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800133	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800197	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800198	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800199	VOC	47.600	XXXX	Rubber Tire Manufacturing
30800701	VOC	70.000	WWWW	Reinforced Plastics
30800702	VOC	70.000	WWWW	Reinforced Plastics
30800703	VOC	70.000	WWWW	Reinforced Plastics
30800704	VOC	70.000	WWWW	Reinforced Plastics
30800705	VOC	70.000	WWWW	Reinforced Plastics
30800720	VOC	70.000	WWWW	Reinforced Plastics
30800721	VOC	70.000	WWWW	Reinforced Plastics
30800722	VOC	70.000	WWWW	Reinforced Plastics
30800723	VOC	70.000	WWWW	Reinforced Plastics
30800724	VOC	70.000	WWWW	Reinforced Plastics
30800799	VOC	70.000	WWWW	Reinforced Plastics
30801001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
31401001	VOC	43.900	QQQQQ	Friction Products Manufacturing
31401002	VOC	43.900	QQQQQ	Friction Products Manufacturing
31401501	VOC	35.790	VVVV	Boat Manufacturing
31401503	VOC	35.790	VVVV	Boat Manufacturing
31401504	VOC	35.790	VVVV	Boat Manufacturing
31401510	VOC	35.790	VVVV	Boat Manufacturing
31401511	VOC	35.790	VVVV	Boat Manufacturing
31401512	VOC	35.790	VVVV	Boat Manufacturing
31401513	VOC	35.790	VVVV	Boat Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
31401514	VOC	35.790	VVVV	Boat Manufacturing
31401515	VOC	35.790	VVVV	Boat Manufacturing
31401516	VOC	35.790	VVVV	Boat Manufacturing
31401517	VOC	35.790	VVVV	Boat Manufacturing
31401518	VOC	35.790	VVVV	Boat Manufacturing
31401525	VOC	35.790	VVVV	Boat Manufacturing
31401530	VOC	35.790	VVVV	Boat Manufacturing
31401531	VOC	35.790	VVVV	Boat Manufacturing
31401540	VOC	35.790	VVVV	Boat Manufacturing
31401541	VOC	35.790	VVVV	Boat Manufacturing
31401550	VOC	35.790	VVVV	Boat Manufacturing
31401551	VOC	35.790	VVVV	Boat Manufacturing
31401552	VOC	35.790	VVVV	Boat Manufacturing
31401553	VOC	35.790	VVVV	Boat Manufacturing
31401560	VOC	35.790	VVVV	Boat Manufacturing
31401561	VOC	35.790	VVVV	Boat Manufacturing
31401562	VOC	35.790	VVVV	Boat Manufacturing
31401563	VOC	35.790	VVVV	Boat Manufacturing
31401570	VOC	35.790	VVVV	Boat Manufacturing
31401571	VOC	35.790	VVVV	Boat Manufacturing
31604001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
31604002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
31604003	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
32099997	VOC	38.900	TTTT	Leather Finishing Operations
32099998	VOC	38.900	TTTT	Leather Finishing Operations
32099999	VOC	38.900	TTTT	Leather Finishing Operations
40201101	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201103	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201104	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201105	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201111	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201112	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201113	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201114	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201115	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201116	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201121	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201122	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201197	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201198	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201199	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201201	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201210	VOC	60.170	OOOO	Fabric Printing, Coating, & Dyeing
40201301	VOC	82.050	JJJJ	Paper and Other Web Coating
40201303	VOC	82.050	JJJJ	Paper and Other Web Coating
40201304	VOC	82.050	JJJJ	Paper and Other Web Coating
40201305	VOC	82.050	JJJJ	Paper and Other Web Coating
40201310	VOC	82.050	JJJJ	Paper and Other Web Coating
40201320	VOC	82.050	JJJJ	Paper and Other Web Coating
40201330	VOC	82.050	JJJJ	Paper and Other Web Coating
40201399	VOC	82.050	JJJJ	Paper and Other Web Coating
40201601	VOC	66.730	IIII	Auto and Light Trucks Surface Coating

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40201602	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201603	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201604	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201605	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201606	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201607	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201608	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201609	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201619	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201620	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201621	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201622	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201623	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201624	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201625	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201626	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201627	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201628	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201629	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201630	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201631	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201632	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201699	VOC	66.730	IIII	Auto and Light Trucks Surface Coating
40201702	VOC	70.830	KKKK	Metal Can
40201703	VOC	70.830	KKKK	Metal Can
40201704	VOC	70.830	KKKK	Metal Can
40201705	VOC	70.830	KKKK	Metal Can
40201706	VOC	70.830	KKKK	Metal Can
40201721	VOC	70.830	KKKK	Metal Can
40201722	VOC	70.830	KKKK	Metal Can
40201723	VOC	70.830	KKKK	Metal Can
40201724	VOC	70.830	KKKK	Metal Can
40201725	VOC	70.830	KKKK	Metal Can
40201726	VOC	70.830	KKKK	Metal Can
40201727	VOC	70.830	KKKK	Metal Can
40201728	VOC	70.830	KKKK	Metal Can
40201729	VOC	70.830	KKKK	Metal Can
40201731	VOC	70.830	KKKK	Metal Can
40201732	VOC	70.830	KKKK	Metal Can
40201733	VOC	70.830	KKKK	Metal Can
40201734	VOC	70.830	KKKK	Metal Can
40201735	VOC	70.830	KKKK	Metal Can
40201736	VOC	70.830	KKKK	Metal Can
40201737	VOC	70.830	KKKK	Metal Can
40201738	VOC	70.830	KKKK	Metal Can
40201739	VOC	70.830	KKKK	Metal Can
40201799	VOC	70.830	KKKK	Metal Can
40201801	VOC	53.060	SSSS	Metal Coil
40201802	VOC	53.060	SSSS	Metal Coil
40201803	VOC	53.060	SSSS	Metal Coil
40201804	VOC	53.060	SSSS	Metal Coil
40201805	VOC	53.060	SSSS	Metal Coil

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40201806	VOC	53.060	SSSS	Metal Coil
40201807	VOC	53.060	SSSS	Metal Coil
40201899	VOC	53.060	SSSS	Metal Coil
40202001	VOC	73.070	RRRR	Metal Furniture
40202002	VOC	73.070	RRRR	Metal Furniture
40202003	VOC	73.070	RRRR	Metal Furniture
40202004	VOC	73.070	RRRR	Metal Furniture
40202005	VOC	73.070	RRRR	Metal Furniture
40202010	VOC	73.070	RRRR	Metal Furniture
40202011	VOC	73.070	RRRR	Metal Furniture
40202012	VOC	73.070	RRRR	Metal Furniture
40202013	VOC	73.070	RRRR	Metal Furniture
40202014	VOC	73.070	RRRR	Metal Furniture
40202015	VOC	73.070	RRRR	Metal Furniture
40202020	VOC	73.070	RRRR	Metal Furniture
40202021	VOC	73.070	RRRR	Metal Furniture
40202022	VOC	73.070	RRRR	Metal Furniture
40202023	VOC	73.070	RRRR	Metal Furniture
40202024	VOC	73.070	RRRR	Metal Furniture
40202025	VOC	73.070	RRRR	Metal Furniture
40202031	VOC	73.070	RRRR	Metal Furniture
40202032	VOC	73.070	RRRR	Metal Furniture
40202033	VOC	73.070	RRRR	Metal Furniture
40202034	VOC	73.070	RRRR	Metal Furniture
40202035	VOC	73.070	RRRR	Metal Furniture
40202036	VOC	73.070	RRRR	Metal Furniture
40202037	VOC	73.070	RRRR	Metal Furniture
40202038	VOC	73.070	RRRR	Metal Furniture
40202039	VOC	73.070	RRRR	Metal Furniture
40202099	VOC	73.070	RRRR	Metal Furniture
40202101	VOC	74.000	QQQQ	Wood Building Products
40202103	VOC	74.000	QQQQ	Wood Building Products
40202104	VOC	74.000	QQQQ	Wood Building Products
40202105	VOC	74.000	QQQQ	Wood Building Products
40202106	VOC	74.000	QQQQ	Wood Building Products
40202107	VOC	74.000	QQQQ	Wood Building Products
40202108	VOC	74.000	QQQQ	Wood Building Products
40202109	VOC	74.000	QQQQ	Wood Building Products
40202110	VOC	74.000	QQQQ	Wood Building Products
40202111	VOC	74.000	QQQQ	Wood Building Products
40202117	VOC	74.000	QQQQ	Wood Building Products
40202118	VOC	74.000	QQQQ	Wood Building Products
40202131	VOC	74.000	QQQQ	Wood Building Products
40202132	VOC	74.000	QQQQ	Wood Building Products
40202133	VOC	74.000	QQQQ	Wood Building Products
40202140	VOC	74.000	QQQQ	Wood Building Products
40202199	VOC	74.000	QQQQ	Wood Building Products
40202201	VOC	77.000	PPPP	Plastic Parts Coating
40202202	VOC	77.000	PPPP	Plastic Parts Coating
40202203	VOC	77.000	PPPP	Plastic Parts Coating
40202204	VOC	77.000	PPPP	Plastic Parts Coating
40202205	VOC	77.000	PPPP	Plastic Parts Coating

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40202206	VOC	77.000	PPPP	Plastic Parts Coating
40202207	VOC	77.000	PPPP	Plastic Parts Coating
40202208	VOC	77.000	PPPP	Plastic Parts Coating
40202209	VOC	77.000	PPPP	Plastic Parts Coating
40202210	VOC	77.000	PPPP	Plastic Parts Coating
40202211	VOC	77.000	PPPP	Plastic Parts Coating
40202212	VOC	77.000	PPPP	Plastic Parts Coating
40202213	VOC	77.000	PPPP	Plastic Parts Coating
40202214	VOC	77.000	PPPP	Plastic Parts Coating
40202215	VOC	77.000	PPPP	Plastic Parts Coating
40202220	VOC	77.000	PPPP	Plastic Parts Coating
40202229	VOC	77.000	PPPP	Plastic Parts Coating
40202230	VOC	77.000	PPPP	Plastic Parts Coating
40202239	VOC	77.000	PPPP	Plastic Parts Coating
40202240	VOC	77.000	PPPP	Plastic Parts Coating
40202249	VOC	77.000	PPPP	Plastic Parts Coating
40202250	VOC	77.000	PPPP	Plastic Parts Coating
40202259	VOC	77.000	PPPP	Plastic Parts Coating
40202270	VOC	77.000	PPPP	Plastic Parts Coating
40202280	VOC	77.000	PPPP	Plastic Parts Coating
40202299	VOC	77.000	PPPP	Plastic Parts Coating
40202501	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202502	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202503	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202504	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202505	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202510	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202511	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202512	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202515	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202520	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202521	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202522	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202523	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202524	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202525	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202531	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202532	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202533	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202534	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202535	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202536	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202537	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202542	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202543	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202544	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202545	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202546	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202599	VOC	47.930	MMMM	Misc. Metal Parts and Products
40202601	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202602	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202603	VOC	66.200	HHHHH	Misc. Coating Manufacturing

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
40202604	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202605	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202606	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202607	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40202699	VOC	66.200	HHHHH	Misc. Coating Manufacturing
40388801	VOC	65.630	UUU	Petroleum Refineries
40388802	VOC	65.630	UUU	Petroleum Refineries
40388803	VOC	65.630	UUU	Petroleum Refineries
40388804	VOC	65.630	UUU	Petroleum Refineries
40388805	VOC	65.630	UUU	Petroleum Refineries
40399999	VOC	65.630	UUU	Petroleum Refineries
50400101	VOC	50.080	GGGGG	Site Remediation
50400102	VOC	50.080	GGGGG	Site Remediation
50400103	VOC	50.080	GGGGG	Site Remediation
50400104	VOC	50.080	GGGGG	Site Remediation
50400150	VOC	50.080	GGGGG	Site Remediation
50400151	VOC	50.080	GGGGG	Site Remediation
50400201	VOC	50.080	GGGGG	Site Remediation
50400202	VOC	50.080	GGGGG	Site Remediation
50410001	VOC	50.080	GGGGG	Site Remediation
50410002	VOC	50.080	GGGGG	Site Remediation
50410003	VOC	50.080	GGGGG	Site Remediation
50410004	VOC	50.080	GGGGG	Site Remediation
50410005	VOC	50.080	GGGGG	Site Remediation
50410010	VOC	50.080	GGGGG	Site Remediation
50410020	VOC	50.080	GGGGG	Site Remediation
50410021	VOC	50.080	GGGGG	Site Remediation
50410022	VOC	50.080	GGGGG	Site Remediation
50410030	VOC	50.080	GGGGG	Site Remediation
50410040	VOC	50.080	GGGGG	Site Remediation
50410101	VOC	50.080	GGGGG	Site Remediation
50410110	VOC	50.080	GGGGG	Site Remediation
50410111	VOC	50.080	GGGGG	Site Remediation
50410112	VOC	50.080	GGGGG	Site Remediation
50410120	VOC	50.080	GGGGG	Site Remediation
50410121	VOC	50.080	GGGGG	Site Remediation
50410122	VOC	50.080	GGGGG	Site Remediation
50410123	VOC	50.080	GGGGG	Site Remediation
50410124	VOC	50.080	GGGGG	Site Remediation
50410210	VOC	50.080	GGGGG	Site Remediation
50410211	VOC	50.080	GGGGG	Site Remediation
50410212	VOC	50.080	GGGGG	Site Remediation
50410213	VOC	50.080	GGGGG	Site Remediation
50410214	VOC	50.080	GGGGG	Site Remediation
50410215	VOC	50.080	GGGGG	Site Remediation
50410216	VOC	50.080	GGGGG	Site Remediation
50410310	VOC	50.080	GGGGG	Site Remediation
50410311	VOC	50.080	GGGGG	Site Remediation
50410312	VOC	50.080	GGGGG	Site Remediation
50410313	VOC	50.080	GGGGG	Site Remediation
50410314	VOC	50.080	GGGGG	Site Remediation
50410321	VOC	50.080	GGGGG	Site Remediation

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
50410322	VOC	50.080	GGGGG	Site Remediation
50410405	VOC	50.080	GGGGG	Site Remediation
50410406	VOC	50.080	GGGGG	Site Remediation
50410407	VOC	50.080	GGGGG	Site Remediation
50410408	VOC	50.080	GGGGG	Site Remediation
50410409	VOC	50.080	GGGGG	Site Remediation
50410420	VOC	50.080	GGGGG	Site Remediation
50410510	VOC	50.080	GGGGG	Site Remediation
50410511	VOC	50.080	GGGGG	Site Remediation
50410512	VOC	50.080	GGGGG	Site Remediation
50410513	VOC	50.080	GGGGG	Site Remediation
50410514	VOC	50.080	GGGGG	Site Remediation
50410520	VOC	50.080	GGGGG	Site Remediation
50410521	VOC	50.080	GGGGG	Site Remediation
50410522	VOC	50.080	GGGGG	Site Remediation
50410523	VOC	50.080	GGGGG	Site Remediation
50410524	VOC	50.080	GGGGG	Site Remediation
50410525	VOC	50.080	GGGGG	Site Remediation
50410530	VOC	50.080	GGGGG	Site Remediation
50410531	VOC	50.080	GGGGG	Site Remediation
50410532	VOC	50.080	GGGGG	Site Remediation
50410533	VOC	50.080	GGGGG	Site Remediation
50410534	VOC	50.080	GGGGG	Site Remediation
50410535	VOC	50.080	GGGGG	Site Remediation
50410536	VOC	50.080	GGGGG	Site Remediation
50410537	VOC	50.080	GGGGG	Site Remediation
50410538	VOC	50.080	GGGGG	Site Remediation
50410539	VOC	50.080	GGGGG	Site Remediation
50410540	VOC	50.080	GGGGG	Site Remediation
50410541	VOC	50.080	GGGGG	Site Remediation
50410542	VOC	50.080	GGGGG	Site Remediation
50410543	VOC	50.080	GGGGG	Site Remediation
50410560	VOC	50.080	GGGGG	Site Remediation
50410561	VOC	50.080	GGGGG	Site Remediation
50410562	VOC	50.080	GGGGG	Site Remediation
50410563	VOC	50.080	GGGGG	Site Remediation
50410564	VOC	50.080	GGGGG	Site Remediation
50410565	VOC	50.080	GGGGG	Site Remediation
50410610	VOC	50.080	GGGGG	Site Remediation
50410620	VOC	50.080	GGGGG	Site Remediation
50410621	VOC	50.080	GGGGG	Site Remediation
50410622	VOC	50.080	GGGGG	Site Remediation
50410623	VOC	50.080	GGGGG	Site Remediation
50410640	VOC	50.080	GGGGG	Site Remediation
50410641	VOC	50.080	GGGGG	Site Remediation
50410642	VOC	50.080	GGGGG	Site Remediation
50410643	VOC	50.080	GGGGG	Site Remediation
50410644	VOC	50.080	GGGGG	Site Remediation
50410645	VOC	50.080	GGGGG	Site Remediation
50410710	VOC	50.080	GGGGG	Site Remediation
50410711	VOC	50.080	GGGGG	Site Remediation
50410712	VOC	50.080	GGGGG	Site Remediation

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
50410720	VOC	50.080	GGGGG	Site Remediation
50410721	VOC	50.080	GGGGG	Site Remediation
50410722	VOC	50.080	GGGGG	Site Remediation
50410723	VOC	50.080	GGGGG	Site Remediation
50410724	VOC	50.080	GGGGG	Site Remediation
50410725	VOC	50.080	GGGGG	Site Remediation
50410726	VOC	50.080	GGGGG	Site Remediation
50410740	VOC	50.080	GGGGG	Site Remediation
50410760	VOC	50.080	GGGGG	Site Remediation
50410761	VOC	50.080	GGGGG	Site Remediation
50410762	VOC	50.080	GGGGG	Site Remediation
50410763	VOC	50.080	GGGGG	Site Remediation
50410764	VOC	50.080	GGGGG	Site Remediation
50410765	VOC	50.080	GGGGG	Site Remediation
50410766	VOC	50.080	GGGGG	Site Remediation
50410780	VOC	50.080	GGGGG	Site Remediation
50480001	VOC	50.080	GGGGG	Site Remediation
50482001	VOC	50.080	GGGGG	Site Remediation
50482002	VOC	50.080	GGGGG	Site Remediation
50482599	VOC	50.080	GGGGG	Site Remediation
50490004	VOC	50.080	GGGGG	Site Remediation
62540001	VOC	62.900	UUUU	Cellulose Products
62540010	VOC	62.900	UUUU	Cellulose Products
62540020	VOC	62.900	UUUU	Cellulose Products
62540021	VOC	62.900	UUUU	Cellulose Products
62540022	VOC	62.900	UUUU	Cellulose Products
62540023	VOC	62.900	UUUU	Cellulose Products
62540024	VOC	62.900	UUUU	Cellulose Products
62540025	VOC	62.900	UUUU	Cellulose Products
62540030	VOC	62.900	UUUU	Cellulose Products
62540040	VOC	62.900	UUUU	Cellulose Products
62540041	VOC	62.900	UUUU	Cellulose Products
62540042	VOC	62.900	UUUU	Cellulose Products
62540050	VOC	62.900	UUUU	Cellulose Products
62580001	VOC	62.900	UUUU	Cellulose Products
62582001	VOC	62.900	UUUU	Cellulose Products
62582002	VOC	62.900	UUUU	Cellulose Products
62582501	VOC	62.900	UUUU	Cellulose Products
62582502	VOC	62.900	UUUU	Cellulose Products
62582503	VOC	62.900	UUUU	Cellulose Products
62582599	VOC	62.900	UUUU	Cellulose Products
64130001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130110	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130111	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130112	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130125	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130201	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130210	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64130211	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64130225	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64131030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64132030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64133030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64180001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64182001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64182002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64182599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64420001	VOC	62.900	UUUU	Cellulose Products
64420010	VOC	62.900	UUUU	Cellulose Products
64420011	VOC	62.900	UUUU	Cellulose Products
64420012	VOC	62.900	UUUU	Cellulose Products
64420013	VOC	62.900	UUUU	Cellulose Products
64420014	VOC	62.900	UUUU	Cellulose Products
64420015	VOC	62.900	UUUU	Cellulose Products
64420016	VOC	62.900	UUUU	Cellulose Products
64420020	VOC	62.900	UUUU	Cellulose Products
64420021	VOC	62.900	UUUU	Cellulose Products
64420022	VOC	62.900	UUUU	Cellulose Products
64420030	VOC	62.900	UUUU	Cellulose Products
64420031	VOC	62.900	UUUU	Cellulose Products
64420032	VOC	62.900	UUUU	Cellulose Products
64420033	VOC	62.900	UUUU	Cellulose Products
64420034	VOC	62.900	UUUU	Cellulose Products
64420040	VOC	62.900	UUUU	Cellulose Products
64420041	VOC	62.900	UUUU	Cellulose Products
64420042	VOC	62.900	UUUU	Cellulose Products
64430001	VOC	62.900	UUUU	Cellulose Products
64430010	VOC	62.900	UUUU	Cellulose Products
64430011	VOC	62.900	UUUU	Cellulose Products
64430012	VOC	62.900	UUUU	Cellulose Products
64430013	VOC	62.900	UUUU	Cellulose Products
64430014	VOC	62.900	UUUU	Cellulose Products
64430015	VOC	62.900	UUUU	Cellulose Products
64430016	VOC	62.900	UUUU	Cellulose Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64430017	VOC	62.900	UUUU	Cellulose Products
64430030	VOC	62.900	UUUU	Cellulose Products
64431001	VOC	62.900	UUUU	Cellulose Products
64431010	VOC	62.900	UUUU	Cellulose Products
64431011	VOC	62.900	UUUU	Cellulose Products
64431012	VOC	62.900	UUUU	Cellulose Products
64431013	VOC	62.900	UUUU	Cellulose Products
64431014	VOC	62.900	UUUU	Cellulose Products
64431015	VOC	62.900	UUUU	Cellulose Products
64431016	VOC	62.900	UUUU	Cellulose Products
64431017	VOC	62.900	UUUU	Cellulose Products
64431030	VOC	62.900	UUUU	Cellulose Products
64450001	VOC	62.900	UUUU	Cellulose Products
64450010	VOC	62.900	UUUU	Cellulose Products
64450011	VOC	62.900	UUUU	Cellulose Products
64450012	VOC	62.900	UUUU	Cellulose Products
64450013	VOC	62.900	UUUU	Cellulose Products
64450014	VOC	62.900	UUUU	Cellulose Products
64450020	VOC	62.900	UUUU	Cellulose Products
64450021	VOC	62.900	UUUU	Cellulose Products
64450022	VOC	62.900	UUUU	Cellulose Products
64450030	VOC	62.900	UUUU	Cellulose Products
64450031	VOC	62.900	UUUU	Cellulose Products
64450032	VOC	62.900	UUUU	Cellulose Products
64450033	VOC	62.900	UUUU	Cellulose Products
64450034	VOC	62.900	UUUU	Cellulose Products
64450035	VOC	62.900	UUUU	Cellulose Products
64450036	VOC	62.900	UUUU	Cellulose Products
64450040	VOC	62.900	UUUU	Cellulose Products
64450041	VOC	62.900	UUUU	Cellulose Products
64450042	VOC	62.900	UUUU	Cellulose Products
64450050	VOC	62.900	UUUU	Cellulose Products
64450051	VOC	62.900	UUUU	Cellulose Products
64450052	VOC	62.900	UUUU	Cellulose Products
64450053	VOC	62.900	UUUU	Cellulose Products
64450060	VOC	62.900	UUUU	Cellulose Products
64450061	VOC	62.900	UUUU	Cellulose Products
64450062	VOC	62.900	UUUU	Cellulose Products
64520001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64520041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64521011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64521041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610110	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610111	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610112	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610120	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610121	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610122	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610130	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610131	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610132	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610140	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610141	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610142	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610143	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610150	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610201	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610210	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610211	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610212	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610220	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610221	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610222	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610230	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610231	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610232	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610240	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610241	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610242	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610250	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610301	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610310	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610311	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64610312	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610320	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610321	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610322	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610330	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610331	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610332	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610340	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64610350	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615023	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64615030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620013	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620017	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620018	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620021	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620027	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620033	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620034	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620035	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620036	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620037	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64620038	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630035	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64630041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630042	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630081	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630082	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64630083	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631012	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631025	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631026	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631081	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631082	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64631083	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632015	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632016	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632040	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632041	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632042	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632050	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632051	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632052	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632053	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632080	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632081	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632082	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64632083	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64680001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682501	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682502	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64682599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64820010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64821001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64821010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64822001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64822010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64823001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64823010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64824001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64824010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64880001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64882001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64882002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64882599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
64920001	VOC	62.900	UUUU	Cellulose Products
64920010	VOC	62.900	UUUU	Cellulose Products
64920011	VOC	62.900	UUUU	Cellulose Products
64920012	VOC	62.900	UUUU	Cellulose Products
64920013	VOC	62.900	UUUU	Cellulose Products
64920020	VOC	62.900	UUUU	Cellulose Products
64920021	VOC	62.900	UUUU	Cellulose Products
64920022	VOC	62.900	UUUU	Cellulose Products
64920030	VOC	62.900	UUUU	Cellulose Products
64920031	VOC	62.900	UUUU	Cellulose Products
64920032	VOC	62.900	UUUU	Cellulose Products
64920033	VOC	62.900	UUUU	Cellulose Products
64920034	VOC	62.900	UUUU	Cellulose Products
64930001	VOC	62.900	UUUU	Cellulose Products
64930010	VOC	62.900	UUUU	Cellulose Products
64930011	VOC	62.900	UUUU	Cellulose Products
64930012	VOC	62.900	UUUU	Cellulose Products
64930020	VOC	62.900	UUUU	Cellulose Products
64930021	VOC	62.900	UUUU	Cellulose Products
64930030	VOC	62.900	UUUU	Cellulose Products
64930031	VOC	62.900	UUUU	Cellulose Products
64930035	VOC	62.900	UUUU	Cellulose Products
64930040	VOC	62.900	UUUU	Cellulose Products
64930041	VOC	62.900	UUUU	Cellulose Products
64930045	VOC	62.900	UUUU	Cellulose Products
64930050	VOC	62.900	UUUU	Cellulose Products
64931001	VOC	62.900	UUUU	Cellulose Products
64931010	VOC	62.900	UUUU	Cellulose Products
64931011	VOC	62.900	UUUU	Cellulose Products
64931012	VOC	62.900	UUUU	Cellulose Products
64931020	VOC	62.900	UUUU	Cellulose Products
64931021	VOC	62.900	UUUU	Cellulose Products
64931022	VOC	62.900	UUUU	Cellulose Products
64931030	VOC	62.900	UUUU	Cellulose Products
64931031	VOC	62.900	UUUU	Cellulose Products
64931032	VOC	62.900	UUUU	Cellulose Products
64931040	VOC	62.900	UUUU	Cellulose Products
64931041	VOC	62.900	UUUU	Cellulose Products
64931050	VOC	62.900	UUUU	Cellulose Products

SCC	PLLTCODE	CE_MACT	SUBPART	MACT CATEGORY DESCRIPTION
64980001	VOC	62.900	UUUU	Cellulose Products
64982001	VOC	62.900	UUUU	Cellulose Products
64982002	VOC	62.900	UUUU	Cellulose Products
64982599	VOC	62.900	UUUU	Cellulose Products
65135001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
65140001	VOC	44.500	YY	Generic MACT (Cyanide)
65140010	VOC	44.500	YY	Generic MACT (Cyanide)
65140011	VOC	44.500	YY	Generic MACT (Cyanide)
65140012	VOC	44.500	YY	Generic MACT (Cyanide)
65140013	VOC	44.500	YY	Generic MACT (Cyanide)
65140014	VOC	44.500	YY	Generic MACT (Cyanide)
65140015	VOC	44.500	YY	Generic MACT (Cyanide)
65140016	VOC	44.500	YY	Generic MACT (Cyanide)
65140017	VOC	44.500	YY	Generic MACT (Cyanide)
65140018	VOC	44.500	YY	Generic MACT (Cyanide)
65140030	VOC	44.500	YY	Generic MACT (Cyanide)
68430001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430030	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430031	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68430032	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445013	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445020	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445022	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445101	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68445201	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68510001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68510010	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68510011	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68580001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68582001	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68582002	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc
68582599	VOC	66.200	FFFF	Misc. Organic Chemical Production and Proc

Table B-5 NonEGU Source Shutdowns

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
10003	1000300021	SUNCO INC R M	001	BOILER #1
10003	1000300021	SUNCO INC R M	002	BOILER #2
10003	1000300021	SUNCO INC R M	003	BOILER #3
10003	1000300016	MOTIVA ENTERPRISES LLC	072	METHANOL PLT HTR 41-H-1
10003	1000300004	WILMINGTON PIECE DYE CO	ALL	ALL
10003	1000300032	GENERAL CHEMICAL CORPORATION	ALL	ALL
10003	1000300074	METACHEM PRODUCTS LLC	ALL	ALL
10003	1000300127	VPI FILM LLC	ALL	ALL
10003	1000300129	LAFARGE NORTH AMERICA INC	ALL	ALL
10003	1000300350	KANEKA DELAWARE CORPORATION	ALL	ALL
25001	1200202	PARTYLITE WORLDWIDE	ALL	ALL
25001	1200614	BOURNE LANDFILL	ALL	ALL
25003	1170002	ADVANCED INFORMATION	ALL	ALL
25003	1170005	CATAMOUNT PELLET FUE	ALL	ALL
25003	1170048	SPRAGUE NORTH ADAMS	ALL	ALL
25003	1170056	BERKSHIRE GAS STOCKB	ALL	ALL
25003	1170078	MACDERMID GRAPHIC AR	ALL	ALL
25003	1170091	LANE CONSTRUCTION CO	ALL	ALL
25005	1200009	TEXAS INSTRUMENTS	ALL	ALL
25005	1200031	CONDEA VISTA CO	ALL	ALL
25005	1200036	ELKAY REVERE CORP	ALL	ALL
25005	1200037	AEROVOX INCORPORATED	ALL	ALL
25005	1200065	ROSEMAR SILVER COMPA	ALL	ALL
25005	1200080	ATTLEBORO REFINING C	ALL	ALL
25005	1200116	STEDRO TEXTILES	ALL	ALL
25005	1200138	CLIFTEX CORPORATION	ALL	ALL
25005	1200169	PAUL DEVER STATE SCH	ALL	ALL
25005	1200209	PHARMACY SERVICE COR	ALL	ALL
25005	1200216	BRISTOL COUNTY JAIL	ALL	ALL
25005	1200235	SEA WATCH INTERNATIO	ALL	ALL
25005	1200393	OLSONS GREENHOUSES	ALL	ALL
25005	1200468	AA WILL MATERIALS-FR	ALL	ALL
25005	1200498	CRAPO HILL LANDFILL	ALL	ALL
25005	1200510	KREW INCORPORATED	ALL	ALL
25005	1200513	AEROVOX INCORPORATED	ALL	ALL
25005	1200542	LALLY COLUMN CORP	ALL	ALL
25005	1200673	HOMELAND BUILDERS	ALL	ALL
25005	1200824	JUSTIN CLOTHING CO	ALL	ALL
25005	1200880	VELVET DRIVE TRANSMI	ALL	ALL

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
25005	1192308	INTERSTATE MAT & RUB	ALL	ALL
25009	1210057	COASTAL METAL FINISH	ALL	ALL
25009	1210058	AMESBURY CHAIR	ALL	ALL
25009	1210075	HAMPSHIRE FABRICS	ALL	ALL
25009	1210099	WASTE MANAGEMENT HUN	ALL	ALL
25009	1210110	CUSTOM INDUSTRIES IN	ALL	ALL
25009	1210114	SAGAMORE INDUSTRIAL	ALL	ALL
25009	1210143	LABELS INC	ALL	ALL
25009	1210154	NEWARK ATLANTIC PAPE	ALL	ALL
25009	1210208	TEK COATING COMPANY	ALL	ALL
25009	1210209	NATIONAL NORTHEAST	ALL	ALL
25009	1210223	STARENSIER INC	ALL	ALL
25009	1210400	SANMINA CORPORATION	ALL	ALL
25009	1210401	COVANTA HAVERHILL IN	ALL	ALL
25009	1210404	TEKE FURNITURE RESTO	ALL	ALL
25009	1190756	PERMAIR LEATHERS INC	ALL	ALL
25009	1190842	SLB SNACKS INC	ALL	ALL
25009	1190983	SALEM OIL & GREASE C	ALL	ALL
25009	1191036	JCR ELECTRONICS	ALL	ALL
25009	1195900	LEPAGES INC	ALL	ALL
25013	0420008	DELUXE FINANCIAL	ALL	ALL
25013	0420010	FRYE COPYSYSTEMS INC	ALL	ALL
25013	0420013	JAHN FOUNDRY CORPORA	ALL	ALL
25013	0420052	APW/WRIGHT LINE	ALL	ALL
25013	0420130	KODAK POLYCHROME GRA	ALL	ALL
25013	0420175	FIBERMARK DSI	ALL	ALL
25013	0420218	SPRINGFIELD PRINTING	ALL	ALL
25013	0420252	KODAK POLYCHROME GRA	ALL	ALL
25013	0420528	NATIONAL METAL INDUS	ALL	ALL
25015	0420060	BERKSHIRE GAS HATFIE	ALL	ALL
25015	0420105	INDUSTRIAL POWER SER	ALL	ALL
25015	0420170	TECHALLOY COMPANY IN	ALL	ALL
25015	0420424	MAGNAT MACHINETECH I	ALL	ALL
25015	0420463	INDUSTRIAL PROP OF E	ALL	ALL
25015	0420540	GENERAL CABLE CORP	ALL	ALL
25015	0420614	REXAM IMAGE PRODUCTS	ALL	ALL
25017	1210013	MERRIMACK MAGNETICS	ALL	ALL
25017	1210050	MAJILITE MFG INC	ALL	ALL
25017	1210064	FINISH UNLIMITED INC	ALL	ALL
25017	1190080	MASS BROKEN STONE CO	ALL	ALL
25017	1210127	USM CORPORATION	ALL	ALL

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
25017	1210147	UMASS LOWELL-RESIDEN	ALL	ALL
25017	1210182	JOAN FABRICS CORP	ALL	ALL
25017	1190203	SC WAKEFIELD 200	ALL	ALL
25017	1190212	OLYMPUS SPECIALTY HO	ALL	ALL
25017	1190258	ROYAL INSTITUTIONAL	ALL	ALL
25017	1210334	T&T INDUSTRIAL	ALL	ALL
25017	1190465	PRINTED CIRCUIT CORP	ALL	ALL
25017	1190611	GEORGE MEADE FOUNDRY	ALL	ALL
25017	1190734	NEW ENGLAND CONFECTI	ALL	ALL
25017	1180794	SCHOTT CML FIBEROPTI	ALL	ALL
25017	1190984	SUNGARD AVAILABILITY	ALL	ALL
25017	1191008	RAYTHEON SYSTEMS CO	ALL	ALL
25017	1191217	BOSTON SCIENTIFIC CO	ALL	ALL
25017	1191267	AGFA DIVISION OF BAY	ALL	ALL
25017	1191351	MIT EDUCATIONAL FACI	ALL	ALL
25017	1191389	LONGVIEW FIBRE COMPA	ALL	ALL
25017	1191534	SWISSTRONICS INCORPO	ALL	ALL
25017	1191653	FOCAL INCORPORATED	ALL	ALL
25017	1191668	LEE PRODUCTS COMPANY	ALL	ALL
25017	1191735	TYCO ELECTRONICS COR	ALL	ALL
25017	1191897	GENZYME CORPORATION	ALL	ALL
25017	1194001	WF WOOD INC	ALL	ALL
25017	1194010	RR DONNELLEY & SONS	ALL	ALL
25017	1214012	PERFORMANCE CORRUGAT	ALL	ALL
25021	1190246	SOUTHWOOD COMMUNITY	ALL	ALL
25021	1190313	INNOVATIVE MEMBRANE	ALL	ALL
25021	1180359	BEVILACQUA PAVING CO	ALL	ALL
25021	1200515	FOXBOROUGH REALTY AS	ALL	ALL
25021	1200616	PLAINVILLE GENERATIN	ALL	ALL
25021	1190670	RAYTHEON ELECTRONIC	ALL	ALL
25021	1190714	TEVA PHARMACEUTICAL	ALL	ALL
25021	1190962	NIDEC AMERICA CORPOR	ALL	ALL
25021	1191562	BARCLAY HOUSE THE	ALL	ALL
25021	1191726	MWRA QUINCY PS	ALL	ALL
25021	1192130	CURRY WOODWORKING IN	ALL	ALL
25021	1199000	MEDFIELD STATE HOSPI	ALL	ALL
25023	1200637	FRANKLIN FIXTURES IN	ALL	ALL
25023	1200698	CRANBERRY GRAPHICS I	ALL	ALL
25023	1192101	GTR FINISHING CORPOR	ALL	ALL
25023	1192109	ALGER CORPORATION TH	ALL	ALL
25023	1192210	IMPERIA CORPORATION	ALL	ALL

FIPS	SITE ID	FACILTY NAME	EU ID	UNIT DESCRIPTION
25023	1199994	TEST-RADIUS-FITZGERA	ALL	ALL
25025	1190035	BOSTON WATER & SEWER	ALL	ALL
25025	1190057	NEPONSET RIVER VALLE	ALL	ALL
25025	1190101	UNIFIRST CORP	ALL	ALL
25025	1190357	DAMRELL EWER PARTNER	ALL	ALL
25025	1190478	WINTHROP COMMUNITY H	ALL	ALL
25025	1190649	ZAPCO READVILLE COGE	ALL	ALL
25025	1190808	PUBLIC HEALTH COMMUN	ALL	ALL
25025	1191551	BEACON CAPITAL PARTN	ALL	ALL
25025	1191566	NEW ENGLAND TRAWLER	ALL	ALL
25025	1191621	FEDERAL MOGUL FRICTI	ALL	ALL
25025	1191662	EQUITY OFFICE	ALL	ALL
25025	1191956	CHANNEL CENTER:PARCE	ALL	ALL
25025	1195596	SYNTHON IND INCORPOR	ALL	ALL
25027	1180010	CANTERBURY TOWERS	ALL	ALL
25027	1180014	ER BUCK CHAIR COMPAN	ALL	ALL
25027	1180029	GENERAL ELECTRIC FIT	ALL	ALL
25027	1180091	ANGLO FABRICS COMPAN	ALL	ALL
25027	1180100	ZAPCO ENERGY TACTICS	ALL	ALL
25027	1180111	CINCINATTI MILACRON	ALL	ALL
25027	1180114	NEW ENGLAND PLATING	ALL	ALL
25027	1180129	GF WRIGHT STEEL & WI	ALL	ALL
25027	1180132	STANDARDFOUNDRY	ALL	ALL
25027	1180174	WORCESTER TOOL & STA	ALL	ALL
25027	1180203	WORCESTER COUNTY HOS	ALL	ALL
25027	1180244	HI TECH METALS & FIN	ALL	ALL
25027	1180340	GHM INDUSTRIES INC	ALL	ALL
25027	1180353	ADVANCED MICROSENSOR	ALL	ALL
25027	1180355	NEWARK AMERICA	ALL	ALL
25027	1180373	ZYGO TERAOPTIX	ALL	ALL
25027	1180389	ETHAN ALLEN-DUDLEY	ALL	ALL
25027	1180439	INLAND PAPERBOARD &	ALL	ALL
25027	1180484	NELMOR COMPANY	ALL	ALL
25027	1180518	JAMESBURY INCORPORAT	ALL	ALL
25027	1180556	M&H TIRE CO INC	ALL	ALL
25027	1180568	CROFT CORPORATION	ALL	ALL
25027	1180796	LINCOLN PLAZA CENTER	ALL	ALL
25027	1180994	COZ PLASTICS INC	ALL	ALL
25027	1181045	WORCESTER TAPER PIN	ALL	ALL
33011	3301100093	BATESVILLE MANUFACTURING	ALL	ALL
33015	3301500058	VENTURE SEABROOK	ALL	ALL

Appendix C – Area Source Growth Factors

Table C-1 Area Source Growth Factors by SCC Code

See Electronic File: MANE-VU_Area_gf_scc.xls

This table contains records with area source growth factors by county and SCC. The format for the tables is as follows:

Column A – County FIPS code

Column B – Source Classification Code (SCC)

Column C – EGAS_02_09 this is the EGAS 5.0 factor for projecting from 2002 to 2009

Column D – AEO5_02_09 this is the DOE AEO 2005 factor for projecting from 2002 to 2009

Column E – ST_02_09 this is the state-supplied factor for projecting from 2002 to 2009

Column F – GF_02_09 this is the final factor actually used for projecting from 2002 to 2009 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column G – EGAS_02_12 this is the EGAS 5.0 factor for projecting from 2002 to 2012

Column H – AEO5_02_12 this is the DOE AEO 2005 factor for projecting from 2002 to 2012

Column I – ST_02_12 this is the state-supplied factor for projecting from 2002 to 2012

Column J – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column K – EGAS_02_18 this is the EGAS 5.0 factor for projecting from 2002 to 2018

Column J – AEO5_02_18 this is the DOE AEO 2005 factor for projecting from 2002 to 2018

Column M– ST_02_18 this is the state-supplied factor for projecting from 2002 to 2018

Column N – GF_02_09 this is the final factor actually used for projecting from 2002 to 2012 (it is the state-supplied factor, if available; if no state-supplied factor, then it is the AEO2005 factor; if no AEO2005 factor, then it is the default EGAS 5.0 factor)

Column O – SCC description

Appendix D – Area Source Control Factors

Table D-1 Area Source Control Factors for 2001 OTC VOC Model Rules

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
AIM Coatings						
09	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
09	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
10	2401002000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Solvent-based;Surface Coating
10	2401003000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Water-based;Surface Coating
10	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
10	2401102000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings- Solve;Surface Coating
10	2401103000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings- Water;Surface Coating
11	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
11	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
11	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
11	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
23	2401001000	VOC	29.50	29.50	29.50	Total: All Solvent Types;Architectural Coatings;Surface Coating
23	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
23	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
23	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
24	2401002000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Solvent-based;Surface Coating
24	2401003000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings - Water-based;Surface Coating
24	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
24	2401008999	VOC	31.00	31.00	31.00	Solvents: NEC;Traffic Markings;Surface Coating
24	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
24	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
25	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
25	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
25	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
25	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
33	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
33	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
33	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
33	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
34	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
34	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
34	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
34	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
36	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
36	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
42	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
42	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
42	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
42	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
44	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
44	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
50	2401001000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Architectural Coatings;Surface Coating
50	2401008000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Traffic Markings;Surface Coating
50	2401100000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Industrial Maintenance Coatings;Surface Coating
50	2401200000	VOC	31.00	31.00	31.00	Total: All Solvent Types;Other Special Purpose Coatings;Surface Coating
Consumer Products						
09	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
10	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
10	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
10	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
10	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
11	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
11	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
11	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
23	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
23	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
23	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
24	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
25	2460000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Processes;Miscellaneous Non-industrial: Consumer and Commerc
33	2460000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Processes;Miscellaneous Non-industrial: Consumer and Commerc
34	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
34	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
34	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
34	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
36	2460000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Processes;Miscellaneous Non-industrial: Consumer and Commerc
42	2465000000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Products/Processes;Miscellaneous Non-industrial: Consumer
44	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
44	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
44	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
44	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
50	2460100000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Personal Care Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460200000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Household Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460400000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Automotive Aftermarket Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460500000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Coatings and Related Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460600000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All Adhesives and Sealants;Miscellaneous Non-industrial: Consumer and Commerc
50	2460800000	VOC	14.20	14.20	14.20	Total: All Solvent Types;All FIFRA Related Products;Miscellaneous Non-industrial: Consumer and Commerc
50	2460900000	VOC	14.20	14.20	14.20	Total: All Solvent Types;Miscellaneous Products (Not Otherwise Covered);Miscellaneous Non-industrial: Consumer and Commerc
Mobile Equipment Repair and Refinishing						
09	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
10	2401005500	VOC	38.00	38.00	38.00	Surface Preparation Solvents;Auto Refinishing: SIC 7532;Surface Coating
10	2401005600	VOC	38.00	38.00	38.00	Primers;Auto Refinishing: SIC 7532;Surface Coating
10	2401005700	VOC	38.00	38.00	38.00	Top Coats;Auto Refinishing: SIC 7532;Surface Coating
10	2401005800	VOC	38.00	38.00	38.00	Clean-up Solvents;Auto Refinishing: SIC 7532;Surface Coating
11	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
23	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
24	2401005000	VOC	0.00	0.00	0.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
25	2401005000	VOC	0.00	0.00	0.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
33	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
34	2401005000	VOC	19.00	19.00	19.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
36	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
42	2401005000	VOC	0.00	0.00	0.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
44	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
50	2401005000	VOC	38.00	38.00	38.00	Total: All Solvent Types;Auto Refinishing: SIC 7532;Surface Coating
Solvent Cleaning Operations						
09	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Processes/All Industries;Degreasing
23	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Processes/All Industries;Degreasing
23	2415030000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Electronic and Other Elec. (SIC 36): All Processes;Degreasing
23	2415045000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Miscellaneous Manufacturing (SIC 39): All Processe;Degreasing
23	2415065000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Auto Repair Services (SIC 75): All Processes;Degreasing
23	2415300000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Industries: Cold Cleaning;Degreasing
25	2415000000	VOC	7.00	7.00	7.00	Total: All Solvent Types;All Industries: Cold Cleaning;Degreasing
33	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Industries: Cold Cleaning;Degreasing
34	2415000000	VOC	17.00	17.00	17.00	Total: All Solvent Types;All Processes/All Industries;Degreasing
36	2415020000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Fabricated Metal Products (SIC 34): All Processes;Degreasing
36	2415025000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Industrial Machinery and Equipment (SIC 35): All P;Degreasing
36	2415035000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Transportation Equipment (SIC 37): All Processes;Degreasing
36	2415045000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Miscellaneous Manufacturing (SIC 39): All Processe;Degreasing
36	2415055000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Automotive Dealers (SIC 55): All Processes;Degreasing
36	2415060000	VOC	66.00	66.00	66.00	Total: All Solvent Types;Miscellaneous Repair Services (SIC 76): All Proces;Degreasing
44	2415000000	VOC	66.00	66.00	66.00	Total: All Solvent Types;All Processes/All Industries;Degreasing

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
Portable Fuel Containers						
09	2501060300	VOC	41.3	63.8	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
10	2501011010	VOC	41.3	63.8	75.0	Vapor Losses;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011015	VOC	41.3	63.8	75.0	Spillage;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501011016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
10	2501012010	VOC	41.3	63.8	75.0	Vapor Losses;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012015	VOC	41.3	63.8	75.0	Spillage;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
10	2501012016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
11	2501011011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
11	2501011012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
11	2501011016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
11	2501012011	VOC	41.3	63.8	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
11	2501012012	VOC	41.3	63.8	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Storage
11	2501012016	VOC	41.3	63.8	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
23	2501060300	VOC	41.3	63.8	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
24	2501011011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
24	2501011012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
24	2501011016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
24	2501012011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
24	2501012012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
24	2501012016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
25	2501011000	VOC	18.8	41.3	75.0	;;
25	2501012000	VOC	18.8	41.3	75.0	;;
33	2501060300	VOC	26.3	48.8	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
34	2501000120	VOC	33.8	56.3	75.0	Gasoline;All Storage Types: Breathing Loss;Petroleum and Petroleum Product Storage
36	2501011011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Residential;Petroleum and Petroleum Product Storage
36	2501011012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Residential;Petroleum and Petroleum Product Storage
36	2501011016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Residential;Petroleum and Petroleum Product Storage
36	2501012011	VOC	48.8	71.3	75.0	Permeation;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
36	2501012012	VOC	48.8	71.3	75.0	Diurnal;Portable Containers: Commercial;Petroleum and Petroleum Product Storage

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
36	2501012016	VOC	48.8	71.3	75.0	Transport;Portable Containers: Commercial;Petroleum and Petroleum Product Storage
42	2501060300	VOC	48.8	71.3	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
44	2501060300	VOC	18.8	41.3	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage
50	2501060300	VOC	18.8	41.3	75.0	Total;Portable Containers: Residential & Com;Petroleum and Petroleum Product Storage

Table D-2 Area Source Control Factors for On-Board Vapor Recovery

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
09001	2501060101	VOC	23.81	28.57	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09001	2501060102	VOC	23.81	28.57	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09003	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09003	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09005	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09005	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09007	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09007	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09009	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09009	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09011	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09011	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09013	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09013	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
09015	2501060101	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
09015	2501060102	VOC	23.81	33.33	38.10	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
10001	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
10003	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
10005	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
11001	2501060100	VOC	40.54	48.65	56.76	Stage 2: Total;Gasoline Service Stations
23001	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23003	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23005	2501060100	VOC	28.57	33.33	42.86	Stage 2: Total;Gasoline Service Stations
23007	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23009	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23011	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23013	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23015	2501060100	VOC	53.68	67.65	79.41	Stage 2: Total;Gasoline Service Stations
23017	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23019	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23021	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23023	2501060100	VOC	28.57	33.33	42.86	Stage 2: Total;Gasoline Service Stations
23025	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23027	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23029	2501060100	VOC	53.80	68.35	79.75	Stage 2: Total;Gasoline Service Stations
23031	2501060100	VOC	28.57	33.33	42.86	Stage 2: Total;Gasoline Service Stations
24001	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
24003	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24005	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24009	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24011	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24013	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24015	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24017	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24019	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24021	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24023	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24025	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24027	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24029	2501060100	VOC	53.53	68.24	80.00	Stage 2: Total;Gasoline Service Stations
24031	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24033	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
24035	2501060100	VOC	53.53	68.24	80.00	Stage 2: Total;Gasoline Service Stations
24037	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24039	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24041	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24043	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24045	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24047	2501060100	VOC	54.24	68.36	80.23	Stage 2: Total;Gasoline Service Stations
24510	2501060100	VOC	26.09	34.78	43.48	Stage 2: Total;Gasoline Service Stations
25001	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25003	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25005	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25007	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25009	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25011	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25013	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25015	2501060102	VOC	38.24	50.00	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25017	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25019	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25021	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25023	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25025	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
25027	2501060102	VOC	38.24	47.06	55.88	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
33001	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33003	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33005	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33007	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
33009	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
33011	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33013	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33015	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33017	2501060100	VOC	38.24	50.00	55.88	Stage 2: Total;Gasoline Service Stations
33019	2501060100	VOC	53.75	68.13	80.00	Stage 2: Total;Gasoline Service Stations
34001	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34003	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34005	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34007	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34009	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34011	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34013	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34015	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34017	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34019	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34021	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34023	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34025	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34027	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34029	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34031	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34033	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34035	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34037	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34039	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
34041	2501060100	VOC	38.89	47.22	58.33	Stage 2: Total;Gasoline Service Stations
36001	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36003	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36005	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36007	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36009	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36011	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36013	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36015	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36017	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36019	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36021	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36023	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36025	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36027	2501060100	VOC	53.80	67.72	79.75	Stage 2: Total;Gasoline Service Stations
36029	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36031	2501060100	VOC	53.57	67.86	79.76	Stage 2: Total;Gasoline Service Stations
36033	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36035	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36037	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36039	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36041	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36043	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36045	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
36047	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36049	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36051	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36053	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36055	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36057	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36059	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36061	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36063	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36065	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36067	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36069	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36071	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36073	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36075	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36077	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36079	2501060100	VOC	53.80	67.72	79.75	Stage 2: Total;Gasoline Service Stations
36081	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36083	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36085	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36087	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36089	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36091	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36093	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36095	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36097	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36099	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36101	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36103	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36105	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36107	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36109	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36111	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36113	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36115	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36117	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36119	2501060100	VOC	34.48	41.38	51.72	Stage 2: Total;Gasoline Service Stations
36121	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
36123	2501060100	VOC	54.29	68.57	80.00	Stage 2: Total;Gasoline Service Stations
42001	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42003	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42005	2501060102	VOC	26.09	34.78	39.13	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42007	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42009	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42011	2501060101	VOC	26.09	34.78	39.13	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42013	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
42015	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42017	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42019	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42021	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42023	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42025	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42027	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42029	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42031	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42033	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42035	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42037	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42039	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42041	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42043	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42045	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42047	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42049	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42051	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42053	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42055	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42057	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42059	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42061	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42063	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42065	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42067	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42069	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42071	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42073	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
42075	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42077	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42079	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42081	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42083	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42085	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42087	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42089	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42091	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42093	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42095	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42097	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42099	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42101	2501060102	VOC	30.43	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42103	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42105	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42107	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42109	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42111	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42113	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42115	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42117	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42119	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42121	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42123	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42125	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42127	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42129	2501060102	VOC	26.09	34.78	43.48	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
42131	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
42133	2501060101	VOC	53.98	68.75	80.11	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
44001	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44003	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44005	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44007	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
44009	2501060000	VOC	38.24	50.00	55.88	Total: All Gasoline/All Processes;Gasoline Service Stations
50001	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50001	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50001	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50003	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50003	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50003	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50005	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50005	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50005	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50007	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50007	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50007	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50009	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50009	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50009	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50011	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50011	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50011	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50013	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50013	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50013	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50015	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50015	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50015	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50017	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50017	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50017	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50019	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50019	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50019	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50021	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service

FIPS	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018	SCC Description
						Stations
50021	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50021	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50023	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50023	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50023	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50025	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50025	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50025	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations
50027	2501060101	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Uncontrolled;Gasoline Service Stations
50027	2501060102	VOC	37.14	48.57	57.14	Stage 2: Displacement Loss/Controlled;Gasoline Service Stations
50027	2501060103	VOC	37.14	48.57	57.14	Stage 2: Spillage;Gasoline Service Stations

Table D-3 Area Source Growth/Control Factors for Residential Wood Combustion

SCC	SCC Description	Assumptions	Growth and Control Factor		
			2002-2009	2002-2012	2002-2018
2104008000	Total: Woodstoves and Fireplaces	1 - 0.01056*(Year-2002) (Assumes 19.4% fireplaces 71.6%old woodstoves 9.1%new woodstoves)	0.926	0.894	0.831
2104008001	Fireplaces: General	Increase 1%/yr: 1 + 0.01*(Year-2002)	1.070	1.100	1.160
2104008002	Fireplaces: Insert; non-EPA certified	Decrease 2%/yr: 1 - 0.02*(Year-2002)	0.860	0.800	0.680
2104008003	Fireplaces: Insert; EPA certified; non-catalytic	Increase 2%/yr: 1 + 0.02*(Year-2002)	1.140	1.200	1.320
2104008004	Fireplaces: Insert; EPA certified; catalytic	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008010	Woodstoves: General	Decrease 2%/yr (same as 2104008002)	0.860	0.800	0.680
2104008030	Catalytic Woodstoves: General	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008050	Non-catalytic Woodstoves: EPA certified	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008051	Non-catalytic Woodstoves: Non-EPA certified	Decrease 2%/yr (same as 2104008002)	0.860	0.800	0.680
2104008052	Non-catalytic Woodstoves: Low Emitting	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320
2104008053	Non-catalytic Woodstoves: Pellet Fired	Increase 2%/yr (same as 2104008003)	1.140	1.200	1.320

Table E-1 NonEGU BOTW Control Factors for Adhesives and Sealants Application, Asphalt Production Plants, Cement Kilns, and Glass/Fiberglass Furnaces

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
Control Measure: Adhesives and Sealants Application								
09003	6484	R0131	01	40200701	VOC	64.40	64.40	64.40
09003	6484	R0132	01	40200701	VOC	64.40	64.40	64.40
09015	0647	P0085	01	40200701	VOC	64.40	64.40	64.40
10001	1000100004	003	2	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	2	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	3	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	4	40200701	VOC	64.40	64.40	64.40
10001	1000100004	005	5	40200701	VOC	64.40	64.40	64.40
10003	1000300365	002	2	40200706	VOC	64.40	64.40	64.40
10003	1000300365	002	1	40200710	VOC	64.40	64.40	64.40
23001	2300100076	003	2	40200701	VOC	64.40	64.40	64.40
24003	003-0250	232	01F232	40200701	VOC	64.40	64.40	64.40
24003	003-0250	232	01S232	40200701	VOC	64.40	64.40	64.40
24005	005-2407	17	01F17	40200701	VOC	64.40	64.40	64.40
24005	005-2407	17	01S17	40200701	VOC	64.40	64.40	64.40
24025	025-0006	45	01F45	40200710	VOC	64.40	64.40	64.40
24025	025-0006	45	01S45	40200710	VOC	64.40	64.40	64.40
24025	025-0423	5	01F5	40200701	VOC	64.40	64.40	64.40
24025	025-0423	5	01S5	40200701	VOC	64.40	64.40	64.40
24025	025-0423	6	01F6	40200701	VOC	64.40	64.40	64.40
24025	025-0423	6	01S6	40200701	VOC	64.40	64.40	64.40
24025	025-0423	7	01F7	40200701	VOC	64.40	64.40	64.40
24025	025-0423	7	01S7	40200701	VOC	64.40	64.40	64.40
24045	045-0082	12	01F12	40200710	VOC	64.40	64.40	64.40
24045	045-0082	12	01S12	40200710	VOC	64.40	64.40	64.40
25005	1200077	12	0108	40200701	VOC	64.40	64.40	64.40
25005	1200100	23	0111	40200701	VOC	64.40	64.40	64.40
25005	1200100	26	0114	40200701	VOC	64.40	64.40	64.40
25005	1200100	28	0116	40200701	VOC	64.40	64.40	64.40
25005	1200101	08	0107	40200701	VOC	64.40	64.40	64.40
25005	1200101	09	0108	40200706	VOC	64.40	64.40	64.40
25005	1200101	10	0109	40200701	VOC	64.40	64.40	64.40
25005	1200101	11	0110	40200701	VOC	64.40	64.40	64.40
25005	1200101	12	0111	40200701	VOC	64.40	64.40	64.40
25005	1200183	07	0203	40200701	VOC	64.40	64.40	64.40
25005	1200388	04	0104	40200701	VOC	64.40	64.40	64.40
25005	1200388	05	0105	40200701	VOC	64.40	64.40	64.40
25005	1200388	05	0205	40200701	VOC	64.40	64.40	64.40
25005	1200509	04	0104	40200701	VOC	64.40	64.40	64.40
25005	1200585	02	0102	40200710	VOC	64.40	64.40	64.40
25005	1200673	07	0107	40200710	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
25005	1200707	08	0106	40200710	VOC	64.40	64.40	64.40
25005	1200851	11	0110	40200710	VOC	64.40	64.40	64.40
25009	1190683	03	0103	40200706	VOC	64.40	64.40	64.40
25009	1190690	09	0108	40200710	VOC	64.40	64.40	64.40
25009	1210026	15	0115	40200710	VOC	64.40	64.40	64.40
25009	1210046	01	0101	40200706	VOC	64.40	64.40	64.40
25009	1210083	05	0104	40200710	VOC	64.40	64.40	64.40
25009	1210093	09	0209	40200701	VOC	64.40	64.40	64.40
25009	1210110	01	0101	40200701	VOC	64.40	64.40	64.40
25009	1210212	30	0321	40200706	VOC	64.40	64.40	64.40
25009	1210212	30	0721	40200706	VOC	64.40	64.40	64.40
25009	1210212	32	0322	40200706	VOC	64.40	64.40	64.40
25009	1210212	32	0622	40200706	VOC	64.40	64.40	64.40
25009	1210212	32	0922	40200706	VOC	64.40	64.40	64.40
25009	1210276	03	0102	40200701	VOC	64.40	64.40	64.40
25009	1210332	01	0101	40200701	VOC	64.40	64.40	64.40
25009	1210332	02	0102	40200701	VOC	64.40	64.40	64.40
25009	1210332	03	0103	40200701	VOC	64.40	64.40	64.40
25009	1210341	10	0110	40200710	VOC	64.40	64.40	64.40
25009	1211013	07	0105	40200710	VOC	64.40	64.40	64.40
25009	1211013	08	0306	40200710	VOC	64.40	64.40	64.40
25009	1211013	33	0331	40200701	VOC	64.40	64.40	64.40
25009	1211013	72	0259	40200710	VOC	64.40	64.40	64.40
25009	1211013	89	0253	40200710	VOC	64.40	64.40	64.40
25013	0420145	16	0112	40200710	VOC	64.40	64.40	64.40
25013	0420213	01	0201	40200701	VOC	64.40	64.40	64.40
25013	0420260	02	0102	40200710	VOC	64.40	64.40	64.40
25013	0420265	06	0105	40200701	VOC	64.40	64.40	64.40
25013	0420561	01	0101	40200701	VOC	64.40	64.40	64.40
25013	0420798	05	0105	40200710	VOC	64.40	64.40	64.40
25013	0420821	10	0106	40200701	VOC	64.40	64.40	64.40
25015	0420558	01	0101	40200710	VOC	64.40	64.40	64.40
25017	1180795	02	0102	40200706	VOC	64.40	64.40	64.40
25017	1180795	03	0103	40200706	VOC	64.40	64.40	64.40
25017	1180795	04	0104	40200706	VOC	64.40	64.40	64.40
25017	1180795	05	0105	40200706	VOC	64.40	64.40	64.40
25017	1180795	06	0106	40200706	VOC	64.40	64.40	64.40
25017	1180795	07	0107	40200701	VOC	64.40	64.40	64.40
25017	1180795	08	0108	40200701	VOC	64.40	64.40	64.40
25017	1180795	09	0109	40200701	VOC	64.40	64.40	64.40
25017	1190355	05	0101	40200706	VOC	64.40	64.40	64.40
25017	1190424	04	0104	40200701	VOC	64.40	64.40	64.40
25017	1190424	08	0106	40200701	VOC	64.40	64.40	64.40
25017	1190424	11	0107	40200701	VOC	64.40	64.40	64.40
25017	1190424	20	0110	40200701	VOC	64.40	64.40	64.40
25017	1190424	24	0111	40200701	VOC	64.40	64.40	64.40
25017	1190424	28	0112	40200701	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
25017	1190424	32	0213	40200701	VOC	64.40	64.40	64.40
25017	1190424	37	0117	40200701	VOC	64.40	64.40	64.40
25017	1190429	06	0106	40200710	VOC	64.40	64.40	64.40
25017	1190560	02	0101	40200710	VOC	64.40	64.40	64.40
25017	1190560	23	0106	40200710	VOC	64.40	64.40	64.40
25017	1190585	08	0104	40200706	VOC	64.40	64.40	64.40
25017	1190585	17	0106	40200710	VOC	64.40	64.40	64.40
25017	1190692	09	0107	40200701	VOC	64.40	64.40	64.40
25017	1190692	10	0108	40200701	VOC	64.40	64.40	64.40
25017	1190692	11	0108	40200701	VOC	64.40	64.40	64.40
25017	1190953	04	0104	40200710	VOC	64.40	64.40	64.40
25017	1190999	11	0111	40200710	VOC	64.40	64.40	64.40
25017	1190999	11	0211	40200710	VOC	64.40	64.40	64.40
25017	1190999	13	0313	40200710	VOC	64.40	64.40	64.40
25017	1191104	03	0103	40200710	VOC	64.40	64.40	64.40
25017	1191192	05	0104	40200701	VOC	64.40	64.40	64.40
25017	1191296	26	0116	40200701	VOC	64.40	64.40	64.40
25017	1191296	27	0117	40200701	VOC	64.40	64.40	64.40
25017	1191471	04	0103	40200710	VOC	64.40	64.40	64.40
25017	1191564	08	0108	40200710	VOC	64.40	64.40	64.40
25017	1191844	53	0135	40200710	VOC	64.40	64.40	64.40
25017	1191844	53	0335	40200710	VOC	64.40	64.40	64.40
25017	1192051	12	0107	40200710	VOC	64.40	64.40	64.40
25017	1192051	26	0115	40200710	VOC	64.40	64.40	64.40
25017	1210036	03	0103	40200701	VOC	64.40	64.40	64.40
25017	1210036	05	0104	40200710	VOC	64.40	64.40	64.40
25017	1210036	07	0105	40200701	VOC	64.40	64.40	64.40
25017	1210373	01	0101	40200701	VOC	64.40	64.40	64.40
25017	1210373	02	0102	40200701	VOC	64.40	64.40	64.40
25017	1210373	03	0103	40200701	VOC	64.40	64.40	64.40
25017	1210373	04	0104	40200701	VOC	64.40	64.40	64.40
25017	1210373	04	0204	40200701	VOC	64.40	64.40	64.40
25017	1210373	05	0105	40200701	VOC	64.40	64.40	64.40
25017	1210373	05	0205	40200701	VOC	64.40	64.40	64.40
25017	1210373	06	0106	40200701	VOC	64.40	64.40	64.40
25017	1210373	06	0206	40200701	VOC	64.40	64.40	64.40
25017	1210373	09	0109	40200701	VOC	64.40	64.40	64.40
25017	1210373	10	0110	40200701	VOC	64.40	64.40	64.40
25017	1210912	02	0202	40200710	VOC	64.40	64.40	64.40
25021	1190319	04	0103	40200710	VOC	64.40	64.40	64.40
25021	1190319	11	0111	40200710	VOC	64.40	64.40	64.40
25021	1190569	23	0215	40200710	VOC	64.40	64.40	64.40
25021	1192106	03	0103	40200710	VOC	64.40	64.40	64.40
25021	1192121	07	0107	40200701	VOC	64.40	64.40	64.40
25021	1192131	03	0103	40200710	VOC	64.40	64.40	64.40
25021	1192491	07	0107	40200701	VOC	64.40	64.40	64.40
25021	1192491	08	0108	40200701	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
25021	1200125	55	0146	40200710	VOC	64.40	64.40	64.40
25021	1200125	56	0147	40200710	VOC	64.40	64.40	64.40
25021	1200127	10	0209	40200710	VOC	64.40	64.40	64.40
25021	1200228	04	0203	40200710	VOC	64.40	64.40	64.40
25021	1200452	04	0102	40200701	VOC	64.40	64.40	64.40
25023	1192198	11	0107	40200710	VOC	64.40	64.40	64.40
25023	1192198	12	0108	40200710	VOC	64.40	64.40	64.40
25023	1192198	19	0109	40200710	VOC	64.40	64.40	64.40
25023	1192198	23	0109	40200710	VOC	64.40	64.40	64.40
25023	1192198	25	0109	40200710	VOC	64.40	64.40	64.40
25023	1192198	26	0109	40200710	VOC	64.40	64.40	64.40
25023	1192203	01	0101	40200710	VOC	64.40	64.40	64.40
25023	1192237	08	0102	40200710	VOC	64.40	64.40	64.40
25023	1192436	09	0105	40200701	VOC	64.40	64.40	64.40
25023	1200177	05	0105	40200701	VOC	64.40	64.40	64.40
25023	1200637	04	0104	40200710	VOC	64.40	64.40	64.40
25023	1200637	07	0105	40200707	VOC	64.40	64.40	64.40
25025	1191397	05	0106	40200701	VOC	64.40	64.40	64.40
25025	1191397	06	0107	40200701	VOC	64.40	64.40	64.40
25027	1180025	01	0301	40200710	VOC	64.40	64.40	64.40
25027	1180115	17	0209	40200701	VOC	64.40	64.40	64.40
25027	1180115	25	0311	40200710	VOC	64.40	64.40	64.40
25027	1180115	36	0117	40200710	VOC	64.40	64.40	64.40
25027	1180115	39	0118	40200701	VOC	64.40	64.40	64.40
25027	1180115	77	0251	40200710	VOC	64.40	64.40	64.40
25027	1180225	04	0104	40200710	VOC	64.40	64.40	64.40
25027	1180265	05	0205	40200701	VOC	64.40	64.40	64.40
25027	1180310	03	0203	40200701	VOC	64.40	64.40	64.40
25027	1180310	03	0303	40200701	VOC	64.40	64.40	64.40
25027	1180505	07	0107	40200701	VOC	64.40	64.40	64.40
25027	1180505	23	0123	40200710	VOC	64.40	64.40	64.40
25027	1180998	27	0111	40200710	VOC	64.40	64.40	64.40
25027	1180998	30	0113	40200701	VOC	64.40	64.40	64.40
25027	1200856	12	0110	40200701	VOC	64.40	64.40	64.40
25027	1200856	13	0111	40200701	VOC	64.40	64.40	64.40
33011	3301100076	004	1	40200701	VOC	64.40	64.40	64.40
33011	3301100076	005	1	40200701	VOC	64.40	64.40	64.40
33011	3301100076	009	1	40200701	VOC	64.40	64.40	64.40
33017	3301700010	001	1	40200701	VOC	64.40	64.40	64.40
33017	3301700010	002	1	40200701	VOC	64.40	64.40	64.40
36063	9290900018	ADHES1	HM1FP	40200701	VOC	64.40	64.40	64.40
36069	8329900028	000005	WABFP	40200701	VOC	64.40	64.40	64.40
36103	1473000001	EI0001	E10EI	40200701	VOC	64.40	64.40	64.40
36103	1473000001	U00002	103FP	40200706	VOC	64.40	64.40	64.40
36115	5533000016	U00011	SL2FP	40200710	VOC	64.40	64.40	64.40
36117	8543600007	1MLDRB	SC3FP	40200701	VOC	64.40	64.40	64.40
36117	8543600007	2KLZRS	SC2FP	40200701	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42001	420010009	103	1	40200706	VOC	64.40	64.40	64.40
42013	420130480	101	2	40200701	VOC	64.40	64.40	64.40
42017	420171041	101	1	40200701	VOC	64.40	64.40	64.40
42019	420190029	104	1	40200701	VOC	64.40	64.40	64.40
42019	420190029	105	1	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	1	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	2	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	3	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	4	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	5	40200701	VOC	64.40	64.40	64.40
42019	420190090	102	6	40200701	VOC	64.40	64.40	64.40
42035	420350429	P105	1	40200710	VOC	64.40	64.40	64.40
42035	420350429	P106	1	40200710	VOC	64.40	64.40	64.40
42039	420390013	106	1	40200707	VOC	64.40	64.40	64.40
42039	420390014	102	1	40200701	VOC	64.40	64.40	64.40
42039	420390014	103	1	40200701	VOC	64.40	64.40	64.40
42039	420390014	104	1	40200701	VOC	64.40	64.40	64.40
42039	420390014	105	1	40200701	VOC	64.40	64.40	64.40
42045	420450954	121	1	40200701	VOC	64.40	64.40	64.40
42055	420550022	100	1	40200706	VOC	64.40	64.40	64.40
42055	420550022	101	1	40200706	VOC	64.40	64.40	64.40
42061	420610016	104	1	40200701	VOC	64.40	64.40	64.40
42061	420610016	105	1	40200701	VOC	64.40	64.40	64.40
42061	420610032	101	2	40200701	VOC	64.40	64.40	64.40
42061	420610032	101	4	40200701	VOC	64.40	64.40	64.40
42061	420610032	101	6	40200701	VOC	64.40	64.40	64.40
42061	420610032	102	2	40200701	VOC	64.40	64.40	64.40
42061	420610032	102	4	40200701	VOC	64.40	64.40	64.40
42061	420610032	102	6	40200701	VOC	64.40	64.40	64.40
42061	420610032	103	2	40200701	VOC	64.40	64.40	64.40
42061	420610032	103	4	40200701	VOC	64.40	64.40	64.40
42069	420690023	107	1	40200701	VOC	64.40	64.40	64.40
42069	420690023	108	1	40200701	VOC	64.40	64.40	64.40
42071	420710802	102	1	40200710	VOC	64.40	64.40	64.40
42071	420710804	102	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	101	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	101	2	40200710	VOC	64.40	64.40	64.40
42077	420770071	102	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	102	2	40200710	VOC	64.40	64.40	64.40
42077	420770071	103	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	104	1	40200710	VOC	64.40	64.40	64.40
42077	420770071	105	1	40200710	VOC	64.40	64.40	64.40
42081	420810039	113	1	40200710	VOC	64.40	64.40	64.40
42081	420810559	P104	1	40200710	VOC	64.40	64.40	64.40
42091	420910826	002	1	40200701	VOC	64.40	64.40	64.40
42097	420970001	105	1	40200710	VOC	64.40	64.40	64.40
42097	420970001	201	1	40200710	VOC	64.40	64.40	64.40

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42097	420970001	202	1	40200710	VOC	64.40	64.40	64.40
42097	420970034	104	1	40200710	VOC	64.40	64.40	64.40
42097	420970034	105A	1	40200710	VOC	64.40	64.40	64.40
42101	4210101591	004	1	40200701	VOC	64.40	64.40	64.40
42101	4210102051	005	10	40200712	VOC	64.40	64.40	64.40
42101	4210102051	005	11	40200712	VOC	64.40	64.40	64.40
42101	4210102051	005	12	40200712	VOC	64.40	64.40	64.40
42101	4210102051	006	5	40200712	VOC	64.40	64.40	64.40
42101	4210102051	007	6	40200712	VOC	64.40	64.40	64.40
42101	4210102051	008	14	40200712	VOC	64.40	64.40	64.40
42101	4210102051	009	7	40200712	VOC	64.40	64.40	64.40
42101	4210103217	010	2	40200710	VOC	64.40	64.40	64.40
42109	421090001	113	1	40200710	VOC	64.40	64.40	64.40
42109	421090001	140	1	40200710	VOC	64.40	64.40	64.40
42119	421190477	P101	1	40200710	VOC	64.40	64.40	64.40
42129	421290071	105	1	40200701	VOC	64.40	64.40	64.40
42129	421290311	101	1	40200701	VOC	64.40	64.40	64.40
42133	421330034	103	1	40200701	VOC	64.40	64.40	64.40
42133	421330055	101	1	40200706	VOC	64.40	64.40	64.40
42133	421330055	101	2	40200706	VOC	64.40	64.40	64.40
44003	AIR1438	8	8	40200710	VOC	64.40	64.40	64.40
44007	AIR1859	2	2	40200701	VOC	64.40	64.40	64.40
44007	AIR3850	1	1	40200701	VOC	64.40	64.40	64.40
44007	AIR537	2	2	40200710	VOC	64.40	64.40	64.40
44009	AIR594	7	7	40200710	VOC	64.40	64.40	64.40
50005	9	4	1	40200701	VOC	64.40	64.40	64.40
Control Measure: Asphalt Production Plants								
34001	70003	U101	OS1	30500207	NOX	0.00	35.00	35.00
34001	70003	U101	OS2	30500207	NOX	0.00	35.00	35.00
34001	70003	U12	OS0	30500207	NOX	0.00	35.00	35.00
34001	70003	U13	OS0	30500207	NOX	0.00	35.00	35.00
34001	70003	U6	OS1	30500207	NOX	0.00	35.00	35.00
34001	70015	U401	OS1601	30500207	NOX	0.00	35.00	35.00
34001	70015	U401	OS2101	30500207	NOX	0.00	35.00	35.00
34001	70015	U401	OS401	30500207	NOX	0.00	35.00	35.00
34007	50373	U11	OS1	30500207	NOX	0.00	35.00	35.00
34007	50373	U6	OS1	30500207	NOX	0.00	35.00	35.00
34009	73014	U9	OS3	30500207	NOX	0.00	35.00	35.00
34009	73014	U9	OS7	30500207	NOX	0.00	35.00	35.00
34013	05005	U2	OS1	30500207	NOX	0.00	35.00	35.00
34015	55261	U4	OS1	30500207	NOX	0.00	35.00	35.00
34017	11171	U2	OS1	30500207	NOX	0.00	35.00	35.00
34021	60031	U6	OS1	30500207	NOX	0.00	35.00	35.00
34023	15129	U7	OS1	30500207	NOX	0.00	35.00	35.00
34025	20022	U1	OS1	30500207	NOX	0.00	35.00	35.00
34025	20023	U2	OS1	30500207	NOX	0.00	35.00	35.00
34025	20025	U26	OS1	30500207	NOX	0.00	35.00	35.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
34025	20025	U3	OS2	30500207	NOX	0.00	35.00	35.00
34027	25009	U13	OS1	30500207	NOX	0.00	35.00	35.00
34027	25009	U2	OS1	30500207	NOX	0.00	35.00	35.00
34027	25268	U100	OS101	30500207	NOX	0.00	35.00	35.00
34027	25268	U1601	OS1601	30500207	NOX	0.00	35.00	35.00
34027	25268	U1601	OS1602	30500207	NOX	0.00	35.00	35.00
34029	78010	U1500	OS1501	30500207	NOX	0.00	35.00	35.00
34029	78010	U1500	OS1502	30500207	NOX	0.00	35.00	35.00
34029	78010	U1601	OS1601	30500207	NOX	0.00	35.00	35.00
34029	78010	U900	OS1	30500207	NOX	0.00	35.00	35.00
34029	78012	U101	OS1	30500207	NOX	0.00	35.00	35.00
34029	78014	U2	OS1	30500207	NOX	0.00	35.00	35.00
34031	30005	U100	OS113	30500207	NOX	0.00	35.00	35.00
34031	30005	U2300	OS2301	30500207	NOX	0.00	35.00	35.00
34031	30005	U2300	OS2332	30500207	NOX	0.00	35.00	35.00
34031	30085	U100	OS201	30500207	NOX	0.00	35.00	35.00
34031	30085	U100	OS901	30500207	NOX	0.00	35.00	35.00
34031	30085	U100	OS903	30500207	NOX	0.00	35.00	35.00
34035	35014	U100	OS113	30500207	NOX	0.00	35.00	35.00
34035	35014	U100	OS2301	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1201	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1202	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1301	30500207	NOX	0.00	35.00	35.00
34035	36009	U1000	OS1401	30500207	NOX	0.00	35.00	35.00
34037	83008	U4	OS1	30500207	NOX	0.00	35.00	35.00
36081	2630200138	D00001	P01FP	30500251	NOX	35.00	35.00	35.00
36085	2640300031	3ADRYR	302FP	30500251	NOX	35.00	35.00	35.00
36119	3550800247	1MIXER	001FP	30500205	NOX	35.00	35.00	35.00
Control Measure: Cement Kilns								
23013	2301300028	001	1	30500706	NOX	60.00	60.00	60.00
24013	013-0012	39	01S39	30500606	NOX	46.67	46.67	46.67
24021	021-0013	21	01S21	30500706	NOX	46.67	46.67	46.67
24021	021-0013	22	01S22	30500706	NOX	46.67	46.67	46.67
24043	043-0008	24	01S24	30500606	NOX	46.67	46.67	46.67
36001	4012200004	U00002	OX1FP	30501202	NOX	70.00	70.00	70.00
36001	4012200004	U00003	FZ1FP	30501204	NOX	70.00	70.00	70.00
36001	4012200004	U00003	FZ2FP	30501204	NOX	70.00	70.00	70.00
36001	4012200004	U00003	SS1FP	30501206	NOX	70.00	70.00	70.00
36001	4012200004	U00012	OX2FP	30501202	NOX	70.00	70.00	70.00
36001	4012200004	U00013	FC2FP	30501204	NOX	70.00	70.00	70.00
36001	4012400001	041000	K12FP	30500706	NOX	20.00	20.00	20.00
36039	4192600021	U00K18	00CEP	30500706	NOX	20.00	20.00	20.00
36113	5520500013	0UKILN	G02FP	30500606	NOX	20.00	20.00	20.00
42019	420190024	101	4	30500706	NOX	0.00	52.38	52.38
42019	420190024	121	4	30500706	NOX	0.00	52.38	52.38
42073	420730024	226	1	30500606	NOX	0.00	54.29	54.29
42073	420730024	227	1	30500606	NOX	0.00	60.00	60.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42073	420730024	228	1	30500606	NOX	0.00	54.18	54.18
42073	420730026	501	1	30500706	NOX	0.00	56.52	56.52
42073	420730026	502	1	30500706	NOX	0.00	56.52	56.52
42077	420770019	101	2	30500606	NOX	0.00	54.40	54.40
42079	420790013	101	1	30501201	NOX	85.00	85.00	85.00
42079	420790013	102	1	30501201	NOX	85.00	85.00	85.00
42079	420790013	103	1	30501204	NOX	85.00	85.00	85.00
42079	420790013	104	1	30501204	NOX	85.00	85.00	85.00
42079	420790060	104	1	30501301	NOX	85.00	85.00	85.00
42095	420950006	102	1	30500606	NOX	0.00	57.04	57.04
42095	420950006	122	1	30500606	NOX	0.00	57.04	57.04
42095	420950012	101	2	30500706	NOX	0.00	45.21	45.21
42095	420950012	102	2	30500706	NOX	0.00	45.21	45.21
42095	420950045	142	1	30500606	NOX	0.00	32.20	32.20
42095	420950045	143	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	101	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	102	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	103	1	30500606	NOX	0.00	32.20	32.20
42095	420950127	104	1	30500606	NOX	0.00	32.20	32.20
42133	421330060	200	4	39000602	NOX	0.00	45.21	45.21
Control Measure: Glass and Fiberglass Furnaces								
24510	510-0285	10	01S10	30501402	NOX	85.00	85.00	85.00
25027	1200856	04	0304	30501402	NOX	85.00	85.00	85.00
25027	1200856	05	0304	30501402	NOX	85.00	85.00	85.00
34005	45982	U6	OS0	39999991	NOX	0.00	20.00	20.00
34011	75475	U1	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U3	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U35	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U37	OS1	30501401	NOX	0.00	20.00	20.00
34011	75475	U5	OS1	30501401	NOX	0.00	20.00	20.00
34011	75503	U2	OS1001	30501401	NOX	0.00	20.00	20.00
34011	75503	U3	OS1	30501401	NOX	0.00	20.00	20.00
34011	75503	U4	OS1	30501401	NOX	0.00	20.00	20.00
34011	75503	U5	OS1	30501401	NOX	0.00	20.00	20.00
34011	75505	U12	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U143	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U144	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U146	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U150	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U151	OS1	30599999	NOX	0.00	20.00	20.00
34011	75505	U6	OS1	30599999	NOX	0.00	20.00	20.00
34011	75506	U1	OS1	30501401	NOX	0.00	20.00	20.00
34011	75506	U1	OS3	30501401	NOX	0.00	20.00	20.00
34023	18070	U1	OS1	30501401	NOX	0.00	20.00	20.00
34033	65499	U1	OS1	30501401	NOX	0.00	20.00	20.00
34033	65499	U2	OS1	30501401	NOX	0.00	20.00	20.00
34033	65499	U3	OS1	30501401	NOX	0.00	20.00	20.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
36001	4010300016	KILNSG	10BEI	39001399	NOX	20.00	20.00	20.00
36001	4010300016	KILNSG	KNFFP	39001399	NOX	20.00	20.00	20.00
36001	4012200004	EI0001	E20EI	39000689	NOX	70.00	70.00	70.00
36011	7055200004	AFURNC	FRNFP	30501402	NOX	70.00	70.00	70.00
36015	8070400036	000001	O1AFP	30501402	NOX	70.00	70.00	70.00
36069	8320500041	UFURNC	FURFP	30501403	NOX	70.00	70.00	70.00
36089	6403000002	U00001	101FP	30501401	NOX	70.00	70.00	70.00
36089	6403000002	U00003	300FP	30501416	NOX	70.00	70.00	70.00
36101	8460300008	PCCTNK	GL2FP	30501416	NOX	70.00	70.00	70.00
42003	4200300164	003	1	30501404	NOX	85.00	85.00	85.00
42003	4200300164	007	1	30501404	NOX	85.00	85.00	85.00
42003	4200300164	008	1	30501404	NOX	85.00	85.00	85.00
42003	4200300165	P01	1	30501402	NOX	85.00	85.00	85.00
42003	4200300165	P02	1	30501402	NOX	85.00	85.00	85.00
42003	4200300165	P04	1	30501402	NOX	85.00	85.00	85.00
42003	4200300227	003	1	30590003	NOX	85.00	85.00	85.00
42003	4200300227	003	2	30590003	NOX	85.00	85.00	85.00
42003	4200300342	002	1	30501403	NOX	85.00	85.00	85.00
42003	4200300342	002	3	30501403	NOX	85.00	85.00	85.00
42007	420070012	103	1	30501402	NOX	85.00	85.00	85.00
42007	420070012	104	1	30501408	NOX	85.00	85.00	85.00
42007	420070012	105	1	30501408	NOX	85.00	85.00	85.00
42007	420070022	102	1	30501799	NOX	85.00	85.00	85.00
42027	420270021	P101	1	30501404	NOX	85.00	85.00	85.00
42027	420270021	P102	1	30501404	NOX	85.00	85.00	85.00
42027	420270021	P102	3	30501404	NOX	85.00	85.00	85.00
42027	420270021	P103	1	30501404	NOX	85.00	85.00	85.00
42031	420310009	102	1	30501402	NOX	85.00	85.00	85.00
42031	420310009	S105A	1	30501402	NOX	85.00	85.00	85.00
42039	420390012	101	1	30501403	NOX	85.00	85.00	85.00
42039	420390012	102	1	30501403	NOX	85.00	85.00	85.00
42041	420410013	101	1	30501403	NOX	85.00	85.00	85.00
42041	420410013	102	1	30501403	NOX	85.00	85.00	85.00
42045	420450041	101	1	30501410	NOX	85.00	85.00	85.00
42051	420510020	101	1	30501402	NOX	85.00	85.00	85.00
42051	420510020	102	1	30501402	NOX	85.00	85.00	85.00
42065	420650003	110	1	30501402	NOX	85.00	85.00	85.00
42065	420650007	103	1	30501402	NOX	85.00	85.00	85.00
42065	420650007	104	1	30501402	NOX	85.00	85.00	85.00
42079	420790008	101	1	30501704	NOX	85.00	85.00	85.00
42079	420790008	102	1	30501704	NOX	85.00	85.00	85.00
42079	420790008	103	1	30501701	NOX	85.00	85.00	85.00
42079	420790018	101	1	30501402	NOX	85.00	85.00	85.00
42079	420790018	101	2	30501402	NOX	85.00	85.00	85.00
42079	420790018	102	1	30501402	NOX	85.00	85.00	85.00
42079	420790018	102	2	30501402	NOX	85.00	85.00	85.00
42079	420790018	103	1	30501402	NOX	85.00	85.00	85.00

FIPS	SITEID	EU ID	PROCESS ID	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
42083	420830002	101	1	30501402	NOX	85.00	85.00	85.00
42083	420830002	201	1	30501402	NOX	85.00	85.00	85.00
42083	420830006	101	1	30501402	NOX	85.00	85.00	85.00
42083	420830006	102	1	30501402	NOX	85.00	85.00	85.00
42083	420830006	103	1	30501402	NOX	85.00	85.00	85.00
42095	420950047	101A	3	30501701	NOX	85.00	85.00	85.00
42095	420950047	103A	3	30501701	NOX	85.00	85.00	85.00
42117	421170020	P109	1	30501402	NOX	85.00	85.00	85.00
42117	421170020	P124	1	30501404	NOX	85.00	85.00	85.00
42117	421170020	P127	1	30501408	NOX	85.00	85.00	85.00
42125	421250001	107	1	30501404	NOX	85.00	85.00	85.00
42125	421250001	107	3	30501404	NOX	85.00	85.00	85.00
42129	421290233	101	2	30501404	NOX	85.00	85.00	85.00
42129	421290233	102	2	30501404	NOX	85.00	85.00	85.00
42129	421290553	101	1	30501402	NOX	85.00	85.00	85.00
42133	421330066	104	3	30501414	NOX	85.00	85.00	85.00

Table E-2 NonEGU BOTW Control Factors for ICI Boilers

	Boiler Size Range (mmBtu/hour)						
	< 25	25 to 50	50 to 100	100 to 250	>250		
SCC	**CF0_25**	**CF25_50**	**CF50_100**	**CF100_250**	**CF250**	**SCC_L4**	**SCC_L3**
10200104	10	50	10	40	0	Traveling Grate (Overfeed) Stoker	Anthracite Coal
10200202	10	50	10	40	0	Pulverized Coal: Dry Bottom	Bituminous/Subbituminous Coal
10200203	10	50	10	40	0	Cyclone Furnace	Bituminous/Subbituminous Coal
10200204	10	50	10	40	0	Spreader Stoker	Bituminous/Subbituminous Coal
10200205	10	50	10	40	0	Overfeed Stoker	Bituminous/Subbituminous Coal
10200206	10	50	10	40	0	Underfeed Stoker	Bituminous/Subbituminous Coal
10200212	10	50	10	40	0	Pulverized Coal: Dry Bottom (Tangential)	Bituminous/Subbituminous Coal
10200222	10	50	10	40	0	Pulverized Coal: Dry Bottom (Subbituminous Coal)	Bituminous/Subbituminous Coal
10200401	10	50	10	40	0	Grade 6 Oil	Residual Oil
10200402	10	50	10	40	0	10-100 Million Btu/hr **	Residual Oil
10200403	10	50	10	40	0	< 10 Million Btu/hr **	Residual Oil
10200404	10	50	10	40	0	Grade 5 Oil	Residual Oil
10200405	10	50	10	40	0	Cogeneration	Residual Oil
10200501	10	50	10	40	0	Grades 1 and 2 Oil	Distillate Oil
10200502	10	50	10	40	0	10-100 Million Btu/hr **	Distillate Oil
10200503	10	50	10	40	0	< 10 Million Btu/hr **	Distillate Oil
10200504	10	50	10	40	0	Grade 4 Oil	Distillate Oil
10200505	10	50	10	40	0	Cogeneration	Distillate Oil
10200601	10	50	10	75	0	> 100 Million Btu/hr	Natural Gas
10200602	10	50	10	75	0	10-100 Million Btu/hr	Natural Gas
10200603	10	50	10	75	0	< 10 Million Btu/hr	Natural Gas
10200604	10	50	10	75	0	Cogeneration	Natural Gas
10200701	10	50	10	75	0	Petroleum Refinery Gas	Process Gas
10200704	10	50	10	75	0	Blast Furnace Gas	Process Gas
10200707	10	50	10	75	0	Coke Oven Gas	Process Gas
10200710	10	50	10	75	0	Cogeneration	Process Gas
10200799	10	50	10	75	0	Other: Specify in Comments	Process Gas
10200802	10	50	10	40	0	All Boiler Sizes	Petroleum Coke
10200901	10	10	10	10	10	Bark-fired Boiler	Wood/Bark Waste
10200902	10	10	10	10	10	Wood/Bark-fired Boiler	Wood/Bark Waste

	Boiler Size Range (mmBtu/hour)						
	< 25	**25 to 50**	**50 to 100**	**100 to 250**	**>250**		
SCC	**CF0_25**	**CF25_50**	**CF50_100**	**CF100_250**	**CF250**	**SCC_L4**	**SCC_L3**
10200903	10	10	10	10	10	Wood-fired Boiler - Wet Wood (>=20% moisture)	Wood/Bark Waste
10200904	10	10	10	10	10	Bark-fired Boiler (< 50,000 Lb Steam) **	Wood/Bark Waste
10200905	10	10	10	10	10	Wood/Bark-fired Boiler (< 50,000 Lb Steam) **	Wood/Bark Waste
10200906	10	10	10	10	10	Wood-fired Boiler (< 50,000 Lb Steam) **	Wood/Bark Waste
10200907	10	10	10	10	10	Wood Cogeneration	Wood/Bark Waste
10200908	10	10	10	10	10	Wood-fired Boiler - Dry Wood (<20% moisture)	Wood/Bark Waste
10201001	10	50	10	75	0	Butane	Liquified Petroleum Gas (LPG)
10201002	10	50	10	75	0	Propane	Liquified Petroleum Gas (LPG)
10201003	10	50	10	75	0	Butane/Propane Mixture: Specify Percent Butane in	Liquified Petroleum Gas (LPG)
10300101	10	50	10	40	0	Pulverized Coal	Anthracite Coal
10300102	10	50	10	40	0	Traveling Grate (Overfeed) Stoker	Anthracite Coal
10300103	10	50	10	40	0	Hand-fired	Anthracite Coal
10300203	10	50	10	40	0	Cyclone Furnace (Bituminous Coal)	Bituminous/Subbituminous Coal
10300206	10	50	10	40	0	Pulverized Coal: Dry Bottom (Bituminous Coal)	Bituminous/Subbituminous Coal
10300207	10	50	10	40	0	Overfeed Stoker (Bituminous Coal)	Bituminous/Subbituminous Coal
10300208	10	50	10	40	0	Underfeed Stoker (Bituminous Coal)	Bituminous/Subbituminous Coal
10300209	10	50	10	40	0	Spreader Stoker (Bituminous Coal)	Bituminous/Subbituminous Coal
10300225	10	50	10	40	0	Traveling Grate (Overfeed) Stoker (Subbituminous C	Bituminous/Subbituminous Coal
10300226	10	50	10	40	0	Pulverized Coal: Dry Bottom Tangential (Subbitumin	Bituminous/Subbituminous Coal
10300401	10	50	10	40	0	Grade 6 Oil	Residual Oil
10300402	10	50	10	40	0	10-100 Million Btu/hr **	Residual Oil
10300403	10	50	10	40	0	< 10 Million Btu/hr **	Residual Oil
10300404	10	50	10	40	0	Grade 5 Oil	Residual Oil
10300501	10	50	10	40	0	Grades 1 and 2 Oil	Distillate Oil
10300502	10	50	10	40	0	10-100 Million Btu/hr **	Distillate Oil
10300503	10	50	10	40	0	< 10 Million Btu/hr **	Distillate Oil
10300504	10	50	10	40	0	Grade 4 Oil	Distillate Oil
10300601	10	50	10	75	0	> 100 Million Btu/hr	Natural Gas
10300602	10	50	10	75	0	10-100 Million Btu/hr	Natural Gas
10300603	10	50	10	75	0	< 10 Million Btu/hr	Natural Gas
10300701	10	50	10	75	0	POTW Digester Gas-fired Boiler	Process Gas
10300799	10	50	10	75	0	Other Not Classified	Process Gas

	Boiler Size Range (mmBtu/hour)						
	< 25	**25 to 50**	**50 to 100**	**100 to 250**	**>250**		
SCC	**CF0_25**	**CF25_50**	**CF50_100**	**CF100_250**	**CF250**	**SCC_L4**	**SCC_L3**
10300811	10	50	10	75	0	Landfill Gas	Landfill Gas
10300901	10	10	10	10	0	Bark-fired Boiler	Wood/Bark Waste
10300902	10	10	10	10	0	Wood/Bark-fired Boiler	Wood/Bark Waste
10300903	10	10	10	10	0	Wood-fired Boiler - Wet Wood (>=20% moisture)	Wood/Bark Waste
10300908	10	10	10	10	0	Wood-fired Boiler - Dry Wood (<20% moisture)	Wood/Bark Waste
10301002	10	50	10	75	0	Propane	Liquified Petroleum Gas (LPG)
10301003	10	50	10	75	0	Butane/Propane Mixture: Specify Percent Butane in	Liquified Petroleum Gas (LPG)

Table E-3 Area Source BOTW Control Factors for Adhesives and Sealants Application, Asphalt Paving, Consumer Products, and Portable Fuel Containers

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
Control Measure: Adhesives and Sealants					
09	2440020000	VOC	64.40	64.40	64.40
10	2440020000	VOC	64.40	64.40	64.40
11	2440020000	VOC	64.40	64.40	64.40
23	2440020000	VOC	64.40	64.40	64.40
24	2440020000	VOC	64.40	64.40	64.40
25	2440020000	VOC	64.40	64.40	64.40
33	2440020000	VOC	64.40	64.40	64.40
34	2440020000	VOC	64.40	64.40	64.40
36	2440020000	VOC	64.40	64.40	64.40
42	2440020000	VOC	64.40	64.40	64.40
44	2440020000	VOC	64.40	64.40	64.40
Control Measure: Asphalt Paving					
09	2461022000	VOC	20.00	20.00	20.00
24	2461022000	VOC	20.00	20.00	20.00
25	2461022000	VOC	20.00	20.00	20.00
33	2461022000	VOC	20.00	20.00	20.00
34	2461022000	VOC	75.00	75.00	75.00
36	2461022000	VOC	20.00	20.00	20.00
42	2461022000	VOC	0.00	20.00	20.00
Control Measure: Consumer Products					
09	2465000000	VOC	2.00	2.00	2.00
10	2460100000	VOC	2.00	2.00	2.00
10	2460200000	VOC	2.00	2.00	2.00
10	2460400000	VOC	2.00	2.00	2.00
10	2460500000	VOC	2.00	2.00	2.00
10	2460600000	VOC	2.00	2.00	2.00
10	2460800000	VOC	2.00	2.00	2.00
10	2460900000	VOC	2.00	2.00	2.00
11	2460100000	VOC	2.00	2.00	2.00
11	2460200000	VOC	2.00	2.00	2.00
11	2460400000	VOC	2.00	2.00	2.00
11	2460500000	VOC	2.00	2.00	2.00
11	2460600000	VOC	2.00	2.00	2.00
11	2460800000	VOC	2.00	2.00	2.00
11	2460900000	VOC	2.00	2.00	2.00
23	2460100000	VOC	2.00	2.00	2.00
23	2460200000	VOC	2.00	2.00	2.00
23	2460400000	VOC	2.00	2.00	2.00
23	2460500000	VOC	2.00	2.00	2.00
23	2460600000	VOC	2.00	2.00	2.00
23	2460800000	VOC	2.00	2.00	2.00

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
23	2460900000	VOC	2.00	2.00	2.00
24	2465000000	VOC	2.00	2.00	2.00
25	2460000000	VOC	2.00	2.00	2.00
33	2460000000	VOC	2.00	2.00	2.00
34	2465000000	VOC	2.00	2.00	2.00
36	2460000000	VOC	2.00	2.00	2.00
42	2465000000	VOC	2.00	2.00	2.00
44	2460100000	VOC	2.00	2.00	2.00
44	2460200000	VOC	2.00	2.00	2.00
44	2460400000	VOC	2.00	2.00	2.00
44	2460500000	VOC	2.00	2.00	2.00
44	2460600000	VOC	2.00	2.00	2.00
44	2460800000	VOC	2.00	2.00	2.00
44	2460900000	VOC	2.00	2.00	2.00
Control Measure: Portable Fuel Containers					
09	2501060300	VOC	5.80	23.20	58.00
10	2501011010	VOC	5.80	23.20	58.00
10	2501011011	VOC	5.80	23.20	58.00
10	2501011012	VOC	5.80	23.20	58.00
10	2501011015	VOC	5.80	23.20	58.00
10	2501011016	VOC	5.80	23.20	58.00
10	2501012010	VOC	5.80	23.20	58.00
10	2501012011	VOC	5.80	23.20	58.00
10	2501012012	VOC	5.80	23.20	58.00
10	2501012015	VOC	5.80	23.20	58.00
10	2501012016	VOC	5.80	23.20	58.00
11	2501011011	VOC	5.80	23.20	58.00
11	2501011012	VOC	5.80	23.20	58.00
11	2501011016	VOC	5.80	23.20	58.00
11	2501012011	VOC	5.80	23.20	58.00
11	2501012012	VOC	5.80	23.20	58.00
11	2501012016	VOC	5.80	23.20	58.00
23	2501060300	VOC	5.80	23.20	58.00
24	2501011011	VOC	5.80	23.20	58.00
24	2501011012	VOC	5.80	23.20	58.00
24	2501011016	VOC	5.80	23.20	58.00
24	2501012011	VOC	5.80	23.20	58.00
24	2501012012	VOC	5.80	23.20	58.00
24	2501012016	VOC	5.80	23.20	58.00
25	2501011000	VOC	0.00	23.20	58.00
25	2501012000	VOC	0.00	23.20	58.00
33	2501060300	VOC	5.80	23.20	58.00
34	2501000120	VOC	5.80	23.20	58.00
36	2501011011	VOC	5.80	23.20	58.00
36	2501011012	VOC	5.80	23.20	58.00
36	2501011016	VOC	5.80	23.20	58.00
36	2501012011	VOC	5.80	23.20	58.00

FIPSST	SCC	PLLTCODE	CE_2009	CE_2012	CE_2018
36	2501012012	VOC	5.80	23.20	58.00
36	2501012016	VOC	5.80	23.20	58.00
42	2501060300	VOC	5.80	23.20	58.00
44	2501060300	VOC	5.80	23.20	58.00

Table E-4 Area Source BOTW Control Factors for ICI Boilers

SCC	Control Factor	SCC_L4	SCC_L3	SCC_L2
2102001000	18.9	Total: All Boiler Types	Anthracite Coal	Industrial
2102002000	18.9	Total: All Boiler Types	Bituminous/Subbituminous Coal	Industrial
2102004000	18.9	Total: Boilers and IC Engines	Distillate Oil	Industrial
2102005000	18.9	Total: All Boiler Types	Residual Oil	Industrial
2102006000	18.9	Total: Boilers and IC Engines	Natural Gas	Industrial
2102007000	18.9	Total: All Boiler Types	Liquified Petroleum Gas (LPG)	Industrial
2102008000	10.0	Total: All Boiler Types	Wood	Industrial
2102011000	10.0	Total: All Boiler Types	Kerosene	Industrial
2103001000	19.5	Total: All Boiler Types	Anthracite Coal	Commercial/Institutional
2103002000	19.5	Total: All Boiler Types	Bituminous/Subbituminous Coal	Commercial/Institutional
2103004000	19.5	Total: Boilers and IC Engines	Distillate Oil	Commercial/Institutional
2103004001	19.5		Distillate Oil	Commercial/Institutional
2103004002	19.5		Distillate Oil	Commercial/Institutional
2103005000	19.5	Total: All Boiler Types	Residual Oil	Commercial/Institutional
2103006000	19.5	Total: Boilers and IC Engines	Natural Gas	Commercial/Institutional
2103007000	19.5	Total: All Combustor Types	Liquified Petroleum Gas (LPG)	Commercial/Institutional
2103008000	10.0	Total: All Boiler Types	Wood	Commercial/Institutional
2103011000	10.0	Total: All Combustor Types	Kerosene	Commercial/Institutional

APPENDIX D-2

DOCUMENTATION OF 2018 EMISSIONS FROM ELECTRIC GENERATING UNITS IN THE EASTERN UNITED STATES FOR MANE-VU REGIONAL HAZE MODELING

Bureau of Air Quality
Department of Environmental Protection

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Documentation of 2018 Emissions from Electric Generating Units in the Eastern United States for MANE-VU's Regional Haze Modeling

Revised Final Draft

28 April 2008

Prepared for:

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Greg Stella of Alpine prepared a final draft of this document for MANE-VU/MARAMA under Work Order #7 of the MANE-VU Future Year Emissions Inventory Umbrella Contract. This work was supported by funds provided to MARAMA by the Ozone Transport Commission (OTC) through their memorandum of agreement. OTC's funding for this work was provided by the U.S. Environmental Protection Agency under assistance agreement XA 97318101.

MARAMA further revised Section 5 of the document after receipt of Mr. Stella's final work product. MARAMA provided text and tables to reflect emissions inventory analysis that continued after the expiration of Alpine's contract.

Special recognition is given to Julie McDill, MARAMA's project manager, who initiated the collection and aggregation of documentation used to prepare this report. Ms. McDill and Susan Wierman, MARAMA's Executive Director provided analytical and editorial contributions to the preparation of this document, and Patrick Davis of MARAMA and Dr. John Graham of NESCAUM contributed to emissions inventory data analysis and summaries.

This report was prepared for use by the MANE-VU States and does not necessarily represent the position of the U.S. Environmental Protection Agency.

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1 INTRODUCTION

1.1 Background

Development of an emissions inventory is an important foundation for performing regional scale atmospheric modeling for regulatory air quality management. The accuracy of the atmospheric model's prediction of air quality depends, in part, on the accurate representation of emissions from a variety of source sectors including point, area, non-road, on-road and biogenic sources. Electric generating units (EGUs) are an important point source sector and are often considered for controls to meet air quality objectives. Therefore, it is especially important to accurately represent and document EGU emissions and associated characteristics in a regulatory modeling application. This report is intended to describe the development of future year EGU emission estimates for use in Mid-Atlantic/Northeast Visibility Union (MANE-VU) 2018 regional haze modeling.

This document synthesizes information from several documents that already describe parts of the process of preparing emissions estimates and provides information not yet included in other documents. It covers the following: preparation of the inter-Regional Planning Organization (RPO) Integrated Planning Model® (IPM) runs commonly referred to as the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) IPM runs, the post-processing of those runs to create Sparse Matrix Operator Kernel Emissions (SMOKE) input files, the modification of those files to reflect state estimates of emissions, and the adjustments made by MANE-VU modelers to maintain the Clean Air Interstate Rule (CAIR) cap. It also provides background information about preparing EGU forecasts and related work by the U.S. Environmental Protection Agency (EPA).

2 PREPARATION OF EGU FORECASTS

Emission projections for point sources are dependent upon changes in source level activity, the emission factors or installed controls. The approach taken to project point source emissions depends on the level of detail necessary in the projection year file. Changes in point source emissions are accounted for by a combination of growth, control, and retirement rates. Growth rates are applied to estimate the overall change in activity, while retirement rates are applied to estimate the decrease in emissions activity from existing sources. Retirement (and replacement of these sources with new sources) must be considered because regulations affecting new sources may differ from those affecting existing sources.

The projection year control factor accounts for both changes in emission factors due to technology improvements and new levels of control required by regulations. The control factor accounts for three variables: regulation control, rule effectiveness, and rule penetration.

Control factors are closely linked to the type of emission process (identified by Source Classification Code (SCC)) and secondarily to the type of industry identified by Standard Industrial Classification (SIC). Point source projections should account for Federal, State, and local regulations affecting these categories.

A complicating factor is the requirement for emission offsets in nonattainment areas through New Source Review requirements. This may be accounted for by 1) restricting growth under the assumption that it will be offset; 2) applying reductions to selected source categories to account for the emission growth which must be offset; or 3) selecting the individual sources, based on a cost analysis, from which offsets are likely to come.

When projecting Electricity Generating Unit (EGU) emissions in the Eastern United States, emission trading should be considered. There are three general approaches to performing projections while accounting for such trading schemes. The first option is to optimize control levels across the domain based on the cost of alternative controls. The second option is to survey individual sources to determine how they will comply (will they apply controls and sell or buy allowances) and use this as the basis for the future year control level. The third option is to apply the control level used to establish the budget to all affected sources and ignore which sources may choose to buy or sell credits/allowances.

Other factors which must be considered include programs, such as fuel switching, designed to provide source flexibility in meeting future air quality requirements. Fuel switching refers to instances where a unit historically burned one primary fuel, such as coal, and under a "fuel switching" program the unit would burn an alternate fuel, such as natural gas, during a certain period of time and may switch back to the "historic" fuel for some or all of the year. Fuel switching is often done in cases where sources average their emissions to meet federal mandates. Fuel switching may also be used as a seasonal compliance strategy (e.g., switching from residual fuel oil to natural gas in order to reduce NOx emissions during the ozone season. The variation in emissions over the course of the year caused by fuels switching must be calculated properly in projections.

Repowering is another example of a planned change in emission rates which should be considered. In this case, the unit may be switching entirely from coal to natural gas or may be completing a major modification which would lower the emission rate.

Spatial allocation is another factor which must be considered, particularly if air quality modeling will be performed using the projection. For point sources, important questions are which facilities will retire and where new growth will occur. Changes in land use patterns may also impact the location of point source emissions. As undeveloped and rural areas become suburban and urban areas, the number of point sources in that area will increase.

As can be seen from the discussion above, any number of complicating issues can lead to emission forecasts which may differ from user to user. An inconsistent decision made between two parties can lead to significant differences in growth, control, or placement of emissions from point source forecasts. For this reason, the RPOs made a conscious decision to utilize consistent forecasting methods for EGU emissions, as they are one of the most significant contributors to regional haze in the United States. This decision, to coordinate on the projection of EGU source emissions, led to the preparation of an EGU forecast methods document from which a coordinated decision was made on methods to develop EGU emissions in future years.

2.1 EGU Forecast Methods Document

Early in the planning process there was a joint agreement by the RPOs to work together to develop future year EGU emissions estimates based on the use of the Integrated Planning Model® (IPM). The decision to use IPM modeling resulted in part on a study of EGU forecast methods by E.H. Pechan and Associates, Inc. (Pechan) for the Midwest Regional Planning Organization (MRPO) (Pechan, 2004), which recommended IPM as a viable methodology. Although IPM results were available from work conducted by EPA to support their rulemaking for the Clean Air Interstate Rule (CAIR), the RPOs concluded that certain model inputs needed to be revised. Thus, the RPOs decided to work together to hire contractors to conduct new IPM modeling and to post-process the IPM results. This section describes the recommendation to use IPM.

The Lake Michigan Air Directors Consortium (LADCO) sought contractor assistance in reviewing emissions inventory growth for existing and new EGUs (Pechan, 2004). Because the results of EGU emission forecasts are used in urban or regional scale air quality modeling exercises to estimate future year air pollutant concentrations, growth methods are needed to supply model-ready emission model inputs. The purpose of LADCO's project was to begin to examine EGU growth methods.

The primary pollutants of interest were sulfur dioxide (SO_2), oxides of nitrogen (NO_x), particulate matter (PM), ammonia (NH_3), and mercury (Hg). Projection years of interest included 2009 (the approximate time for ozone and $PM_{2.5}$ attainment) and 2018 (a longer term regional haze planning horizon). The geographic area of interest was the eastern half of the United States (to capture the trading issues affecting the Midwest States).

This 2004 Pechan report provided a detailed evaluation of three EGU growth modeling methods of interest to the LADCO States for consideration in developing its own approach. These evaluations addressed the following attributes of each modeling approach:

- Description of primary analytical modeling methods;
- Geographic areas of application;
- Advantages; and
- Disadvantages.

The material in this evaluation was intended to be used to determine which of the currently available modeling approaches might be best suited for use by the LADCO States (and other RPOs) for future state implementation plan (SIP) and air dispersion modeling work. The models evaluated in this report included the IPM, the National Energy Modeling System (NEMS), and the Electric Power Market Model (EPMM).

Based on the conclusions and summary of the report (Pechan, 2004), the four participating RPOs (MANE-VU, MRPO, VISTAS, and the Central Regional Air Planning Association, CENRAP) decided to use IPM as the tool for forecasting EGU emissions.

2.2 The Integrated Planning Model (IPM)

IPM was developed by ICF Consulting, Inc. (ICF) and used to support public and private sector clients. This model is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and environmental, transmission, dispatch, and reliability constraints. It can be used to evaluate the cost and emissions impacts of proposed policies to limit emissions of SO_2, NO_x, carbon dioxide (CO_2), and Hg from the electric power sector. The IPM model was a key analytical tool used by EPA in developing CAIR and the Clean Air Mercury Rule (CAMR).

Among the factors that make IPM particularly well suited to model multi-emissions control programs are (1) its ability to capture complex interactions among the electric power, fuel, and environmental markets; (2) its detail-rich representation of emission control options encompassing a broad array of retrofit technologies along with emission reductions through fuel switching, changes in capacity mix and electricity dispatch strategies; and (3) its capability to model a variety of environmental market mechanisms, such as emissions caps, allowances, trading, and banking. IPM's ability to capture the dynamics of the allowance market and its provision of a wide range of emissions reduction options are particularly important for assessing the impact of multi-emissions environmental policies like CAIR and CAMR.

2.3 U.S. EPA Use of IPM

The U.S. EPA uses IPM to analyze the projected impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia.

2.3.1 EPA's Base Case 2004

The EPA's Base Case 2004 (EPA, 2005a) served as the starting point against which EPA compared various policy scenarios. It is a projection of electricity sector activity that takes into account federal and state air emission laws and regulations whose provisions were either in effect or enacted and clearly delineated at the time the base case was finalized in August 2004. Regulations mandated under the Clean Air Act Amendments of 1990 (CAAA), but whose provisions have not yet been finalized, were not included in the base case. These include:

- Measures to Implement Ozone and Particulate Matter (PM) Standards: EPA Base Case 2004 predates and so does not include the provisions of CAIR, the primary federal regulatory measure for achieving the National Ambient Air Quality Standards (NAAQS) for ozone (8-hour standard of 0.08 ppm) and fine particles (24-hour average of 65 ug/m3 or less and annual mean of 15 ug/m3 for particles of diameter 2.5 micrometers or less, i.e., $PM_{2.5}$). EPA Base Case 2004 was used to evaluate policy alternatives which ultimately resulted in CAIR. The final CAIR was issued on March 10, 2005. EPA Base Case 2004 includes measures to implement ozone and particulate matter standards to the extent that some of the state regulations included in EPA Base Case 2004 contain measures to bring non-attainment areas into attainment. Individual permits issued by states in response to ozone and particulate matter standards are not captured in the base case.

- Mercury Regulations on Electric Steam Generating Units: EPA Base Case 2004 predates both CAMR, which was issued by EPA on March 15, 2005 and the "Maximum Achievable Control Technology" (MACT) standards, which were scheduled to be promulgated by December 15, 2004, but, pending litigation, have been superseded by CAMR. Consequently, this base case does not include any federal regulatory measures for mercury control. (CAMR was vacated in 2008.)

- Clean Air Visibility Rules: On July 1, 1999, EPA issued Regional Haze Regulations to meet the national goal for visibility established in Section 169A of the CAAA, which calls for "prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas (156 national parks and wilderness areas), which impairment results from manmade air pollution." The regulations required states to submit revised SIPs that (1) establish goals that provide for reasonable progress towards achieving natural visibility conditions at Class I areas, (2) adopt a long-term control strategy that includes such measures as are necessary to achieve the reasonable progress goals, and (3) require Best Available Retrofit Technology (BART) for sources in listed source categories placed in operation between 1962 and 1977.

In effect, EPA Base Case 2004 offered a snapshot projection of the electric sector assuming that the only future environmental regulations were those with provisions known at the time that the base case assumptions were finalized. While not necessarily an accurate reflection of what would actually occur, this assumption ensured that the base case was policy neutral with respect to future environmental policies.

2.3.2 EPA CAIR Case

On January 30, 2004, EPA proposed CAIR, which set emission reduction requirements for 29 States and the District of Columbia. Those emission reduction requirements were based on achieving highly cost-effective emission reductions from large electricity generating units.

While EPA believed that the modeling it initially performed for the January 2004 proposal provided a reasonable estimate of the impact of requiring highly cost-effective emission reductions from electricity generating units, it did not exactly model the proposed control region. For both SO_2 and NO_x, EPA used modeling assumptions that differed slightly from the January 2004 CAIR proposal. For SO_2 in particular, EPA modeled the program assuming a cap on national emissions rather than in the 29 States proposed. Although EPA believed the modeling done at that time provided a reasonable approximation of the impacts of the original CAIR, because 92 percent of the SO_2 emissions in the 48 contiguous States occur in the 28 States that were covered by the proposal, EPA completed additional analysis. This additional analysis examined the effect of covering the geographic region proposed in the January 30, 2004 proposal using the NO_x emissions cap and a close approximation of the SO_2 cap proposed for CAIR (EPA, 2005a).

For the supplemental proposal, EPA performed refined modeling of the emission reduction requirements proposed on January 30, 2004. In this refined modeling, EPA modeled the exact control regions for both SO_2 and NO_x, as proposed.

2.3.3 EPA's CAIR Modeling Limitations

The U.S. EPA's modeling was based on its best judgment for various input assumptions that were uncertain, particularly assumptions for future fuel prices and electricity demand growth (EPA, 2004). In addition, modeling using IPM did not take into account the potential for advancements in the capabilities of pollution control technologies for SO_2 and NO_x removal as well as reductions in their costs over time.

<u>Retirement Ratios:</u> EPA issued a CAIR supplemental notice of proposed rulemaking that proposed two alternatives for how the SO_2 reduction target would be achieved. The proposal took comment on implementing the reduction requirements in the second phase either by using a 2.86 to 1 ratio (which would match the 65 percent SO_2 reduction target) of acid rain allowances to emissions, or alternatively, by implementing the reductions using a 3 to 1 ratio (for administrative simplicity) and then letting States create and distribute additional allowances equal to the surplus created by the 3 to 1 ratio to achieve the proposed 65 percent reduction. In either case, the effective cap on SO_2 emissions from the power sector would be the same.

Modelers assumed a 3 to 1 Title IV allowance retirement ratio for 2015 and beyond to implement the reductions in the proposed control region. The model did not add back the 130,000 tons of SO_2 from over-compliance that would result from this ratio. Therefore, in this modeling, EPA analyzed slightly greater SO_2 emission reductions than required by the proposal. This assumption was made for modeling simplicity and was expected to result in a slight overestimate of costs for the proposal and of the emissions reductions achieved.

BART: The EPA did not incorporate any best achievable retrofit technology (BART) modeling in this analysis. BART would achieve reductions in non-CAIR States and had the potential to mitigate leakage issues.

Demand Response: EPA's 2004 CAIR case includes a demand response to increased gas prices but not electricity prices. In the model, increased gas prices would prompt the public to curtail their use of gas and encourage them to seek substitutes. However, no provision for demand response was included for electricity prices. If demand had been allowed to change in response to increasing prices of electricity,, one can assume that consumers would have reduced their demand for electricity, lowering electricity prices and reducing generation and emissions to some extent.

State Rules: Only some State adopted rules were incorporated into EPA's modeling framework. A list of the State Multi-pollutant regulations used in IPM 2.1, IPM 2.1.6, and IPM 2.1.9 can be located in Appendix 3-2 of EPA's Standalone Documentation for EPA Base Case 2004 (v.2.1.9) Using the Integrated Planning Model (EPA, 2005a).

Because of the limitations noted above, the RPOs decided to initiate their own IPM modeling based on the EPA's latest update of the IPM input framework, called IPM 2.1.9. EPA completed the input framework for IPM 2.1.9 in March of 2003.

2.4 RPO Use of IPM – Phase I

In August 2004, VISTAS contracted with ICF to run IPM to provide revised utility forecasts for 2009 and 2018 under two future scenarios – Base Case and CAIR Case (ICF, 2004). The Base Case represented the current operation of the power system under laws and regulations as known at the time the run was made, including those that come into force in the study horizon. The CAIR Case was the Base Case with the proposed CAIR rule superimposed. Run results were parsed at the unit level for the 2009 and 2018 run years.

In August 2004, MRPO contracted with Pechan to post-process the VISTAS' IPM outputs to provide the (National Emission Inventory Input Format) NIF formatted emission files needed for the regional inventory. The IPM output files were delivered by ICF to VISTAS in November 2004 and the post-processed data files were delivered by Pechan to the MRPO in December 2004.

These IPM runs (VISTAS_CAIR_2) and the NIF files that were generated from the parsed data sets are commonly referred to as the Phase I Inter-RPO runs. The Phase I runs were ultimately not used in RPO modeling of regional haze, as further revisions to the inputs were necessary once CAIR was adopted.

2.5 RPO Adjustments to IPM – Phase II

On March 10, 2005, EPA issued the final CAIR. A consortium of RPOs, (MANE-VU, VISTAS, MRPO, and CENRAP) conducted another round of IPM modeling which reflected changes to control assumptions based on the final CAIR as well as additional changes to model inputs based on state and local agency and stakeholder comments. Several conference calls were conducted in the spring of 2005 among the participating RPOs to discuss and provide comments on IPM assumptions related to six main topics: power system operation, generating resources, emission control technologies, set-up parameters, financial assumptions, and fuel assumptions. Based on these discussions, VISTAS sponsored a new set of IPM runs to reflect the final CAIR requirements as well as certain changes to IPM assumptions that were agreed to by the RPOs. ICF performed the following four runs using IPM during the summer of 2005. This set of IPM runs is referred to as the VISTAS Phase II analysis or Inter-RPO v.2.1.9 runs.

- Base Case with EPA 2.1.9 coal, gas, and oil price assumptions (VISTASII_BC_1Z1).
- Base Case with EPA 2.1.9 coal and gas supply curves adjusted for the U.S. Energy Information Administration's most recent Annual Energy Outlook (AEO 2005) reference case price and volume relationships (VISTASII_BC_2Y).
- Strategy Case with EPA 2.1.9 coal, gas and oil price assumptions (VISTASII_PC_1f).
- Strategy Case with EPA 2.1.9 coal and gas supply curves adjusted for AEO 2005 reference case price and volume relationships (VISTASII_PC_2C).

The above runs were parsed for 2009 and 2018 run years. The output taken from the Strategy Case with EPA 2.1.9 coal, gas, and oil price assumptions (VISTASII_PC_1f) is also referred to as the Inter-RPO CAIR Case IPM 2.1.9 and is the basis for discussion in the remainder of this report.

The Phase II scenarios were based on VISTAS Phase I and EPA IPM 2.1.9 assumptions (EPA, 2005b). Additional changes that were implemented in the above four runs are summarized below and in associated documentation (ICF, 2007):

- Unadjusted AEO 2005 electricity demand projections were used. (U.S. EPA runs were adjusted to reflect reduced demand due to voluntary conservation projects sponsored by U.S. EPA)
- Gas supply curves were adjusted for AEO 2005 reference case price and volume relationships. The EPA 2.1.9 gas supply curves were scaled such that IPM solved for AEO 2005 gas prices when the power sector gas demand in IPM is consistent with AEO 2005 power sector gas demand projections.
- The coal supply curves used in EPA 2.1.9 were scaled such that the average mine mouth coal prices that the IPM was solving in aggregated coal supply regions were comparable to AEO 2005. Coal grades and supply regions contained in AEO 2005 and EPA 2.1.9 were not directly comparable. An iterative approach was used to obtain comparable results. The coal transportation matrix was not updated with Energy Information Administration (EIA) assumptions due to significant differences between the EPA 2.1.9 and EIA AEO 2005 coal supply and coal demand region configurations.

- The cost and performance of new units were updated to AEO 2005 reference case levels.
- The run years 2008, 2009, 2012, 2015, 2018, 2020 and 2026 were modeled.
- The AEO 2005 life extension costs for fossil and nuclear units were incorporated.
- The extensive NEEDS comments provided by VISTAS, MRPO, CENRAP and MANE-VU were incorporated into the Phase I NEEDS input file.
- MANE-VU's comments in regards to the northeast state regulations were incorporated.
- Northeast Renewable Portfolio Standards (RPS) were modeled based on the Regional Greenhouse Gas Initiative analysis. A single RPS cap was modeled for MA, RI, NY, NJ, MD, and CT. These states could buy credits from NY or from the PJM Interconnection and New England model regions.
- Selective Catalytic Reduction (SCR) and Scrubber Feasibility Limits: No limits were applied in 2008, 2009 and 2010 to the capacity for installing these emissions controls.
- The Clean Air Visibility Rule (CAVR) was not modeled.
- Modelers assumed a Title IV SO_2 Bank for 2007 of 4.98 million tons.
- The investments required under the Illinois Power, Mirant and First Energy NSR settlements (as identified during spring 2005) were incorporated in the above runs.

For the Phase II inter-RPO set of IPM runs, ICF generated two different parsed files for each of the two scenarios. One file includes all fuel burning units (fossil, biomass, landfill gas) as well as non-fuel burning units (hydro, wind, etc.). The second file contains just the fossil-fuel burning units (e.g., emissions from biomass and landfill gas are omitted). In all RPOs the fossil-only file was used for modeling. This is consistent with EPA, since EPA used the fossil only results for CAIR analyses.

2.6 State Results – Phase II

Table 1 presents unmodified State level fuel use and emission results from the 2018 Inter-RPO CAIR Case IPM v. 2.1.9 fossil-only parsed file (VISTASII_PC_1f). Note that IPM produces only NO_x and SO_2 emissions estimates.

Table 1. State Level Fuel Use and Emission Summary; 2018 VISTASII_PC_1f.xls. (fossil only)

		Fuel Use (TBtu)		Emissions (Tons)		
State	**RPO**	**Summer**	**Annual**	**Summer NOx**	**Annual NOx**	**Annual SO2**
Connecticut	MANE-VU	62.1572	142.7141	1,521	3,418	6,697
Delaware	MANE-VU	41.9472	92.7542	5,485	12,341	35,442
District Of Columbia	MANE-VU	2.0774	4.8716	49	103	83
Maine	MANE-VU	21.8494	49.8748	804	1,827	5,436
Maryland	MANE-VU	195.3393	437.8991	6,832	14,709	28,065
Massachusetts	MANE-VU	188.0653	433.3227	8,004	18,157	17,486
New Hampshire	MANE-VU	32.4638	73.8699	1,393	3,089	7,469
New Jersey	MANE-VU	140.8000	304.7240	6,432	13,636	32,495
New York	MANE-VU	282.4272	669.0821	10,926	24,376	51,445
Pennsylvania	MANE-VU	687.1446	1,540.1322	36,329	82,881	135,946
Rhode Island	MANE-VU	15.1701	40.0407	244	576	55
Vermont	MANE-VU	1.3677	3.0597	74	105	35
	MANE-VU Total	**1,670.8093**	**3,792.3450**	**78,093**	**175,219**	**320,651**
Alabama	VISTAS	605.2513	1,329.1117	19,416	41,715	190,029
Florida	VISTAS	831.5942	1,813.5433	26,620	56,506	139,526
Georgia	VISTAS	687.9659	1,530.2279	26,228	56,180	178,196
Kentucky	VISTAS	494.6026	1,121.9188	27,904	64,099	229,596
Mississippi	VISTAS	211.7079	443.3923	4,269	8,895	27,226
North Carolina	VISTAS	431.1262	984.5996	25,412	57,774	102,217
South Carolina	VISTAS	326.3757	749.2039	20,240	46,318	118,584
Tennessee	VISTAS	300.8087	672.6405	13,348	29,873	112,343
Virginia	VISTAS	305.6546	710.9991	18,443	43,144	80,602
West Virginia	VISTAS	477.7910	1,080.9570	22,556	51,208	124,464
	VISTAS Total	**4,672.8781**	**10,436.5940**	**204,435**	**455,711**	**1,302,784**
Illinois	MRPO	564.3359	1,281.6624	31,214	71,234	241,136
Indiana	MRPO	665.8976	1,534.4126	40,820	95,376	376,864
Michigan	MRPO	537.6731	1,257.6784	42,629	98,685	398,562
Ohio	MRPO	773.6334	1,785.3989	35,888	83,129	215,501
Wisconsin	MRPO	303.7451	691.5260	19,794	45,701	155,369
	MRPO Total	**2,845.2851**	**6,550.6783**	**170,345**	**394,124**	**1,387,433**
Arkansas	CENRAP	211.9455	479.1864	14,836	33,097	82,605
Iowa	CENRAP	238.7101	548.7369	22,252	51,119	147,305
Kansas	CENRAP	213.4288	465.8685	37,207	83,333	81,486
Louisiana	CENRAP	225.6282	481.9880	14,240	30,432	74,263
Minnesota	CENRAP	175.6582	388.8279	17,940	41,029	85,847
Missouri	CENRAP	416.5504	918.5720	34,350	77,660	280,887
Nebraska	CENRAP	113.8064	255.2901	22,524	50,781	73,629
Oklahoma	CENRAP	357.5522	745.1097	36,695	76,048	113,680
Texas	CENRAP	1,710.8244	3,236.6605	79,449	153,837	339,433
	CENRAP Total	**3,664.1040**	**7,520.2400**	**279,493**	**597,336**	**1,279,135**
Arizona	WRAP	442.6160	1,022.0551	36,168	81,858	60,640
California	WRAP	602.8505	1,403.6297	10,464	23,767	5,447
Colorado	WRAP	215.1782	486.7281	31,074	70,171	87,163
Idaho	WRAP	14.5575	34.1372	309	718	0
Montana	WRAP	88.4363	200.1442	17,034	38,504	22,066
Nevada	WRAP	179.3334	408.0758	20,978	47,404	31,172
New Mexico	WRAP	155.2294	344.7868	32,965	74,010	52,917
North Dakota	WRAP	131.5025	297.0199	31,745	71,711	108,645
Oregon	WRAP	109.6842	255.3128	4,968	11,330	10,034
South Dakota	WRAP	16.3929	36.8730	6,457	14,574	12,085
Utah	WRAP	146.1278	330.1164	26,905	60,782	37,819
Washington	WRAP	155.7190	362.9219	11,625	26,379	12,236
Wyoming	WRAP	202.3566	457.1643	35,935	81,182	40,265
	WRAP Total	**2,459.9843**	**5,638.9652**	**266,628**	**602,390**	**480,488**
National Total		**15,313.0609**	**33,938.8226**	**998,994**	**2,224,779**	**4,770,490**

2.7 MANE-VU Sponsored CAIR Plus IPM Modeling

Using the IPM Phase II RPO modeling platform MANE-VU contracted with ICF to evaluate the impact of both tightening the SO_2 and NO_x CAIR caps and to expand the CAIR region to include the electricity generating sector in additional states the Eastern United States. As part of this analysis, ICF developed a new Base Case that implemented EPA's CAIR, CAMR and CAVR policies and a Policy Case with lower SO_2 and NO_x CAIR caps in an extended region. The new Base Case was developed for comparison to the Policy Case. The model assumptions and data used in this analysis are somewhat different than those in the RPO Phase II analysis and are described in Section B of the project report (ICF, 2007). Neither the base or policy cases from the CAIR Plus project were used in subsequent SIP modeling.

3 POST PROCESSING OF IPM OUTPUT

3.1 Use of SMOKE Emissions Processing Model

On behalf of MANE-VU, NESCAUM modelers used an emissions processing model to prepare data produced by the IPM model for use in air quality and visibility modeling. The Sparse Matrix Operator Kernel Emissions (SMOKE) Modeling System is an emissions processing system designed to create gridded, speciated, hourly emissions for input into a variety of air quality models, such as EPA's Community Multi-Scale Air Quality (CMAQ) model and Regional Modeling System for Aerosols and Deposition (REMSAD) (Houyoux, et. al., 2000). SMOKE supports area, biogenic, mobile (both onroad and nonroad), and point source emissions processing for criteria, particulate, and toxic pollutants. For biogenic emissions modeling, SMOKE uses the Biogenic Emission Inventory System, version 2.3 (BEIS2) and version 3.09 and 3.12 (BEIS3). SMOKE is also integrated with the onroad emissions model MOBILE6.

The sparse matrix approach used throughout SMOKE permits rapid and flexible processing of emissions data. Flexible processing comes from splitting the processing steps of inventory growth, controls, chemical speciation, temporal allocation, and spatial allocation into independent steps whenever possible. The results from these steps are merged together in the final stage of processing using vector-matrix multiplication. It allows individual steps (such as adding a new control strategy, or processing for a different grid) to be performed and merged without having to redo all of the other processing steps. Individual emission scenarios were simulated for MANE-VU using the SMOKE Modeling System.

The Northeast States for Coordinated Air Use Management (NESCAUM), on behalf of MANE-VU and its participating States, conducted regional air quality simulations for calendar year 2002 and several future periods (NESCAUM, 2008). This work was directed at satisfying a number of goals under the Haze State Implementation Plan (SIP), including a contribution assessment, a pollution apportionment for 2018, and the evaluation of visibility benefits of control measures being considered for achieving reasonable progress goals and establishing a long-term emissions management strategy for MANE-VU Class I areas. The modeling tools utilized for these analyses include the Fifth-Generation NCAR / Penn State Mesoscale **Model** (MM5), SMOKE, CMAQ and REMSAD, and incorporate tagging features that allow for the tracking of individual source regions or measures. These tools have been evaluated and found to perform adequately relative to U.S. EPA modeling guidance.

As described below, in order for NESCAUM to process the Electric Generating Unit (EGU) emissions generated by the Integrated Planning Model® (IPM) procedures noted above, a series of intermediate steps were required to get the activity and emission data into the appropriate format for SMOKE processing.

3.2 Preparing IPM Output for Use in SMOKE Model

IPM can produce projections at the regional, state, plant, or unit level. Data must be parsed to provide the unit level information required for chemical transport modeling. Parsing involves developing detailed unit level information from the model's projections at the model plant level. ICF parsed the VISTASII_PC_1f data for use by the RPOs.

Further post-processing of IPM parsed output is needed to prepare the files for use by the SMOKE emissions processing model. The following sections describe the intermediate steps necessary to make these conversions. The first step is the augmentation of the IPM parsed output files to include additional unit level characteristics and pollutant estimates necessary for one atmosphere modeling. This step converts the IPM parsed data files into EPA's National Emission Inventory Input Format (NIF). The second step is the additional conversion of these NIF files into the Inventory Data Analyzer (IDA) format required by the SMOKE emissions processor.

3.2.1 IPM to NIF

After running IPM, ICF provided an initial spreadsheet file containing unit-level records for both:

(1) "existing" units (those currently in operation during the modeled base year) and
(2) committed/planned or new generic aggregates (new generic units expected to come online or identified as needed to meet electric generation demand in a geographic area).

IPM parsed file records include unit and fuel type data; existing, retrofit (for SO_2 and NO_x), and separate NO_x control information; annual SO_2 and NO_x emissions and heat input; summer season (May-September) NO_x and heat input; July day NO_x and heat input; coal heat input by coal type; nameplate capacity megawatt (MW), and State FIPS codes (Federal Information Processing codes used to identify geographic areas). Existing units also had county FIPS code, a unique plant identifier (ORISPL) and unit ID (also called boiler ID) (BLRID); generic units did not have these data.

The processing of IPM parsed data to NIF format included estimating emissions not generated by IPM and adding control efficiencies, stack parameters, latitude-longitude coordinates, and State identifiers (plant ID, point ID, stack ID, process ID) from a series of lookup tables or by matching to individual units as configured in base year 2002 emission files (Pechan, 2005). Additionally, new generic units created by IPM were sited in a county and given appropriate IDs. This processing is described in more detail below.

<u>Generic Units:</u> The new generic units and associated data were prepared by transforming the generic aggregates into units similar in size and fuel to existing units in terms of the available data. Generic aggregates were split into smaller generic units based on their unit types and capacity. Each generic unit was provided a dummy ORIS unique plant and boiler ID, and were given a county FIPS code based on an algorithm that sited each generic unit by assigning a sister plant that is in a county based on its attainment/nonattainment status. Within a State, existing plants (in county then ORIS plant code order) in attainment counties were used first as sister sites to new generic units (to obtain county location), followed by existing plants in PM nonattainment counties, followed by existing plants in 8-hour ozone nonattainment counties. No States identified counties that should not be considered when siting new generic units, so this process was identical to the one used for EPA IPM post-processing under CAIR.

SCCs were assigned to existing units using unit/fuel/firing/bottom type data. SCCs were assigned to generic units using unit and fuel type information. Latitude-longitude coordinates were assigned, first using the EPA-provided data files, secondly using an in-house contractor developed latitude-longitude file, and lastly using county centroids. These additional location files were only used when the data were not provided in the original 2002 base year files. Stack parameters were then assigned to each unit, first using the EPA-provided data files, secondly using an in-house stack parameter file based on previous EIA-767 data, and lastly using an EPA June 2003 SCC-based default stack parameter file. These data were only used when the data were not provided in the 2002 base year files.

IPM does not calculate emissions for all pollutants necessary for regional haze modeling. Therefore additional data were required to estimate VOC, CO, filterable primary PM_{10} and $PM_{2.5}$, PM condensable, and NH_3 emissions. Thus, ash and sulfur contents were assigned by first using 2002 EIA-767 values for existing units or SCC-based defaults; filterable PM_{10} and $PM_{2.5}$ efficiencies were obtained from the 2002 EGU NEI that were based on 2002 EIA-767 control data and the PM Calculator program (a default of 99.2 percent is used for coal units if necessary); fuel use was back calculated from the given heat input and a default SCC-based heat content; and emission factors were obtained from an EPA-approved emission factor file based on AP-42 emission factors. Table 2 presents the SCC-based default heat content and stack parameters used when actual data were not available. Table 3 (worksheet sccemfac100704 from MRPOpostprocdatafiles.xls, Pechan 2005) reflects emission factors used to develop emission estimates of CO, VOC, filterable PM, and NH_3.

Table 2. SCC Default Heat Content and Stack Parameters from IPM to NIF Conversion.

			Stack Parameters			
SCC	**Fuel**	**Heat Content (Btu/SCC Unit)**	**Height (ft)**	**Diameter (ft)**	**Temp (degrees F)**	**Velocity (ft/s)**
10100201	Bituminous Coal	23.4286	603.2	19.8	281.2	76.5
10100202	Bituminous Coal	23.4286	509.7	14.6	226.0	62.0
10100203	Bituminous Coal	23.4286	491.6	16.6	278.4	80.5
10100204	Bituminous Coal	23.4286	225.0	0.6	67.2	2.4
10100211	Bituminous Coal	23.4286	0.0	0.0	0.0	0.0
10100212	Bituminous Coal	23.4286	445.6	17.4	275.2	77.6
10100217	Bituminous Coal	23.4286	399.3	10.8	245.6	40.1
10100221	Subbituminous Coal	17.8870	983.0	22.8	350.0	110.0
10100222	Subbituminous Coal	17.8870	468.5	16.0	254.7	65.6
10100223	Subbituminous Coal	17.8870	446.8	15.9	308.0	93.6
10100224	Subbituminous Coal	17.8870	255.5	10.0	251.3	15.3
10100226	Subbituminous Coal	17.8870	495.8	18.9	259.2	91.2
10100238	Subbituminous Coal	17.8870	600.0	22.5	315.0	78.0
10100301	Lignite Coal	12.9149	427.5	22.3	232.8	74.2
10100302	Lignite Coal	12.9149	483.5	21.0	229.4	92.4
10100303	Lignite Coal	12.9149	462.0	21.7	271.3	72.5
10100317	Lignite Coal	12.9149	326.7	12.3	326.7	74.7
10100601	Natural Gas	1023.8846	263.9	10.3	236.0	46.9
10100801	Coke	27.4376	371.3	5.5	122.4	20.4
10102018	Waste Coal	12.0929	0.0	0.0	0.0	0.0
20100201	Natural Gas	1023.8846	62.0	10.0	585.3	61.3
20100301	Gasified Coal	1023.8846	62.0	10.0	585.3	61.3

Table 3. EPA-Approved Emission Factor File for CO, VOC, filterable PM, and NH_3.

SCC	FUEL	COEF	VOCEF	PM10EF	PM25EF	NH3EF	PMFLAG
10100201	BIT	0.5000	0.0400	2.6000	1.4800	0.030	A
10100202	BIT	0.5000	0.0600	2.3000	0.6000	0.030	A
10100203	BIT	0.5000	0.1100	0.2600	0.1100	0.030	A
10100204	BIT	5.0000	0.0500	13.2000	4.6000	0.030	
10100211	BIT	0.5000	0.0400	2.6000	1.4800	0.030	A
10100212	BIT	0.5000	0.0600	2.3000	0.6000	0.030	A
10100217	BIT	18.0000	0.0500	12.4000	1.3640	0.030	
10100221	SUB	0.5000	0.0400	2.6000	1.4800	0.030	A
10100222	SUB	0.5000	0.0600	2.3000	0.6000	0.030	A
10100223	SUB	0.5000	0.1100	0.2600	0.1100	0.030	A
10100224	SUB	5.0000	0.0500	13.2000	4.6000	0.030	
10100226	SUB	0.5000	0.0600	2.3000	0.6000	0.030	A
10100238	SUB	18.0000	0.0500	16.1000	4.2000	0.030	
10100301	LIG	0.2500	0.0700	1.8170	0.5214	0.030	A
10100302	LIG	0.6000	0.0700	2.3000	0.6600	0.030	A
10100303	LIG	0.6000	0.0700	0.8710	0.3690	0.030	A
10100317	LIG	0.1500	0.0300	12.0000	1.4000	0.030	
10100601	NG	84.0000	5.5000	1.9000	1.9000	3.200	
10100801	PC	0.6000	0.0700	7.9000	4.5000	0.397	A
10102018	WC	0.1500	0.0300	12.0000	1.4000	0.030	
20100201	NG	83.8628	2.1477	1.9380	1.9380	6.560	
20100301	IGCC	34.6500	2.2050	11.5500	11.5500	6.560	
Notes:							
1. SCCs beginning with 101002 (coal), 101003 (coal), 101008 (coke), or 101020 (waste coal), emission factors in LB/TON; SCCs beginning with 101006 (natural gas), 201002 (natural gas), or 201003 (IGCC), emission factors are in LB/E6FT3.							
2. If PMFLAG = 'A', then multiply ash content with PM emission factor.							

Source: Table derived from worksheet sccemfac100704 from MRPOpostprocdatafiles.xls, Pechan 2005.

<u>Condensable PM:</u> To estimate total primary PM emissions, additional calculations were conducted to derive condensable PM emissions from these sources. In MANE VU and VISTAS PM condensable emissions were calculated based on factors derived from AP-42 defaults. In MRPO no condensable emissions were estimated or included in the inventory. (Janssen, 2008) Table 4 (worksheet pmcdef from MRPOpostprocdatafiles.xls, Pechan 2005) shows these PM condensable emission factors and SCC assignments.

Table 4. EPA-Approved Condensable PM Emission Factor Assignment.

SCC	PMCDEF (LB/E6BTU)
10100201, 10100202, 10100203, 10100211, 10100212, 10100221, 10100222, 10100223, 10100226, 10100301, 10100302, 10100303	0.0200[2]
10100201, 10100202, 10100203, 10100211, 10100212, 10100221, 10100222, 10100223, 10100226, 10100301, 10100302, 10100303 [1]	(0.1 * sulfur content - 0.03)[3]
10100204, 10100224	0.0400
10100217, 10100238, 10100317, 10102018	0.0100
10100601	0.0057
10100801	0.0100
20100201, 20100301	0.0047
Notes:	
1. If the emission factor is less than 0.01, then it is set equal to 0.01.	
2. AND there is either an SO_2 FGD or a PM scrubber (for MRPO post-processing); or AND there is an SO_2 wet FGD (for EPA post-processing).	
3. AND there is any PM control other than a scrubber and there is no SO_2 control (for MRPO post-processing); or AND there is any control other than an SO_2 wet FGD (for EPA post-processing).	

Source: Table derived from worksheet pmcdef from MRPOpostprocdatafiles.xls, Pechan 2005.

Additional Pollutants: As noted above, in processing IPM parsed data to convert it to NIF format, emissions of additional pollutants were estimated. Emissions for 28 temporal-pollutant combinations were estimated since there are seven pollutants (VOC, CO, primary PM_{10} and $PM_{2.5}$, NH_3, SO_2 and NO_x) and four temporal periods (annual, summer season, winter season, July day).

Crosswalk Match to 2002 Inventory: The final step in the IPM to NIF conversion process was to match the IPM unit IDs with the identifiers in the base year 2002 inventory for existing EGUs. A crosswalk file was used to obtain FIPS State and county, plant ID (within State and county), and point ID. If the FIPS State and county, plant ID and point ID were in the 2002 base year NIF tables, then the process ID and stack ID were obtained from the NIF; otherwise, defaults, described above, were used.

The post-processed files were then provided in NIF 3.0 format. Two sets of tables were developed : “NIF files” for IPM units that had a crosswalk match and were in the 2002 base year inventory, and “NoNIF files” for IPM units that were not in the 2002 base year inventory (which included existing units with or without a crosswalk match as well as generic units). Two special cases relating to the crosswalk match were handled as follows:

1. One-to-many match: At a given plant, if one IPM boiler ID was matched to more than one point ID, the boiler data were put on the first point ID records; records from the other point IDs were deleted from the relevant tables.

2. Many-to-one match: At a given plant, if more than one IPM boiler ID was matched to one point ID, all the boilers’ emissions (tons), throughput (really heat input in MMBtu), and capacity (MW) were summed (“summed boiler”) and put on that point

ID's records in the relevant tables. The values for stack parameters and latitude-longitude values were those from the first record summed.

3.3 State Results – Phase II Augmented

Summarizing the results of the estimation of additional pollutants, Table 5 presents additional pollutant augmented State level emission results from the 2018 Inter-RPO CAIR Case IPM v. 2.1.9 fossil-only parsed file (VISTASII_PC_1f with pollutant augmentation; found in modeling file *ida_egu_18_basef_2453605.txt* from VISTAS BaseF). A comparison of RPO totals for SO_2 and NO_x shows that these are the same as presented in Table 1.

3.4 NIF to IDA

The main purpose of the SMOKE conversion task was to convert EGU emission inventories provided in NIF format into the IDA format required by the SMOKE model for the criteria pollutants VOC, NO_x, CO, SO_2, PM_{10}, $PM_{2.5}$, and NH_3. Annual and seasonal emissions were taken directly from the NIF structured inventories with no alternate temporal calculations performed (e.g., estimate seasonal emissions from annual or annual from seasonal). The temporal allocation module of the SMOKE emissions processor was intended to be used to further define temporal distribution of these emissions.

No quality assurance (QA) related to the reported values in the NIF files was conducted (e.g., it was assumed that reported emission levels were correct) and therefore the QA focus was to maintain the integrity of the mass files in the conversion to IDA.

Each set of NIF structured data had a unique set of relational tables necessary to maintain the information required in each source sector based on its reporting requirements. Conversion scripts to read the information from each of these relational data sets and convert them to the IDA structures required by this task were implemented by Alpine (Alpine, 2006). Prior to and after the conversion from NIF to IDA, a list of emission summary reports was developed to check that the emissions input into the conversion process were the same as output into the IDA formatted files.

Table 5. State Level Emission Summary; 2018 VISTASII_PC_1f with Pollutant Augmentation. Modeling file *ida_egu_18_basef_2453605.txt* from VISTAS Base F. (fossil-only)

		Annual Emissions (Tons)						
		IPM Generated		**Augmented Pollutants**				
State	**RPO**	**NOx**	**SO2**	**VOC**	**CO**	**PM-10**	**PM-2.5**	**NH3**
Connecticut	MANE-VU	3,418	6,697	145	9,837	959	927	341
Delaware	MANE-VU	12,341	35,442	117	1,183	2,950	2,438	76
District Of Columbia	MANE-VU	103	83	5	154	104	99	12
Maine	MANE-VU	1,827	5,436	53	4,057	296	279	139
Maryland	MANE-VU	14,709	28,065	575	11,831	8,253	6,433	435
Massachusetts	MANE-VU	18,157	17,486	484	13,860	3,918	3,233	1,059
New Hampshire	MANE-VU	3,089	7,469	73	1,697	2,268	2,156	124
New Jersey	MANE-VU	13,636	32,495	352	7,611	4,017	3,515	564
New York	MANE-VU	24,376	51,445	758	22,242	11,031	9,343	1,472
Pennsylvania	MANE-VU	82,881	135,946	1,920	41,445	31,580	23,756	1,790
Rhode Island	MANE-VU	576	55	42	1,627	157	156	127
Vermont	MANE-VU	105	35	3	117	26	25	9
	MANE-VU Total	**175,218**	**320,651**	**4,528**	**115,659**	**65,558**	**52,360**	**6,148**
Alabama	VISTAS	41,714	190,029	1,599	27,888	20,401	15,936	2,009
Florida	VISTAS	56,506	139,526	2,027	58,982	24,804	18,403	3,948
Georgia	VISTAS	56,180	178,196	1,940	33,040	25,929	19,087	2,374
Kentucky	VISTAS	64,099	229,596	1,623	17,103	24,659	18,813	782
Mississippi	VISTAS	8,895	27,226	511	12,228	7,270	4,358	918
North Carolina	VISTAS	57,774	102,217	1,232	14,386	31,797	26,551	847
South Carolina	VISTAS	46,318	118,584	932	11,263	26,740	22,629	793
Tennessee	VISTAS	29,873	112,343	922	7,391	15,008	12,988	449
Virginia	VISTAS	43,144	80,602	863	16,482	19,652	17,300	881
West Virginia	VISTAS	51,208	124,464	1,447	12,946	23,538	16,968	721
	VISTAS Total	**455,711**	**1,302,784**	**13,096**	**211,709**	**219,798**	**173,034**	**13,722**
Illinois	MRPO	71,233	241,136	2,229	17,868	32,650	30,132	1,152
Indiana	MRPO	95,376	376,864	2,105	19,416	35,082	27,835	1,274
Michigan	MRPO	98,685	398,562	1,623	17,522	38,902	34,276	1,091
Ohio	MRPO	83,129	215,501	2,254	23,832	42,754	33,323	1,773
Wisconsin	MRPO	45,701	155,369	1,101	11,901	15,629	14,246	626
	MRPO Total	**394,124**	**1,387,432**	**9,312**	**90,539**	**165,016**	**139,813**	**5,915**
Arkansas	CENRAP	33,097	82,605	696	11,429	3,897	3,326	814
Iowa	CENRAP	51,119	147,305	770	8,759	10,033	8,615	569
Kansas	CENRAP	83,333	81,486	798	7,203	8,520	6,807	461
Louisiana	CENRAP	30,432	74,263	660	11,043	3,966	3,590	919
Minnesota	CENRAP	41,029	85,847	674	5,563	8,162	7,034	343
Missouri	CENRAP	77,660	280,887	1,579	13,165	18,456	16,769	800
Nebraska	CENRAP	50,781	73,629	450	3,590	2,296	1,915	217
Oklahoma	CENRAP	76,048	113,680	1,008	28,182	5,561	4,840	1,355
Texas	CENRAP	153,837	339,433	4,988	102,583	38,952	31,631	6,424
	CENRAP Total	**597,336**	**1,279,135**	**11,622**	**191,518**	**99,842**	**84,528**	**11,902**
Arizona	WRAP	81,858	60,640	1,170	29,037	11,515	9,644	2,189
California	WRAP	23,767	5,447	1,496	56,188	5,442	5,337	4,402
Colorado	WRAP	70,171	87,163	667	12,139	4,751	4,166	609
Idaho	WRAP	718	0	36	1,398	113	113	109
Montana	WRAP	38,504	22,066	326	3,035	7,217	4,636	193
Nevada	WRAP	47,404	31,172	479	9,862	5,244	4,315	750
New Mexico	WRAP	74,010	52,916	554	5,991	13,435	7,637	388
North Dakota	WRAP	71,711	108,645	784	9,937	5,670	4,757	324
Oregon	WRAP	11,330	10,034	276	9,322	1,311	1,305	722
South Dakota	WRAP	14,574	12,085	110	536	362	297	33
Utah	WRAP	60,782	37,819	423	3,523	6,459	4,881	211
Washington	WRAP	26,379	12,236	451	11,848	3,780	3,192	898
Wyoming	WRAP	81,182	40,265	678	5,672	8,537	7,116	341
	WRAP Total	**602,389**	**480,488**	**7,449**	**158,487**	**73,834**	**57,395**	**11,170**
National Total		**2,224,778**	**4,770,490**	**46,007**	**767,912**	**624,049**	**507,129**	**48,857**

4 MODIFICATIONS BY OTHER REGIONS

4.1 Emission Control Modifications within VISTAS, MRPO, and CENRAP

State and local agencies and invited stakeholders from VISTAS, MRPO, and CENRAP reviewed the results of the Inter-RPO Phase II set of IPM runs. These stakeholders primarily reviewed and commented on the IPM results with respect to IPM decisions on NO_x post-combustion controls and SO_2 scrubbers and provided additional information on when and where new SO_2 and NO_x controls were planned to come online based on the best available data from state rules, enforcement agreements, compliance plans, permits, and discussions/commitments from individual companies. They also reviewed the IPM results to verify that known and existing controls and emission rates were properly reflected in the IPM runs. After considering comments, adjustments to the IPM results were made to specific units using any new information they had as part of the permitting process or other contact with the industry that indicated which units would install controls as a result of CAIR and when these new controls would come on-line (MACTEC, 2007; MRPO 2006; ENVIRON 2007).

As described in the following section, some entities specified changes to the controls assigned by IPM to reflect their best estimates of emission control levels. These changes typically involved either 1) adding selective catalytic reduction (SCR) or scrubber controls to units where IPM did not predict SCR or scrubber controls, or 2) removing IPM-assigned SCR or scrubber controls at units where the commenting entity indicated there were no firm plans for controls at those units.

At this point in the process MANE-VU decided not to make any changes to the northeastern state IPM output regardless of state knowledge of discrepancies with actual conditions. MANE-VU determined that IPM provided a reasonable estimate of the impact of the CAIR cap and trade program consistent with methods used by EPA, and planners were concerned that adjustments would not reflect the allocation of ALL allowed emissions under CAIR.

In MANE-VU's final modeling, many of the changes made by the other RPOs were included, but due to the timing of the release of revised data, the location with respect to the modeling domain, and need to progress with modeling, MANE-VU did not incorporate changes reflected in the final CENRAP EGU files.

4.2 Emission Factor and Control Modifications for VISTAS Emission Sources

VISTAS reviewed the PM and NH_3 emissions from its States' EGUs provided after the original IPM to NIF conversation conducted for the RPOs and identified significantly higher emissions in 2009/2018 than in 2002. VISTAS determined this conversion used a set of PM and NH_3 emission factors that were "the most recent EPA approved uncontrolled emission factors" for estimating 2009/2018 EGU emissions but were most likely not the same emission factors used by States for estimating these emissions in 2002. Thus, the emission increase from 2002 to 2009/2018 was simply an artifact of the change in emission factors, not anything to do with changes in activity or control technology application. During this review, VISTAS additionally identified an inconsistent use of SCCs for determining emission factors between the base and future years.

Documentation (Alpine, 2005a, b) indicates that VISTAS adjusted the 2002 base year emissions inventory to account for these discrepancies in base year and future year PM and NH_3 emission factor use. Using the latest "EPA-approved" uncontrolled emission factors by SCC, Alpine utilized data collected under EPA's Consolidated Emissions Reporting Rule (CERR) or data reported by VISTAS. Alpine used reported annual heat input, fuel throughput, heat, ash, and sulfur content to estimate annual uncontrolled emissions for units identified as output by IPM. This step was conducted for non-CEM pollutants (CO, VOC, PM, and NH_3) only. For PM emissions, the condensable component of emissions was calculated and added to the resulting PM primary estimations. The resulting emissions were then adjusted by any control efficiency factors reported in the CERR or VISTAS data collection effort. The second adjustment was to the future year inventories. Alpine updated the SCCs in the future year inventory to assign the same base year SCC. Using the same methods as described for the 2002 revisions, those non-IPM generated pollutants were estimated using IPM predicted fuel characteristics and base year 2002 SCC assignments.

In addition to the changes to the emission factor assignments, SCC, and IPM-assigned controls, VISTAS also specified other changes to the IPM results or converted IPM to NIF files. Comments on changes in stack parameters from the 2002 inventory were implemented in the converted files for the 2018 inventory. Changes to stack parameters were also made in cases where new controls were scheduled to be installed. In cases where an emission unit was projected to have an SO_2 scrubber by 2018, some States were able to provide revised stack parameters for some units based on design features for the new control system. Other units projected to install scrubbers by 2018 were not far enough along in the design process to have specific design details. For those units, VISTAS made the following assumptions: 1) the scrubber is a wet scrubber; 2) keep the current stack height the same; 3) keep the current flow rate the same, and 4) change the stack exit temperature to 169 degrees F (this is the virtual temperature derived from a wet temperature of 130 degrees F) (MACTEC, 2007). VISTAS determined that exit temperature (wet) of 130 degrees F +/- 5 degrees F is representative of different size units and wet scrubber technology.

4.3 Emission Inventory Replacement within WRAP Domain

During the development of their EGU emission forecast, the western states RPO (WRAP) conducted an exercise where IPM was not used to prepare emission estimates from EGU sources. Using capacity factor adjustments and emission control assumptions, WRAP developed a forecast of EGU emissions based on its initial 2002 base year inventory (ERG, 2006). This revised forecast was used by many of the RPOs and replaced the emissions generated for the domain by IPM. This change by WRAP is reflected in the difference in State emission totals between Tables 5 and 6. As WRAP is outside the MANE VU modeling domain, this change was not reflected in MANE-VU modeling. MANE-VU did not change its boundary conditions to reflect this change.

4.4 Eliminating Double Counting of EGU Units

An additional set of procedures was used by MANE-VU and VISTAS to avoid double counting of EGU emissions in the 2018 point source inventory (MACTEC, 2006, 2007). Since each

RPO's 2002 emissions inventory file contained both EGUs and non-EGU point sources, and EGU emissions were projected using IPM, it was necessary to split the 2002 point source file into two components. The first component contained those emission units accounted for in the IPM forecasts. The second component contained all other point sources not accounted for in IPM.

As described in the previous section, 2018 NIF files for EGUs were prepared from the IPM parsed files. All IPM matched units were initially removed from the 2018 point source inventory to create the non-EGU inventory (which was projected to 2018 using non-EGU growth and control factors). This was done on a unit-by-unit basis based on a cross-reference table that matched IPM emission unit identifiers (ORISPL plant code and BLRID emission unit code) to NIF emission unit identifiers (FIPSST state code, FIPSCNTY county code, State Plant ID, State Point ID). When there was a match between the IPM ORISPL/BLRID and the emission unit ID, the unit was assigned to the EGU inventory; all other emission units were assigned to the non-EGU inventory.

If an emission unit was contained in the NIF files created from the IPM output, the corresponding unit was removed from the initial 2018 point source inventory. For VISTAS, the NIF 2018 EGU files from the IPM parsed files were then merged with the non-EGU 2018 files to create a complete 2018 point source scenario.

Next, several ad-hoc QA/QC queries were done to verify that there was no double-counting of emissions in the EGU and non-EGU inventories:

- The IPM parsed files were reviewed to identify EGUs accounted for in IPM. This list of emission units was compared to the non-EGU inventory derived from the IPM-NIF cross-reference table to verify that units accounted for in IPM were not double-counted in the non-EGU inventory. As a result of this comparison, a few adjustments were made in the cross-reference table to add emission units for plants to ensure these units accounted for in IPM were moved to the EGU inventory.

- The non-EGU inventory was further reviewed to identify remaining emission units with an Standard Industrial Classification (SIC) code of "4911 Electrical Services" or Source Classification Code of "1-01-xxx-xx External Combustion Boiler, Electric Generation". The list of sources meeting these selection criteria were compared to the IPM parsed file to ensure that these units were not double-counted.

- VISTAS invited various stakeholder groups to review the 2018 point source inventory to verify whether there was any double counting of EGU emissions. In some instances, corrections were provided where an emission unit was double counted.

4.5 Preliminary Results from Phase II Additional Modifications

Table 6 summarizes the Base G emissions inventory for EGUs, presenting State level emission results from the 2018 Inter-RPO CAIR Case IPM v. 2.1.9 parsed file modified by VISTAS, MRPO, and WRAP per the methods noted in the above sections. Note that no changes occurred to the MANE-VU state emissions as a result of these changes.

Table 6. State Level Emission Summary; 2018 VISTAS Base G Modeling file ptinv_egu_2018_11sep2006.txt. Based on 2018 VISTASII_PC_1f (fossil-only) with adjustments from VISTAS, MRPO, and WRAP.

		Annual Emissions (Tons)						
State	**RPO**	**NOx**	**SO2**	**VOC**	**CO**	**PM-10**	**PM-2.5**	**NH3**
Connecticut	MANE-VU	3,418	6,697	145	9,836	959	927	341
Delaware	MANE-VU	12,341	35,442	117	1,183	2,950	2,438	76
District Of Columbia	MANE-VU	103	83	5	154	104	99	12
Maine	MANE-VU	1,827	5,436	53	4,057	296	279	139
Maryland	MANE-VU	14,709	28,065	575	11,831	8,253	6,433	435
Massachusetts	MANE-VU	18,157	17,486	484	13,860	3,917	3,233	1,059
New Hampshire	MANE-VU	3,089	7,469	73	1,697	2,268	2,156	124
New Jersey	MANE-VU	13,636	32,495	352	7,611	4,017	3,515	564
New York	MANE-VU	24,376	51,445	758	22,242	11,031	9,343	1,471
Pennsylvania	MANE-VU	82,881	135,946	1,919	41,446	31,580	23,756	1,790
Rhode Island	MANE-VU	576	55	42	1,627	157	156	127
Vermont	MANE-VU	105	35	3	117	26	25	9
	MANE-VU Total	**175,219**	**320,651**	**4,528**	**115,660**	**65,558**	**52,360**	**6,148**
Alabama	VISTAS	62,860	135,782	1,620	21,611	7,385	4,380	1,033
Florida	VISTAS	56,827	133,037	1,857	42,573	9,287	6,288	2,665
Georgia	VISTAS	69,308	226,477	1,805	35,584	18,217	11,319	1,676
Kentucky	VISTAS	59,740	211,225	1,344	12,125	6,194	4,067	436
Mississippi	VISTAS	10,455	15,143	1,055	11,822	7,007	6,853	545
North Carolina	VISTAS	56,526	96,402	1,147	16,376	32,676	26,014	608
South Carolina	VISTAS	50,068	87,202	860	13,078	28,110	24,454	578
Tennessee	VISTAS	30,008	112,353	886	7,126	15,861	13,321	241
Virginia	VISTAS	60,615	109,391	921	14,017	13,505	11,757	553
West Virginia	VISTAS	51,177	115,322	1,382	11,896	6,344	3,643	177
	VISTAS Total	**507,583**	**1,242,334**	**12,877**	**186,205**	**144,586**	**112,094**	**8,513**
Illinois	MRPO	71,233	241,136	2,229	17,868	32,649	30,132	1,152
Indiana	MRPO	95,376	351,858	2,105	19,416	35,081	27,835	1,274
Michigan	MRPO	78,605	288,006	1,623	17,521	38,902	34,276	1,091
Ohio	MRPO	83,129	215,501	2,254	23,832	42,753	33,322	1,772
Wisconsin	MRPO	45,701	155,369	1,101	11,901	15,629	14,246	626
	MRPO Total	**374,044**	**1,251,871**	**9,311**	**90,539**	**165,015**	**139,812**	**5,915**
Arkansas	CENRAP	33,097	82,605	696	11,429	3,897	3,326	814
Iowa	CENRAP	51,119	147,305	770	8,758	10,033	8,615	569
Kansas	CENRAP	83,333	81,486	798	7,203	8,520	6,807	461
Louisiana	CENRAP	30,432	74,263	660	11,043	3,966	3,590	919
Minnesota	CENRAP	41,029	85,847	674	5,563	8,162	7,035	343
Missouri	CENRAP	77,660	280,887	1,579	13,165	18,456	16,769	799
Nebraska	CENRAP	50,781	73,629	450	3,590	2,296	1,914	217
Oklahoma	CENRAP	76,048	113,680	1,008	28,182	5,561	4,840	1,355
Texas	CENRAP	153,837	339,433	4,988	102,581	38,952	31,630	6,424
	CENRAP Total	**597,336**	**1,279,135**	**11,622**	**191,515**	**99,842**	**84,527**	**11,901**
Arizona	WRAP	59,774	55,941	724	17,806	2,811	634	630
California	WRAP	17,537	1,528	2,558	31,173	1,219	1,059	0
Colorado	WRAP	77,113	60,914	1,465	18,939	3,138	307	537
Idaho	WRAP	2,236	1,683	50	3,283	335	87	0
Montana	WRAP	44,733	31,303	565	11,818	1,796	247	13
Nevada	WRAP	54,300	22,118	1,570	10,598	4,230	768	903
New Mexico	WRAP	32,925	17,796	695	10,976	794	627	43
North Dakota	WRAP	82,741	152,828	909	13,647	3,958	2,645	383
Oregon	WRAP	15,742	15,096	474	5,753	1,288	323	219
South Dakota	WRAP	17,681	13,522	118	689	247	217	52
Utah	WRAP	76,136	41,394	597	17,150	4,637	2,000	1,350
Washington	WRAP	16,884	7,011	249	4,008	1,474	1,027	12
Wyoming	WRAP	104,142	96,745	1,147	18,871	10,445	7,411	404
	WRAP Total	**601,942**	**517,879**	**11,122**	**164,711**	**36,371**	**17,353**	**4,547**
National Total		**2,256,124**	**4,611,869**	**49,460**	**748,629**	**511,371**	**406,146**	**37,024**

4.6 Revised Results – VISTAS Base G2 Adjustment

VISTAS further refined their future predictions based on further state input. The resulting modeling file was called the Base G2 inventory. Table 7 presents State level emission results from the Base G2 2018 Inter-RPO CAIR Case IPM v. 2.1.9 parsed file modified by VISTAS.

Some states specified changes to the controls assigned by IPM to reflect their best estimates of emission control levels. These changes typically involved either 1) adding selective catalytic reduction (SCR) or scrubber controls to units where IPM did not predict SCR or scrubber controls, or 2) removing IPM-assigned SCR or scrubber controls at units where the commenting entity indicated their were no firm plans for controls at those units. These changes were based on those states' best available information about where and when emissions controls were expected to be installed, as well as information concerning IPM-predicted plant closures that were deemed unlikely to occur. In comparing Table 7 with Table 6, it can be seen that the changes included in the Base G2 inventory were requested by the states of Florida, Georgia, and North Carolina.

Note that no changes were made at this time by the MANE-VU states. The net effect of these changes was to reduce emissions of SO_2 relative to either Table 5 or Table 6.

Table 7. State Level Emission Summary; 2018 VISTAS Base G2 Modeling file egu_18_vistas_g2_20feb2007.txt. Based on 2018 VISTASII_PC_1f (fossil-only) with adjustments from VISTAS, MRPO, and WRAP.

		Annual Emissions (Tons)						
State	**RPO**	**NOx**	**SO2**	**VOC**	**CO**	**PM-10**	**PM-2.5**	**NH3**
Connecticut	MANE-VU	3,418	6,697	145	9,836	959	927	341
Delaware	MANE-VU	12,341	35,442	117	1,183	2,950	2,438	76
District Of Columbia	MANE-VU	103	83	5	154	104	99	12
Maine	MANE-VU	1,827	5,436	53	4,057	296	279	139
Maryland	MANE-VU	14,709	28,065	575	11,831	8,253	6,433	435
Massachusetts	MANE-VU	18,157	17,486	484	13,860	3,917	3,233	1,059
New Hampshire	MANE-VU	3,089	7,469	73	1,697	2,268	2,156	124
New Jersey	MANE-VU	13,636	32,495	352	7,611	4,017	3,515	564
New York	MANE-VU	24,376	51,445	758	22,242	11,031	9,343	1,471
Pennsylvania	MANE-VU	82,881	135,946	1,919	41,446	31,580	23,756	1,790
Rhode Island	MANE-VU	576	55	42	1,627	157	156	127
Vermont	MANE-VU	105	35	3	117	26	25	9
	MANE-VU Total	**175,219**	**320,651**	**4,528**	**115,660**	**65,558**	**52,360**	**6,148**
Alabama	VISTAS	62,860	135,782	1,620	21,611	7,385	4,380	1,033
Florida	VISTAS	58,341	139,200	1,904	42,947	9,355	6,331	2,665
Georgia	VISTAS	69,308	75,051	1,805	35,584	18,217	11,319	1,676
Kentucky	VISTAS	59,740	211,225	1,344	12,125	6,194	4,067	436
Mississippi	VISTAS	10,455	15,143	1,055	11,822	7,007	6,853	545
North Carolina	VISTAS	56,526	102,680	1,147	16,376	32,676	26,014	608
South Carolina	VISTAS	50,068	87,202	860	13,078	28,110	24,454	578
Tennessee	VISTAS	30,008	112,353	886	7,126	15,861	13,321	241
Virginia	VISTAS	60,615	109,391	921	14,017	13,505	11,757	553
West Virginia	VISTAS	51,177	105,932	1,382	11,896	6,344	3,643	177
	VISTAS Total	**509,098**	**1,093,959**	**12,923**	**186,579**	**144,654**	**112,137**	**8,513**
Illinois	MRPO	71,233	241,136	2,229	17,868	32,649	30,132	1,152
Indiana	MRPO	95,376	351,858	2,105	19,416	35,081	27,835	1,274
Michigan	MRPO	78,605	288,006	1,623	17,521	38,902	34,276	1,091
Ohio	MRPO	83,129	215,501	2,254	23,832	42,753	33,322	1,772
Wisconsin	MRPO	45,701	155,369	1,101	11,901	15,629	14,246	626
	MRPO Total	**374,044**	**1,251,871**	**9,311**	**90,539**	**165,015**	**139,812**	**5,915**
Arkansas	CENRAP	33,097	82,605	696	11,429	3,897	3,326	814
Iowa	CENRAP	51,119	147,305	770	8,758	10,033	8,615	569
Kansas	CENRAP	83,333	81,486	798	7,203	8,520	6,807	461
Louisiana	CENRAP	30,432	74,263	660	11,043	3,966	3,590	919
Minnesota	CENRAP	41,029	85,847	674	5,563	8,162	7,035	343
Missouri	CENRAP	77,660	280,887	1,579	13,165	18,456	16,769	799
Nebraska	CENRAP	50,781	73,629	450	3,590	2,296	1,914	217
Oklahoma	CENRAP	76,048	113,680	1,008	28,182	5,561	4,840	1,355
Texas	CENRAP	153,837	339,433	4,988	102,581	38,952	31,630	6,424
	CENRAP Total	**597,336**	**1,279,135**	**11,622**	**191,515**	**99,842**	**84,527**	**11,901**
Arizona	WRAP	59,774	55,941	724	17,806	2,811	634	630
California	WRAP	17,537	1,528	2,558	31,173	1,219	1,059	0
Colorado	WRAP	77,113	60,914	1,465	18,939	3,138	307	537
Idaho	WRAP	2,236	1,683	50	3,283	335	87	0
Montana	WRAP	44,733	31,303	565	11,818	1,796	247	13
Nevada	WRAP	54,300	22,118	1,570	10,598	4,230	768	903
New Mexico	WRAP	32,925	17,796	695	10,976	794	627	43
North Dakota	WRAP	82,741	152,828	909	13,647	3,958	2,645	383
Oregon	WRAP	15,742	15,096	474	5,753	1,288	323	219
South Dakota	WRAP	17,681	13,522	118	689	247	217	52
Utah	WRAP	76,136	41,394	597	17,150	4,637	2,000	1,350
Washington	WRAP	16,884	7,011	249	4,008	1,474	1,027	12
Wyoming	WRAP	104,142	96,745	1,147	18,871	10,445	7,411	404
	WRAP Total	**601,942**	**517,879**	**11,122**	**164,711**	**36,371**	**17,353**	**4,547**
National Total		**2,257,639**	**4,463,494**	**49,506**	**749,003**	**511,439**	**406,189**	**37,024**

5 ADDITIONAL ADJUSTMENTS BY NORTHEASTERN STATES AND MODELERS FOR REGIONAL HAZE SIP MODELING

5.1 Introduction

MANE VU used the G2 inventory as the basis for further adjustments to incorporate MANE-VU state changes and also to represent the MANE VU control strategy for key EGUs. These modifications resulted in a) SO_2 emissions reductions at one MANE-VU EGU source subject to Best Available Retrofit Technology (BART) requirements, 2) emissions increases in MANE-VU to reflect states' best estimates that some sources predicted by IPM to be closed would continue to operate and information about where and when emission controls would or would not be installed, 3) SO_2 emissions reductions at key EGUs (or alternative facilities) to reflect the MANE-VU EGU strategy, and 4) increases in SO_2 emissions to estimate the effect of emissions trading under the CAIR program. Each of these is explained below.

5.2 Best Available Retrofit Technology (BART)

To assess the impacts of the implementation of the BART provisions of the Regional Haze Rule, NESCAUM included estimated reductions anticipated for BART-eligible facilities not covered by CAIR in the MANE-VU region in the 2018 CMAQ modeling analysis. A survey of state staff indicated that eight units would likely be controlled under BART alone. State-provided potential control technologies and levels of control for these sources were incorporated into the 2018 emission inventory projections used in MANE-VU's March 2008 modeling run (NESCAUM, 2008b). The eight BART-eligible units included one EGU point source, which is located in Maine (Wyman Station).

5.3 MANE-VU State Modifications of IPM Results

Previously, during development of the Base G and Base G2 inventories, MANE-VU states had relied on the RPO IPM model results (Base F) without revisions. In 2007, the MANE-VU states decided that they should revise the estimates, as other RPOs had done, to reflect their best estimates of future source operations and controls. State and regional staff reviewed and revised the IPM results with respect to when and where new SO_2 controls were planned to come online. Modifications were based on state rules, enforcement agreements, compliance plans, permits, and commitments from individual companies. States reviewed the IPM results to verify that known and existing controls and emission rates were properly reflected in the IPM results. In addition, states noted that some units predicted by IPM to close were very unlikely to cease operation.

The net effect of these adjustments was an increase in SO_2 emissions in the MANE-VU region as a whole. In Delaware SO_2 emissions decreased due to controls on a major source. Emissions in Connecticut, the District of Columbia, Rhode Island, and Vermont remained the same as predicted by RPO IPM 2.1.9 (Base F). Emissions of SO_2 in other MANE-VU states increased. No changes were made in emissions of other pollutants.

5.4 MANE-VU EGU Strategy

MANE-VU states have recognized that SO_2 emissions from power plants are the single largest contributing sector to visibility impairment in the Northeast's Class I areas. Sulfate formed through atmospheric processes from SO_2 emissions are responsible for over half the mass and approximately 70-80 percent of the extinction on the worst visibility days (NESCAUM, 2006a, and b). The emissions from power plants dominate the SO_2 inventory.

A modeling analysis was conducted to identify those EGUs with the greatest impact on visibility in MANE-VU. As part of the MANE VU Contribution Assessment, two MANE-VU modeling centers undertook CALPUFF modeling to identify the top 100 stacks that impacted three of the MANE VU Class I areas in the base year, 2002. These three areas are Acadia, Brigantine and Lye Brook. Details of the modeling are provided in Appendix D of the Contribution Assessment. (NESCAUM, 2006a) The 100 top stacks for each Class I area are listed in Tables 10 and 20 from Appendix D "Dispersion Model Techniques" of the Contribution Assessment.

The two modeling centers used 2002 U.S. EPA Continuous Emission Monitoring System (CEMS) data reported by the power companies, which is stack based rather than emission unit based. A power plant may have several stacks. Each stack may vent emissions from one or more units at the plant. The two modeling centers also used different meteorological data—one used data from the MM5 model and the other used National Weather Service observation-based meteorology.

There are differences between results from the two centers because of the differences in meteorological input data and also because of rounding when summing annual emissions. As a result the MM5-based modeling identified some stacks as being in the top 100 impacting a MANE-VU Class I area that were not identified by the observation-based modeling, and vice versa. For purposes of identifying key stacks, all stacks on either list were included.

MARAMA combined the lists of the top 100 EGU stacks in Tables 10 and 20 from Appendix D of the Contribution Assessment and eliminated both duplications and stacks that were outside the MANE-VU consultation area. (The consultation area includes states contributing at least 2% of the sulfate monitored at MANE-VU Class I areas in 2002.) This process resulted in 167 unique stacks impacting one or more of the three MANE-VU Class I areas. The use of stacks rather than units or facilities was chosen as more consistent with the results of the modeling presented in the Contribution Assessment. The Contribution Assessment Appendix D tables did not identify the units or facilities that were modeled, only providing a CEMS Identification number. MARAMA used information contained in IPM input files to match up the plant name and type where the stack was located. The resulting list of 167 stacks is found in Appendix A of this report.

MANE-VU asked states in the consultation area to pursue 90 percent control on all units emitting from those stacks by 2018. MANE-VU recognized that this level of control may not be feasible in all cases. NESCAUM modelers incorporated State comments gathered during the inter-RPO consultation process in estimating the impact of this strategy on visibility at Class I areas. This process is described below in Section 5.5.

5.5 Implementation of MANE-VU Control Strategy for Key EGUs

As part of the MANE-VU strategy to improve visibility, MANE-VU asked states to pursue a 90 percent reduction in SO_2 emissions from the 167 EGU stacks identified as described in Section 5.4 and listed in Appendix A. MARAMA gathered information from MANE-VU, MRPO, and VISTAS states and regional staff to obtain information about anticipated emissions changes.

State and local agencies and individual stakeholders from MANE-VU, MRPO and VISTAS reviewed and revised the IPM results with respect to controls planned to come online. They also reviewed the IPM results to verify that known and existing controls and emission rates were properly reflected in the IPM runs. In addition, commenters noted that some units predicted by IPM to be shutdown would not shutdown.

Adjustments to the IPM results were made to specific units using information states had obtained as part of the permitting process or other contact with the industry that indicated which units would install controls as a result of CAIR and when these new controls would come on-line (Koerber, 2007; VISTAS 2007). In general, the changes at specific EGUs provided by VISTAS reflected their Base G2 inventory, and, as discussed with MRPO, the changes NESCAUM made to emissions from sources in the MRPO were consistent with sources where controls were predicted in EPA's IPM 3.0 run for 2018, since MRPO modeling relied on IPM 3.0. In addition to the 167 stacks, MANE-VU incorporated further corrections to source emissions as requested by VISTAS states at the following locations: North Carolina (Cliffside), South Carolina (Jefferies), Kentucky (Spurlock), and Virginia (Chesapeake and Clinch River). .

NESCAUM determined the desired emissions levels for the 167 key stacks based on a 90 percent reduction in continuous emissions monitoring data from 2002. This established a target emissions level for the region from those stacks. NESCAUM compared these levels with the information provided by the states for those sources. In each region, predicted 2018 emissions exceeded the target level. Therefore, emissions reductions from other sources were considered in order to meet the target emissions reductions for the region.(both within MANE-VU and in other RPOs). This resulted in a net decrease in emissions in all three affected RPOs. Emissions of SO_2 would have decreased by over 14,000 tons per year in MANE-VU, over 304,000 tons per year in the Midwest, and over 197,000 tons per year in the VISTAS region.

However, MANE-VU planners recognized that CAIR allows emissions trading, and that reductions at one unit could be offset increases at another unit within the CAIR region. Because most states do not restrict trading, MANE-VU decided that emissions should be increased to represent the implementation of the strategy for the 167 stacks within the limits of the CAIR program. Therefore, NESCAUM increased the emissions from states subject to the CAIR cap and trade program. For MANE-VU, 75,809 tons were added back, leaving total regional emissions from the MANE-VU region greater than the original Inter-RPO IPM-based estimate but consistent with state projections. The remaining 440,541 tons added back were allocated to

VISTAS and MRPO based on the fraction of their contribution to the total SO_2 emissions. The additional emissions correspond to an increase of 20.5 percent, with a total of 223,856 tons added to MRPO and 216,685 added to VISTAS.

Table 8 shows the emissions difference between the results of two IPM runs and the modeling inventories used by three Regional Planning Organizations (RPOs). VISTAS used Base G2, MANE-VU used the March 2008 Modeling Inventory, and MRPO used IPM 3.0..

Table 8. Comparison of Regional SO_2 Emissions Estimates.
(1000 tons per year)

	MANE-VU	MRPO	VISTAS	TOTAL
RPO 2.1.9 (VISTASII_PC_1f) (fossil only)	**321**	**1,387**	**1,303**	**3,011**
Reductions made by VISTAS and MRPO (Base G2)	0	-136	-209	-344
Net additional changes made by MANE-VU	66	24	222	311
MANE-VU March 2008 Modeling Inventory (fossil only)	**387**	**1,276**	**1,316**	**2,978**
MANE-VU minus RPO 2.1.9 (negative numbers mean MANE-VU's modeling inventory was less than RPO 2.1.9)	66	-112	13	-33
EPA 3.0 (fossil only)	**421**	**1,328**	**1,458**	**3,207**
RPO 2.1.9 minus EPA 3.0 (negative number means RPO 2.1.9 was less than EPA 3.0)	-100	59	-155	-196
MANE-VU 3/08 minus EPA 3.0 (negative numbers mean MANE-VU's modeling inventory was less than EPA 3.0)	-34	-53	-142	-229

The intent of the MANE-VU modelers' final EGU emissions adjustments was to retain the same level of emissions as predicted by the RPO CAIR IPM run for the three regions together, but to modify the locations of the emissions to better reflect the states' estimates and to achieve reductions at the 167 stacks identifie++d as important contributors to regional haze at MANE-VU Class I areas. As shown in Table 8, above, the MANE-VU adjustments resulted in total emissions from the three regions being less than the SO_2 emissions predicted by the RPO 2.1.9 IPM run but greater than emissions in the G2 inventory used by VISTAS modelers. In both the MANE-VU and VISTAS regions, the MANE-VU Modeling Inventory is greater than the VISTAS/Inter-RPO IPM run and in MRPO it is smaller. Results from IPM 3.0 also are provided for comparison, and are uniformly greater than the MANE-VU Modeling Inventory for EGUs.

All future EGU emissions estimates involve uncertainty. MANE-VU believes its process of adding back emissions resulted in a reasonable, conservative estimate of the implementation of the MANE-VU request for a 90% reduction at key EGU facilities.

5.6 State Results – Northeastern State Adjustments

Table 9 presents State level emission results as modified by the Northeastern States per the methods noted in the above sections. This table summarizes the input data used in the MANE-VU 2018 March 2008 Modeling run as documented in NESCAUM's *2018 Visibility Projections* report dated March 2008.

Table 9. State Level 2018 Emission Summary; March 2008 MANE-VU EGU Modeling Inventory. (See next page for file names.)

		Annual Emissions (Tons)						
State	**RPO**	**NOx**	**SO2**	**VOC**	**CO**	**PM-10**	**PM-2.5**	**NH3**
Connecticut	MANE-VU	3,418	6,697	145	9,836	959	927	341
Delaware	MANE-VU	12,341	10,941	117	1,183	2,950	2,438	76
District Of Columbia	MANE-VU	103	83	5	154	104	99	12
Maine	MANE-VU	1,827	6,806	53	4,057	296	279	139
Maryland	MANE-VU	14,709	43,764	575	11,831	8,253	6,433	435
Massachusetts	MANE-VU	18,157	45,941	484	13,860	3,917	3,233	1,059
New Hampshire	MANE-VU	3,089	10,766	73	1,697	2,268	2,156	124
New Jersey	MANE-VU	13,636	15,918	352	7,611	4,017	3,515	564
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Pennsylvania	MANE-VU	82,881	170,992	1,919	41,446	31,580	23,756	1,790
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Vermont	MANE-VU	105	35	3	117	26	25	9
	MANE-VU Total	**175,219**	**386,584**	**4,528**	**115,660**	**65,558**	**52,360**	**6,148**
Alabama	VISTAS	62,860	163,567	1,620	21,611	7,385	4,380	1,033
Florida	VISTAS	58,341	167,685	1,903	42,946	9,355	6,330	2,665
Georgia	VISTAS	69,308	90,408	1,805	35,584	18,217	11,319	1,676
Kentucky	VISTAS	59,740	255,559	1,344	12,125	6,194	4,067	436
Mississippi	VISTAS	10,455	18,241	1,055	11,822	7,007	6,853	545
North Carolina	VISTAS	56,526	126,042	1,147	16,376	32,676	26,014	608
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Illinois	MRPO	71,233	208,832	2,229	17,868	32,649	30,132	1,152
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	MRPO Total	**374,044**	**1,275,598**	**9,311**	**90,539**	**165,015**	**139,812**	**5,915**
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Louisiana	CENRAP	30,432	74,263	660	11,043	3,966	3,590	919
Minnesota	CENRAP	41,029	85,847	674	5,563	8,162	7,035	343
Missouri	CENRAP	77,660	280,887	1,579	13,165	18,456	16,769	799
Nebraska	CENRAP	50,781	73,629	450	3,590	2,296	1,914	217
Oklahoma	CENRAP	76,048	113,680	1,008	28,182	5,561	4,840	1,355
Texas	CENRAP	153,837	339,433	4,988	102,581	38,952	31,630	6,424
	CENRAP Total	**597,336**	**1,279,135**	**11,622**	**191,515**	**99,842**	**84,527**	**11,901**
Arizona	WRAP	59,774	55,941	724	17,806	2,811	634	630
California	WRAP	17,537	1,528	2,558	31,173	1,219	1,059	0
Colorado	WRAP	77,113	60,914	1,465	18,939	3,138	307	537
Idaho	WRAP	2,236	1,683	50	3,283	335	87	0
Montana	WRAP	44,733	31,303	565	11,818	1,796	247	13
Nevada	WRAP	54,300	22,118	1,570	10,598	4,230	768	903
New Mexico	WRAP	32,925	17,796	695	10,976	794	627	43
North Dakota	WRAP	82,741	152,828	909	13,647	3,958	2,645	383
Oregon	WRAP	15,742	15,096	474	5,753	1,288	323	219
South Dakota	WRAP	17,681	13,522	118	689	247	217	52
Utah	WRAP	76,136	41,394	597	17,150	4,637	2,000	1,350
Washington	WRAP	16,884	7,011	249	4,008	1,474	1,027	12
Wyoming	WRAP	104,142	96,745	1,147	18,871	10,445	7,411	404
	WRAP Total	**601,942**	**517,879**	**11,122**	**164,711**	**36,371**	**17,353**	**4,547**
National Total		**2,257,639**	**4,774,936**	**49,505**	**749,003**	**511,439**	**406,188**	**37,023**

Files used in preparing Table 9 include for CENRAP and WRAP, the VISTAS Base G2 Modeling file (egu_18_vistas_g2_20feb2007.txt.), and the following additional files:

MANE-VU:
- EGU2018_MANEVUv3_nonSO2.ida
- EGU2018_MANEVU_SO2_non167plus.ida
- EGU2018_MANEVU_SO2_167plus.ida

VISTAS:
- EGU2018_VISTASG2_SO2_non167plus_CAIR addback.ida
- EGU2018_VISTASG2_SO2_167plus_CAIRadd back.ida
- EGU2018_VISTASG2_nonSO2.ida

MRPO:
- EGU2018_MWRPO_SO2_167plus_CAIRaddback. ida
- EGU2018_MWRPO_SO2_non167p_non65_CAIR addback.ida
- EGU2018_MWRPO_SO2_65_CAIRaddback.ida
- EGU2018_MWRPO_nonSO2.ida

6 EGU PREPARATION TIMELINE

The following section provides a chronological review of the events and milestones that occurred during the preparation of EGU emission forecasts in support of regional haze SIP preparation.

2004

- VISTAS/MRPO sponsor first IPM 2.1.6 runs for 2018 (Phase I)
- Phase I (VISTAS_CAIR_2) results released

2005

- RPOs move to IPM 2.1.9 (Phase II)
- Revisions to NEEDS input file and global parameters submitted by RPOs for revised runs
- Phase II (VISTAS_II_PC_1f) results released
- IPM parsed to NIF and NIF to SMOKE IDA format conversion occurs
- Initial RPO adjustments and modifications of IPM results
- RPOs share IPM 2.1.9 inputs and configuration from Phase II with EPA
- EPA releases IPM 2.1.9 results of CAIR/CAMR modeling

2006

- Additional RPO control and modeling file adjustments to Phase II runs
- RPOs simulate 2018 forecast year to support regional haze SIP submittals
- RPOs work with EPA to configure NEEDS 3.0 for next round of EPA modeling
- EPA releases IPM 2006 revised projections
- RPOs identify potential control measures and estimate benefits for meeting reasonable progress goals
- Additional RPO control and modeling file adjustments to Phase II runs

2007

- RPOs analyze cost and other factors associated with potential control measures
- RPOs coordinate with EPA on inputs and runs of IPM 3.0
- EPA releases IPM 3.0 results of revised CAIR/CAMR/CAVR modeling
- Interstate and inter-regional consultation regarding potential control measures
- MANE-VU states agree to pursue several control measures
- RPOs begin regional modeling to assess visibility impacts of controls

2008

- RPOs model to determine progress goals for regional haze SIP
- States finalize regional haze SIPs

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Appendix A

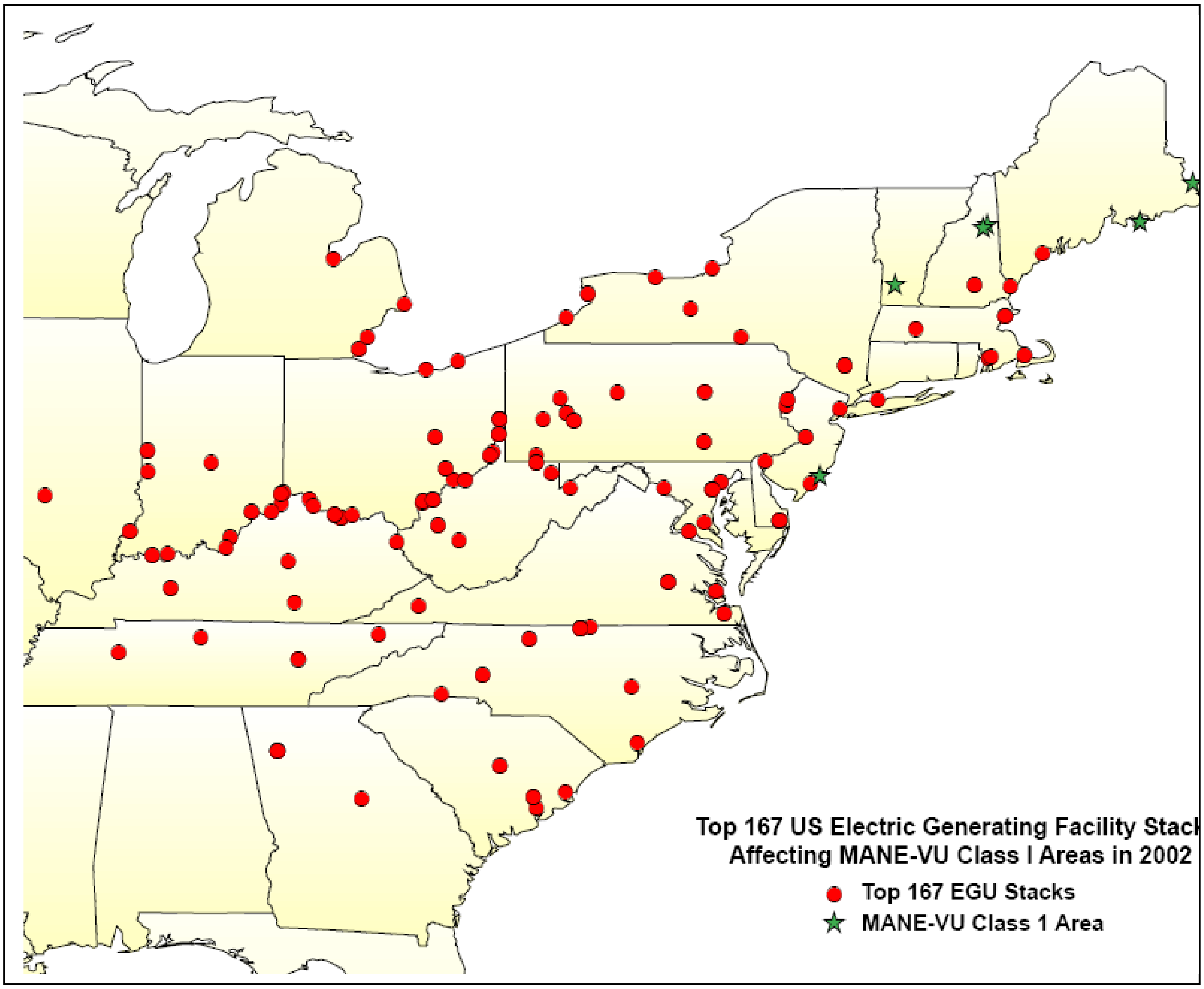
TOP ELECTRIC GENERATING EMISSION POINTS CONTRIBUTING TO VISIBILITY IMPAIRMENT IN MANE-VU IN 2002

For each of three MANE-VU Class I Areas the 100 Electric Generating Unit (EGU) stacks with the most significant impact on visibility impairment were identified by Calpuff modeling conducted by two modeling centers.[1] Many of these stacks have a regional impact and therefore significantly impact more than one Class I Area. When the "Top Impacting" stacks are aggregated into a single group there are 167 individual "Top Impacting" stacks identified. The map on the following page indicates the location of the 167 stacks, and the table following the map provides identifying information, emissions used in the Calpuff modeling, and predicted impacts. The following information may be found in the listed columns of the following table:

1. Row Number (1 through 167)
2. CEMS Unit ID: an arbitrary number identifying the CEMS unit
3. ORIS ID: a standard identification number associated with each unit
4. Acadia MM5: The rank of this source based on its predicted sulfate ion annual impact on Acadia in 2002 using meteorological data from the MM5 model. (A blank in columns 4, 5, 6, 7, 8, or 9 indicates this source was not among the top 100 for this Class I area as predicted by the indicated model.)
5. Acadia VTDEC: The rank of this source in terms of its predicted sulfate ion annual impact on Acadia in 2002 using National Weather Service data.
6. Brig MM5: The rank of this source in terms of its predicted sulfate ion annual impact on Brigantine in 2002 using meteorological data from the MM5 model.
7. Brig VTDEC: The rank of this source in terms of its predicted sulfate ion annual impact on Brigantine in 2002 using National Weather Service data.
8. Lye MM5: The rank of this source in terms of its predicted sulfate ion annual impact on Lye Brook in 2002 using meteorological data from the MM5 model.
9. Lye VTDEC: The rank of this source in terms of its predicted sulfate ion annual impact on Lye Brook in 2002 using National Weather Service data.
10. MM5 2002 SO_2 Tons per Year: Emissions calculated from CEMS data and used by modelers who used the MM5 generated meteorological data
11. VTDEC 2002 SO_2 Tons per Year: Emissions calculated from CEMS data and used by modelers who used the national weather service generated meteorological data
12. Plant Number (1 through 105): The 167 stacks are located at 105 plants.
13. Plant Name—table is in alphabetical order by plant within each state
14. Plant Type: coal fired or oil/gas fired electric generating units
15. State Name—table is in alphabetical order by state
16. State Code

[1] For more information and detailed modeling results, see Appendix D: Source Dispersion Model Methods, in NESCAUM 2006a.

Figure A-1. Top 167 US Electric Generating Facility Stacks Affecting MANE-VU Class I Areas in 2002.



Row number	CEMS Unit	ORIS ID	Acadia MM5	Acadia VTDEC	Brig MM5	Brig VTDEC	Lye MM5	Lye VTDEC	MM5 2002 S02 TPY	VTDEC 2002 SO2 TPY		Plant Name	Plant Type	State Name	State Code
1	D005935	593			90	54			2,138	2,136	1	EDGE MOOR	O/G Steam	Delaware	10
2	D005941	594				95				3,742	2	INDIAN RIVER	Coal Steam	Delaware	10
3	D005942	594				74				3,760	2	INDIAN RIVER	Coal Steam	Delaware	10
4	D005943	594			84	44			4,686	4,682	2	INDIAN RIVER	Coal Steam	Delaware	10
5	D005944	594			69	21			7,390	7,384	2	INDIAN RIVER	Coal Steam	Delaware	10
6	D007031LR	703	79			86		75	38,520	38,486	3	BOWEN	Coal Steam	Georgia	13
7	D007032LR	703	72		89		61	68	37,289	37,256	3	BOWEN	Coal Steam	Georgia	13
8	D007033LR	703	71	99	74	64	63	94	43,067	43,029	3	BOWEN	Coal Steam	Georgia	13
9	D007034LR	703	69	95	86	58	60	89	41,010	40,974	3	BOWEN	Coal Steam	Georgia	13
10	D00709C02	709		84		75	89	71	47,591	47,549	4	HARLLEE BRANCH	Coal Steam	Georgia	13
11	D00861C01	861	28	96		65	46	62	42,355	42,318	5	COFFEEN	Coal Steam	Illinois	17
12	D010011	1001			53				28,876	28,851	6	CAYUGA	Coal Steam	Indiana	18
13	D010012	1001	95		46	68			26,016	25,992	6	CAYUGA	Coal Steam	Indiana	18
14	D00983C01	983					52		19,922		7	CLIFTY CREEK	Coal Steam	Indiana	18
15	D00983C02	983					54		18,131		7	CLIFTY CREEK	Coal Steam	Indiana	18
16	D0099070	990		55	100	70		37	29,801	29,774	8	ELMER W STOUT	O/G Steam	Indiana	18
17	D06113C03	6113	30	48	14	43	22	41	71,182	71,119	9	GIBSON	Coal Steam	Indiana	18
18	D06113C04	6113	44	70	97	83	73	83	27,848	27,823	9	GIBSON	Coal Steam	Indiana	18
19	D01008C01	1008			73		100	47	24,109	24,087	10	R GALLAGHER	Coal Steam	Indiana	18
20	D01008C02	1008			98			55	23,849	23,828	10	R GALLAGHER	Coal Steam	Indiana	18
21	D06166C02	6166	62	44	30	81	33	57	51,708	51,663	11	ROCKPORT	Coal Steam	Indiana	18
22	D00988C03	988						77		15,946	12	TANNERS CREEK	Coal Steam	Indiana	18
23	D00988U4	988	14	29	52	34	7	19	45,062	45,022	12	TANNERS CREEK	Coal Steam	Indiana	18
24	D01010C05	1010	43	32	12	28	31	17	60,747	60,693	13	WABASH RIVER	Coal Steam	Indiana	18
25	D067054	6705	34	60	34		44	73	40,118	40,082	14	WARRICK	Coal Steam	Indiana	18
26	D06705C02	6705	92		75		96		27,895		14	WARRICK	Coal Steam	Indiana	18
27	D01353C02	1353	38	30	15	26	85	29	41,545	41,508	15	BIG SANDY	Coal Steam	Kentucky	21

Row number	CEMS Unit	ORIS ID	Acadia MM5	Acadia VTDEC	Brig MM5	Brig VTDEC	Lye MM5	Lye VTDEC	MM5 2002 S02 TPY	VTDEC 2002 SO2 TPY		Plant Name	Plant Type	State Name	State Code
28	D01384CS1	1384	22				58		21,837	21,817	16	COOPER	Coal Steam	Kentucky	21
29	D01355C03	1355	21		51	99	68	52	38,104	38,070	17	E W BROWN	Coal Steam	Kentucky	21
30	D060182	6018	83				39		12,083		18	EAST BEND	Coal Steam	Kentucky	21
31	D01356C02	1356	93	71		88	50	59	25,646	25,623	19	GHENT	Coal Steam	Kentucky	21
32	D060411	6041	61						18,375		20	H L SPURLOCK	Coal Steam	Kentucky	21
33	D060412	6041	53		91			98	20,491	20,473	20	H L SPURLOCK	Coal Steam	Kentucky	21
34	D013644	1364			81				7,185		21	MILL CREEK	Coal Steam	Kentucky	21
35	D013782	1378					87		20,245		22	PARADISE	Coal Steam	Kentucky	21
36	D013783	1378	76	100	11	84	55	42	46,701	46,660	22	PARADISE	Coal Steam	Kentucky	21
37	D015074	1507	78						1,170		23	WILLIAM F WYMAN	O/G Steam	Maine	23
38	D006021	602	90		38			100	20,014	19,996	24	BRANDON SHORES	Coal Steam	Maryland	24
39	D006022	602	99		29			99	19,280	19,263	24	BRANDON SHORES	Coal Steam	Maryland	24
40	D015521	1552			63				17,782	17,767	25	C P CRANE	Coal Steam	Maryland	24
41	D015522	1552			68				14,274	14,262	25	C P CRANE	Coal Steam	Maryland	24
42	D01571CE2	1571	42	47	1	4	20	28	48,566	48,522	26	CHALK POINT	Coal Steam	Maryland	24
43	D01572C23	1572	73	79	47	45	69	32	32,188	32,159	27	DICKERSON	Coal Steam	Maryland	24
44	D015543	1554			77				10,084	10,075	28	HERBERT A WAGNER	O/G Steam	Maryland	24
45	D015731	1573	67	50	16	12	56	38	36,823	36,790	29	MORGANTOWN	Coal Steam	Maryland	24
46	D015732	1573	59	53	10	13	51	39	30,788	30,761	29	MORGANTOWN	Coal Steam	Maryland	24
47	D016191	1619	37	80					9,252	9,244	30	BRAYTON POINT	Coal Steam	Massachusetts	25
48	D016192	1619	35	66					8,889	8,881	30	BRAYTON POINT	Coal Steam	Massachusetts	25
49	D016193	1619	4	14	65	56	79		19,325	19,308	30	BRAYTON POINT	Coal Steam	Massachusetts	25
50	D015991	1599	5	36			65		13,014	13,002	31	CANAL	O/G Steam	Massachusetts	25
51	D015992	1599	7	27			74		8,980	8,971	31	CANAL	O/G Steam	Massachusetts	25
52	D016061	1606						48		5,249	32	MOUNT TOM	Coal Steam	Massachusetts	25
53	D016261	1626	85						3,430		33	SALEM HARBOR	Coal Steam	Massachusetts	25
54	D016263	1626	91	78					4,971	4,966	33	SALEM HARBOR	Coal Steam	Massachusetts	25

Row number	CEMS Unit	ORIS ID	Acadia MM5	Acadia VTDEC	Brig MM5	Brig VTDEC	Lye MM5	Lye VTDEC	MM5 2002 S02 TPY	VTDEC 2002 SO2 TPY		Plant Name	Plant Type	State Name	State Code
55	D016264	1626	32	25					2,880	2,878	33	SALEM HARBOR	O/G Steam	Massachusetts	25
56	D016138	1613	94						4,376		34	SOMERSET	Coal Steam	Massachusetts	25
57	D01702C09	1702						96		4,565	35	DAN E KARN	Coal Steam	Michigan	26
58	D01733C12	1733	49	24	80	80	45	22	46,081	46,040	36	MONROE	Coal Steam	Michigan	26
59	D01733C34	1733	27	26		76	26	27	39,362	39,327	36	MONROE	Coal Steam	Michigan	26
60	D017437	1743		91						15,805	37	ST CLAIR	Coal Steam	Michigan	26
61	D017459A	1745					76	61	18,341	18,324	38	TRENTON CHANNEL	Coal Steam	Michigan	26
62	D023641	2364	2	57					9,356	9,348	39	MERRIMACK	Coal Steam	New Hampshire	33
63	D023642	2364	1	17	99		28	87	19,453	19,435	39	MERRIMACK	Coal Steam	New Hampshire	33
64	D080021	8002	45	74					5,033	5,028	40	NEWINGTON	O/G Steam	New Hampshire	33
65	D023781	2378		81	2	15			9,747	9,738	41	B L ENGLAND	Coal Steam	New Jersey	34
66	D024032	2403	63	97	25	50	40	44	18,785	18,768	42	HUDSON	O/G Steam	New Jersey	34
67	D024081	2408			95				8,076		43	MERCER	Coal Steam	New Jersey	34
68	D024082	2408			60				5,675		43	MERCER	Coal Steam	New Jersey	34
69	D02549C01	2549		64	41		42	72	25,343	25,320	44	C R HUNTLEY	Coal Steam	New York	36
70	D02549C02	2549					99		12,317		44	C R HUNTLEY	Coal Steam	New York	36
71	D024804	2480					71		7,720		45	DANSKAMMER	O/G Steam	New York	36
72	D02554C03	2554	33	51	62		27	51	30,151	30,125	46	DUNKIRK	Coal Steam	New York	36
73	D02526C03	2526					78		14,929		47	WESTOVER	Coal Steam	New York	36
74	D025276	2527					80		12,650		48	GREENIDGE	Coal Steam	New York	36
75	D025163	2516			96				7,359		49	NORTHPORT	O/G Steam	New York	36
76	D025945	2594		76						1,747	50	OSWEGO	O/G Steam	New York	36
77	D02642CS2	2642					91		14,086		51	ROCHESTER 7	Coal Steam	New York	36
78	D080061	8006						93		3,817	52	ROSETON	O/G Steam	New York	36
79	D080062	8006						88		2,840	52	ROSETON	O/G Steam	New York	36
80	D080421	8042	13	12	18	5	10	34	57,820	57,769	53	BELEWS CREEK	Coal Steam	North Carolina	37
81	D080422	8042	23	15	32	10	15	49	45,296	45,256	53	BELEWS CREEK	Coal Steam	North Carolina	37
82	D027215	2721	98	45	87	39	97	85	19,145	19,128	54	CLIFFSIDE	Coal Steam	North Carolina	37
83	D027133	2713		61						14,460	55	L V SUTTON	Coal Steam	North Carolina	37

Row number	CEMS Unit	ORIS ID	Acadia MM5	Acadia VTDEC	Brig MM5	Brig VTDEC	Lye MM5	Lye VTDEC	MM5 2002 S02 TPY	VTDEC 2002 SO2 TPY		Plant Name	Plant Type	State Name	State Code
84	D027093	2709				97				9,390	56	LEE	Coal Steam	North Carolina	37
85	D027273	2727	100	40		48	75	84	26,329	26,305	57	MARSHALL	Coal Steam	North Carolina	37
86	D027274	2727	89	39	83	51	66	82	27,308	27,284	57	MARSHALL	Coal Steam	North Carolina	37
87	D06250C05	6250	60	59		35	37		27,395	27,371	58	MAYO	Coal Steam	North Carolina	37
88	D027121	2712				59			12,031	12,020	59	ROXBORO	Coal Steam	North Carolina	37
89	D027122	2712	82	41	54	23	94		29,337	29,310	59	ROXBORO	Coal Steam	North Carolina	37
90	D02712C03	2712	56	37	57	24	21	78	30,776	30,749	59	ROXBORO	Coal Steam	North Carolina	37
91	D02712C04	2712	88	72		47	47		22,962	22,941	59	ROXBORO	Coal Steam	North Carolina	37
92	D0283612	2836	55	20	48	89	29	35	41,432	41,395	60	AVON LAKE	Coal Steam	Ohio	39
93	D028281	2828	29	9	31	30	24	8	37,307	37,274	61	CARDINAL	Coal Steam	Ohio	39
94	D028282	2828						56	20,598	20,580	61	CARDINAL	Coal Steam	Ohio	39
95	D028283	2828						80		15,372	61	CARDINAL	Coal Steam	Ohio	39
96	D028404	2840	3	1	6	2	2	3	87,801	87,724	62	CONESVILLE	Coal Steam	Ohio	39
97	D02840C02	2840	84	73			81	63	22,791	22,771	62	CONESVILLE	Coal Steam	Ohio	39
98	D028375	2837		86	56		35	70	35,970	35,938	63	EASTLAKE	Coal Steam	Ohio	39
99	D081021	8102			23	71	59	95	18,207	18,191	64	GEN J M GAVIN	Coal Steam	Ohio	39
100	D081022	8102				78			12,333	12,322	64	GEN J M GAVIN	Coal Steam	Ohio	39
101	D028501	2850	36	67	39	53		45	30,798	30,771	65	J M STUART	Coal Steam	Ohio	39
102	D028502	2850	24	65	40	49	98	46	28,698	28,673	65	J M STUART	Coal Steam	Ohio	39
103	D028503	2850	26		72	62			27,968	27,944	65	J M STUART	Coal Steam	Ohio	39
104	D028504	2850	20	77	45	52	88	54	27,343	27,319	65	J M STUART	Coal Steam	Ohio	39
105	D060312	6031			67	77		90	19,517	19,500	66	KILLEN STATION	Coal Steam	Ohio	39
106	D02876C01	2876	40	7	3	9	30	10	72,593	72,529	67	KYGER CREEK	Coal Steam	Ohio	39
107	D028327	2832	65	28	59	22	48	20	46,991	46,950	68	MIAMI FORT	Coal Steam	Ohio	39
108	D02832C06	2832				60	43	64	23,694	23,673	68	MIAMI FORT	Coal Steam	Ohio	39
109	D028725	2872	74	92	78		90	36	30,079	30,052	69	MUSKINGUM RIVER	Coal Steam	Ohio	39
110	D02872C04	2872	6	19	13	6	19	15	83,134	83,060	69	MUSKINGUM RIVER	Coal Steam	Ohio	39
111	D02864C01	2864	70	56	61	63	49	24	35,193	35,162	70	R E BURGER	Coal Steam	Ohio	39

Row number	CEMS Unit	ORIS ID	Acadia MM5	Acadia VTDEC	Brig MM5	Brig VTDEC	Lye MM5	Lye VTDEC	MM5 2002 S02 TPY	VTDEC 2002 SO2 TPY		Plant Name	Plant Type	State Name	State Code
112	D07253C01	7253		89	58	57		33	30,977	30,949	71	RICHARD GORSUCH		Ohio	39
113	D028665	2866		82				53	19,796	19,779	72	W H SAMMIS	Coal Steam	Ohio	39
114	D028667	2866	57	16	42	41	41	16	33,601	33,572	72	W H SAMMIS	Coal Steam	Ohio	39
115	D02866C01	2866	97	54	93	96	92	30	24,649	24,627	72	W H SAMMIS	Coal Steam	Ohio	39
116	D02866C02	2866		69	92			50	26,022	25,999	72	W H SAMMIS	Coal Steam	Ohio	39
117	D02866M6A	2866		85				58	19,564	19,546	72	W H SAMMIS	Coal Steam	Ohio	39
118	D060191	6019		93		72		60		21,496	73	W H ZIMMER	Coal Steam	Ohio	39
119	D028306	2830	46	38	70	40	12	69	30,466	30,439	74	WALTER C BECKJORD	Coal Steam	Ohio	39
120	D031782	3178	77	63				81	16,484	16,469	75	ARMSTRONG	Coal Steam	Pennsylvania	42
121	D031403	3140	31	34	9	46	18	18	38,801	38,767	76	BRUNNER ISLAND	Coal Steam	Pennsylvania	42
122	D03140C12	3140	52	46	49	69	25	23	29,736	29,709	76	BRUNNER ISLAND	Coal Steam	Pennsylvania	42
123	D082261	8226	25	21	33	42	36	9	40,268	40,232	77	CHESWICK	Coal Steam	Pennsylvania	42
124	D03179C01	3179	16	10	5	8	5	4	79,635	79,565	78	HATFIELD'S FERRY	Coal Steam	Pennsylvania	42
125	D031221	3122	11	6	26	38	17	14	45,754	45,714	79	HOMER CITY	Coal Steam	Pennsylvania	42
126	D031222	3122	9	4	37	92	13	11	55,216	55,167	79	HOMER CITY	Coal Steam	Pennsylvania	42
127	D031361	3136	8	2	4	14	6	1	87,434	87,357	80	KEYSTONE	Coal Steam	Pennsylvania	42
128	D031362	3136	18	3	8	19	8	2	62,847	62,791	80	KEYSTONE	Coal Steam	Pennsylvania	42
129	D03148C12	3148			71		84		17,214		81	MARTINS CREEK	Coal Steam	Pennsylvania	42
130	D031491	3149	19	8	35	7	1	6	60,242	60,188	82	MONTOUR	Coal Steam	Pennsylvania	42
131	D031492	3149	15	5	21	20	3	5	50,276	50,232	82	MONTOUR	Coal Steam	Pennsylvania	42
132	D031131	3113			82				9,674		83	PORTLAND	Coal Steam	Pennsylvania	42
133	D031132	3113			36		93		14,294		83	PORTLAND	Coal Steam	Pennsylvania	42
134	D03131CS1	3131	54	31	79		32	65	22,344	22,324	84	SHAWVILLE	Coal Steam	Pennsylvania	42
135	D033193	3319				100				11,045	85	JEFFERIES	O/G Steam	South Carolina	45
136	D033194	3319		90		87				11,838	85	JEFFERIES	O/G Steam	South Carolina	45
137	D03297WT1	3297		68		61				17,671	86	WATEREE	Coal Steam	South Carolina	45
138	D03297WT2	3297		83		73				17,199	86	WATEREE	Coal Steam	South Carolina	45
139	D03298WL1	3298		35	94	37			25,170	25,148	87	WILLIAMS	Coal Steam	South Carolina	45

Row number	CEMS Unit	ORIS ID	Acadia MM5	Acadia VTDEC	Brig MM5	Brig VTDEC	Lye MM5	Lye VTDEC	MM5 2002 S02 TPY	VTDEC 2002 SO2 TPY		Plant Name	Plant Type	State Name	State Code
140	D062491	6249		58		82				17,920	88	WINYAH	Coal Steam	South Carolina	45
141	D03403C34	3403			85				20,314		89	GALLATIN	Coal Steam	Tennessee	47
142	D03405C34	3405	39						19,368		90	JOHN SEVIER	Coal Steam	Tennessee	47
143	D03406C10	3406	10	11	27	33	4	43	104,523	104,431	91	JOHNSONVILLE	Coal Steam	Tennessee	47
144	D03407C15	3407	64	87		66	67	76	37,308	37,274	92	KINGSTON	Coal Steam	Tennessee	47
145	D03407C69	3407	48	98		91	82	91	38,645	38,611	92	KINGSTON	Coal Steam	Tennessee	47
146	D038033	3803				55				9,493	93	CHESAPEAKE	Coal Steam	Virginia	51
147	D038034	3803		94		16				10,806	93	CHESAPEAKE	Coal Steam	Virginia	51
148	D037974	3797				90				9,293	94	CHESTERFIELD	Coal Steam	Virginia	51
149	D037975	3797		88	44	27	86		19,620	19,602	94	CHESTERFIELD	Coal Steam	Virginia	51
150	D037976	3797	66	18	7	3	34	66	40,570	40,534	94	CHESTERFIELD	Coal Steam	Virginia	51
151	D03775C02	3775	47						16,674		95	CLINCH RIVER	Coal Steam	Virginia	51
152	D038093	3809		52	64	29			10,477	10,468	96	YORKTOWN	Coal Steam	Virginia	51
153	D03809CS0	3809	96	43	19	17	62		21,219	21,201	96	YORKTOWN	Coal Steam	Virginia	51
154	D039423	3942						79		10,126	97	ALBRIGHT	Coal Steam	West Virginia	54
155	D039431	3943	51	23	20	32	16	13	42,385	42,348	97	FORT MARTIN	Coal Steam	West Virginia	54
156	D039432	3943	50	22	22	31	14	12	45,850	45,809	97	FORT MARTIN	Coal Steam	West Virginia	54
157	D039353	3935	41	33	28	11	64	26	42,212	42,174	98	JOHN E AMOS	Coal Steam	West Virginia	54
158	D03935C02	3935	17	42	43	1	11	21	63,066	63,010	98	JOHN E AMOS	Coal Steam	West Virginia	54
159	D03947C03	3947	86	62	55		57	25	38,575	38,541	99	KAMMER	Coal Steam	West Virginia	54
160	D03936C02	3936				98			15,480	15,467	100	KANAWHA RIVER	Coal Steam	West Virginia	54
161	D03948C02	3948	58	13	17	36	9	7	55,405	55,356	101	MITCHELL	Coal Steam	West Virginia	54
162	D062641	6264	75	49	50	18	77	40	42,757	42,719	102	MOUNTAINEER	Coal Steam	West Virginia	54
163	D03954CS0	3954	68		24	25	23	67	20,130	20,112	103	MT STORM	Coal Steam	West Virginia	54
164	D0393851	3938				79		97	12,948	12,936	104	PHILIP SPORN	Coal Steam	West Virginia	54
165	D03938C04	3938				94			26,451	26,427	104	PHILIP SPORN	Coal Steam	West Virginia	54
166	D060041	6004			66		83	31	21,581	21,562	105	PLEASANTS	Coal Steam	West Virginia	54
167	D060042	6004			88			92	20,550	20,532	105	PLEASANTS	Coal Steam	West Virginia	54

APPENDIX D-3

FUTURE YEAR ELECTRICITY GENERATING SECTOR EMISSION INVENTORY DEVELOPMENT USING THE INTEGRATED PLANNING MODEL (IPM®) IN SUPPORT OF FINE PARTICULATE MASS AND VISIBILITY MODELING IN THE VISTAS AND MIDWEST RPO REGIONS

Bureau of Air Quality
Department of Environmental Protection

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Final Report

Future Year Electricity Generating Sector Emission Inventory Development Using the Integrated Planning Model (IPM®) in Support of Fine Particulate Mass and Visibility Modeling in the VISTAS and Midwest RPO Regions

Prepared for

Visibility Improvement State and Tribal Association of the Southeast (VISTAS)

Prepared by

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April 2005

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A. Overview

In order to model regional haze, visibility and other air quality issues, Visibility Improvement State and Tribal Association of the Southeast (VISTAS) awarded a contract to ICF Resources, L.L.C. (ICF) in August 2004, seeking ICF's services to generate future year emission inventory for the electric generating sector of the contiguous United States using the Integrated Planning Model (IPM®).

IPM is a dynamic linear optimization model that can be used to examine air pollution control policies for various pollutants throughout the contiguous U.S. for the entire electric power system. The dynamic nature of IPM enables the projection of the behavior of the power system over a specified future period. The optimization logic determines the least-cost means of meeting electric generation and capacity requirements while complying with specified constraints including air pollution regulations, transmission bottlenecks, and plant-specific operational constraints. The versatility of IPM allows users to specify which constraints to exercise and populate IPM with their own datasets.

This report summarizes the analysis that ICF has performed in generating the future year electricity generating sector emission inventory by using IPM (hereafter, the analysis is referred to as the VISTAS analysis). The model assumptions and data used in this analysis are presented in Section B and the Appendix. The results are presented in Section C and the analysis limitations are presented in Section D.

Since the modeling is based on the EPA's prior analyses for which detailed public documentation is available, we have summarized only the incremental changes that were proposed by VISTAS and MRPO as part of this analysis. For detailed documentation on EPA's prior modeling using IPM, please visit www.epa.gov/airmarkets/epa-ipm.

B. Modeling Assumptions

The VISTAS analysis is based on the USEPA Modeling Applications Using IPM (V.2.1.6). As per the analytical needs of VISTAS and MRPO, the following changes were made to the underlying assumptions in the US EPA Base Case (V2.1.6) in this analysis:

i) The underlying database in the VISTAS analysis is US EPA's National Electric Energy Data System (NEEDS[1]) NODA Database, with changes based upon the comments and technical directions from VISTAS and MRPO's stakeholders. The changes focused on existing installations of NO_x, SO_2 and particulate matter (PM) controls, NO_x emission rates, SO_2 emission limits, capacity of existing units, heat rate and unit identifications of selected units in the VISTAS and MRPO regions. These changes are summarized in detail in Appendix 1.

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[1] The NEEDS database contains the existing and planned/committed unit data in EPA modeling applications of IPM. NEEDS includes basic geographic, operating, air emissions, and other data on these generating units. For data sources underlying NEEDS and description of fields as well as the documentation on EPA Modeling Applications Using IPM (V.2.1.6), please visit website http://www.epa.gov/airmarkets/epa-ipm/index.html

ii) The analysis covers the period between 2007 and 2030. To make the model size and run time tractable, IPM is run for a number of selected years within the study horizon known as run years. Each run year represents several calendar years in the study horizon, and all calendar years within the study horizon are mapped to their representative run years. Although results are only reported for the run years, IPM takes into account all years in the study horizon while developing the projections. Table 1 summarizes the mapping between the run years and the calendar years. Model results are available for all run years; the last run year (2026) results are, however, not recommended to be used because of end-year effects.

Table 1: IPM Run Years

Run Year	Calendar Years
2007	2007-2007
2009	2008-2009
2010	2010-2012
2015	2013-2017
2018	2018-2018
2020	2019-2022
2026	2023-2030

iii) The Duke Power and Progress Energy SO_2 and NO_x control technology investment strategies for complying with North Carolina's Clean Smokestacks Rule were explicitly hardwired in the analysis.

iv) The CAIR rule implemented as part of this analysis is broadly consistent with the Environmental Protection Agency 40 CFR Parts 51, et al. Supplemental Proposal for the Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule), proposed on June 10, 2004. Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin are the states affected by the CAIR SO_2 and the CAIR annual NO_x policies starting 2010. Connecticut is affected by an ozone season NO_x policy. The CAIR plants affected by the annual NO_x policy are capped at 1.6 million tons starting 2010 and 1.33 million tons starting 2015. The power plants affected by the CAIR SO_2 policy have to surrender 2 Title IV SO_2 allowances for every ton of SO_2 emitted starting 2010 and 3 Title IV SO_2 allowances for every ton of SO_2 emitted starting 2015.

C. Analysis Results

ICF ran IPM under two future scenarios – Base Case and CAIR Case. The Base Case represents the current operation of the power system under currently known laws and regulations, including those that come into force in the study horizon. The CAIR Case is the Base Case with the proposed CAIR rule superimposed. The run results were parsed at the unit level for the 2009 and 2018 run years. Appendix 2 summarizes the SO_2 and NO_x emission results on a state level. The following paragraphs discuss the results from the two runs.

1. Emissions

Table 2 presents the emissions from the Base Case and the CAIR Case in the VISTAS analysis.

Table 2: SO_2 and NO_x Emissions from the Electric Power Sector (Million Tons)

		Base Case		CAIR Case	
		2009	**2018**	**2009**	**2018**
CAIR Affected Region	**SO_2**	9.1	8.2	5.3	4.1
	NO_x*	2.9	3.0	2.8	1.4
VISTAS States	**SO_2**	3.44	2.96	2.28	1.42
	NO_x	1.09	1.09	1.07	0.44
Midwest RPO States	**SO_2**	3.05	2.61	1.51	1.33
	NO_x	0.83	0.88	0.83	0.34

*Note: Excludes Connecticut

In the CAIR region, compared with the Base Case, SO_2 emissions would be reduced by 3.8 million tons in 2009 and by 4.1 million tons in 2018. The NO_x emissions would be cut by 1.6 million tons annually in 2018, compared with the Base Case.

Total projected state-level emissions for SO_2 and NO_x for both the Base Case and the CAIR Case are included in Tables A11, A12, A13, and A14 in the Appendix.

2. Projected Costs

For the proposed CAIR region, the analysis projects the annualized incremental cost for the US to be $2.1 billion in 2009 and $3.6 billion in 2018. This represents a 3.3% increase in production cost in 2009 and a 4.6% increase in 2018 over the base case. The production cost as projected by IPM includes the capital costs of new investment decisions, fuel costs and the operation and maintenance costs of power plants. The marginal costs of emission reductions (allowance prices) in the CAIR case are shown in Table 3.

Table 3: Marginal Costs of Emission Reductions in CAIR Case (1999 $)

		2009	2018
Marginal Cost ($/ton)	SO_2	700	1,100
	NO_x	1,500	1,700

3. Projected Control Technology Retrofits

In the VISTAS analysis, the proposed CAIR policy requires the installation of an additional 67 GW of SO_2 scrubbers and an additional 35 GW of selective catalytic reduction (SCR) on existing coal capacity by 2018 (see Table 4). The pool of existing SCR's that are used during the ozone season in the NO_x SIP call region in the Base Case are allowed to operate year-round in the CAIR Case.

Table 4: Pollution Control Installations by Technology in 2018 (GW)

Technology	Base Case (Cumulative)	CAIR Case (Cumulative)
Scrubber	19	86
SCR	33	67

4. Projected Generation Mix

Table 5 shows the generation mix under the proposed CAIR policy. Coal-fired generation and natural gas-fired generation are projected to remain relatively unchanged due to the phased-in nature of the proposed CAIR.

Relative to the Base Case, in 2009, 2.7 GW of coal-fired capacity is projected to be uneconomic to maintain (approximately 1%) and 90 MW of coal-fired capacity is projected to repower to natural gas in the CAIR Case.

Table 5: National Generation Mix (BkWh's)

Generating Fuel Use	2009		2018	
	Base Case	CAIR Case	Base Case	CAIR Case
Coal	2,115	2,072	2,219	2,154
Oil/Natural Gas	821	862	1,301	1,364
Other	1,197	1,197	1,196	1,194

5. Projected Coal Production for the Electric Power Sector

Coal production for electricity generation is expected to increase with or without the proposed CAIR (Table 6). The reductions in emissions from the power sector will be met through the installation of pollution controls for SO_2 and NO_x.

Table 6: Coal Production in the Electric Power Sector (Million Tons)

Supply Area	2009		2018	
	Base Case	CAIR Case	Base Case	CAIR Case
Appalachia	327	296	297	306
Interior	182	184	189	212
West	528	545	611	550
National	1,038	1,025	1,096	1,067

6. Projected Retail Electricity Prices

National average retail electricity prices in the CAIR Case are projected to increase 2.4 percent in 2009 and 1.6 percent in 2018. Table 7 and Table 8 summarize the national and regional level retail electricity prices. These estimates were developed using the Retail Electricity Price Model.

Table 7: National Average Retail Electricity Prices (1999 Mills/kWh)

	Base Case	CAIR Case	Percent Change
2009	59.4	60.9	2.4%
2018	63.2	64.3	1.6%

Source: Retail Electricity Price Model as documented in http://www.epa.gov/clearskies/tech_sectiong.pdf

Retail electricity prices by NERC region are in Table 8

Table 8: Retail Electricity Prices by NERC Region (1999 Mills/kWh)

Power Region	Primary States Included	Base Case		CAIR Case	
		2009	2018	2009	2018
ECAR	OH,MI,IN,KY,WV,PA	51.3	56.7	53.8	58.7
ERCOT	TX	53.0	65.0	54.8	65.3
MAAC	PA,NJ,MD,DC,DE	56.9	69.3	59.5	71.6
MAIN	IL,MO,WI	51.9	60.3	53.6	61.7
MAPP	MN,IA,SD,ND,NE	54.6	49.4	54.7	49.8
NY	NY	80.0	88.1	81.8	89.6
NE	VT,NH,ME,MA,CT,RI	73.8	82.8	75.4	83.5
FRCC	FL	70.8	68.8	71.7	69.6
STV	VA,NC,SC,GA,AL,MS,TN,AR,LA	56.4	54.1	57.4	55.3
SPP	KS,OK,MO	52.8	57.4	53.7	58.0
PNW	WA,OR,ID	50.1	48.0	50.6	48.0
RM	MT,WY,CO,UT,NM,AZ,NV,ID	61.5	65.1	62.1	65.2
CALI	CA	96.8	98.2	97.6	98.3

Source: Retail Electricity Price Model as documented in http://www.epa.gov/clearskies/tech_sectiong.pdf

7. Projected Fuel Price Impacts

The impacts of the CAIR on mine mouth coal prices and natural gas prices at the Henry Hub are summarized in Table 9.

Table 9: Average Coal Mine Mouth and Henry Hub Natural Gas Prices (1999$/MMBtu)

Fuel	Base Case		CAIR Case	
	2009	2018	2009	2018
Coal	0.62	0.55	0.60	0.55
Natural Gas	2.77	2.97	2.9	2.99

D. Limitations of Analysis

VISTAS modeling using IPM is based on various economic and engineering input assumptions that are inherently uncertain, such as assumptions for future fuel prices, electricity demand growth and the cost and performance of control technologies. As configured, IPM does not take into account demand response (i.e., consumer reaction to changes in electricity prices).

E. Appendix

1. Changes made to the NEEDS NODA Database for the VISTAS Analysis

NEEDS NODA is the most recent version of the NEEDS database that EPA has made public. It contains existing and planned/committed generation unit data in the contiguous United States. In Appendix 1, the changes suggested by VISTAS and MRPO stakeholders are presented side by side against the values in the original NEEDS NODA for comparison. For description of the items changed, please visit website http://www.epa.gov/airmarkets/epa-ipm/index.html.

Table A1 Changes made to NO_x Post Combustion Control Installations on Existing Units

Plant Name	Unique ID	Post Combustion NO_x Control (NEEDS NODA)	Post Combustion NO_x Control (VISTAS)	Data Source*
ASHEVILLE	2706_B_1	SNCR	None	Progress Energy **
BARRY	3_B_1	SNCR	None	Southern Company
BARRY	3_B_2	SNCR	None	Southern Company
BARRY	3_B_3	SNCR	None	Southern Company
BARRY	3_B_4	SNCR	None	Southern Company
Barry	3_G_A1	None	SCR	Southern Company
Barry	3_G_A2ST	None	SCR	Southern Company
MT STORM	3954_B_3	None	SCR	NC-WV-SC
PLEASANTS	6004_B_1	None	SCR	NC-WV-SC
PLEASANTS	6004_B_2	None	SCR	NC-WV-SC
Victor J Daniel Jr	6073_G_3	None	SCR	Southern Company
Victor J Daniel Jr	6073_G_3CT	None	SCR	Southern Company
Victor J Daniel Jr	6073_G_4CT	None	SCR	Southern Company

* Data Source shows the names of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

** Progress Energy Compliance Plan for NC Clean Smokestacks Rule shows the existing NO_x control as AEFLGR and not SNCR.

Table A2 Changes made to NO_x Emission Rates (lbs/MMBtu)

Plant Name	Unique ID	Mode1 Rate** (VISTAS)	Mode2 Rate** (VISTAS)	Mode3 Rate** (VISTAS)	Mode4 Rate** (VISTAS)	Data Source*
GREENE COUNTY	10_B_1	0.718	0.718	0.468	0.468	Southern Company
GREENE COUNTY	10_B_2	0.416	0.416	0.380	0.380	Southern Company
Greene County	10_G_GT10	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT2	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT3	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT4	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT5	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT6	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT7	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT8	0.090	0.090	0.090	0.090	Southern Company
Greene County	10_G_GT9	0.090	0.090	0.090	0.090	Southern Company
CROSS	130_B_1	0.100	0.100	0.100	0.100	SC
CROSS	130_B_2	0.100	0.100	0.100	0.100	SC
EATON	2046_B_1	0.280	0.280	0.280	0.280	Southern Company
EATON	2046_B_2	0.280	0.280	0.280	0.280	Southern Company
EATON	2046_B_3	0.280	0.280	0.280	0.280	Southern Company
Chevron Oil	2047_G_1	0.320	0.320	0.320	0.320	Southern Company
Chevron Oil	2047_G_2	0.320	0.320	0.320	0.320	Southern Company
Chevron Oil	2047_G_3	0.320	0.320	0.320	0.320	Southern Company
Chevron Oil	2047_G_4	0.320	0.320	0.320	0.320	Southern Company
Chevron Oil	2047_G_5	0.064	0.064	0.064	0.064	Southern Company
SWEATT	2048_B_1	0.280	0.280	0.280	0.280	Southern Company
SWEATT	2048_B_2	0.280	0.280	0.280	0.280	Southern Company
Sweatt	2048_G_A	0.320	0.320	0.320	0.320	Southern Company
JACK WATSON	2049_B_1	0.280	0.280	0.280	0.280	Southern Company
JACK WATSON	2049_B_2	0.280	0.280	0.280	0.280	Southern Company
JACK WATSON	2049_B_3	0.280	0.280	0.280	0.280	Southern Company
JACK WATSON	2049_B_4	0.470	0.470	0.415	0.415	Southern Company
JACK WATSON	2049_B_5	0.590	0.590	0.415	0.415	Southern Company
Jack Watson	2049_G_A	0.880	0.880	0.880	0.880	Southern Company
E C GASTON	26_B_1	0.473	0.473	0.473	0.473	Southern Company
E C GASTON	26_B_2	0.473	0.473	0.473	0.473	Southern Company
E C GASTON	26_B_3	0.457	0.457	0.457	0.457	Southern Company
E C GASTON	26_B_4	0.457	0.457	0.457	0.457	Southern Company
E C GASTON	26_B_5	0.429	0.060	0.429	0.060	Southern Company
E C Gaston	26_G_GT4	0.880	0.880	0.880	0.880	Southern Company
ASHEVILLE	2706_B_1	0.491	0.319	0.491	0.319	-
CLIFFSIDE	2721_B_5	0.294	0.070	0.294	0.070	NC-WV-SC
BARRY	3_B_1	0.500	0.500	0.500	0.500	Southern Company
BARRY	3_B_2	0.500	0.500	0.500	0.500	Southern Company
BARRY	3_B_3	0.300	0.300	0.300	0.300	Southern Company
BARRY	3_B_4	0.290	0.290	0.290	0.290	Southern Company
BARRY	3_B_5	0.380	0.380	0.380	0.380	Southern Company
Barry	3_G_A1	0.013	0.013	0.013	0.013	Southern Company
Barry	3_G_A1CT	0.013	0.013	0.013	0.013	Southern Company
Barry	3_G_A1ST	0.013	0.013	0.013	0.013	Southern Company
Barry	3_G_A2C1	0.013	0.013	0.013	0.013	Southern Company
Barry	3_G_A2C2	0.013	0.013	0.013	0.013	Southern Company
Barry	3_G_A2ST	0.013	0.013	0.013	0.013	Southern Company
W S LEE	3264_B_1	0.393	0.393	0.250	0.250	NC-WV-SC
W S LEE	3264_B_2	0.415	0.415	0.250	0.250	NC-WV-SC
W S Lee	3264_G_4	0.320	0.320	0.320	0.320	SC
W S Lee	3264_G_5	0.320	0.320	0.320	0.320	SC
W S Lee	3264_G_6	0.320	0.320	0.320	0.320	SC
MCMEEKIN	3287_B_MC	0.350	0.350	0.350	0.350	SC

Plant Name	Unique ID	Mode1 Rate** (VISTAS)	Mode2 Rate** (VISTAS)	Mode3 Rate** (VISTAS)	Mode4 Rate** (VISTAS)	Data Source*
	M1					
MCMEEKIN	3287_B_MCM2	0.350	0.350	0.350	0.350	SC
MT STORM	3954_B_3	0.604	0.060	0.604	0.060	NC-WV-SC
JAMES H MILLER JR	6002_B_1	0.275	0.060	0.275	0.060	Southern Company
JAMES H MILLER JR	6002_B_2	0.247	0.060	0.247	0.060	Southern Company
JAMES H MILLER JR	6002_B_3	0.306	0.070	0.306	0.070	Southern Company
JAMES H MILLER JR	6002_B_4	0.275	0.070	0.275	0.070	Southern Company
PLEASANTS	6004_B_1	0.302	0.060	0.302	0.060	NC-WV-SC
PLEASANTS	6004_B_2	0.335	0.060	0.335	0.060	NC-WV-SC
WANSLEY	6052_B_1	0.405	0.070	0.405	0.070	Southern Company
WANSLEY	6052_B_2	0.390	0.070	0.390	0.070	Southern Company
Wansley	6052_G_5A	0.880	0.880	0.880	0.880	Southern Company
VICTOR J DANIEL JR.	6073_B_1	0.310	0.310	0.310	0.310	Southern Company
VICTOR J DANIEL JR.	6073_B_2	0.350	0.350	0.350	0.350	Southern Company
Victor J Daniel Jr	6073_G_3	0.013	0.013	0.013	0.013	Southern Company
Victor J Daniel Jr	6073_G_3CT	0.013	0.013	0.013	0.013	Southern Company
Victor J Daniel Jr	6073_G_3ST	0.013	0.013	0.013	0.013	Southern Company
Victor J Daniel Jr	6073_G_4	0.013	0.013	0.013	0.013	Southern Company
Victor J Daniel Jr	6073_G_4CT	0.013	0.013	0.013	0.013	Southern Company
Victor J Daniel Jr	6073_G_4ST	0.013	0.013	0.013	0.013	Southern Company
MCINTOSH	6124_B_1	0.613	0.613	0.410	0.410	Southern Company
McIntosh	6124_G_CT1	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT2	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT3	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT4	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT5	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT6	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT7	0.090	0.090	0.090	0.090	Southern Company
McIntosh	6124_G_CT8	0.090	0.090	0.090	0.090	Southern Company
WINYAH	6249_B_1	0.100	0.100	0.100	0.100	SC
WINYAH	6249_B_2	0.120	0.120	0.120	0.120	SC
WINYAH	6249_B_3	0.120	0.120	0.120	0.120	SC
WINYAH	6249_B_4	0.120	0.120	0.120	0.120	SC
SCHERER	6257_B_1	0.450	0.450	0.150	0.150	Southern Company
SCHERER	6257_B_2	0.450	0.450	0.150	0.150	Southern Company
SCHERER	6257_B_3	0.300	0.300	0.150	0.150	Southern Company
SCHERER	6257_B_4	0.300	0.300	0.150	0.150	Southern Company
Wilson	6258_G_5A	0.880	0.880	0.880	0.880	Southern Company
Wilson	6258_G_5B	0.880	0.880	0.880	0.880	Southern Company
Wilson	6258_G_5C	0.880	0.880	0.880	0.880	Southern Company
Wilson	6258_G_5D	0.880	0.880	0.880	0.880	Southern Company
Wilson	6258_G_5E	0.880	0.880	0.880	0.880	Southern Company
Wilson	6258_G_5F	0.880	0.880	0.880	0.880	Southern Company
Wilson	6258_G_IC1	0.880	0.880	0.880	0.880	Southern Company
CRIST	641_B_2	0.280	0.280	0.280	0.280	Southern Company
CRIST	641_B_3	0.280	0.280	0.280	0.280	Southern Company
CRIST	641_B_4	0.400	0.400	0.240	0.240	Southern Company

Plant Name	Unique ID	Mode1 Rate** (VISTAS)	Mode2 Rate** (VISTAS)	Mode3 Rate** (VISTAS)	Mode4 Rate** (VISTAS)	Data Source*
CRIST	641_B_5	0.400	0.400	0.240	0.240	Southern Company
CRIST	641_B_7	0.482	0.060	0.482	0.060	Southern Company
SCHOLZ	642_B_1	0.540	0.540	0.320	0.320	Southern Company
SCHOLZ	642_B_2	0.570	0.570	0.320	0.320	Southern Company
SMITH	643_B_1	0.490	0.490	0.240	0.240	Southern Company
SMITH	643_B_2	0.410	0.410	0.410	0.410	Southern Company
Lansing Smith	643_G_CT1	0.880	0.880	0.880	0.880	Southern Company
GADSDEN	7_B_1	0.544	0.544	0.544	0.544	Southern Company
GADSDEN	7_B_2	0.544	0.544	0.544	0.544	Southern Company
Atkinson	700_G_5A	0.320	0.320	0.320	0.320	Southern Company
Atkinson	700_G_5B	0.320	0.320	0.320	0.320	Southern Company
BOWEN	703_B_1BLR	0.405	0.070	0.405	0.070	Southern Company
BOWEN	703_B_2BLR	0.405	0.070	0.405	0.070	Southern Company
BOWEN	703_B_3BLR	0.409	0.070	0.409	0.070	Southern Company
BOWEN	703_B_4BLR	0.419	0.070	0.419	0.070	Southern Company
Bowen	703_G_6	0.880	0.880	0.880	0.880	Southern Company
HAMMOND	708_B_1	0.800	0.800	0.410	0.410	Southern Company
HAMMOND	708_B_2	0.800	0.800	0.410	0.410	Southern Company
HAMMOND	708_B_3	0.800	0.800	0.410	0.410	Southern Company
HAMMOND	708_B_4	0.404	0.070	0.404	0.070	Southern Company
HARLLEE BRANCH	709_B_1	0.800	0.800	0.519	0.519	Southern Company
HARLLEE BRANCH	709_B_2	0.800	0.800	0.374	0.374	Southern Company
HARLLEE BRANCH	709_B_3	0.800	0.800	0.381	0.381	Southern Company
HARLLEE BRANCH	709_B_4	0.800	0.800	0.381	0.381	Southern Company
JACK MCDONOUGH	710_B_MB1	0.450	0.450	0.230	0.230	Southern Company
JACK MCDONOUGH	710_B_MB2	0.450	0.450	0.230	0.230	Southern Company
Jack McDonough	710_G_3A	0.320	0.320	0.320	0.320	Southern Company
Jack McDonough	710_G_3B	0.320	0.320	0.320	0.320	Southern Company
MCMANUS	715_B_1	0.310	0.310	0.310	0.310	Southern Company
MCMANUS	715_B_2	0.310	0.310	0.310	0.310	Southern Company
McManus	715_G_3A	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_3B	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_3C	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_4A	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_4B	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_4C	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_4D	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_4E	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_4F	0.880	0.880	0.880	0.880	Southern Company
McManus	715_G_IC1	3.200	3.200	3.200	3.200	Southern Company
MITCHELL	727_B_3	0.625	0.625	0.625	0.625	Southern Company
Mitchell	727_G_4A	0.880	0.880	0.880	0.880	Southern Company
Mitchell	727_G_4B	0.880	0.880	0.880	0.880	Southern Company
Mitchell	727_G_4C	0.880	0.880	0.880	0.880	Southern Company

* Data Source shows the names of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories. “SC” reflects the spreadsheet CopyofSCIPMdata.xls. Rate changes include VISTAS interpretation of stakeholder submitted data.

**

Mode 1 Rate (Uncontrolled Base Rate) – This emission rate reflects current configuration of combustion controls. If a post combustion NO_x control such as a SCR or a SNCR exists, it is assumed that it is not operating.

Mode 2 Rate (Controlled Base Rate) – This emission rate reflects current configuration of combustion controls. If a post combustion NO_x control such as a SCR or a SNCR exists, it is assumed that it is operating.

Mode 3 Rate (Uncontrolled Policy Rate) – This emission rate reflects a state of the art configuration of combustion controls. If a post combustion NO_x control such as a SCR or a SNCR exists, it is assumed that it is not operating.
Mode 4 Rate (Controlled Policy Rate) – This emission rate reflects a state of the art configuration of combustion controls. If a post combustion NO_x control such as a SCR or a SNCR exists, it is assumed that it is operating.

For more details on the development of these rates please refer to http://www.epa.gov/airmarkets/epa-ipm/section3powsysop.pdf

Table A3 Changes made to SO_2 Scrubber Installations on Existing Units

Plant Name	Unique ID	Wet/DryScrubber (NEEDS NODA)	Wet/DryScrubber (VISTAS)	Data Source*
NORTH BRANCH POWER STATION	7537_B_1A	Dry Scrubber	-	NC-WV-SC
NORTH BRANCH POWER STATION	7537_B_1B	Dry Scrubber	-	NC-WV-SC
Morgantown Energy Facility	10743_G_GEN1	Dry Scrubber	-	NC-WV-SC

* Data Source shows the name of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

Table A4 Changes made to SO_2 Emission Rate Limits (lbs/MMBtu)

Plant Name	Unique ID	SO_2 Rate (NEEDS NODA)	SO_2 Rate (VISTAS)	Data Source*
GREENE COUNTY	10_B_1	4.000	1.197	Southern Company
GREENE COUNTY	10_B_2	4.000	1.197	Southern Company
EATON	2046_B_1	4.800	0.001	Southern Company
EATON	2046_B_2	4.800	0.001	Southern Company
EATON	2046_B_3	4.800	0.001	Southern Company
SWEATT	2048_B_1	4.800	0.001	Southern Company
SWEATT	2048_B_2	4.800	0.001	Southern Company
JACK WATSON	2049_B_1	4.800	0.001	Southern Company
JACK WATSON	2049_B_2	4.800	0.001	Southern Company
JACK WATSON	2049_B_3	4.800	0.001	Southern Company
JACK WATSON	2049_B_4	4.800	0.885	Southern Company
JACK WATSON	2049_B_5	4.800	0.885	Southern Company
E C GASTON	26_B_1	3.800	1.667	Southern Company
E C GASTON	26_B_2	3.800	1.667	Southern Company
E C GASTON	26_B_3	3.800	1.667	Southern Company
E C GASTON	26_B_4	3.800	1.667	Southern Company
E C GASTON	26_B_5	3.800	1.667	Southern Company
BUCK	2720_B_5	2.300	1.630	NC-WV-SC
BUCK	2720_B_6	2.300	1.630	NC-WV-SC
BUCK	2720_B_7	2.300	1.630	NC-WV-SC
BUCK	2720_B_8	2.300	1.630	NC-WV-SC
BUCK	2720_B_9	2.300	1.630	NC-WV-SC
CLIFFSIDE	2721_B_1	2.300	2.200	NC-WV-SC
CLIFFSIDE	2721_B_2	2.300	2.200	NC-WV-SC
CLIFFSIDE	2721_B_3	2.300	2.200	NC-WV-SC
CLIFFSIDE	2721_B_4	2.300	2.200	NC-WV-SC
CLIFFSIDE	2721_B_5	2.300	2.200	NC-WV-SC
DAN RIVER	2723_B_1	2.300	1.810	NC-WV-SC
DAN RIVER	2723_B_2	2.300	1.810	NC-WV-SC
DAN RIVER	2723_B_3	2.300	1.810	NC-WV-SC
BARRY	3_B_1	1.800	1.197	Southern Company
BARRY	3_B_2	1.800	1.197	Southern Company
BARRY	3_B_3	1.800	1.197	Southern Company
BARRY	3_B_4	1.800	1.197	Southern Company
BARRY	3_B_5	1.800	1.197	Southern Company
JAMES H MILLER JR	6002_B_1	1.800	0.795	Southern Company
JAMES H MILLER JR	6002_B_2	1.800	0.795	Southern Company
JAMES H MILLER JR	6002_B_3	1.800	0.795	Southern Company
JAMES H MILLER JR	6002_B_4	1.800	0.795	Southern Company
VICTOR J DANIEL JR.	6073_B_1	4.800	0.885	Southern Company
VICTOR J DANIEL JR.	6073_B_2	4.800	0.885	Southern Company
SCHERER	6257_B_1	1.200	0.796	Southern Company
SCHERER	6257_B_2	1.200	0.796	Southern Company
SCHERER	6257_B_3	1.200	0.796	Southern Company
SCHERER	6257_B_4	1.200	0.796	Southern Company
CRIST	641_B_2	0.740	0.001	Southern Company

Plant Name	Unique ID	SO_2 Rate (NEEDS NODA)	SO_2 Rate (VISTAS)	Data Source*
CRIST	641_B_3	0.740	0.001	Southern Company
CRIST	641_B_4	5.900	1.197	Southern Company
CRIST	641_B_5	5.900	1.197	Southern Company
CRIST	641_B_6	5.900	1.197	Southern Company
CRIST	641_B_7	5.900	1.197	Southern Company
SCHOLZ	642_B_1	6.170	1.200	Southern Company
SCHOLZ	642_B_2	6.170	1.200	Southern Company
SMITH	643_B_1	6.170	1.197	Southern Company
SMITH	643_B_2	6.170	1.197	Southern Company
GADSDEN	7_B_1	4.000	2.500	Southern Company
GADSDEN	7_B_2	4.000	2.500	Southern Company
BOWEN	703_B_1BLR	4.580	1.667	Southern Company
HAMMOND	708_B_1	4.580	1.667	Southern Company
HAMMOND	708_B_2	4.580	1.667	Southern Company
HAMMOND	708_B_3	4.580	1.667	Southern Company
HAMMOND	708_B_4	4.580	1.667	Southern Company
HARLLEE BRANCH	709_B_1	4.580	1.667	Southern Company
HARLLEE BRANCH	709_B_2	4.580	1.667	Southern Company
HARLLEE BRANCH	709_B_3	4.580	1.667	Southern Company
HARLLEE BRANCH	709_B_4	4.580	1.667	Southern Company
JACK MCDONOUGH	710_B_MB1	4.580	1.667	Southern Company
JACK MCDONOUGH	710_B_MB2	4.580	1.667	Southern Company
MCMANUS	715_B_1	3.159	2.620	Southern Company
MCMANUS	715_B_2	3.159	2.620	Southern Company
MITCHELL	727_B_3	4.580	2.500	Southern Company
YATES	728_B_Y2BR	4.580	1.667	Southern Company
YATES	728_B_Y3BR	4.580	1.667	Southern Company
YATES	728_B_Y4BR	4.580	1.667	Southern Company
YATES	728_B_Y5BR	4.580	1.667	Southern Company
KRAFT	733_B_1	4.580	1.270	Southern Company
KRAFT	733_B_2	4.580	1.270	Southern Company
KRAFT	733_B_3	4.580	1.270	Southern Company
KRAFT	733_B_4	0.800	0.001	Southern Company
RIVERSIDE	734_B_11	2.632	0.001	Southern Company
RIVERSIDE	734_B_12	3.159	0.001	Southern Company
RIVERSIDE	734_B_4	2.632	0.001	Southern Company
RIVERSIDE	734_B_5	2.632	0.001	Southern Company
RIVERSIDE	734_B_6	2.632	0.001	Southern Company
GORGAS	8_B_10	4.000	1.667	Southern Company
GORGAS	8_B_6	4.000	2.500	Southern Company
GORGAS	8_B_7	4.000	2.500	Southern Company
GORGAS	8_B_8	4.000	1.667	Southern Company
GORGAS	8_B_9	4.000	1.667	Southern Company

- Data Source shows the names of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

Table A5 Changes made to Particulate Matter (PM) Control Installations on Existing Units

Plant Name	Unique ID	PM Control (NEEDS NODA)	PM Control (VISTAS)	Data Sources *
G G ALLEN	2718_B_3	Hot-side ESP	Cold-side ESP	NC-WV-SC
G G ALLEN	2718_B_5	Hot-side ESP	Cold-side ESP	NC-WV-SC
WESTON	4078_B_3	Hot-side ESP + Fabric Filter	Fabric Filter	Wisconsin

* Data Sources shows the name of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

Table A6 Changes made to Summer Net Dependable Capacity (MW)

Plant Name	Unique ID	Capacity (NEEDS NODA)	Capacity (VISTAS)	Data Source*
VACA_SC_Combined Cycle	077_C_077	1317	807	SC
CRIST	641_B_1	24	0 **	Southern Company
Lansing Smith	A274_G_A274	500	530	Southern Company
Atkinson	700_G_5A	32	15.3	Southern Company
Atkinson	700_G_5B	32	15.3	Southern Company
Dahlberg	7709_G_10	75	80	Southern Company
Dahlberg	7709_G_9	75	80	Southern Company
FRANKLIN	A7840_G_A331	570	630	Southern Company
Mill Creek	A294_G_A294	320	326.8	NC-WV-SC
Mill Creek	A295_G_A295	240	245.1	NC-WV-SC
Mill Creek	A296_G_A296	80	81.7	NC-WV-SC
SCE&G Hardeeville	3286_C_2		170	SC
SCE&G Hardeeville	3286_C_3		170	SC
SCE&G Hardeeville	3286_C_4		170	SC
Cross 3	130_C_3		660	SC

* Data Source shows the name of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories. “SC” reflects the spreadsheet CopyofSCIPMdata.xls.

** Zero capacity denotes that the unit was retired in 2002.

Table A7 Changes made to Heat Rate (Btu/kWh)

Plant Name	Unique ID	ORIS Code	BGCI	Unit ID	Heat Rate (NEEDS NODA)	Heat Rate (VISTAS)	Data Source*
ALLEN S KING	1915_B_1	1915	B	1	8879	9229	Minnesota

* Data Source shows the name of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

Table A8 Changes made to Unit ID

Plant Name	Unique ID	ORIS Code	BGCI	Unit ID (NEEDS NODA)	Unit ID (VISTAS)	Data Source*
Talbot County Energy	A397_G_A397	7916	G	397	1	Oglethorpe
Talbot County Energy	A398_G_A398	7916	G	398	2	Oglethorpe
Talbot County Energy	A399_G_A399	7916	G	399	3-4	Oglethorpe
Talbot County Energy	A400_G_A400	7916	G	400	5-6	Oglethorpe
Mill Creek	A294_G_A294	7981	G	294	1-4	NC-WV-SC
Mill Creek	A295_G_A295	7981	G	295	5-7	NC-WV-SC
Mill Creek	A296_G_A296	7981	G	296	8	NC-WV-SC

* Data Source shows the name of sheets in NEEDS-NODA-VISTAS-Aug18Rev.xls, provided by Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

Table A9 Duke and Progress Energy SO_2 Control Plan for North Carolina Clean Smokestacks Rule

Unit	Technology	Operation Date	Company
Asheville 1	Scrubber	2005	Progress Energy
Asheville 2	Scrubber	2006	Progress Energy
Cape Fear 5	Scrubber	2012	Progress Energy
Cape Fear 6	Scrubber	2011	Progress Energy
Mayo 1	Scrubber	2008	Progress Energy
Roxboro 1	Scrubber	2009	Progress Energy
Roxboro 2	Scrubber	2007	Progress Energy
Roxboro 3	Scrubber	2007	Progress Energy
Roxboro 4	Scrubber	2007	Progress Energy
Sutton 3	Scrubber	2012	Progress Energy
Allen 1	Scrubber	2011	Duke Power
Allen 2	Scrubber	2011	Duke Power
Allen 3	Scrubber	2011	Duke Power
Allen 4	Scrubber	2012	Duke Power
Allen 5	Scrubber	2012	Duke Power
Belews Creek 1	Scrubber	2008	Duke Power
Belews Creek 2	Scrubber	2008	Duke Power
Cliffside 5	Scrubber	2009	Duke Power
Marshall 1	Scrubber	2007	Duke Power
Marshall 2	Scrubber	2007	Duke Power
Marshall 3	Scrubber	2006	Duke Power
Marshall 4	Scrubber	2006	Duke Power

Source: Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

Table A10 Duke and Progress Energy NO_x Control Plan for North Carolina Clean Smokestacks Rule

Unit	Technology	Operation Date	Company
Asheville 1	SCR	2009	Progress Energy
Lee 2	ROFA	2007	Progress Energy
Lee 3	SCR	2010	Progress Energy
Sutton 2	ROFA	2006	Progress Energy
Allen 1	SNCR	2003	Duke Power
Allen 2	SNCR	2007	Duke Power
Allen 3	SNCR	2005	Duke Power
Allen 4	SNCR	2006	Duke Power
Allen 5	SNCR	2008	Duke Power
Belews Creek 1	SCR	2003	Duke Power
Belews Creek 2	SCR	2004	Duke Power
Buck 3	SNCR	2009	Duke Power
Buck 4	SNCR	2008	Duke Power
Buck 5	SNCR	2006	Duke Power
Buck 6	SNCR	2007	Duke Power
Cliffside 1	SNCR	2009	Duke Power
Cliffside 2	SNCR	2009	Duke Power
Cliffside 3	SNCR	2008	Duke Power
Cliffside 4	SNCR	2008	Duke Power
Cliffside 5	SCR	2002	Duke Power
Dan River 1	SNCR	2009	Duke Power
Dan River 2	SNCR	2009	Duke Power
Dan River 3	SNCR	2007	Duke Power
Marshall 1	SNCR	2007	Duke Power
Marshall 2	SNCR	2006	Duke Power
Marshall 3	SNCR	2005	Duke Power
Marshall 4	SNCR	2008	Duke Power
Riverbend 4	SNCR	2007	Duke Power
Riverbend 5	SNCR	2008	Duke Power
Riverbend 6	SNCR	2008	Duke Power
Riverbend 7	SNCR	2007	Duke Power

Source: Gregory Stella, VISTAS Technical Advisor for Emissions Inventories.

2. Emission Results

Tables A11, A12, A13 and A14 present the Base Case and the CAIR Case NO_x and SO_2 emissions by state and season in 2009 and 2018 run years.

Table A11 State Level Base Case NO_x Emissions by Season (Thousand Tons)

NO_x Emission (Base Case)	Winter		Summer	
	2009	2018	2009	2018
CAIR Affected States				
Alabama	97.93	100.12	34.06	34.89
Arkansas	23.92	24.68	19.73	19.96
District Of Columbia	0.00	0.03	0.00	0.05
Delaware	6.09	7.30	2.78	3.42
Florida	80.78	86.48	67.84	72.61
Georgia	92.95	94.65	38.95	34.29
Iowa	39.67	47.64	30.90	36.59
Illinois	101.87	119.29	27.74	37.91
Indiana	176.21	183.22	61.12	61.74
Kansas	46.35	50.19	36.58	39.32
Kentucky	131.21	132.43	47.76	49.80
Louisiana	27.55	28.46	22.92	23.26
Massachusetts	9.80	11.69	5.64	8.74
Maryland	48.93	50.40	9.07	9.88
Michigan	80.77	85.49	35.64	34.26
Minnesota	39.60	44.65	30.21	34.14
Missouri	84.20	86.01	33.32	30.67
Mississippi	20.98	21.97	17.68	18.21
North Carolina	40.99	39.94	25.74	24.73
New Jersey	10.93	13.57	4.76	5.79
New York	31.75	30.74	18.00	18.79
Ohio	221.12	234.60	50.99	47.99
Pennsylvania	139.63	144.99	58.57	54.52
South Carolina	33.44	35.53	17.06	19.70
Tennessee	88.26	88.30	18.75	24.15
Texas	91.74	91.77	92.76	102.30
Virginia	44.06	37.63	21.15	19.35
Wisconsin	44.08	44.81	35.52	35.59
West Virginia	146.12	147.16	27.86	23.37
Total	2,000.92	2,083.74	893.12	926.01
Non CAIR States				
Arizona	43.51	45.10	35.05	35.71
California	21.46	18.71	13.13	12.91
Colorado	38.20	39.43	30.04	30.90
Connecticut	3.56	4.49	2.63	2.81
Idaho	0.85	0.76	0.65	0.34
Maine	1.03	1.04	0.81	0.82
Montana	21.40	21.42	16.92	17.01
North Dakota	39.97	39.97	31.67	31.67
Nebraska	27.26	27.49	21.75	21.96
New Hampshire	1.33	1.65	0.74	1.18
New Mexico	40.80	40.90	32.70	32.97
Nevada	18.94	21.12	10.94	16.55
Oklahoma	41.56	41.86	36.02	38.41

NO_x Emission (Base Case)	Winter		Summer	
	2009	**2018**	**2009**	**2018**
Oregon	7.54	7.79	5.89	6.07
Rhode Island	0.29	0.32	0.23	0.30
South Dakota	8.10	8.11	6.44	6.44
Utah	33.87	33.83	26.88	26.43
Vermont	0.01	0.01	0.01	0.02
Washington	16.48	14.94	12.19	11.79
Wyoming	45.24	45.24	35.93	35.93
Total	411.39	414.19	320.62	330.23
National Total	2,412.31	2,497.93	1,213.74	1,256.23

Table A12 State Level Base Case SO_2 Emissions by Season (Thousand Tons)

SO_2 Emission (Base Case)	Winter		Summer	
	2009	2018	2009	2018
CAIR Affected States				
Alabama	279.95	209.76	185.64	165.55
Arkansas	45.95	45.95	36.49	36.49
District Of Columbia	0.00	0.00	0.00	0.00
Delaware	22.94	26.88	15.11	17.45
Florida	122.20	120.04	97.19	95.45
Georgia	328.97	310.23	253.11	243.79
Iowa	86.91	101.85	66.32	78.32
Illinois	215.50	242.21	130.41	177.13
Indiana	434.76	300.46	291.49	228.01
Kansas	45.06	47.83	36.59	37.99
Kentucky	279.82	241.21	203.42	188.21
Louisiana	55.29	55.29	43.92	43.92
Massachusetts	9.55	10.21	2.21	6.86
Maryland	179.99	187.19	129.98	143.59
Michigan	219.48	227.46	160.86	177.17
Minnesota	52.19	53.20	39.47	39.43
Missouri	153.41	158.24	110.96	119.58
Mississippi	47.72	47.72	37.90	37.90
North Carolina	109.66	80.15	72.83	53.68
New Jersey	31.74	19.49	22.99	14.08
New York	100.81	89.14	48.13	53.50
Ohio	860.12	647.74	584.09	460.62
Pennsylvania	525.90	503.94	359.82	361.58
South Carolina	93.19	99.82	70.44	79.21
Tennessee	274.69	184.91	161.76	138.75
Texas	221.74	231.04	184.26	188.83
Virginia	133.86	103.85	87.09	77.75
Wisconsin	87.01	85.93	69.31	67.53
West Virginia	349.02	274.96	249.54	208.00
Total	5,367.45	4,706.71	3,751.31	3,540.37
Non CAIR States				
Arizona	33.81	28.38	26.85	22.54
California	3.64	3.64	2.88	2.88
Colorado	51.13	51.13	40.59	40.61
Connecticut	3.62	3.62	2.85	2.85
Idaho	0.03	0.03	0.02	0.02
Maine	3.01	3.01	2.42	2.42
Montana	11.32	12.90	8.95	10.28
North Dakota	74.59	74.54	58.98	58.94
Nebraska	39.52	39.92	31.48	31.63
New Hampshire	5.20	4.62	2.26	2.98
New Mexico	29.49	29.49	23.42	23.42
Nevada	12.09	13.32	6.14	10.25
Oklahoma	65.56	65.56	52.08	52.08

SO_2 Emission (Base Case)	Winter		Summer	
	2009	**2018**	**2009**	**2018**
Oregon	5.67	5.67	4.50	4.50
Rhode Island	0.00	0.00	0.00	0.00
South Dakota	6.74	6.74	5.35	5.35
Utah	29.65	20.86	23.43	15.04
Vermont	0.02	0.02	0.01	0.01
Washington	6.63	6.65	5.15	5.17
Wyoming	41.73	28.93	33.14	22.98
Total	423.46	399.05	330.53	313.96
National Total	5,790.90	5,105.76	4,081.84	3,854.33

Table A13 State Level CAIR Case NO_x Emissions by Season (Thousand Tons)

NO_x Emission (CAIR Case)	Winter		Summer	
	2009	2018	2009	2018
CAIR Affected States				
Alabama	96.01	21.06	36.32	18.89
Arkansas	24.01	17.81	19.73	14.41
District Of Columbia	0.00	0.05	0.02	0.04
Delaware	4.92	3.86	0.92	3.01
Florida	80.05	30.71	67.84	28.83
Georgia	88.13	33.33	31.30	32.22
Iowa	39.36	23.69	30.64	16.83
Illinois	108.01	38.49	33.62	30.78
Indiana	174.47	49.88	64.17	37.28
Kansas	46.51	17.41	36.48	14.84
Kentucky	129.41	36.28	47.90	28.43
Louisiana	27.80	16.91	22.92	14.01
Massachusetts	10.03	8.38	6.43	6.23
Maryland	46.83	7.76	11.25	6.58
Michigan	80.25	39.64	35.94	30.88
Minnesota	40.35	21.80	30.79	17.02
Missouri	82.31	50.25	36.39	27.68
Mississippi	20.98	5.68	17.78	5.11
North Carolina	40.69	33.56	26.50	26.49
New Jersey	11.08	6.73	4.27	5.64
New York	25.18	22.18	19.25	17.99
Ohio	214.10	47.83	43.53	34.32
Pennsylvania	129.93	42.08	54.03	33.21
South Carolina	34.01	20.39	16.20	16.00
Tennessee	87.13	15.77	17.44	16.68
Texas	91.58	82.32	92.49	90.41
Virginia	39.54	23.15	23.53	17.15
Wisconsin	41.88	21.25	33.52	16.56
West Virginia	145.07	24.52	29.50	17.70
Total	1,959.60	762.79	890.73	625.24
Non CAIR States				
Arizona	43.50	45.11	35.04	35.68
California	20.40	18.52	13.00	12.91
Colorado	38.14	39.55	30.05	30.88
Connecticut	3.90	5.06	3.00	3.50
Idaho	0.85	0.78	0.65	0.34
Maine	1.03	1.08	0.76	0.85
Montana	21.40	21.42	16.98	17.01
North Dakota	38.73	39.97	29.27	31.76
Nebraska	27.43	27.52	21.83	22.08
New Hampshire	0.97	1.71	0.75	1.35
New Mexico	40.80	40.92	32.70	32.98
Nevada	19.96	22.36	11.06	17.60
Oklahoma	41.64	42.42	36.06	40.57

NO_x Emission (CAIR Case)	Winter		Summer	
	2009	2018	2009	2018
Oregon	7.54	7.79	5.89	6.07
Rhode Island	0.29	0.34	0.21	0.30
South Dakota	8.10	8.11	6.44	6.45
Utah	33.87	33.83	26.86	26.43
Vermont	0.01	0.02	0.01	0.02
Washington	16.48	14.94	12.19	11.78
Wyoming	45.24	45.24	35.93	35.93
Total	410.29	416.69	318.68	334.51
National Total	2,369.89	1,179.48	1,209.41	959.75

Table A14 State Level CAIR Case SO_2 Emissions by Season (Thousand Tons)

SO_2 Emission (CAIR Case)	Winter		Summer	
	2009	2018	2009	2018
CAIR Affected States				
Alabama	190.85	125.61	124.00	100.91
Arkansas	45.95	45.95	36.49	36.49
District Of Columbia	0.00	0.00	0.00	0.00
Delaware	16.78	9.84	5.14	7.09
Florida	110.87	70.51	89.28	56.09
Georgia	244.73	117.05	149.70	104.56
Iowa	89.51	97.92	68.86	71.77
Illinois	141.81	149.61	93.99	113.51
Indiana	200.81	182.52	140.39	139.08
Kansas	44.63	40.60	35.76	32.84
Kentucky	197.05	127.58	145.63	98.20
Louisiana	34.59	18.80	27.47	14.93
Massachusetts	10.70	9.48	2.93	6.73
Maryland	41.64	14.40	25.23	10.01
Michigan	216.30	221.63	157.75	174.22
Minnesota	45.46	47.48	35.48	35.41
Missouri	148.86	151.22	110.16	118.11
Mississippi	47.72	28.96	37.90	23.00
North Carolina	80.70	41.41	51.49	36.93
New Jersey	19.09	11.35	15.17	8.65
New York	57.16	26.70	37.60	20.71
Ohio	259.36	122.94	144.93	88.31
Pennsylvania	128.67	74.04	77.16	57.49
South Carolina	85.48	85.74	58.09	66.81
Tennessee	168.50	53.32	111.44	50.29
Texas	216.76	195.36	178.90	159.08
Virginia	89.83	66.57	51.09	49.68
Wisconsin	83.88	78.63	66.32	62.03
West Virginia	154.15	64.86	92.70	47.07
Total	3,171.82	2,280.08	2,171.02	1,789.98
Non CAIR States				
Arizona	33.81	28.38	26.85	22.54
California	3.64	3.64	2.88	2.88
Colorado	50.79	51.16	40.28	40.61
Connecticut	3.62	3.62	2.58	2.85
Idaho	0.03	0.03	0.02	0.02
Maine	3.01	3.01	2.10	2.42
Montana	11.32	13.00	9.01	10.33
North Dakota	71.08	74.54	54.63	59.20
Nebraska	39.82	39.92	31.63	31.70
New Hampshire	0.92	4.47	0.70	3.52
New Mexico	29.49	29.49	23.42	23.42
Nevada	12.90	14.33	6.23	11.09
Oklahoma	65.56	65.56	52.08	52.08

SO_2 Emission (CAIR Case)	Winter		Summer	
	2009	**2018**	**2009**	**2018**
Oregon	5.67	5.67	4.50	4.50
Rhode Island	0.00	0.00	0.00	0.00
South Dakota	6.74	6.74	5.35	5.35
Utah	29.65	20.86	23.35	15.04
Vermont	0.02	0.02	0.01	0.01
Washington	6.11	6.65	4.80	5.17
Wyoming	39.68	28.93	31.52	22.98
Total	413.87	400.02	321.96	315.72
National Total	3,585.68	2,680.10	2,492.97	2,105.71

3. Generation Results

Tables A15 and A16 present the generation in the Base Case and the CAIR Case by state and season in 2009 and 2018 run years.

Table A15 State Level Base Case Generation by Season (GWh)

Base Case Generation	Winter		Summer	
	2009	2018	2009	2018
CAIR Affected States				
Alabama	89,306	107,340	71,273	89,828
Arkansas	27,458	35,937	27,331	29,377
District Of Columbia	-	70	-	113
Delaware	3,688	4,873	2,754	4,030
Florida	103,348	140,092	91,525	117,000
Georgia	93,099	103,667	73,028	86,929
Iowa	26,718	32,128	20,016	23,757
Illinois	111,860	120,671	79,329	91,331
Indiana	78,544	86,210	57,036	65,667
Kansas	26,507	27,819	21,332	22,583
Kentucky	61,480	62,605	46,396	48,451
Louisiana	35,891	48,346	35,855	38,090
Massachusetts	31,527	37,098	22,173	27,421
Maryland	31,487	33,118	22,747	26,002
Michigan	61,566	75,353	45,410	54,723
Minnesota	27,529	31,431	21,104	23,976
Missouri	51,304	54,766	38,644	42,737
Mississippi	20,631	32,250	24,165	29,593
North Carolina	72,173	77,731	54,210	58,315
New Jersey	31,669	38,312	26,922	29,698
New York	86,175	90,403	66,311	69,245
Ohio	98,345	111,448	69,610	80,018
Pennsylvania	129,591	140,974	93,686	101,509
South Carolina	57,536	66,909	47,731	54,364
Tennessee	57,630	59,073	40,526	43,453
Texas	175,132	192,596	176,889	210,649
Virginia	44,517	55,805	34,038	42,987
Wisconsin	37,353	40,072	29,408	31,217
West Virginia	60,407	61,029	45,922	47,604
Total	1,732,468	1,968,124	1,385,371	1,590,666
Non CAIR States				
Arizona	68,796	84,020	58,556	66,427
California	153,862	193,482	115,891	148,755
Colorado	24,277	29,820	17,665	22,200
Connecticut	18,145	20,347	12,832	13,661
Idaho	6,535	6,859	5,123	4,814
Maine	4,510	4,554	3,259	3,284
Montana	14,651	15,017	11,972	12,277
North Dakota	15,999	15,999	12,683	12,688
Nebraska	17,523	17,985	14,926	15,717
New Hampshire	19,201	18,995	14,611	14,436
New Mexico	16,508	17,492	13,485	14,417
Nevada	21,432	24,996	15,590	20,097
Oklahoma	42,002	45,145	36,058	40,794

Base Case Generation	Winter		Summer	
	2009	2018	2009	2018
Oregon	34,193	37,710	25,959	28,498
Rhode Island	2,822	3,045	1,865	2,474
South Dakota	5,103	5,116	4,200	4,210
Utah	18,558	18,525	14,807	14,561
Vermont	3,328	3,284	2,102	1,985
Washington	61,086	64,342	43,874	47,400
Wyoming	24,650	24,627	19,574	19,555
Total	573,182	651,360	445,030	508,249
National Total	2,305,650	2,619,484	1,830,401	2,098,915

Table A16 State Level CAIR Case Generation by Season (GWh)

CAIR Case Generation	Winter		Summer	
	2009	2018	2009	2018
CAIR Affected States				
Alabama	94,570	114,813	74,254	91,185
Arkansas	28,520	38,336	27,342	30,538
District Of Columbia	-	164	27	140
Delaware	4,109	4,888	1,395	3,816
Florida	103,047	134,673	91,525	114,079
Georgia	90,975	106,074	68,713	87,944
Iowa	26,654	32,155	20,160	22,069
Illinois	113,576	118,442	83,009	91,406
Indiana	77,812	85,811	59,219	64,105
Kansas	26,553	25,090	21,262	21,729
Kentucky	60,623	61,425	45,949	47,837
Louisiana	39,178	47,708	35,792	37,296
Massachusetts	32,086	35,865	22,315	26,056
Maryland	30,432	33,919	22,226	26,140
Michigan	61,409	77,361	45,712	55,464
Minnesota	28,657	31,549	22,190	24,725
Missouri	50,909	54,005	38,878	43,636
Mississippi	20,654	38,386	26,053	31,804
North Carolina	72,011	76,972	54,051	59,626
New Jersey	32,728	37,732	26,430	30,620
New York	86,621	90,452	67,306	70,406
Ohio	94,457	109,773	66,893	80,432
Pennsylvania	125,813	135,339	93,940	100,257
South Carolina	59,092	67,948	47,929	54,154
Tennessee	57,255	55,011	40,017	42,531
Texas	174,956	188,405	176,614	205,557
Virginia	42,300	55,560	34,556	41,982
Wisconsin	37,205	41,005	28,850	31,286
West Virginia	59,826	59,948	43,305	46,823
Total	1,732,029	1,958,806	1,385,910	1,583,642
Non CAIR States				
Arizona	68,764	84,088	58,527	66,182
California	153,862	193,060	115,905	148,764
Colorado	23,897	29,789	17,750	22,086
Connecticut	17,851	20,146	12,783	13,817
Idaho	6,535	6,907	5,123	4,809
Maine	4,510	5,032	3,213	3,605
Montana	14,651	15,018	11,996	12,275
North Dakota	15,380	15,999	11,862	12,738
Nebraska	17,566	18,061	14,947	15,816
New Hampshire	18,921	19,856	14,663	15,201
New Mexico	16,514	17,636	13,485	14,519
Nevada	21,896	25,564	15,641	20,582
Oklahoma	42,459	50,227	36,383	45,539

CAIR Case Generation	Winter		Summer	
	2009	2018	2009	2018
Oregon	34,193	37,678	25,959	28,474
Rhode Island	2,822	3,032	1,651	2,410
South Dakota	5,103	5,116	4,200	4,220
Utah	18,558	18,525	14,796	14,561
Vermont	3,328	3,446	2,102	2,096
Washington	61,086	64,281	43,874	47,356
Wyoming	24,650	24,627	19,574	19,555
Total	572,547	658,087	444,434	514,605
National Total	2,304,577	2,616,893	1,830,343	2,098,247

4. Cost Results

Tables A17, A18, A19 and A20 present the fixed operation and maintenance cost (FOM), variable operation and maintenance cost (VOM), fuel cost and the capital cost in the Base Case and the CAIR Case by IPM model region and season in 2009 and 2018 run years respectively.

Table A17 FOM Cost by IPM Model Region (Million 1999$)

FOM Cost by Region	Base Case		CAIR Case	
	2009	2018	2009	2018
AZNM	999.8	1,173.9	999.8	1,173.9
CALI	1,399.3	1,767.7	1,397.1	1,767.6
DSNY	554.3	365.1	559.0	386.4
ECAO	3,163.2	3,282.9	3,310.1	3,583.2
ENTG	1,172.8	1,351.0	1,177.5	1,361.8
ERCT	1,905.2	2,084.9	1,905.2	2,097.9
FRCC	1,500.1	1,570.0	1,504.2	1,595.8
LILC	71.1	89.7	79.1	92.5
MACE	1,712.7	1,859.8	1,698.8	1,850.0
MACS	474.3	504.5	503.3	548.3
MACW	843.0	961.8	849.6	989.5
MANO	2,462.9	2,942.4	2,466.9	2,949.6
MAPP	1,282.3	1,352.2	1,276.4	1,347.3
MECS	525.5	625.8	525.5	631.5
NENG	1,230.3	1,246.7	1,233.3	1,247.1
NWPE	512.5	539.5	518.4	545.3
NYC	145.0	162.1	145.0	167.5
PNW	906.4	988.3	906.4	988.1
RMPA	295.2	305.0	295.5	305.3
SOU	1,490.9	1,674.5	1,510.6	1,777.1
SPPN	477.7	564.3	477.7	566.9
SPPS	651.9	715.0	656.3	722.2
TVA	1,380.2	1,469.9	1,384.2	1,508.4
UPNY	726.7	792.6	713.3	782.1
VACA	2,764.7	3,099.6	2,756.4	3,096.6
WUMS	461.8	494.1	461.8	495.5
National Total	29,109.7	31,983.2	29,311.5	32,577.6

Table A18 VOM Cost by IPM Model Region (Million 1999$)

VOM Cost by Region	Base Case		CAIR Case	
	2009	2018	2009	2018
AZNM	301.4	349.7	301.3	349.7
CALI	525.1	677.9	523.7	677.6
DSNY	41.0	34.1	41.4	51.4
ECAO	1,218.5	1,316.6	1,378.1	1,883.4
ENTG	158.6	195.1	170.2	228.0
ERCT	493.4	602.5	492.9	621.6
FRCC	303.2	404.1	307.8	466.1
LILC	24.9	39.5	24.4	33.6
MACE	140.5	166.4	137.6	174.4
MACS	70.6	83.1	97.8	141.1
MACW	188.1	203.1	226.7	300.4
MANO	313.9	359.5	335.8	408.4
MAPP	306.1	337.8	309.5	353.1
MECS	146.3	181.0	145.8	211.6
NENG	174.5	205.0	176.8	205.3
NWPE	235.2	249.6	236.7	252.7
NYC	12.1	25.5	12.1	30.0
PNW	93.3	126.3	93.3	126.0
RMPA	117.5	128.0	117.2	127.9
SOU	409.5	512.1	431.8	720.1
SPPN	147.0	158.1	147.4	161.5
SPPS	201.2	231.2	204.0	242.3
TVA	286.2	312.0	290.1	400.3
UPNY	81.8	90.4	85.0	91.1
VACA	570.6	679.9	602.2	720.4
WUMS	110.0	138.3	111.4	143.2
National Total	6,670.4	7,807.0	7,001.0	9,121.3

Table A19 Fuel Cost by IPM Model Region (Million 1999$)

Fuel Cost by Region	Base Case		CAIR Case	
	2009	2018	2009	2018
AZNM	2,231.5	2,884.8	2,296.0	2,912.2
CALI	3,804.4	5,249.7	3,883.0	5,266.9
DSNY	512.8	531.4	537.3	642.6
ECAO	5,452.7	6,207.7	5,346.3	5,844.2
ENTG	1,700.8	2,398.6	1,817.2	2,388.2
ERCT	4,950.1	5,835.0	5,121.9	5,812.3
FRCC	2,979.2	4,480.9	3,045.0	4,282.9
LILC	400.7	530.3	407.5	454.6
MACE	1,106.4	1,453.7	1,195.5	1,461.6
MACS	528.2	599.7	502.4	599.4
MACW	1,039.5	1,258.4	1,039.9	1,176.8
MANO	2,073.1	2,192.0	2,133.0	2,158.4
MAPP	1,560.0	1,666.6	1,561.8	1,676.2
MECS	1,070.6	1,322.5	1,075.2	1,434.1
NENG	1,868.1	2,291.3	1,915.8	2,297.8
NWPE	679.2	643.8	687.8	659.6
NYC	313.2	459.5	326.0	512.2
PNW	1,078.6	1,326.2	1,126.8	1,333.3
RMPA	429.3	596.2	426.8	595.4
SOU	3,933.6	5,195.6	4,146.3	5,399.1
SPPN	678.0	731.7	683.1	726.5
SPPS	1,908.5	2,197.0	1,952.0	2,287.2
TVA	1,633.0	1,868.4	1,675.8	1,972.9
UPNY	599.3	758.0	655.3	703.8
VACA	3,057.0	3,800.8	3,135.3	3,928.7
WUMS	625.4	748.5	632.9	732.9
National Total	46,213.0	57,228.2	47,325.9	57,259.8

Table A20 Capital Cost by IPM Model Region (Million 1999$)

Capital Cost by Region	Base Case		CAIR Case	
	2009	2018	2009	2018
AZNM	0.0	114.8	0.0	114.8
CALI	375.3	1287.1	454.1	1290.4
DSNY	0.0	0.7	0.0	73.3
ECAO	97.2	226.9	505.9	1164.9
ENTG	3.3	4.4	10.3	36.7
ERCT	0.9	978.4	0.6	1029.3
FRCC	13.3	455.4	25.2	540.3
LILC	54.0	167.9	62.4	143.9
MACE	4.2	22.1	4.2	33.8
MACS	18.2	134.0	94.7	261.9
MACW	0.0	0.3	80.9	162.8
MANO	2.7	21.6	35.4	71.3
MAPP	52.9	52.9	52.9	68.7
MECS	0.0	212.4	0.0	237.9
NENG	76.3	160.0	87.3	163.9
NWPE	0.0	23.0	0.0	23.0
NYC	0.0	103.9	0.0	137.1
PNW	5.5	183.8	5.5	182.2
RMPA	0.0	0.0	0.0	0.0
SOU	4.6	412.9	55.5	770.0
SPPN	5.3	28.0	5.3	51.0
SPPS	0.0	142.9	12.2	171.8
TVA	0.0	10.4	11.8	135.2
UPNY	0.0	4.1	11.6	23.2
VACA	232.6	647.5	221.1	667.1
WUMS	10.3	138.8	10.2	149.8
National Total	956.6	5,534.2	1,747.2	7,704.1