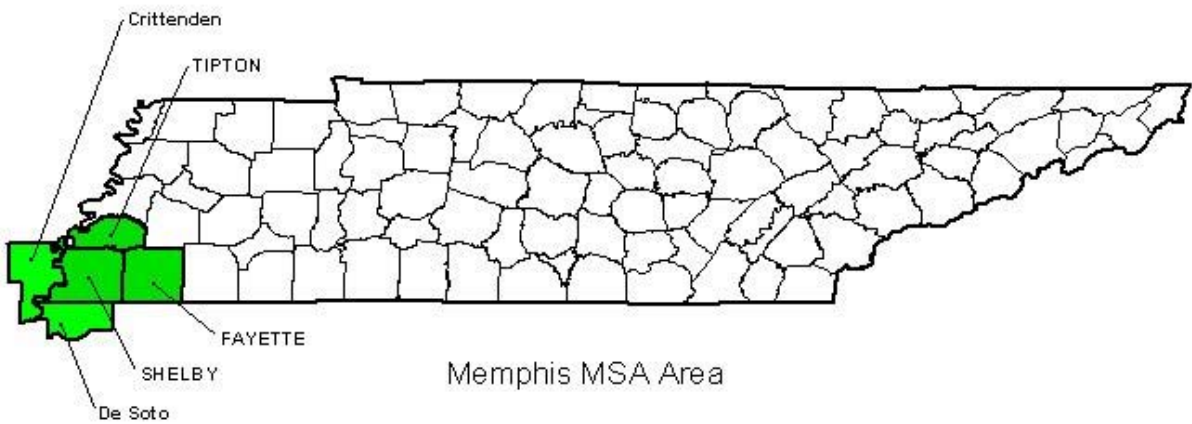


Memphis TN-AR-MS MSA

Local Air Quality Improvement Plan

Tennessee MSA Areas Pre-2000 Census



The Memphis TN-AR-MS Metropolitan Statistical Area encompasses three states and five counties. It includes Fayette, Shelby, and Tipton counties in Tennessee as well as Crittenden county in Arkansas and De Soto county in Mississippi. In 2000, this MSA was listed as the 43rd largest MSA within the United States.

Fayette County, Tennessee

Geography/Topography

Fayette County has a land area of 705 square miles and is located in the rolling terrain of the West Tennessee Plain. It is located in the east portion of the MSA just east of Shelby County.

Meteorological Information

Wind data from Memphis, TN for the period of record from 1988 through 1992 was determined to be representative for Fayette County. The predominate wind direction and speed is from the southwest at 7 to 10 knots (see Figure 1 A). The mean high temperature for July is 92.1 F, while the mean low is 72.9 F. The mean July precipitation is 4.2 inches. The period of record for this data is from 1971 through 2000.

Planning Authority

The authority for air quality planning for Fayette County resides with the Tennessee Department of Environment and Conservation. Transportation planning for the western portion of Fayette County is performed by the Memphis Area Metropolitan Planning Organization, while the remainder of the county is administered by the Tennessee Department of Transportation.

Air Monitoring

There is no ozone monitor located in Fayette County.

Population

Based on projections to 2002 from the 2000 census data, there are 31,202 persons living in Fayette County (see Table 1 C). This indicates a population density of 44 persons per square mile. The population of Fayette County is essentially 100% rural. The largest city in Fayette County is Somerville (see Table 1 C).

Fayette County's population from 1990 through 2000 increased by approximately 12% (25,628 to 28,806). The population is expected to increase by 12% between 2000 and 2010 (see Table 1 B).

Based on the 2002 population data for the entire Memphis MSA, Fayette County represents approximately 3% of the total MSA population (see Table 1 C).

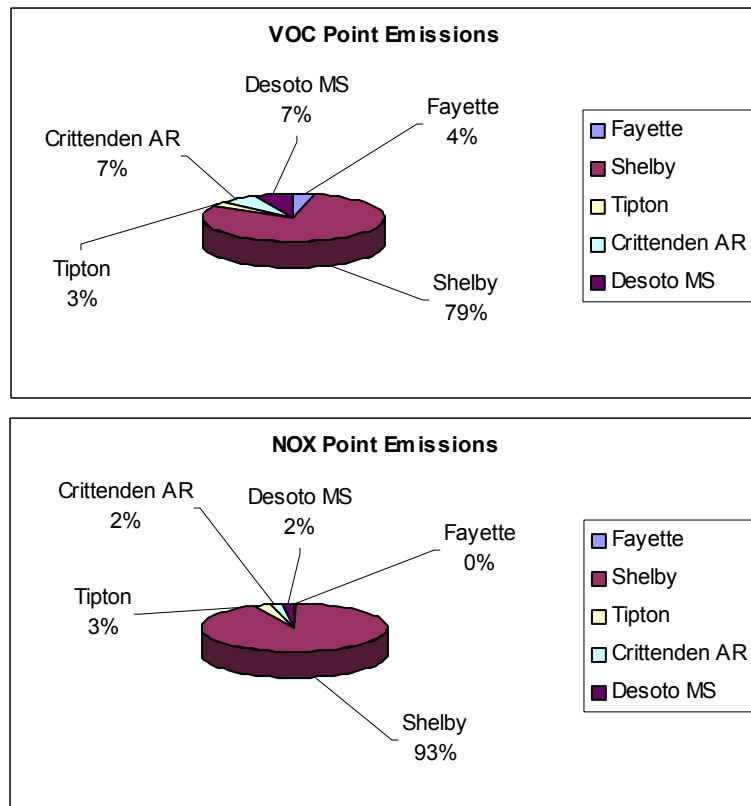
Air Emissions

All air emission estimates were derived from EPA's 1999 National Emission Inventory (NEI) database.

Point source NOX emissions from Fayette County were estimated at 0.36 ton/day in 1999 which represents less than 1% of the 158.35 ton/day of overall NOX point source emissions from the Memphis MSA (see Table 1 D).

Point source VOC emissions from Fayette County were estimated at 6.12 ton/day in 1999 which represents approximately 4% of the 160.87 ton/day of overall VOC point source emissions from the Memphis MSA (see Table 1 D).

1999 NEI Point Source Emissions (ton/day)

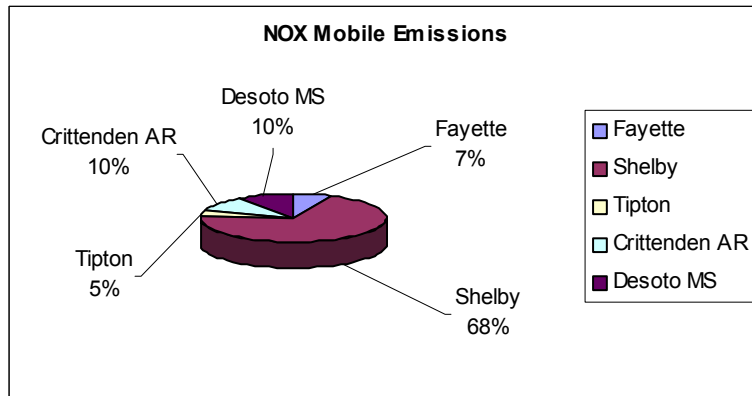
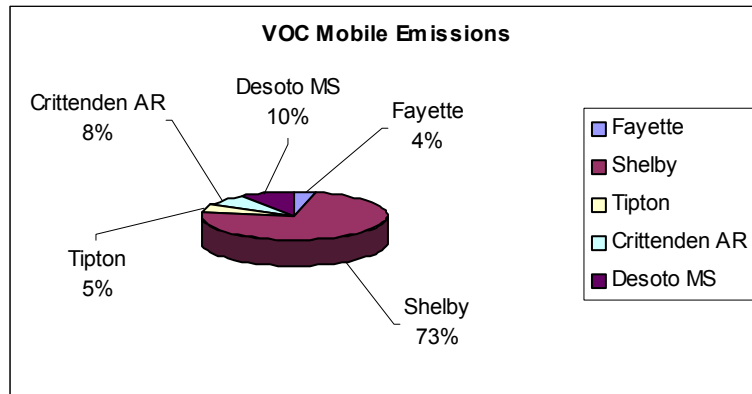


For NOX and VOC control, point sources located within Fayette County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guideline Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements for Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS).

Mobile source NOX emissions from Fayette County were estimated at 12.30 ton/day in 1999 which represents approximately 7% of the 187.74 ton/day of overall NOX mobile source emissions from the Memphis MSA (see Table 1 D).

Mobile source VOC emissions from Fayette County were estimated at 3.31 ton/day in 1999 which represents approximately 4% of the 87.72 ton/day of overall VOC mobile source emissions from the Memphis MSA (see Table 1 D).

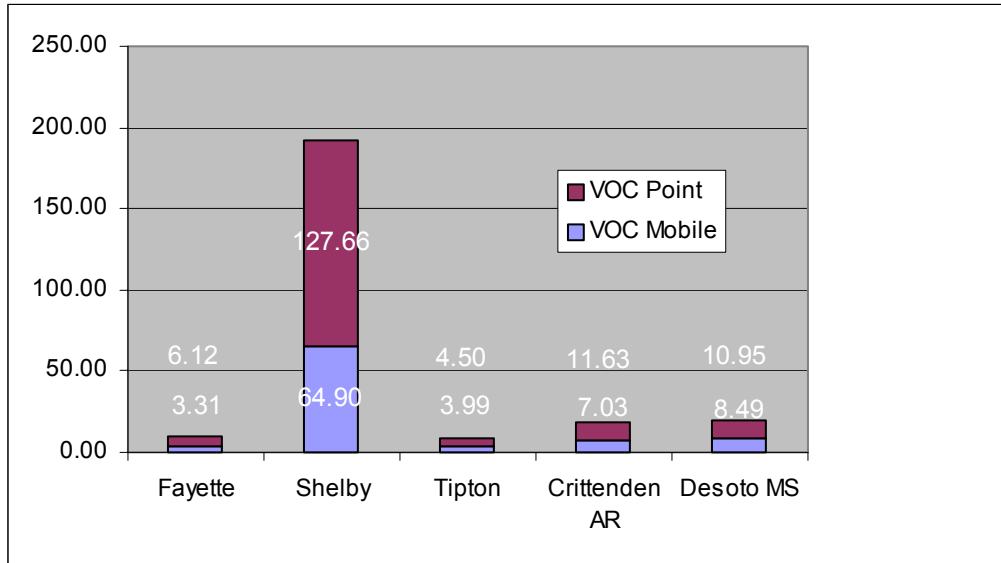
1999 NEI Mobile Source Emissions (ton/day)



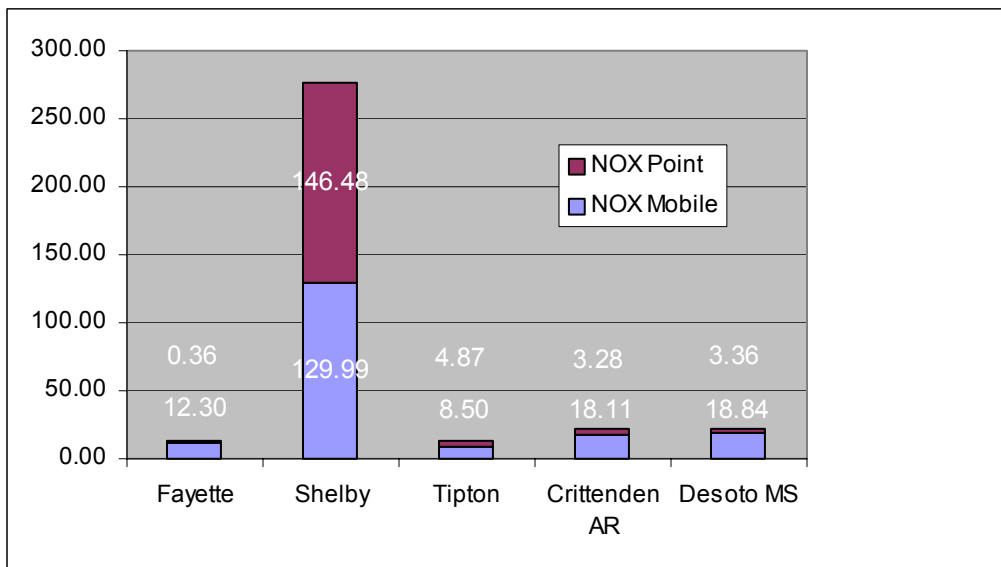
Commuting traffic from surrounding counties into Fayette County is high. Commuting traffic from Fayette County into surrounding counties is significant.

Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

1999 NEI VOC Contribution (ton/day)



1999 NEI NOX Contribution (ton/day)



Summary

Local air pollution emission reductions for Fayette County are listed in the Quantification of Control Measures Table. The local measures listed are to be implemented by the local government of Fayette County. All local measures are to be implemented by ozone season of 2007, at the latest. The most desirable implementation is the soonest time possible (ideally ozone season of 2005). Local jurisdictions understand that measures are to be implemented on a schedule that concurs with the schedule in the attainment demonstration modeling.

For a Weight of Evidence Analysis, review the summary Attainment Demonstration for the Memphis Area and see the complete Weight of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Documentation (TSD) for details.

Some voluntary measures were not included in the modeling demonstration. These measures will, it is expected, create even further reductions in the ozone level of the EAC. Effectiveness of these measures may not necessarily be quantifiable, however, given the concern for air quality in the region, any reduction is viewed as positive.

Please review the detailed attainment demonstration contained in the Modeling Analysis Technical Support Documentation, which includes specific information on the EAC's control measures and subsequent ozone design value. County level endorsement of their local control measures can be found in Attachment 1.

Emission Reductions for the AS-4 EAC Attainment Strategy
Quantification of Control Measures

Control Measure by Source Category	Fayette, TN		
	NOx TPD	VOC TPD	CO TPD
Area			
Open Burning Ban - Land clearing2C.	0.000	0.000	0.000
Onroad Mobile			
Intelligent Transportation Sys (CMAQ Report)	0.000	0.000	0.000
Lower interstate truck speeds by 10 mph	0.000	0.000	0.000
Anti-idling Legis. (1% veh idle 5 min/day)	0.000	0.000	0.000
Voluntary Control Measures	0.000	0.000	0.000
Point	0.000	0.000	0.000

Please see Table 7-4a on page 7-18 of the Modeling Analysis Technical Support Document for additional details and further discussion.

Shelby County, Tennessee

Geography/Topography

Shelby County has a land area of 755 square miles and is located at the extreme southwest corner of West Tennessee in the rolling terrain where the Mississippi River Valley meets the West Tennessee Plain. It is at the center of the MSA that includes portions of Arkansas and Mississippi at the juncture of I-40 and I-55.

Meteorological Information

Wind data from Memphis, TN for the period of record from 1988 through 1992 was determined to be representative for Shelby County. The predominate wind direction and speed is from the southwest at 7 to 10 knots (see Figure 1 A). The mean high temperature for July is 92.1 F, while the mean low is 72.9 F. The mean July precipitation is 4.2 inches. The period of record for this data is from 1971 through 2000.

Planning Authority

The authority for air quality planning for Shelby County resides with Memphis & Shelby County Health Department, Pollution Control Section. Transportation planning for Shelby County is performed by the Memphis Area Metropolitan Planning Organization.

Air Monitoring

For the 2001-2003 monitoring period, the ozone monitor 471571004-1 (Edmund Orgill Park) located in Shelby County shows an 8-hour design value of 0.089 parts per million (ppm) which would be classified as non-attainment (see Table 1 A).

Population

Based on projections to 2002 from the 2000 census data, there are 905,678 persons living in Shelby County (see Table 1 C). This indicates a population density of 1200 persons per square mile. The population of Shelby County is approximately 3% rural with the remaining 97% living in incorporated areas. The largest cities in Shelby County are Memphis, Bartlett, and Germantown (see Table 1 C).

Shelby County's population from 1990 through 2000 increased by approximately 8% (827,868 to 897,472). The population is expected to increase by 5% between 2000 and 2010 (see Table 1 B).

Based on the 2002 population data for the entire Memphis TN-AR-MS MSA, Shelby County represents approximately 79% of the total MSA population (see Table 1 C).

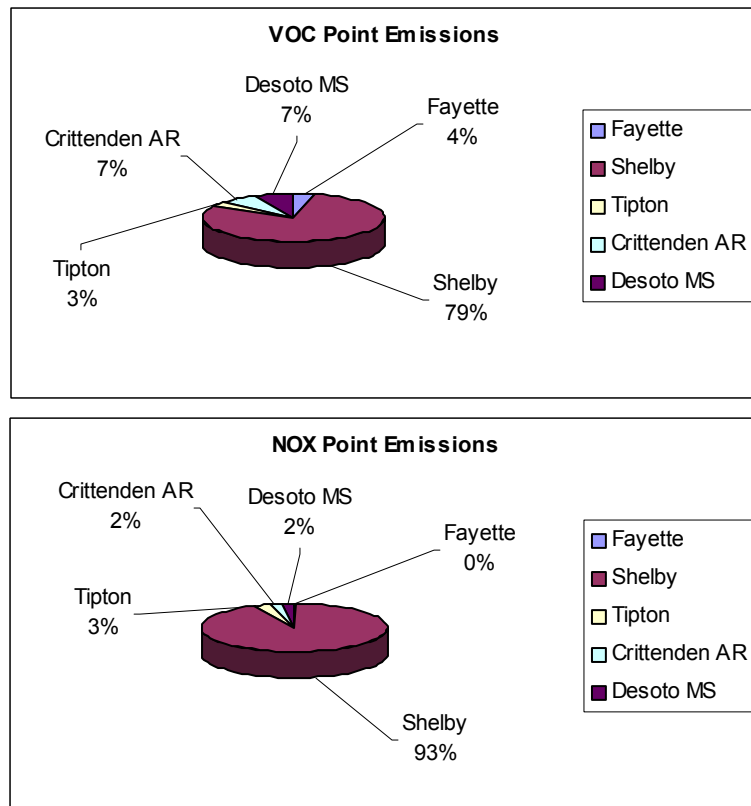
Air Emissions

All air emission estimates were derived from EPA's 1999 National Emission Inventory (NEI) database.

Point source NOX emissions from Shelby County were estimated at 146.48 ton/day in 1999 which represents approximately 93% of the 158.35 ton/day of overall NOX point source emissions from the Memphis MSA (see Table 1 D).

Point source VOC emissions from Shelby County were estimated at 127.66 ton/day in 1999 which represents approximately 79% of the 160.87 ton/day of overall VOC point source emissions from the Memphis MSA (see Table 1 D).

1999 NEI Point Source Emissions (ton/day)

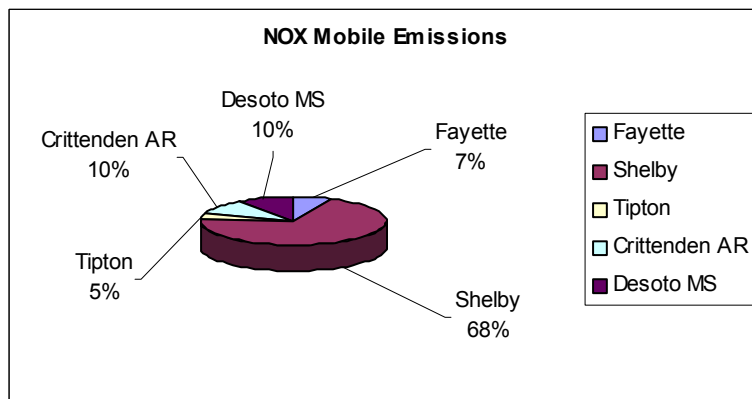
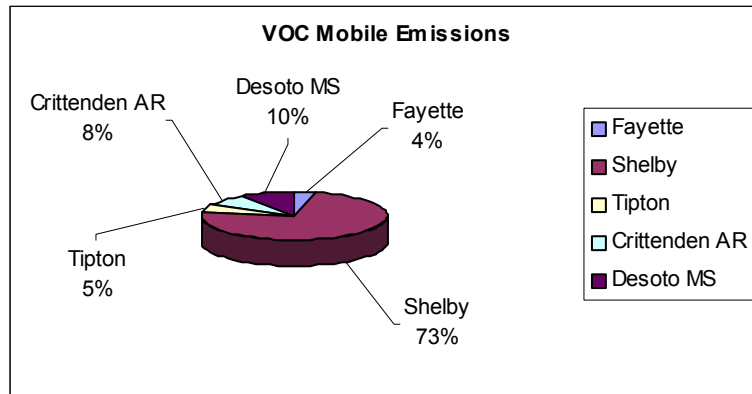


For NOX and VOC control, point sources located within Shelby County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guideline Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements for Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS).

Mobile source NOX emissions from Shelby County were estimated at 129.99 ton/day in 1999 which represents approximately 68% of the 187.74 ton/day of overall NOX mobile source emissions from the Memphis MSA (see Table 1 D).

Mobile source VOC emissions from Shelby County were estimated at 64.90 ton/day in 1999 which represents approximately 73% of the 87.72 ton/day of overall VOC mobile source emissions from the Memphis MSA (see Table 1 D).

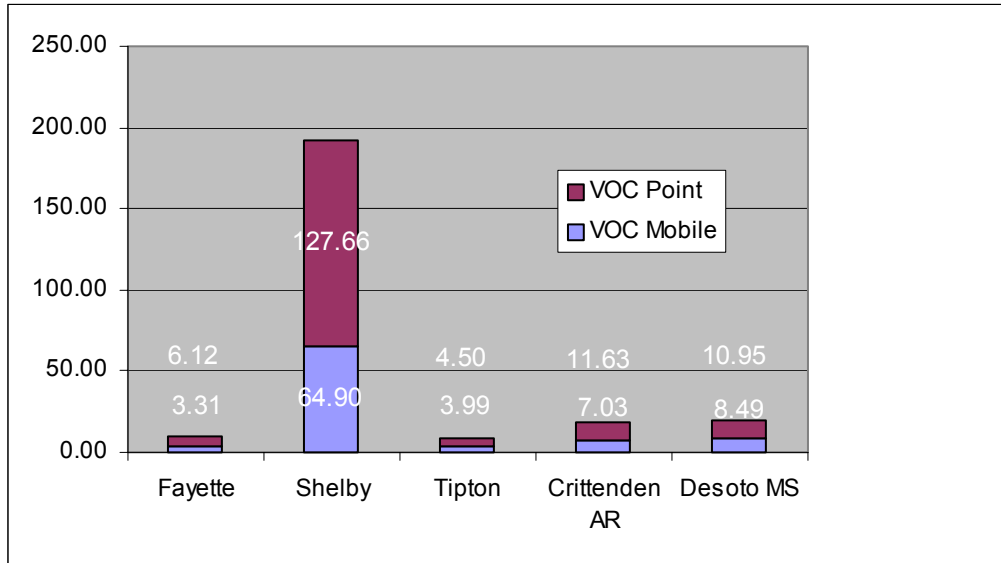
1999 NEI Mobile Source Emissions (ton/day)



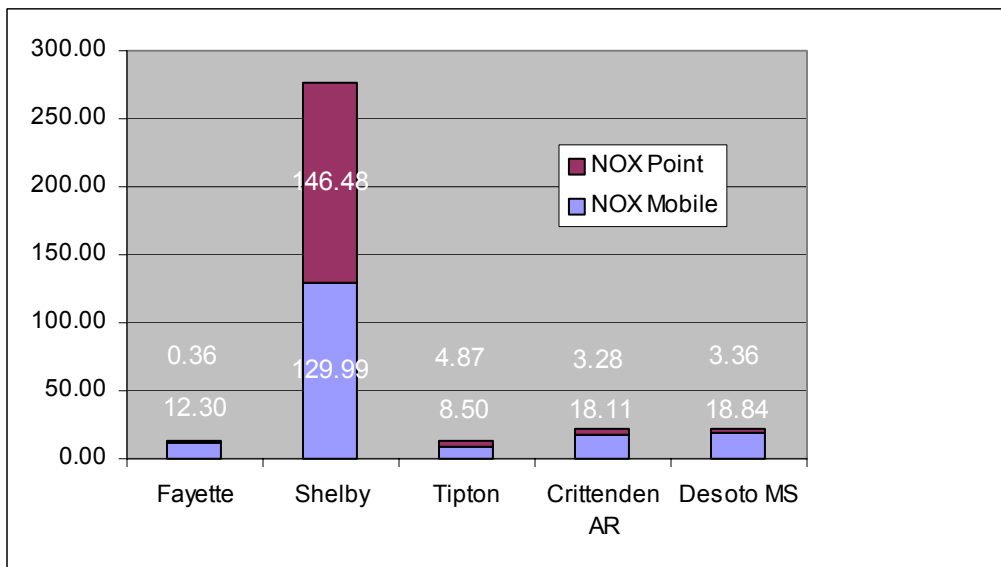
Commuting traffic from surrounding counties into Shelby County is minimal. Commuting traffic from Shelby County into surrounding counties is not significant.

Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

1999 NEI VOC Contribution (ton/day)



1999 NEI NOX Contribution (ton/day)



Summary

Local air pollution emission reductions for Shelby County are listed in the Quantification of Control Measures Table. The local measures listed are to be implemented by the local government of Shelby County. All local measures are to be implemented by ozone season of 2007, at the latest. The most desirable implementation is the soonest time possible (ideally ozone season of 2005). Local jurisdictions understand that measures are to be implemented on a schedule that concurs with the schedule in the attainment demonstration modeling.

For a Weight of Evidence Analysis, review the summary Attainment Demonstration for the Memphis Area and see the complete Weight of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Documentation (TSD) for details.

Some voluntary measures were not included in the modeling demonstration. These measures will, it is expected, create even further reductions in the ozone level of the EAC. Effectiveness of these measures may not necessarily be quantifiable, however, given the concern for air quality in the region, any reduction is viewed as positive.

Please review the detailed attainment demonstration contained in the Modeling Analysis Technical Support Documentation, which includes specific information on the EAC's control measures and subsequent ozone design value. County level endorsement of their local control measures can be found in Attachment 1.

Emission Reductions for the AS-4 EAC Attainment Strategy
Quantification of Control Measures

Control Measure by Source Category	NOx TPD	Shelby, TN VOC TPD	CO TPD
Area			
Open Burning Ban - Land clearing2C.	0.300	7.170	13.140
Onroad Mobile			
Intelligent Transportation Sys (CMAQ Report)	0.159	0.061	0.660
Lower interstate truck speeds by 10 mph	5.900	0.000	0.000
Anti-idling Legis. (1% veh idle 5 min/day)	0.012	0.012	0.079
Voluntary Control Measures	0.676	0.449	0.883
Point	4.900	0.245	0.000

Please see Table 7-4a on page 7-18 of the Modeling Analysis Technical Support Document for additional details and further discussion.

Tipton County, Tennessee

Geography/Topography

Tipton County has a land area of 459 square miles and is located in the rolling terrain of the West Tennessee Plain. It is located in the north portion of the Memphis MSA just north of Shelby County along the US Highway 51 corridor.

Meteorological Information

Wind data from Memphis, TN for the period of record from 1988 through 1992 was determined to be representative for Tipton County. The predominate wind direction and speed is from the southwest at 7 to 10 knots (see Figure 1 A). The mean high temperature for July is 92.1 F, while the mean low is 72.9 F. The mean July precipitation is 4.2 inches. The period of record for this data is from 1971 through 2000.

Planning Authority

The authority for air quality planning for Tipton County resides with the Tennessee Department of Environment and Conservation. Transportation planning for Tipton County is performed by the Tennessee Department of Transportation.

Air Monitoring

There is no ozone monitor located in Tipton County.

Population

Based on projections to 2002 from the 2000 census data, there are 53,436 persons living in Tipton County (see Table 1 C). This indicates a population density of 116 persons per square mile. The population of Tipton County is approximately 66% rural with the remaining 34% living in incorporated areas. The largest city in Tipton County is Covington (see Table 1 C).

Tipton County's population from 1990 through 2000 increased by approximately 35% (37,861 to 51,271). The population is expected to increase by 8% between 2000 and 2010 (see Table 1 B).

Based on the 2002 population data for the entire Memphis MSA, Tipton County represents approximately 5% of the total MSA population (see Table 1 C).

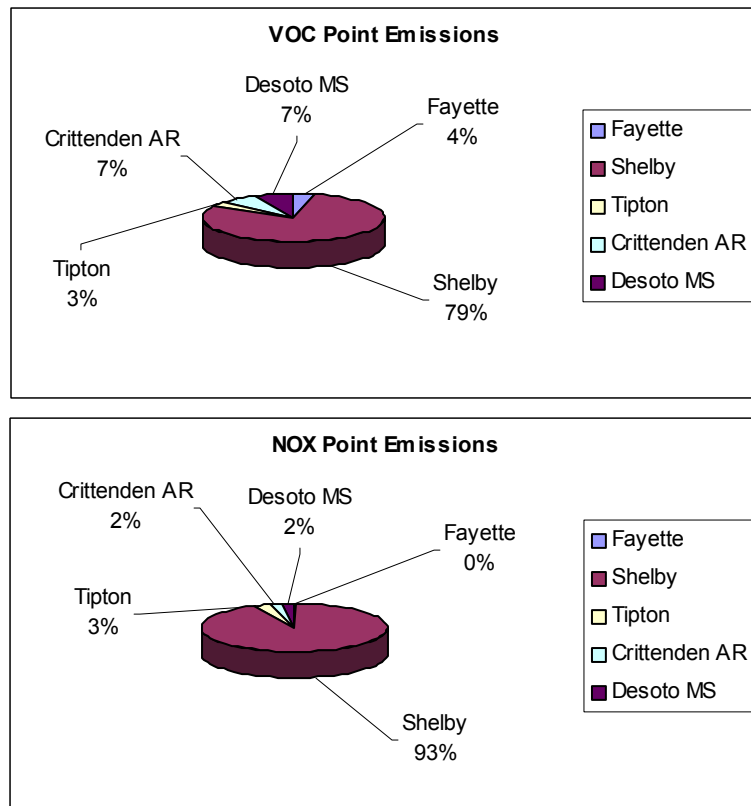
Air Emissions

All air emission estimates were derived from EPA's 1999 National Emission Inventory (NEI) database.

Point source NOX emissions from Tipton County were estimated at 4.87 ton/day in 1999 which represents approximately 3% of the 158.35 ton/day of overall NOX point source emissions from the Memphis MSA (see Table 1 D).

Point source VOC emissions from Tipton County were estimated at 4.50 ton/day in 1999 which represents approximately 3% of the 160.87 ton/day of overall VOC point source emissions from the Memphis MSA (see Table 1 D).

1999 NEI Point Source Emissions (ton/day)

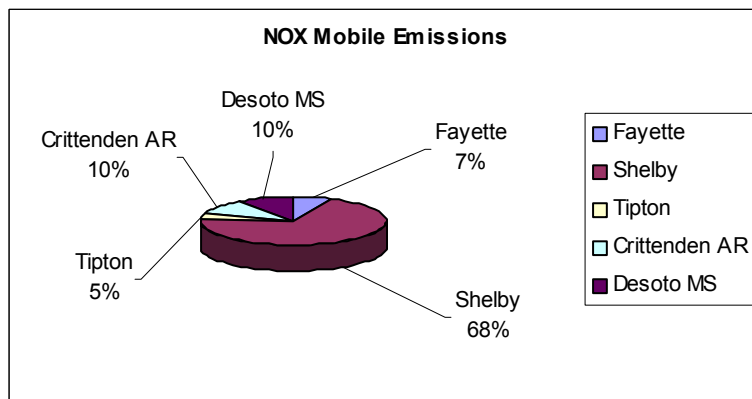
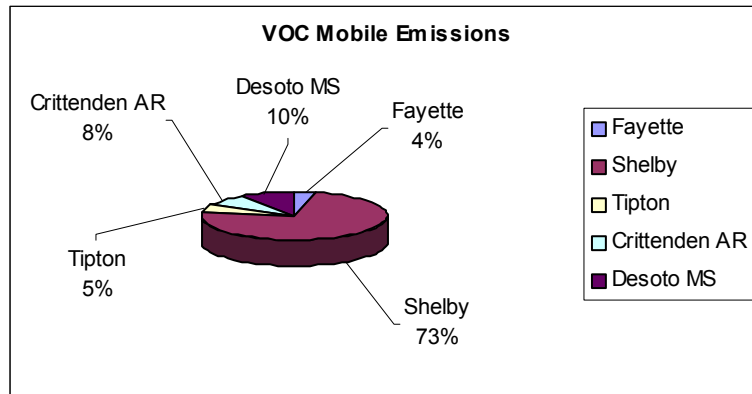


For NOX and VOC control, point sources located within Tipton County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guideline Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements for Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS).

Mobile source NOX emissions from Tipton County were estimated at 8.50 ton/day in 1999 which represents approximately 5% of the 187.74 ton/day of overall NOX mobile source emissions from the Memphis MSA (see Table 1 D).

Mobile source VOC emissions from Tipton County were estimated at 3.99 ton/day in 1999 which represents approximately 5% of the 87.72 ton/day of overall VOC mobile source emissions from the Memphis MSA (see Table 1 D).

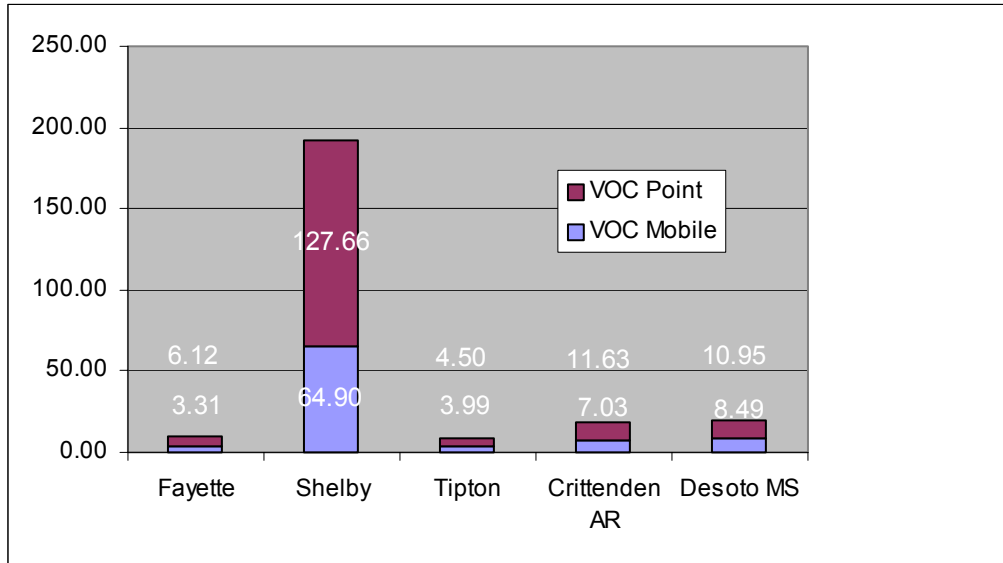
1999 NEI Mobile Source Emissions (ton/day)



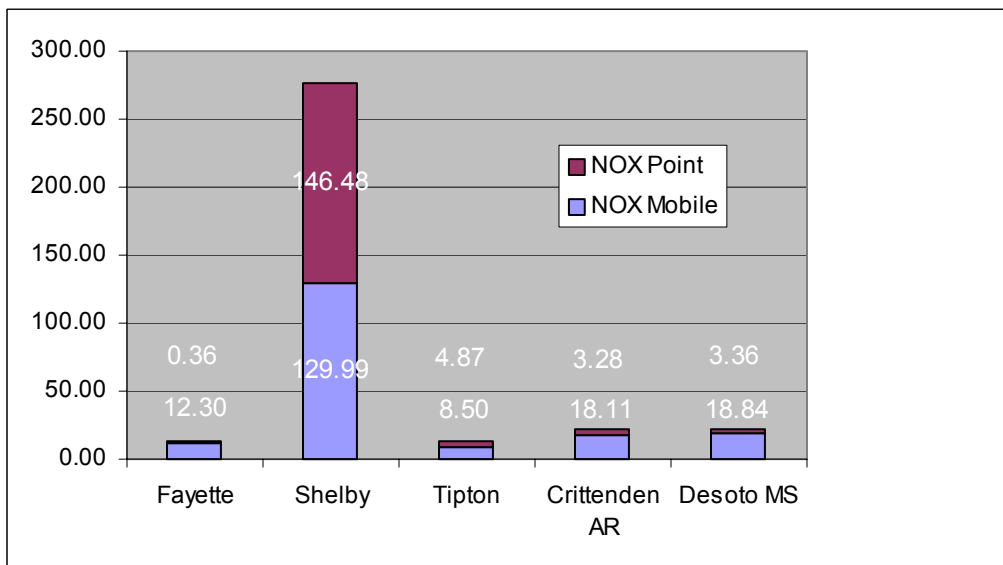
Commuting traffic from surrounding counties into Tipton County is minimal. Commuting traffic from Tipton County into surrounding counties is high.

Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

1999 NEI VOC Contribution (ton/day)



1999 NEI NOX Contribution (ton/day)



Summary

Local air pollution emission reductions for Tipton County are listed in the Quantification of Control Measures Table. The local measures listed are to be implemented by the local government of Tipton County. All local measures are to be implemented by ozone season of 2007, at the latest. The most desirable implementation is the soonest time possible (ideally ozone season of 2005). Local jurisdictions understand that measures are to be implemented on a schedule that concurs with the schedule in the attainment demonstration modeling.

For a Weight of Evidence Analysis, review the summary Attainment Demonstration for the Memphis Area and see the complete Weight of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Documentation (TSD) for details.

Some voluntary measures were not included in the modeling demonstration. These measures will, it is expected, create even further reductions in the ozone level of the EAC. Effectiveness of these measures may not necessarily be quantifiable, however, given the concern for air quality in the region, any reduction is viewed as positive.

Please review the detailed attainment demonstration contained in the Modeling Analysis Technical Support Documentation, which includes specific information on the EAC's control measures and subsequent ozone design value. County level endorsement of their local control measures can be found in Attachment 1.

Emission Reductions for the AS-4 EAC Attainment Strategy
Quantification of Control Measures

Control Measure by Source Category	NOx TPD	Tipton, TN VOC TPD	CO TPD
Area			
Open Burning Ban - Land clearing2C.	0.000	0.000	0.000
Onroad Mobile			
Intelligent Transportation Sys (CMAQ Report)	0.000	0.000	0.000
Lower interstate truck speeds by 10 mph	0.000	0.000	0.000
Anti-idling Legis. (1% veh idle 5 min/day)	0.000	0.000	0.000
Voluntary Control Measures	0.000	0.000	0.000
Point	0.000	0.000	0.000

Please see Table 7-4a on page 7-18 of the Modeling Analysis Technical Support Document for additional details and further discussion.

Memphis TN-AR-MS MSA

Figure 1 A
Memphis MSA
Wind Rose

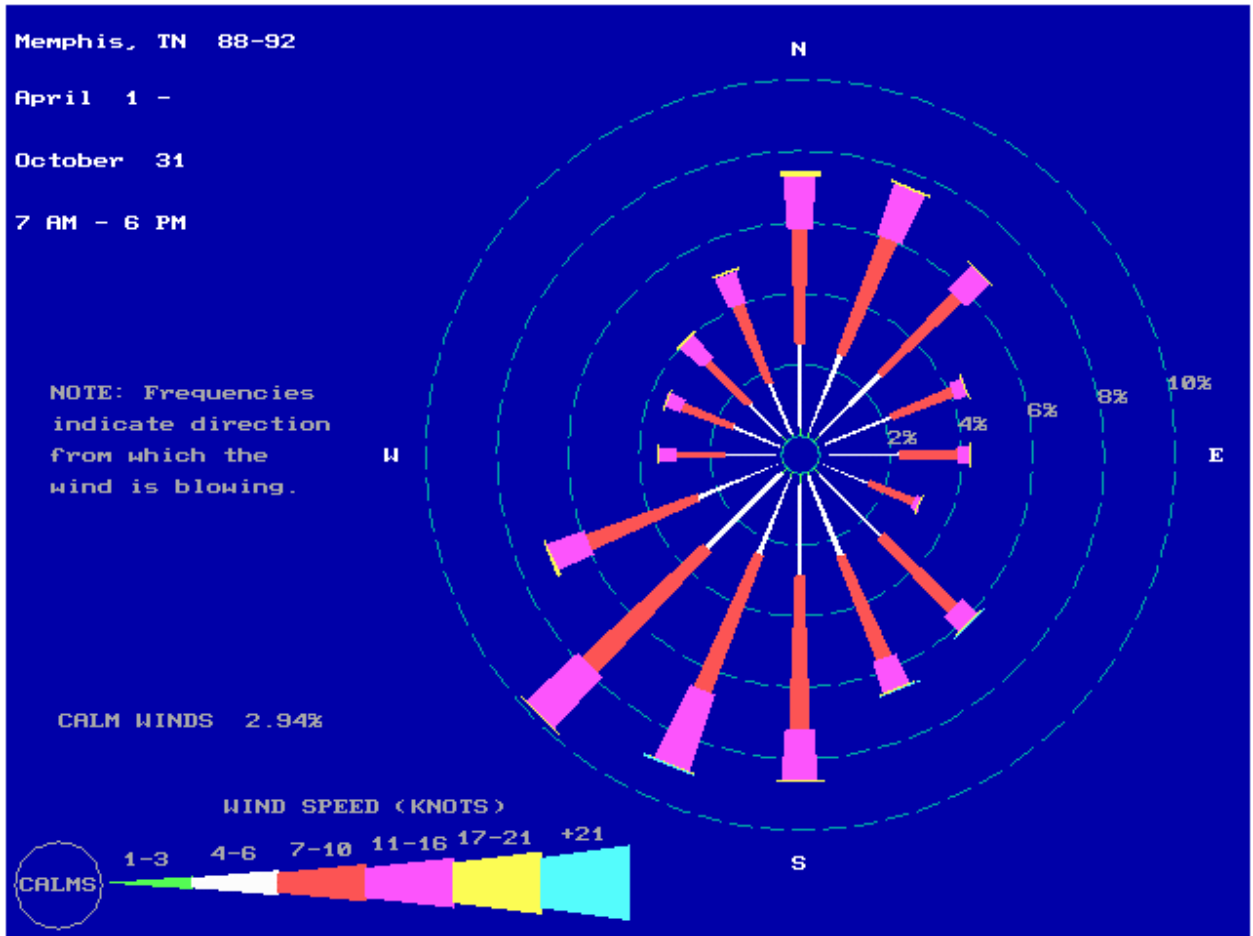


Figure 1 B
Memphis MSA
1999 NEI VOC and NOX Emissions
(ton/day)

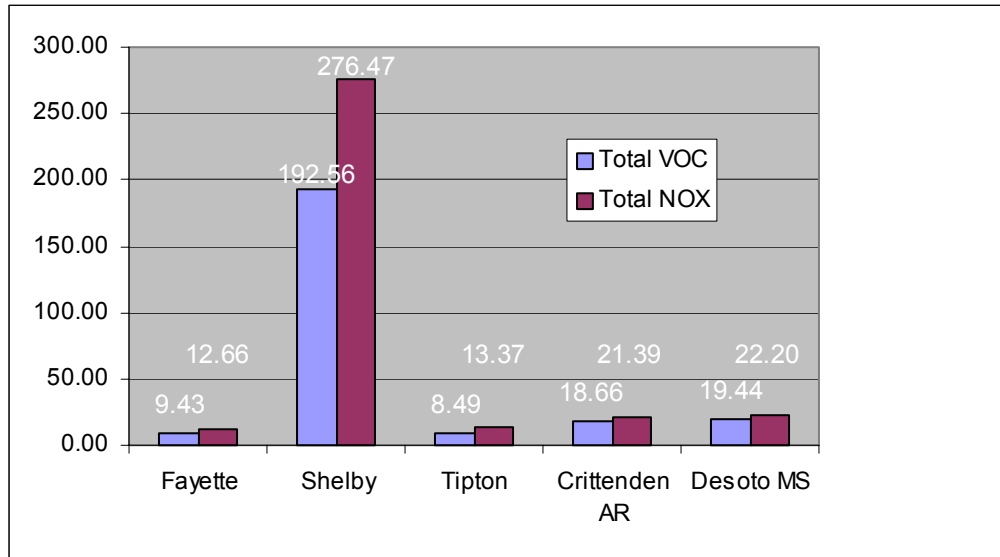


Table 1 A
Memphis MSA
Ozone Design Values
(ppm)

County	Site Name	MONITOR ID	1999 2001 Design Value PPM	2000 2002 Design Value PPM	2001 2003 Design Value PPM
Shelby Co	1330 Frayser Blvd	471570021 - 1	0.093	0.087	0.084
Shelby Co	6855 Mudville Rd. Edmond Orgill Park	471571004 - 1	0.093	0.090	0.089

Table 1 B
Memphis MSA
Population Growth Data

County	Population 1990	Population 2000	PERCENT CHANGE 1990 - 2000	Population 2002	Area in Square Miles	2002 Pop. Density (Sq. Mile)	Projection 2010	% Growth 2000 - 2010
Tennessee								
Fayette	25,628	28,806	12.4	31,202	704.5	44.3	32,236	11.9
Shelby	827,868	897,472	8.4	905,678	754.53	1200.3	943,806	5.2
Tipton	37,861	51,271	35.4	53,436	459.37	116.3	55,559	8.4
Arkansas								
Crittenden	49,959	50,983	2.0				51,291	0.6
Mississippi								
DeSoto	67,910	107,199	57.9				144,068	34.4
TOTALS	1,009,226	1,135,731		990,316			1,226,960	

**Table 1 C
Memphis MSA
2002 Population Estimates**

Tennessee Counties		Population
Shelby		905,678
*Memphis	(650,100)	
*Bartlett	(40,543)	
*Collierville	(31,872)	
*Germantown	(37,348)	
Tipton		53,436
*Covington	(8,463)	
Fayette		31,202
*Somerville	(2,915)	
TN TOTALS		990,316

Mississippi		
*DeSoto		107,199

Arkansas		
*Crittenden		50,866

TN, MS & AR TOTALS		1,148,381
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* Based on 2000 Census Data

**Table 1 D
Memphis MSA
1999 NEI VOC and NOX Emissions
(ton/day)**

County	VOC			NOX		Total
	Mobile	Point	Total	Mobile	Point	
Fayette	3.31	6.12	9.43	12.30	0.36	12.66
Shelby	64.90	127.66	192.56	129.99	146.48	276.47
Tipton	3.99	4.50	8.49	8.50	4.87	13.37
Crittenden AR	7.03	11.63	18.66	18.11	3.28	21.39
Desoto MS	8.49	10.95	19.44	18.84	3.36	22.20
TOTAL	87.72	160.87	248.59	187.74	158.35	346.09

Summary Attainment Demonstration For The Memphis Area

The attainment and screening tests and additional corroborative analyses indicate that the Memphis EAC area will be in attainment of the 8-hour ozone standard by 2007. Good modeling results and good representation of typical 8-hour ozone conducive meteorological conditions by the simulation periods provide a sound basis for the application of the model-based tests. Variations in the selection of days or the radius of influence assumptions employed in the application of the attainment test do not alter the results of the modeled attainment test significantly. There are no locations within a subdomain encompassing the Memphis EAC area for which high ozone concentrations (greater than any near a monitor) are consistently simulated. The values of the simulated ozone exposure metrics indicate a significant reduction in 8-hour ozone for the 2007 AS-4 control measures simulation - approximately 50 percent for each of the exposure-type metrics. Estimates of modeling system noise also suggest that, relative to the 2007 baseline simulation, the simulated ozone reductions associated with the AS-4 control measures are meaningful within the context of the simulation – that is, the measures are expected to result in meaningful further ozone reductions by 2007, compared to the baseline values.

Three of the four monitoring sites in the Memphis area have future-year estimated design values for 8-hour ozone that are less than 84 ppb. One site, the Marion site in Crittenden County, AR, has an EDV that is greater than the 84 ppb standard. The 2007 EDV for this site is 88 ppb if the 2000-2002 design value is used, 86 ppb if the 2001-2003 design value is used, and 84 ppb if a meteorologically adjusted design value is used. The 2000-2002 design value is the highest recorded in recent years. Based on the values for the other years as well as the indications from the meteorological adjustment, use of the 2000-2002 design value likely represents a worst case for Memphis for 2007.

To further support future attainment of the 8-hour ozone standard for the Memphis area, ADEQ is currently designing a scoping study and field program to examine the spatial representativeness and causes of high observed ozone concentrations at the Marion site. An improved understanding of the 8-hour ozone issues in Crittenden County will enable the more effective implementation of the planned attainment/maintenance strategies for the area.

Please see the complete Weight Of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Document (TSD) for details.

Attachment 1