

**1997 NAAQS
Eight-Hour Ozone
Revised Maintenance Plan
for
Shelby County, Tennessee**

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I. NON REGULATORY PORTION

1. Purpose

The purpose of this plan revision is to provide and document sufficient alternative emission reductions to off-set emission benefits assigned to the City of Memphis' Inspection and Maintenance (I/M) program in the Shelby County Ozone Maintenance Plan (2010 O₃ Maintenance Plan) approved by the Environmental Protection Agency (EPA) (75 Federal Register (FR), January 4, 2010 (see Attachment I)). This revision identifies the types and amounts of emission reductions attributable to I/M and where equivalent reductions will be achieved to off-set those I/M reductions so that this updated maintenance plan may be adopted.

If all other components of this plan are approved, Shelby County requests that the specific components of the City of Memphis' I/M program approved into the State Implementation Plan (SIP) in 1986 be formally removed from the SIP to include removal from the 2010 O₃ Maintenance Plan, as these new components will substitute for the air quality benefits attributable to I/M. The revised 2010 O₃ Maintenance Plan will continue to identify county-wide basic I/M as a contingency measure and identify the events or conditions that would cause it to be triggered for implementation.

2. Background

The City of Memphis was designated as nonattainment of the carbon monoxide (CO) National Ambient Air Quality Standard (NAAQS) in 1978 (43 FR, March 3, 1978 (the 1978 document is not available but the date is referenced in 45 FR, p. 53810, left hand column, August 13, 1980 (see Attachment I))). Local transportation sources in the urbanized area were identified as the prime contributors of CO to monitored CO violations. As a result, I/M was adopted as the control strategy to return the area to attainment of the CO standard.

Effective on August 31, 1994, the CO nonattainment area was redesignated to attainment of the CO standard (59 FR, p. 44938, August 31, 1994 (see Attachment I)). The initial 10-year maintenance plan approved with that redesignation contained a continuation of the approved I/M program. Subsequently, further improvements in automotive technology led to a consistent reduction in locally monitored levels of CO. A required second 10-year CO maintenance plan was approved by the EPA (71 FR, p. 62384, October 25, 2006 (see Attachment I)) and demonstrated that I/M was no longer needed to maintain the CO NAAQS. The benefits of the continuation of the I/M program were not relied upon in that maintenance plan update.

In 2004, Shelby County, Tennessee, along with Crittenden County, Arkansas, was designated nonattainment of the 1997 ozone (O₃) NAAQS, with a classification of 'moderate' (69 FR, p. 23858, April 30, 2004 (see Attachment I)). Under Part D, Subpart 2 of the Clean Air Act Amendments of 1990 (CAA), moderate O₃ nonattainment areas with a county population over a given threshold are required to adopt a county-wide I/M plan as part of the required SIP (CAA Section 182(b)(4)). At the time, the area's O₃ design value (DV) was within CAA requirements (Section 181(a)(4)) to consider reducing the classification from moderate to marginal nonattainment of the 1997 ozone NAAQS. Shelby County worked closely with the State of Tennessee, Crittenden

County and the State of Arkansas to prepare a petition for reconsideration. All parties involved in the petition adopted additional measures to control O₃-forming emissions in the region. EPA granted the petition (69 FR, p. 56697, September 22, 2004 (see Attachment I)) which removed the SIP planning requirements mandated of moderate ozone non-attainment areas, including the adoption of a county-wide I/M program in Shelby County.

The reclassification to marginal also reset the expected attainment date of the area to June 15, 2007. The area failed to achieve attainment on that date and in accordance with CAA Section 181(b)(2)(A), EPA reclassified the area to moderate O₃ nonattainment (73 FR, p. 16547, March 28, 2008 (see Attachment I)). This reclassification again reset the attainment date, this time to June 15, 2010 with a SIP submittal due date of March 1, 2009. That SIP was to include all CAA requirements of a moderate O₃ nonattainment area, including county-wide I/M in Shelby County.

The end of the 2008 ozone monitoring season resulted in the DV for the entire ozone nonattainment area meeting the 1997 O₃ NAAQS. Shelby County and the State of Arkansas prepared separate redesignation requests and maintenance plans for their portions of the non-attainment area and coordinated their efforts in crafting the submittals. The separate submittals were made because Arkansas submits plans to EPA Region 6 headquarters in Dallas, Texas, while submittals from Tennessee are directed to EPA Region 4 headquarters in Atlanta, Georgia. After review and approval by the Tennessee State Air Board, the Shelby County request was submitted to EPA Region 4 in February, 2009.

EPA took final action on the Shelby County submittal (75 FR, January 4, 2010 (see Attachment I)) by approving the maintenance plan and redesignating the Shelby County portion of the nonattainment area to attainment with an effective date of February 3, 2010. While this removed the immediate requirement to adopt county-wide I/M, the approved maintenance plan included a continuation of the City of Memphis I/M program and set a county-wide I/M program as a contingency measure in the event that the 1997 O₃ NAAQS was violated after redesignation to attainment.

In mid-2012, the Memphis City Council voted to defund the operation of the City of Memphis I/M program beginning with Fiscal Year 2013/2014. Vehicle inspection operations at all four City of Memphis inspection stations ended on June 28, 2013. This termination of services is the principal reason this plan has been drafted and submitted as a failure to correct the potential violation of the SIP by not conducting these vehicle inspections may lead to the imposition of available sanctions authorized by the CAA.

3. Pollutants to be Reduced

Although I/M was first implemented as a CO control measure, the program was shown to be unnecessary for continued maintenance of the CO NAAQS in the second 10-year maintenance plan as discussed above. Therefore, I/M emission reductions of CO are not being considered in this revision of the 2010 O₃ Maintenance Plan. However, as the City of Memphis' tailpipe I/M program is included as a control measure in the 2010 O₃ Maintenance Plan, reductions of ozone precursors identified by EPA as oxides of nitrogen (NO_x) and volatile organic compounds (VOC) are attributable to the program, and therefore must be addressed. Although it may be possible with

analysis to substitute NO_x and VOC's for one another, the goal of this plan is to provide an off-set at a ratio of 1.1 to 1.0 for each pollutant.

4. Reduction Quantities

The quantities of NO_x and VOC reductions creditable to the City of Memphis' I/M program were determined using the most current EPA approved on-road emission model, MOVES2010b, and inputs developed by the current travel demand model (TDM) used by the Memphis Area Metropolitan Planning Organization (MPO). These figures match those provided by the contractor for the MPO to conduct this modeling and are the most current available. After consultation with air quality and conformity partners on the MPO (as documented in Attachment II), 2013 was chosen as the year for analysis of the affected change in emissions. While I/M testing ended in mid-2013, the air quality benefits associated with the program extends for the remainder of the 2013 ozone season as inspection and maintenance had occurred for all vehicles with effectiveness dropping off at a rate of approximately one twelfth (8.33%) per month or 25% by the end of September., Historically elevated levels of ozone after October 1st are rare.

2013 inputs for the MOVES2010b model were developed by interpolating TDM results for 2011 and 2015 in order to achieve 2013 emission reductions attributable to the Memphis I/M program. The results of this interpolation are provided in Table I below:

TABLE I

2013 Inspection and Maintenance Program Comparison*				
	No I/M	With I/M	Change	
	tons/day	tons/day	tons/day	%
VOC	13.609	13.257	0.352	2.66%
NO _x	29.652	29.652	-	0.00%

* As calculated by the SCHD-PCS (see MOVES2010b Input File in Attachment III). Calculation does not include evaporative emissions from refueling which is included in the area source emissions category.

At 0.352 tons of VOC and 0.000 tons of NO_x emissions per ozone season day, the target for alternative emission reductions to replace the effect of the City of Memphis discontinuing the I/M program are calculated as 129 tons per year (tpy) of VOC and no reductions in NO_x.

5. Emission Reduction Requirements

Creditable emissions reductions for use as off-sets during nonattainment must be quantifiable, enforceable, and permanent. Additionally, to the extent possible, they should be contemporaneous with the loss of the air quality benefits of the I/M program so as not to negatively affect local air quality in the short term. Further, reductions cannot be those that are otherwise required due to existing or new federal control requirements, or from the implementation of controls required from enforcement actions or prior SIP requirements.

Due to the current ozone non-attainment status of Shelby County, any past reductions that meet the

criteria of being available for an emissions credit bank that can be used for industrial permitting off-sets, should be viewed as contemporaneous if those emissions are removed from the emissions bank and are therefore no longer available for industrial off-sets. Since the area is classified as marginal nonattainment, the off-set requirements are 1.1 to 1 (CAA Section 182). This means banked credits available must be divided by 1.1 to determine the amount available from this source for off-set credit.

6. Emission Reductions

The Department has identified reductions from the 2011 closure of Cleo Inc. (source number 0153) as banked emissions available for industrial permitting off-sets. The company ceased operation partway through CY 2011 and surrendered their Title V major source air pollution permit, making the reductions permanent and enforceable (see Attachment V). Cleo Inc. reported and paid air pollution fees on actual VOC emissions of 239.1 tons in 2009 and 254.5 tons in 2010. Since the DV used to designate the area nonattainment was based on 2009-2011 data, these stationary source emissions contributed to that DV and therefore are available as off-set credits. Dividing the average of the last two full years of operation by 1.1, results in 224.4 tons that are available to be used as off-sets. During the same operational period, Cleo averaged 1.09 tpy of NO_x emissions, which have also been removed from the current local emissions inventory.

7. Regulatory Analysis

Carbon Monoxide (CO) and Ozone (O₃)

This proposal satisfies both the requirements of Section 110(l) and Section 193 of the Clean Air Act (CAA). Section 193 reads as follows:

Each regulation, standard, rule, notice, order and guidance promulgated or issued by the Administrator under this chapter, as in effect before November 15, 1990, shall remain in effect according to its terms, except to the extent otherwise provided under this chapter, inconsistent with any provision of this chapter, or revised by the Administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement, or plan in effect before November 15, 1990, in any area which is a nonattainment area for any air pollutant may be modified after November 15, 1990, in any manner unless the modification insures equivalent or greater emission reductions of such air pollutant.

This provision requires EPA to call for “equivalent or greater reductions” before it can allow termination of the I/M program, but it only applies to a pollutant for which the area is currently non-attainment. Hence, there is a need to compensate with appropriate emissions off-sets any increases in NO_x and VOCs as precursors to ozone.

There is no requirement for equivalent reductions for CO because the Memphis area is now designated attainment for CO and is under its second ten-year maintenance plan. This approved maintenance plan includes a 480.69 tons per day (tpd) safety margin. It has been previously demonstrated that the continuation of the I/M program is not necessary to prevent interference with maintenance of the CO standard. See 71 FR, pp. 62384-62388, October 25, 2006 which is included

in Attachment I. This demonstration and the safety margin provided in the second ten-year maintenance plan meet the mandate of Section 110(l) of the CAA which states in part:

...The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act.

This revision of the O₃ Maintenance Plan will not interfere with continued attainment of the CO NAAQS.

Similar to the CO discussion above, the O₃ Maintenance Plan is an applicable requirement that calls for the operation of an I/M program. This action modifies that plan and provides greater contemporaneous emission reductions than those achieved by the I/M program.

The method selected to demonstrate off-setting emissions and request a revision to the O₃ Maintenance Plan is not without precedent. EPA has taken action to allow termination of I/M obligations for Louisville, Kentucky in 2005 (70 FR, p. 28429, May 18, 2005 (see Attachment I), and its approval of a revision to amend the Wisconsin SIP to change the I/M program in the Milwaukee area (78 FR, p. 24373, September 19, 2013 (see Attachment I)). Moreover, it is consistent with the approach proposed by the Illinois EPA to reduce the scope of vehicle coverage of the I/M programs in the Chicago and East St. Louis areas. This request involved dropping older vehicles that are not equipped with On-board Diagnostic (OBD) computer ports from the vehicles required to undergo emissions inspection (78 FR, p. 68378, November 14, 2013 (see Attachment I)).

Critical to the Louisville and Wisconsin revisions was the reliance upon stationary source emission reductions, and similarly, the proposal in Illinois is reliant on the shutdown of stationary sources as the source of “equivalent or greater reductions” for lost emissions reduction benefits from operation of the I/M programs. Likewise, the Memphis proposal relies upon use of a portion of the emission credits resulting from the shutdown of the Cleo Inc. plant in 2011.

Nitrogen Dioxide (NO₂)

NO₂ is a subset of NO_x, and as shown in the modeling and discussed above regarding the O₃ NAAQS, the elimination of the tailpipe-only I/M program results in no increase in on-road NO_x emissions.

Lead (Pb)

Pb is no longer blended into on-road motor fuel, so that component of mobile sources has no contribution to Pb emissions. Therefore, approval of this Plan amendment will have no impact on Pb emissions in the community.

Sulfur Dioxide (SO₂)

SO₂ is emitted from motor vehicles, but the amount emitted is a function of the sulfur content of the fuel being combusted. The I/M program did not address fuel composition. In fact, recent changes in the federal requirements for the sulfur content of on-road gasoline and on-road diesel fuel has

resulted in a dramatic decrease in SO₂ emissions attributable to on-road sources. Therefore, approval of this Plan amendment will have no impact on SO₂ emissions in the community.

Particulate Matter (PM)

Shelby County is in attainment of all current PM standards based upon 2010-2012 air quality data. Local annual and daily design values of 10.88 micrograms per cubic meter (μ/m^3) and 20.47 μ/m^3 , respectively, are well within the new fine particulate matter (PM_{2.5}) NAAQS of 12 μ/m^3 (annual) and 35 μ/m^3 (daily). Also, local monitoring has shown a steady decrease in PM concentrations over many years. Ongoing stationary source and mobile source changes are expected to continue that trend. The tailpipe I/M program only tested for excess CO and hydrocarbons (VOCs) from gasoline powered motor vehicles. Studies have shown that VOCs can be a precursor to PM in certain chemical and meteorological circumstances. This revision to the maintenance plan offers a 1.1 to 1 reduction of VOCs in the local airshed which should off-set any increase in PM concentrations from the program's closure.

8. Intergovernmental Consultation

Crucial to the process to assure continuity and consistency between agencies throughout Shelby County, the State of Tennessee, and Region 4, is the intergovernmental consultation process required by 40 CFR 51, Subpart M. Information related to interagency contact and discussion can be found in Attachment IX. This information validates the cooperation that has been achieved between the parties that have worked together through this revision process. The help and cooperation received has been needed and is much appreciated.

II. REGULATORY PORTION

These sections replace the 2010 Maintenance Plan approved effective February 3, 2010.

9. Revised Maintenance Plan

In accordance with the 1990 Clean Air Act Amendments, Section 107(d)(3)(e) and Section 175A, the following sections, including revisions to those sections necessary to adjust for increases in NO_x and VOC emissions from closure of the City of Memphis Inspection and Maintenance Program, demonstrate maintenance of the 1997 8-hour NAAQS throughout the maintenance period. This maintenance plan, critical in preventing the deterioration of an area's air quality, sets forth measures to be carried out until November 30, 2021. During these years, the plan contains commitments to continue existing programs and to implement programs and measures depending upon emission inventory and air quality monitoring results. These provisions of the plan assure both an on-going effort to maintain the NAAQS and the opportunity and obligation to implement new programs and measures in the event unforeseen developments overwhelm the effectiveness of the mandated effort to maintain the 1997 8-hour ozone NAAQS.

A. Projections - Shelby County emissions for 2021 remain the same as those provided in the 2010 O₃ Maintenance Plan approved by the EPA (75 FR, January 4, 2010 (see Attachment I)) with the exception of point and on-road source emissions. On-road emissions for 2006 and 2021 were remodeled utilizing MOVES2010b, which replaced and updated estimates from the previous model, MOBILE6.2 used for this purpose. Point source emissions for 2006 remain the same. 2021 point source emissions for VOC's and for NO_x have been adjusted from the 2010 O₃ Maintenance Plan by subtracting the emissions that were credited to the closure of Cleo Inc. The actual emissions resulting from the closure, in the amount of 0.676 tpd VOC, are more than sufficient to account for the 0.387 tpd (0.352 tpd times 1.1) needed to off-set the VOC emissions increase resulting from the shutdown of the I/M Program, there being no change in NO_x emissions from the shutdown. In keeping with the required 1.1 to 1 off-set ratio, the local emissions banked will be reduced by 0.352 multiplied by 1.1 which yields 0.387 tpd or 141.3 tons per year (tpy). The emissions bank will therefore include the remaining VOC emissions that result from the shutdown of Cleo Inc. in the amount of 0.289 tpd or 105.5 tpy. Projections for on-road mobile, point, area, and non-road mobile sources are presented in Table II and were projected forward from the 2006 inventory to 2021 (taking into account the 2013 I/M and Cleo Inc. changes), beyond the 10-year interval required in Section 175(A) of the CAA. This maintenance demonstration projects the future emissions of VOC's and NO_x will remain below those of base year 2006.

The Shelby County base year and future year emission inventory estimates are presented in Table II and in Figures 1 and 2.

TABLE II

Summer Season Tons Per Day							
Volatile Organic Compounds Emission Inventory							
Type Inventory	Year	Area	Non-Road	On-Road*	Point**	Total	Baseline
Baseyear	2006	37.531	22.698	24.167	13.665	98.061	98.061
Projection	2021	47.039	19.734	8.558	17.715	93.046	98.061
Nitrogen Oxides Emission Inventory							
Baseyear	2006	2.101	26.657	58.013	14.458	101.229	101.229
Projection	2021	2.695	21.607	16.035	18.373	58.710	101.229

Note: to resolve double counting, the point source emission estimates for Graphic Arts and Degreasing were subtracted from the area source emissions estimates. To accomplish this task, both the SIC and the SCC codes of the categories believed to be involved were located and the related emissions were then used.

* 2006 On-Road emissions include the effect of I&M reductions on City of Memphis vehicles. As a result of the cessation of the I&M program by the City of Memphis in 2013, I&M reductions can no longer be included in 2021 projections. Estimates are made utilizing MOVES2010b.

** Cleo Inc. terminated their operating permit in 2011. 2009 and 2010 actual emissions of VOC amounted to 239.1 and 254.5 tons per year (tpy) as certified by the source for each of those years. These figures, averaged and divided by 365 results in 0.676 tpd which is subtracted from the 2010 O3 Maintenance 2021 projection of 18.391 tpd yielding the point source emissions of 17.715 tpd for 2021.

Figure 1

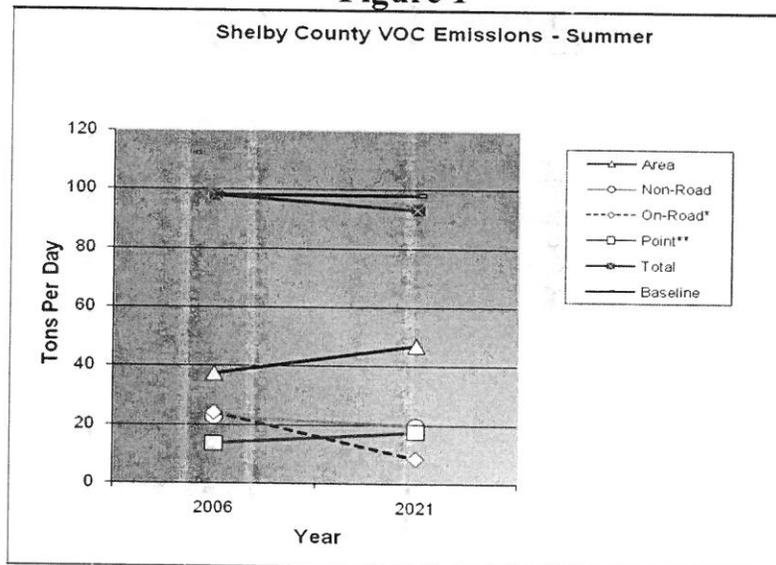
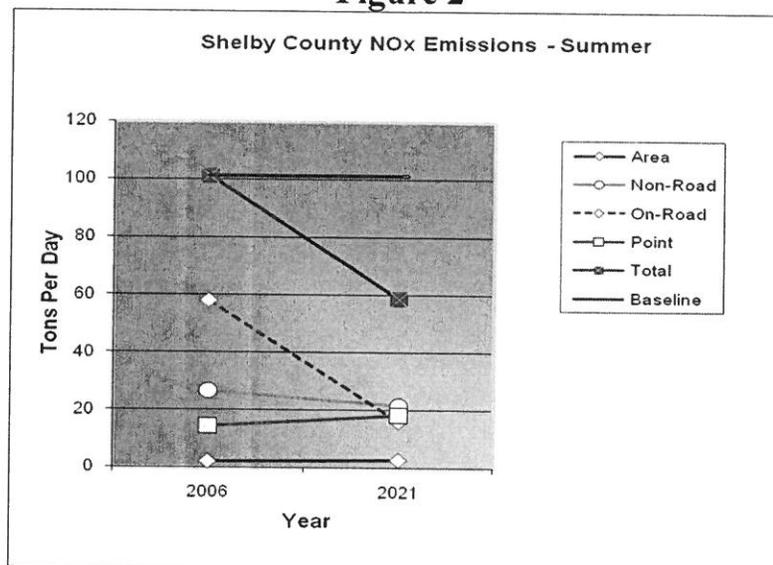


Figure 2



B. Motor Vehicle Emissions Budgets - The transportation conformity rule found in 40 CFR Part 93 requires specific emission budgets be defined for the on-road mobile sources portion of the Shelby County emission inventory. These budgets are used by transportation authorities to assure that transportation plans, programs, and projects are consistent with, and conform to, the maintenance of acceptable air quality in Shelby County. Section 93.118(b) states in part:

Consistency with the motor vehicle emissions budget(s) must be demonstrated for each year for which the applicable (and/or submitted) implementation plan specifically establishes motor vehicle emissions budget(s), for the attainment year (if it is within the timeframe of the transportation plan), for the last year of the transportation plan's forecast period, and for any intermediate years as necessary so that the years for which consistency is demonstrated are no more than ten years apart

These projections for on-road mobile, point, area, and non-road mobile sources are presented in Table II and were projected forward from the 2006 inventory to 2021 (taking into account the 2013 I/M and Cleo Inc. changes), beyond the 10-year interval required in Section 175(A) of the CAA. This maintenance demonstration projects the future emissions of VOC's and NO_x will remain below those of base year 2006.

In accordance with Section 93.118, this maintenance plan sets motor vehicle emission budgets (MVEB) for Shelby County, based on a 2006 attainment base year inventory with 2021 as the final year of the plan, and remain the same as those provided in the 2010 O₃ Maintenance Plan approved by the EPA (75 Federal Register, January 4, 2010 (see Attachment I)), with the exception of point and on-road source emissions. On-road emissions for 2006 and 2021 were remodeled utilizing MOVES2010b which replaced and updated estimates from the previous model, MOBILE6.2. Point source emissions for 2006 remain the same. 2021 point source emissions for VOC's and for NO_x have been adjusted from the 2010 O₃ Maintenance Plan by subtracting emissions credited to the closure of Cleo Inc. in 2013, and then ratioed to assure total off-set of the increase in emissions

resulting from the shutdown of the City of Memphis I/M Program. MVEBs for VOC's and NO_x are contained in Table III and are depicted in Figures 3 and 4.

TABLE III

Summer Season Tons Per Day											
Volatile Organic Compounds On-Road Emission Budget											
Type Inventory	Year	Area	Non-Road	On-Road	Point	Offsets from Cleo Inc. 1.1 : 1	Total	Baseline	On-Road Allocation Percent	On-Road Budget	On-Road Safety Margin
Baseyear	2006	37.531	22.698	24.167	13.665	N/A	98.061	98.061	N/A	24.167	N/A
Projection	2021	47.039	19.734	8.558	17.715	0.387	93.433	98.061	0.95	12.954	4.396

Nitrogen Oxides On-Road Emission Budget											
Type Inventory	Year	Area	Non-Road	On-Road	Point	Offsets	Total	Baseline	On-Road Allocation Percent	On-Road Budget	On-Road Safety Margin
Baseyear	2006	2.101	26.657	58.013	14.458	-	101.229	101.229	N/A	58.013	N/A
Projection	2021	2.695	21.607	16.035	18.373	-	58.710	101.229	0.95	56.428	40.393

Note: to resolve double counting, the point source emission estimates for Graphic Arts and Degreasing were subtracted from the area source emissions estimates. To accomplish this task, both the SIC and the SCC codes of the categories believed to be involved were located and the related emissions were then used.

* 2006 On-Road emissions include the affect of I&M reductions on City of Memphis vehicles. As a result of the cessation of the I&M program by the City of Memphis in 2013, I&M reductions can no longer be included in 2021 projections. Estimates are made utilizing MOVES2010b.

** Cleo Inc. terminated their operating permit in 2011. 2009 and 2010 actual emissions of VOC amounted to 239.1 and 254.5 tons per year (tpy) as certified by the source for each of those years. These figures, averaged and divided by 365, results in 0.676 tpd which is subtracted from the 2010 O3 Maintenance 2021 projection of 18.391 tpd, yielding the point source emissions of 17.715 tpd for 2021. On-road emissions increased as a result of the shutdown of the City of Memphis I/M program by 0.352 tpd. Emission reductions from the closure of Cleo Inc. amounted to 0.676 tpd. Of this amount 0.387 tpd (0.352 tpd times 1.1) were used to offset the on-road emission increase.

Figure 3

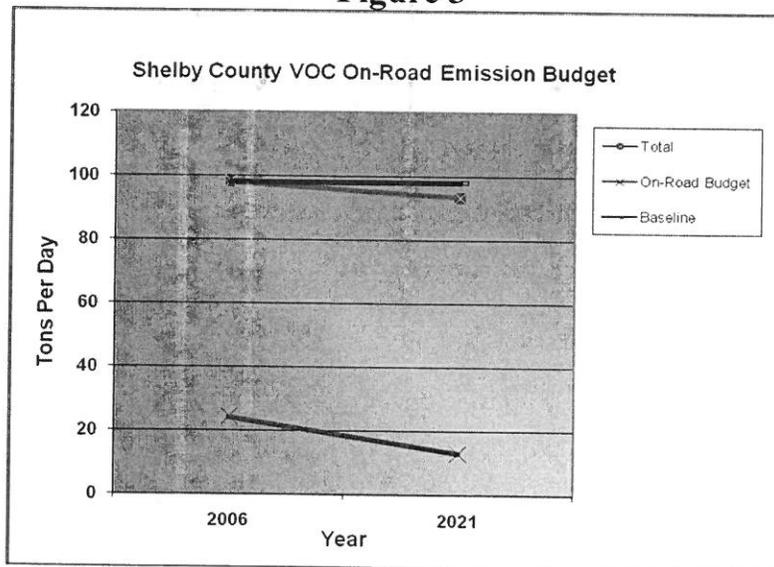
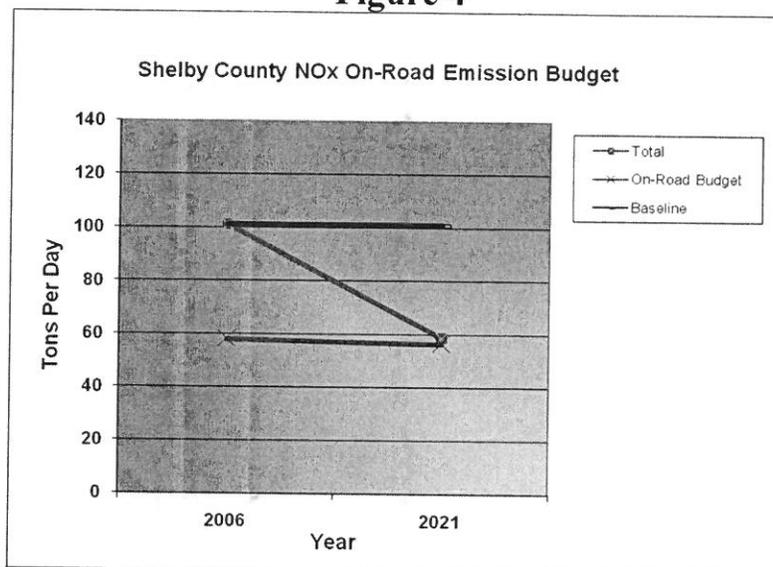


Figure 4



The MVEB reflects the total on-road mobile source emissions for 2021 plus an allocation from available VOC and NO_x safety margins. The allocation from the safety margins is available because of reductions of VOC and NO_x that have occurred, and are projected to occur, primarily from mobile sources. VOC and NO_x reductions are anticipated from point and non-road mobile source categories, but not to the extent that they occur in the on-road source category. VOC reductions from area sources are also anticipated to occur due to control techniques instituted on a federal level on industrial manufacturing activities. However, future population increases act to balance area source reductions such that there is a net increase in VOC emissions in this category. The MVEB is constrained to assure that the total emissions from all source categories do not exceed the 2006 attainment year emissions.

Under 40 CFR 93.101, the safety margin is the difference between the attainment level and the projected level, from all sources, of emissions in the maintenance plan. The attainment level of emissions is the level of emissions during one of the years in which Shelby County met the 1997 8-hour ozone NAAQS. The safety margin, in whole or in part, can be allocated to the transportation sector as long as total emissions from all categories remain below the attainment level. Ninety-five percent (95%) of the safety margin emissions are allocated to the MVEB. Specifically, 4.752 tpd of the available VOC safety margin and 40.390 tpd of the available NO_x safety margin, are allocated to the 2021 MVEB. The remaining safety margin in 2021 for VOC is 0.25 tpd and for NO_x is 2.126 tpd. The MVEB is consistent with the plan for maintaining total emissions from all source categories at or below the 2006 VOC and NO_x emission levels through 2021. For future year conformity determinations, transportation authorities should rely on the MVEB unless plan revisions occur.

C. Air Quality Monitoring Network – The existing Shelby County ozone air quality monitoring network will continue to be operated in its present configuration. Any change to the present configuration will be in accordance with the Memorandum of Agreement (MOA) finalized on June 20, 2008 between the Shelby County Government, Arkansas Department of Environmental

Quality (ADEQ) and the Mississippi Department of Environmental Quality (MDEQ). This MOA is in accordance with 40 CFR 58 Appendix D, Section 2(e), and is located in Attachment V along with a 2014 map showing ozone monitor locations in the Memphis MSA. In addition, any changes in the air monitoring network will be discussed with EPA prior to the change.

D. Triennial Emission Inventory – In order to track the progress of the maintenance plan, a triennial emission inventory of actual emissions for Shelby County will be performed using the latest emission factors, models and methodologies to include area, non-road mobile, on-road mobile and point sources of VOC and NO_x. The first year for inclusion as an inventory year considering the date of this revision to the 2010 O₃ Maintenance Plan is 2014. Successive inventory years will be 2017 (which is also a transportation emission budget year that coincides with the Shelby County Revised CO Maintenance Plan) and 2020.

E. Stationary Source Control - Sources wishing to locate in Memphis will continue to undergo new source review requirements. Existing stationary source control will continue. Companies will continue to be sought for the purpose of voluntarily reducing VOC and/or NO_x emissions where possible. Implementation of new federal control measures, as expected and where and when appropriate, will continue to be required.

The NO_x SIP Call indicated that Tennessee's 8-hour ozone nonattainment areas received significant contributions from several upwind states. The Department believes that additional NO_x emission reductions to comply with the NO_x SIP call will contribute to continued compliance with the Ozone NAAQS in the area.

The Clean Air Interstate Rule (CAIR) updates and expands the NO_x Budget Trading Program required by the NO_x SIP call and continues to require additional NO_x reductions that began in 2009. The CAIR also includes reduction requirements in states not previously included in the NO_x SIP call that could have a positive impact on ozone air quality in the Memphis area. These include, Mississippi, Arkansas, Louisiana, and Missouri. The significant additional NO_x reductions required by CAIR are expected to aid in the maintenance of the 8-hour ozone NAAQS in this area.

F. Voluntary Measures

The Department, as well as other entities in the County and the State, continues to research and implement voluntary measures that have a positive effect on local air quality. Some of the agencies involved in this effort include: The Shelby County Health Department Pollution Control Section, the Memphis Area Transit Authority (MATA), Memphis Light Gas and Water (MLGW), the Metropolitan Planning Organization (MPO), the Shelby Farms Park Conservancy, and the Memphis and Shelby County Division of Planning and Development which includes the Memphis and Shelby County Office of Sustainability.

1. Energy Reduction:

There are many individual energy reduction projects that have recently occurred in the nonattainment area. Many of these have come about due to political leadership encouraging such projects through several initiatives.

As one example, the Green Building Task Force reviewed the Existing Building Code, among other such materials, recommending revisions that would lead to Memphis and Shelby County becoming a regional leader for green buildings, sustainable development, and adaptive reuse of existing buildings in the jurisdiction. The task force and consultant submitted their final recommendations in June 2012. For the end result, energy efficiency codes will be proposed before the legislative bodies. Once adopted it is estimated these codes could reduce utility consumption by at least 933,790 kilowatt-hours (kWh) on an annual basis.

The Clean and Green Initiative (www.memphiscleanandgreen.com) is a 5 year strategy for developing renewable energy at municipal facilities. Led by Memphis Bioworks Foundation, in conjunction with Siemens Industry, Inc., Building Technologies Division, the specific activities associated with the Clean & Green Initiative include: energy conservation and reduction in municipal buildings and facilities, including street lights; energy generation, including solar or other technologies; conversion of vehicles to compressed natural gas (CNG); public safety efforts, including street lighting; trash recycling and redeployment of materials; biomass conversion to energy, liquid fuels and chemicals; waste remediation and environmental clean-up; and waste and water management systems that preserve energy, improve the environment and increase the value of City services.

In The Mayors' Energy Challenge, City of Memphis Mayor A C Wharton, Jr. and Shelby County Mayor Mark H. Luttrell, Jr. have partnered with Pathway Lending, a non-profit commercial lender in Tennessee, as well as the State of Tennessee, MLGW, and the Tennessee Valley Authority to present the Challenge to business owners and residents in Memphis and Shelby County. This public-private partnership is designed to provide the necessary tools and resources to motivate individuals in the community to make their homes and businesses more energy efficient. This provides a threefold return to the community: individuals will be able to save money; contractors will have more business opportunities; and there will be less carbon emitted in the community.

Examples of some of the projects inspired by these and other initiatives include:

- Visitor's Center at Shelby Farms. This building underwent an energy conservation based renovation in 2012. A new HVAC system, window tinting and UV-lamp to clean the HVAC coils were all installed. A 20% reduction in the energy use is anticipated from these renovations.
- Trustee's Building at 157 Poplar Ave. This building was refurbished last year. This work included the installation of a new more energy efficient HVAC system and other energy conservation upgrades.
- Sears Crosstown Sustainability Improvements. The historic Sears Crosstown building is being preserved and redeveloped as a mixed-use vertical urban village in Midtown Memphis. Eight Founding Partners have committed to inhabit nearly 600,000 square feet of the historic building. The project seeks to use \$2.01 million in Qualified Energy Conservation Bond proceeds to finance a number of sustainable design elements, including rainwater harvesting, green roofs, low-flow plumbing fixtures, high efficiency building systems, and light emitting diode (LED) lighting among other items.
- 20 public electric vehicle (EV) charging stations in Shelby County as reported on the EV website: <http://www.blinknetwork.com/blinkMap.html>

- Solar Energy Generation Installations:
- Agricenter Solar Farm is a 998.4 kilowatt (kW) farm producing 1,600,000 kWh annually
 - Bioworks solar panels on their parking garage: a 750 kW array
 - All Better Pediatrics: a 28 kW array
 - Memphis Pediatrics Germantown: a 50 kW array
 - St. Agnes-St. Dominic School: 17.4 kW array
 - Brother Industries: two 59.8 kWh solar farms. Additionally, in 2012, Brother installed a High Efficiency Air Compressor to replace an inefficient unit installed in 1998. The new compressor consumes 171,000 less kW per year due to the compressor using a variable drive system.

2. Land Use Planning:

The Memphis and Shelby County Office of Sustainability has been charged with the implementation and oversight of the Sustainable Shelby Implementation Plan developed from extensive community input in 2008. The Office is local government's leading advocate and resource for sustainability and coordinates various regional initiatives. One such initiative is the ongoing updating of the recently adopted Unified Development Code (UDC) designed to reduce sprawl, encourage renewed urban development, and make communities more people focused. Through this office, Shelby County Government received a \$2.6 million grant that is being used to establish a "greenprint" plan. This plan will establish a unified vision for a region-wide network of greenspace areas including parks, greenways, byways, blueways, conservation lands, natural areas, wildlife management areas, open space areas, and other similar spaces. A consortium of greenway organizations, related businesses and local and state governments is leading the planning effort.

In addition to the new UDC and the Regional Greenprint plan currently being developed, the City of Memphis recently adopted a Complete Streets policy that will complement the other two. This helps to ensure that future development and redevelopment will focus on providing accommodation to all users of transportation and public spaces.

3. Transportation:

The Tennessee Department of Transportation (TDOT) has been aggressively working on an Intelligent Transportation System in Shelby County. In 2007, the system was made fully functional with the completion of the local control center. Besides assisting in managing flow on local expressways and improving incident response times, which greatly reduce congestion and associated pollution, the message boards are used to alert citizens to unhealthy air quality forecasts and encourage actions to avert such episodes.

Shelby County is experiencing dramatic growth in greenway and bicycle trail planning and construction. The 6.5 mile Shelby Farms Greenline has been a community-building success and it is to be extended seven miles east from the current eastern terminus at the centrally-located 4,500-acre Shelby Farms Park. Additionally, the Wolf River Greenway continues to be expanded with the future goal of having an off-road path from the Mississippi River to the eastern edge of the County.

The Main to Main Multi-Modal Connector Project (<http://main2main.com>) will include major infrastructure repairs and improvements on Downtown Memphis' Main Street from Uptown to the Harahan Bridge and convert the Harahan Bridge into a bike/pedestrian path. This project is made possible by \$15 million in federal funds through the Transportation Investment Generating Economic Recovery Grant (TIGER IV), as well as matching grants from state and local funds and private funds.

The Shelby County Trails Plan proposed possible alternative routes and enhanced connectivity from the Mississippi River Corridor Trail to various points in the city. The southern route expansion will create a recognized access to jobs because it will directly connect neighborhoods to the business district and industrial complexes in Memphis within Shelby County. The goal is to create a Trails Plan that includes the expansion of the southern route which will provide an alternative transportation choice.

After being identified as one of the most unfriendly areas in the country for bicycles by *Bicycling Magazine*, local elected officials rallied to improve the area's position in the important transportation mode. The effort resulted in the magazine recognizing the area as the 'Most Improved' in its most recent evaluation. This has translated into increased public and private funding for new and innovative infrastructure projects that have received national and international recognition. These projects not only help provide safe alternative transportation choices, but also help address health and air quality concerns in the area.

Shelby County Bike Infrastructure (miles)					
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Shared Use Path	15	22	25	26	31
Shared Lanes	56	56	65	70	115
Bike Lanes	2	8	31	48	74
Mtn. Bike Trails	17	17	17	17	17
Source: City of Memphis Division of Engineering, September 23, 2013					

This table notes the expansion of bicycle paths and infrastructure in Shelby County over the past five years.

The Greater Memphis area has been the recipient of federal Congestion Management/Air Quality (CMAQ) funding since the program was first adopted into national highway legislation. Various projects have been evaluated, approved by the MPO and either fully or partially implemented. The area is noted as being a leader in traffic signalization projects to reduce congestion. As part of the approval process, expected emissions reductions are developed. Again, while recognizing these reductions are not creditable, the role they play in helping the area to maintain progress toward acceptable ozone air quality is important. Below is a summary of those programs and their expected benefit in reducing emissions.

SUMMARY OF CMAQ PROJECTS AND PROJECTED EMISSIONS REDUCTIONS

Name of Project	Cost (Millions)	CO Reduction (tpy)	VOC Reduction (tpy)	NO _x Reduction (tpy)
Shelby County Signal Project	\$21.13	72.580	6.076	6.540
MATA Hybrid Bus Purchase	\$2.4	0.03	1.9	7.7
Coordinated Signal System 1	\$1.07	5.28	0.45	0.60
Coordinated Signal System 2	\$1.77	40.26	3.42	4.56
Coordinated Signal System 3	\$2.72	40.26	3.42	4.56
Houston Levee at Houston Hill Traffic Signal	\$0.12	1.65	0.14	0.19
Covington Pike Signal System	\$0.90	4.91	58.62	(-0.99)
City of Memphis - 50-Mile Connections	\$1.70	0.70	0.53	5.95
TOTAL	\$31.81	165.67	74.56	30.1

4. Health Department Initiatives:

Recognizing that industrial regulation was no longer the only path to clean air, in 2007 Shelby County Government established the Air Quality Improvement Branch (AQIB) within the Pollution Control Section. AQIB staff has been tasked with identifying other projects and funding sources to support local clean air efforts.

On Ozone Action Days, the cost of bus or trolley fare is subsidized from Health Department funds allowing the rider to pay just \$0.25 to ride public transportation. There have been 36 actions days since their start in 2009 with an average estimated daily ridership increase for those days of 5% - 10%. Additionally, since implementation of the program, the Memphis Area Transit Authority (MATA) reports that overall daily ridership has increased by 4%. See the table below for additional information.

Calendar Year	Ozone Action Days	Total Riders on Action Days	Average Daily Ridership On Action Days
2009	3	121,548	40,516
2010	4	109,429	27,357
2011	13	350,641	26,972
2012	14	403,763	28,840
2013	2	44,405	22,203

The retrofitting of older diesel engines is a recognized cost-effective method of reducing emissions from mobile sources. The Department has been aggressively pursuing this initiative. To date, this

program has resulted in the retrofitting of approximately 298 public school busses, 85 sanitation trucks and 80 public transit buses. These fleets were targeted because they are heavy diesel engine vehicles that regularly travel through heavily populated areas.

The Department also manages a rideshare/vanpool program and supports it with a multi-faceted education and outreach program. The education and outreach initiatives include on-site visits to businesses, industry, events such as the local Earth Day celebration, and multi-media ads. Through this program, the Department was a founding planning member and participant in the now annual Tiger Blue Goes Green celebration on the campus of the University of Memphis.

In 2007, the Department received a Community-Scale Air Toxics monitoring grant to help further research emissions from Barge traffic on the Mississippi River. The study was completed in late 2010. As the fourth largest inland port in the United States, it is believed that this traffic could be a significant contributor to local air quality problems. EPA's Office of Air Quality Planning and Standards is using information gathered during that study to further research the test methods utilized during this innovative project. This local study identified potential problems of venting into the air of emissions from petro-chemical barges and resulted in the tank barge industry adopting a new 'Best Practices' guide for petro-chemical tank barge operators.

The Department is currently developing and preparing to implement a new and inventive air toxics monitoring project across the County. This project will document actual public exposure to toxic air pollutants across 100 census tracts and may be used to identify suspect sources of that exposure.

G. Contingency Provisions

Section 175A of the Act requires a maintenance plan to include contingency provisions to promptly correct any violation of the NAAQS which occurs after redesignation of an area as an attainment area. In addition, in order for an area to take early action to address potential violations of the NAAQS before they occur, it is recommended that contingency provisions will be enacted when specified action levels indicate the need to do so. Shelby County is adopting a three-phase approach to addressing ozone related air quality problems in the area. Each phase will include increasingly aggressive provisions to be implemented in the event of specified indicators.

Phase 1 is designed to respond immediately to potential ozone air quality problems and to assist the area in meeting the new 2008 8-hour ozone NAAQS. Whenever the Department forecasts ozone levels above the 2008 NAAQS, an air quality alert will be issued to the local media and other interested parties. On such an alert, the following actions will take place:

- All open burning permits issued by the Department are suspended until the forecast shows improvement. During ozone season, holders of such permits are required to contact the office on a daily basis to determine if burning will be allowed.
- Air quality alerts, which began in 2009, will continue to be posted on the Intelligent Transportation System boards located on the expressway system in Shelby County, encouraging motorists to take actions to reduce emissions.
- The Memphis Area Transit Authority will offer greatly reduced fares on these days. The Department has received Congestion Mitigation and Air Quality funds, approved through the local MPO to support this program which began in 2009.

- The Memphis area has a significant amount of installed standby electrical power generation capacity. The largest of these is a bank of standby combustion turbines operated by TVA's Allen Steam Plant. Beginning with the steam plant, then adopted as standard permitting practice by the Department in 2008, all such equipment is prohibited from operation strictly for maintenance or readiness testing on ozone air quality alert days. Stationary source inspections now include a review of the operating days of this type of equipment.

Besides these provisions, the Department will continue to look into effective ozone alert day measures, and will continue an aggressive public education and outreach program which began in 2009. The Department maintains a meteorologist on staff to produce local air quality forecasts. These forecasts have been recognized by the states of Tennessee, Arkansas and Mississippi, as the primary forecasts for the region, and they use them to conduct outreach to the counties surrounding Shelby County. The Department will continue to work with State and local agencies to encourage adoption of measures to reduce ozone formation at all times, but especially during air quality alerts.

Phase 2 of the plan is designed to address potential future problems as a result of unanticipated increases in local emissions. This part of the plan will be implemented when the Department-certified triennial emissions inventory of VOCs or NO_x (ozone season tons per day) exceeds the 2006 base year attainment inventory by ten percent (10%) or more, with at least one exceedance of the 1997 ozone NAAQS being recorded at any nonattainment area monitor, based on certified data, during the most recent monitoring season. On this occurrence, the Department will conduct an investigation into the possible causes to determine if they are attributable to reporting errors or a non-recurring anomaly in the local emission profile. The investigation will last no longer than three months when the results will be reported to the EPA and the Tennessee Air Pollution Control Division.

If the investigation reveals the data are valid, further action is required. Following consultation with the Tennessee Air Pollution Control Division and the EPA, the Department will seek to expand voluntary programs and develop regulations for submission to affected local legislative bodies, and/or the Tennessee State Air Board, as appropriate, to address the causes of concern. Proof of adoption of such regulations will be submitted to the EPA within nine months after the end of the investigation. All regulatory programs will be implemented within eighteen to twenty-four months. Such measures could include, but are not limited to:

- Programs or incentives to decrease motor vehicle use;
- Programs to require additional emissions reductions on stationary sources;
- Restrictions of certain roads or lanes for, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles
- Employer-based transportation incentive plans; and,
- Additional programs for new construction of paths for use by pedestrian or non-motorized vehicles when economically feasible and in the public interest.

Phase 3 will be implemented when a monitored violation of the 1997 ozone NAAQS occurs in the nonattainment area, according to certified data, during the most recent monitoring season. Similar to Phase 2, on that occasion, the Department will conduct an investigation to determine if the cause of the violation can be attributed to errors or clearly identifiable exceptional events outside of local control. Prior to certification of the data, the Department will solicit the involvement of all State

agencies having jurisdiction in the surrounding area. The investigation will last no longer than three months when the results will be reported to the EPA and the Tennessee Air Pollution Control Division.

If the investigation reveals the data are valid, further action is required. In addition to the provisions described in Phase 2, according to EPA guidance, provisions required to be implemented in such circumstances are certain measures initially required under the area's 'moderate' designation. Those provisions are:

- Expansion and implementation of a Basic I&M program in Shelby County that meets the requirements of Section 182(a)(2)(B) of the CAA.
- A Reasonably Available Control Technology (RACT) regulation for legacy major sources of NO_x emissions in Shelby County.
- Adoption of all industrial and commercial VOC controls as provided in final EPA-approved Control Technology Guidelines (CTGs) through the date of the recorded violation.

Within six months of the conclusion of the investigation, the Department will prepare regulations for submission to affected local legislative bodies and/or the Tennessee State Air Board, as appropriate, to adopt these controls. The effective date of these controls will be within eighteen to twenty-four months of final adoption by the appropriate entity.

9. Meet All Requirements Applicable To The Area Under Section 110 And Part D Of The Clean Air Act

Regulations for Memphis and Shelby County were originally approved by the EPA on May 31, 1972 (37 FR 10842 to 10894) as an appendix to the Tennessee SIP. The SIP contained a section that recognized the Department as the agency with authority for the control of air pollution in Shelby County and included a control strategy demonstration along with the Department's regulations. In 1978, the City of Memphis was designated nonattainment for carbon monoxide and Shelby County was designated nonattainment for ozone. Nonattainment plans, along with new control strategy demonstrations, were developed for Memphis and Shelby County. In 1980 and 1981 (45 FR, p. 8004, February 6, 1980; 45 FR, p. 53809, August 13, 1980; and 46 FR, p. 43970, September 2, 1981 (see Attachment I), the EPA approved those plans. The Department revised the regulations in several administrative and substantive areas. The Department adopted certain portions of the State regulations, revised old regulations and recodified the air pollution control section of Memphis and Shelby County Codes accordingly. On July 7, 1986, the State of Tennessee submitted to the EPA Memphis and Shelby County regulations (Board Order 17-86) as a revision to the SIP. The EPA placed the regulations on hold until the federally approved SIP for Tennessee and Memphis could be compiled. The EPA compared the federally approved State regulations and the federally approved Memphis regulations to determine the approvability of the revised Memphis regulations. The EPA's direct final approval/disapproval of the 1986 submittal was formalized in the Federal Register (54 FR, p. 25456, June 15, 1989 (see Attachment I)) and became effective on August 14, 1989.

EPA concluded that the control strategy demonstration was adequate in protecting the National Ambient Air Quality Standards. Consequently, the EPA approved the local regulations as a transfer of enforcement authority rather than as a substantive revision to the SIP. The EPA used the following conditions and conclusions to arrive at the above procedure:

- The local regulations must be equal to the corresponding federally approved State regulation.
- The local regulations cannot be treated as separable from the SIP, which the State submits and implements, but must be considered part of the SIP.
- As Tennessee State law requires that a local regulation be equivalent to or not less stringent than the corresponding state regulation, the State of Tennessee must certify to the EPA that each regulation has been reviewed by the State and found to meet this requirement.
- Tennessee must retain overall authority and responsibility for developing and implementing, including enforcing, the SIP.

Administrative materials and regulatory documents were submitted to the Tennessee Air Pollution Control Board on September 23, 2003 with a request that a submittal be made to EPA in order to revise the SIP for Memphis and Shelby County, taking into account changes that have occurred in the Memphis and Shelby County Air Program since 1989. Information regarding this submittal is found in Attachment VI.

The Tennessee Code Annotated, Section 68-201-115 (see Attachment VII), requires geopolitical areas within Tennessee that desire to have their own air pollution control programs to adopt regulations as stringent as State of Tennessee regulations. After review by and upon the recommendation of the Tennessee Air Pollution Control Division, the Tennessee Air Pollution Control Board issues a certificate granting this authority but subject to limitations as established by the Board. This authority continues to be granted to Shelby County and all included municipalities every two years, the most recent certificate having been issued for the 2008-2010 period. Copies of these recent certificates are also found in Attachment VII.

Regulatory changes made by the State of Tennessee will be adopted by reference by the Department when and where applicable, prior to the granting of authority by the Tennessee Air Pollution Control Board to the Department, as provided by the Tennessee Code Annotated and the Certificate of Exemption process. Where such authority is not transferred it remains with the State of Tennessee.

11. Public Comment

Public comment was sought concerning the maintenance plan revision during a comment period from January 31, 2014 to March 14, 2014. A public hearing was held on March 4, 2014. Comments were received concerning the redesignation request. Comments and response to comments are contained in Attachment IX. A copy of the newspaper notice is included.