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Technical Support Document for Memphis Ozone Nonattainment Area
September 2004

1.0 Summary.

The States of Tennessee and Arkansas presented a petition to EPA, Regions 4 and 6, requesting downward reclassification of the Memphis Ozone Nonattainment Area (MONA) from Moderate to Marginal for the 8-hour ozone standard. The petition was presented to EPA July 15, 2004. The petition is based on the area's Moderate design value of 92 ppb being within 5% of the maximum Marginal design value of 0.091 ppm as allowed by the Clean Air Act.

2.0 Introduction.

This section describes the statutory provisions and EPA guidance regarding reclassification of ozone nonattainment areas. Sections 181(a)(4) and 182(b)(3) of the Clean Air Act provide that areas may be reclassified under certain circumstances. This technical support document addresses the provisions of section 181(a)(4) and a specific request for reclassifications received by the State of Michigan. The EPA has not received any requests for reclassification under section 182(b)(3) for the 8-hour ozone standard.[1]

Under section 181(a)(4), an ozone nonattainment area may be reclassified "if an area classified under paragraph (1) (Table 1) would have been classified in another category if the design value in the area were 5 percent greater or 5 percent less than the level on which such classification was based." In the April 30, 2004 notice, we indicated that an area with a moderate design value of 96 ppb (or less) would be eligible to request a bump down because five percent less than 96 ppb is 91 ppb, a marginal design value.

The EPA previously described criteria to implement the section 181(a)(4) provisions in a final rule designating and classifying areas published on November 6, 1991 (56 FR 56698). As stated in that notice, the provisions of section 181(a)(4) set out general criteria and grant the Administrator broad discretion in making or determining not to make, a reclassification. As part of the 1991 action, EPA developed more specific criteria to evaluate

[1]Section 182(b)(3) specifies that EPA would approve any request from a State to reclassify to a higher classification.

whether it is appropriate to reclassify a particular area. The EPA also described these criteria in the April 30, 2004 final rule. The general and specific criteria are as follows:

General: The EPA may consider the number of exceedances of the national primary ambient air quality standard for ozone in the area, the level of pollution transport between the area and other affected areas, including both intrastate and interstate transport, and the mix of sources and air pollutants in the area.

Request by State: The EPA does not intend to exercise its authority to bump down areas on EPA's own initiative. Rather, EPA intends to rely on the State to submit a request for a bump down. A Tribe may also submit such a request and, in the case of a multi-state nonattainment area, all affected States must submit the reclassification request.

Discontinuity: A five percent reclassification must not result in an illogical or excessive discontinuity relative to surrounding areas. In particular, in light of the area-wide nature of ozone formation, a reclassification should not create a "donut hole" where an area of one classification is surrounded by areas of higher classification.

Attainment: Evidence should be available that the proposed area would be able to attain by the earlier date specified by the lower classification in the case of a bump down.

Emissions reductions: Evidence should be available that the area would be very likely to achieve the appropriate total percent emission reduction necessary in order to attain in the shorter time period for a bump down.

Trends: Near- and long-term trends in emissions and air quality should support a reclassification. Historical air quality data should indicate substantial air quality improvement for a bump down. Growth projections and emission trends should support a bump down. In addition, we will consider whether vehicle miles traveled and other indicators of emissions are increasing at higher than normal rates.

Years of data: For the 8-hour ozone standard, the 2001-2003 period is central to determining classification. Data from 2004 may be used to corroborate a bump down request but should not be the sole foundation for the bump down request.

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Limitations on Bump Downs

An area may only be reclassified to the next lower classification. An area cannot present data from other years as justification to be reclassified to an even lower classification. In addition, section 181(a)(4) does not permit moving areas from subpart 2 into subpart 1.

In 1991, EPA approved reclassifications when the area met the first requirement (a request by the State to EPA) and at least some of the other criteria and did not violate any of the criteria (emissions, reductions, trends, etc.). In our April 30, 2004 final rule on designations and classifications, we stated our intention to use this method and these criteria once again to evaluate reclassification requests under section 181(a)(4), with minor changes described in that notice. In that notice we also described how we applied these criteria in 1991. For additional information, see section 5, "Areas requesting a 5% downshift per §181(a)(4) and EPA's response to those requests," of the Technical Support Document, October 1991, for the 1991 rule. [Docket A-90-42A.]

EPA is not basing this reclassification determination on consideration of whether the nonattainment area being reclassified does or does not cause any pollution transport. The EPA is presently addressing ozone pollution transport issues throughout the eastern part of the United States under other Clean Air Act provisions. Specifically, EPA has proposed a determination that emissions from certain states contribute significantly to downwind nonattainment for ozone under CAA section 110(a)(2)(D) through the Clean Air Interstate Rule (CAIR). The CAIR proposal, published in a Federal Register notice dated January 30, 2004, would require upwind States to eliminate emissions that contribute significantly to nonattainment in downwind States. 69 Fed. Reg. 454566. The EPA previously issued the NOx SIP call (63 FR 57356) to address interstate ozone transport. In the event of any intrastate transport issue, states have the obligation to develop attainment SIPs for each area that show timely attainment, and can address any intrastate transport issues in that context.

The April 30, 2004 notice invited States to submit the reclassification requests within 30 days of the effective date of the designations and classifications. The effective date was June 15 which means that reclassification requests were to be submitted by July 15, 2004. This relatively short time frame is necessary because section 181(a)(4) only authorizes the Administrator to make such reclassifications within 90 days after

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the initial classification, September 15, 2004.

3.0 Background.

The MONA was designated nonattainment for the 8-hour ozone standard on April 15, 2004, and classified “Moderate” based on a design value of 92 ppb.

The MONA consists of Shelby County, Tennessee, and Crittenden County, Arkansas. The recently revised Memphis Metropolitan Stastical Area (MSA), which has a population of just over 1.2 million, includes Shelby, Tipton, and Fayette Counties, Tennessee; DeSoto, Marshall, Tate and Tunica Counties, Mississippi; and Crittenden County, Arkansas. Crittenden County, which lies adjacent to the Mississippi River and just west of Memphis, Tennessee, is mostly a rural county with small communities and little industry. In 2001, Crittenden County reported a population of just over 51,000, while Shelby County (which includes the City of Memphis) reported a population of 896,000. Fayette County had a population of 31,000, while Tipton County had a population of 53,000. DeSoto County, Mississippi, which is also quite rural and serves as a bedroom community for Memphis, had a population of 114,000. Marshall, Tate and Tunica counties in Mississippi were added to the MSA as a result of the findings of the federal Census Bureau’s 2000 Census. In 2001, their populations were reported as: 35,000, 25,000 and 9000, respectively. Interstate 40 runs east-west through Crittenden County, while Interstate 55 runs north from the center of the Crittenden County and is adjacent to the City of Memphis.

Within the Memphis MSA, ground-level ozone is measured at the Crittenden County monitor, which is located 10 miles northwest of downtown Memphis in Marion, Arkansas; at two monitors in Shelby County (Edmund Orgill Park and Frayser Street); and at one monitor located in the central part of DeSoto County. In recent years, the Marion monitor has measured some of the highest 1- and 8-hour average ozone concentrations in the Memphis MSA. For example, the 8-hour design values for 2001, 2002, and 2003 at the Marion monitor are 92, 94, and 92 ppb, respectively. Design values for the Shelby County monitors are: 93, 90, and 89 ppb at the Edmund Orgill Park monitor, and 93, 87, and 84 ppb at the Frayser Street monitor. The 8-hour design values at the DeSoto County monitor are 86, 86, and 81 ppb.

4.0 Reclassification Request by States.

The State’s request and the rationale is as follows:

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1. Request by States: The States of Tennessee and Arkansas present this petition.

2. Discontinuity: Multiple screening tests demonstrate that no discontinuity exists with surrounding areas.

3. Attainment: Local modeling and a meteorological adjustment methodology was used in the discussion for attainment.

4. Emissions Reductions: Emissions reductions that were included in the local modeling and additional reductions beyond that modeled are detailed in the petition.

5. Trends: Long term and near term emission and air quality trends support reclassification.

6. Years of Data: 2001 - 2003 air quality data were used to designate the area to nonattainment.

5.0 EPA Review of the Reclassification Request.

5.1 Request by State.
The States of Tennessee and Arkansas submitted the petition by the date required.

5.2 Discontinuity
The modeling tests documented in the petition demonstrate that no discontinuity exists with surrounding areas. Since the entire MONA is included in the request and the MONA is surrounded by attainment areas, there will be no area of one classification (MONA) surrounded by an area of a higher classification.

5.3 Attainment
The modeling submitted showed attainment when using methodology for adjusting meteorology. The appropriateness of this method is under review by EPA. The EPA's evaluation of the modeling submitted without a meteorology adjustment and other assumptions shows the design value declining to 88 ppb by 2007, which makes notable progress toward attainment. Also, EPA's Clean Air Interstate Rule (CAIR) modeling shows the area should have a design value of 86 ppb by 2010, which also shows notable progress towards attainment. In addition, the CAIR modeling does not include any local controls expected prior to 2007. Therefore, local controls could be expected to further lower the CAIR 2010 design value. Both modeling projects indicate more reductions are needed beyond

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that modeled for attainment by 2007. Additional controls beyond that modeled have been identified and submitted in the petition. Local modeling to assess the impact of the additional controls and to identify and implement more controls if needed will be performed as a part of a monitoring study.

5.4 Emissions Reductions

Attainment is expected because of the combination of measures to be implemented and potential measures listed in the petition along with the commitment of the areas to implement additional measures as needed to achieve attainment As strong support for adequate emission reductions being implemented, Arkansas is conducting a study with limited additional modeling which should identify the sources affecting the monitors more precisely. EPA is providing $100,000 and Arkansas is providing $50,000 for this study. Arkansas, Tennessee and the Memphis-Shelby County local agency are committed to assess the results of the study and implement additional controls beyond those modeled or identified in the reclassification petition by 2006, if required by the study results. This commitment is made by the Governors, State, and Local officials of both States as signatories to the petition. In addition, the State of Tennessee and the City of Memphis/Shelby County have submitted letters reinforcing the commitments to provide additional measures as the modeling and study results might identify.

The petition lists 19 emission reduction measures for potential implementation at the state and local level. Some of these measures are quantifiable and enforceable and others are voluntary. However, these measures, when combined with potential Federal measures expected during the period, could bring the area into attainment by 2007. Tennessee is considering measures such as NOx Reasonably Available Control Technology rules for stationary sources, expanded Stage I vapor recovery, emissions inspections, and anti-tampering measures. Memphis-Shelby county is considering measures such as diesel engine idling limits, reduced speed limits, controlled burning restrictions, and On Board Diagnostic II emission testing. Arkansas is considering measures such as Stage I vapor recovery, truck stop electrification, and replacement/retrofit construction equipment engines.

In addition, EPA has provided Arkansas with $100,000 in funds to implement truck stop electrification in Crittenden

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County.

5.5 Trends

The area's design value is 92 ppb, one ppb above the Marginal classification design value based on 2001 - 2003 data. The area has not had any exceedences at the Crittenden County monitor in 2004 through September 10. The 4th highest monitor value is 78 ppb. If this value remains the 4th highest for 2004, the design value will decline to 87, well within the Marginal range and only 3 ppb above the attainment level. With the monitor values already established for 2002 and 2003, the Crittenden County monitor could have a 4th high value as high as 91 ppb for 2004 and the design value would still decline from 92 to 91, which is the upper limit for the Marginal classification. Also, with the monitor values already established for 2002 and 2003 for the Shelby County monitors, the 2004 data, to date, are indicating attainment. The design value trends for the two Shelby County monitors have declined since 2000. Air quality trends data from 1982 to 2003 for the Shelby County monitors was reviewed. In addition, from 1998 to present the number of 8-hr ozone exceedances by year have consistently decreased at a majority of the monitors. Therefore, the trends in design value and exceedences indicate the Marginal classification is reasonable at this time. A table of historical design values is in Appendix 6.2.

The emissions from ozone precursors VOC and NOX from stationary sources in Shelby County, TN, have declined significantly since 1993. Emissions estimates in the Memphis MSA (excluding Marshall, Tate and Tunica), from the Memphis Early Action compact March 31, 2004 submittal, indicate that emissions should decrease by 28% for NOX and 19 % for VOCs from 2001 to 2007. The air quality and emissions trends support reclassification.

Shelby County is included in the NOx SIP call which requires reductions of 57.5 tons per day (tpd) of NOx emissions from the Tennessee Valley Authority (TVA) Allen Power Plant. Selective Catalytic Reduction Controls are on all emission units at the TVA Allen Plant. These and other NOx SIP call controls were included in the modeling studies and should further reduce the possibility of regional transport affecting the MONA. The area has yet to fully realize the air quality improvements which will be achieved from the 57.5 tpd reduction. We anticipate drops in the number of

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exceedences and the magnitude of the 4th highest monitor observations in 2004 which would begin to demonstrate the air quality improvement achieved in response to the measures. Also, it is anticipated the 2004 and 2005 design values will show air quality improvements from these measures.

Population growth projections used in analysis for 8-hour ozone designations show virtually no growth for the MONA between 2000 and 2010. Crittenden County is projected to grow 0.2% and Shelby County 5.2% over the 10 year period. This low level of growth should not add significant emissions to the MONA.

5.6 Years of data

The period used for classification is 2001 - 2003.

5.7 Additional Information

The petitioners have emphasized that the States of Tennessee and Arkansas, along with the local governments of Shelby and Crittenden Counties, have produced a plan of action which will result in real ozone reductions and attainment by 2007 through an exhaustive collaborative effort.

EPA Regions 4 and 6 received letters from City, State and Congressional Representatives, supporting approval of the petition. In addition, the Tennessee Chapter of the Sierra Club sent a letter to the Memphis and Shelby County Health Department and copied EPA Region 4 requesting that EPA require public participation in the petition process for reclassification and that the area retain the moderate designation until five years of data are collected to justify a downward reclassification of the area.

EPA Regions 4 and 6 also received additional letters from the State of Tennessee and the City of Memphis/Shelby County on September 9, 2004, further strengthening the commitment to implement additional measures shown necessary to attain the 8-hour ozone standard by the beginning of the 2006 ozone season (Appendix 6.1).

5.8 Conclusions

The Request by States criteria is satisfied since the petition was submitted by the governors of Tennessee and Arkansas. The Discontinuity criteria is satisfied since the

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modeling tests submitted showed there would be no area surrounded by one or more areas of higher classification. The Attainment criteria is not failed since the modeling shows notable progress toward attainment. The Emissions Reductions criteria is satisfied because of the emission reductions available and the commitment by the state and local agencies to add any controls necessary to attain the 8-hour standard based on a comprehensive study of sources contributing to nonattainment. The Trends criteria is satisfied since the downward trends in air quality monitor and emissions data and the lack of growth over the time period to attainment are strong indicators of progress towards attainment. The Years of Data criteria is satisfied since the years chosen (2001 - 2003) are consistent with the time period used for the designations for the 8-hour ozone standard. In addition, the air quality monitor data through September 10, 2004, indicates that the area's design value is likely to be in the Marginal range by the end of the 2004 ozone season.

In summary, the data, analysis, and commitments presented in the petition support the likelihood of attainment of the 8-hour NAAQS by 2007 and support the request for downward revision to the 8-hour ozone classification for the MONA. The EPA will be working with the States and the MONA to assist in the development of measures through use of the field study results and updated modeling.

5.9 EPA action
The request meets certain criteria EPA established (request, discontinuity, emission reductions, trends, and data) and does not violate any of the criteria (attainment). Therefore, EPA is approving the reclassification request for Memphis.

6.0 Additional Information

Additional information regarding the bump down request for this area is contained in the docket for this action. This information includes the State request, supporting documents, and other necessary material.

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