

US EPA ARCHIVE DOCUMENT

Request to Reclassify the Detroit-Ann Arbor Area to Marginal Nonattainment for Ozone

July 15, 2004

This analysis was prepared by the Michigan Department of Environmental Quality (MDEQ) and the Southeast Michigan Council of Governments (SEMCOG).

The MDEQ and the SEMCOG, the designated lead local agency for air quality planning in the Detroit-Ann Arbor (Southeast Michigan) area, jointly prepared this document supporting a request for reclassification to marginal nonattainment for the eight-hour ozone standard. Section 181(a)(4) of the Clean Air Act states:

“If an area classified under paragraph (1) (Table 1) would have been classified in another category if the design value in the area were five percent greater or five percent less than the level on which such classification was based, the Administrator may, **in the Administrator’s discretion**, (emphasis added) within 90 days after the initial classification, by the procedure required under paragraph (3), adjust the classification to place the area in such other category. In making such adjustment, the Administrator may consider the number of exceedances of a 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.”

This request is made considering these provisions and the criteria outlined in the U.S. Environmental Protection Agency’s (EPA’s) 1991 criteria for evaluating reclassifications, which is referenced in the final rule for eight-hour ozone designations and classifications. In order to meet the 90-day provision of section 181(a)(4), the EPA is requiring that states’ reclassification requests be submitted by July 15, 2004. The EPA will then respond to reclassification requests by September 15, 2004.

We respectfully submit that there are several pieces of evidence supporting a reclassification to marginal nonattainment that are compelling and provide an unequivocal policy basis for support by the Administrator of the EPA.

Clean Air Act: Design Value within Five Percent of Another Category

The Clean Air Act (CAA) allows the EPA Administrator to reclassify ozone nonattainment areas to an adjacent category in subpart 2 “if the design value in the area were five percent greater or five percent less than the level on which such classification was based.” The Clean Air Act directs the Administrator to consider other factors in making this adjustment such as number of exceedances, levels of transport, and the mix of pollutants. Further, the EPA

states it will consider other factors such as emission reductions. Accordingly, there are several relevant pieces of information we ask the Administrator to consider in making a judgment about the merits of this reclassification request.

Because erroneous conclusions often result from decisions based on a single data point, we begin by presenting relevant, long-term data on design values in Southeast Michigan. Figure 1 displays eight-hour ozone design values from 1990-2003. For twelve consecutive years (1991-2002), the ozone design value was 96 parts per billion (ppb) or less. And, for each of three consecutive years preceding 2003, the design value for the region was below 90 ppb, a level that the EPA would have used to assign Southeast Michigan a marginal classification. Thus far this year (as of June 30, 2004), there are no peak eight-hour averages that exceed 84 ppb (not yet validated).

Furthermore, the highest design value recorded since 1991 was in 2003. This was the result of an unusual episode that covered large sections of the eastern half of the country and resulted in unusually high ozone levels in Southeast Michigan. Figures 2 and 3 from the EPA's AIRNow website show the large geographic area affected by this episode. In fact, similar ozone levels were recorded in such disparate places as Port Huron and the Seney National Wildlife Refuge, a federal Class 1 area in Michigan's Upper Peninsula. Figure 4 shows the ozone monitoring sites in Michigan, and Table 1 compares eight-hour peak averages at various sites in the region with the Seney site on June 25, 2003. The design value would plummet from 97 to 92 ppb if only one day (June 25) in that multi-day episode (from June 22 to June 25) was not in the database, as shown in Figure 5. Therefore, except for one day in 13 years, the design value in Southeast Michigan would be 96 ppb or less. More details on the unrepresentative nature of the June 2003 episode are provided in a subsequent section.

In the final eight-hour ozone designation rule, published on April 30, 2004, the EPA states that moderate nonattainment areas with an eight-hour ozone design value of 96 ppb or lower (from 2001 to 2003) may be eligible for a reclassification to marginal nonattainment. Southeast Michigan's eight-hour design value is 97 ppb. However, we submit that a design value of 97 ppb is within the five percent criteria. The ozone implementation rules refers to the criteria set in CAA, Section 181(a)(4) which provides that if the design value of an area were five percent less or more than the design value on which the classification were based, the Administrator may adjust the classification. The statutory language is five percent, not 5.0 percent. Monitoring values are routinely rounded in practice. Rounding conventions would dictate that 5.49 is the practical equivalent of 5 percent and 97 ppb meets this criteria.

Further, the ozone implementation rule does not list the upper end of marginal as 91 ppb (See Table 2 in the appendix), as assumed by the EPA in its calculation of the five percent reclassification threshold, and its resulting determination that

only values of 96 ppb or lower are within five percent of a marginal classification. A footnote* in the new 8-hour ozone classification table, indicates that marginal nonattainment areas' design values range from 85 ppb and up to "but not including" 92 ppb. An 8-hour ozone design value of some value less than 92 and greater than 91 ppb may be used by the Administrator in the five percent determination. Accordingly, using a value of five percent of a number less than 92, added to the lesser value, could yield 97 ppb. This is an area where the Administrator could apply the discretion provided to him under the law.

In summary, several pieces of evidence support the conclusion that Southeast Michigan meets the 5 percent reclassification criterion. They include:

- Design values were 96 ppb or less for 12 consecutive years between 1991 and 2002;
- The design values for the 3 years preceding the June 2003 episode (2000, 2001, 2002) were all below 90 ppb and would have automatically resulted in a marginal classification;
- The June 2003 episode was an unusual event (more detail follows);
- June 25, 2003, is the single day over 13 years driving the design value up to 97 ppb.
- Emissions in the region on June 25, 2003, had minimal impact on peak ozone levels.
- The regional design value would have been 92 ppb but for June 25, 2003; and
- A design value of 97 ppb still meets the 5 percent criteria.

Unusualness of June 2003 Ozone Episode

The policy implications of the June 2003 ozone episode are clear. If only one day of that multi-day episode was excluded (June 25), the design value for the region would have plummeted to 92 ppb. Thus, this episode and the significant change it produced in the latest 3-year design value, directly resulted in the EPA's determination to classify the region as moderate instead of marginal nonattainment. **In other words, June 25, 2003, is the single day over a 13-year period that might be used to determine if Southeast Michigan merits a reclassification to marginal.** As the Administrator is empowered in the Clean Air Act to consider several factors in responding to a reclassification petition, this section puts the June 2003 ozone episode in proper context.

There are several indicators that point to the unusualness of this episode. First, the high ozone levels in 2003 were spread to a large area of the eastern United States, as shown in the EPA's AIRNow maps in Figure 2 and 3. In Michigan, even the Upper Peninsula's Seney National Wildlife Refuge, a federal Class 1

*This "but not including" footnote is not present in the 1-hour ozone classification table contained in Section 181 of the CAA.

area, experienced an eight-hour average of 118 ppb, a level close to the 123 ppb monitored in Southeast Michigan at Port Huron on the very same day. At New Haven, the other site that typically records peak ozone levels in the region, the eight-hour average only differed from Seney by 1 ppb, as shown in Table 1.

Second, an eight-hour average of 123 ppb is unusually high for Southeast Michigan. To demonstrate, the eight-hour peak ozone values at all sites in the region for a 12-year period were ranked. Table 3 shows 123 ppb was the highest eight-hour value recorded at any site in the entire region over the past 12 years.

Third, the eight-hour peak at Tecumseh, the region's rural, upwind site, was well in excess of the standard at 111 ppb (see Table 4). Peak ozone levels were recorded downwind of Detroit at New Haven (119 ppb) and Port Huron (123 ppb). Thus, only 8-12 ppb of the peak ozone on that day is attributable to emissions in Southeast Michigan. Just as important, the 111 ppb at the Tecumseh site is indicative of the unusual nature of the episode because it is well beyond any other eight-hour average for that site back to 1993. This is supported by back trajectory analyses. Figure 6 shows that the eight-hour ozone peak of 111 ppb at Tecumseh on June 25, 2003, was caused by transport from the south. Figure 7 shows that this air mass from Tecumseh passed through the region to the downwind monitoring sites. In other words, the high ozone levels at Tecumseh originated outside of Southeast Michigan and the high ozone at the downwind sites had little to do with emissions in the region.

Table 1 shows that emissions in the region only contributed 8-12 ppb to peak ozone at Port Huron (the difference between rural, upwind measurements at Tecumseh and downwind at New Haven and Port Huron). And, with the exception of Allen Park and Linwood, which often record lower levels because of NO_x scavenging, ozone levels in the region were consistently close to the 111 ppb at Tecumseh. Clearly, transport was overwhelming on June 25, 2003, and emissions in the region contributed little to the extraordinarily high levels of ozone. Nonetheless, June 25, 2003, is the single day in 13 years that drives the latest 3-year design value to 97 ppb and leads to the EPA's moderate classification. This moderate classification results in the automatic imposition of control measures that would not have affected the outcome of that episode or another one like it. Additional supporting evidence is that the episode was so widespread and severe to have resulted in comparable levels of ozone in areas with precursor emission levels approaching zero (Seney).

In summary, we have been able to verify that ozone levels were unusual during that time frame. Section 181(a)(4) of the Clean Air Act specifically empowers the Administrator to consider impacts of transport, such as just described, in making a decision on reclassification. Due to the impact of transport on June 25, 2003, using that day as a basis for mandating the control strategy requirements that accompany a moderate classification is inappropriate. The EPA has a history of recognizing that certain monitoring data could lead to faulty regulatory

applications. We submit this is one such circumstance and request the Administrator use his discretion and consider the impact of June 25, 2003, on this reclassification decision.

This situation is analogous to when State Implementation Plans (SIPs) were being prepared in response to the Clean Air Act Amendments of 1990. Ozone levels in the summer of 1988 were also extraordinarily high, making modeling demonstrations of attainment unrealistic and unachievable; i.e., requiring massive precursor emission reductions. Nonetheless, many states, including Michigan, were able to achieve attainment of the ozone NAAQS with more modest emission reductions. (As indicated later, a recent circuit court ruling upholds and reinforces the EPA's ability to go beyond air quality modeling results and consider "weight of evidence" in making attainment related decisions. Also, according to the EPA's February 19, 2004, document on Early Action Compact (EAC) areas¹, weight of evidence procedures can be used for an EAC area's attainment test.)

Section 181 of the Clean Air Act specifically empowers the Administrator to consider "the level of pollution transport between the area and other affected areas, including both intrastate and interstate transport" in making reclassification decisions. Accordingly, we respectfully request that, in making his decision, the Administrator weigh the evidence showing that emissions in the region contributed less than 10 percent to peak ozone levels on the single day in 13 years driving the design value up to 97 ppb resulting in an automatic moderate classification for Southeast Michigan. In addition, we ask the Administrator to consider the June 2003 episode in conjunction with the other relevant evidence presented in the remainder of this support document.

Expected Emissions Reductions: On-Road Mobile Sources

Table 5 was prepared by SEMCOG to demonstrate the expected reductions in vehicle emissions expected in Southeast Michigan over the next few years. These data were prepared using EPA's latest Mobile model, Mobile 6.2, using SEMCOG's local transportation data inputs and travel projections. These figures demonstrate that vehicle emissions of the two main ozone precursors: volatile organic compounds (VOC) and nitrogen oxides (NOx) will decline by 40 percent and 37 percent, respectively, between 2002 and 2007, even after accounting for increasing levels of travel. Moreover, the declining trend will continue well into 2010, reaching reductions of 54 percent for both pollutants.

To address modeling uncertainties, SEMCOG projected the emissions impact of doubling the rate of growth in travel. Results, in Figures 8 and 9, show this decline will occur even if SEMCOG's forecasted growth in travel was doubled! These reductions are due to the Tier 2 emission standards, heavy-duty emission

¹ February 19, 2004. Frequently Asked Questions on eight-hour Ozone Early Action Compacts--Volume 2: Weight of Evidence

standards, lower sulfur fuel, more durable emission control systems, and a higher than typical rate of fleet turnover in Southeast Michigan's automotive hub.

Assuming the region was targeting a 15 percent reduction in VOC emissions as is required for moderate areas, and assuming that 2002 mobile source emissions represent about 30 percent of the entire inventory, a reduction of 88 tons per day would need to be achieved.² The reduction of 71 tons per day in mobile source emissions represents a considerable fraction of that needed reduction.

While a 15 percent plan was not previously implemented in Southeast Michigan because of redesignation to attainment of the one-hour ozone standard, a low vapor pressure fuel was implemented as a contingency measure and results in emission reductions of approximately 9 tons per day (see Table 6). Thus, 80 of the 88 tons per day needed to achieve a 15 percent reduction are in place.

Tables 7 and 8 show the additional reductions that might be expected from a vehicle testing program that is an automatic requirement in moderate areas. This information is presented to give perspective on how it would impact future episodes of the type experienced in June 2003.

As indicated earlier, these reductions are not of a magnitude to have had any major impact on ozone levels of the type experienced on June 25, 2003. For example, emissions from all sources in the region on that day only contributed 8-12 ppb to the peak ozone in the region. Furthermore, emission levels in the Seney area with an eight-hour average of 118 ppb are likely to have been at least an order of magnitude less than emissions in Southeast Michigan. We request the Administrator consider this fact when evaluating whether a moderate or marginal classification is more appropriate for Southeast Michigan.

Even though these major reductions in precursor emissions are occurring, SEMCOG has hired a contractor to evaluate the additional benefits of a wide range of cleaner fuels. The MDEQ and the SEMCOG will assess these results and determine the appropriateness of implementing a fuels measure in the region and Michigan's other nonattainment areas as it relates to both attainment and maintenance issues. This evaluation will include an assessment of fuel-related benefits from reduced intrastate transport.

Finally, on-road mobile source reductions of a similar magnitude will be achieved in upwind regions.

² Because the 2002 inventory was not available at the time of this submittal, the 2002 on-road mobile inventory was estimated to be about 30 percent of the total NOx and VOC inventory. This was determined by using Southeast Michigan's *Ozone Maintenance Plan Revision* (submitted to EPA in December 2003), and gauging the decreasing trend in on-road mobile source emissions between 2000 and 2002.

Expected Emissions Reductions: Point Sources

The point source component of the region's total inventory continues to decline. Between 1999 and 2002, point source NOx emissions decreased by 37,534 tons/year and point source VOC emissions decreased by 4,148 tons/year.³ Most importantly, the offset provisions are tie-barred to the nonattainment designation preventing any increases or expansions from major sources.

Furthermore, the levels of manufacturing have declined in just the past few years. Data for the SEMCOG region from the North American Industrial Classification System of the U.S. Census Bureau show that between March 2000 and March 2004, approximately 81,620 manufacturing jobs have been lost in Southeast Michigan. We present this information merely as anecdotal evidence that manufacturing levels have declined. Even if the manufacturing sector fully recovers, the offset provisions require net decreases in emissions and improvements in air quality prior to permit issuance.

Point source emissions of NOx are projected to decline significantly in Southeast Michigan due to the implementation of the EPA's NOx SIP call rule-making. Table 9 shows that NOx emissions from these sources are expected to decline by 85 percent between 2000 and 2007. Further, the compliance date for the SIP call is May 31, 2004, well before 2007. Note that the quote below demonstrates how this rule-making is replete with references to the ozone reduction benefits it would provide for both one-hour and eight-hour attainment.

“The EPA projects that these regional NOx reductions will bring the vast majority of all new ozone nonattainment areas into attainment with the eight-hour ozone standard without having to implement more costly local controls. It will also help reduce ozone levels in the remaining nonattainment areas east of the Mississippi River.⁴”

In summary, emissions reductions of NOx from implementation of the SIP call between 2000 and 2007 are estimated to be 288 tons per day. An additional 157 tons per day will be achieved from on-road mobile sources between 2002 and 2007. As with mobile sources, similar degrees of NOx reductions are expected in upwind areas.

Expected Emissions Changes: Area Sources

The only tool available at this time for estimating area source emissions is the EPA's EGAS model. A new version of the EGAS model, which is expected to

³ Point source emission estimates obtained from EPA's Final 1999 National Emissions Inventory (NEI) and EPA's Preliminary 2002 NEI for the 7-county SEMCOG region. (Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties)

⁴ EPA Fact Sheet: Final Rule for Reducing Regional Transport of Ground-Level Ozone (Smog) and Two Related Proposals. September 24, 1998.

address some of the limitations of the current model, will be available in the fall for developing better area source emission estimates for the SIP.

In addition, the MDEQ is working with the LADCO (Lake Michigan Air Directors' Consortium) on a project to develop more accurate local area source emission estimates for the SIP. The LADCO has hired a contractor to assist in this effort and to provide guidance to the LADCO states on developing local area source emission estimates for the SIP. The results of this work will be ready by fall 2004.

Expected Emissions Changes: Non-road Sources

No non-road mobile emission estimates are available for this report. The only tool available is the EPA's NONROAD model, which is based on national default data. Like the work for area sources, the MDEQ is working with the LADCO to improve this component of the inventory based on local data. Specifically, the LADCO is developing updated activity, equipment population, and temporal emission profiles for the following categories: construction equipment, agricultural equipment, marine vessels, and recreational vessels. More accurate non-road mobile emission estimates will be developed for the SIP.

All the most up-to-date inventory information will be included in the June 15, 2005, submittal (see "Commitment to control measures" section) and will be used in formulating a control strategy.

Attainment by 2007

The EPA's 1991 reclassification guidance, which is referenced in the final eight-hour rule, stipulates that a request for reclassification be accompanied by evidence demonstrating that the area will be able to attain by the earlier date specified by the lower classification, which is marginal in this case. However, the Clean Air Act is silent on this issue. We ask the EPA to consider that initial marginal classifications were not based on a state's submitted evidence that attainment by 2007 was achievable. Thus, reclassification should not hinge so much on evidence of attainment by 2007, so much as the state's commitment to attain by 2007. Such a commitment is contained at the end of this reclassification request with interim milestones leading to a SIP submittal in 2007.

Nonetheless, the following section includes information supporting the feasibility of achieving attainment by 2007. We request the Administrator consider this information as further evidence that a marginal classification is truly more appropriate for Southeast Michigan.

Modeling Results: EPA Modeling

During formulation and finalization⁵ of the ozone transport rulemaking⁵, the EPA stated its position about the merits of reducing both one-hour and eight-hour ozone levels. More recently, the Technical Support Document for the Interstate Air Quality Rule (Air Quality Modeling Analysis, EPA, January 2004, 69 FR 4566) contained modeling information relevant to this request. Table 10 shows a table that was excerpted from that document. It shows EPA's nonattainment projections for a base case scenario, i.e., expected benefits that would accrue in 2010 from implementation of measures in the Clean Air Act and the ozone transport rulemaking. Specifically, all of Southeast Michigan is projected to be in attainment under this base case scenario.

The forecasted benefits in the EPA's 2010 modeling are understated because mobile source emissions are most likely overestimated. As noted earlier, the vehicle fleet in Southeast Michigan turns over faster than average. To demonstrate, Table 11 shows the impact of fleet turnover in the region on emission rates. For example, emission rates for VOCs in 2010 are 41 percent lower than the emission rate that is based on the EPA's national default vehicle registration data.

Discontinuity

In the EPA's 1991 guidance for reclassification requests, an area must show that the "reclassification does not result in an illogical or excessive discontinuity relative to surrounding areas." In other words, a "donut hole" cannot be created where the area would be surrounded by areas at a higher classification.

This would not occur in Southeast Michigan. All adjacent nonattainment areas to Southeast Michigan are Subpart 1 nonattainment areas.

Other Considerations

There are several other factors we request the EPA consider in determining the merits of a reclassification to marginal nonattainment.

1. Early attainment: Moderate areas have until 2010 to comply with the new ozone standard. Marginal areas must comply by 2007. By granting this request, the EPA helps keep Michigan on a path to improve air quality sooner. **Specifically, controls will be in place ahead of the applicable schedule for moderate areas, or marginal areas not making the early submittal commitments contained in this request.**

⁵ *Federal Register*, October 27, 1998. Volume 63, Number 207, p. 57355-57404. Known as the "NOx SIP Call."

2. Continued mobile source reductions: In order to help assure continued air quality improvement, SEMCOG has forecasted mobile source emissions to 2025. As shown in Figure 8, both NO_x and VOC emissions will decline so significantly, they will represent a fraction of today's emission levels.
3. Ozone Action: The MDEQ and the SEMCOG are active partners in the highly successful Ozone Action program. Our latest survey shows that over 90 percent of the respondents now recognize the Ozone Action program.⁶ More importantly, the majority of residents are taking steps to curb emissions on declared Ozone Action days. As the EPA knows, the exact emission reduction benefits of this program cannot be calculated, but contribute to improved air quality. We commit to continued implementation and support for this program.

Consideration of All Evidence

The MDEQ and the SEMCOG recognize the uncertainties inherent in emission modeling, dispersion modeling, and modeling future activity levels. As reflected in a recent court decision, so does the EPA.⁷

Accordingly, rather than deciding on any single factor, we request the Administrator holistically consider all the evidence presented in this analysis that supports a policy decision to reclassify Southeast Michigan to marginal nonattainment. That evidence includes:

- The unusualness of the June 2003 episode, most notably June 25, 2003;
- Less than 10 percent of the ozone on the worst day in 13 years, the same day contributing to the higher than usual design value, is attributable to emissions from the region. Therefore, subjecting the area to the requirements of moderate areas because of this episode would be inappropriate;
- Historical monitoring data show that the regional design value for 12 consecutive years was 96 ppb or less. Absent June 25, 2003, the design value for the last three years would plummet to 92 ppb;
- Mobile source emissions will decline by as much as 40 percent between 2002 and 2007 and are projected to continue declining through 2025 (see Figure 10);
- The EPA predicted attainment for Southeast Michigan by 2010 based on implementation of Clean Air Act controls already being phased in and the NO_x SIP call rule. Mobile emissions in that analysis were likely overestimated; and
- More importantly, Michigan is committing to implement additional control measures necessary for attainment and to early identification and legal authority for implementation (see following section).

⁶ SEMCOG Quality of Life Survey. 2002.

⁷ United States Court of Appeals for the Second Circuit (Docket No. 02-4107) on May 19, 2004.

With respect to interpreting modeling results, the ability of the EPA to take a weight of evidence approach was recently reinforced by the U.S. Court of Appeals (referenced above). The Court clarified that the EPA could consider a variety of factors in addition to modeling results in evaluating the merits of a SIP attainment demonstration. Also, the EPA recognized the merits of a weight of evidence approach in its criteria for implementing Early Action Compacts. And, as previously indicated, other marginal classifications were not premised on a state demonstrating attainment by 2007, the same year the SIP is due. To remedy the dilemma posed by the same deadline for the SIP submittal and attainment, Michigan commits to the early submittals outlined below.

Commitment to Control Measures

The State of Michigan is committed to early compliance and maintenance of the ozone standard. As such, Michigan commits to the implementation of control measures necessary to achieve and maintain the ozone standard. The MDEQ and the SEMCOG are working with a task force with broad-based representation to evaluate the merits of several emission reduction alternatives. This includes a special study to quantify the benefits of a wide range of fuels.

The fact that the SIPs are due on the same date attainment is required for marginal areas poses a dilemma. In order to address this dilemma and consistent with the policy approach in Early Action Compacts, Michigan commits to interim milestones in advance of a 2007 SIP submittal should the EPA grant a marginal classification for Southeast Michigan. Specifically, Michigan commits to the following schedule, which will result in emission reductions and cleaner air earlier than under the current moderate classification.

1. June 2005 – Identification of additional controls

By June 2005, the MDEQ will submit to the EPA, Region 5 an analysis of various emission control strategies. In order to account for the uncertainty of predictive models, Michigan commits to additional control(s). The results of the analysis, evaluation of alternatives, and details of the control strategy, including an air quality assessment, will be in this submittal.

2. June 2006 – Adoption of rules/laws

Following the June 2005 submittal, the MDEQ will expeditiously pursue the necessary rules and/or legislative authority to implement the control strategy for submittal to the EPA by June 2006.

3. June 2007 – Submittal of SIP

The complete SIP package will be submitted by June 2007 as specified for marginal nonattainment areas. However, reclassification based on this request places the state on a track for implementation of controls more expeditiously than for either moderate areas or marginal areas, both of which are not required to make any such commitments prior to June 2007.