



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 20 2006

THE ADMINISTRATOR

Marc D. Machlin, Esq.
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Hamilton Square
600 Fourteenth Street, N.W.
Washington, D.C. 20005-2004

**Re: Petition of Oakland County, Michigan
for Reconsideration of EPA's PM 2.5 Non-Attainment Designation**

Dear Mr. Machlin:

This letter is in response to your March 7, 2005, letter to EPA enclosing the above referenced petition for reconsideration on behalf of Oakland County, Michigan.

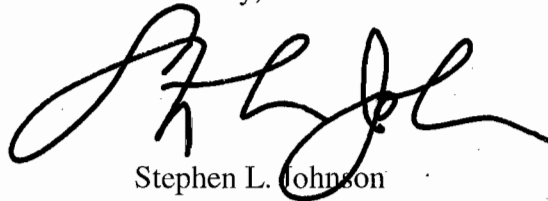
We have reviewed the petition and the arguments presented therein, the additional technical analyses prepared on behalf of Oakland County by Gradient Corporation, and the extra insights imparted in your meetings with EPA in Washington on July 12, 2005, and in Research Triangle Park on July 14, 2005. The issues that you have raised and the information that you have presented have prompted us to rethink carefully the inclusion of Oakland County in the Detroit - Ann Arbor nonattainment area.

After further evaluation, however, EPA has concluded that Oakland County does properly belong in the Detroit - Ann Arbor nonattainment area. Reexamination of the facts and circumstances of the area reconfirms our initial view that Oakland County is contributing to the nonattainment problem in Southeast Michigan, and therefore that inclusion of the county in the Detroit - Ann Arbor nonattainment area is appropriate so that the State of Michigan may develop a nonattainment area SIP that will provide for attainment of the PM 2.5 NAAQS. Given the county's level of contribution, exclusion of Oakland County from the nonattainment area could adversely impact the State's efforts to achieve the PM 2.5 NAAQS in Southeast Michigan and would potentially result in greater burdens on the remaining counties in the Detroit - Ann Arbor nonattainment area in order to achieve the NAAQS.

The enclosed document addresses the petition for reconsideration in more detail. EPA hopes that the responses will help to explain the Agency's conclusions more fully so that you will better understand the final decision.

EPA appreciates Oakland County's interest in these issues and the information that it has provided. Nevertheless, this information does not persuade EPA to reconsider its previous designation decision. Therefore, your petition for reconsideration is denied. EPA appreciates your commitment to continued improvement of air quality in Southeast Michigan, and looks forward to working with Oakland County along with the State of Michigan in order to achieve that goal.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. L. Johnson', written in a cursive style.

Stephen L. Johnson

Enclosure

cc:

Steven E. Chester, Director
Michigan Department of Environmental Quality

EPA Response to Oakland County, MI Petition for Reconsideration

For the sake of clarity and to minimize repetition, EPA has organized most of this response according to the structure of the March 7, 2005, Oakland County petition for reconsideration. We discuss additional information or additional analysis conducted by EPA in response to the petition in the section where relevant. Then, following discussion of this petition, an additional section discusses the supplemental material provided on September 13, 2005.

- I. "Under the Clean Air Act, an area may be designated as a nonattainment area only if the area is violating one of EPA's PM 2.5 standards or is contributing to violations in a nearby area."
 - A. "The Clean Air Act requires EPA to give substantial deference to state designations."

The Petitioner argued that the statutory structure and statutory language of the Clean Air Act (CAA) give states the "primary responsibility" for designation decisions and that EPA may override a state's initial designation recommendation only when "necessary." Petition at 13.

EPA agrees that the CAA contemplates cooperation and coordination between the Agency and states in the context of initial designations for a new or revised NAAQS. Under section 107(d) of the CAA, Congress has set forth an explicit process and chronology for states and EPA to make initial designation decisions. Section 107(d)(1)(A) provides that the Governor of each state shall make the initial recommendations for designations of areas within such state, as attainment, nonattainment, or unclassifiable, as those terms are explicitly defined. Section 107(d)(1)(B) provides that EPA must promulgate the designations, and "may make such modifications as the Administrator deems necessary to the designations of the areas" recommended by the states. In the event of a decision by EPA to modify the recommendation of a state, section 107(d)(B)(ii) provides that EPA must notify the state and give the state an opportunity to demonstrate why the Agency's proposed modification is inappropriate.

By the explicit wording of the statute, the state's initial submission of designations to EPA are simply "recommendations," albeit recommendations that are supposed to comport with the statutory definitions for designations and the requirements for areas that either violate or contribute to violations of the standard. By contrast, the CAA obligates EPA to make the actual designation decisions. This distinction illustrates that EPA must be the final decision maker concerning the designations, and that EPA must insure that the designations comport with the requirements of section 107(d).¹ In general, EPA will defer to the recommendations of the state

¹ EPA notes that to read section 107(d) differently so that EPA must approve whatever

in which the area is located when the recommendation is consistent with the requirements of the statute, but must make a modification when EPA concludes that the recommendation is inappropriate.

The Petitioner asserts that EPA may make modifications to state recommendations only when “necessary.” EPA notes that this term is not explicitly defined in section 107(d), but the Agency interprets the term in light of the other requirements of that section. In this instance, EPA concluded that it was “necessary” to modify the designation recommendation of the State of Michigan because the Agency determined that the recommendations were not in accordance with section 107(d)(1)(A)(i). That section explicitly provides that the state must recommend (and ultimately that EPA must designate) as “nonattainment” any area “that does not meet (or that contributes to ambient air quality in a nearby area that does not meet)” the NAAQS.

By its initial recommendation letter of February 13, 2004, the State of Michigan recommended that EPA designate only Wayne County and Monroe County as nonattainment, and do so as two separate nonattainment areas. Although the state provided a number of relevant and well reasoned arguments for its recommendation, a primary point emphasized in the analysis was that only these two counties had monitors with data showing violations of the NAAQS during the 2001-2003 period². EPA had previously provided guidance to the states, stating the Agency’s views as to the types of information that are relevant to assess the issue of contribution to violations of the NAAQS. While the state could assess contribution differently than suggested in the guidance, or could apply EPA’s guidance and reasonably reach different conclusions, it is ultimately EPA’s obligation to decide the issue of contribution under section 107(d).

On June 29, 2004, EPA notified the State of Michigan of the need to modify the state’s initial recommendation, explained the basis for EPA’s decision that modification was necessary,

recommendation a state might make would potentially create a problem under the Appointments Clause of the U.S. Constitution, and that it would be inappropriate to interpret the provision in such a way as to create a constitutional conflict when it is not compelled by the explicit wording of the statute.

² Subsequently, by letter dated February 22, 2005, the State of Michigan requested that EPA designate only Wayne County as nonattainment. This request was occasioned by EPA’s decision to allow states to include additional monitor data from 2004, when such data would result in elimination of violations at all monitors in a given nonattainment area for the 2002-2004 period. Because the data at the monitor in Monroe County was favorably impacted by inclusion of 2004 data, the state modified its earlier request. However, in this later request, the State of Michigan reiterated its position that EPA should designate as nonattainment only the county with a violating monitor, thereby not including, as required by section 107(d), other counties that EPA has determined contribute to the violation of the annual PM 2.5 NAAQS in Wayne County.

and provided an opportunity for the state to explain why the modification contemplated by EPA was inappropriate. In short, EPA concluded that the state recommendation did not adequately account for the other counties within the state that contributed to violations of the NAAQS within Wayne and Monroe Counties. EPA therefore found that to meet the requirements of section 107(d), it was "necessary" to modify the initial recommendation of the state. The state availed itself of the opportunity to rebut EPA's conclusions in a letter dated September 1, 2004. EPA again responded to the issues raised by the state in the final designations decisions published in the Federal Register on January 5, 2005, the supplemental notice on April 5, 2005, and in the TSD for these actions.³

EPA believes that the CAA provides the Agency with the authority and the responsibility to make the final decision with respect to designation of areas that contribute to violations of the NAAQS, and that it has done so properly here. Although EPA and the State of Michigan ultimately disagreed on the final designation for the Detroit - Ann Arbor area, it does not follow that EPA did not give proper consideration to the state recommendations as contemplated in section 107(d).

- B. "The Clean Air Act requires EPA to base all PM 2.5 designations on actual monitoring data for PM 2.5 levels in ambient air."

The Petitioner also argued that EPA is obligated to make PM 2.5 designations based upon air quality monitor data and that EPA has ignored this obligation. Specifically, the Petitioner pointed to the language of section 107(d)(6)(A) in which Congress directed that states must make designations "based on air quality monitoring data collected in accordance with any applicable Federal reference methods for the relevant areas." Petition at 14. From this and similar statutory references to the creation of the monitor network, the Petitioner infers that EPA may "only" use monitor data to make designation decisions, *i.e.*, any other fact or factor cannot be any part of the designations decision.

EPA believes that the Petitioner is reading the statutory provision both too narrowly and in a way that is patently inconsistent with the remainder of section 107(d). First, to state that designations should be "based on" the data from the monitors does not mean that no other fact or consideration could be relevant or a part of the designation decision. Had Congress meant to require that EPA should base designations "exclusively," "solely," or "only" on monitor data, it

³ See, 70 FR 944 (Jan. 5, 2005); 70 FR 19848 (April 14, 2005).

would have worded the provision in that way. In accordance with an ordinary reading of that term, EPA has “based” the PM 2.5 designations on the monitor data, and such data is a crucial component in each designation. The importance of the air quality monitor data to the analysis in the designation process is readily apparent throughout the process, as evidenced in the extensive reliance on that data in the January TSD for the Detroit - Ann Arbor nonattainment area. EPA believes, however, that it would be unreasonable to read the term “based on” so narrowly as to preclude the Agency from utilizing the monitor data in conjunction with any other information or factors. Merely as one extreme example, such a narrow reading would even preclude the use of the monitor data in light of meteorological information. The Petitioner would, perhaps, like to pick and choose the additional facts beyond mere monitor data that EPA may use, but that is not consistent with the asserted principle that EPA may only use monitor data.

Second, had Congress meant that “only” monitor data may be a basis for a designation of nonattainment, as the Petitioner infers, then one must ask why the definition of nonattainment in section 107(d)(1)(A)(i) includes both “any area that does not meet” the NAAQS and any area that “contributes to ambient air quality in a nearby area that does not meet” the NAAQS. If the only path to a nonattainment designation were to have a monitor in that location actually registering a violation of the NAAQS, there would be no provision requiring the inclusion of areas that merely “contribute” to violations elsewhere. The statute thus explicitly contemplates that EPA may designate an area nonattainment even if a monitor in that location is itself registering attainment. Moreover, if the only way EPA could designate an area nonattainment (or attainment for that matter) were solely through actual monitor data, that would suggest that there must be at least one monitor in at least every county, if not everywhere, throughout each state. Such a reading would be implausible on its face, as the very statutes cited by the Petitioner neither require nor provide funding for a monitor network of this density and scope.

Third, the Petitioner overlooks the distinction between use of monitoring data to identify the existence of violations of air quality standards versus the use of a variety of data to define the boundaries of the nonattainment area. As provided in EPA’s guidance, EPA solely used monitoring data to determine that a portion of Southeast Michigan is violating the PM 2.5 air quality standards. However, defining the boundaries of this nonattainment area exclusively with monitoring data is neither required by the CAA nor practicable. Instead, EPA considered the types of information it recommended in guidance for the designations process, including air quality data, emissions data, and several other types of information, to define the appropriate boundaries for the nonattainment area in Southeast Michigan so that it included the areas that EPA determined either to be violating the standards, or contributing to violations in nearby areas, or both. We believe that this approach is most consistent with the statute.

Fourth, the Petitioner’s own analysis contradicts the view that only air quality monitoring data are suitable for consideration. A core feature of the Petitioner’s analysis is the use of meteorological data to differentiate air quality when winds are blowing from the north across Oakland County into Wayne County, versus when winds blow from the south. The Petitioner’s

interpretation of section 107(d) would seem to suggest that EPA may not use such meteorological data, even to determine nonattainment area boundaries. The Petitioner also provides no rationale to explain why meteorological data may be used, but not other types of relevant information such as emissions data. EPA's interpretation of section 107(d) to allow consideration of all relevant information available to EPA faces no such contradiction, and EPA believes that both kinds of data, and the other types of information EPA suggested in its guidance, are appropriate for consideration in defining boundaries.

Fifth, if EPA were to attempt to define boundaries for a nonattainment area in Southeast Michigan solely on the basis of air quality monitoring data, this approach would also lead EPA to conclude that Oakland County should be within the Detroit - Ann Arbor nonattainment area. Available data suggest that annual average ambient PM 2.5 concentrations in Oakland County tend to be between 14 and 15 $\mu\text{g}/\text{m}^3$. For example, for the years 2001-2003, the average of the concentrations monitored in Oakland County was 14.8 $\mu\text{g}/\text{m}^3$. If EPA were solely considering air quality monitoring data, EPA would infer that Oakland County could be contributing as much as between 14/15ths and nearly 100% of the standard to air quality in other nearby counties, especially in immediately adjacent Wayne County with its monitored violation of the NAAQS. EPA would emphasize that it does not believe that section 107 requires such a simplistic analysis, and evidently the Petitioner agrees. The Petitioner's proffered technical analysis is actually much more thoughtful and sophisticated, and EPA's view of the Petitioner's technical analysis is provided later in this document. Nevertheless, the narrow point here is that, even if EPA were to apply the extremely narrow interpretation of section 107(d) that the Petitioner advocates with this argument, EPA would still presumably conclude that Oakland County should be part of the Detroit - Ann Arbor nonattainment area.

EPA agrees that the statute directs the Agency to base designation decisions on monitor data, but believes that the Agency is not precluded from taking into account other relevant facts and factors. It is for this very reason that EPA developed detailed guidance to the states to help to insure that both states and EPA were considering appropriate types of information in the designations process generally, and in assessing the boundaries for nonattainment areas specifically. Again, the State of Michigan and EPA ultimately disagreed about whether to expand the Detroit - Ann Arbor nonattainment area beyond Wayne County, but to argue that neither the state nor EPA could consider any information other than monitor data in making designation decisions is not a reasonable reading of section 107(d).

II. "As MDEQ has Determined, Oakland County is Meeting EPA's Ambient Air Standards for PM 2.5"

The Petitioner asserts that the monitor located within Oakland County "conclusively" demonstrates that Oakland County is in attainment of both the 24 hour and annual PM 2.5 NAAQS. Petition at 16. The petition correctly notes that there is one PM 2.5 monitoring site in

the county, located in Oak Park. The Petitioner describes this location as a "worst case" location, and asserts that ambient concentrations elsewhere in the county should logically be lower than concentrations at this site. The petition presents 3-year average concentrations recorded at this monitor site, indicates that these averages are below 15 $\mu\text{g}/\text{m}^3$, and therefore concludes that PM 2.5 concentrations throughout the county are below the level permitted by the PM 2.5 NAAQS.

In fact, EPA believes that it is not clear whether air quality in Oakland County is better or worse than the PM 2.5 air quality standards. The data at the Oak Park site (site identification number 26-125-0001) are incomplete, in particular for the last quarter of 2001 and the first two quarters of 2002. As a general rule, EPA finds PM 2.5 data from a monitor to be complete only if data are available for at least 75 percent of the scheduled sampling days in each calendar quarter of the relevant period. In cases where data are available for at least 11 days but less than 75 percent of the scheduled sampling days, EPA conducts a further "data substitution" analysis.⁴ In areas such as Oakland County where available data on average are below the standard, this further analysis replaces missing data with worst case concentrations observed at the site. In some cases, after substitution for missing data the 3-year average would still be below the level of standard, in which case EPA concludes it has sufficiently complete data to conclude that the monitor shows concentrations below the standard. However, in Oakland County, this assessment shows a reasonable possibility that a hypothetical set of data provided through data substitution would have shown the monitor to be recording concentrations above the standard, not below it. Therefore, EPA has concluded that data from this monitor are incomplete and EPA cannot judge whether concentrations at this site are above or below the standard.

EPA notes that the fact that data are incomplete at this monitor is not a basis for altering the designation of Oakland County. EPA did not designate Oakland County as nonattainment because of a violating monitor, but rather because of its determination that Oakland County contributes to violations in Wayne County. Because of this contribution to nonattainment, EPA continues to believe that Oakland County should be designated as part of the Detroit-Ann Arbor nonattainment area, irrespective of whether the air quality within the county is meeting the standard or not meeting the standard, and irrespective of whether the air quality within the county can be determined through data substitution. At this juncture, EPA believes that it is not necessary to reexamine whether sufficient data exist to establish conclusively whether air quality within Oakland County is in fact violating the standards. However, the claim that Oakland County air quality is below the standard is an important part of the Petitioner's statements, and

⁴ Guidance for such analyses is provided in a 1999 document prepared by EPA's Office of Air Quality Planning and Standards entitled "Guideline on Data Handling Conventions for the PM NAAQS," document number EPA-454/R-99-08.

therefore EPA is noting the incompleteness issue here.

In its summary of data used in its contribution analysis, EPA reported average concentrations at the worst case monitoring site in each county, whether or not the data were complete. In a more exhaustive compilation of these data also available on EPA's web site, EPA also reported whether or not the air quality values reflected complete data. This compilation identifies the Oakland County monitor data as being incomplete. Although the average of the available data is below the standard, EPA does not have sufficient data to determine whether the air within Oakland County is meeting the standards.

This data incompleteness does not mean, however, that a designation of "unclassifiable" is warranted for Oakland County. EPA has the information necessary to make the designation. Even if the monitor in Oakland County did have complete data that conclusively demonstrated compliance with the NAAQS as asserted by the Petitioner, that alone would not be outcome determinative in the designation process. Section 107(d) explicitly contemplates that EPA must designate as nonattainment areas that violate the NAAQS, or areas that contribute to such violations in nearby areas, even if such areas monitor attainment. EPA also notes that in this case, the incomplete monitor data is not a basis for a designation of "unclassifiable." Such a designation is only appropriate where the Agency lacks sufficient information to make a designation. Here, even if the monitor in Oakland County were unequivocally showing attainment of the NAAQS at that site, EPA nonetheless believes that Oakland County is contributing to nonattainment in adjacent Wayne County.

III. "As MDEQ has determined, Oakland County makes no 'contribution' to nonattainment in any nearby areas"

A "Air Flowing From Oakland County To Wayne County Contains PM 2.5 At Levels That Are Lower Than Rural Background Concentrations"

The Petitioner argues that Oakland County makes no contribution to nonattainment in Wayne County. Oakland County's petition includes an attachment that provides a report prepared by the Gradient Corporation that analyzes Oakland County air quality. Most prominently, the report provides graphs that show concentrations at the Oak Park site differentiated according to whether the wind is from the north or the south. According to the report, on days with south winds, average concentrations for the years between 2000 and 2004 ranged from about $15 \mu\text{g}/\text{m}^3$ to about $20 \mu\text{g}/\text{m}^3$. In contrast, among days with north winds, the report concludes that average concentrations during these years ranged from $8.2 \mu\text{g}/\text{m}^3$ to $9.7 \mu\text{g}/\text{m}^3$. The petition and the attached Gradient report compare these north wind day averages against annual average concentrations at two sites EPA used for background purposes. Specifically, a site at M. K. Goddard Station in Northwest Pennsylvania was reported to have an

average concentration of $11.9 \mu\text{g}/\text{m}^3$, and a site at Bondville in Central Illinois was reported to have an average concentration of $12.3 \mu\text{g}/\text{m}^3$. From this comparison, the Petitioner concludes that concentrations in Oakland County during north wind conditions are below background levels. The Petitioner argues that because values are relatively lower in Oakland County, air blowing from Oakland County to Wayne County is improving air quality in Wayne County, not contributing to its problem. Indeed, this comparison leads the Petitioner to state that "[t]hese numbers show conclusively that air from Oakland County is not causing any harm whatsoever in Wayne County."

The Gradient report also uses other approaches for examining Oakland County air quality. The report provides a wind rose for days with concentrations less than $15 \mu\text{g}/\text{m}^3$ and a contrasting wind rose for days with concentrations greater than or equal to $15 \mu\text{g}/\text{m}^3$. The low concentration wind rose is dominated by winds from the west and northwest, whereas the high concentration wind rose is dominated by winds from the southwest. The Petitioner and the Gradient report provide concentration data from sites in northern Wayne County. Concentrations at these sites are below the level of the air quality standard—indeed, average concentrations at the Livonia site are lower than those at the Oak Park site—which the Petitioner cites as further evidence that "no portion of Oakland County is contributing to nonattainment in Wayne County." Finally, the Gradient report notes that Macomb County shows concentrations below the standard, and that EPA designated Genesee and Lapeer Counties attainment, and thus concludes that Oakland County clearly does not contribute to nonattainment in these counties.

The Petitioner raised novel arguments and supported them with new analyses not previously submitted to EPA. EPA has carefully reviewed the arguments put forth by the Petitioner, and conducted new technical analysis, to determine their validity.

Comparison of Oakland County concentrations on days with north winds against background concentrations is a critical element of the Petitioner's analysis. Therefore, a critical part of the review of the petition is a review of background concentrations. EPA believes that this review must consider the locations from which background concentrations are being determined, and the review must consider the conditions, particularly wind directions, under which the concentrations truly represent background levels.

As noted, the Petitioner uses data from Bondville, Illinois, and M.K. Goddard Station, Pennsylvania, to represent background concentrations. As justification for the selection of these specific sites, the Petitioner cites EPA's use of these sites as background sites. However, EPA used these sites as background sites for a different purpose and in a different manner. EPA used these sites to assess the composition of the "urban excess" fractions of observed urban concentrations, i.e., the composition of the fractions of observed urban concentrations that EPA believes arise as relatively local impacts of urban area emissions. This assessment by definition must use data from sites that make speciated measurements of the different components of PM 2.5, e.g. sulfates, nitrates, and organic particles. Such data are available from only a relatively

limited number of sites (especially at the time EPA did its assessment), most of which are located in urban areas. In order to have a suitable comparison of urban data with rural data for a given urban area, such as Southeast Michigan, EPA often used data from a monitor at some distance from the urban area. While the network of speciated monitors was adequate for calculations of the urban excess, EPA is fortunate to have an even more extensive network of monitor sites that measure total PM 2.5. Because the analysis relied upon in the petition involves a comparison of total PM 2.5 levels, rather than speciated data, this comparison may be made with any of several total PM 2.5 monitor sites that are much closer to Oakland County and that are more representative of total PM 2.5 background to Southeast Michigan.

Assessments of background concentrations must also address the conditions that exist when the measurements are taken. Background concentrations may be defined as those concentrations that exist in the air as it enters the region of interest. This suggests that background concentrations for Southeast Michigan are best determined using data from a site north of the area when the wind is blowing from the north and using data from a site to the south when the wind is blowing from the south.

A common method for determining background concentrations has been to identify a rural site, typically a site that is frequently upwind of the area of interest, and to calculate an average concentration at that site. For various reasons, this method can give results that are misleading for PM 2.5. First, a high fraction of PM 2.5 in the Eastern United States arises from long range transport. Second, this long range transport varies according to the trajectory that the air parcel has followed. An air parcel that has passed through the power plant-rich Ohio River Valley can be expected to have higher concentrations than an air parcel that has come directly from Michigan's Upper Peninsula.

EPA's January 2005 TSD for the designations includes the following comment on trajectories provided by the State of Michigan: "Trajectory information can often be misleading; since a high fraction of observed PM 2.5 concentrations are attributable to long range transport, trajectories for high concentration days tend to be a better measure of whether distant contributions to transported 'background' concentrations are high rather than indicating high local contributions." A similar observation applies to the wind-segregated concentration information provided in Oakland County's petition. That is, analyses such as Gradient's analysis are prone to show simply that background concentrations are higher when winds are from the south than when winds are from the north, without providing useful information on the magnitude of local contributions for the different wind directions.

A fundamental feature of the Petitioner's comparison of Oakland County concentrations to "background" concentrations is that the Petitioner compares Oakland County concentrations on days with winds from the north against "background site" concentrations averaged across all days with all wind directions. EPA believes this is an "apples to oranges" comparison in which a subset of Oakland County data are compared against a full set of rural site data. Indeed, the

Petitioner is comparing a subset of Oakland County data that preferentially includes days that would be expected to reflect low background concentrations, whereas the rural site data reflect high as well as low background levels.

In order to evaluate the petition, EPA conducted further analyses to provide a comparison of more comparable data. EPA followed the same methodology as Gradient of using resultant winds to segregate data into north wind and south wind concentrations, except that EPA performed this analysis for other monitoring sites that are more indicative of background concentrations entering Southeast Michigan. Specifically, EPA performed this analysis for sites in Saginaw (site ID 26-145-0018), Genesee (site ID 26-049-0021), and Bay City (site ID 26-017-0014). EPA also performed this analysis for a site in Monroe County (site ID 26-115-0005), which provides information in the southern part of the Detroit metropolitan area that may be contrasted with data from Oakland County. This analysis used data from 2002 to 2004. More complete documentation of this analysis is being placed in the public docket for the PM 2.5 designations process (docket EPA-HQ-2003-0061).

The following table summarizes some of the results of EPA's further analyses. (All concentrations are in $\mu\text{g}/\text{m}^3$.)

	Saginaw			Genesee			Oakland			Allen Park		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
North	156	7.32	5.13	163	8.72	5.85	145	10.00	6.54	156	13.66	7.46
South	160	13.05	7.08	159	14.73	7.39	158	17.63	9.27	158	23.48	9.69
Missing data	20	10.94	7.88	21	12.16	7.81	20	15.72	9.72	19	19.48	10.09

This table illustrates several important findings. EPA's assessment found that all of these Michigan sites observed higher concentrations on days identified as south wind days than on days identified as north wind days. This result is the same as the Petitioner's finding for the Oakland County site, but EPA's assessment extends this result to other sites in Michigan. This demonstrates the importance of examining background concentrations on a direction-specific basis. In particular, these findings indicate that air that is flowing from Oakland County toward Wayne County has substantially lower "background" concentrations than air flowing the opposite direction.

A second important finding is that Oakland County has substantially higher average concentrations on "north wind days" than do background sites north of Oakland County. This is the most pertinent comparison, since the best indication of whether Oakland County is adding to

the air pollution loading of air flowing into Wayne County is derived by examining background concentrations specifically for days when air is in fact flowing from the direction of Oakland County toward Wayne County. As shown in the above table, on days identified as having north winds, the average concentration at the Oakland County site, $10.00 \mu\text{g}/\text{m}^3$, is well above comparable average concentrations at the background sites of Genesee and Saginaw, with averages for these days of $8.72 \mu\text{g}/\text{m}^3$ and $7.32 \mu\text{g}/\text{m}^3$, respectively.

A third important finding is that use of background sites relatively near to Oakland County confirm EPA's view of gradients of concentrations in Southeast Michigan. Sites in Michigan provide a better indication of total PM 2.5 background concentrations than do sites in Illinois or Pennsylvania cited by the Petitioner for this purpose, and PM 2.5 data are available from suitable Michigan sites. These data indicate that PM 2.5 concentrations progressively increase as one proceeds from north of the area toward Wayne County. Consequently, these data indicate that counties between Saginaw County and Wayne County, notably including Oakland County, are contributing to PM 2.5 concentrations in air parcels that arrive in Wayne County.

Notwithstanding the fairly straightforward nature of EPA's analysis, the comparison of EPA's analysis with the Petitioner's analysis highlights several deficiencies in the Petitioner's analysis. The Petitioner's analysis reported background concentrations that were averaged across all wind directions. Comparison of Oakland County concentrations on "north wind" days against annual average concentrations at the background site clearly distorts the comparison. The Petitioner used background concentrations from sites at great distances from Southeast Michigan, even though more representative PM 2.5 data from much closer sites are available. These deficiencies undermine the reliability of the Petitioner's finding of Oakland County "north wind" concentrations being below background levels.

EPA has additional concerns about the new analysis provided by the Petitioner. First, as noted above, the data for the Oak Park site are incomplete. This raises questions about whether the data are fully representative of conditions at the site or whether there may be some bias in the results by virtue of the data set potentially disproportionately excluding certain types of days. Second, in using full day resultant winds, the analysis obscures the variability of winds and the fact that days with resultant winds from the north often have several hours during which the winds are from the south. As a result, days identified in the Gradient analysis as having winds from the south will often have at least some north winds that would blow Oakland County emissions toward Oak Park and into Wayne County.

EPA has conducted its own analyses to provide further perspective on the comparison of Oakland County PM 2.5 concentrations against background concentrations. EPA examined concentrations sorted by eight wind directions rather than just two. As with the two-directional analysis, EPA found a clear, progressive increase in concentrations as one proceeds from Saginaw County to Genesee County to Oakland County to Wayne County. For example, the average concentrations on days identified as having northwest winds in Saginaw County was

6.74 $\mu\text{g}/\text{m}^3$, in Genesee County was 7.74 $\mu\text{g}/\text{m}^3$, in Oakland County was 8.77 $\mu\text{g}/\text{m}^3$, and in Wayne County (Allen Park) was 12.14 $\mu\text{g}/\text{m}^3$.

EPA also developed plots similar to those prepared by the Petitioner, plotting average concentrations by wind direction for Oakland County but also for the other sites in Michigan. This graphical presentation of these results also support the view that although concentrations tend to be lower on days when winds are blowing from the north and northwest, the concentrations of PM 2.5 tend to increase on such days as one proceeds from upwind to downwind of Oakland County.

The petition focuses solely on Oakland County. Nevertheless, the Petitioner also implies that it supports the State of Michigan's recommendation to designate Monroe County as attainment. Unfortunately, the Petitioner provided no assessment of whether Monroe County should be considered to contribute to violations in Wayne County.

By consideration of the relevant types of information suggested in the guidance documents, EPA believes that Monroe County contributes to violations in Wayne County. However, EPA also examined this question using the methods used by the Petitioner. Segregating days into "south wind days" and "north wind days," as discussed above, EPA found average concentrations at the Monroe County monitor on "south wind days" to be 16.98 $\mu\text{g}/\text{m}^3$. That is, when winds are blowing generally from Monroe County toward Wayne County, PM 2.5 concentrations average well above the standard and well above the concentration that the Petitioner considers to be background. Thus, the methods recommended by the Petitioner clearly yield results that support EPA's conclusion that Monroe County contributes to violations, inconsistent with its implied support for designating Monroe County attainment.

EPA has a straightforward view underlying its identification of Oakland County as contributing to nonattainment in the Detroit area: violations in the Detroit area arise in part from emissions of various pollutants in the area, Oakland County emits a significant fraction of these emissions, and the wind periodically blows these emissions toward the sites in the Detroit area that are violating the air quality standard. EPA believes that the Petitioner's analysis does not refute any elements of EPA's view, nor does the Petitioner provide any countervailing theory that would explain how emissions in Oakland County might have no effect on Wayne County, let alone a cleansing effect on air entering Wayne County.

EPA concludes that the air quality analysis provided by the Petitioner fails to provide a convincing basis for changing the designation of Oakland County. The detailed technical arguments provided by the Petitioner were thought provoking and raised interesting theories. Nevertheless, in the final analysis, EPA believes that the method of analysis suggested by the Petitioner, applied correctly, serves to confirm EPA's prior conclusion. EPA continues to believe that Oakland County contributes to violations of the PM 2.5 standard in the Detroit-Ann Arbor area, as that term is meant by Section 107(d) of the Clean Air Act, in that emissions from the

County are part of the reason that Southeast Michigan has a nonattainment problem.

B. "In rejecting MDEQ's recommended designations, and in establishing a presumption requiring a uniform designation for Metropolitan Statistical Areas, EPA violated the Clean Air Act and the Data Quality Act"

1. "EPA's actions violated the Clean Air Act and the PM 2.5 Regulations"

The Petitioner repeated its arguments that EPA improperly failed to defer to the state's recommendations by not giving the state "primary responsibility" with respect to the designations and by not modifying those recommendations only when "necessary." As explained above in section I A, EPA disagrees with the Petitioner's interpretation of the statute and views on these initial points.

In addition, however, the Petitioner asserted that EPA usurped state primacy in the designation process by improper use of the boundaries of OMB Metropolitan Statistical Areas as a presumption for setting nonattainment area boundaries. According to the Petitioner, this presumption "effectively denied to the State of Michigan ... the primacy intended by Congress." Petition at 19. As a result, the Petitioner argues that the boundaries for the Detroit - Ann Arbor nonattainment area include seven counties, when only one county has a monitor with data exceeding the PM 2.5 NAAQS.

EPA disagrees with this characterization of the process. First, section 107(d) directs EPA to designate as nonattainment, both those areas that violate the standards, and those areas that contribute to violations in other nearby areas. The statute does not, however, specify precisely how EPA should evaluate the question of what areas contribute to a violation. Nor does the statute preclude EPA from using any specific means that it might reasonably decide are necessary to evaluate more effectively the issue of contribution by, for example, using a starting presumption as a means of ensuring a rigorous and deliberate approach to designations by states and by the Agency itself.

Second, both the April 1, 2003 Holmstead guidance and the February 2004 Wegman guidance, were, by their obvious intent and by their explicit terms, only guidance.⁵ These documents merely indicated EPA's views about how states and the Agency should evaluate area boundaries, but were not inflexible edicts from which states or others could not deviate. For

⁵ See, Memorandum entitled "Designations for the Fine Particle National Ambient Air Quality Standards," from Jeffrey R. Holmstead, dated April 1, 2003; Memorandum entitled "Additional Guidance On Defining Area Boundaries for PM 2.5 Designations," from Lydia N. Wegman, dated February 12, 2004.

example, the April 2003 guidance explicitly stated that “[t]his guidance is not binding on States, Tribes, the public, or EPA.” The discussion of the factors that the Petitioner finds so constraining consists primarily of a list of nine examples of types of relevant information.⁶ EPA explicitly stated that it would make the actual decisions for designations subsequently and that this guidance document did not decide any specific issue or predetermine the result for any particular geographic area. Similarly, the February 2004 guidance, which essentially pertains to whether it would be more appropriate to use the 1999 MSA boundaries or the revised 2003 MSA boundaries as an initial presumptive boundary, provides only that states and others are “encouraged” to follow the recommendation to use the most recent boundaries. Most importantly, EPA stated in each document that the MSA boundaries are merely a “presumptive boundary,” and provided a series of considerations and factors that states or others could use to determine the appropriate boundaries for each area. Put most simply, the presumption was a rebuttable one, which states could follow or not in making recommendations.

Third, EPA contends that the use of OMB’s MSA boundaries as a starting presumption in the designation process is a patently reasonable step to begin the process.⁷ As EPA explained in the April 2003 guidance, the Agency examined the question of the “typical geographic scale of source areas that contribute to violations of the PM 2.5 standard.” This analysis indicated that PM 2.5 nonattainment is typically the result of both long range transport of certain types of emissions and particles (such as sulfates associated with coal fired power plants) and more localized emissions and particles (such as carbonaceous particles and nitrates associated with mobile sources). The local emissions are typically the result of urban type sources, and such sources naturally occur with greater density in more populated areas. Because of this pattern of emissions and particles, EPA concluded that violations of the PM 2.5 NAAQS result from a combination of sources, both regional in scope and more localized in scope. While regional emission reduction strategies, such as EPA’s Clean Air Interstate Rule (CAIR) will serve to alleviate the impacts of emissions from more distant sources, achieving the standards will also in many instances require local emission reduction strategies. The provisions and structure of the CAA are specifically designed to address this very situation, as regional reductions can be

⁶ The Petitioner elsewhere suggests that the factors were evidently not prescriptive enough because they were too “subjective,” but EPA notes that it gave states an opportunity to review how the Agency considered the relevant types of information in light of the facts and circumstances of each nonattainment area in EPA’s initial response to state recommendations, and gave thus gave states an opportunity to persuade EPA to assess the recommended types of information differently in each situation, as appropriate.

⁷ EPA notes that Congress mandated such a presumption in the case of ozone, thereby tending to confirm that such an approach is also reasonable for PM 2.5. There is no provision that bars EPA from using a comparable presumption for PM 2.5, and no reason to believe that such a presumption would not be appropriate.

achieved through mechanisms based upon section 110(a)(2)(D) designed to reduce interstate transport, whereas local reductions can be achieved through the State Implementation Plan (SIP) process generally, and through nonattainment area plans specifically. To provide for an effective nonattainment area SIP, however, one must start with a designated nonattainment area with boundaries that appropriately encompass the full range of sources that contribute to nonattainment in the area. Because EPA concluded that local sources typically found throughout urban areas contribute to nonattainment problems, it is appropriate that EPA suggest a starting rebuttable presumption for evaluation of nonattainment boundaries that will encompass the entire local urban area. OMB's independently developed MSA boundaries, based on data collected by the U.S. Census Bureau, are a logical starting point, because they represent OMB's judgment as to the geographic area that is comprised of the urban core and the economically integrated nearby communities. EPA believes that use of these MSA boundaries as an initial presumption resulted in more consistent and robust decision making by both states and EPA.

The Petitioner also repeated its argument that EPA cannot make designations upon any basis other than monitoring data alone. As explained above in section I B, EPA disagrees with the basic premise of the Petitioner's argument and contends that it has based the designations on the monitor data, in conjunction with other permissible and appropriate factors. In this context, the Petitioner argues that the use of the MSA boundaries as a presumption for nonattainment area boundaries, with various factors to rebut the presumptive boundaries, is a scheme to "give the agency broad discretion to evaluate and weigh on a highly subjective basis surrogates for PM 2.5."

EPA disagrees with this characterization. It is the statute itself that gives EPA the discretion to make the ultimate designation decision. EPA recommended the presumption and factors as a means of insuring that the initial state designation recommendations and the ultimate EPA designation decisions would be reached after a full and careful weighing of the available information and relevant considerations, as applied to the specific facts and circumstances of each geographic location. While it may be correct that states and EPA had to rely on some information that might be less than perfect (such as emissions inventories or VMT estimates), EPA contends that this information was both suitable and sufficient for the purpose. The Petitioner implies that only monitor data would be sufficiently reliable and objective to make designations determinations. However, if this were correct, such an approach would require innumerable monitors closely spaced across the entire State of Michigan. EPA does not interpret section 107(d) to require such an approach.

Finally, the Petitioner argued that EPA's designation in Michigan using a presumption and factors is inconsistent with EPA's own regulations, because the PM 2.5 NAAQS pertain only to a given ambient concentration of PM 2.5 as measured by specific reference method monitors that measure only PM 2.5. EPA believes that this argument ignores both the legal requirements and the scientific facts of this situation. First, under the CAA, EPA must regulate both the pollutant and its precursors. In the case of PM 2.5, the range of commonly accepted chemical

precursors includes NO_x, SO₂, VOCs, and ammonia.⁸ While not all of these precursors may be found in all areas, or in amounts or concentrations that justify regulation in all areas, it does not follow that EPA can ignore the impacts of precursor emissions in making designation decisions. Thus, the contribution of PM 2.5 precursor emissions and their contribution to PM 2.5 nonattainment in a given area is a critical component of the designation process. EPA used the best information available for this purpose, including the most up to date emissions inventory information reflecting information provided by the state. Second, as noted above, section 107(d) requires EPA to designate as nonattainment all nearby areas that contribute to nonattainment, which would necessarily include areas that do not themselves have monitored nonattainment for the PM 2.5 NAAQS.

2. "EPA's actions not only were arbitrary and capricious, but also violated the Data Quality Act"

The Petitioner asserted that EPA's recommendation of MSA boundaries as a presumption for nonattainment areas is arbitrary and capricious because: (a) OMB itself indicated that such boundaries are suitable for use for some purposes but not others; and (b) there is no evidence to support the presumption that Oakland County is contributing to Wayne County, merely because it is within the MSA for metropolitan Detroit. The Petitioner suggests that EPA's guidance suggesting factors for consideration in designating nonattainment areas is merely an effort to "bridge a technical chasm." Petition at 22.

To support the first point, the Petitioner quoted an excerpt of OMB's description of the "Metropolitan Area concept" from a Federal Register preamble from 2000, pertaining to appropriate and inappropriate uses of MSA boundaries.⁹ Although the Petitioner puts great weight on the notion that these boundaries are "for statistical purposes only," EPA notes that OMB describes the MSAs as a "statistical representation of the social and economic linkages

⁸ EPA is currently considering the appropriate way to address PM 2.5 precursors in a proposed implementation regulation. See 70 FR 65984, especially at 70 FR 65999 (November 1, 2005).

⁹ 66 FR 82228 (Dec. 22, 2000).

between urban cores and outlying, integrated areas.”¹⁰ Moreover, OMB describes the “success” of the MSAs in terms of their use to “inform the debate and development of public policies.” OMB did note that it is appropriate to use the MSAs in ways such as “informing policy,” and that it is inappropriate to use MSAs for “implementing nonstatistical programs and determining program eligibility.”

EPA believes that the Agency has used the MSAs appropriately, and in keeping with OMB’s admonition, because it did so specifically as a means of informing the debate and developing public policy, in this case concerning the appropriate boundaries for designation purposes. Because the MSA boundaries are specifically designed to describe those areas that are “urban cores and outlying, integrated areas” that have significant “social and economic linkages,” the MSA boundaries dovetail with EPA’s view that nonattainment areas need to encompass the sources that contribute to the nonattainment problem in a given area, and with the statute’s directive that EPA designate as nonattainment both those areas that violate the NAAQS and those areas that contribute to such violations. In this instance, areas that are socially and economically integrated are likely to be areas that are contributing to a nonattainment problem, whether, for example, by emissions from stationary sources or by emissions from mobile source from a significant number of commuters. It is for this very reason that EPA concluded that the MSA was a suitable initial rebuttable presumption for nonattainment area boundaries, but suggested relevant factors for consideration for additions or subtractions from such areas to insure that each area has boundaries that are tailored to the actual facts and circumstances in that location. EPA did not ultimately determine that Oakland County should be in the nonattainment area merely because it is within the MSA; EPA determined that Oakland County contributed to violations of the NAAQS in the Southeast Michigan area through an evaluation of relevant facts.

The Petitioner also pointed out that because EPA evaluated data in the suggested factors used to make designation decisions, such data must meet the Agency’s obligations under the Data Quality Act. The Petitioner alleged a “dearth” of data to support EPA’s designation decisions, and argued that EPA’s use of emissions data generally, and the “weighted emissions score” in particular, fail to meet the requirements of the Data Quality Act.

EPA disagrees with the Petitioner’s characterization of the data and methodology used for the designations process. Pursuant to the Data Quality Act and OMB guidelines, EPA has promulgated its own information quality principles outlined in “Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the

¹⁰ Id.

Environmental Protection Agency”(EPA IQGs). The primary purpose of the EPA IQGs is to ensure and maximize the quality of information disseminated by the Agency. In particular, section 5.1 of the EPA IQGs emphasize that EPA’s goal is to ensure and maximize the objectivity, utility, and integrity of the information EPA disseminates.

EPA believes that the information used to make the designation determinations is consistent with these principles, and that EPA has used information that is appropriate for this purpose. The Petitioner takes issue with EPA’s use of certain emissions information as a basis for determining what areas surrounding a violating monitor are likely to contribute to violations at that monitor. As described in greater detail in the January 2005 Federal Register notice and the associated TSD, EPA used emissions data as one important factor in the designations process.¹¹ The emissions data that EPA used is derived from information provided by the states and reflects the best and most recent information available to EPA at the time it was developing these designations. These data are appropriate because they provide an adequately reliable indication both of the absolute magnitude of the emissions that might be contributing to various nonattainment problems across the country and, more importantly, of the relative magnitude of emissions in areas nearby to violating monitors.

The Petitioner also criticizes EPA’s methodology of evaluating the relative contribution of various areas to monitored violations. Because of the complex nature of PM 2.5 formation, EPA concluded that it is appropriate to consider not just emissions of direct PM 2.5, but also emissions of the various precursor chemicals that form PM 2.5 in the atmosphere. The Petitioner suggests that EPA should look exclusively at ambient PM 2.5 data as a basis for making designation decisions which, in addition to being incorrect as a matter of law, is simply inconsistent with the scientific information concerning the formation of PM 2.5. Based on information concerning the transport of PM 2.5 and its precursors, EPA also concluded that it is appropriate to look at emissions of these precursors not just in the urban core of a city, often the location of a violating monitor, but also in the surrounding metropolitan area, in accordance with the requirement that EPA evaluate for contribution to nonattainment in nearby areas. To assess the amount of PM 2.5 and precursors contributed by these nearby areas, EPA used available information to factor out the portion of emissions coming from beyond the metropolitan area. By applying the weighted emissions score to the remainder, EPA evaluated the relative degree of contribution of emissions from surrounding nearby areas to the monitored nonattainment. The Petitioner disparages this as a magic trick, but EPA believes that this was a reasonable method to assess the available information, and a reasonable way to fulfill the statutory requirement to ascertain which areas contribute to nonattainment.

¹¹ See, “Air Quality Designations and Classifications for Fine Particles (PM 2.5) National Ambient Air Quality Standards,” 70 FR 944, 947 (Jan. 5, 2006).

3. "EPA's actions failed to meet due process and APA requirements"

The Petitioner asserts that EPA's guidance documents issued for the designation process were legislative rules, and that EPA failed to follow either CAA or APA notice and comment procedures for issuance of a regulation. To support this contention, the Petitioner argues that EPA in fact treated the guidance as inflexible and binding requirements. Citing recent D.C. Circuit decisions, the Petitioner asserted that the guidance documents imposed rights and obligations, but did not "genuinely" leave the agency and its decision makers free to exercise discretion. As a secondary argument, the Petitioner also asserts that EPA failed to comply with requirements for due process, because the Agency did not allow parties such as Oakland County an opportunity for notice and comment in the designations process.

As to the first argument, EPA believes that the April 2003 guidance and February 2004 guidance were in fact guidance, both in their explicit terms, and as applied by EPA. The Petitioner asserts that the April 2003 guidance document constitutes a legislative rule that the Agency should have created through notice and comment rulemaking because it was "obviously intended to be binding on all EPA personnel and on the States and other interested parties." As support for this conclusion, Petitioner points out that EPA never said in the February 2004 guidance document or the January 2005 final designation Federal Register notice "that States or EPA regional offices were free to disregard the EPA guidance or to deviate from the agency's 'nine factor' test." The Petitioner also contends that, in the January 2005 final designation notice, "EPA treated the 'guidance' document as having the force and effect of law."

EPA disagrees with this characterization. The Agency believes that the April 2003 guidance was plainly guidance and not a legislative rule under applicable precedent. Contrary to the Petitioner's assertions, there is no reason to believe that the 2003 guidance was "obviously intended to be binding." Indeed, when EPA issued the guidance, the Agency explicitly explained that "[t]his guidance is not binding on States, Tribes, the public, or EPA." The language of the 2003 guidance itself supports EPA's intent to issue guidance and not a binding legislative rule.

In light of EPA's statement that the 2003 guidance was "not binding," there was no need for EPA to reiterate that point in the subsequent 2004 guidance or in the January 2005 Federal Register notice. The 2004 guidance was plainly and explicitly an outgrowth of the 2003 guidance, and there is nothing in the 2004 guidance to suggest that EPA had retroactively decided to make the 2003 guidance binding. In fact, EPA emphasized that "[a]ll other information contained in the April [2003] boundary guidance continues to apply[.]"

Finally, we disagree with the Petitioner's contention that EPA treated the 2003 guidance as having the "force and effect of law" in the January 2005 Federal Register notice. The basis for this contention is unclear, as the Petitioner does not identify any examples where EPA treated the guidance as having such force and effect. In any event, the record plainly demonstrates that EPA

did not treat either the April 2003 guidance or the February 2004 guidance as having the force and effect of law. The January 2005 Federal Register notice highlights several instances in which EPA made designation decisions that demonstrate flexibility and discretion in the application of the guidance, in response to input from states and as the Agency made its final designation determinations. For example, the final designations decisions demonstrate that EPA determined that it was appropriate to allow inclusion of data from 2004 as part of the process, agreed to partial county designations and even satellite partial county designations where the facts and circumstances warranted such an approach, and other more area-specific changes not mentioned in the guidance, where warranted by the relevant facts and circumstances. The notice shows EPA's flexibility in setting nonattainment area boundaries after considering relevant facts and information provided by the states. These decisions demonstrate that EPA simply treated the guidance documents as guidance, with no binding effect on the Agency or any other entity.

EPA notes that the ultimate concern is whether the Agency had the proper factual basis upon which to make the designation decisions, and that the guidance served to assure that the process would result in a more robust analysis and decision making process. EPA believes that the record demonstrates the appropriateness of the designations.

With respect to the second point, EPA notes the explicit provisions of the CAA. In section 107(d), Congress set forth a very detailed and specific process for designations. This provision provides: (i) that Governors of states make the initial recommendations to EPA for designations and boundaries; (ii) that EPA evaluates these state recommendations, makes modifications to the recommendations if necessary, and notifies the state of modifications; and (iii) that EPA allow states at least 120 days to respond to any EPA modification. In each segment of this provision, Congress has explicitly provided that EPA and either the "Governor" or the "State" are the participants in this process. The statute does not direct EPA to treat separately with each local government in a state, and EPA believes that this is not illogical in that it is the state that bears the "primary responsibility for assuring air quality within the entire geographic area comprising such State." CAA section 107(a).¹²

In addition, in section 107(d)(2), the CAA provides that the final designation shall be published in the Federal Register, but also explicitly stipulates that designations are not subject to the procedural requirements of the APA. By providing the specific statutory process of section 107(d), and by not listing designations on the list of actions subject to the procedural requirements of section 307(d), Congress has effectively determined the process that is due in the

¹² Of course, EPA anticipates that each local government will have consulted, to the degree necessary or desired, with the state in the designations process. In this instance, EPA understands that the Petitioner has actively consulted with the State of Michigan in this process, and thus had an opportunity to participate in the process, even though section 107(d) does not provide local governments with the same role as the state itself.

case of designations. This process does not include consultation with local governments or public participation beyond the specific process outlined in section 107(d). It should also be noted that local governments are also afforded other opportunities to participate in the process, as is evident from the Petitioner's petition for reconsideration and pending petition for review.

C. "Even under EPA's Unlawful Multi-Factor Test, Oakland County Qualifies As An Attainment Area for PM-2.5"

The petition provides a critique of EPA's evaluation of the relevant facts in light of the factors recommended in the guidance documents for evaluation of nonattainment area boundaries. We address the issues in the order followed by the Petitioner.

1. Factor One - Comparison of emissions

The Petitioner relies upon a report by Gradient to challenge EPA's evaluation of the effect of emissions in Oakland County on nonattainment in the area. The Gradient report provides several alternate calculations of composite emission scores. Gradient calculates an alternate composite emission score based on pollutant weighting factors derived by comparing Detroit area PM 2.5 composition data to composition data from Bondville, Illinois (in contrast to EPA's comparison to composition data from a site in Northwest Pennsylvania). Gradient calculates an alternate composite emission score that is normalized on a square mile basis. The petition further questions the magnitude of the "urban increment" generated in the Detroit area.

Gradient also questions the design of the weighted emission score, and highlights the uncertainties inherent in this score. Gradient notes the uncertainty inherent in assuming a linear relationship between emissions of precursors (e.g., SO₂ and NO_x) and the corollary PM 2.5 components (sulfates and nitrates). Gradient also notes uncertainties associated with the emission inventories and expresses concern that it could not fully evaluate the inventory because EPA Region V did not fully document the source of some of the emission estimates (particularly those for carbon and crustal material). Gradient observes that the composition of PM 2.5 varies across the Detroit area, so that use of a single set of data to represent the relative proportions of the PM 2.5 components misrepresents the relative significance of emissions in different parts of the area. Gradient concludes that the sensitivity of the composite emission score to variations in inputs demonstrates the unreliability of this metric.

EPA recognizes the uncertainties inherent in use of emissions data in general, and in the use of composite emission scores in particular, as indicators of contribution to nonattainment. EPA believes that it used the best available indicators for comparing the emissions of Oakland County to the emissions of other counties that are potential contributors to the Detroit area violations. At the same time, Gradient provides useful information to indicate the sensitivity of the emissions metric to relevant uncertainties. EPA concludes that the information provided by

Gradient supports the designation of Oakland County as a contributing portion of the Detroit nonattainment area.

The first issue raised by Gradient is the selection of a rural site for comparison to Detroit in deriving the estimated composition of the Detroit urban excess PM 2.5. This composition is then used to determine weighting factors to be applied to emissions information for the different pollutants. Gradient instead recommends use of Bondville, Illinois, as a rural site because this site is more commonly upwind of Detroit. EPA believes that the M.K. Goddard site in Northwest Pennsylvania provides a better representation of background air quality for Detroit. The M.K. Goddard site is closer to Detroit, and EPA believes that site and Detroit are more likely to be in the same synoptic air mass irrespective of the frequency with which the M.K. Goddard site is upwind of Detroit. Nevertheless, Bondville data provide a plausible basis for calculating an alternate composition of Detroit's urban excess PM 2.5, for use in calculating an alternate set of composite emission scores. Gradient calculates an alternate Oakland County composite emission score of 12.6, which continues to rank Oakland County as the third largest composite emission score in the Detroit area.

Gradient next recommends normalizing the composite emission scores by county area. This normalization in effect ranks counties according to emissions density. EPA debated the use of emissions density metrics but concluded that contribution of a county to nearby nonattainment is more tied to total emissions than to emissions density. Nevertheless, Gradient's calculation provides a worthwhile perspective. Gradient calculates an Oakland County composite emission density score of 11.5, the fourth highest score in the area and just slightly lower than St. Clair's score of 11.6.

The petition questions the magnitude of the urban excess PM 2.5. However, the alternate data ($3.9 \mu\text{g}/\text{m}^3$ as compared to $4.3 \mu\text{g}/\text{m}^3$) also suggest that urban excess PM 2.5 is an important component of total PM 2.5 in the Detroit area, thus reinforcing EPA's view that it is important for the Detroit nonattainment area to include all the counties that contribute to nonattainment in the area.

To address Gradient's concerns about the design of the composite emission score, it is helpful to review the design and purpose of this metric. PM 2.5 has multiple origins, resulting from emissions of multiple species, and the composite emission score is designed to summarize information for these multiple species. For the underlying emissions for each component, EPA is judging each county's potential contribution based on the county's emissions as a percentage of the metropolitan area total emissions. For example for sulfate, which arises predominantly from emissions of sulfur dioxide, EPA computes each county's percentage of the metropolitan area sulfur dioxide emissions. The following table summarizes this information for Oakland County. (All emissions are in tons and from the 2001 inventory.)

Comparison of Oakland County, Michigan Emissions to the Metropolitan Area Totals

	Carbon	Crustal	SO ₂	NO _x
Oakland Co	2,264	1,829	8,277	44,171
Detroit CMSA	15,041	21,163	278,661	341,698
Percent of Emissions	15%	9%	3%	13%

Ultimately, EPA's judgment of the potential contribution of a county to nonattainment relies on this type of underlying emissions information. The data on this table show that Oakland County has a significant fraction of the emissions of all the relevant emitted pollutants except perhaps for sulfur dioxide. As a result, almost any approach to examining these data will indicate that Oakland County has a significant potential for contributing to nonattainment in the Detroit area.

Nevertheless, the use of multiple variables, i.e. the use of emissions data for multiple pollutants, begs the question of the relative importance given to each pollutant. Since the goal is to evaluate counties' contributions to urban excess PM 2.5, EPA is using the estimated composition of the urban excess PM 2.5 as a set of weighting factors that give more or less importance to the different pollutants in accordance with their importance as components of urban excess PM 2.5.

Gradient suggests that the composition of urban excess PM 2.5 as inferred from comparison to Bondville data is very different from the composition as inferred from comparison to M.K. Goddard Station data. This makes it especially noteworthy that applying weighting factors based on comparison to Bondville data give nearly the same composite emission score as applying weighting factors based on comparison to M.K. Goddard Station data. This fact supports the view that almost any reasonable way of examining the above emissions data will lead to the conclusion that Oakland County is a significant contributor to violations in the Detroit area.

Some specific concerns expressed by Gradient also warrant a response. Gradient expresses concern about nonlinearity between emissions and impacts, particularly between precursor emissions and photochemically produced particles. While EPA concedes the existence of such nonlinearities, Gradient provides no data or argument to suggest the direction of the

deviations from linearity or to suggest any adjustments to EPA's default linear assumption. Gradient expresses concern about lack of access to underlying emissions information. EPA made available a wealth of pertinent information on its web site (see <http://www.epa.gov/pmdesignations>.) Detailed information on the emissions inventory was and is available on <http://www.epa.gov/cair/technical.html>, particularly the linked document entitled "Clean Air Interstate Rule - Emission Inventory Technical Support Document." We would have provided Gradient with further information had we received such a request. Nevertheless, we believe that EPA made sufficient information available for the public to identify and evaluate the core issues of its action. Finally, Gradient expresses concern that variations in PM 2.5 composition across the area result in emissions having different levels of significance in different areas. EPA believes, again, that almost any means of weighting the Oakland County emissions data will yield about the same result, and in any case the issue is specifically Oakland County's contribution to Detroit area violations, not Oakland County's contribution to extraneous parts of the Detroit area.

2. Comparison of Air Quality

The Petitioner's discussion of the air quality factor briefly repeats arguments described above, for example that Oakland County is attaining the standard and during north winds records concentrations that are below background levels. EPA's response is also provided above. In brief, the air quality data at the monitor in Oakland County is in fact incomplete and thus inadequate to determine whether violations are occurring, and a comparison against a more properly determined background concentration suggests that concentrations in Oakland County exceed background levels.

3. Population Density and Degree of Urbanization

The Petitioner states that the presence of an attaining monitor demonstrates that the admittedly significant population of Oakland County is irrelevant for designation purposes. The Petitioner describes Oakland County as suburban. EPA believes that the population data show that Oakland County is an integral and substantial part of Southeast Michigan, irrespective of what concentrations the monitor in this portion of the area records. EPA believes further that the suburban character of Oakland County, as suburban to Detroit, is a factor that supports designating Oakland County as an integral part of the Detroit-Ann Arbor nonattainment area. EPA believes that the incomplete air quality data in Oakland County are not indicative of the degree of relevance of the population data in establishing whether Oakland County contributes to violations in Southeast Michigan.

4. Traffic and Commuting Patterns

The Petitioner states that "Fewer than 18% of Oakland County workers commute into Wayne County." This is similar to the information used in EPA's original assessment,

discounting for workers commuting from Oakland County to other counties that are included in EPA's data. EPA's data for VMT reflect local information and are not based solely upon miles of roads or population. The total number of commuters from Oakland County to Wayne County is substantial, suggesting that emissions caused by commuters from and within Oakland County contribute to violations recorded in Wayne County.

5. Extent of Growth

The Petitioner provides growth information that is very similar to the information EPA used. Therefore, the growth information provided by the Petitioner does not justify any revisions to EPA's action.

6. Meteorology

The Petitioner's discussion of the nine factors provides merely a two sentence summary of the extensive discussion of the relationship between meteorology and air quality in Oakland County. EPA has addressed this discussion above.

7. Geography/Topography

The Petitioner comments that EPA did not adequately account for sources in nearby parts of Canada as part of its analysis. Presumably the Petitioner is not seeking for EPA to pursue designating Windsor, Ontario, as nonattainment. Full consideration of emissions in Canada would have had minimal changes on the relative contributions of Michigan counties to Detroit area nonattainment and was unnecessary for defining contributing U.S. areas.

8. Jurisdictional Boundaries

The petition states that designating the full county as attainment would be more simple to administer. EPA believes that designating the full county nonattainment is as simple to administer, were administrative convenience the sole controlling consideration. As explained elsewhere, however, the designation decision must turn upon whether Oakland County contributes to nonattainment in another nearby area, and based upon the facts and circumstances, EPA concludes that it does have such impacts.

9. Level of Control of Emissions

The petition summarizes information on per capita emissions of PM 2.5 from point and area sources in Oakland County as compared to other counties in the Detroit area. The petition finds Oakland County to have lower per capita emissions than the other counties in the Detroit Metropolitan Area. The petition concludes that this information "indicates that the existing 'level of control' is more than adequate."

Per capita emissions are indicative of the mixture of source types in the area. The Petitioner provides no direct evidence regarding the emission controls in place in Oakland County or elsewhere, and the Petitioner provides no reason to conclude that the cited per capita emissions data reflect different emission controls rather than a different source mix. Thus, EPA believes that the attainment planning process will provide an appropriate forum to assess more carefully the current level of controls in Oakland County and elsewhere in Southeast Michigan as well as to assess what additional controls in Oakland County and elsewhere in Southeast Michigan might be warranted to address nonattainment in the area.

Supplemental Material

The Petitioner provided supplemental material in correspondence dated September 13, 2005. Although this material (including attachments) primarily refines and elaborates on previous material, for clarity this material is reviewed in the separate section that follows.

The Petitioner also made oral presentations to EPA on July 12 and July 14, 2005. In general, the information in these presentations is addressed in the pertinent sections of the review of the primary petition, and no separate discussion reviewing these presentations is necessary.

In summary, the supplemental material supports five conclusions:

1. Use of a variety of meteorological data sets yields similar results as were derived in the Petitioner's original analysis using meteorological data from the Detroit City Airport.
2. Use of more recent data yields results that are similar to the Petitioner's original results.
3. Wayne County sites record lower concentrations on days with predominantly north winds, supporting the view that "transport from Oakland County actually improves air quality in Wayne County.
4. The weighted emission scores change significantly with addition of Toledo area emissions into the baseline, supporting the view that the weighted emission scores are an unreliable indicator of contributions to nonattainment.
5. Nonattainment designations "discourage economic expansion, discourage Brownfields redevelopment, . . . increase sprawl, and in areas like Oakland County that are meeting the standards, mislead the public as to their air quality.

The following is EPA's response to each of these elements of the Petitioner's supplemental material:

1. EPA appreciates the Petitioner's assessment using various meteorological data sets. EPA accepts the Petitioner's conclusion that Detroit City Airport data are adequately representative for these purposes and that use of various meteorological data sets from Southeast Michigan yield similar results. Nevertheless, for reasons discussed above, EPA does not believe these results justify a conclusion that Oakland County does not contribute to violations in Southeast Michigan.

2. Again, EPA appreciates the Petitioner's assessment using more recent air quality data. EPA accepts the Petitioner's conclusion that more recent data yield similar results as prior data. Nevertheless, for reasons discussed above, EPA does not believe these results justify a conclusion that Oakland County does not contribute to violations in Southeast Michigan.

3. As noted above, an important component of PM 2.5 is particles that have been transported long distances. Consequently, an air parcel that has traversed areas like Northern Michigan and Northern Wisconsin with low emissions is likely to have lower concentrations than an air parcel that has traversed areas like portions of Indiana and Ohio with relatively high emissions. As a result, one would expect to find the results found by the Petitioner, that air parcels blowing from the north into Southeast Michigan have substantially lower concentrations than air parcels blowing into Southeast Michigan from the south. Indeed, this set of facts is a plausible explanation both for the Petitioner's finding here that Wayne County sites record lower concentrations during "north wind" conditions and for the finding discussed above that the Oakland County site exhibits the same pattern.

The Petitioner appears to support two corollary misconceptions. The first misconception is that an area that is meeting the air quality standards cannot be contributing to PM 2.5 concentrations in locations that are violating the standards. The second misconception is that a finding that a violating site is predominantly below the standard when the wind is from the north means that counties to the north are not contributing to the violations.

The data for Oakland County provide a useful illustration of why these beliefs are in error. On days identified as north wind days, the data show a steady increase in concentrations as one progresses from Saginaw to Genesee to Oakland to Wayne County. Indeed, on this set of days, concentrations at sites that would be considered downwind of Oakland County averages several $\mu\text{g}/\text{m}^3$ higher than concentrations at sites that would be considered upwind. This evidence suggests that emissions from Oakland County are contributing to violations in Wayne County.

It is important to remember that the pertinent standard is based on annual average concentrations. As a result, impacts on low concentration days will have just as much relevance as equivalent impacts on high concentration days. For example, an increase of $3 \mu\text{g}/\text{m}^3$ on 60 low concentration days will have just as much impact on the annual average as an increase of 3

$\mu\text{g}/\text{m}^3$ on 60 high concentration days. Thus, the Petitioner's analysis of concentrations in Wayne County on "north wind" days does not refute EPA's view that Oakland County contributes to violations in Wayne County.

The Petitioner further asserts in effect that air parcels that traverse Oakland County are cleansed as they do so. This would be counterintuitive, and the Petitioner provides no theory as to how this could be occurring. However, further examination suggests that this apparent result is an artifact of comparing the Oakland County concentrations under a subset of circumstances against annual average concentrations at a distant site that do not properly represent background concentrations for Oakland County for those circumstances.

4. The supplemental material presents weighted emission scores that reflect two modifications: use of background concentrations from Bondville, Illinois in determining the composition of Detroit's "urban excess" and thus determining the weighting factors, and use of a baseline set of emissions that includes emissions from the Toledo Metropolitan Area as well as Southeast Michigan. The use of background data from Bondville, Illinois, has been addressed above and need not be addressed here. The discussion here will focus on the addition of Toledo area emissions into the emissions baseline used to calculate weighted emission scores.

Given that the weighted emission scores are calculated by comparing each county's emissions against the overall area's emissions, i.e. the overall area's emissions are in the denominator of the equation, it is not surprising that recalculating the weighted emission scores with a larger area and larger overall area emissions yields lower weighted emission scores. For each pollutant, the effect is linear, i.e. every county's sub-score for the pollutant is reduced by the same percentage. The fact that different counties have different proportions of emissions of the pollutants introduces some variation in the percentage reduction in the overall weighted emission score, but fundamentally the change leads to similar reductions for all counties. Therefore, it is not surprising that the revised scores yield a similar comparison of counties in Southeast Michigan. Indeed, these revised scores, like the weighted emission scores that EPA used, support designating Oakland County as part of the Detroit-Ann Arbor nonattainment area.

The Petitioner's presentation of weighted emission scores with a baseline that includes Toledo area emissions, along with a footnote commenting on the attainment designation for the Toledo area "[d]espite the 'contribution' of [this area] to the USEPA's designated Southeast Michigan non-attainment area," appears intended to raise a question about why EPA designated these Ohio counties attainment despite designating Oakland County attainment. The Petitioner appears not to be advocating that EPA designate the Ohio counties as nonattainment; the Petitioner appears instead to be merely seeking to question whether EPA acted consistently in designating the Ohio counties attainment while designating Oakland County nonattainment.

EPA's evaluation of counties outside but near to the Detroit-Ann Arbor-Flint area included evaluation of whether Lucas and Fulton Counties should be considered to contribute to

violations in Southeast Michigan. (Wood County was not fully evaluated because it was not considered to be nearby to Southeast Michigan.) A variety of factors distinguish Oakland County from these Ohio counties. Most notably, whether one uses the weighted emission scores that EPA calculated or the scores that the Petitioner calculated, Oakland County has a higher composite emission score than any of the Toledo area counties. Oakland County is also closer to the violations, has greater commuting into the area of the violations, and of course is integrally part of Southeast Michigan in a way than none of the Toledo area counties are. EPA therefore believes that inclusion of Oakland County and exclusion of Lucas, Fulton, and Wood Counties from the Detroit-Ann Arbor nonattainment area is fully justified.

5. EPA understands the Petitioner's concerns about various effects of being designated nonattainment. However, the criteria for designations given in Section 107 of the Clean Air Act do not provide for EPA to consider these effects. Furthermore, EPA believes that nonattainment designations do not have significant levels of the effects feared by the Petitioner. Evidence available to EPA suggests that areas designated nonattainment have experienced growth rates that are similar to that of areas designated attainment. Many active Brownfields efforts are in areas that are designated nonattainment. EPA believes that designating an area nonattainment does not encourage sprawl or the associated effects on vehicle miles traveled. Therefore, EPA does not believe that the nonattainment designation for Oakland County will have the types of draconian effects cited by the Petitioner.

We understand the Petitioner's concern about communicating appropriate information to the public. The Clean Air Act requires nonattainment designations for locations that contribute to violations as well as locations that observe violations, so by definition EPA must define nonattainment areas to include some locations that are not themselves observing violations. The message for Oakland County must be more complicated because the incompleteness of the data renders us unable to determine whether violations are occurring in this county. In any case, Southeast Michigan is clearly observing violations of the air quality standard, and we believe the public in Southeast Michigan, particularly the public in the area designated nonattainment, is well served by being notified that portions of the area are experiencing unhealthful air quality. We look forward to working with Oakland County to communicate this message to the Oakland County public.

Conclusion

EPA concludes that Oakland County contributes to violations of the PM 2.5 NAAQS in the Detroit-Ann Arbor nonattainment area. The petitioner has provided an improper comparison of Oakland County concentrations to background concentrations, insofar as the identified background concentrations reflect a different set of conditions (i.e. an average for all wind directions and a value for a distant site) than the conditions for the Oakland County values. An EPA assessment using more comparable data shows that Oakland County concentrations exceed

background levels. Indeed, EPA's assessment reconfirms and further supports its view that Oakland County contributes to violations observed in Wayne County. For this and other reasons detailed above, EPA denies the petition for reconsideration.