MEMORANDUM

TO: Docket No. EPA-HQ-OAR-2012-0918
Air Quality Designations for the 2012 $PM_{2.5}$ Standard

FROM: Beth W. Palma
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SUBJECT: Georgia Deferred Area - Air Quality Designations for the 2012 $PM_{2.5}$ National Ambient Air Quality Standard (SAN 5706)

This memorandum provides the rationale for the U.S. Environmental Protection Agency's decision to use the additional time available to it under section 107(d)(1)(B) of the Clean Air Act (CAA) to obtain additional information and further evaluate air quality monitoring data before promulgating initial area designations for the 2012 primary annual fine particle National Ambient Air Quality Standard (2012 annual $PM_{2.5}$ NAAQS)[1] for certain areas in Georgia and relevant nearby counties in Alabama and South Carolina.

Upon promulgation of a NAAQS, section 107(d) of the CAA requires the EPA to subsequently promulgate area designations based on that NAAQS. Specifically, EPA must designate as "nonattainment" those areas that are violating a NAAQS, or that are contributing to a violation of the NAAQS in a nearby area. By contrast, the EPA designates as "unclassifiable/attainment" those areas where air quality monitoring data indicate attainment of the NAAQS, and for areas that do not have monitors but which the EPA has reason to believe are likely to be in attainment and are not contributing to nearby violations. Finally, the EPA reserves the category of "unclassifiable" for areas where the EPA cannot determine based on available information whether an area is meeting the NAAQS or contributing to a nearby violation.

As described in more detail in the memorandum, *Data Quality Issues in Georgia Affecting Air Quality Designations for the 2012 $PM_{2.5}$ National Ambient Air Quality Standards*, Georgia's monitoring program has experienced data completeness issues for several areas across the State.[2] Given these data completeness issues, for several counties the EPA cannot calculate a valid design value for the 2011-2013 time period (the data that the EPA is using to determine areas that violate the 2012 annual $PM_{2.5}$ NAAQS). Without a valid design value, the EPA has insufficient information to determine whether these areas are meeting or are not meeting the

[1] On December 14, 2012, the EPA promulgated a revised primary annual $PM_{2.5}$ NAAQS (78 FR 3086, January 15, 2013). In that action, the EPA revised the primary annual $PM_{2.5}$ standard, strengthening it from 15.0 micrograms per cubic meter ($\mu g/m^3$) to 12.0 $\mu g/m^3$.

[2] Memorandum from Liz P. Naess, Group Leader, Air Quality Analysis Group, US EPA Office of Air Quality Planning and Standard, to EPA Docket EPA-HQ-OAR-2012-0918, Air Quality Designations for the 2012 $PM_{2.5}$ Standards, titled "Data Quality Issues in Georgia Affecting Air Quality Designations for the 2012 $PM_{2.5}$ National Ambient Air Quality Standard."

NAAQS. However, the EPA believes that forthcoming monitoring data will likely result in the three years of complete and valid data needed to assess compliance with the standard and promulgate designations for the areas identified below. Accordingly, the EPA is deferring designations for these areas, and using the additional time available under section 107(d)(1)(B) of the CAA to assess that forthcoming data, and to promulgate initial area designations for the identified areas.

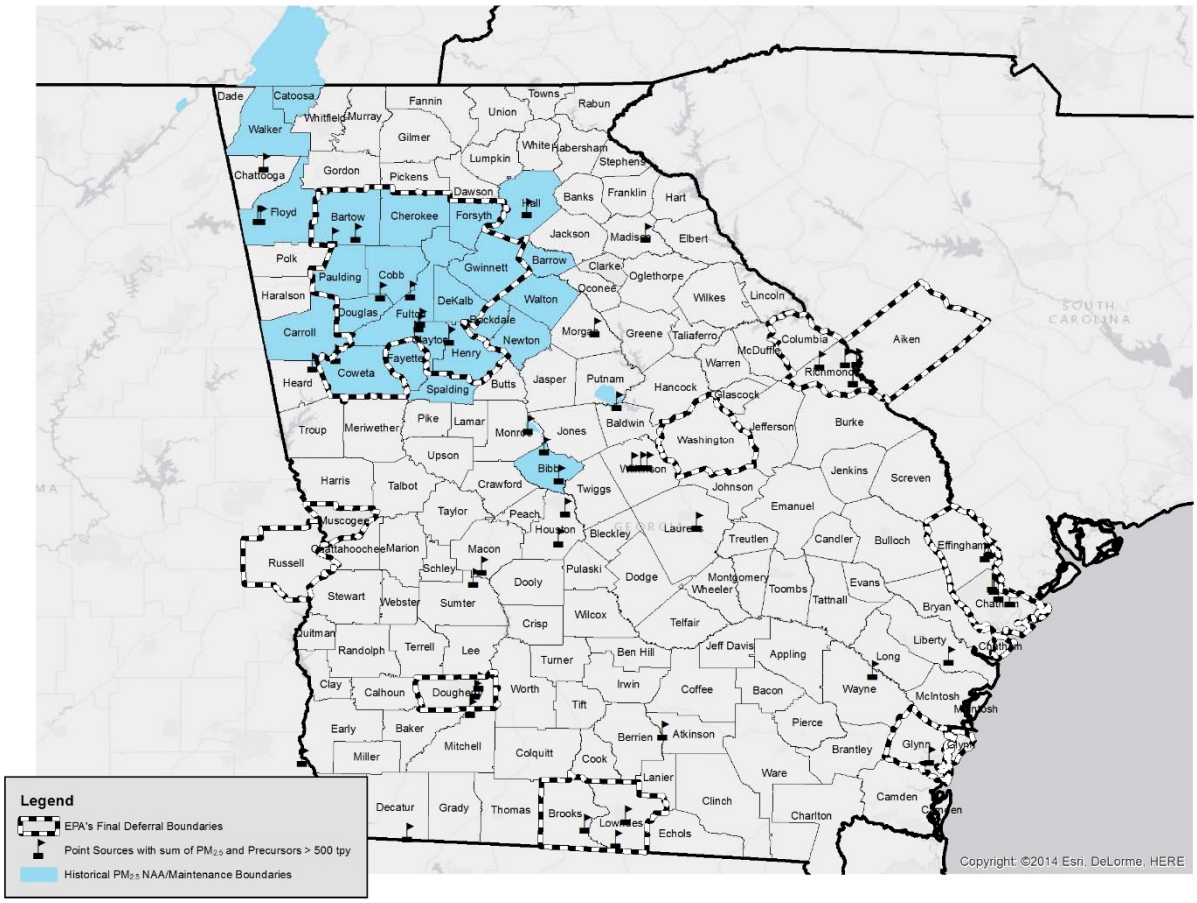
Table 1a identifies the counties for which the EPA is exercising its discretionary authority to defer designations. Figure 1 displays a map of the areas being deferred. Counties being deferred either contain monitors with incomplete 2011-2013 data, or are in the same Core Based Statistical Areas (CBSA) as such counties and would be most likely to contribute to a violation of the NAAQS should forthcoming data reveal such a violation. Accordingly, the EPA has determined that it currently lacks sufficient information to promulgate designations for these counties. The additional time afforded EPA by the decision to defer designations for these counties will allow the EPA to collect and assess that forthcoming information (including air quality monitoring data) before designations for these areas are promulgated.

Table 1a. Counties* for which the EPA is Deferring Designations

County with Incomplete Data	**Adjacent County**	**Associated Area Name**
Dougherty	---	Albany
Cobb Fulton Gwinnett Paulding	Bartow Clayton Cherokee Coweta DeKalb Douglas Forsyth Henry	Atlanta
Richmond	Aiken (South Carolina) Columbia	Augusta
Glynn	---	Brunswick
Muscogee	Russell (Alabama)	Columbus
Chatham	Effingham	Savannah
Lowndes	Brooks	Valdosta
Washington	---	Washington County

*Unless otherwise noted, the counties listed in this table are in Georgia.

Figure 1. Map of Georgia Counties (including Adjacent Counties in Alabama and South Carolina) that the EPA is Deferring



This memorandum also provides information regarding certain counties nearby the deferred counties listed in Table 1a, which the EPA is not deferring designations for. Instead, the EPA is, for the time being, designating these counties "unclassifiable/attainment," based on the EPA's determination that these counties are less likely to contribute to nearby affected monitors than the counties that the EPA is deferring designations for within the same CBSA. Because these unclassifiable/attainment counties are relatively less likely to be contributing to a hypothetical NAAQS violations that may be revealed by forthcoming monitoring data, there is comparatively less justification to defer designations for these counties.

In conducting the contribution analyses described in this memorandum, the EPA focused only on counties located within the same CBSA as an affected monitor, because such counties would be most likely to contain nearby sources that would contribute to any hypothetical violation at that monitor. In the event that complete data at any affected monitor ultimately reveals a violation of the NAAQS, the EPA intends to conduct the full five-factor analysis to analyze potential

contribution, as described in the April 2013 memorandum issued for this designation process.[3] Such an analysis would reevaluate contribution from all counties within the violating monitor's CBSA (including those currently being designated unclassifiable/attainment in this action), as well as from additional nearby areas with the potential to contribute to that violating monitor. As a result of any such future analyses, the boundaries of any future nonattainment areas may differ from the boundaries of the areas for which the EPA currently is deferring designations.

Table 1b shows information on the available, but incomplete, $PM_{2.5}$ annual average concentration data from 2012, 2013 and 2014 at the highest reading monitors in the Georgia areas for which the EPA is currently deferring designations. This data is not directly relevant to the analyses contained in this memorandum, but serves as context to show that it is less likely that any of these areas is violating the 2012 $PM_{2.5}$ standard of 12.0 micrograms per cubic meter ($\mu g/m^3$), and that complete data collected after 2013 will demonstrate these areas all meet the NAAQS. Nonetheless, as a regulatory matter, at this time the EPA cannot determine that areas with affected monitors are attaining the standards, and is thus invoking its discretionary right to defer designations for those areas.

Table 1b: $PM_{2.5}$ Annual Averages 2012-2014 for the Deferred Areas in Georgia

Area	2012 Annual Average ($\mu g/m^3$)	2013 Annual Average ($\mu g/m^3$)	Preliminary 2014 Annual Average for Q1-Q3 ($\mu g/m^3$)[4]
Savannah	9.2	9.0	9.5
Atlanta	11.3[5]	10.4	11.3
Albany	10.6	10.0	10.2
Brunswick	7.5[6]	8.2	8.3
Valdosta	8.6	8.5	8.9
Columbus	10.4	9.7	10.4
Augusta	10.4	9.2	10.2
Washington	9.8	9.4	10.2

The EPA will work with Georgia, Alabama, and South Carolina to finalize the designations for these counties as soon as complete certified $PM_{2.5}$ monitoring data are available, which the EPA anticipates will allow for prompt promulgation of these designations. When complete air quality

[3] Memorandum dated April 16, 2013, from Gina McCarthy, Assistant Administrator, to Regional Administrators, Regions 1-10, titled "Initial Area Designations for the 2012 Revised Primary Annual Fine Particle National Ambient Air Quality Standard."

[4] Preliminary 2014 data is based on uncertified data in AQS for the first three quarters of 2014.

[5] This annual average contains a quarter with less than 50% of the required data.

[6] This annual average contains a quarter with less than 50% of the required data.

monitoring data are available and have been certified, the EPA invites the affected states to submit revised designation and boundary recommendations, as appropriate. If at that time the EPA believes that it is necessary to modify a state's recommendation and to promulgate a designation different from the state's recommendation, then the EPA will notify the state at least 120 days prior to promulgating the final designation and the EPA will provide the state an opportunity to comment on the potential modification. Each state will then have an opportunity to respond to the EPA's proposed designations and boundaries. Pursuant to section 107(d), the EPA cannot promulgate the designation for these areas less than 120 days from the date of the EPA's announced intention to modify the recommendation. The EPA will promulgate the designations for these deferred areas at a later date, in a separate final rule.

Approach

In determining the appropriate set of neighboring counties to include with the set of monitored counties for which the EPA is deferring designations, the EPA conducted a hypothetical analysis assuming that the monitors with the incomplete data were violating the 2012 standard of 12.0 $\mu g/m^3$. The EPA is proceeding under this assumption under the precautionary principle that because it is unclear whether there is a violation in this area due to data incompleteness, then for purposes of conducting the contribution analysis the EPA will presume that there may be such a violation. The EPA's contribution analysis for these hypothetical violations focused on counties within the same CBSA as the affected monitor because these counties would be most likely to contain nearby sources that contribute to any violations. Specifically, the EPA evaluated all counties in the same CBSA as the county with the monitors in question, and assessed the relatively likelihood that these presumptively "nearby" counties could contribute to any hypothetical violation of the standard at the affected monitors. Using information similar to the information used for determining nonattainment area boundaries,[7] the EPA evaluated the information available for these CBSAs, including the more limited Air Quality Data, as well as emissions and emissions-related data; meteorology; and geography/topography.[8] One of the EPA's primary boundary considerations for determining whether to defer a final designation decision for these counties is whether the agency believes the emissions in those nearby counties are likely to contribute to the potential violations, and whether the meteorological data indicate that those emissions would be likely to impact an affected monitor. Where available evidence indicates that emissions in adjacent counties could likely have the potential to contribute to

[7] Memorandum dated April 16, 2013, from Gina McCarthy, Assistant Administrator, to Regional Administrators, Regions 1-10, titled "Initial Area Designations for the 2012 Revised Primary Annual Fine Particle National Ambient Air Quality Standard."

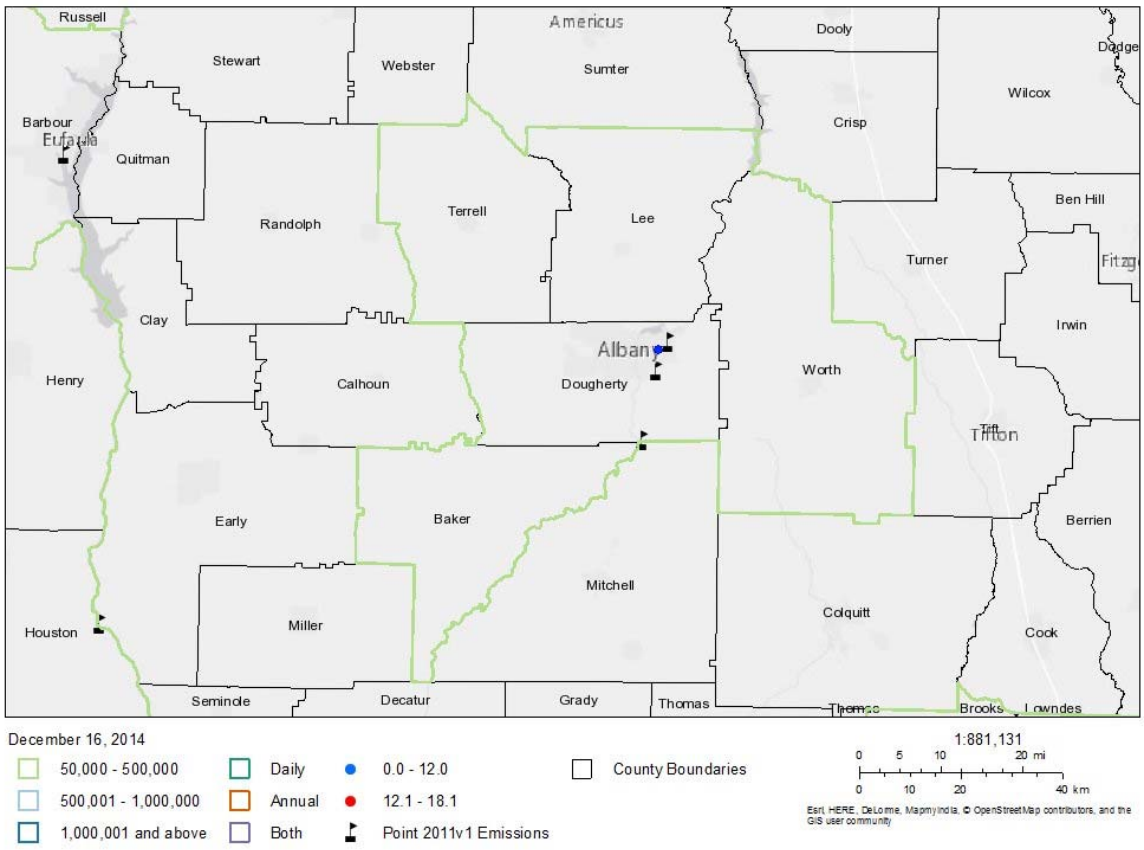
[8] The EPA did not consider jurisdictional boundaries for purposes of deferred designations because jurisdictional boundaries are most helpful for nonattainment planning purposes, whereas these evaluations merely concern EPA's best assessment of an appropriate dividing line between deferred and unclassifiable/attainment counties. No areas in Georgia are being designated nonattainment pursuant to this analysis, although this would change in the future if forthcoming data reveal a NAAQS violation. This and other circumstances described in this memorandum and other deferral memoranda being released today further highlight critical differences between the considerations and analysis for designating areas nonattainment or unclassifiable, versus the process for deferring designations.

monitors with data incompleteness, the EPA is deferring the designation for those counties as well as for the county with the affected monitor.

Albany Area (Albany, GA CBSA)

Albany is located in a CBSA that includes five counties in Georgia (Baker, Dougherty, Lee, Terrell, and Worth). The most populated and industrialized portion of the Albany area, where most of the emissions and emissions activities occur, is primarily contained in Dougherty County. More information on the EPA's evaluation of the emissions for the counties in the Albany CBSA is provided below. The Albany area does not have any geographical or topographical barriers meaningfully limiting air pollution transport within its air shed. Therefore, this factor did not play a meaningful role in this evaluation. The Albany CBSA is outlined in green in Figure 2, along with the location of point sources and air quality monitors.

Figure 2. Albany CBSA with Point Sources and Air Quality Monitor Location



The Dougherty County monitor located in the Albany area has incomplete 2011-2013 data. Based on incomplete data, the incomplete Dougherty County design value (DV) is 10.9 $\mu g/m^3$.

The EPA evaluated $PM_{2.5}$ and the precursor emissions, along with other related data from the counties in the Albany CBSA. The Albany area has three major point sources, all of which are in Dougherty County: MillerCoors, LLC, Procter & Gamble Paper Products Co., and GA Power Company Plant Mitchell. Other sources in the CBSA include county level emissions from non-point sources, nonroad mobile, on-road mobile, fires and local traffic. As can be seen in Table 2 below, Dougherty County has the largest SO_2 emissions (1,703 tpy) and NOx emissions (4,962 tpy) of any of the counties in the CBSA and a large amount of direct $PM_{2.5}$ emissions (2,183 tpy). Dougherty is the most populous county in the Albany CBSA with approximately 60 % of the population residing this county. Although the remainder of the CBSA accounts for 40 % of the populations in the CBSA, the areas outside of Dougherty are mainly rural. While the population density in Dougherty is 287 people per square mile, the population density in the remainder of the counties ranges from 10 to 80 people per square mile. The highest category of emissions from the other counties in the CBSA are total direct $PM_{2.5}$, with Worth County having the highest level at (3,027 tpy).[9] A further evaluation of the direct $PM_{2.5}$ emissions for Baker, Lee, Terrell and Worth counties indicates that the majority of these emissions are contributed by fires, and most of the fire emissions are from prescribed fires.

Table 2. Summary Statistics for the Albany, GA CBSA[10]

	Dougherty	**Baker**	**Lee**	**Terrell**	**Worth**
Core urbanized county or outlying?	Core[11]	Outlying	Outlying	Outlying	Outlying
SO_2 emissions (tpy)	1,703	138	116	105	145
$PM_{2.5}$ emissions (tpy)	2,183	1,958	1,718	1,741	3,027
NOx emissions (tpy)	4,962	704	1,246	933	1,625
NH_3 emissions (tpy)	302	560	340	423	829
VOC emissions (tpy)	4,157	1,458	1,708	1,451	2,592

[9] The majority of these direct $PM_{2.5}$ emissions are from non-point sources and may be event-related. If a violation of the NAAQS occurs when three years of complete data becomes available, the potential impacts of these event-related emissions may be further evaluated.

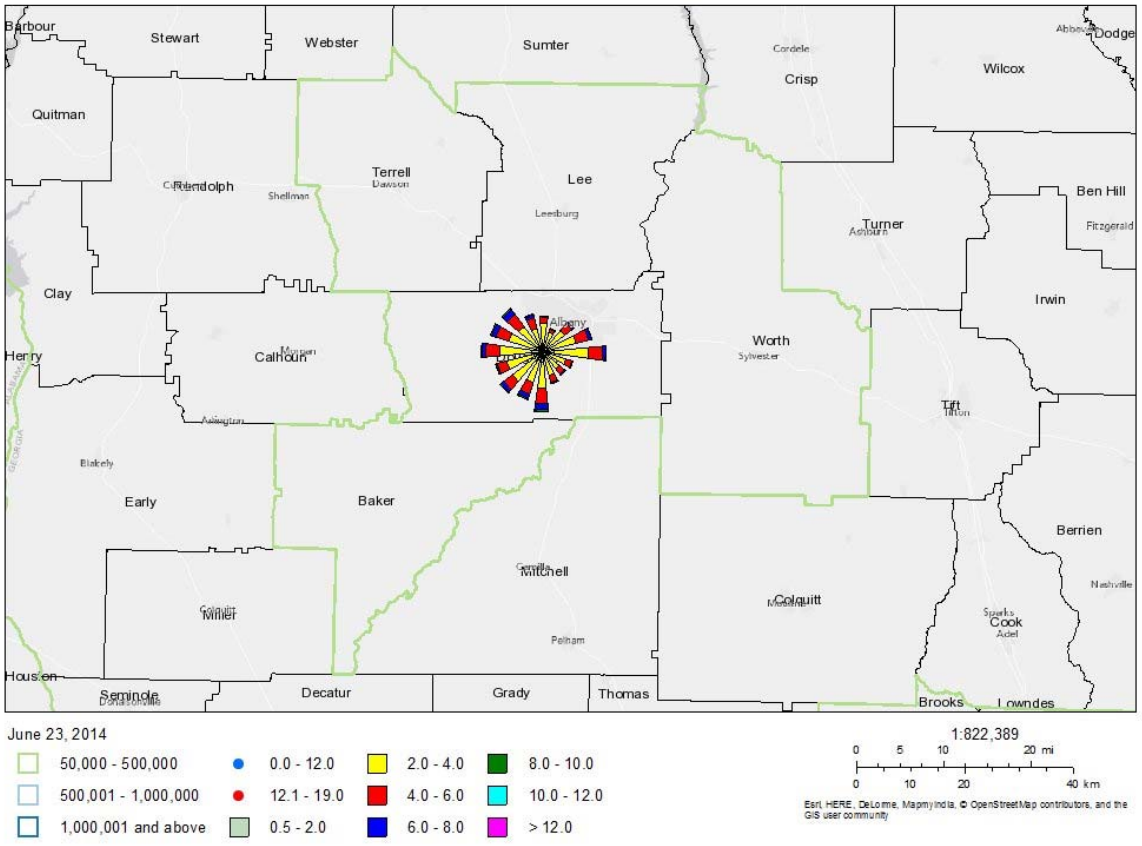
[10] Emissions from this table are generated from the 2011 National Emissions Inventory (NEI). Sulfur dioxide is denoted by SO_2, oxides of nitrogen is denoted by NOx, ammonia is denoted by NH_3 and volatile organic compounds is denoted by VOC in this table.

[11] In this document, the EPA's reference to a county as a Core county is an indication of whether most of the urbanized area and population in is within a CBSA.

Population	94,755	3,437	28,440	9,322	21,626
VMT (Millions)	956	59	278	157	310
VMT (% of CBSA)	54%	3%	16%	9%	18%

The EPA also evaluated the meteorology in the area by evaluating wind data collected at the monitor located in the Albany CBSA as shown in Figure 3. As shown, the winds blow from all directions at times throughout the year, with a lower frequency from the northerly directions. These variable winds occur mostly at mid-level speeds of 2 to 6 meters per second. This indicates that emissions sources in Lee County to the north are less likely to contribute to the Albany monitor.

Figure 3. Wind Rose in the Area of Analysis for the Albany Area



Albany GA CBSA Conclusion

Based on the information summarized in Table 2 and the wind rose data, the EPA is concluding that of the five counties in the Albany CBSA, Dougherty County has the greatest potential to

contribute to potential future violations of the standard at the Dougherty County monitor currently lacking complete data. For all other counties in the Albany CBSA, the EPA believes that it is relatively less likely that emissions from these counties would contribute to any hypothetical violation of the 2012 annual $PM_{2.5}$ NAAQS.

With the exception of direct $PM_{2.5}$ and NH_3 emissions, Dougherty County has the most emissions of any county in the CBSA. The NH_3 emissions are most likely related to agricultural activities. The relative potential for particles traveling from agricultural activities is less likely than from industrial sources because of their proximity to the ground. More than 50 percent of the direct $PM_{2.5}$ emissions in the outlying counties (i.e., Baker, Lee, Terrell and Worth counties) in the Albany CBSA are due to prescribed fires. In general, the carbonaceous fractions of direct emissions of $PM_{2.5}$ (i.e., particulate organic carbon and particulate elemental carbon) are an important "local" contributor to ambient $PM_{2.5}$ concentrations and are comparatively less likely to travel great distances. In Baker, Lee, Terrell, and Worth Counties – just as in other parts of southern Georgia and some nearby areas of southeast Alabama and northern Florida – large amounts of direct $PM_{2.5}$ emissions are associated with prescribed and managed fires, which can be an annual activity. Although these emission totals are higher than direct $PM_{2.5}$ emissions in other parts of the country, emissions associated with such fires are different than emissions from stationary and mobile sources. In general, these fires are only allowed to occur during conditions and times of the year that minimize their air quality impact, and emissions from these prescribed fires therefore tend to have lower ambient $PM_{2.5}$ potential than is implied by their mass. Furthermore, most prescribed fires are low-intensity fires performed in accordance with burn permits issued by the Georgia Forestry Commission, which limit these fires to circumstances with "good smoke dispersion conditions." Therefore, the potential for large quantities of smoke (direct $PM_{2.5}$ emissions) from Baker, Lee, Terrell and Worth counties to be transported long distances and to contribute to potential violations at the monitor in Albany is relatively less likely.

Of particular importance to the EPA's conclusion are the population and emissions of SO_2 and $PM_{2.5}$ in Baker, Lee, Terrell and Worth Counties, which are relatively low when compared to Dougherty County. Although the county-level NOx, VOC and ammonia emissions appear sizable in the Table 2 above, ambient $PM_{2.5}$ concentrations in the southeastern U.S. tend to be impacted most significantly by emissions of direct $PM_{2.5}$ emissions and SO_2 emissions. Furthermore, although the outlying counties account for 40% of the population in the Albany CBSA, the 60% located in Dougherty County are more densely concentrated and thus correlate more strongly with an increased likelihood of contribution. Emissions in Dougherty County, for the most part, are much higher than emissions in the other counties with the exceptions noted above. Additionally, the wind rose data suggest that emissions from Lee County are less likely to contribute at the Dougherty County monitor. Accordingly, the EPA is not deferring designations for Baker, Lee, Terrell, or Worth Counties, and is designating them unclassifiable/attainment based on the available data.

Atlanta Area (Atlanta-Sandy Springs-Roswell, GA CBSA)

1.0 Atlanta Area Summary

Atlanta-Sandy Springs-Roswell, Georgia is a 29-county CBSA in which the EPA has determined that designations for 12 full counties of this area should be deferred for the 2012 annual $PM_{2.5}$ NAAQS. Designations for the following counties are being deferred due to existing $PM_{2.5}$ monitoring sites in these counties that have invalid design values for 2013: Fulton, Cobb, Gwinnett and Paulding. In addition, the EPA has determined that the following adjacent counties would have the potential to contribute to a violating monitor, if there were one, at one of the invalid sites: Bartow, Cherokee, Clayton, Coweta, DeKalb, Douglas, Forsyth and Henry.

As shown in Figure 4, below, for 2013 in the Atlanta CBSA, there are two attaining monitors with complete data and four monitors with incomplete data. The EPA focused much of its analysis on the Fire Station #8 monitor because it has historically been the highest reading monitor in Atlanta. The Fire Station #8 site is three miles downwind of Georgia Power Company's Plant McDonough-Atkinson, and less than a mile away from a major rail hub. The only other monitor in the Atlanta area that was violating in 2012 was the Clayton County monitor. The Clayton County monitor currently has a complete, valid 2013 design value that is below the standard at 11.1 $\mu g/m^3$.

Most of the urbanized portion of the Atlanta CBSA is located within five central counties. Pockets of urbanization around these core counties exist in adjacent counties as well.

Due to data completeness issues, the EPA is unable at this time to calculate valid design values for four counties within the Atlanta CBSA – the counties of Cobb, Fulton, Gwinnett and Paulding. Without valid design values, the EPA has insufficient information to determine whether these areas are meeting the NAAQS. However, the EPA believes that forthcoming monitoring data for these counties will likely result in the three years of complete and valid data necessary to make such a determination. Accordingly, the EPA has decided to defer designations for Cobb, Fulton, Gwinnett and Paulding Counties, pursuant to CAA section 107(d)(1)(B).

In determining whether to defer designations for other portions of the Atlanta CBSA, the EPA considered the relatively likelihood that any counties in the CBSA could potentially contribute to violations in Cobb, Fulton, Gwinnett or Paulding Counties, in the event that complete data subsequently shows that monitors in any of those four counties violates the standard. The EPA has determined that eight counties – Bartow, Clayton, Coweta, DeKalb, Cherokee, Henry, Forsyth, and Douglas – would be the counties most likely to contribute to any violation that may be identified in the future. Both Clayton and DeKalb counties have valid attaining 2011-2013 design values, but the designations for these counties are being deferred because these counties have high emissions, are upwind of the deferred monitored counties, and overall would be relatively more likely to contribute to a hypothetical violation at an affected monitor. Generally, these counties have similar features with respect to high SO_2 and PM emissions, point sources, high population and VMT, relative to other counties in the CBSA.

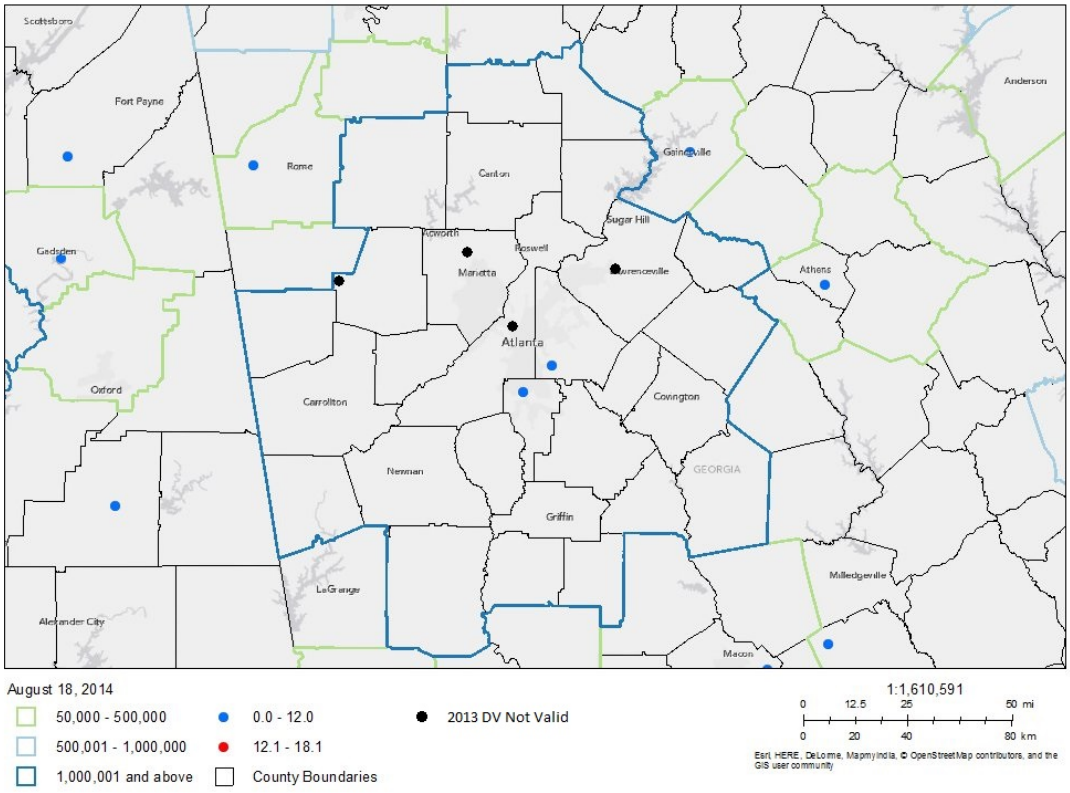
Substantial emission reductions have been realized in the Atlanta area since the time the EPA evaluated the area for the 1997 $PM_{2.5}$ standards. This is evident by the smaller footprint of

recently violating monitors for this area. Specifically, based on 2010-2012 data, only two monitors in the Atlanta area (one in Fulton County and one in Clayton County) had violating design values. In 2005, when the designations for the 1997 annual $PM_{2.5}$ NAAQS were finalized, there were five monitors scattered throughout the metropolitan area with design values violating the 1997 standards. In contrast, there were only two monitors in the area with 2012 design values exceeding the 2012 annual $PM_{2.5}$ NAAQS, and these two monitors are located 14 miles apart.

The South DeKalb monitor (traditionally one of the higher reading monitors for this area) has complete data for the entire period as the data collected there was not impacted by a 2011 snow storm that impacted data completeness for other monitors in Georgia. For 2013, this monitor has a valid attaining design value of 10.5 $\mu g.m^3$, well below the 2012 standard.

For purposes of this contribution analysis, the EPA has assumed that the four monitors with incomplete data – Fire Station #8, Cobb-Kennesaw, Gwinnett-Gwinnett Tech and Paulding-Yorkville – may be in violation of the standard. The EPA notes that Cobb-Kennesaw, Gwinnett-Gwinnett Tech and Paulding-Yorkville monitors all had steadily declining design values from 2008 through 2011 and recorded valid 2011 design values of 12.3, 12.1 and 11.0 $\mu g/m^3$, respectively. The EPA believes that Table 3 below and Figure 6 below, show that these three monitors were likely on a trajectory for recording attaining design values by the year 2011, notwithstanding the data completeness issues that led to invalid design values for 2011, 2012 and 2013. Nevertheless, these counties lacked the complete data necessary to develop a valid 2011-2013 design value, and are thus being deferred on that basis.

Figure 4: Map of the Atlanta Area.



2.0 Deferred Boundary Determination

As noted above, the EPA's starting point, for an area that has monitors with incomplete data and no violating monitors, is the CBSA where one exists. The Atlanta area had invalid data at several monitoring sites in 2011. For the period 2010-2012, Atlanta had valid design values at five monitors, with two violating the standard (Clayton and Fulton Counties). For 2011-2013, the Area has only three valid design values, all attaining the standard; the remaining four monitors in operation have invalid data. Although the monitor readings have been trending downward, the EPA has determined that it lacks sufficient information at this time to promulgate designations for the four counties with incomplete monitoring data, as well for several nearby counties that could potentially contribute to the four counties with data completeness issues. However, because the EPA believes that these data incompleteness issues can be rectified with forthcoming data, the EPA is deferring designations for these counties.

3.0 Technical Analysis for the Atlanta CBSA

In this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the $PM_{2.5}$ Designations Mapping Tool[12] and the EPA PM Designations Guidance and Data web page[13]) and/or data provided to the EPA by states or tribes. This technical analysis identifies the areas with emissions that could contribute to a potential violation of the 2012 annual $PM_{2.5}$ standard at the incomplete monitors. The EPA evaluated the relevant information for these areas and other nearby areas with emissions sources or activities that potentially contribute to ambient fine particle concentrations at the monitors with invalid 2013 design values in the area based on the using a weight of evidence of the five factors recommended in the EPA guidance.

[12]The EPA's $PM_{2.5}$ Designations Mapping Tool can be found at *http://geoplatform2.epa.gov/PM_MAP/index.html*.

[13] The EPA's PM Designations Guidance and Data web page can be found at *http://www.epa.gov/pmdesignations/2012standards/techinfo.htm*.

Figure 5: Map of EPA's Deferred Area for the Atlanta Area.

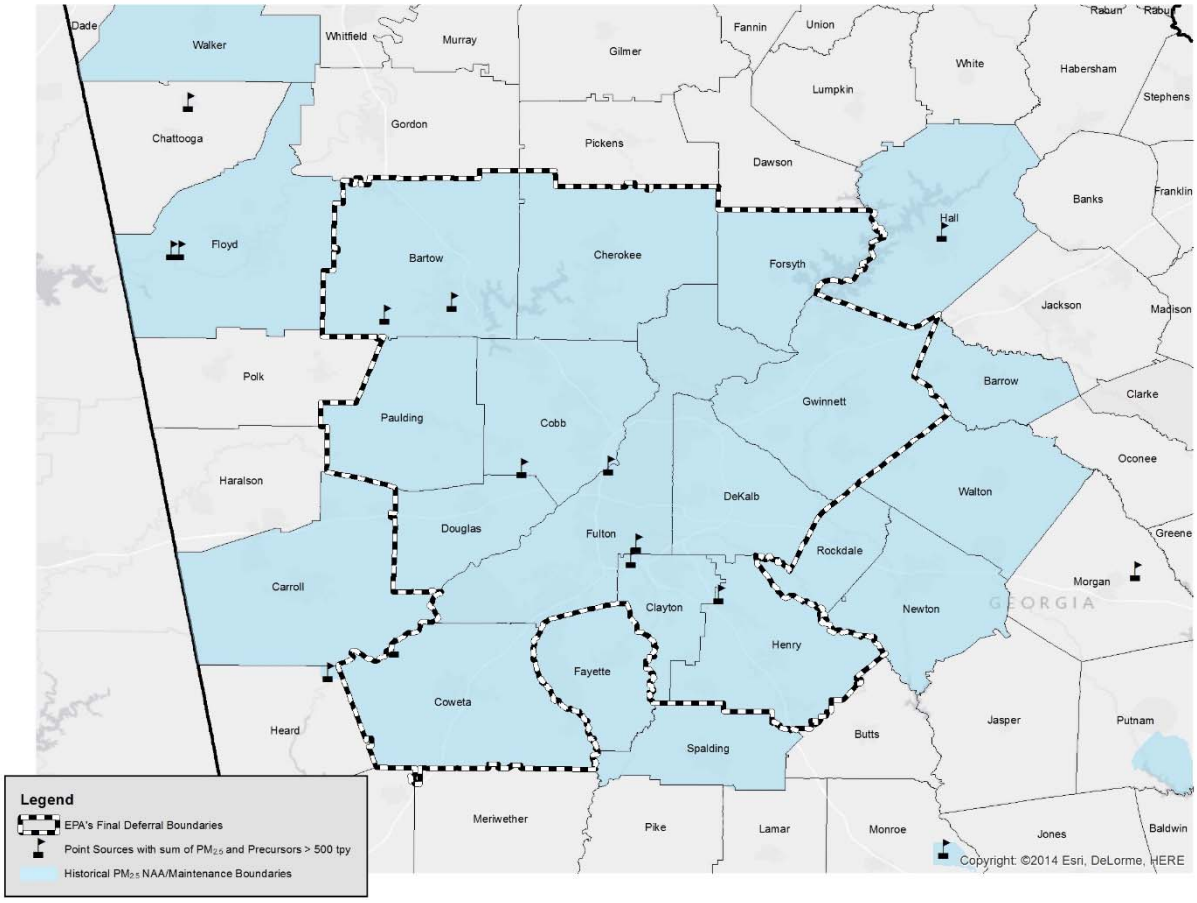


Figure 5 is a map of the boundary within which that the EPA is deferring designations for in the Atlanta Region. For purposes of the 1997 annual $PM_{2.5}$ NAAQS, portions of this area were designated nonattainment. The boundary for the nonattainment area for the 1997 annual $PM_{2.5}$ NAAQS included the entire counties of Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall,[14] Henry, Newton, Paulding, Rockdale, Spalding, Walton, and partial counties of Heard and Putnam.[15]

Air Quality Data

All data collected during the year are important when determining contributions to an annual standard such as the 2012 annual $PM_{2.5}$ NAAQS. Compliance with an annual NAAQS depends on monitor readings throughout the year, including days with monitored ambient concentrations

[14] Hall County is not a part of the Atlanta CBSA.

[15] Putnam County is not a part of the Atlanta CBSA.

below the level of the NAAQS. For the 2012 annual $PM_{2.5}$ NAAQS, the annual mean is calculated as the mean of quarterly means. A high quarter can drive the mean for an entire year, which, in turn, can drive an elevated 3-year DV. Although all data are important, seasonal or episodic emissions can provide insight as to relative contributors to measured $PM_{2.5}$ concentrations. For these reasons, for this air quality analysis, the EPA assessed and characterized air quality at, and in the proximity of, the monitoring site locations with invalid data first, by evaluating trends and the spatial extent of measured concentrations at monitors in the area of analysis, and then, by identifying the conditions most associated with high average concentration levels of $PM_{2.5}$ mass in the area of analysis.

In most cases, the EPA assessed air quality data on a seasonal, or quarterly, basis.[16] The EPA also identified the spatial extent of these high $PM_{2.5}$ concentrations. The mass and composition at the design value location represents contributions from various emission sources including local, area-wide (which may comprise nearby urban and rural areas) and regional sources. To determine the source mix (by mass) at the design value monitoring site, the EPA examined the chemical composition of the monitored $PM_{2.5}$ concentrations by pairing each violating FRM/FEM/ARM monitoring site with a collocated or nearby Chemical Speciation Network (CSN) monitoring site or sites. Then, the EPA contrasted the approximated mass composition at the design value monitoring site with data collected at IMPROVE[17] and other monitoring locations whose data are representative of regional background.[18,19] This comparison of

[16] Although compliance with the annual NAAQS depends on contributions from all days of the year, examining data on a quarterly or seasonal basis can inform the relationship between the temporal variability of emissions and meteorology and the resulting $PM_{2.5}$ mass and composition. In some areas of the country where there may be noticeable month-to-month variations in average $PM_{2.5}$, the quarterly averages may not adequately represent seasonal variability. In these areas, air quality data may be aggregated and presented by those months that best correspond to the local "seasons" in these areas.

[17] IMPROVE stands for Interagency Monitoring for Protected Visual Environments and is an aerosol monitoring network in mostly rural and remote areas.

[18] The "urban increment" analysis assesses and characterizes the increase in seasonal and annual average $PM_{2.5}$ mass and chemical constituents observed at violating monitoring site(s) relative to monitoring sites outside the area of analysis (which represent background concentrations). Developing the urban increment involves pairing a violating FRM/FEM/ARM monitor with a collocated monitor or nearby monitor with speciation data. The EPA made every effort to pair these data to represent the same temporal and spatial scales. However, in some cases, the paired violating and CSN "urban" monitoring locations were separated by some distance such that the included urban CSN site(s) reflect(s) a different mixture of emissions sources, which could lead to misinterpretations. To generally account for differences in $PM_{2.5}$ mass between the violating site and the nearby CSN site(s), the EPA determined material balance of the $PM_{2.5}$ composition at the violating site by assigning the extra measured $PM_{2.5}$ mass to the carbon components of $PM_{2.5}$. Where the general urban increment approach may be misleading, or in situations where non-carbonaceous emissions are believed to be responsible for a local $PM_{2.5}$ concentration gradient, the EPA used alternative analyses to reflect the mix of urban and rural sources contributing to the measured concentrations at violating monitoring sites.

[19] The urban monitors were paired with any rural sites within a 150 mile radius of an urban site to calculate spatial means of the quarterly averages of each species. If there were no rural sites within 150 miles, then the nearest rural site was used alone. That rural mean was then subtracted from the quarterly mean of the urban site to get the increment. Negative values were simply replaced with zeros.

local/area-wide chemical composition data to regional chemical composition data derives an "urban increment," which helps differentiate the influence of more distant emissions sources from the influence of closer emissions sources, thus representing the portion of the measured potential violation that is associated with nearby emission contributions.[20,21,22]

$PM_{2.5}$ Design Values and Total Mass Measurements – The EPA examined ambient $PM_{2.5}$ air quality monitoring data represented by the DVs at the monitoring sites with invalid data and at other monitors in the area of analysis. The EPA calculated DVs based on air quality data for the most recent 3 consecutive calendar years of air quality data from suitable FEM/FRM/ARM monitoring sites in the EPA's Air Quality System (AQS). For this designations analysis, the EPA generally reviewed data for the 2011-2013 period (i.e., the 2013 design value), which are the most recent years with air quality data. A monitor's DV is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2012 annual $PM_{2.5}$ NAAQS is met at a monitoring site when the 3-year average annual mean concentration is 12.0 $\mu g/m^3$ or less (e.g., 12.1 $\mu g/m^3$ or greater is a violation). A DV is only valid if minimum data completeness criteria are met or when other regulatory data processing provisions are satisfied (See 40 CFR part 50 Appendix N). Table 3 identifies the current design values (i.e., the 2013 DV) where available, and the recent design values from 2008 to 2012 for all monitoring sites in the Atlanta CBSA.[23]

There is currently not enough verifiable data from the monitors in the Atlanta area to obtain an accurate determination of air quality in the Atlanta CBSA. As noted in an August 8, 2014, memorandum from Gregg M. Worley, Chief of Region 4's Air Toxics & Monitoring Branch, to R. Scott Davis, Chief of Region 4's Air Planning Branch, the Atlanta area had less than 50% data completeness in the first quarter of 2011 and, therefore, does not meet the data handling requirements of 40 CFR Part 58, Appendix N, 4.1(c)(ii), for conducting data substitution during the period 2011 through 2013.

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[20] In most, but not all, cases, the violating design value monitoring site is located in an urban area. Where the violating monitor is not located in an urban area, the "urban increment" represents the difference between local and other nearby emission sources in the vicinity of the violating monitoring location and more regional sources.

[21] Hand, et. al. Spatial and Seasonal Patterns and Temporal Variability of Haze and its Constituents in the United States: Report V, June 2011. Chapter 7 – Urban Excess in $PM_{2.5}$ Speciated Aerosol Concentrations, *http://vista.cira.colostate.edu/improve/Publications/Reports/2011/PDF/Chapter7.pdf*

[22] US EPA, Office of Air Quality Planning and Standards, December 2004. (2004) Area Designations for 1997 Fine Particle ($PM_{2.5}$) Standards, Technical Support Document for State and Tribal Air Quality Fine Particle ($PM_{2.5}$) Designations, Chapter 3, Urban Excess Methodology. Available at *www.epa.gov/pmdesignations/1997standards/documents/final/TSD/Ch3.pdf*

[23] In certain circumstances, one or more monitoring locations within a monitoring network may not meet the network technical requirements set forth in 40 CFR 58.11(e), which states, "State and local governments must assess data from Class III $PM_{2.5}$ FEM and ARM monitors operated within their network using the performance criteria described in table C-4 to subpart C of part 53 of this chapter, for cases where the data are identified as not of sufficient comparability to a collocated FRM, and the monitoring agency requests that the FEM or ARM data should not be used in comparison to the NAAQS. These assessments are required in the monitoring agency's annual monitoring network plan described in §58.10(b) for cases where the FEM or ARM is identified as not of sufficient comparability to a collocated FRM…."

Table 3. Air Quality Data Collected at Regulatory Monitors in the Atlanta CBSA (all DV levels in µg/m^3)[a,b]

County - Site name	Monitor Site ID	06-08 DV	07-09 DV	08-10 DV	09-11 DV	10-12 DV	11-13 DV
Clayton-Forest Park	13-063-0091	15.3	13.6	12.9	12.6	12.3	11.1
DeKalb-South DeKalb	13-089-0002	14.4	13.0	12.1	11.9	11.5	10.5
Fulton-Fire Station #8	13-121-0039	**NV**	**NV**	**NV**	13.2	13.0	**NV**
Cobb-Kennesaw	13-067-0003	15.3	13.5	12.3	**NV**	**NV**	**NV**
Gwinnett-Gwinnett Tech	13-135-0002	14.5	12.7	12.1	**NV**	**NV**	**NV**
Paulding-Yorkville	13-223-0003	13.5	12.2	11.0	**NV**	**NV**	**NV**
Cobb - Powder Springs	13-067-0004	14.7	12.8	**NV**	**NV**	11.1	-
DeKalb – Doraville	13-089-2001	14.4	13.4	12.3	**NV**	**NV**	-
Fulton - E. Rivers Sch.	13-121-0032	14.8	13.5	12.3	**NV**	**NV**	-
NV: Not valid							

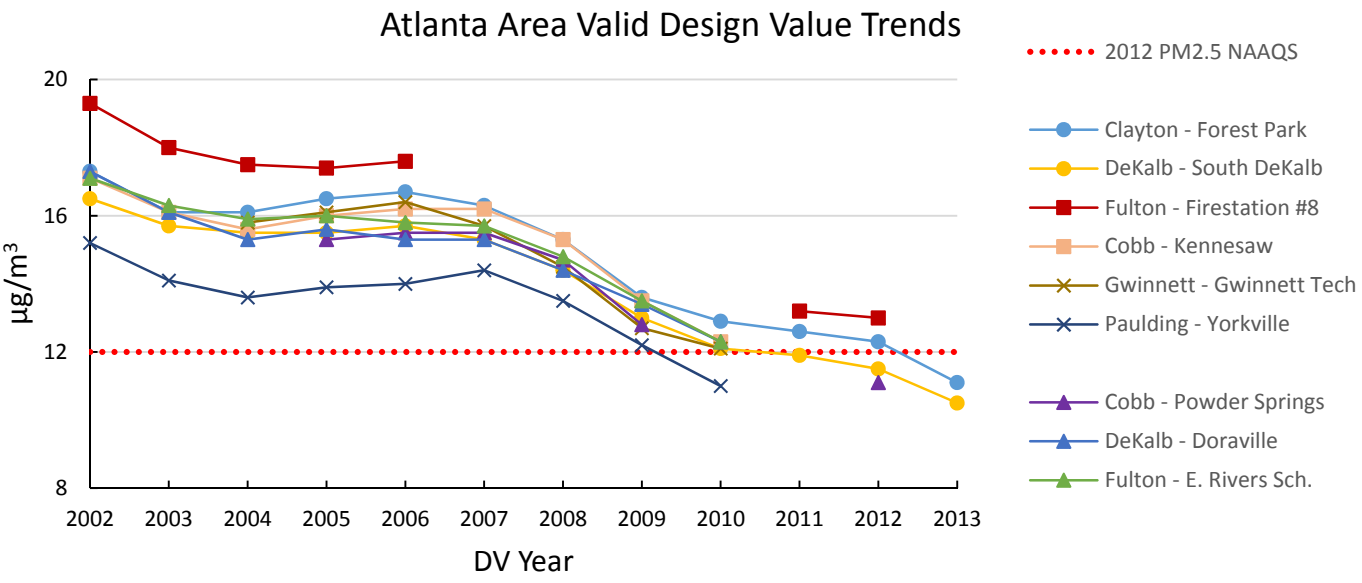
[a] This design value does not include data from Class III FEM monitors that are not eligible for comparison to the NAAQS, as approved by the EPA pursuant to 40 CFR 58.11(e).

[b] Site approved for shutdown during network plan review at the end of 2012.

The Figure 5 map, shown previously, identifies the Atlanta CBSA boundary and monitoring locations with 2013 attaining DVs and invalid DVs; there are no valid violating DVs for 2013. The Fire Station #8 monitor has consistently been the highest DV in the region, including for the 1997 PM designation, when valid data have been available for the site. There are a total of six monitors in the CBSA, and all but two have invalid DVs for 2013.

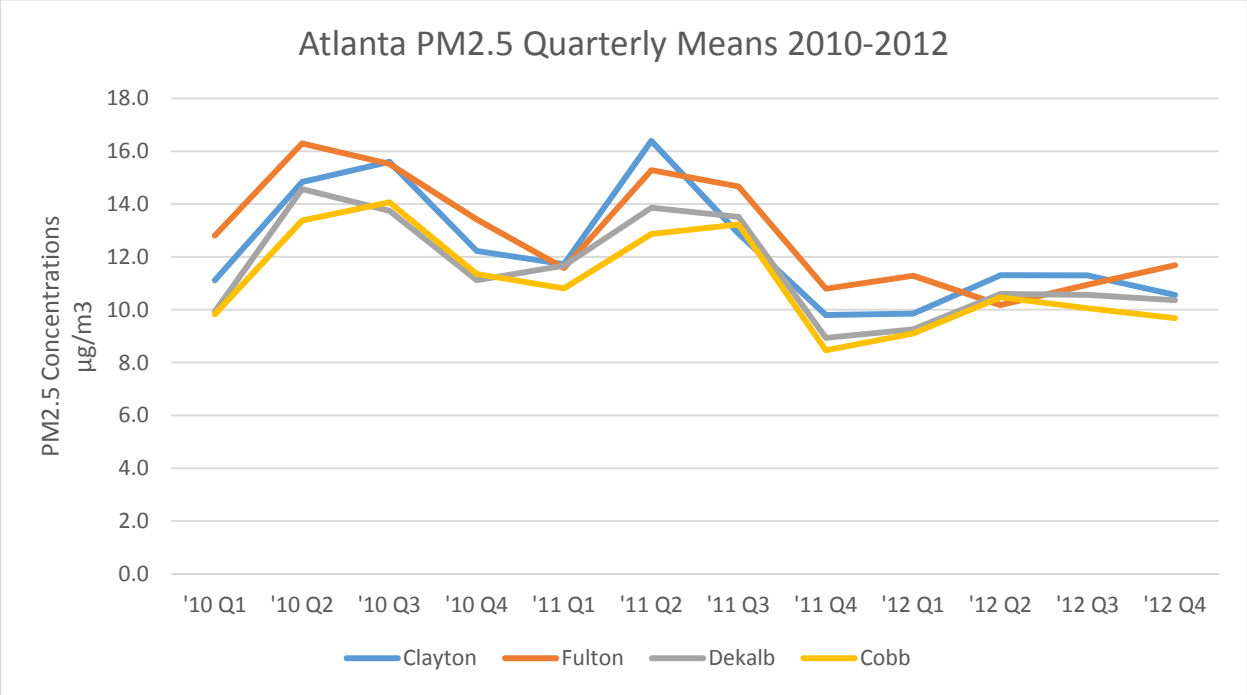
Figure 6, below, shows the history of design values for the monitoring data that is available for the Atlanta area since 2002. The Fire Station #8 monitor in Fulton County exceeded the 2012 $PM_{2.5}$ NAAQS in 2012, but for 2013 the design value is invalid due to incomplete data issues. In the years that Fire Station #8 site had valid design values, the site recorded the highest annual $PM_{2.5}$ design values in the Atlanta area. (Note that the last three sites shown, Cobb-Powder Springs, DeKalb-Doraville and Fulton-E. Rivers School all ceased operation in 2012 in accordance with Georgia's approved monitoring plan.)

Figure 6. Atlanta $PM_{2.5}$ Valid Design Values for 2002-2013



Seasonal variation can highlight those conditions most associated with high average concentration levels of $PM_{2.5}$. Figure 7, below, shows quarterly mean $PM_{2.5}$ concentrations for the 3-year period 2010-2012 for the highest DV monitoring site and the other, non-violating, monitoring sites in each county within the area of analysis. This graphical representation is particularly relevant when assessing air quality data for an annual standard, such as the 2012 annual $PM_{2.5}$ NAAQS, because, as previously stated, the annual mean is calculated as the mean of quarterly means and a high quarter can drive the mean for an entire year, which, in turn, can drive an elevated 3-year DV.

Figure 7. Atlanta $PM_{2.5}$ Quarterly Means for 2010-2012



As context, Quarterly values across the period have peaked in Q2. Overall, the quarterly means from year to year are also trending down at all of these sites.

<u>$PM_{2.5}$ Composition Measurements</u> - To assess potential emissions contributions for each monitoring location with invalid data, the EPA determined the various chemical species comprising total $PM_{2.5}$ to identify the chemical constituents over the analysis area, which can provide insight into the types of emission sources impacting the monitored concentration. To best describe the $PM_{2.5}$ at the monitoring sites that were violating in 2012 (none of the three monitoring sites with valid 2013 design values are violating), the EPA first adjusted the chemical speciation measurement data from a monitoring location at or near the violating FRM monitoring sites using the SANDWICH approach to account for the amount of $PM_{2.5}$ mass constituents

retained in the FRM measurement.[24,25,26,27] In particular, this approach accounts for losses in fine particle nitrate and increases in sulfate mass associated with particle bound water. Figure 4a, below, illustrates the fraction of each $PM_{2.5}$ chemical constituent at the Fulton (131210039) monitoring site based on annual averages for the years 2010-2012.

Figure 8. Atlanta Annual Average $PM_{2.5}$ Chemical Constituents (2010-2012)

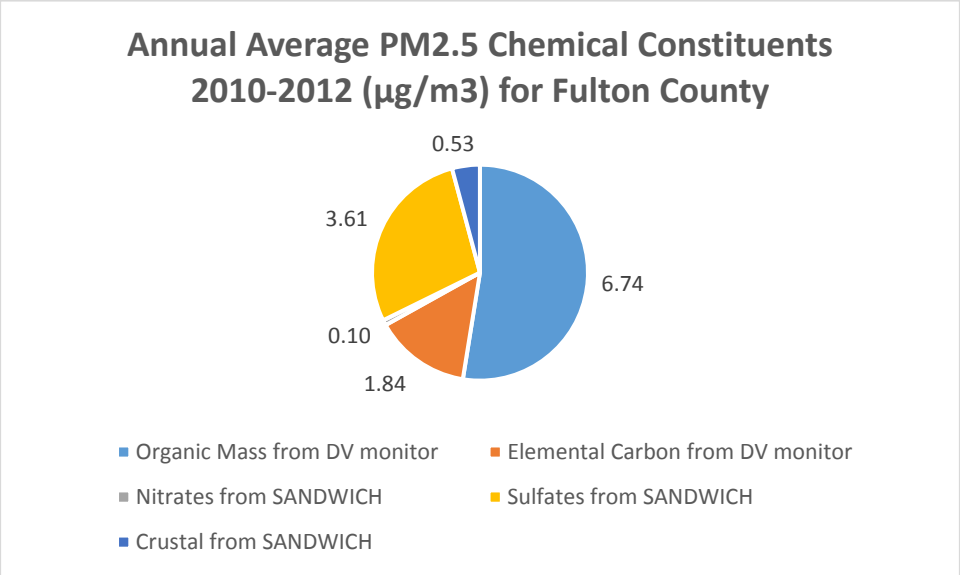


Figure 9 shows annual and quarterly chemical composition profiles and illustrates any seasonal or episodic contributors to $PM_{2.5}$ mass. This "increment analysis," combined with the other

[24] SANDWICH stands for measured **S**ulfate, **A**djusted **N**itrate, **D**erived **W**ater, **I**nferred **C**arbonaceous mass **H**ybrid Material Balance Approach." The SANDWICH adjustment uses an FRM mass construction methodology that results in reduced nitrates (relative to the amount measured by routine speciation networks), higher mass associated with sulfates (reflecting water included in gravimetric FRM measurements) and a measure of organic carbonaceous mass derived from the difference between measured $PM_{2.5}$ and its non-carbon components. This characterization of $PM_{2.5}$ mass also reflects crustal material and other minor constituents. The resulting characterization provides a complete mass closure for the measured FRM $PM_{2.5}$ mass, which can be different than the data provided directly by the speciation measurements from the CSN network.

[25] Frank, N. H., SANDWICH Material Balance Approach for $PM_{2.5}$ Data Analysis, National Air Monitoring Conference, Las Vegas, Nevada, November 6-9, 2006. http://www.epa.gov/ttn/amtic/files/2006conference/frank.pdf.

[26] Frank, N. H., The Chemical Composition of $PM_{2.5}$ to support PM Implementation, the EPA State /Local/Tribal Training Workshop: $PM_{2.5}$ Final Rule Implementation and 2006 $PM_{2.5}$ Designation Process, Chicago IL, June 20-21, 2007, http://www.epa.gov/ttn/naaqs/pm/presents/pm2.5_chemical_composition.pdf.

[27] Frank, N. H. *Retained Nitrate, Hydrated Sulfates, and Carbonaceous Mass in Federal Reference Method Fine Particulate Matter for Six Eastern U.S. Cities*. J. Air & Waste Manage. Assoc. 2006 56:500–511.

relevant information, can provide additional insight as to which sources may contribute to observed PM levels. Simply stated, this analysis can help identify nearby sources of emissions that contribute to the violation at the violating monitoring site.

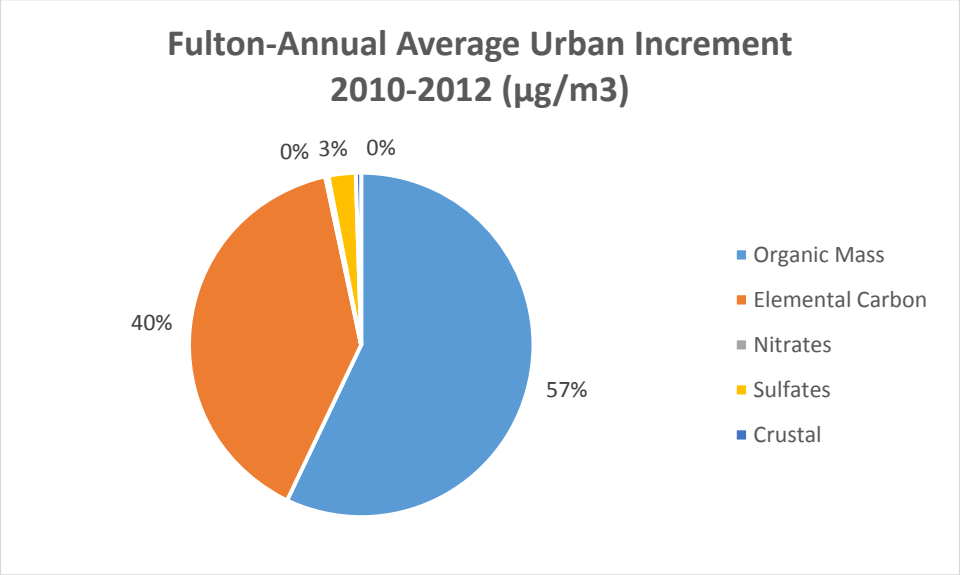
Figure 9. Atlanta Annual and Quarterly Average $PM_{2.5}$ Species (2010-2012)[a]

[a] *Adjusted to FRM Total $PM_{2.5}$* indicates that the speciation profile and total mass depicted in this figure are the result of the urban increment calculation for the particular FRM monitor.

Figures 8 and 9 show that sulfate and OM are the predominant species overall. Crustal and elemental carbon comprise a small percentage in all four quarters. Sulfate peaks in the third quarter. Nitrate is a relatively small component, but is slightly higher in the first quarter. It is more likely that the large sulfate component is caused by SOx emissions from large electric generating units in the area. High levels of organic mass are typically associated with mobile sources, wood or biomass burning and localized combustion sources.[28]

The EPA assessed seasonal and annual average $PM_{2.5}$ constituents at monitoring sites within the area relative to monitoring sites outside of the analysis area to account for the difference between regional background concentrations of $PM_{2.5}$, and the concentrations of $PM_{2.5}$ in the area of analysis, also known as the "urban increment." This analysis differentiates between the influences of emissions from sources in nearby areas and in more distant areas on the violating monitor. Estimating the urban increment in the area helps to illuminate the amount and type of particles at the violating monitor that are most likely to be the result of sources of emissions in nearby areas, as opposed to impacts of more distant or regional sources of emissions. Figure 10, below, includes pie charts showing the annual and quarterly chemical mass constituents of the urban increment. Note that in these charts, sulfates and nitrates have been adjusted to represent their mass in measured PM.

Figure 10. Atlanta CBSA Urban Increment Analysis for 2010-2012.



[28] The EPA Guidance Memorandum, "Initial Area Designations for the 2012 Revised Primary Annual Fire Particulate National Ambient Air Quality Standard," dated April 16, 2013, Attachment 3.

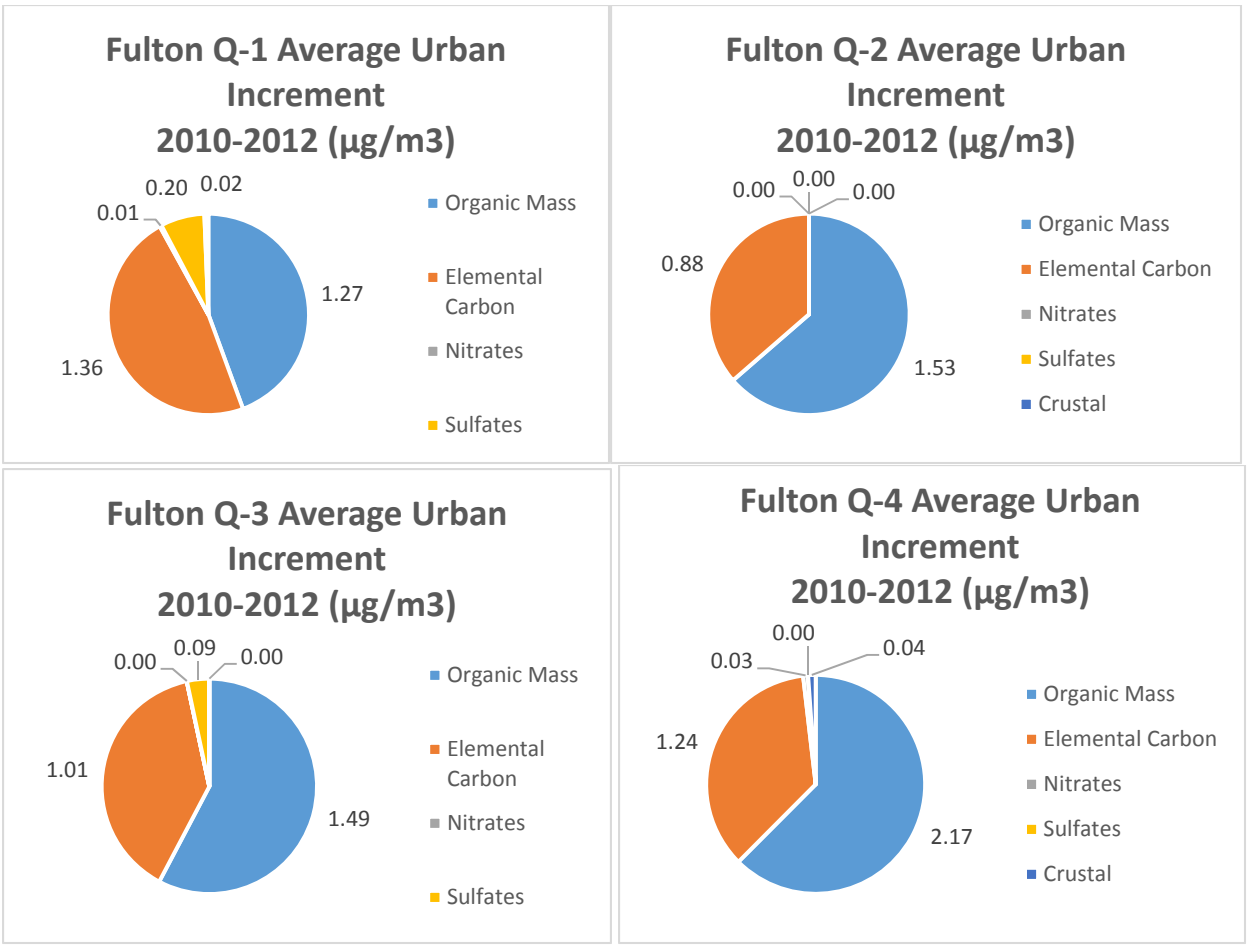
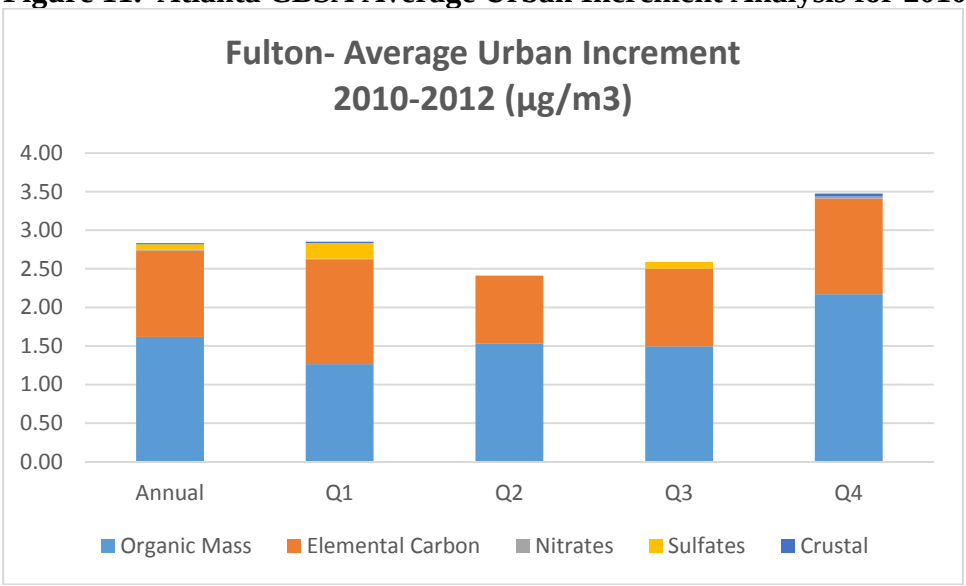


Figure 11. Atlanta CBSA Average Urban Increment Analysis for 2010-2012.



For 2012, Clayton County and Fulton County each had one monitoring site with a DV exceeding the NAAQS. For 2013, the Clayton County design value is below the standard at 11.1 $\mu g/m^3$, however, the Fulton County monitor has an invalid design value.

A comparison of the average urban increment to the total measured $PM_{2.5}$ for the Atlanta area indicates that the urban increment is less than one-third of the total. This indicates a meaningful contribution from regional sources. In addition, Fulton and adjoining counties have clear seasonal peaks in ambient $PM_{2.5}$ concentrations in quarters 1 and 4. Looking at speciated components of the urban increment for the Fulton County monitor, the organic mass component appears to have the largest urban contribution for quarters 2, 3 and 4. Elemental carbon is the second highest urban increment component and peaks during Q1. Carbonaceous mass (Organic Carbon + Elemental Carbon) is typically associated with mobile sources, wood or biomass combustion, and localized combustion sources. The relatively high elemental carbon component could be an indicator of contribution from diesel combustion sources in the area. This analysis points to contribution from both regional and local $PM_{2.5}$ sources.

Emissions and emissions-related data

In this designations process, for each area with a violating monitoring site or a monitoring site with invalid data, the EPA evaluated the emissions data from nearby areas using emissions related-data for the relevant counties to assess each county's potential contribution to $PM_{2.5}$ concentrations at the monitoring sites in the area under evaluation. Similar to the air quality analysis, these data were examined on a seasonal basis. The EPA examined emissions of identified sources or source categories of direct $PM_{2.5}$, the major components of direct $PM_{2.5}$ (organic mass, elemental carbon, crustal material (and/or individual trace metal compounds)), primary nitrate and primary sulfate, and precursor gaseous pollutants (i.e., SO_2, NO_X, total VOC, and NH_3). The EPA also considered the distance of those sources of emissions from the violating monitoring site. While direct $PM_{2.5}$ emissions and its major carbonaceous components are generally associated with sources near violating $PM_{2.5}$ monitoring sites, the gaseous precursors tend to have a more regional influence (although the EPA is mindful of the potential local NOx and VOC emissions contributions to $PM_{2.5}$ from mobile and stationary sources) and transport from neighboring areas can contribute to higher $PM_{2.5}$ levels at the monitoring sites.

Emissions Data

For each county in the Atlanta CBSA, the EPA examined the magnitude of county-level emissions reported in the 2011 NEI version 1 (see *http://www.epa.gov/ttn/chief/net/2011inventory.html*). These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, nonroad mobile, on-road mobile, and fires. The EPA also looked at the geographic distribution of major point sources of the relevant pollutants.[29] Substantial emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

[29] For purposes of this designations effort, "major" point sources are those whose sum of PM precursor emissions ($PM_{2.5}$ + NOx + SO_2 + VOC + NH_3) are greater than 500 tons per year based on NEI 2011v1.

To further analyze area emissions data, the EPA also developed a summary of direct $PM_{2.5}$, components of direct $PM_{2.5}$, and precursor pollutants, which is available at *http://www.epa.gov/pmdesignations/2012standards/docs/nei2011v1pointnei2008v3county.xlsx*. When considered with the urban increment analysis above, evaluating the components of direct $PM_{2.5}$ and precursor gases can help identify specific sources or source types contributing to elevated concentrations at potentially violating monitoring sites and thus assist in identifying appropriate area boundaries. In general, directly emitted particulate organic carbon (POC) and VOCs[30] contribute to $PM_{2.5}$ organic mass (OM); directly emitted EC contributes to $PM_{2.5}$ EC; NO_X, NH_3 and directly emitted nitrate contribute to $PM_{2.5}$ nitrate mass; SO_2, NH_3 and directly emitted sulfate contribute to $PM_{2.5}$ sulfate mass; and directly emitted crustal material and metal oxides contribute to $PM_{2.5}$ crustal matter.[31,32] The EPA believes that the quantities of those nearby emissions as potential contributors to the $PM_{2.5}$ monitors with invalid data are somewhat proportional to the $PM_{2.5}$ chemical constituents in the estimated urban increment. Thus, directly emitted POC is more important per ton than SO_2, partially because POC emissions are already $PM_{2.5}$ whereas SO_2 must convert to $PM_{2.5}$ and not all of the emitted SO_2 undergoes this conversion.

Table 4, below, provides a county-level emissions summary (i.e., the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, nonroad mobile, on-road mobile, and fires) of directly emitted $PM_{2.5}$ and precursor species for the county with the monitoring sites with invalid data and nearby counties in the Atlanta CBSA. Table 5 summarizes the directly emitted components of $PM_{2.5}$ for the same counties in the Atlanta CBSA. This information will be paired with the Urban Increment composition previously shown in Figures 10 and 11.

Table 4. County-Level Emissions of Directly Emitted $PM_{2.5}$ and Precursors in the Atlanta CBSA (tons/year)

County	Total NH_3	Total NOx	Total Direct $PM_{2.5}$	Total SO_2	Total VOC	Total
Coweta	277	10,545	1,615	47,614	3,053	63,104
Cobb	430	17,404	1,859	19,127	15,837	54,657
Fulton	706	24,444	2,614	607	20,237	48,608
Gwinnett	477	16,271	1,504	234	17,862	36,348
DeKalb	466	14,240	1,348	247	14,595	30,895
Bartow	1,200	13,988	2,147	6,716	4,085	28,137
Clayton	180	10,045	550	621	6,232	17,629

[30] As previously mentioned, nearby VOCs are presumed to be a less important contributor to $PM_{2.5}$ OM than POC.

[31] *See*, Seinfeld J. H. and Pandis S. N. (2006) *Atmospheric Chemistry and Physics: From Air Pollution to Climate Change*, 2nd edition, J. Wiley, New York. See also, Seinfeld J. H. and Pandis S. N. (1998) *Atmospheric Chemistry and Physics: From Air Pollution to Climate Change*, 1st edition, J. Wiley, New York.

[32] USEPA Report (2004), The Particle Pollution Report: Current Understanding of Air Quality and Emissions through 2003, found at: *http://www.epa.gov/airtrends/aqtrnd04/pm.html*.

County	Total NH_3	Total NOx	Total Direct $PM_{2.5}$	Total SO_2	Total VOC	Total
Henry	187	7,477	580	76	4,448	12,769
Carroll	2,136	4,085	645	98	3,714	10,678
Cherokee	539	4,530	505	61	4,464	10,098
Heard	786	3,429	1,561	3,116	635	9,526
Forsyth	713	3,737	435	73	4,340	9,297
Newton	147	3,067	663	65	3,170	7,113
Douglas	104	3,006	294	38	2,812	6,254
Walton	583	2,556	480	25	2,482	6,125
Paulding	265	2,332	340	25	2,306	5,267
Barrow	549	2,172	351	25	1,927	5,024
Fayette	85	2,057	275	31	2,402	4,850
Rockdale	89	2,181	253	72	1,915	4,509
Spalding	178	1,642	405	36	1,780	4,042
Butts	69	1,505	256	26	856	2,713
Dawson	1,169	718	191	8	722	2,809
Haralson	397	1,452	320	19	1,678	3,866
Jasper	321	593	651	38	828	2,432
Lamar	694	847	247	10	762	2,559
Meriwether	223	1,691	948	70	1,294	4,226
Morgan	1,129	2,256	598	55	1,335	5,373
Pickens	1,212	1,017	389	12	1,088	3,717
Pike	279	574	384	17	808	2,062

Table 5. County-Level Emissions for Components of Directly Emitted $PM_{2.5}$ in the Atlanta CBSA (tons/year) [33]

County	POM	EC	PSO4	PNO3	Crustal	Residual	Total Direct
Fulton	1,111	628	50	9	299	517	2,614
Bartow	268	196	132	3	683	865	2,147
Cobb	582	344	62	3	381	487	1,859
Coweta	463	180	73	4	392	503	1,615
Heard	257	153	111	7	446	587	1,561
Gwinnett	708	440	17	3	130	206	1,504
DeKalb	611	337	19	3	170	208	1,348

[33] Data are based on the 2011 and 2018 Emissions Modeling Platform Data Files and Summaries (*ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform*) available at: *http://www.epa.gov/ttn/chief/emch/index.html#2011* (accessed 02/26/14).

County	POM	EC	PSO4	PNO3	Crustal	Residual	Total Direct
Meriwether	637	117	11	6	45	132	948
Newton	207	89	9	2	91	266	663
Jasper	449	76	11	5	24	86	651
Carroll	255	115	10	2	108	155	645
Morgan	334	95	8	4	54	103	598
Henry	200	178	11	2	87	102	580
Clayton	211	216	7	1	51	64	550
Cherokee	201	131	5	1	76	90	505
Walton	205	76	6	2	80	111	480
Forsyth	157	105	5	1	76	91	435
Spalding	192	56	5	1	60	91	405
Pickens	105	36	14	1	79	154	389
Pike	228	42	4	2	39	69	384
Barrow	129	60	4	1	50	107	351
Paulding	149	72	4	1	48	66	340
Haralson	159	55	4	1	35	65	320
Douglas	117	74	4	1	47	51	294
Fayette	99	57	3	1	55	61	275
Butts	115	55	3	1	35	47	256
Rockdale	91	60	3	1	46	52	253
Lamar	126	38	3	1	28	51	247
Dawson	94	28	2	1	27	40	191

Table 5 breaks down the direct $PM_{2.5}$ emissions value from Table 4 into its components. These data will also be compared with the previously presented Urban Increment composition.

Using the previously described relationship between directly emitted and precursor gases and the measured mass to evaluate data presented in Tables 4 and 5 the EPA identified the following components warranting additional review: POM, EC and SO_2. The EPA then looked at the contribution of these constituents of interest from each of the counties included in the area of analysis as shown in Tables 6 a-c.

Table 6a. County-Level [POM] Emissions (tons/year)

	Emissions in average tons/yr		
County	**POM**	**Pct.**	**Cumulative %**
Fulton	1,111	13%	13%
Gwinnett	708	8%	22%
Meriwether	637	8%	29%
DeKalb	611	7%	36%
Cobb	582	7%	43%
Coweta	463	5%	49%
Jasper	449	5%	54%
Morgan	334	4%	58%
Bartow	268	3%	61%
Heard	257	3%	64%
Carroll	255	3%	67%
Pike	228	3%	70%
Clayton	211	2%	72%
Newton	207	2%	75%
Walton	205	2%	77%
Cherokee	201	2%	80%
Henry	200	2%	82%
Spalding	192	2%	84%
Haralson	159	2%	86%
Forsyth	157	2%	88%
Paulding	149	2%	90%
Barrow	129	2%	91%
Lamar	126	1%	93%
Douglas	117	1%	94%
Butts	115	1%	95%
Pickens	105	1%	97%
Fayette	99	1%	98%
Dawson	94	1%	99%
Rockdale	91	1%	100%

Table 6b. County-Level [EC] Emissions

	Emissions in average tons/yr		
County	**EC**	**Pct.**	**Cumulative %**
Fulton	628	15%	15%
Gwinnett	440	11%	26%
Cobb	344	8%	34%
DeKalb	337	8%	43%
Clayton	216	5%	48%
Bartow	196	5%	53%
Coweta	180	4%	57%
Henry	178	4%	61%
Heard	153	4%	65%
Cherokee	131	3%	68%
Meriwether	117	3%	71%
Carroll	115	3%	74%
Forsyth	105	3%	76%
Morgan	95	2%	79%
Newton	89	2%	81%
Walton	76	2%	83%
Jasper	76	2%	85%
Douglas	74	2%	86%
Paulding	72	2%	88%
Rockdale	60	1%	90%
Barrow	60	1%	91%
Fayette	57	1%	92%
Spalding	56	1%	94%
Butts	55	1%	95%
Haralson	55	1%	96%
Pike	42	1%	98%
Lamar	38	1%	98%
Pickens	36	1%	99%
Dawson	28	1%	100%

Table 6c. County-Level [SO2] Emissions

	Emissions in average tons/yr		
County	**SO2**	**Pct.**	**Cumulative %**
Coweta	47,614	60%	60%
Cobb	19,127	24%	84%
Bartow	6,716	8%	93%
Heard	3,116	4%	97%
Clayton	621	1%	98%
Fulton	607	1%	98%
DeKalb	247	0%	99%
Gwinnett	234	0%	99%
Carroll	98	0%	99%
Henry	76	0%	99%
Forsyth	73	0%	99%
Rockdale	72	0%	99%
Meriwether	70	0%	99%
Newton	65	0%	99%
Cherokee	61	0%	100%
Morgan	55	0%	100%
Jasper	38	0%	100%
Douglas	38	0%	100%
Spalding	36	0%	100%
Fayette	31	0%	100%
Butts	26	0%	100%
Barrow	25	0%	100%
Paulding	25	0%	100%
Walton	25	0%	100%
Haralson	19	0%	100%
Pike	17	0%	100%
Pickens	12	0%	100%
Lamar	10	0%	100%
Dawson	8	0%	100%

In addition to reviewing county-wide emissions of $PM_{2.5}$ and $PM_{2.5}$ precursors in the area of analysis, the EPA also reviewed emissions from major point sources located in the area of analysis. The magnitude and location of these sources can help inform boundaries. Table 7 provides facility-level emissions of direct $PM_{2.5}$, components of direct $PM_{2.5}$, and precursor pollutants (given in tons per year) from major point sources located in the Atlanta CBSA. Table 7 also shows the distance from the facility to the closest $PM_{2.5}$ monitor with incomplete data.

Table 7. NEI 2011 v1 Point Source Emissions (tons/year)

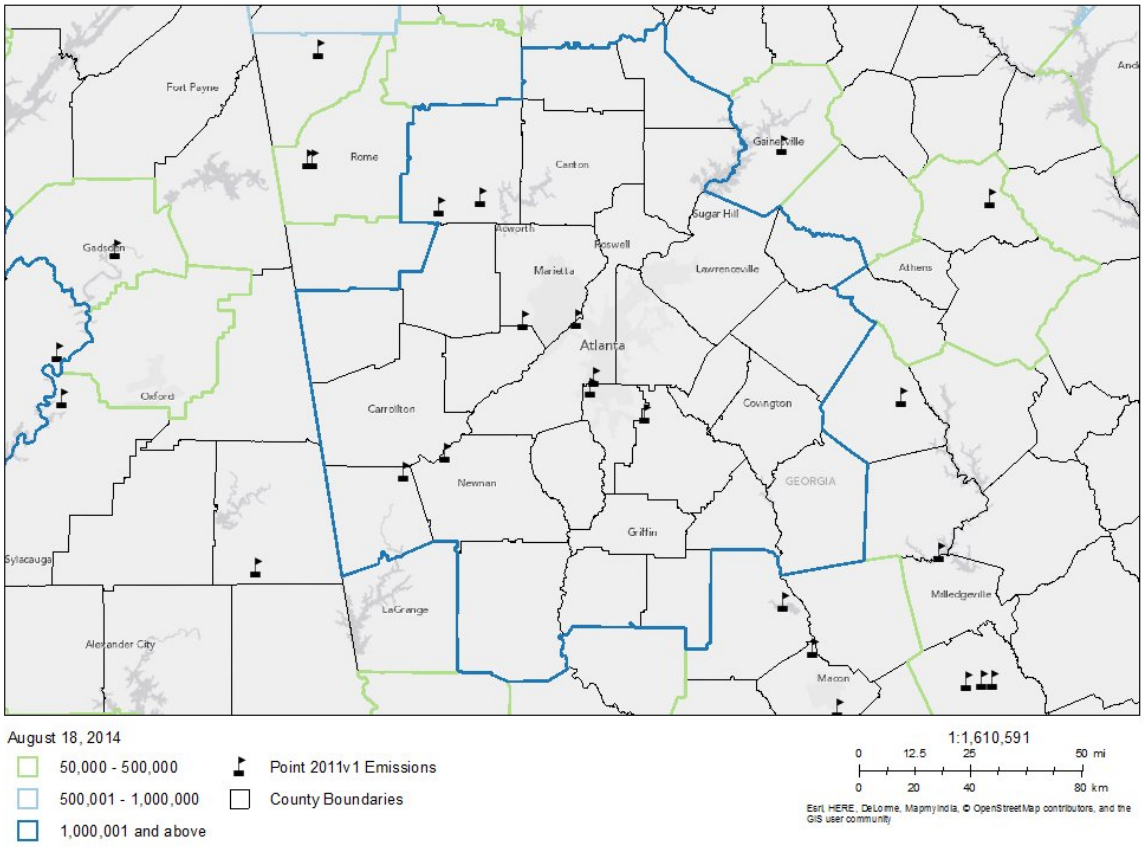
County	Facility Name (Facility ID)	Distance to monitor (miles)	NEI 2011 v1 Emissions - Tons/Year					
			NH3	NOx	$PM_{2.5}$	SO2	VOC	Total
Bartow	Chemical Products Corporation	31	1	23	25	557	2	607
Bartow	Ga Power Company - Plant Bowen	36	15	8,371	1,161	5,889	188	15,623
Clayton	The William B Hartsfield International Airport	11	-	4,316	90	537	788	5,731
Cobb	Caraustar Industries Inc	12	-	176	44	564	15	799
Cobb	Ga Power Company - Plant McDonough/Atkinson	3	14	3,162	424	18,307	27	21,934
Coweta	Ga Power Company - Plant Yates	36	7	6,763	626	47,530	61	54,987
Fulton	Owens Brockway Glass Container Inc.	9	1	350	84	214	3	654
Heard	Ga Power Company - Plant Wansley	44	216	2,831	1,017	3,097	141	7,303
Henry	Transcontinental Gas Pipe Line Company, LLC - Compressor Station 120	19	-	2,259	59	-	404	2,722
Morgan	Georgia-Pacific Wood Products LLC (Madison Plywood)	60	-	207	139	16	199	562

Figure 12, below, shows the major point source emissions (from the 2011 NEI in tons per year) in the area of analysis for the Atlanta CBSA and the relative distances of these sources from the monitoring location(s) with invalid data, as depicted by blue dots. The actual distance from the point sources to the PM monitoring location is presented in Table 7). The distance from the monitoring location with invalid data is particularly important for directly emitted $PM_{2.5}$. The influence of directly emitted $PM_{2.5}$ on ambient $PM_{2.5}$ diminishes more than that of gaseous precursors as a function of distance.[34]

As indicated in Figure 12, there are 12 point sources located within 60 miles of the highest reading invalid monitor (i.e., Fire Station #8). Plant Wansley in Heard County had SO_2 and $PM_{2.5}$ emissions of 75,650 tpy and 3,823 tpy, respectively, at the time of the 1997 $PM_{2.5}$ designation. As context, Georgia Power installed emissions control technology beginning in 2002, and SO_2 and $PM_{2.5}$ emissions have decreased by 96 percent and 73 percent, respectively. Morgan County has one point source located 60 miles away from the Fire Station #8 monitor, and SO_2 and $PM_{2.5}$ emissions from the source are low.

[34] Baker, K. R. and K. M. Foley. *A nonlinear regression model estimating single source concentrations of primary and secondarily formed $PM_{2.5}$.* Atmospheric Environment. 45 (2011) 3758-3767.

Figure 12. Major Point Source Locations in the Atlanta Area



Population density and degree of urbanization

The EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. Population levels and rapid population growth in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that it may be appropriate to examine the county associated with area source and mobile source emissions for potential contribution to the invalid monitors. Table 8 shows the 2000 and 2010 population, population growth since 2000, and population density for each county in the Atlanta CBSA.

Table 8. Population Growth and Population Density.

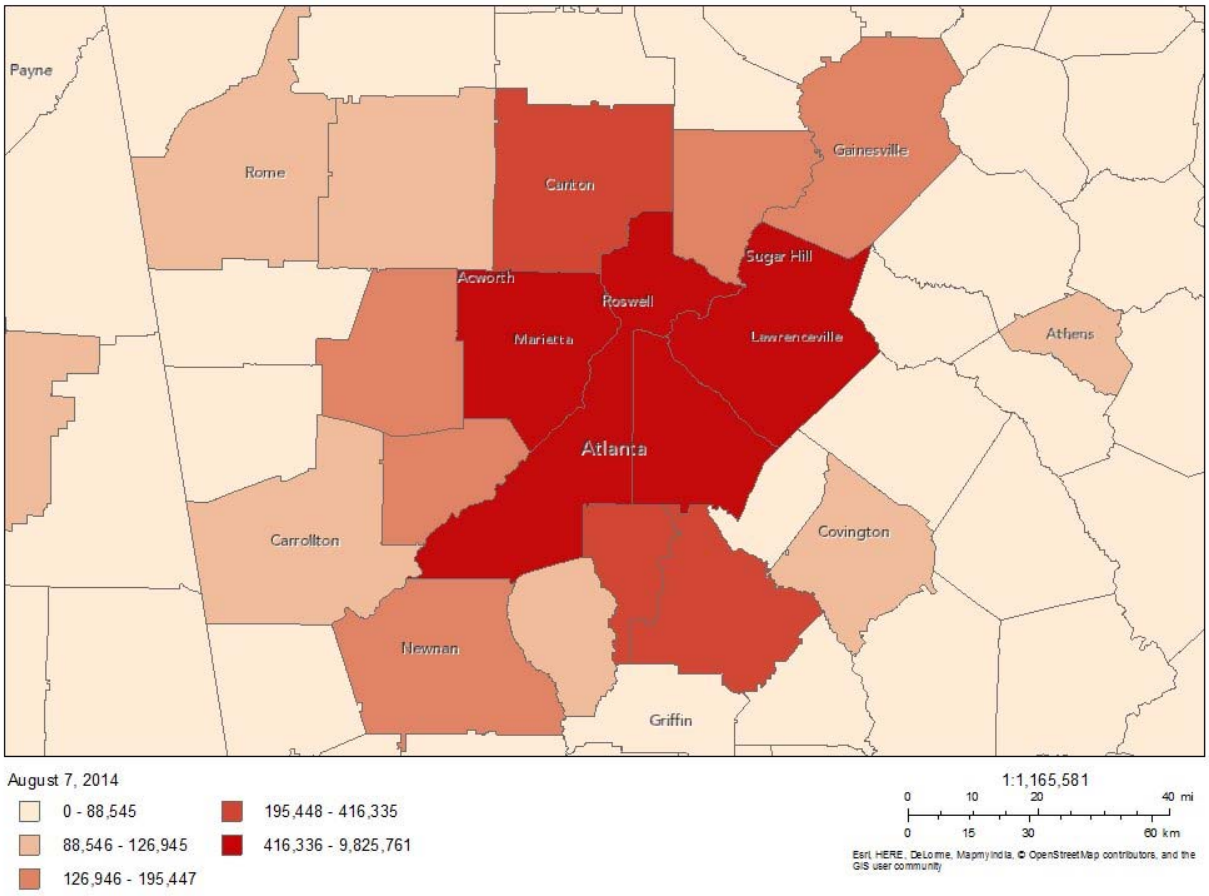
County	Population 2000	Population 2010	% Change from 2000	Land Area (Sq. Miles)	Population Density (per Sq. Mile)	%	Cumul. %
Fulton	816,006	926,119	13.5%	529	1,752	17%	17%
Gwinnett	588,448	808,409	37.4%	433	1,868	15%	33%
DeKalb	665,865	692,546	4.0%	268	2,582	13%	46%
Cobb	607,751	689,695	13.5%	340	2,028	13%	59%
Clayton	236,517	259,832	9.9%	143	1,822	5%	64%
Cherokee	141,903	215,248	51.7%	424	508	4%	68%

County	Population 2000	Population 2010	% Change from 2000	Land Area (Sq. Miles)	Population Density (per Sq. Mile)	%	Cumul. %
Henry	119,341	205,283	72.0%	323	636	4%	72%
Forsyth	98,407	176,820	79.7%	226	783	3%	75%
Paulding	81,678	142,788	74.8%	313	456	3%	78%
Douglas	92,174	132,646	43.9%	199	666	3%	80%
Coweta	89,215	127,906	43.4%	443	289	2%	83%
Carroll	87,268	110,723	26.9%	499	222	2%	85%
Fayette	91,263	107,064	17.3%	197	543	2%	87%
Bartow	76,019	100,161	31.8%	459	218	2%	89%
Newton	62,001	100,130	61.5%	276	362	2%	90%
Rockdale	70,111	85,400	21.8%	131	654	2%	92%
Walton	60,687	84,092	38.6%	329	255	2%	94%
Barrow	46,144	69,732	51.1%	162	430	1%	95%
Spalding	58,417	64,111	9.7%	198	324	1%	96%
Pickens	22,983	29,454	28.2%	232	127	1%	97%
Haralson	25,690	28,786	12.1%	282	102	1%	97%
Butts	19,522	23,756	21.7%	187	127	<1%	98%
Dawson	15,999	22,304	39.4%	211	106	<1%	98%
Meriwether	22,534	21,846	-3.1%	503	43	<1%	98%
Lamar	15,912	18,250	14.7%	185	99	<1%	99%
Pike	13,688	17,905	30.8%	218	82	<1%	99%
Morgan	15,457	17,901	15.8%	350	51	<1%	100%
Jasper	11,426	13,900	21.7%	370	38	<1%	100%
Heard	11,012	11,858	7.7%	296	40	<1%	100%
Total	**4,263,438**	**5,304,665**					

Source: U.S. Census Bureau population estimates for 2000 and 2010

The most densely populated counties are in and adjacent to the monitors with invalid data. Clayton, Cobb, DeKalb, Fulton and Gwinnett Counties had the highest population density (over 1,700 persons per square mile). Barrow, Cherokee, Coweta, Douglas, Forsyth, Henry, Newton and Paulding have seen substantial growth (over 40 percent) since 2000.

Figure 13. 2010 County-Level Population in the Area of Analysis for the Atlanta CBSA Area.



Traffic and VMT

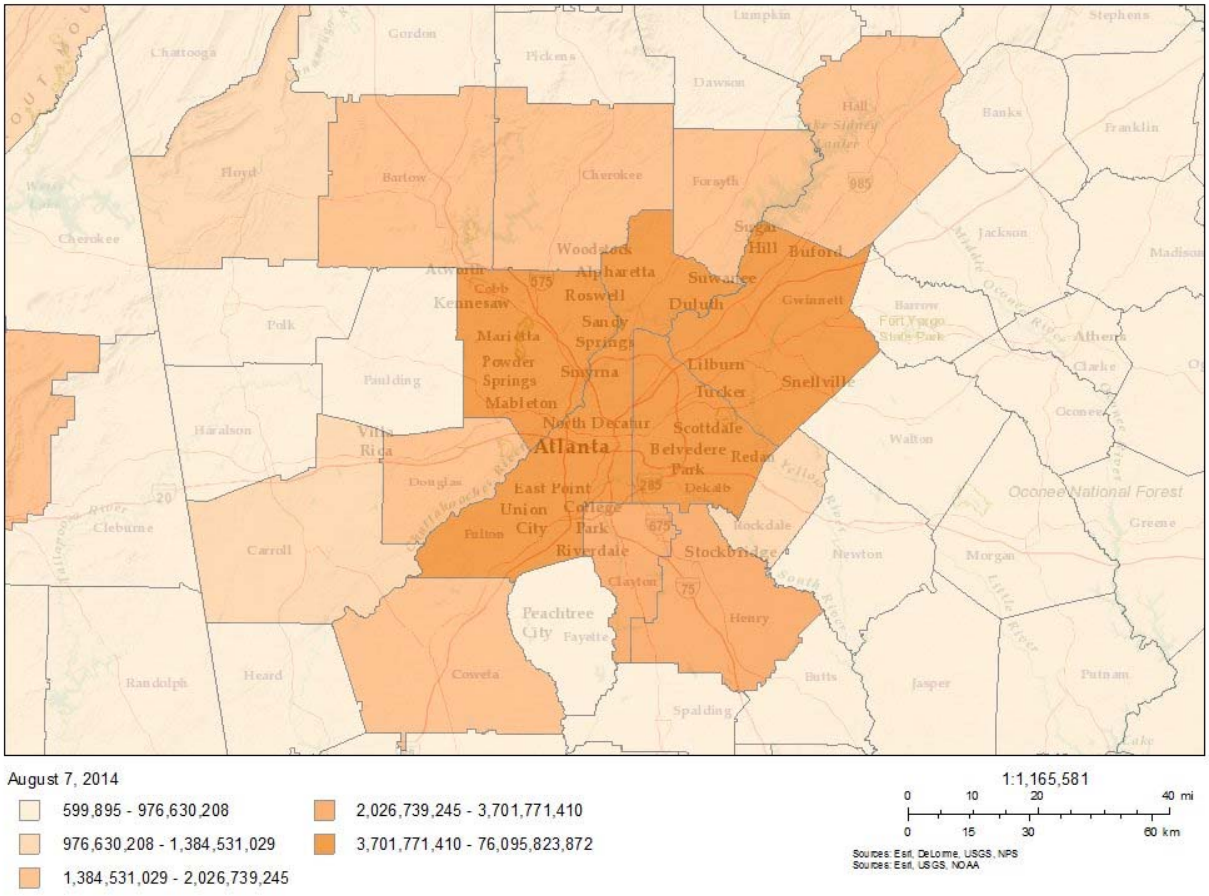
High VMT and/or a high number of commuters associated with a county is generally an indicator that the county is an integral part of an urban area. Mobile source emissions of NOx, VOC, and direct PM may contribute to ambient particulate matter that contributes to potential monitored violations of the NAAQS in the area. In combination with the population/population density data and the location of main transportation arteries, an assessment of VMT helps identify the probable location of nonpoint source emissions that contribute to potential violations in the area. Table 9 shows 2011 VMT while Figure 8 overlays 2011 county-level VMT with a map of the transportation arteries. This data is from the Federal Highway Administration.

Table 9. 2011 VMT by County for the Atlanta CBSA.

County	Total 2011 VMT	Percent	Cumulative %
Fulton	12,221,928,709	22%	22%
DeKalb	7,644,333,957	13%	35%
Gwinnett	7,421,564,338	13%	48%
Cobb	6,617,102,885	12%	60%
Clayton	2,881,122,333	5%	65%
Henry	2,214,706,881	4%	69%
Cherokee	1,872,284,829	3%	72%
Forsyth	1,689,888,438	3%	75%
Bartow	1,651,438,196	3%	78%
Douglas	1,587,530,332	3%	81%
Coweta	1,459,781,612	3%	83%
Carroll	1,249,251,642	2%	85%
Rockdale	984,757,532	2%	87%
Paulding	940,307,960	2%	89%
Fayette	887,949,158	2%	90%
Newton	869,539,158	2%	92%
Barrow	703,578,903	1%	93%
Walton	697,510,275	1%	94%
Spalding	550,494,314	1%	95%
Morgan	464,799,942	1%	96%
Haralson	343,417,806	1%	97%
Butts	333,055,273	1%	97%
Pickens	315,317,952	1%	98%
Meriwether	296,860,449	1%	98%
Lamar	248,137,330	0%	99%
Dawson	220,141,830	0%	99%
Pike	167,900,073	0%	100%
Jasper	135,538,407	0%	100%
Heard	124,143,180	0%	100%
Total	**56,794,383,694**		

http://www.census.gov/hhes/commuting/data/commuting.html

Figure 14. Overlay of 2011 County-level VMT with Transportation Arteries.



Cherokee, Clayton, Cobb, DeKalb, Fulton, Gwinnett, and Henry Counties had the largest VMT. More than half of all the VMT in the CBSA are in Cobb, DeKalb, Fulton, and Gwinnett. It is reasonable to infer that a substantial amount of the traffic is due to inter-county commuters, mainly from the inner core and highly urbanized counties, most of it adjacent to the monitors with invalid data.

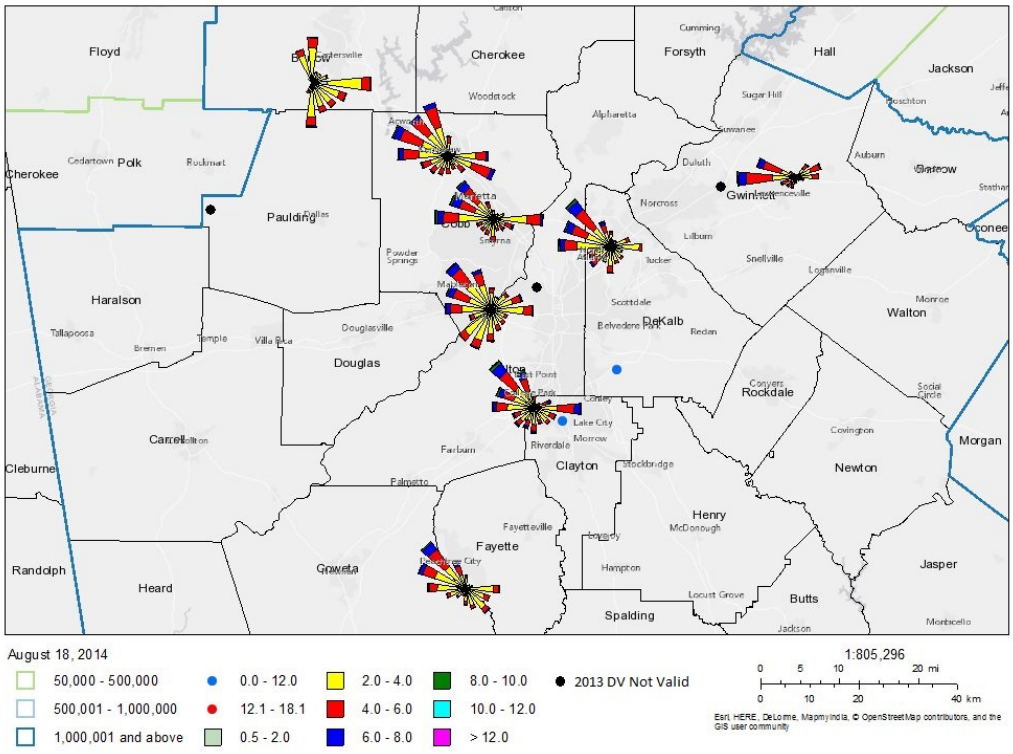
Cherokee, Clayton, Cobb, DeKalb, Douglas, Forsyth, Fulton, Gwinnett, Henry, and Paulding Counties consistently rank highest in direct $PM_{2.5}$/key precursor emissions (i.e., VMT and population). Bartow, Clayton, Cobb, Coweta, and Fulton Counties have large $PM_{2.5}$ precursor emissions from stationary sources in the CBSA. Carroll, Newton, and Rockdale Counties are mid-ranked in emissions and mid-ranked for population and VMT. Barrow, Butts, Dawson, Fayette, Haralson, Heard, Jasper, Lamar, Meriwether, Morgan, Pickens, Pike, Spalding, and Walton Counties have relatively low emissions and relatively low VMT/population counts, and lack large singular point source contributors.

Meteorology

The EPA evaluated available meteorological data to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of directly emitted particulate matter and precursor emissions from sources in the area of analysis. The EPA used two primary tools for this assessment: wind roses and kernel density estimation (KDE). When considered in combination with area $PM_{2.5}$ composition and county-level and facility emissions source location information, wind roses and KDE can help to identify nearby areas contributing to violations at violating monitoring sites.

Wind roses are graphic illustrations of the frequency of wind direction and wind speed. Wind direction can indicate the direction from which contributing emissions are transported; wind speed can indicate the force of the wind and thus the distance from which those emissions are transported. The EPA constructed wind roses from hourly observations of wind direction and wind speed using 2009-2012 data from National Weather Service locations archived at the National Climate Data Center.[35] When developing these wind roses, the EPA also used wind observations collected at meteorological sampling stations collocated at air quality monitoring sites, where these data were available. Figure 15 shows wind roses that the EPA generated from data relevant in the Atlanta CBSA.

Figure 15. Wind Roses in the Atlanta Area.



[35] *ftp.ncdc.noaa.gov/pub/data/noaa* or *http://gis.ncdc.noaa.gov/map/viewer/#app=cdo&cfg=cdo&theme=hourly&layers=1&node=gis* Quality assurance of the National Weather Service data is described here: *http://www1.ncdc.noaa.gov/pub/data/inventories/ish-qc.pdf*

As shown in Figure 15, there is a pattern across the CBSA of predominantly northwest winds and a smaller component of east winds, mostly at mid-level speeds of 4 to 10 meters per second, suggesting that potential emission sources in the north-through-west upwind direction and to a lesser extent in the east upwind direction have potential to contribute to PM levels at the invalid monitors.

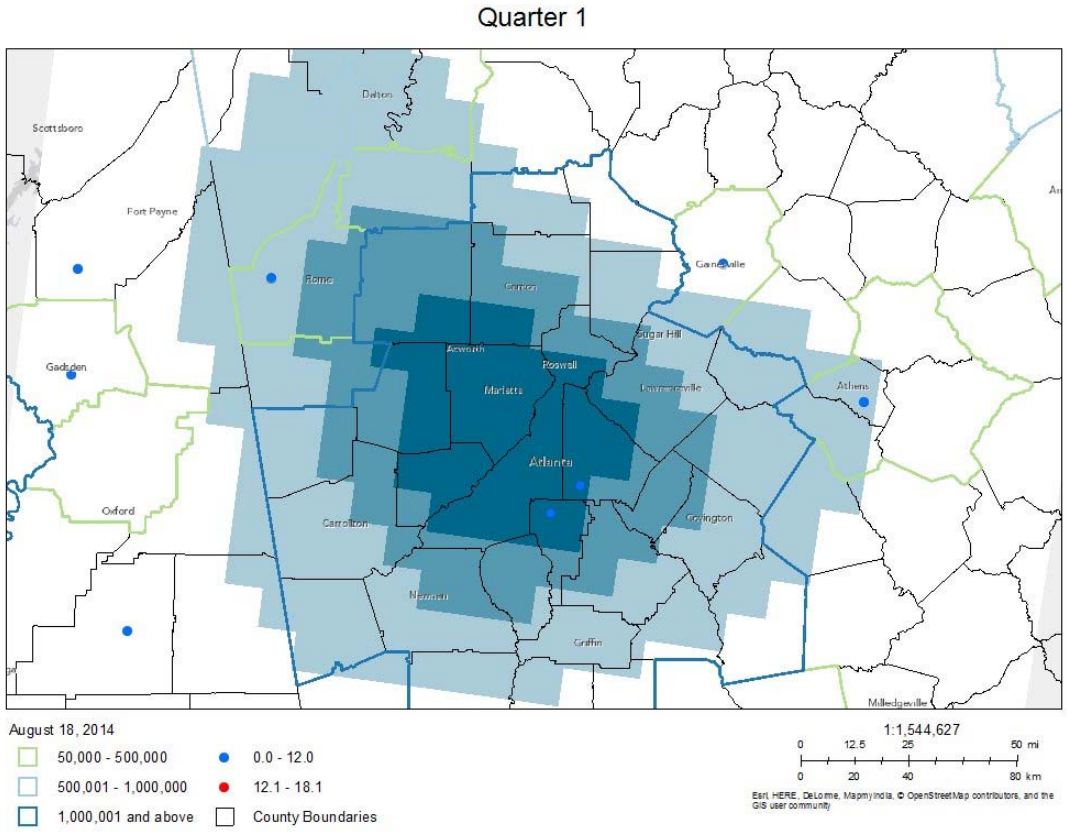
In addition to wind roses, the EPA also generated KDE plots to represent the frequency of HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) backward trajectories at monitoring sites with invalid data.[36,37] These KDEs are graphical statistical estimations to determine the density of trajectory endpoints at a particular location represented by a grid cell. The EPA used KDEs to characterize and analyze the collection of individual HYSPLIT backward trajectories.[38] Higher density values, indicated by darker blue colors, indicate a greater frequency of observed trajectory endpoints within a particular grid cell. Figure 16 shows HYSPLIT KDE plots for the Atlanta area summarized by calendar quarter for the 2010-2012 period. The HYSPLIT KDE is weighted in the northwesterly direction, indicating a greater frequency of trajectories passing over grid cells to the northwest, but the plots also indicate a high frequency of trajectories passing over the primary metro-Atlanta counties as well.

[36] In some past initial area designations efforts, the EPA has used HYSPLIT backward trajectories to assist in determining nonattainment area boundaries. A HYSPLIT backward trajectory is usually depicted on a standard map as a single line, representing the centerline of an air parcel's motion, extending in two dimensional (x,y) space from a starting point and regressing backward in time to a point of origin. Backward trajectories may be an appropriate tool to assist in determining an air parcel's point of origin on a day in which a short-term standard, such as an 8-hour standard or a 24-hour standard, was exceeded. However, for an annual standard, such as the 2012 annual $PM_{2.5}$ NAAQS, every trajectory on every day is important to consider. Plotting a mass of individual daily (e.g., 365 individual back trajectories), or more frequent, HYSPLIT trajectories may not be helpful as this process is likely to result in depicting air parcels originating in all directions from the violating monitoring site.

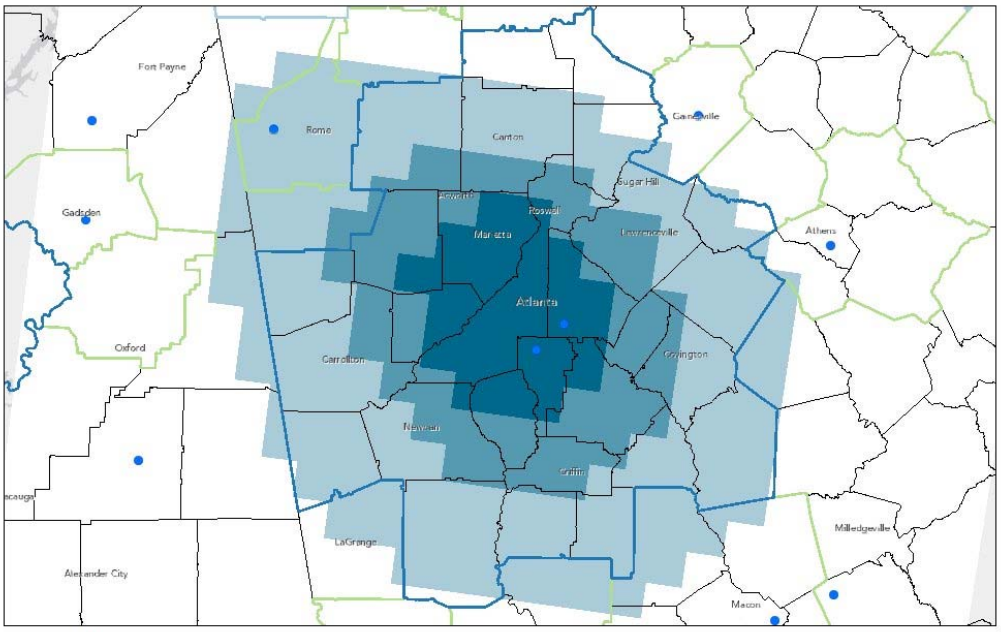
[37] HYSPLIT - Hybrid Single Particle Lagrangian Integrated Trajectory Model, *http://www.arl.noaa.gov/HYSPLIT_info.php*

[38] The KDEs graphically represent the aggregate of HYSPLIT backward trajectories for the years 2010-2012, run every third day (beginning on the first day of monitoring), four times each day, and ending at four endpoint heights.

Figure 16. HYSPLIT Kernel Density Estimation Plots for the Atlanta CBSA Area.



Quarter 2



August 18, 2014

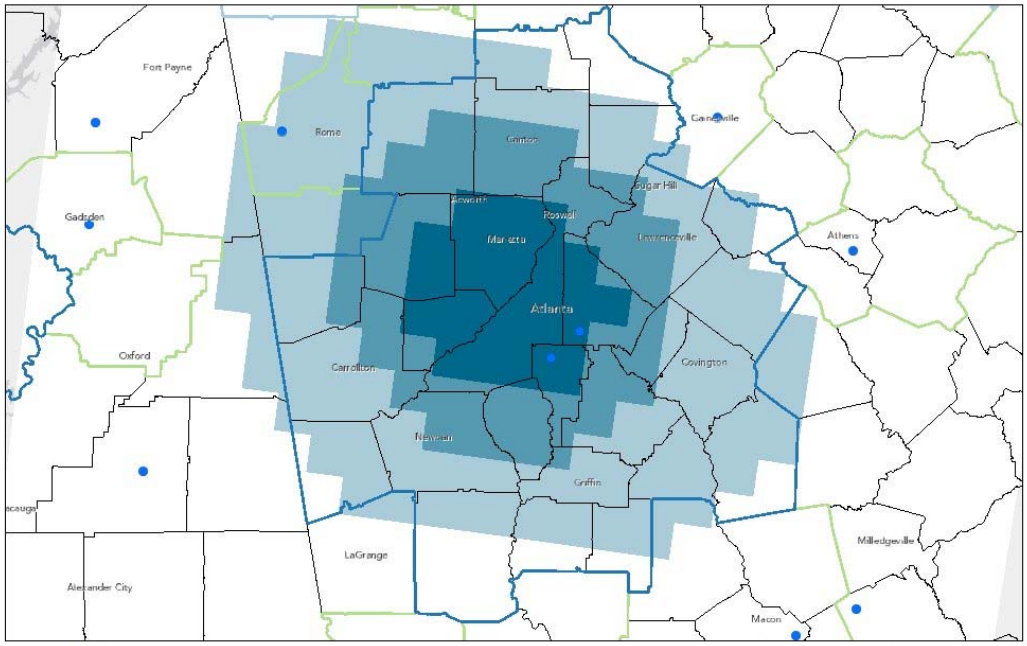
50,000 - 500,000
500,001 - 1,000,000
1,000,001 and above
0.0 - 12.0
12.1 - 18.1
County Boundaries

1:1,544,627

0 12.5 25 50 mi
0 20 40 80 km

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Quarter 3



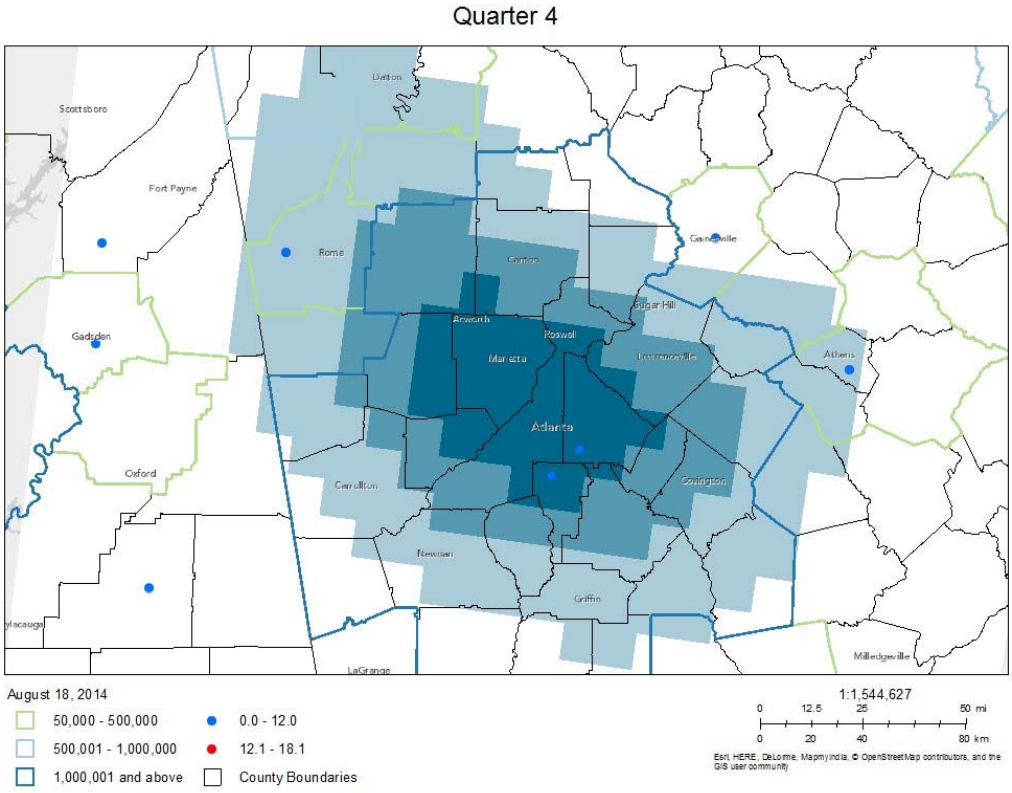
August 18, 2014

50,000 - 500,000
500,001 - 1,000,000
1,000,001 and above
0.0 - 12.0
12.1 - 18.1
County Boundaries

1:1,544,627

0 12.5 25 50 mi
0 20 40 80 km

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



In summary, for the monitors with invalid data in the Atlanta Area, the HYPSPLIT KDE plots and wind roses suggest greatest potential contribution of emissions from Clayton, Cobb, DeKalb, Douglas, and Paulding.

Geography/topography

To evaluate the geography/topography factor, the EPA assessed physical features of the area of analysis that might define the airshed and thus affect the formation and distribution of $PM_{2.5}$ concentrations over the area. The Atlanta Area does not have any geographical or topographical barriers meaningfully limiting air pollution transport within its air shed. Therefore, this factor did not play a meaningful role in this evaluation.

Conclusion for the Counties in the Atlanta CBSA for which the EPA is Deferring Designations

Speciation and urban increment data show high OM and sulfur content. Organic Compounds and SOx components are the most important portions of the total $PM_{2.5}$ mass throughout the year. Organic Compounds are predominately attributed to biogenic emissions sources. The predominant source of SOx and PM emission are point sources.

Based on the assessment of factors described above, both individually and in combination, the EPA has preliminarily concluded that designations for the following counties in Georgia as a part

of the Atlanta should be deferred because there are incomplete design values with the surrounding monitors and based on analysis of the information above the EPA concludes that these counties contain emissions that would be relatively more likely to contribute to any potential violations: Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Forsyth, Fulton, Gwinnett, Henry, and Paulding Counties. These counties are also part of in the Atlanta nonattainment area for the 1997 annual $PM_{2.5}$ NAAQS.

Bartow County – This nearby county does not have a monitoring site, but has the second highest $PM_{2.5}$ emissions in the CBSA with 2,147 tpy and third highest SO_2 emissions in the CBSA with 6,716 tpy. There are two point sources with substantial SO_2 emissions- Georgia Power Company's Plant Bowen (5,889 tpy), and Chemical Products Corporation (557 tpy). Although all winds are relevant when designating areas for an annual NAAQS, here the predominant winds blow in the direction from Bartow County, toward the monitors with invalid data.

Cherokee County – This nearby county does not have a monitoring site, but the meteorology analysis indicates a high frequency of winds blowing from Cherokee County toward monitors with invalid data. This county has more than 10,000 tons of $PM_{2.5}$ related emissions (5^{th} highest in the CBSA), including significant population-related sources (including over 1.8 billion miles VMT).

Clayton County – This nearby county has an attaining monitoring site, but the EPA has concluded that the county would be relatively likely to contribute to particulate matter concentrations at monitors in the CBSA with invalid data in the Atlanta area, particularly in light of the high level of emissions from the Hartsfield-Jackson International Airport. Furthermore, the meteorology analysis indicates that winds blow from Clayton County toward monitors with invalid data during some time periods.

Cobb County – This county has a monitor with invalid data for 2011-2013, and is being deferred on that basis. Additionally, Cobb County has the third highest $PM_{2.5}$ emissions in the CBSA with 1,859 tpy and the second highest SO_2 emissions in the CBSA with 19,127 tpy. There are two point sources with substantial SO_2 emissions: Georgia Power Company's Plant McDonough/Atkinson (18,307 tpy), and Caraustar Industries Inc (564 tpy).

Coweta County – This nearby county does not have a monitoring site, but has the highest SO_2 emissions in the CBSA with 47,614 tpy, and fourth highest $PM_{2.5}$ emissions in the CBSA with 1,615 tpy. There is one point source with substantial SO_2 and $PM_{2.5}$ emissions- Georgia Power Company's Plant Yates (47,530 and 626 tpy, respectively). The meteorology analysis indicates that winds blow from Coweta County toward monitors with invalid data during some time periods. The EPA has determined that a designation for Coweta should be deferred because of the relative likelihood that emissions from this large point source could to contribute to invalid monitors in the Atlanta CBSA, should those monitors subsequently show a violation.

DeKalb County – This nearby county has a valid attaining design value. However, the EPA has concluded that the county is less likely to contribute to particulate matter concentrations at monitors with invalid data through emissions from non-point sources (e.g., area sources) and from mobile source emissions. The county has the seventh highest level of $PM_{2.5}$ emissions in

the CBSA (1,348 tpy), and the second largest VMT (7.6 billion miles). The county is highly urbanized and has 13 percent of the CBSA population, and is 12 miles from the highest reading invalid monitor. The meteorology analysis indicates that winds blow from Dekalb County toward monitors with invalid data during some time periods.

Douglas County – This nearby county does not have a monitoring site, but the EPA has concluded that the county is relatively more likely to contribute to the particulate matter concentrations to monitors with invalid data through emissions from non-point sources (e.g., area sources) and from mobile source emissions. The County is the seventh fastest population growth (43 percent). Although all winds are relevant when designating areas for an annual NAAQS, here the predominant winds blow in the direction from Douglas County, toward the highest reading invalid monitor.

Forsyth County – This nearby county does not have a monitoring site, but the EPA has concluded that the county likely contributes to the particulate matter concentrations in violation of the 2012 annual $PM_{2.5}$ NAAQS through emissions from non-point sources (e.g., area sources) and from mobile source emissions. The County is the fastest population growth (79 percent) and eighth largest VMT (over 1.6 billion miles).

Fulton County – This county has a monitor with invalid data for 2011-2013, and is being deferred on that basis. Furthermore, Plant McDonough/Atkinson power plant is less than three miles from the Fulton County monitor. In addition, there is a major rail yard within a mile of the monitor. The county has the highest $PM_{2.5}$ emissions with 2,614 tpy. There is one point source-Owens Brockway Glass Container Inc., which has a modest 84 tpy of SO_2 emissions. Although all winds are relevant when designating areas for an annual NAAQS, here the predominant winds blow in the direction from Fulton County, toward monitors with invalid data.

Gwinnett County – This county has a monitor with invalid data for 2011-2013, and is being deferred on that basis. Additionally, Gwinnett County has the sixth highest level of $PM_{2.5}$ emissions in the CBSA with 1,504 tpy and third largest VMT (7.4 billion miles). The county is highly urbanized and has 15 percent of the CBSA population.

Henry County – This nearby county does not have a monitoring site, but the EPA has concluded that the county likely contributes to the particulate matter concentrations at the incomplete monitors in the Atlanta CBSA through emissions from non-point sources (e.g., area sources) and from mobile sources The county is highly urbanized as part of the Atlanta metropolitan area, has the third largest population growth (72 percent), and sixth largest VMT (2.2 billion miles). The meteorology analysis indicates that winds blow from Henry County toward monitors with invalid data during some time periods.

Paulding County – This county has a monitor with invalid data for 2011-2013, and is being deferred on that basis. The county is highly urbanized as part of the Atlanta metropolitan area, and has the second largest population growth (74 percent). Although all winds are relevant when designating areas for an annual NAAQS, here the predominant winds blow from the direction of Paulding County toward monitors with invalid data.

The EPA has made the determination not to include seven counties in the Atlanta Area CBSA in the boundary for the Atlanta Area that the EPA is deferring designations for the 2012 $PM_{2.5}$ NAAQS. Based on currently available information, the EPA believes that these counties would be relatively less likely to be contributing to a hypothetical NAAQS violation at any of the monitors with affected data. Accordingly, the EPA believes there is comparatively less of a justification to defer designations for these counties at this time. Discussed as follows, these counties include: Barrow, Carroll, Fayette, Heard, Newton, Rockdale, Spalding and Walton.

Barrow County – There are low emissions; low population; low VMT. This rural county has no major emission sources and is 44 miles away from the Fire Station #8 monitor. As context, SO_2 and PM emissions have decreased 80 percent and 50 percent, respectively, since 2001.

Carroll County – There are low emissions; moderate population growth; moderate VMT and commuters. The predominantly rural county has no major emission sources and is 27 miles away from the Fire Station # 8 monitor. As context, SO_2 and PM emissions have decreased 88 percent and 75 percent, respectively since 2001.

Fayette County – There are low emissions; moderate population growth; moderate VMT and commuters in this county. The county is partially urbanized, has no major emission sources and it is 40 miles away from the Fire Station #8 monitor. As context, SO_2 and PM emissions have decreased 67 percent and 60 percent, respectively, since 2001.

Heard County– A portion of this county was included in the previous nonattainment area in 2005 because of emissions from Plant Wansley. As context, Plant Wansley had SO_2 scrubber controls installed in early 2008; this achieved a 96 percent SO_2 reduction. Otherwise this county has low population; and low VMT.

Newton County – There are low emissions; moderate VMT and low commuters. The predominantly rural county contains no major emission sources and is 37 miles away from the Fire Station #8 monitor. As context, SO_2 and PM emissions have decreased 71 percent and 42 percent, respectively, since 2001.

Rockdale County – There are relatively low emissions; moderate population growth; moderate VMT and low commuters. The County is partially urbanized, has no major emission sources and is 26 miles away from the Fire Station #8 monitor. As context, SO_2 and PM emissions have decreased 68 percent and 67 percent, respectively, since 2001.

Spalding County – There are low emissions; low population; and low VMT. This mostly rural county has no major emission sources and is 39 miles away from the Fire Station #8 monitor. As context, SO_2 and PM emissions have decreased 80 percent and 49 percent, respectively, since 2001.

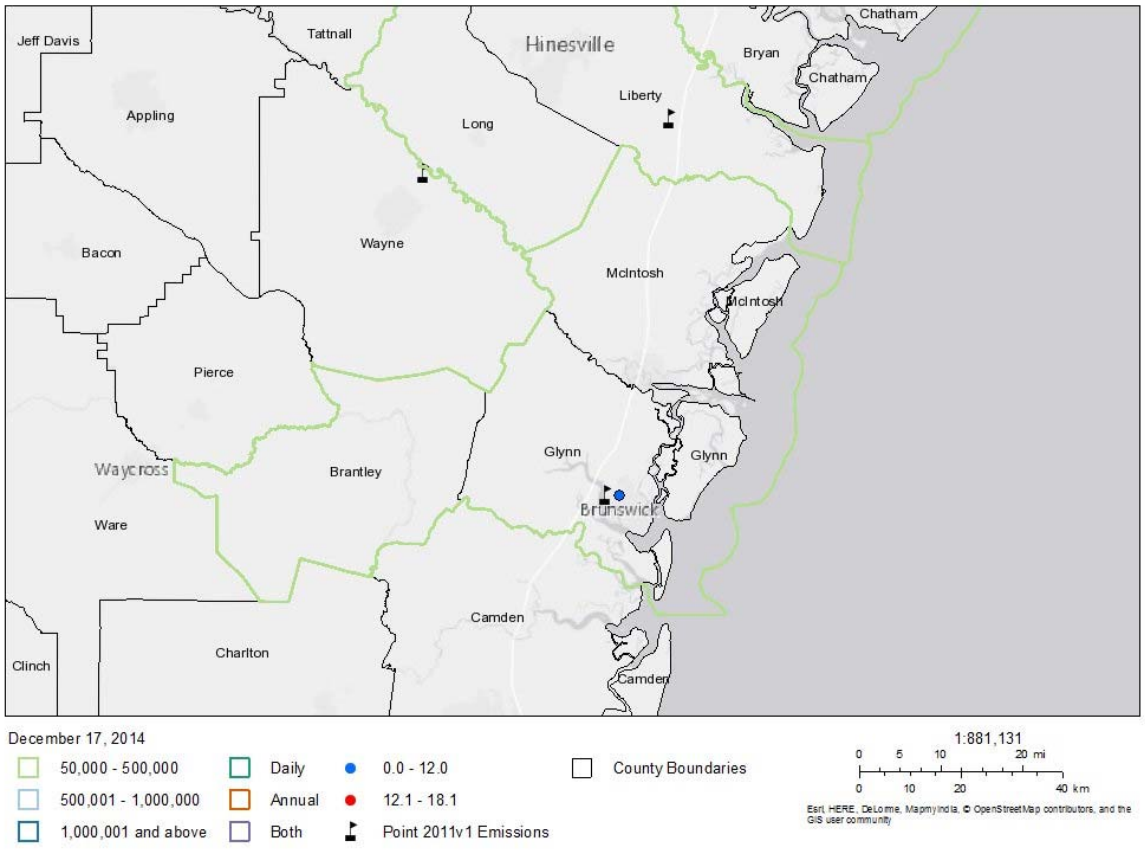
Walton County – There are low emissions; low population; and low VMT. The mostly rural county has no major emission sources and it is 40 miles away from the Fire Station #8 monitor. As context, Walkton County is adjacent to DeKalb County (which has a valid attaining design

value for 2011-2013), and SO_2 and PM emissions in Walton County have decreased 86 percent and 48 percent, respectively, since 2001.

Brunswick Area

The Brunswick, Georgia CBSA is wholly contained in Georgia and includes three counties – Brantley, Glynn and McIntosh. The most populated and industrialized portion of Brunswick is contained within Glynn County. More information on the EPA's evaluation of the emissions for the counties in the CBSA is provided below. The Brunswick area does not have any geographical or topographical barriers meaningfully limiting air pollution transport within its air shed. Therefore, this factor did not play a meaningful role in this evaluation. The Brunswick CBSA is outlined in green in Figure 17 along with the location of point sources and air quality monitors.

Figure 17. Brunswick CBSA with Point Sources and Air Quality Monitor Locations



The Glynn County monitor located in the Albany area has incomplete 2011-2013 data. Based on incomplete data, the incomplete Glynn County DV is 8.2 $\mu g/m^3$.

The City of Brunswick, in Glynn County, Georgia, has one major point source – Brunswick Cellulose Inc. Other sources include county level emissions from non-point sources, nonroad

mobile, on-road mobile, fires and local traffic. Brantley and McIntosh Counties are the other counties in the Brunswick CBSA. The emissions in each of these counties are relatively lower than comparable emissions in Glynn County, particularly for the precursors that tend to drive $PM_{2.5}$ problems in the southern part of Georgia. Additionally, most of the population in the CBSA is concentrated in Glynn County. Summary information on emissions and population can be found in the Table 10 below.

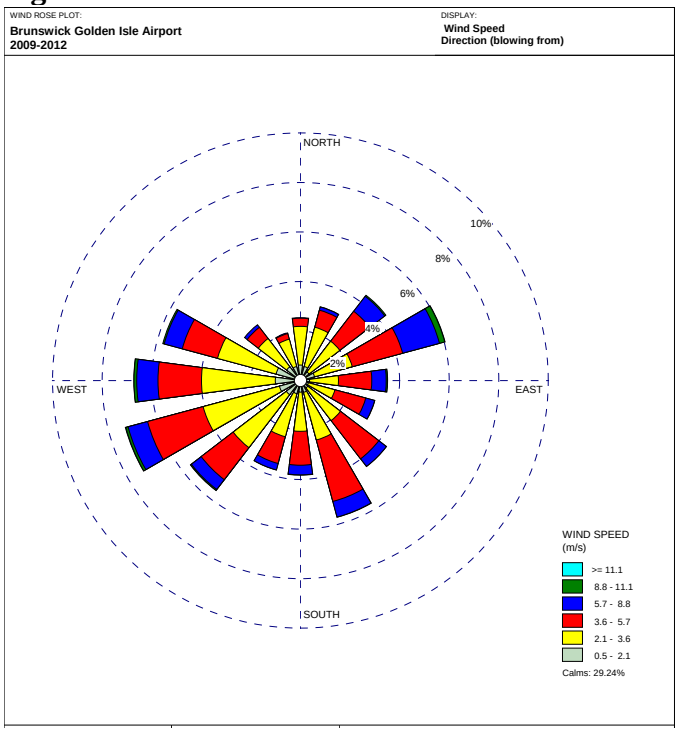
Table 10. Summary statistics for the Brunswick, Georgia CBSA

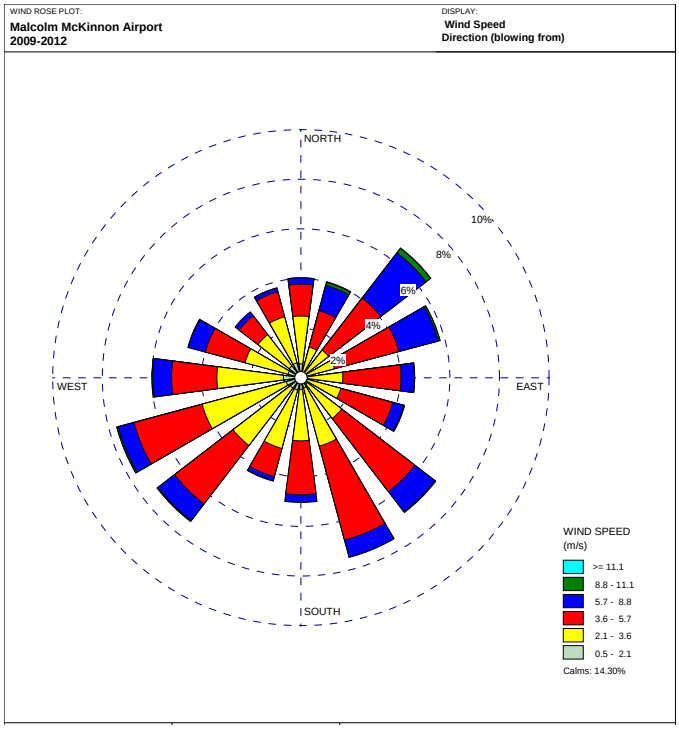
	Glynn	Brantley	McIntosh
Core urbanized county or outlying?	Core	Outlying	Outlying
SO_2 emissions (tpy)	647	41	18
$PM_{2.5}$ emissions (tpy)	1,013	686[39]	373
NOx emissions (tpy)	5,983	746	2,219
NH_3 emissions (tpy)	174	216	47
VOC emissions (tpy)	5,636	822	2,100
Population	79,863	18,487	14,287
Population (% of CBSA)	71%	16%	13%
VMT (Millions)	1,046	166	441
VMT (% of CBSA)	63%	10%	27%

The EPA also evaluated the meteorology in the area by evaluating wind data collected at two locations in the Brunswick CBSA as shown in Figure 18 below. As shown in the figure, there are two airports near the Brunswick area, Brunswick Golden Isles Airport and Malcolm McKinnon Airport, with available surface level wind speed and direction data. The wind rose from each airport indicates that there is a pattern across the CBSA of winds blowing from all directions, but with a higher frequency from the west-southwest, southeast and northeast, mostly at low to mid-level speeds of 2 to 6 meters per second. The wind patterns suggest that potential emission sources in Brantley and McIntosh counties, generally in the west-southwest, southeast and northeast upwind directions should be considered for analysis.

[39] The majority of these direct $PM_{2.5}$ emissions are from non-point sources and are event related. If a violation of the NAAQS occurs when three years of complete data becomes available, the potential impacts of these event-related emissions will be further evaluated for potential exclusion from the design value calculations.

Figure 18. Wind Roses in the Brunswick Area





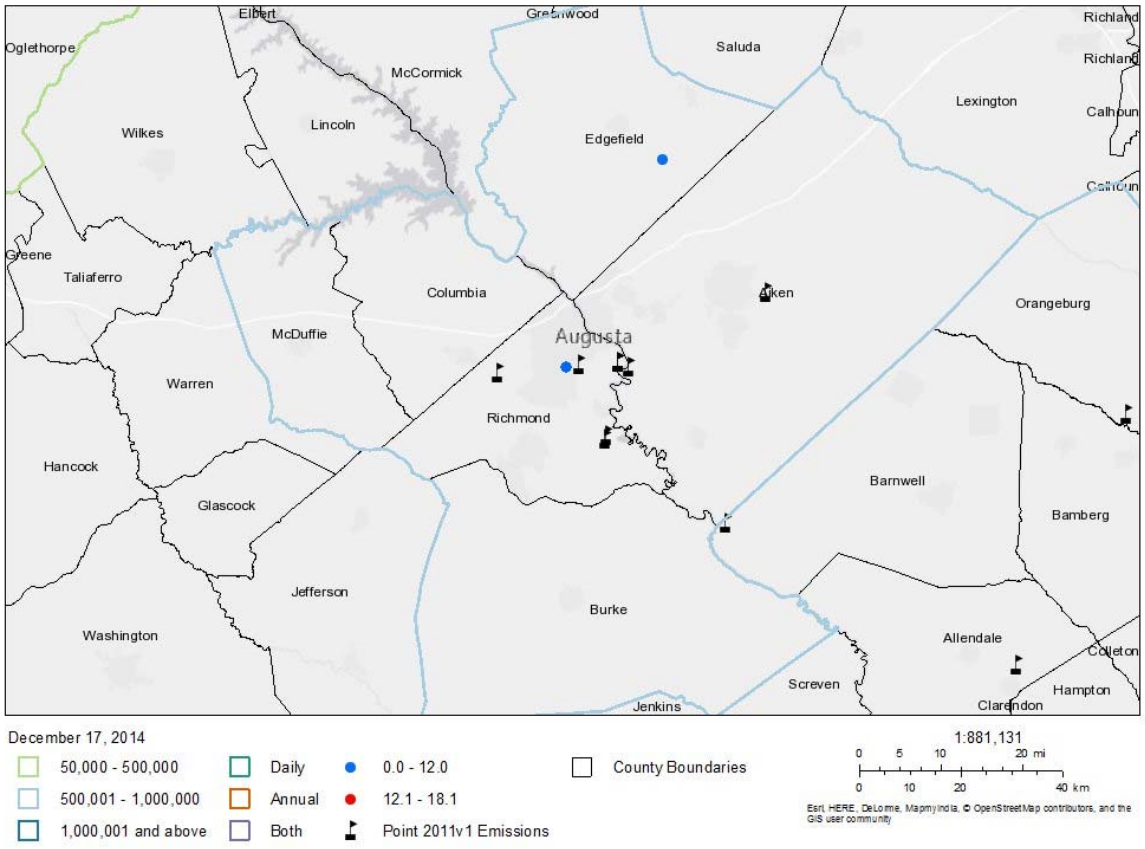
Brunswick, Georgia CBSA Conclusion

The EPA is concluding that Glynn County in the Brunswick CBSA has the most likelihood of all the counties to contribute to a hypothetical violation of the standard at the Glynn County monitor that currently has incomplete data. The EPA identified Glynn County because the monitor with incomplete data is located in the southeast portion of this county and Glynn County contains the majority of emissions, VMT, and is the population center of the CBSA. The outlying counties of Brantley and McIntosh have low population, and low VOC and SO_2 emissions in comparison to Glynn County. The direct $PM_{2.5}$ emissions from Brantley and McIntosh counties are primarily non-point source emissions largely from fire events and road dust sources. The direct $PM_{2.5}$ emissions from these non-point sources are generally local in nature and are less likely to be transported large distances due to their close proximity to the ground. Accordingly, because of incomplete data at the Glynn County monitor in the Brunswick CBSA, the EPA is deferring a designation for Glynn County. Furthermore, the EPA is not deferring a designation for Brantley and McIntosh counties, and is designating these counties as unclassifiable/attainment based on the reduced likelihood that emissions from these counties would contribute to a hypothetical violation at the Glynn County monitor. Should such violation be identified in the future, the EPA will further evaluate Brantley and McIntosh counties for potential contribution to emissions at the Glynn County monitor.

Augusta Area (Augusta, GA-SC CBSA)

Augusta is located in a bi-state CBSA that includes seven counties – five in Georgia (Burke, Columbia, McDuffie, Lincoln, and Richmond) and two in South Carolina (Aiken and Edgefield). The most populated and industrialized portion of the Augusta area where most of the emissions and emissions activities occur is primarily contained in three of the seven counties – Richmond and the southern region of Columbia County in Georgia, and the western region of Aiken County in South Carolina. More information on the EPA's evaluation of the emissions for the counties in the CBSA is provided below. The Augusta area does not have any geographical or topographical barriers meaningfully limiting air pollution transport within its air shed. Therefore, this factor did not play a meaningful role in this evaluation. The Augusta CBSA is outlined in green in Figure 19, along with the location of point sources and air quality monitors.

Figure 19. Augusta CBSA with Point Sources and Air Quality Monitor Locations



The Richmond County monitor located in the Georgia portion of the Augusta area has incomplete 2011-2013 data. Based on incomplete data, the incomplete Richmond County DV is 10.5 µg/m^3. As context, the monitor in Edgefield County, South Carolina (also part of this CBSA) attains the 2012 annual $PM_{2.5}$ NAAQS with a DV of 9.3 µg/m^3.

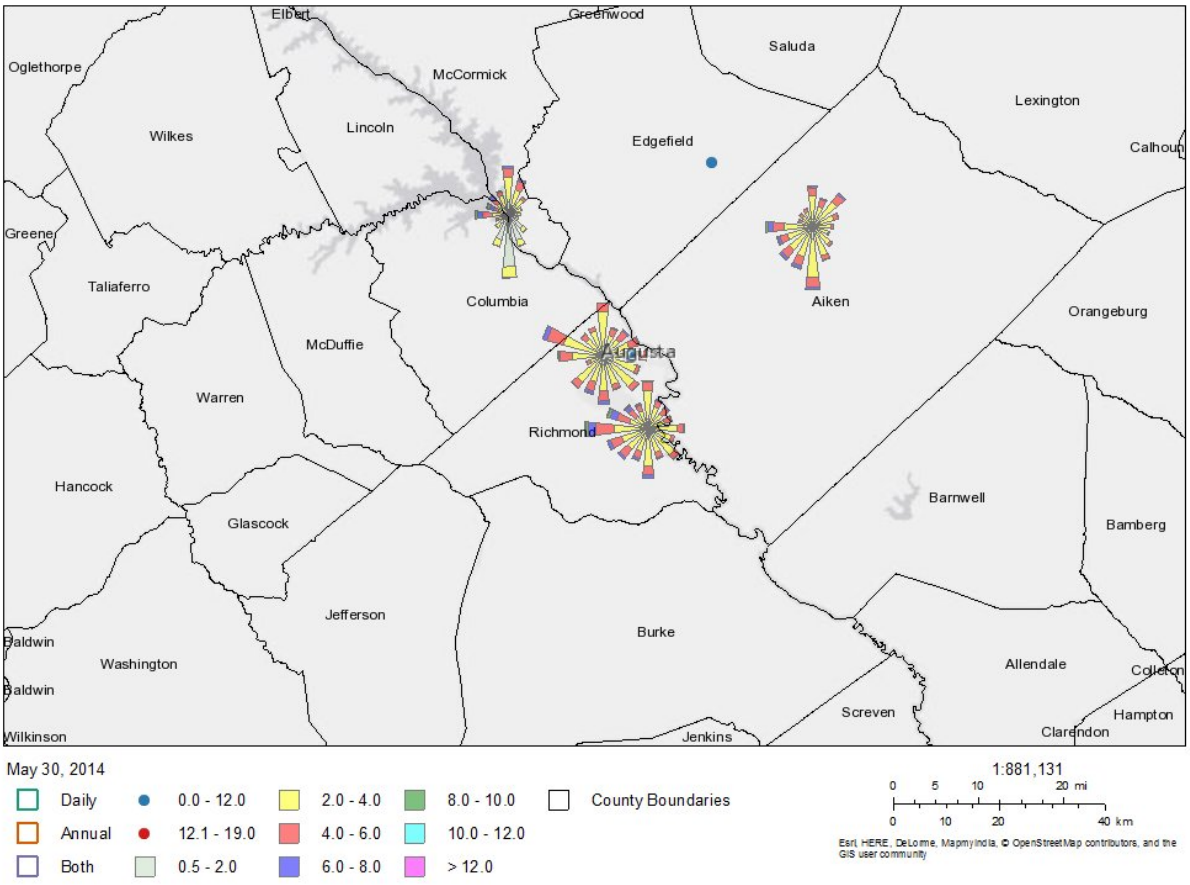
The EPA evaluated $PM_{2.5}$ and precursor emissions, along with other related data from the counties in the Augusta CBSA. As shown in Table 11, Richmond and Aiken Counties account for 98 percent of SO_2 emissions (45 and 53 percent, respectively) and 67 percent (26 and 41 percent, respectively) of $PM_{2.5}$ emissions. Richmond, Columbia and Aiken Counties, together account for 85 percent of the population and 83 percent of the VMT. Population within the CBSA is sharply divided between core and outlying counties. The largest outlying county (Edgefield County) accounts for only 5% of the CBSA population, and all four outlying counties combined comprise only 14% of the CBSA's population. By contrast, even the *smallest* core county (Columbia County) comprises 22% of the CBSA population, and the core counties cumulatively comprise 85% of the CBSA's population.

Table 11. Summary statistics for the Augusta, GA-SC CBSA

	Aiken	Columbia	Richmond	Burke	Lincoln	McDuffie	Edgefield
State	South Carolina	Georgia	Georgia	Georgia	Georgia	Georgia	South Carolina
Core urbanized county or outlying?	Core	Core	Core	Outlying	Outlying	Outlying	Outlying
SO_2 Emissions (tpy)	5,020	28	4,294	73	6	100	45
$PM_{2.5}$ emissions (tpy)	3,660	447	2,364	1,510	203	429	419
NOx emissions (tpy)	7,144	3,758	10,110	1,414	405	1,655	664
NH_3 emissions (tpy)	2,605	118	1,798	672	72	138	434
VOC emissions (tpy)	7,156	3,946	8,471	1,693	1,014	1,252	1,222
Population	160,622	124,965	201,056	23,350	7,966	21,852	26,970
Population (% of CBSA)	28%	22%	35%	4%	1%	4%	5%
VMT (Millions)	1,717	1,014	1,990	299	86	333	225
VMT (% of CBSA)	30%	18%	35%	5%	2%	6%	4%

The EPA also evaluated the meteorology in the area by evaluating wind data collected at three locations in the Augusta CBSA as shown in Figure 20. As shown, the frequency and intensity of wind from any given direction is variable.

Figure 20. Augusta GA-SC CBSA Wind Rose Data



Augusta GA-SC CBSA Conclusion

Based on the information summarized in Table 11 and the wind rose data, the EPA has concluded that of the five counties in the Augusta CBSA, Columbia and Richmond Counties in Georgia, and Aiken County, South Carolina, are the most likely to contribute to potential violations of the standard at the Richmond County monitor, which currently has incomplete data. The EPA identified Aiken County as a county with relatively higher potential to contribute to the invalid monitor because of Aiken County's high population, and the fact that nearly half of SO_2 and $PM_{2.5}$ emissions in the CBSA originate in Aiken County. Two point sources in Aiken County have combined SO_2 emissions greater than 5,000 tpy, and countywide direct $PM_{2.5}$ emissions exceed 3,600 tpy. While wind rose data may suggest a lesser contribution from Aiken County, there remains the potential for transport of these emissions into Richmond County because winds blow from the northeast at times and the point sources have elevated stack releases which may be transported longer distances.

Although Columbia County has somewhat lower emissions, this county is home to roughly one-third of the population of the CBSA, is experiencing high population growth, and has VMT

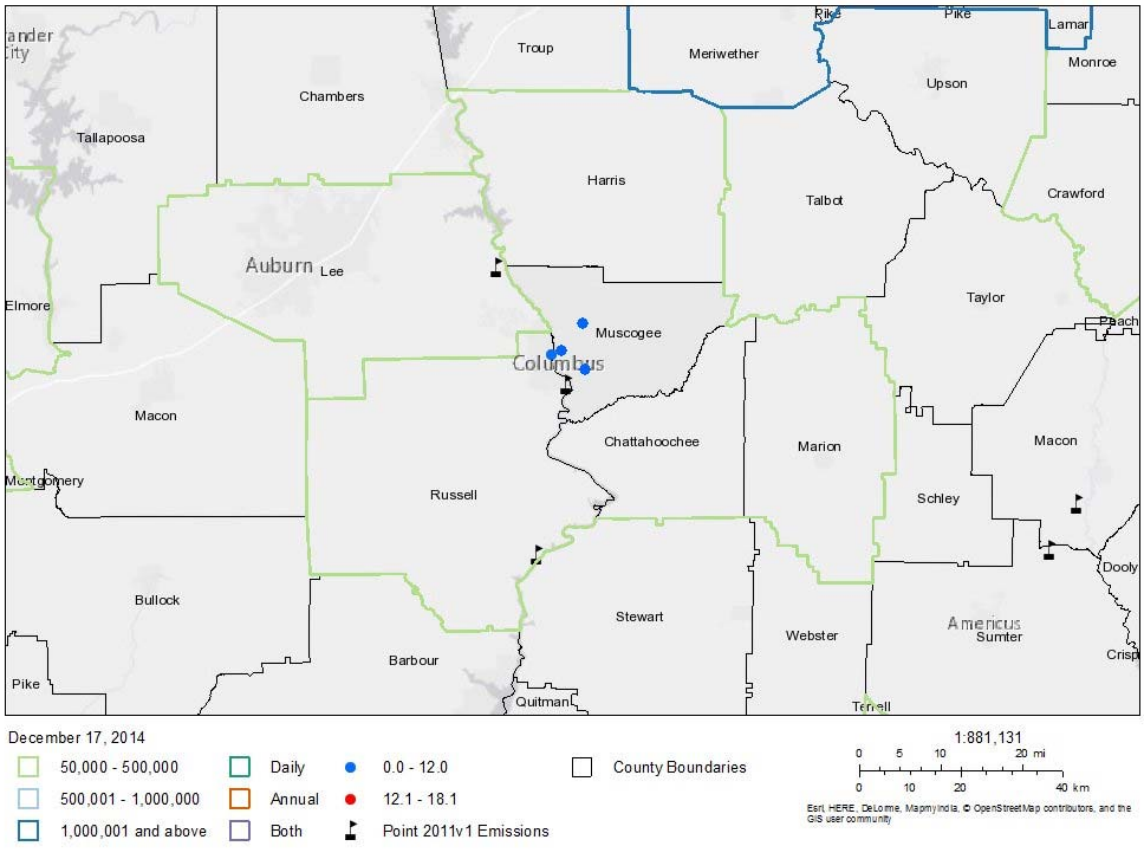
comparative to Richmond and Aiken Counties. Wind rose data indicate the potential for transport of emissions from Columbia County to the affected monitor in Richmond County.

Accordingly, because of the affected monitor in Richmond County, and the potential for contribution to that monitor from Aiken County and Columbia County, the EPA is deferring its decision on designations for these three counties.

However, the EPA is designating the remaining counties unclassifiable/attainment for the following reasons. Although Burke County has comparatively higher direct $PM_{2.5}$ emissions due to non-point sources than the other outlying counties, these are still meaningfully lower than the emissions from the core counties of Richmond and Aiken. These non-point source emissions are primarily from fire events, agricultural and road dust, and waste disposal sources. The direct $PM_{2.5}$ emissions from these non-point sources are generally local in nature and are relatively less likely to be transported large distances. The distance from Burke County to the Richmond County monitor is large compared to the emission sources in Richmond, Columbia and Aiken Counties. The small population and low VMT of Burke County and the outlying counties of Lincoln, McDuffie, and Edgefield Counties lead the EPA to believe that these counties would be relatively likely to be contributing to any nearby violations that may be identified with forthcoming data. Accordingly, the EPA will not defer designations for the counties of Burke, Lincoln, McDuffie, or Edgefield Counties, but will instead designate them unclassifiable/attainment based on the data available at this time.

Columbus Area (Columbus, GA-AL CBSA)

Columbus is in a bi-state CBSA that includes five counties – four in Georgia (Chattahoochee, Harris, Marion, and Muscogee) and one in Alabama (Russell). The most populated and industrialized portion of the Columbus area is mostly contained in two of the five counties – Muscogee County in Georgia, and Russell County in Alabama. The Columbus CBSA is outlined in green in Figure 21, along with the location of point sources and air quality monitors.



The Muscogee County monitor located in the Georgia portion of the Columbus area has incomplete 2011-2013 data. As context, the monitor in Russell County, Alabama (also part of this CBSA) attains the 2012 annual $PM_{2.5}$ NAAQS with a DV of 11.2 µg/m^3. As further context, based on incomplete data, the incomplete Muscogee County DV is 10.8 µg/m^3.

The EPA evaluated $PM_{2.5}$ and precursor emissions, along with other related data from the counties in the Columbus area. As shown in Table 3, Russell County alone accounts for 94 percent of SO_2 emissions and 52 percent of $PM_{2.5}$ emissions. The most populous area is located in the Georgia portion of the CBSA in Muscogee County, which accounts for 64 percent of the population, followed by Russell County, Alabama with 18 percent. A similar pattern in VMT is also noted with Muscogee and Russell Counties together accounting for 82 percent of the VMT (64 percent and 18 percent, respectively). By comparison, the outlying Georgia counties of Chattahoochee, Harris, and Marion account for approximately 35 percent of $PM_{2.5}$ emissions and less than 5 percent of SO_2 emissions and have no major point sources.[40] Only 18 percent of the

[40] For purposes of this designations analysis, "major" point sources are those whose sum of PM precursor emissions ($PM_{2.5}$ + NOx + SO_2 + VOC + NH_3) are greater than 500 tpy based on (NEI 2011v1. NOx is nitrogen oxides; VOC is volatile organic compounds; and NH_3 is ammonia. The EPA notes that emissions from all source categories are relevant in the context of designations, but the presence or absence of major

CBSA population resides in these outlying counties, which is also reflected in a low proportion of VMT (20 percent).

Table 12. Summary statistics for the Columbus, GA-AL CBSA

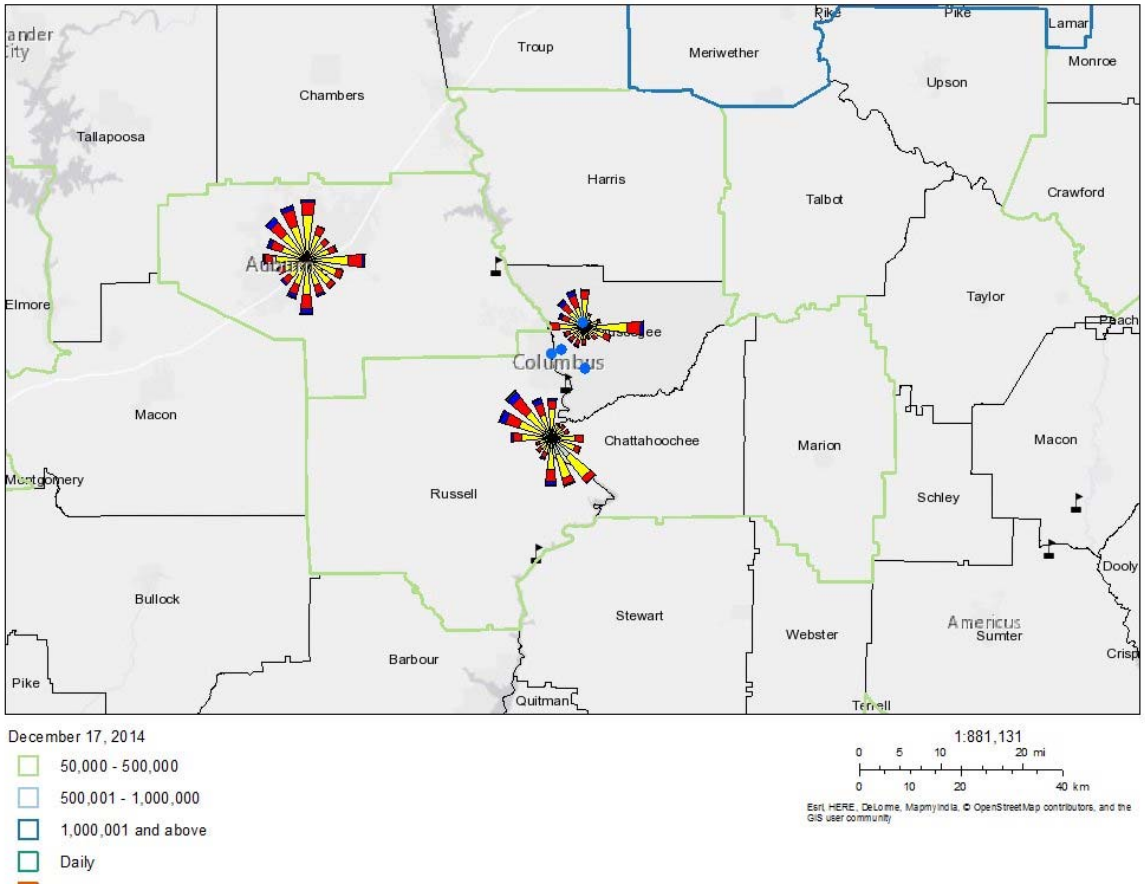
	Muscogee	Russell	Chattahoochee	Harris	Marion
State	Georgia	Alabama	Georgia	Georgia	Georgia
Core urbanized county or outlying?	**Core**	**Core**	**Outlying**	**Outlying**	**Outlying**
SO_2 emissions (tpy)	84	3,487	51	43	29
$PM_{2.5}$ emissions (tpy)	729	3,083	714	809	554
NOx emissions (tpy)	4,969	5,324	429	2,335	349
NH3 emissions (tpy)	144	583	68	109	572
VOC emissions (tpy)	6,105	6,591	619	1,848	502
Population	190,484	53,238	11,131	32,146	8,742
Population (% of CBSA)	64%	18%	4%	11%	3%
VMT (Millions)	1,655	738	74	428	78
VMT (% of CBSA)	56%	25%	2%	14%	3%

The EPA also evaluated the meteorology in the area by evaluating wind data collected at three locations in the Columbus CBSA as shown in Figure 22. The wind roses indicate that wind

point sources helps to identify nearby areas with emissions that are likely to be contributing to violations of the NAAQS.

direction is less likely to originate from the southwest or from the northeast. North-northwest winds are more frequently observed.

Figure 22. Wind Rose Data for Columbus GA-AL CBSA



Columbus GA-AL CBSA Conclusion

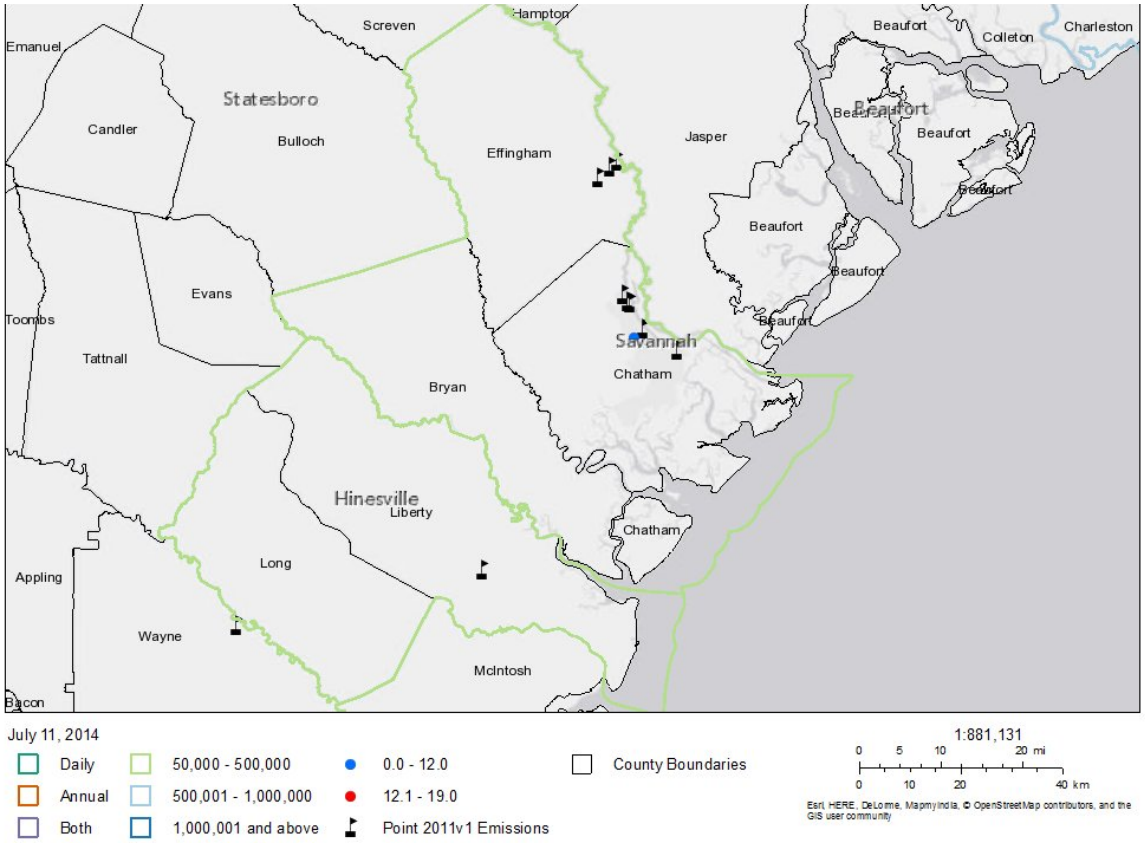
Based on the wind rose data and the information summarized in Table 12, the EPA has concluded that of the five counties in the Columbus CBSA, Muscogee County, Georgia and Russell County, Alabama have relatively higher potential to contribute to potential violations of the standard at the Muscogee County monitor, currently has incomplete data. The EPA identified Muscogee County because the monitor with incomplete data is located in this county. The EPA identified Russell County as a potentially contributing county because it accounts for the majority of emissions in the CBSA, despite the fact that its population is less than one-third of Muscogee County's. Wind rose data further indicate that fairly frequent winds from the southerly direction increase the potential for transport of these emissions from Russell County to Muscogee County. Because of incomplete data at the Muscogee County monitor in the Columbus CBSA, the EPA is deferring a designation for Russell and Muscogee Counties.

By contrast, the outlying counties of Chattahoochee and Marion have low emissions, population, and VMT. The wind rose data also indicate infrequent and low intensity winds impacting the Muscogee County monitor from the southeasterly direction (i.e., from these counties). The third outlying county, Harris County, has comparatively higher VMT than Chattahoochee or Marion County. However, Harris County nevertheless has relatively low emissions compared to the two core counties. This information leads the EPA to believe that these Chattahoochee, Marion and Harris Counties are relatively less likely to contribute to any potential violation that may exist at the Muscogee County, Georgia monitor. Accordingly, the EPA will not defer designation for the Chattahoochee, Harris, or Marion Counties, and is instead at this time designating them unclassifiable/attainment based on the available data.

Savannah Area (Savannah, Georgia CBSA)

The Savannah, Georgia CBSA is wholly contained in Georgia and includes three counties – Bryan, Chatham, and Effingham. Most of the most populated and industrialized portion of Savannah is contained within Chatham County. More information on the EPA's evaluation of the emissions for the counties in the CBSA is provided below. The Savannah area does not have any geographical or topographical barriers meaningfully limiting air pollution transport within its air shed. Therefore, this factor did not play a meaningful role in this evaluation. The Savannah CBSA is outlined in green in Figure 8, along with the location of point sources and air quality monitors.

Figure 23. Savannah, Georgia CBSA with Point Sources and Air Quality Monitor Locations



The Chatham County monitor has incomplete 2011-2013 data that do not allow calculation of a valid 2011-2013 DV. Based on incomplete data, the incomplete Chatham County DV is 10.2 $\mu g/m^3$.

In particular, the EPA evaluated $PM_{2.5}$ and SO_2 emissions and related data from the counties in the Savannah CBSA. As shown in Table 4, Chatham and Effingham Counties account for 99 percent of SO_2 emissions (69 and 30 percent, respectively) and 70 percent of $PM_{2.5}$ emissions (42 percent and 28 percent, respectively). Bryan County has 30 percent of $PM_{2.5}$ emissions from non-point sources. Chatham County is the most populous area with 76 percent of the CBSA population followed by Effingham (15 percent) and Bryan (9 percent). A similar pattern in VMT is also noted with Chatham County accounting for 73 percent of VMT and Effingham and Bryan Counties contributing 11 percent and 15 percent, respectively to VMT.

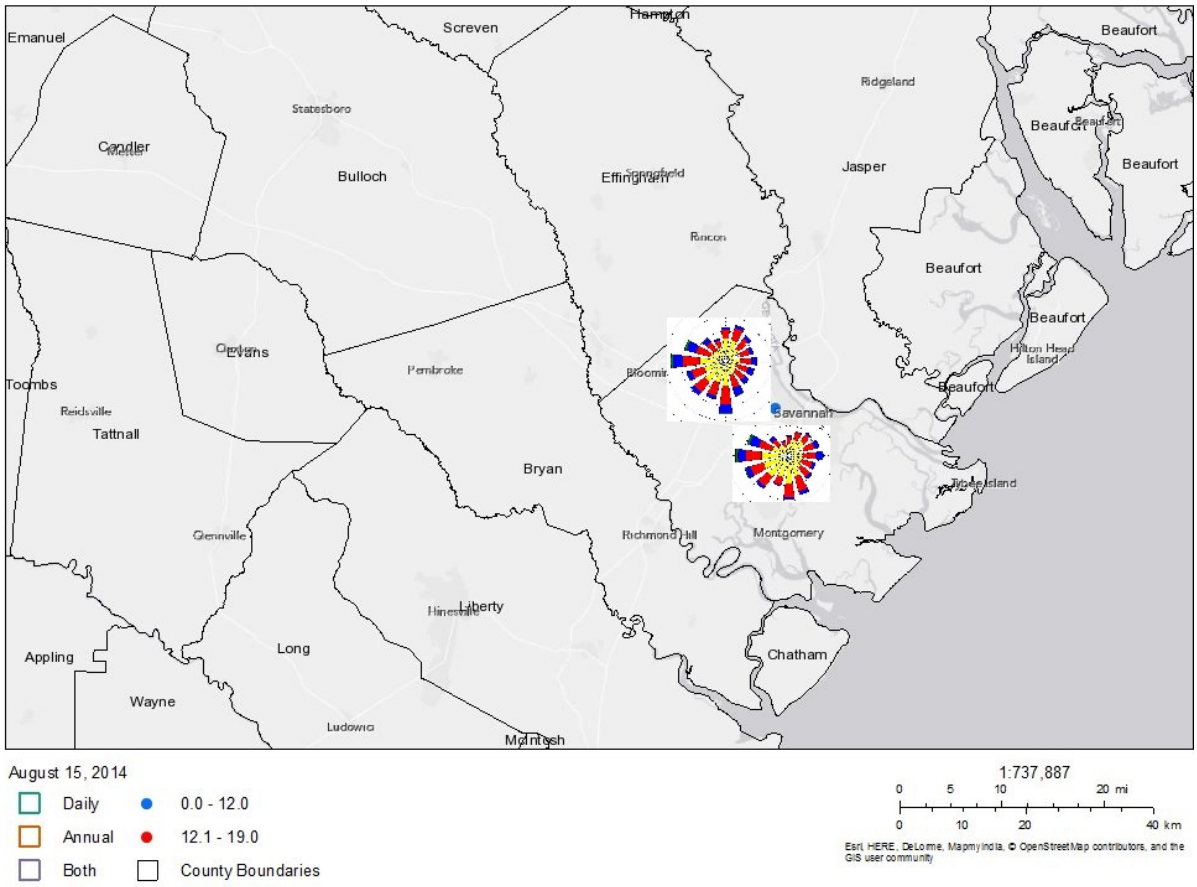
Table 13. Summary statistics for the Savannah, Georgia CBSA

	Chatham	Effingham	Bryan
Core urbanized county or outlying?	Core	Outlying	Outlying
SO_2 Emissions (tpy)	10,312	4,567	97
$PM_{2.5}$ emissions (tpy)	2,039	1,332	1,439[41]
NOx emissions (tpy)	17,000	3,819	2,784
NH_3 emissions (tpy)	452	280	123
VOC emissions (tpy)	12,215	2,550	2,147
Population	265,998	52,420	30,412
Population (% of CBSA)	76%	15%	9%
VMT (Millions)	2,804	437	582
VMT (% of CBSA)	73%	11%	15%

The EPA also evaluated the meteorology in the area by evaluating wind data collected at two locations in the Savannah CBSA as shown in Figure 24. The wind rose data shows that the frequency of wind direction and intensity is variable.

[41] The majority of these direct $PM_{2.5}$ emissions are from non-point sources and are event related. If a violation of the NAAQS occurs when three years of complete data becomes available, the potential impacts of these event-related emissions will be further evaluated.

Figure 24. Wind Rose Data for the Savannah, Georgia CBSA



Savannah Georgia CBSA Conclusion

Based on the wind rose data that shows consistently variable wind direction and intensity and the information summarized in Table 13, the EPA is concluding that two of the three counties in the Savannah CBSA are more likely to have the potential to contribute to any violations of the standard at the Chatham County monitor, which currently has incomplete data. The EPA identified Chatham County because the monitor with incomplete data is located in this county and Chatham County contributes the majority of emissions, VMT, and is the population center of the CBSA. The EPA identified Effingham County as a potentially contributing county because Effingham County has three point sources having combined SO_2 emissions greater than 4,500 tpy (30 percent of CBSA SO_2 emissions) and over 1,300 tpy of direct $PM_{2.5}$ emissions. In addition, the EPA's analysis of meteorology indicates potential transport of these emissions to the $PM_{2.5}$ monitoring site in Chatham County.

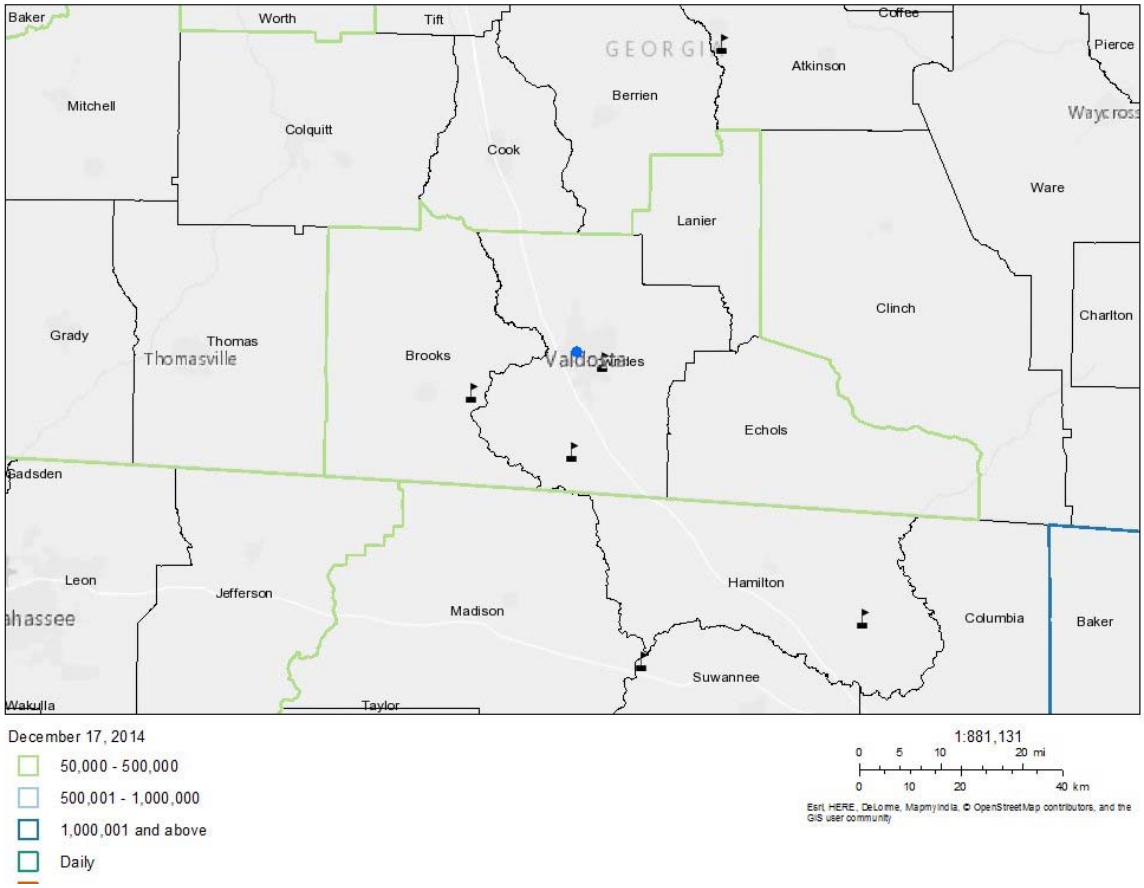
By contrast, outlying Bryan County has low SO_2 emissions (97 tpy) in comparison to Chatham and Effingham Counties (respectively, 10,312 tpy and 4,567 tpy). Bryan County also has the lowest population of any county in the CBSA. Although Bryan County does have a similar level of direct $PM_{2.5}$ emissions as Effingham County, Bryan County is located a substantial distance from the Chatham County monitor in Savannah and direct $PM_{2.5}$ emissions generally have more

localized impacts. Accordingly, because of incomplete data at the Chatham County monitor in the Savannah CBSA, and the potential for Effingham County to contribute to that monitor, the EPA is deferring a designation for Chatham and Effingham Counties. However, the EPA is not deferring a designation for Bryan County and is instead designating this county as unclassifiable/attainment based on the available data.

Valdosta Area (Valdosta, Georgia CBSA)

The Valdosta, Georgia CBSA is wholly contained in Georgia and includes four counties – Brooks, Echols, Lanier, and Lowndes. The Valdosta CBSA and surrounding counties are shown in Figure 25 along with the location of point sources and air quality monitors.

Figure 25. Valdosta CBSA Point Source and Air Quality Monitor Locations



The Lowndes County monitor has incomplete 2011-2013 data that do not allow calculation of a valid 2011-2013 DV. Based on incomplete data, the incomplete Lowndes County DV is 8.9 $\mu g/m^3$.

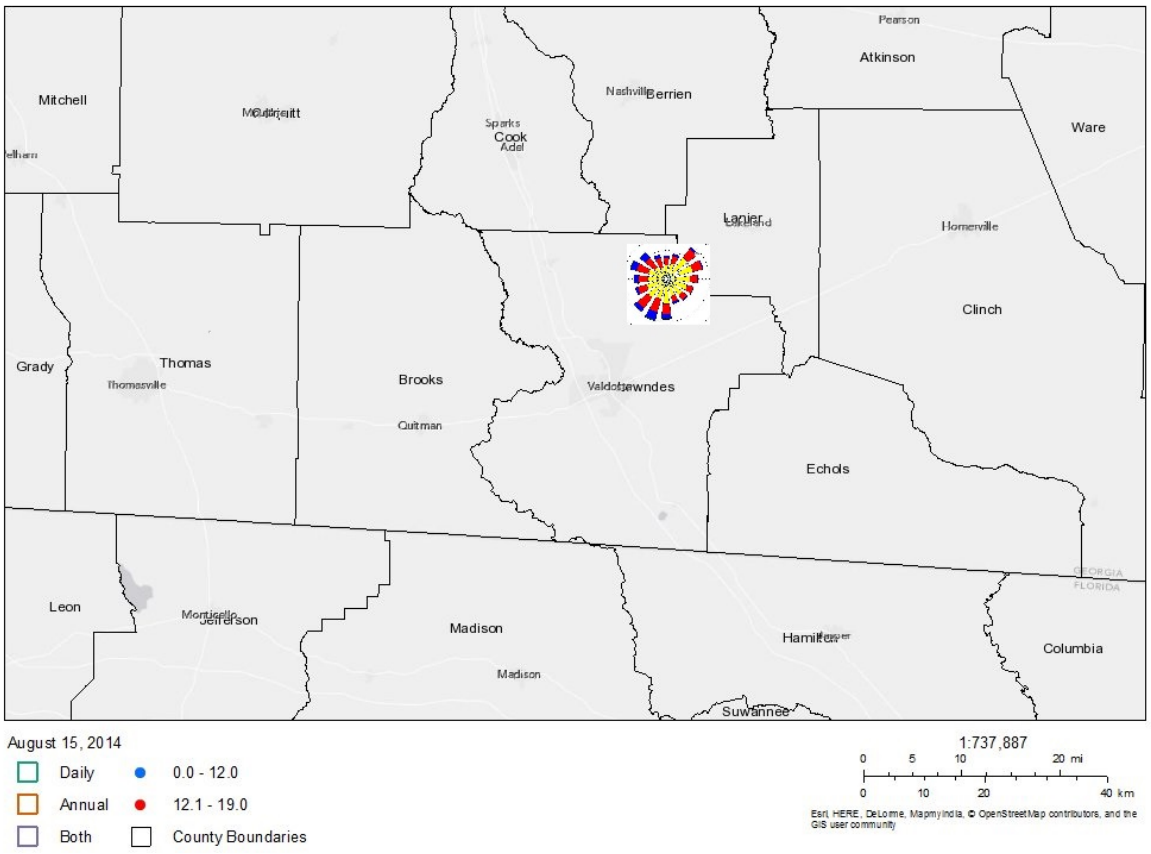
In particular, the EPA evaluated $PM_{2.5}$ and SO_2 emissions and related data from the counties in the Valdosta CBSA. As shown in Table 5, Brooks and Lowndes Counties account for 96 percent of SO_2 emissions (20% and 76%, respectively) and 86% of $PM_{2.5}$ emissions (52 % and 34%, respectively). Lowndes County is the most populous area with 78% of the CBSA population, followed by Brooks (12%), Lanier (7%) and Echols (3%). A similar pattern in VMT is also noted with Lowndes and Brooks Counties accounting for 93% (81% and 12%, respectively) to CBSA VMT, and Echols and Lanier together contributing 7% of VMT.

Table 14. Summary statistics for the Valdosta, Georgia CBSA

	Lowndes	**Brooks**	**Echols**	**Lanier**
Core urbanized county or outlying?	Core	Outlying	Outlying	Outlying
SO_2 emissions (tpy)	784	209	18	22
$PM_{2.5}$ emissions (tpy)	1,941	2,959	309	478
NOx emissions (tpy)	6,255	1,596	321	408
NH_3 emissions (tpy)	273	867	56	159
VOC emissions (tpy)	6,307	2,260	633	723
Population	109,761	16,189	4,037	10,103
Population (% of CBSA)	78%	12%	3%	7%
VMT	1,324	195	39	80
VMT (% of CBSA)	81%	12%	2%	5%

The EPA also evaluated the meteorology in the area by evaluating wind data collected in the Valdosta CBSA as shown in Figure 26. These data indicate frequency of wind direction and intensity is variable.

Figure 26. Wind Rose Data for the Valdosta, Georgia CBSA



Valdosta Georgia CBSA Conclusion

Based on the wind rose data and the information summarized in Table 14, the EPA is concluding that of the four counties in the Valdosta CBSA, Lowndes and Brooks Counties are the most likely to potentially contribute to hypothetical violations of the standard at the Lowndes County monitor, which that currently has incomplete data. The EPA identified Lowndes County because the monitor with incomplete data is located in this county and Lowndes County contributes the majority of emissions, VMT, and is the population center of the CBSA. The EPA identified Brooks County as a potentially contributing county because it has a countywide total of over 2,900 tpy of direct $PM_{2.5}$ emissions from a major point source and other non-point sources, and the EPA's analysis of meteorology indicates possible transport of these emissions from the west/southwest toward the $PM_{2.5}$ monitoring site in Lowndes County. Consequently, because of incomplete data at the Lowndes County monitor in the Valdosta CBSA, and the potential for contribution to that monitor from Lowndes and Brooks Counties, the EPA is deferring a designation for Lowndes and Brooks Counties. Although the meteorological information suggests possible transport from Lanier County, the county has low emissions, no major point sources, and low VMT relative to Lowndes and Brooks Counties. The same is true of Echols County, for which the wind rose data suggest even less likelihood of contribution from this easterly county to the affected monitor in Lowndes County. This information leads the EPA to

believe that Echols and Lanier Counties would be less likely to contribute to a potential violation at the Lowndes County monitor. Accordingly, the EPA is not deferring a designation for either Echols or Lanier Counties and is at this time designating them unclassifiable/attainment based on the available data.

Washington County, GA

Washington County is a single county that is not a part of a larger CBSA. Due to a snow storm in 2011, the Washington County monitor has incomplete 2011-2013 data that do not allow calculation of a valid 2011-2013 DV.[42] Based on incomplete data, the incomplete Washington County DV is 8.9 $\mu g/m^3$.

Washington County, Georgia Conclusion

The EPA is deferring a designation for Washington County because the monitor with incomplete data is located in this county.

As discussed above, the EPA's limited contribution analyses in this deferral memorandum evaluate only those counties in the same CBSA as an affected monitor. Because Washington County is not part of a larger CBSA, the EPA is not at this time assessing the likelihood that any other areas could potentially contribute to a hypothetical violation at the Washington County monitor.

[42] Memorandum from Liz P. Naess, Group Leader, Air Quality Analysis Group, US EPA Office of Air Quality Planning and Standards, to EPA Docket EPA-HQ-OAR-2012-0918, Air Quality Designations for the 2012 $PM_{2.5}$ Standards, titled "Data Quality Issues in Georgia Affecting Air Quality Designations for the 2012 $PM_{2.5}$ National Ambient Air Quality Standard."