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February 29, 2012

Gwendolyn Keyes Fleming, Esq.
Regional Administrator
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8909

Re: 120 Day Response to EPA Proposed 2008 8-hour Ozone NAAQS Designations

Dear Ms. Fleming:

Please find enclosed compelling evidence as to why the South Carolina Department of Health and Environmental Control (Department) further supports that York County, in its entirety, including the Catawba Indian Nation Reservation, be designated "attainment" for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS). Based on our conversations on February 9th, 14th, and 15th, 2012, we look forward to continued and ongoing discussions related to this very important decision.

The Department will show throughout this documentation that York County is not responsible for the violations of the 2008 ozone NAAQS in the Charlotte-Gastonia-Salisbury, NC-SC CSA/CBSA. This is based on more recent, partial county data than that used by EPA in making its decision to include a part of York County in the Charlotte, NC nonattainment area. Further, South Carolina, including York County, has seen a significant reduction in ozone precursor emissions which is reflected in the overall reduction of ozone concentrations. These reductions have occurred and continue to occur because of our commitment to public health and the environment, the statutory authority to require controls on sources regardless of location where controls are deemed necessary, regulations that are more stringent and protective than federal requirements, permanent reductions in emissions from point and non-point sources, and significant voluntary efforts.

The Department hopes that EPA will review and carefully consider South Carolina's more recent data, the partial York county data that represents the area EPA has included in their proposed nonattainment boundary, and other supporting technical documentation included with this submittal. It is for the reasons detailed in the attached documentation that we disagree with the rationale and data that the EPA used in its proposed modification to the Department's recommended designation request. Since states are charged with carrying out requirements of the Clean Air Act, EPA should defer to state recommendations using the most recent air quality data, which for South Carolina indicates attainment of the 2008 8-hour ozone NAAQS. **Therefore, South Carolina again formally requests that York County, in its entirety, including the Catawba Indian Nation Reservation be designated "attainment" for the 2008 8-hour ozone NAAQS.**

We appreciate the valuable time spent with your staff on February 9, 2012, and during the aforementioned follow up discussions. We appreciate your willingness to consider additional information. We have developed a comprehensive response to your staff's technical support document, which clarifies the

proposed York partial county's actual impact on the potential nonattainment area. For example, back trajectory analyses indicate that all of the Charlotte area monitors are being impacted by local plumes from Charlotte, rather than from a larger regional area. As a result of our further review, we look forward to continued discussions regarding these matters, especially if the EPA receives boundary recommendations for this area that may be different from our submittal. Further, we expect EPA will fulfill its obligations to continue its commitment to transparency and provide us as well as the public with the scientific analyses, supporting documentation, and data that would address each and every one of our points should you not concur with this information[1]. If there are any questions concerning this information please feel free to contact Robert Brown at (803) 898-4105 or by e-mail at brownrj@dhec.sc.gov.

Sincerely,

Robert W. King, Jr., P.E.
Acting Commissioner
South Carolina Department of Heath and Environmental Control

Enclosures

ec: Ms. Beverly Banister, Deputy Regional Administrator, US EPA Region 4
Chief Bill Harris, Catawba Indian Nation
Mr. Randy Imler, Executive Director, Catawba Council of Governments
Mr. James Baker, Manager, York County
Mr. Funderburk, Mayor, Fort Mill, South Carolina
Mr. Echols, Mayor, Rock Hill, South Carolina
Myra Reece, Chief, Bureau of Air Quality, SCDHEC
Mr. Harry Mathis, Director, EQC Region 3

cc: Governor Nikki Haley
Congressman James E. Clyburn
Congressman Mick Mulvaney
Congressman Trey Gowdy
Congressman Joe Wilson
Congressman Jeff Duncan
Congressman Tim Scott
Senator Lindsey O. Graham
Senator Jim W. DeMint

[1] See Section 2 on Public Participation of the President's January 18, 2011, Executive Order 13563 -- *Improving Regulation and Regulatory Review*, last accessed February 17, 2012: http://www.whitehouse.gov/the-press-office/2011/01/18/improving-regulation-and-regulatory-review-executive-order

Supporting Documentation for Designating York County, South Carolina, including the Catawba Indian Nation Reservation Attainment for the 2008 Ozone NAAQS

York County, South Carolina, including the Catawba Indian Nation Reservation
Attainment Area
Executive Summary

It is for the reasons highlighted here and further explained in the attached supporting documentation, that South Carolina disagrees with the rationale and data that the EPA used in its proposed modification to the Department's originally recommended designation request. Further evaluation of all of the factors using the most recent, highest quality and relevant data available, we again come to the realization that York County is not responsible for the ozone violations in the Charlotte region. Therefore, South Carolina again formally requests that York County, in its entirety, including the Catawba Indian Nation Reservation be designated "attainment" for the 2008 8-hour ozone National Ambient Air Quality Standards (NAAQS).

Upon review of the ozone nonattainment area boundary recommendations submitted by the South Carolina Department of Health and Environmental Control (Department) on March 12, 2009, and revised October 11, 2011, the United States Environmental Protection Agency (EPA) Region 4, in a letter dated December 8, 2011, notified South Carolina of its intent to support South Carolina's aforementioned ozone designation recommendations for all areas with the exception of a portion of York County. Specifically, the EPA preliminarily concluded that the urbanized portion of York County, South Carolina, including the Catawba Indian Nation Reservation should be included as part of the Charlotte-Gastonia-Salisbury, NC-SC nonattainment area. This proposed nonattainment area encompasses the boundary of the Rock Hill-Fort Mill Area Transportation Study (RFATS) Metropolitan Planning Organization (MPO). Section 107(d)(1)(B)(ii) of the Clean Air Act, provides the State with an opportunity to demonstrate why any proposed modification is inappropriate. Therefore, South Carolina wishes to take this opportunity to demonstrate why the EPA's 'intended' designation is not appropriate. It is our sincere hope that after review of the information presented and discussed at our February 9, 2011, meeting in North Augusta, South Carolina, and after an examination of this supporting documentation (to include our more recent data that addresses only the partial York County contributions - as more accurately representative of EPA's *own* proposed nonattainment area), the EPA will also see their intended/proposed modification as inappropriate.

The criteria and data provided to justify the Department's recommendations are consistent with the EPA memorandum dated December 4, 2008,[1] and address all of the nine factors listed in Attachment 2. Further, the supplementary information provided for the EPA proposed York nonattainment area substantiates how these recommendations are consistent with the definition of attainment in Section 107(d)(1) of the Clean Air Act (CAA) and why a designation of "attainment" is appropriate.

The Technical Support Document (TSD) from the EPA's December 8, 2011, letter grouped the emissions-related factors (from the aforementioned EPA guidance issued December 4, 2008) together under the heading of "Emissions and Emissions-Related Data," which resulted in 5 categories of factors. For the purpose of this discussion, South Carolina will be combining factors 1 (air quality data) and 3 (meteorology), followed by factors 2, 4 and 5 (emissions and emissions-related data; geography and topography; and, jurisdictional boundaries). In addition, we have also included a section on additional supporting information/documentation to include stakeholder involvement and support. In providing this

[1] EPA memorandum from Robert J. Meyers, December 4, 2008, Area Designations for the 2008 Ozone National Ambient Air Quality Standards

response to EPA's proposed modification, the Department has evaluated meteorology, monitoring data, population, urbanization and growth, traffic, and emissions data. The following information summarizes South Carolina's supporting documentation as to why York County, in its entirety including the Catawba Indian Nation Reservation, be designated "attainment." Additional data to support the 5 factors, as well as other supporting information is attached.

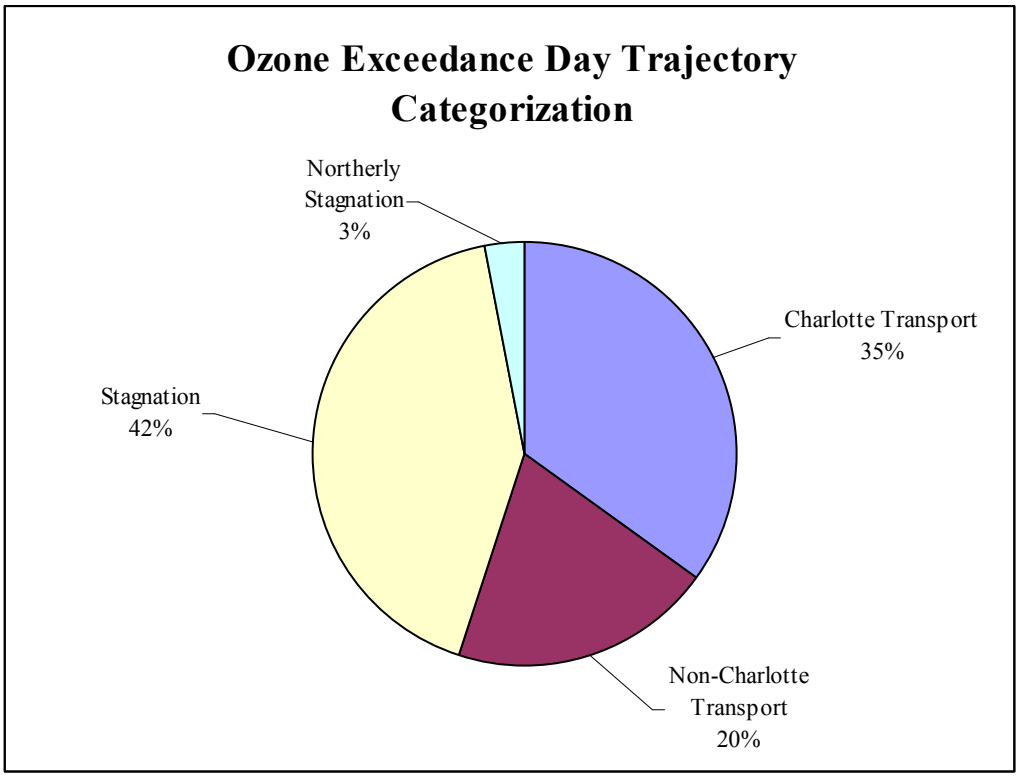
Factors 1 (Air Quality Data) and 3 (Meteorology)

- EPA based its 2011 TSD assessment on 2010 design values; 2011 data are now certified.
- The Department asserts that to determine whether or not an area is contributing to a violation of the standard in a nearby area, it is important to look at all of the factors, including all of the ozone design values from all of the ozone monitoring stations within the area.
- Ozone Design Values for monitors in the EPA proposed nonattainment area (based on certified 2011 monitoring data) are as follows:

  Garinger (Plaza) (Mecklenburg County, NC) - 0.079
  County Line (Mecklenburg County, NC) - 0.078
  Enochville (Rowan County, NC) - 0.076
  Arrowood (Mecklenburg County, NC) - 0.076
  Rockwell (Rowan County, NC) - 0.075
  Crouse (Lincoln County, NC) - 0.071
  Monroe (Union County, NC) - 0.070
  York (York County, SC) – 0.064

- During the last 10 years the ozone design values in the Charlotte region on average have decreased by **22 percent.** During that same time period the York County monitor decreased 24 percent. The 2011 ozone design value at York is well below the standard at 0.064 parts per million (ppm).
- Back trajectory analysis of ***all*** **monitors** in the Charlotte metropolitan area shows that approximately **80 percent** of all air masses on days exceeding the ozone standard passed through Charlotte – indicating local impact. Four unique meteorological scenarios were identified on days exceeding the ozone standard in the Department's back trajectory analysis. These scenarios were called Charlotte Transport, non-Charlotte Transport, Stagnation and Northerly Stagnation. (See Appendix A).
    - Charlotte Transport - defined as trajectories that passed through the Charlotte metropolitan area before arriving at the monitoring site. Typically, these trajectories also traveled long distances before arriving at the monitoring site.
    - Non-Charlotte Transport - defined as trajectories that mainly arrive at the monitor from directions that do not take the trajectory through the Charlotte metropolitan area. Typically, these trajectories also traveled long distances before arriving at the monitoring site.
    - Stagnation - defined as trajectories that were short in length, indicative of light and/or variable wind speeds and typically involved severe curving of the trajectory before arriving at the monitoring site.

- Northerly Stagnation - defined as trajectories that had a component of transport and then began stagnating at the end of the model run with similar characteristics of those trajectories that were categorized as stagnation.



- York County, in its entirety, should be designated "attainment." The existing ozone monitor in York County is reading attainment. Meteorology data shows that emissions from this portion of York County do not significantly contribute to ozone concentrations in the Charlotte area.

Factor 2 (Emissions and Emissions-Related Data)

- The EPA appears to have misrepresented the contribution of the York County portion of the proposed nonattainment area for several reasons, to include:
  - The Department believes that in 2004, one of the EPA's reasons for designating a portion of York County nonattainment was the percentage of York County commuters to Mecklenburg County. We believe the EPA severely overstated the contribution of York County commuters to Charlotte's ozone concentrations. The EPA considered York County, in its entirety, for number of people commuting. This misrepresentation suggested a significant contribution where none exists.
  - The EPA appears to have misinterpreted the contribution of the York County portion of the proposed nonattainment area because it used whole county data in Table 3 (2011 TSD – Total

2008 oxides of nitrogen (NO_X) and volatile organic compounds (VOC) Emissions) and not partial county data. This misinterpretation significantly exaggerates any alleged contributions the proposed partial York County area might make to air quality in the Charlotte area.

- Table 4 from the EPA's 2011 TSD shows population and growth for each county in the Charlotte-Gastonia-Salisbury Combined Statistical Area (CSA), including the entire York County. EPA appears to have again misinterpreted the data in Table 4 because they used whole county data and not partial county data for York County.
- York County's NO_X emission totals are actually in the bottom third of the eight counties under review for nonattainment consideration not "among the highest in the area" as stated by EPA in their 2011 TSD.

- Ozone precursor emissions (nitrogen oxides and volatile organic compounds) have decreased in York County. The percentage decrease for NO_X and VOC from the 2004 designations to the 2008 NEI was 43 percent and 29 percent, respectively.

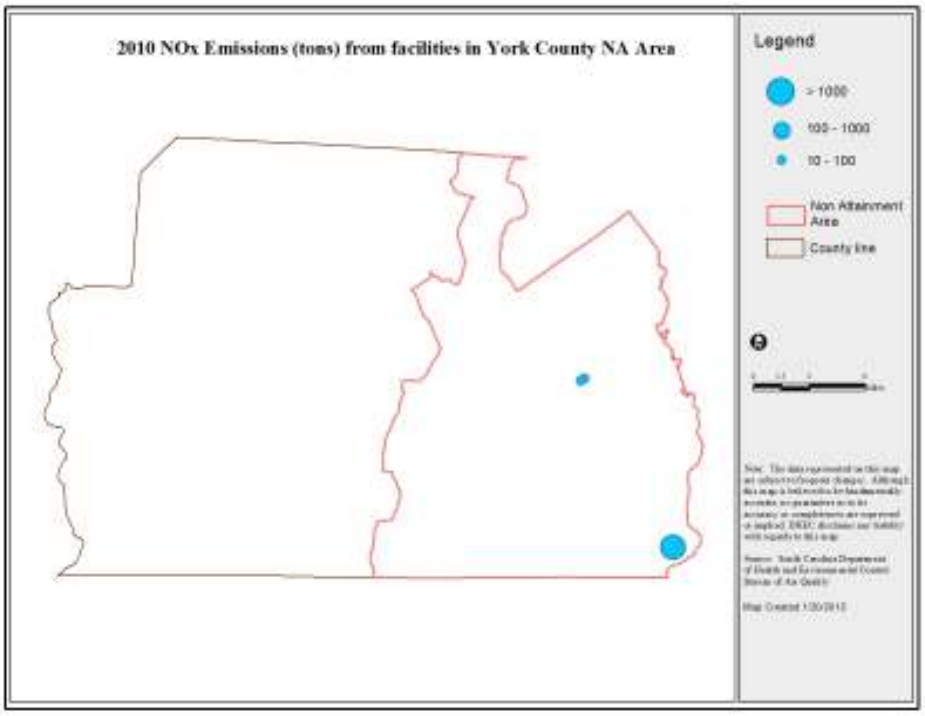
Inventory	NO_X	VOC
2004 EPA (April 2004)	12,271 tons	16,584 tons
2008 NEI v.1.5	7,031 tons	11,840 tons

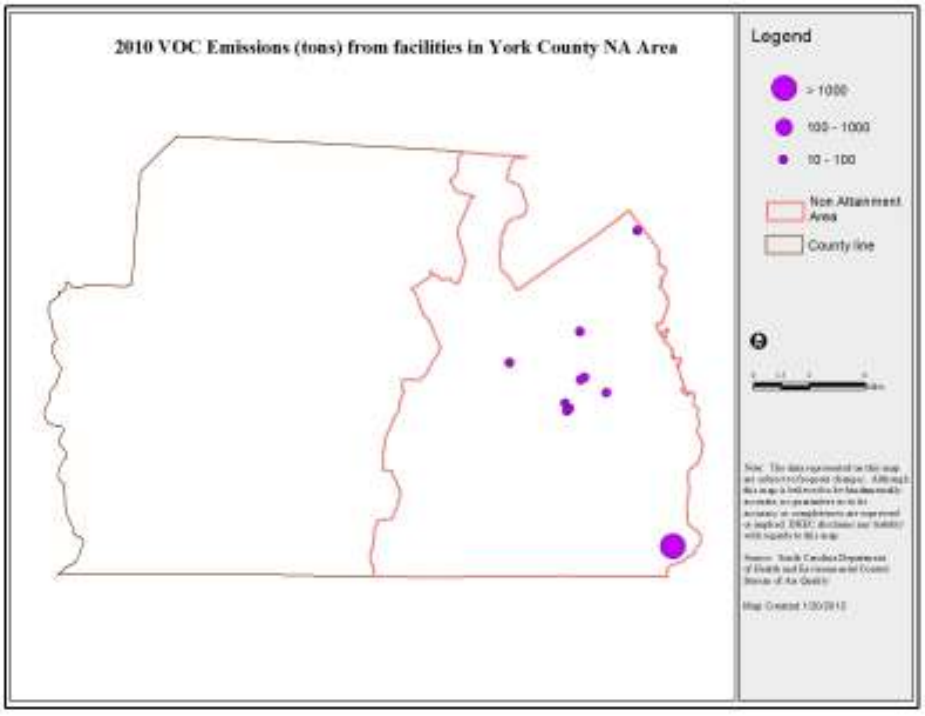
- The total NO_X emissions are projected to continue to decrease (39 percent) through the year 2022, with the on-road NO_X emissions projected to decrease 63 percent during the same period. The total man-made VOC emissions are projected to continue to decrease (9.3 percent) through the year 2022, with the on-road VOC emissions projected to decrease 45 percent during the same period.

- When a major source of emissions closed in this portion of York County, these emissions were not allowed to be "banked" for offsetting purposes. The attainment demonstration modeling showed that "zeroing out" these 2,493 tons of NO_X only reduced ozone concentrations at one ozone monitor on the outskirts of the region by 0.2 ppb.

- The largest facility in York County (Resolute Forest Products) went through the nonattainment new source review (NSR) permitting process in 2006. NO_X Lowest Achievable Emissions Rate (LAER) was applied to recovery furnace #3 and the current NO_X Best Available Control Technology (BACT) control on lime kiln #2 was determined to be LAER. Other than an unlikely second nonattainment new source review project at Resolute Forest Products, it is improbable that this proposed nonattainment area will see reduced emissions from additional NSR projects if designated "nonattainment" for the 2008 ozone NAAQS.

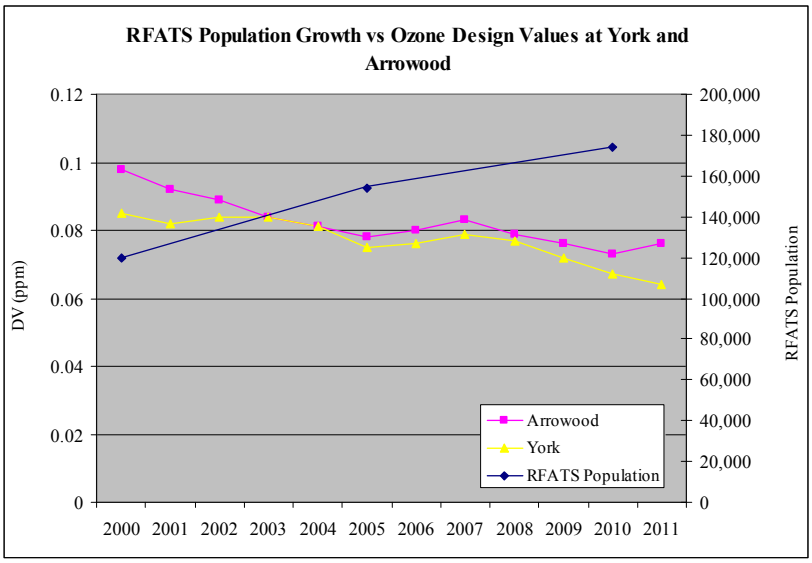
- Other existing sources are considerably smaller than the largest facility and it is unlikely they would have major modifications that would trigger nonattainment new source review. There are only three NO_X sources with actual emissions greater than 10 tons per year in the area.





- Reasonably Achievable Control Technology (RACT) review and required controls have already been applied as part of the 1997 8-hour ozone nonattainment designation. A new nonattainment designation would not require any further review, controls, and/or implementation of emission reductions.

- While the RFATS MPO has experienced population growth from 2000 to 2010, the ozone design values in the Charlotte area, including the York County ozone monitor, have steadily decreased. If an area with dense population growth is an indicator to appropriately include as part of a nonattainment area, then you would expect the results of that growth to also be indicated through ozone monitoring design values. The following figure clearly shows the increase in population versus the decrease in ozone design values. Because the population is for the RFATS MPO, the Department chose to only show design values from the two closest ozone monitors (York CMS and Arrowood).



- Based on historic population, Inspection and Maintenance (I/M) is not currently mandated by the Clean Air Act, in the partial York County area designated nonattainment for the 1997 8-hour ozone NAAQS, nor would the State consider implementing an I/M program based on its lack of effectiveness. A new nonattainment designation would not require I/M for this area.

- The vehicle miles traveled (VMT) for the partial York County area recommended by EPA is actually **17 percent lower** than the data EPA evaluated for its recommendation. Furthermore, based on EPA's 2011 TSD, this VMT data for the partial York County area does NOT "contribute to nonattainment" in the Charlotte region. EPA compared "vehicle miles traveled" (VMT) for whole counties for the Charlotte Combined Statistical Area. The true VMT, for that portion of York County included in the proposed NA area, is actually below the VMT value EPA cited as "contributing to nonattainment."

- **Only 5 percent** of Mecklenburg County workers come from York County, in its entirety (Census 2000). The EPA proposed partial York County nonattainment area would obviously contribute less than that.

- Section 182(b)(1) of the CAA mandates a 15 percent VOC emission reduction, accounting for growth, in the first six years after the baseline year (2002) for moderate and above ozone nonattainment areas. Thus, for the York County portion of the Charlotte-Gastonia-Rock Hill, NC-SC 1997 8-hour ozone nonattainment area, a reasonable further progress (RFP) analysis between 2002 and 2008 was required and submitted in April 2010. The EPA is currently reviewing this state implementation plan (SIP) submittal. A new nonattainment designation would not require an additional RFP analysis.

- This area is "NO_x limited," meaning NO_x emissions rather than VOC emissions control ozone formation.

Factors 4 (Geography and Topography) and 5 (Jurisdictional Boundaries)

- South Carolina's statutory authority to require controls on sources regardless of location further substantiates an "attainment" designation for York County. The Department has the legal authority to seek emission reductions from any source regardless of where it is located if it adversely impacts air quality. The Department currently has regulations that are more stringent and protective than federal requirements. Further, our actions such as addressing NO_X emissions from stationary sources demonstrate our ability and political will to implement controls to improve air quality statewide rather than on an area, county, or partial county basis.

- Department staff has had numerous conversations with representatives of the Catawba Indian Nation Reservation regarding the EPA's proposed nonattainment designation of partial York County to include the Catawba Indian Nation Reservation. Representatives of the Catawba Indian Nation Reservation are aware of the air quality issues we face and are both active and committed to finding ways to voluntarily reduce emissions. The Department in partnership with the Catawba Indian Nation have committed to placing an ozone monitoring station within the boundaries of the Catawba Indian Nation Reservation.

- It would cause unnecessary economic burdens for the EPA to designate a portion of York County, including the Catawba Indian Nation "nonattainment" simply because they are a part of a presumptive boundary (CSA/CBSA). The term "Core Based Statistical Area" (CBSA) is a collective term for both metropolitan and micropolitan statistical areas (metro and micro areas). Metro and micro areas are geographic entities defined by the U.S. Office of Management and Budget (OMB) for use by Federal agencies in collecting, tabulating, and publishing federal statistics. For EPA to default to a presumptive boundary for "consistency" purposes stifles the creativity to improve air quality as expeditiously as possible.

- No additional reductions will be obtained by designating this area nonattainment. Local measures continue to be implemented to reduce ozone precursors, and continuing outreach with the population includes ozone forecasting. A "nonattainment" designation will only result in the consumption of limited and already stressed state and local resources for a bureaucratic process that will not reduce ozone concentrations.

- The Department operates a comprehensive ozone-forecasting program that covers 34 counties in our state, including York County. South Carolina's citizens are informed on a daily basis during ozone forecasting season as to the predicted quality of the air so that they may take actions as appropriate to better protect their health.

- The Rock Hill-Fort Mill Area Transportation Study (RFATS) Metropolitan Planning Organization (MPO) Policy Committee submitted a letter to the EPA requesting the EPA to follow the Department's recommendation to designate all of York County as attainment with the 2008 ozone standard. Members of the RFATS MPO include the Catawba Indian Nation; local members of the SC Senate and House of Representatives; mayors of the Town of Fort Mill, City of Tega Cay, and City of Rock Hill; the local SC Department of Transportation commissioner; and, members of the York County and City of Rock Hill councils (see Appendix C).

- The Board of Directors of the Catawba Regional Council of Governments (COG) in South Carolina

adopted a resolution requesting the EPA follow the Department's recommendation to designate all of York County as attainment for the 2008 ozone standard (see Appendix C).

- The Rock Hill area of South Carolina has been actively involved with numerous emission reduction programs that impact both mobile and stationary sources. For example, As part of their Congestion Mitigation and Air Quality Improvement Program (CMAQ), the City of Rock Hill has reduced 313,173 kg of NO_X emissions through traffic flow improvements. Because of the area's efforts in these projects, air quality in the region (as indicated by the local air monitor) has steadily improved and currently meets the 2008 8-hour ozone NAAQS.

Conclusion

The Department has shown throughout this documentation that York County is not responsible for the violations of the 2008 ozone NAAQS in the Charlotte-Gastonia-Salisbury, NC-SC CSA/CBSA. South Carolina disagrees with the rationale and data that the EPA used in its proposed modification to the Department's originally recommended designation request.

Based on the Department's further review and assessment of the factors (Sections A through D) as well as additional supporting information (Section E) the Department stands firm in its conclusion that it is appropriate for the EPA to designate York County, in its entirety, including the Catawba Indian Nation Reservation, "attainment" for the 2008 ozone NAAQS. Several key points have been documented through this evaluation of the data:

- a continued reduction in ozone concentrations (on average 22 percent over the last 10 years for the Charlotte region);
- air quality and meteorology data including back trajectory and spatial analysis showing that Charlotte is contributing to the majority of its ozone violations;
- the small amount of emissions from sources in the partial York County area;
- VMT of only 1,653 million miles when EPA has used 1,790 million miles of VMT as "contributing to nonattainment;"
- the significant reduction in emissions since the 2004 designations to include the retirement of almost 2,500 tons of NO_X from a closed facility in this partial York County;
- "zeroing out" these almost 2,500 tons of NO_X only reduced ozone concentrations at one ozone monitor on the outskirts of the region by 0.2 ppb; and,
- the projected continuing decline in emissions and the data from the ozone monitoring station in York County is attaining the 2008 8-hour ozone NAAQS.

As previously stated, it is for the reasons detailed in the attached documentation, that South Carolina strongly disagrees with the rationale and more importantly the data that the EPA used in its proposed modification to the Department's recommended designation request. A decision by EPA of this magnitude and importance demands the use of the highest quality and relevant data. We are very concerned of EPA's use of "cut and paste" from earlier decisions and other state's documentation. **Therefore, South Carolina again formally requests that York County, in its entirety, including the Catawba Indian Nation Reservation be designated "attainment" for the 2008 8-hour ozone NAAQS.**

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List of Figures and Tables

Appendices

Appendix A: Justification on Factor 1 and Factor 3
Appendix B: Justification on Factor 2
Appendix C: Consultation & Stakeholder Comments

A. Factors 1 and 3: Air Quality Data and Meteorology

Section A corresponds to EPA factors related to air quality data and meteorology (weather/transport patterns) in the EPA's December 4, 2008, memorandum.

Ozone is a colorless gas that occurs naturally in the atmosphere and can be found in the air we breathe. Ozone is composed of three atoms of oxygen (O_3), one or more than the common oxygen molecule (O_2) we need to breathe to sustain life. The additional oxygen atom makes ozone extremely reactive. Ozone in the Earth's upper atmosphere, known as stratospheric ozone, shields the Earth from the harmful effects of the sun's ultraviolet rays. Ozone found in the atmosphere closer to the Earth's surface (tropospheric ozone) is considered a harmful air pollutant due to its adverse impacts on human health and welfare.

Tropospheric ozone is commonly referred to as ground-level ozone and sometimes called smog. Ozone is not emitted directly by the combustion of fuels. Ozone is formed in the atmosphere by the reaction of volatile organic compounds (VOC) and oxides of nitrogen (NO_X) in the presence of sunlight. These air pollutants, often referred to as ozone precursors, are emitted by many types of pollution sources, including on-road and off-road motor vehicles and engines, power plants and industrial facilities and smaller sources, collectively referred to as area sources. Technical guidance[2] developed by the United States Environmental Protection Agency (EPA) further describes the formation of ozone "…ozone forms in the atmosphere by reactions between VOC and NO_X. Theses reactions take some time to occur, thus the maximum ozone concentration usually occurs four to six hours after maximum emissions, and under conditions of light winds, usually downwind of the urban region." The EPA further states "…the most significant amount of transported ozone and ozone precursors will come from the area where the winds enter the city."

Ozone is predominately a summertime air pollutant. Changing weather patterns contribute to yearly differences in ozone concentrations from region to region. Ozone and the pollutants that form ozone also can be transported into an area from pollution sources found hundreds of miles upwind.

The South Carolina Department of Health and Environmental Control (Department) or its predecessors have operated an ambient air quality monitoring network in South Carolina since 1959. Since that time, the network has continually evolved to meet the requirements and needs of the Department's Air Program and to comply with federal requirements.

The ozone ambient air monitoring network is designed to meet three primary objectives: provide air pollution data to the public in a timely manner; support compliance with ambient air quality standards and emissions strategy development; and support air pollution research studies. Data from the monitoring network support greater understanding of the impacts and effects of ambient air pollution.

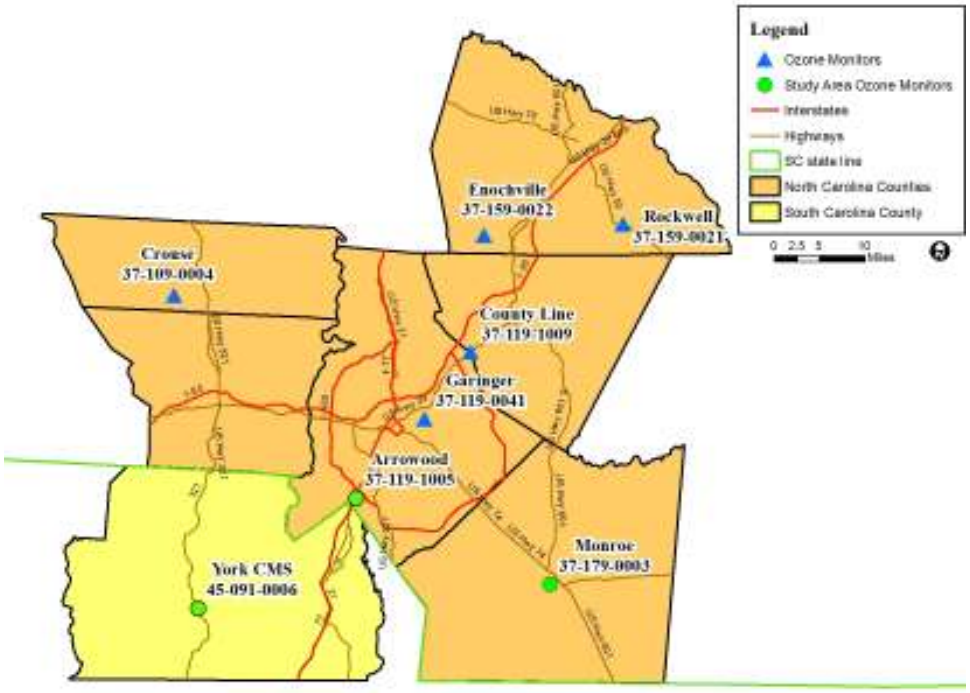
Ozone monitors within the network that support these basic objectives generally serve one or more of the following purposes:
- Determine highest concentrations of pollutants,
- Determine representative concentrations in areas of high population density,
- Determine impact on air quality of significant sources or source categories, and
- Determine general background concentrations.

[2] Guideline on Ozone Monitoring Site Selection EPA-454/R-98-0002, 1998.

Table 2 from the EPA's December 8, 2011, Technical Support Document[3], lists the highest 2008-2010 design values for five counties. In counties where there are multiple ozone monitoring stations, the design value for the county or area is determined by the monitor with the highest level. The 82 parts per billion (ppb) ozone design value (2010) in Mecklenburg County was recorded at Garinger (37-119-0041), which is located within the Charlotte metropolitan area. However, to determine whether or not an area is contributing to a violation of the standard in a nearby area, it is important to look at all of the factors, including all of the ozone design values from all of the ozone monitoring stations so as to consider, as suggested by EPA, whether there are contributing emissions from a broad geographic area.

Figure A-1 indicates the ozone monitoring stations which are located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (MSA) and the adjoining counties of Lincoln and Rowan. Seven ozone monitoring stations are located in North Carolina: Crouse (37-109-0004) in Lincoln County; Enochville (37-159-0022) and Rockwell (37-159-0021) in Rowan County; County Line (37-119-1009), Garinger (37-119-0041), and Arrowood (37-119-1005) in Mecklenburg County, and Monroe (37-179-0003) in Union County. The South Carolina portion of the MSA has one ozone monitoring station, York CMS (45-091-0006), in York County. Data from these eight monitors was used to calculate and compare percent change in ten year ozone design value trends (Table A-2) and to examine ozone concentration gradients (Figure A-5).

Figure A-1: Charlotte Area Monitors



On December 9, 2011, the South Carolina State and Local Air Monitoring Station (SLAMS) ambient concentration data and the quality assurance data for the ozone sites and monitors for the period of April 1 through October 31, 2011 were certified to the EPA. Table A-1 includes the most recent available data.

[3] December 8, 2011, EPA letter to South Carolina Governor Nikki Haley, with enclosed Technical Support Document, herein after referred to as "2011 TSD."

Table A-1: Ozone Design Values for 2002-2011

Site Name	Site ID	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Crouse	37-109-0004	0.094	0.092	0.086	0.081	0.079	0.083	0.082	0.076	0.072	0.071
Garinger	37-119-0041	0.099	0.096	0.091	0.086	0.088	0.090	0.089	0.082	0.078	0.079
Arrowood	37-119-1005	0.089	0.084	0.081	0.078	0.080	0.083	0.079	0.076	0.073	0.076
County Line	37-119-1009	0.102	0.098	0.092	0.087	0.088	0.093	0.094	0.086	0.082	0.078
Rockwell	37-159-0021	0.098	0.100	0.094	0.088	0.083	0.089	0.088	0.083	0.077	0.075
Enochville	37-159-0022	0.101	0.099	0.091	0.085	0.085	0.090	0.088	0.083	0.077	0.076
Monroe	37-179-0003	0.088	0.088	0.085	0.079	0.078	0.081	0.080	0.076	0.072	0.070
York	45-091-0006	0.084	0.084	0.081	0.075	0.076	0.079	0.077	0.072	0.067	0.064

Monitoring Data and Trends

The ten year design value trends indicate decreases at all Charlotte area monitors, with the largest decreases in design values occurring at the monitors farthest from the Charlotte metropolitan area. Monitoring data for York CMS (45-091-0006), Arrowood (37-119-1005), and Monroe (37-179-0003) show a declining ten year trend, with the 2009, 2010, and 2011 York County ozone design values *well below* the 1997 and 2008 ozone National Ambient Air Quality Standard (NAAQS).

A downward trend (Figure A-2) in ozone design values was observed from 2002-2011 for the ozone monitoring stations in the Charlotte-Gastonia-Concord, NC-SC MSA and the adjoining counties of Lincoln and Rowan, with the largest declines occurring at the monitors that are located farthest from the Charlotte metropolitan area. This suggests that local emissions from the Charlotte metropolitan area are responsible for the ozone exceedances. York CMS (45-091-0006) is located well south of the Charlotte metropolitan area and has seen one of the largest decreases in ozone design values.

Figure A-2: Ten Year Ozone Design Values Showing a Downward Trend for Charlotte metropolitan area monitors

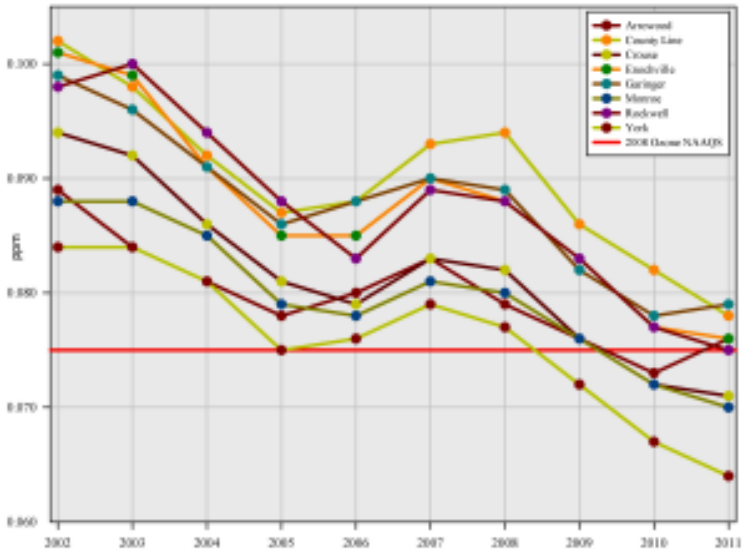


Table A-2 indicates the percent change in ozone design values at the eight ozone monitoring stations since the last ozone nonattainment designation by the EPA in April, 2004 (which utilized data through 2003). Of the eight monitors examined, the sites that are further away from the Charlotte metropolitan area had the largest decrease in design values. The sites closest to the Charlotte metropolitan area had the

smallest decreases. The northern outermost ozone monitoring station of Rockwell (37-159-0021) decreased 25 percent, while Enochville (37-159-0022) and Crouse (37-109-0004) both decreased 23 percent. County Line (37-119-1009) decreased 20 percent. The ozone design values for the southern outermost ozone monitoring station of York CMS (45-091-0006) and Monroe (37-179-0003) decreased 24 percent and 20 percent, respectively. The Garinger (37-119-0041) and Arrowood (37-119-1005) ozone design values, which are central and north of the Charlotte metropolitan area saw a less drastic decline of 18 and 10 percent, respectively. The Ozone Concentration Gradient Map (Figure A-5) also indicates that these two monitors are within the highest ozone concentration areas in the Charlotte metropolitan area.

Table A-2: 2003-2011 Percent Change in Design Values

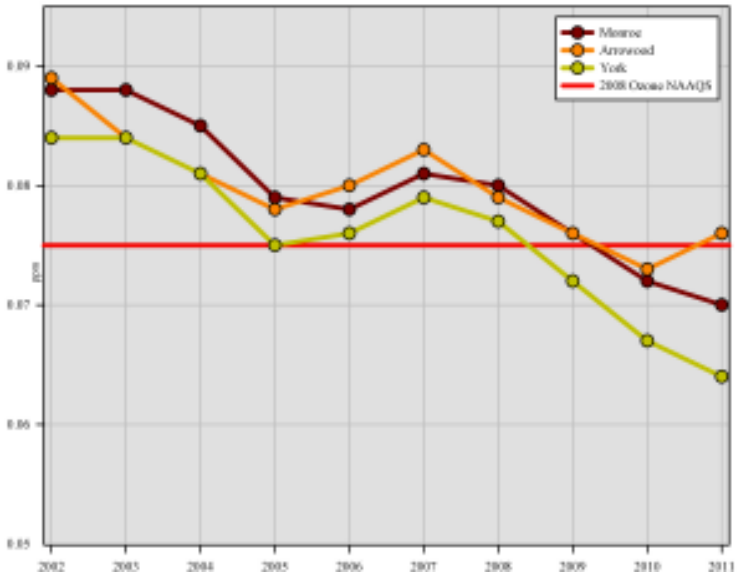
2003-2011 Percent Change in Design Values		
Name	**Site ID**	**Percent (%) Change**
York	45-091-0006	-24
Crouse	37-109-0004	-23
Garinger	37-119-0041	-18
Arrowood	37-119-1005	-10
County Line	37-119-1009	-20
Rockwell	37-159-0021	-25
Enochville	37-159-0022	-23
Monroe	37-179-0003	-20

Due to location and proximity to York County, a separate analysis was conducted by the Department on the three southernmost ozone monitoring stations of York CMS (45-091-0006), Arrowood (37-119-1005), and Monroe (37-179-0003). York CMS (45-091-0006) is located in south-central York County, South Carolina, south-southwest of the Charlotte metropolitan area. Its monitoring objective is upwind background[4] for the Charlotte-Concord-Rock Hill MSA and represents urban scale ambient ozone concentrations (an area approximately 4.0 to 50.0 kilometers). Arrowood (37-119-1005) is located in southwest Mecklenburg County, North Carolina, on the south side of the Charlotte metropolitan area. Its monitoring objective is highest concentration[5] and represents neighborhood scale (an area approximately 0.5 to 4.0 kilometers) ambient air concentrations. Monroe (37-179-0003) is in central Union County, North Carolina, which is south, southeast of Charlotte. The monitoring objective is population exposure[6] and also represents a neighborhood scale ambient air concentration.

York CMS (45-091-0006), Arrowood (37-119-1005), and Monroe (37-179-0003) are located south of the Charlotte metropolitan area. Figure A-3 is a graph that shows the ten-year trend line for the ozone design values for these monitors. The 2008 ozone NAAQS was set at 0.075 parts per million (ppm) based on a three-year average of the annual fourth-highest daily maximum 8-hour average concentration.

[4]http://www.scdhec.gov/environment/baq/docs/ambientair/2012/Final_2012_Monitoring_Plan-with_signatures.pdf pg 38
[5] http://daq.state.nc.us/monitor/monitoring_plan/new_plan/2011_NCDAQ_Network_Plan.pdf pg 64
[6] Ipid. 64

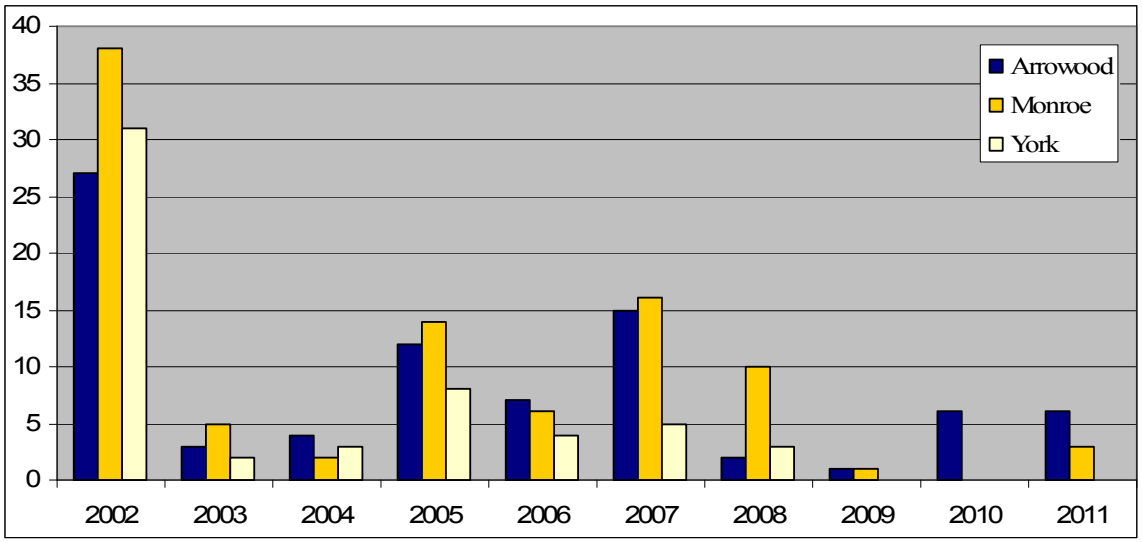
Figure A-3: 2002-2011 Ozone Design Values



From 2002 to 2011, the ozone design values at York CMS (45-091-0006), Arrowood (37-119-1005), and Monroe (37-179-0003) decreased 22 percent, 17 percent, and 20 percent, respectively. The 2011 ozone design value at Arrowood (37-119-1005) was slightly above the standard (0.076 ppm), while the ozone design values at Monroe (37-179-0003) of 0.070 ppm and York CMS (45-091-0006) of 0.064 ppm were well below the standard. In 2009, 2010, and 2011, the ozone design values for the York CMS (45-091-0006) were well below the 2008 ozone NAAQS. These design values indicate a continuation of an overall 10-year decline of ozone concentrations in this area.

Figure A-4 indicates the number of days when the daily 8-hour maximum ozone concentration was above the 2008 ozone NAAQS (0.075 ppm) for York CMS (45-091-0006), Arrowood (37-119-1005), and Monroe (37-179-0003). Since 2002, the number of annual exceedance days at York CMS (45-091-0006) decreased 100 percent. In the same timeframe, Arrowood (37-119-1005) and Monroe (37-179-0003) decreased by 78 and 92 percent, respectively. York CMS (45-091-0006) did not have any exceedances of the 2008 ozone NAAQS in 2009, 2010, or 2011.

Figure A-4: Number of Annual Exceedance Days from 2002-2011



Spatial Analysis

Arrowood (37-119-1005) better represents the southern Charlotte metropolitan area and does not represent York County. The ozone concentration gradient map indicates that ozone concentrations decrease rapidly from the southern side of Charlotte to York County.

Many tools are available to air quality managers to assist is assessing air quality for a given area. For the purpose of this evaluation, the Department conducted a spatial analysis of ozone concentrations in the Charlotte metropolitan area. Spatial analysis of ambient air monitoring data is an important tool for air quality managers to use in estimating concentrations of air pollutants in areas that are unmonitored. The EPA recognizes the importance of these types of analyses and has created guidance documents to assist states in using spatial analysis in their assessment of ambient air quality. In the document titled *Developing Spatially Interpolated Surfaces and Estimating Uncertainty* (EPA-454/R-04-004),[7] the "EPA recognizes the merits of these methods, more specifically kriging, for uses in the modeled attainment tests for the 8-hour ozone and PM 2.5 National Ambient Air Quality Standards attainment demonstrations. These methods provide environmental decision makers the opportunity to show important gradients of air pollution, review the location of monitoring networks and **refine the definition of nonattainment boundaries** (emphasis added)." Furthermore, the EPA relied in part on a kriging[8] analysis in their Technical Support Document to justify previous nonattainment boundary designations for the 1997 ozone NAAQS[9].

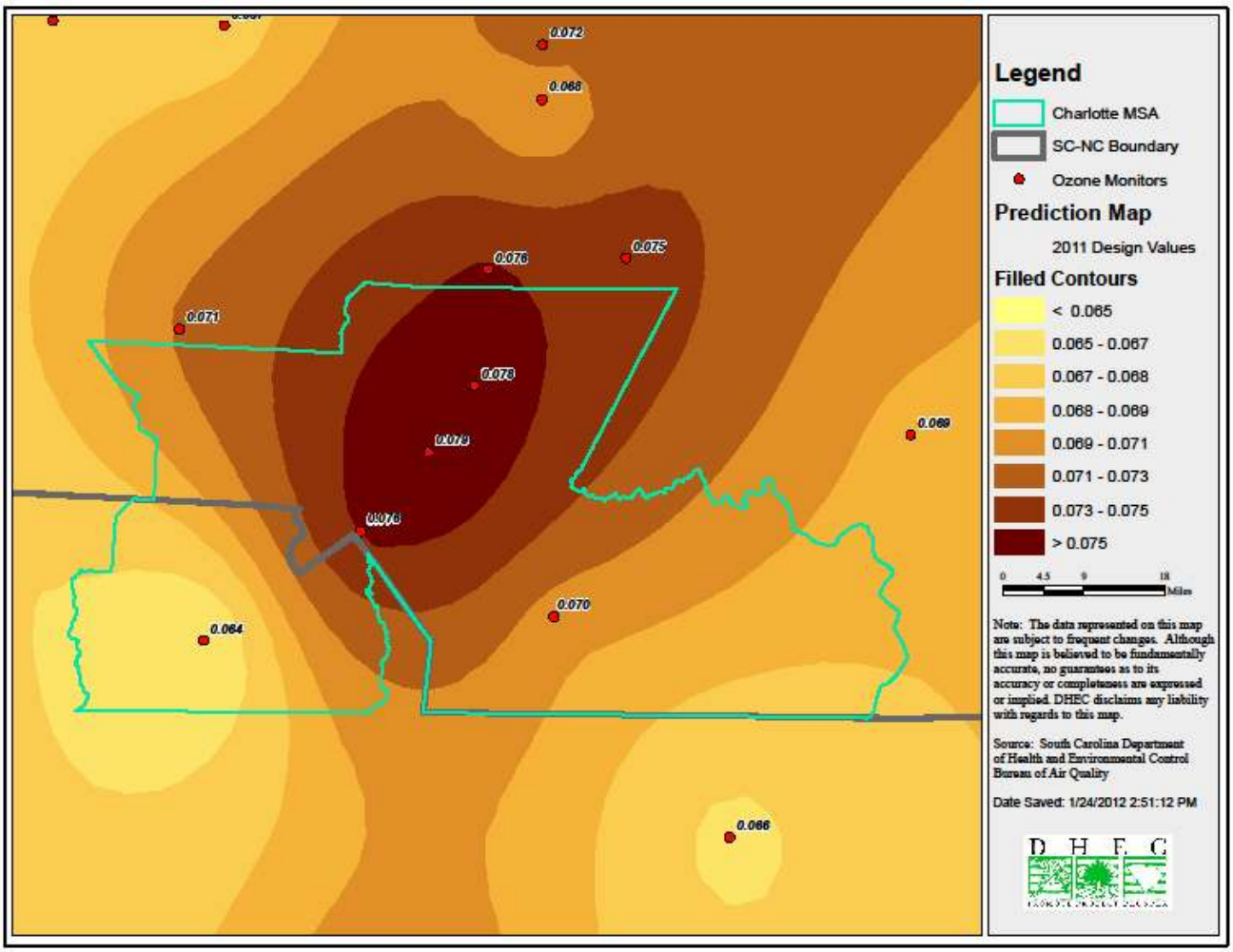
Given this emphasis on the usage and the merits of spatial analysis by the EPA through published guidance documents and previous technical support documents, the following Ozone Concentration Gradient Map (Figure A-5) represents the ozone concentrations around the Charlotte area. Kriging was used to model the ozone concentration gradient surface. The interpolation was based on 2011 ozone design values from **all ozone monitoring stations** located throughout North and South Carolina, in order to better estimate the ozone concentration gradient for the Charlotte-Gastonia-Concord, NC-SC MSA.

[7] http://www.epa.gov/airtrends/specialstudies/dsisurfaces.pdf, accessed 2/15/2012
[8] http://support.esri.com/en/knowledgebase/gisdictionary/term/kriging
[9] http://www.epa.gov/ozonedesignations/1997standards/documents/tsd/ch6.pdf, accessed 2/15/2012.

Because kriging is based on statistics, it allowed a surface to be generated that gave good indication of ozone concentrations in the Charlotte area. See Appendix A for input parameters for the kriging model.

The map shows a dark brown, circular pattern directly over the city of Charlotte with lighter shades as the distance from the downtown area increases. The darkest shading represents areas violating the ozone NAAQS in the downtown Charlotte area. The lighter shades moving out from the Charlotte area indicates a steep decrease in ozone concentrations. The ozone concentration gradient map shows a particularly steep decrease in ozone concentrations from Arrowood (37-119-1005) to York CMS (45-091-0006). The gradient map indicates ozone concentrations in York County are less than the 2008 ozone NAAQS**. The gradient map adds weight to the argument that York County, in its entirety, including the Catawba Indian Nation Reservation should be designated attainment.**

Figure A-5: Ozone Concentration Gradient Based on 2011 Ozone Design Values



Back Trajectory Analysis

The EPA's ozone siting guidance states "…the most significant amount of transported ozone and ozone precursors will come from the area where the winds enter the city."[10] Back trajectories indicate that monitors around Charlotte are impacted by local emissions from the Charlotte metropolitan area. Back trajectory analysis of *all* monitors in the Charlotte metropolitan area shows that approximately 80 percent of all air masses on days exceeding the ozone standard passed through the Charlotte metropolitan area suggesting that at least a portion of the ozone measured at the sites was formed locally. Please see Appendix A for detailed analysis of all exceedance days.

Charlotte Metropolitan Area Trajectory Analysis

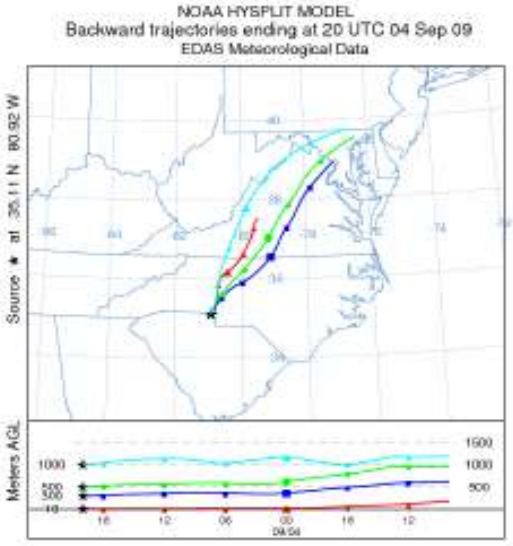
Thirty-six hour back trajectories were run using the HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory) model for each of the ozone monitoring sites in the Charlotte metropolitan area on days when the monitors measured exceedances of the ozone standard. The back trajectories were run using the NAM (North American Mesoscale Model) Data Assimilation System (EDAS) 40 kilometer grid at four different vertical heights (10 meters, 300 meters, 500 meters, and 1000 meters) beginning at 20 Coordinated Universal Time (UTC). A back trajectory allows the viewer to see where an air mass originated and where it travels before ending up at the impact location. **As stated previously, the EPA's ozone siting guidance states "…the most significant amount of transported ozone and ozone precursors will come from the area where the winds enter the city."[11]**

Four unique meteorological scenarios were identified on days exceeding the ozone standard in the Department's back trajectory analysis. These scenarios were called Charlotte Transport, non-Charlotte Transport, Stagnation and Northerly Stagnation. Please see Appendix A for a detailed, daily analysis of all days exceeding the ozone NAAQS.

Back trajectories categorized as Charlotte Transport (Figure A-6) were defined as trajectories that passed through the Charlotte metropolitan area before arriving at the monitoring site. Typically, these trajectories also traveled long distances before arriving at the monitoring site.

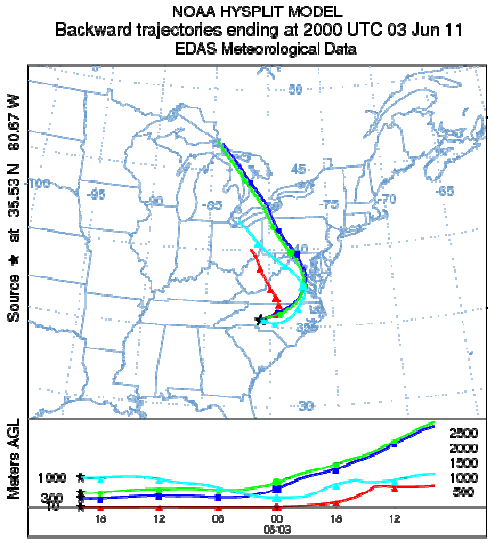
[10] Guideline on Ozone Monitoring Site Selection EPA-454/R-98-0002, 1998.
[11] Ibid.

Figure A-6: Example Back trajectory categorized as Charlotte Transport



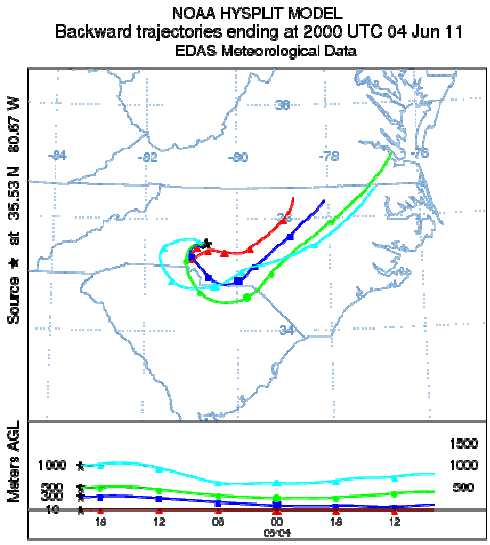
Back trajectories categorized as non-Charlotte Transport (Figure A-7) were defined as trajectories that mainly arrive at the monitor from directions that do not take the trajectory through the Charlotte metropolitan area. Typically, these trajectories also traveled long distances before arriving at the monitoring site.

Figure A-7: Example Back trajectory categorized as non-Charlotte Transport



Back trajectories categorized as Stagnation (Figure A-8) were defined as trajectories that were short in length, indicative of light and/or variable wind speeds and typically involved severe curving of the trajectory before arriving at the monitoring site.

Figure A-8: Example Back trajectory categorized as Stagnation



Finally, back trajectories categorized as Northerly Stagnation (Figure A-9) were defined as trajectories that had a component of transport and then began stagnating at the end of the model run with similar characteristics of those trajectories that were categorized as Stagnation.

Figure A-9: Example Back trajectory categorized as Northerly Stagnation

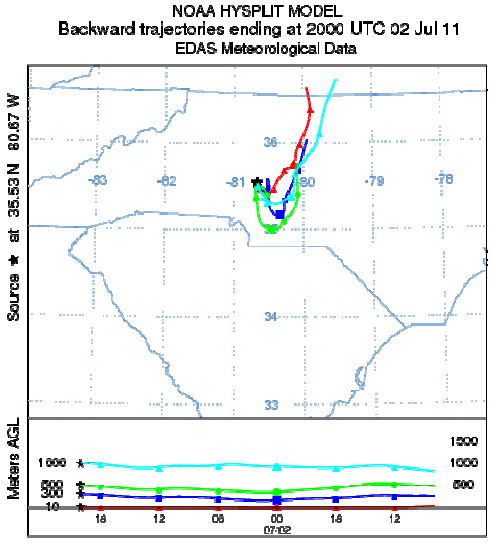


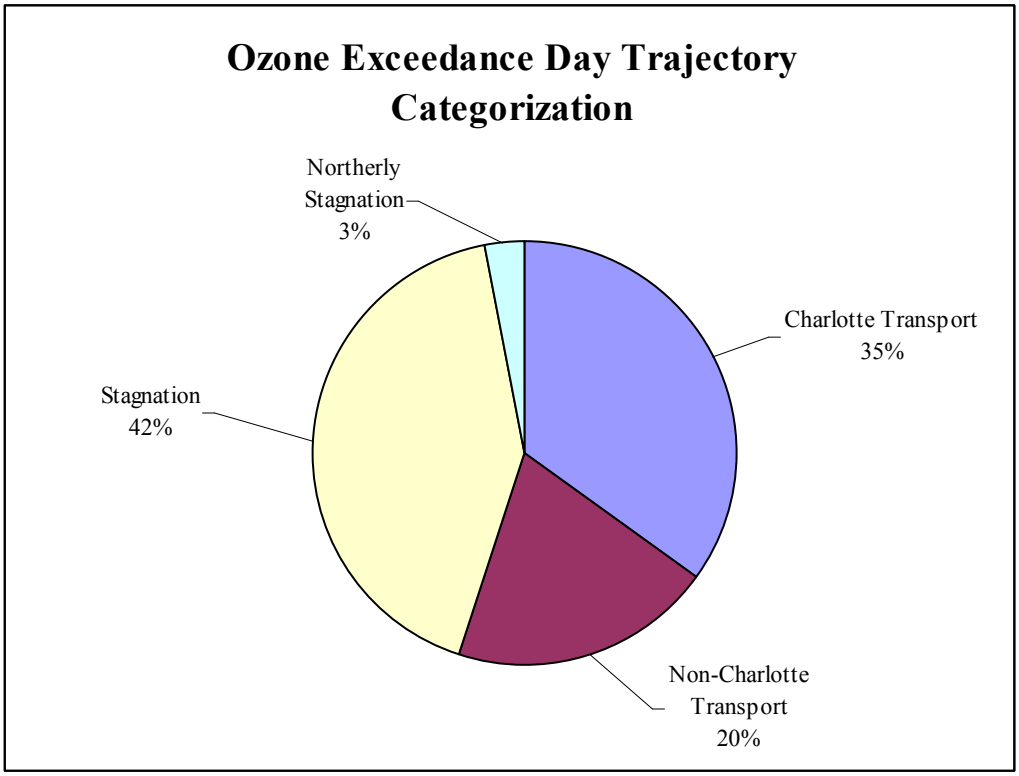
Table A-3 tabulates the trajectory scenarios noted for each monitoring station in the Charlotte metropolitan area. Figure A-10 shows that the majority of the ozone exceedance days are associated with

days classified as Stagnation. During the Department's analysis, it was noted the trajectories on days categorized as Stagnation tended to drift through the Charlotte metropolitan area before arriving at the monitor location. Approximately 80 percent of all air masses on days exceeding the ozone standard passed through the Charlotte metropolitan area suggesting that at least a portion of the ozone measured at the sites was formed locally.

Table A-3: Tabulation of Trajectory Scenarios on Ozone Exceedance Days

Scenario	Arrowood	County Line	Enochville	Garinger	Crouse	Monroe	Rockwell	Scenario Total
Charlotte Transport	10	7	4	7	2	1	4	35
Non-Charlotte Transport		4	2	6	3	2	3	20
Stagnation	3	12	7	8	3		9	42
Northerly Stagnation			2				1	3
Total trajectories categorized	13	23	15	21	8	3	17	100

Figure A-10: Back trajectory Categorization showing the majority of exceedance days occurs on days of stagnation



In conclusion, the ozone design values, ozone trends, concentration gradient and back trajectories indicate that York County has minimal impact on ozone exceedances in the Charlotte MSA. The weight of evidence supports the fact that York County, in its entirety, including the Catawba Indian Nation Reservation be designated attainment for the 2008 ozone NAAQS.

B. Factor 2: Emissions and Emissions-Related Data

Section B corresponds to EPA factors related to emissions data (location of sources and contribution to ozone concentrations); population density and degree of urbanization (including commercial development); traffic and commuting patterns; growth rates and patterns; and level of control of emission sources in the EPA's December 4, 2008, memorandum.

Since its inception, the Department has taken its responsibility to control sources of air pollution very seriously. Section 48-1-50 (Powers of Department) of the South Carolina Pollution Control Act gives the Department the authority to seek emission reductions from any source, regardless of where it is located, if it adversely impacts air quality. The Department has regulations that are more stringent and protective than federal requirements. The Department's action demonstrates our statutory authority, ability, and commitment to implement controls to improve air quality. A nonattainment designation does not provide any additional authority to address emissions where appropriate and needed.

Since being included in the Charlotte-Gastonia-Rock Hill, NC-SC (Metrolina) 1997 8-hour ozone nonattainment area, the Department, along with stakeholders has addressed the required Clean Air Act (CAA) elements and together have continued our commitment to improving air quality, consultation, and voluntary measures.

Emissions Inventory

South Carolina Air Pollution Control Regulation 61-62.1, Section III, Emission Inventory, states "The purposes of emissions inventories are to locate air pollution sources, to define the type and size of sources, to define the type and amount of emissions from each source, to determine pollutant frequency and duration, to determine the relative contributions to air pollution from classes of sources and of individual sources, to provide a basis for air permit fees, and to determine the adequacy of regulations and standards." Using emission inventory information, the Department has evaluated the contribution of sources of air pollutants and their controls to provide supporting information as to why York County, in its entirety should be designated attainment for the 2008 ozone NAAQS.

On June 1, 2011, the Department submitted a SIP revision for the Redesignation Demonstration and Maintenance Plan for the York County portion of the Metrolina 1997 8-hour ozone nonattainment area.[12] Per the requirements in the CAA, this SIP submittal included emissions information. The EPA is currently reviewing this SIP submittal. For the maintenance demonstration, a base year of 2010 was chosen for the purpose of emissions information since it is a year that falls within the attaining design value period of 2008-2010. For the purpose of providing supporting information as to why York County, in its entirety should be designated attainment for the 2008 ozone NAAQS, 2010 emissions data from this SIP revision will be referenced.

The 2011 emissions inventory is not available because states are required by the Air Emission Reporting Rule (AERR) (73 FR 76539) to submit complete emissions inventories on a three-year cycle. For the

[12] Revisions to SC SIP, submitted June 1, 2011, RFATS Redesignation Demonstration and Maintenance Plan; http://www.scdhec.gov/environment/baq/Metrolina-SC_Redesignation/

purpose of meeting the requirements of R. 61-62.1, Section III.C, Emissions Inventory Reporting Requirements, emissions data for 2011 is currently being received and reviewed. As required by this regulation, updated emissions submitted annually by permitted facilities in South Carolina are not due to the Department until the end of March. The last complete inventory summarized 2008 emissions. Irrespective of a new nonattainment designation no additional emissions inventory for this area is required.

Stationary Source Emission Controls in Partial York County

Emission reductions from the nonattainment designation process, including Nonattainment New Source Review (NSR) and Reasonably Available Control Technology (RACT) implementation have already been achieved in the proposed nonattainment area. New sources and modifications to existing sources will be subject to regulations sufficient to continue measured ozone level reductions.

The Department has primary responsibility for ensuring attainment and maintenance of the NAAQS established by EPA. Under Section 110 of the CAA and related provisions, the Department must submit for EPA approval SIP amendments that provide for the attainment and maintenance of such standards through control programs directed to sources of the pollutants involved. The Department also administers the NSR and Prevention of Significant Deterioration (PSD) programs for these pollutants.

Facilities in South Carolina can be divided into size groups based on their air operating permit types. Facilities with specific emissions potential under 100 tons per year (tpy) receive "state" operating permits, larger facilities that can accept emission limits to less than 100 tpy receive Conditional Major (CM, also known as a "federally enforceable state operating permit") permits, and facilities with potential controlled emissions over 100 tpy are required to obtain Title V (TV) permits. There are two TV facilities and nine CM facilities in the proposed York County nonattainment area. The largest TV source is a kraft paper mill (Resolute Forest Products, formerly Bowater); the second, Cytec Carbon Fibers, LLC, has major potential to emit (PTE) for VOC emissions, but not NO_X. The remaining facilities have state operating permits indicating potentials or limitations significantly under 100 tpy (see Table B-1, *Facility Submitted NO_X and VOC Emissions in the Proposed York County nonattainment area*[13]).

Resolute Forest Products underwent nonattainment new source review in 2006; NO_X "lowest available emission rate" (LAER) was applied to recovery furnace #3 and the current NO_X "best available control technology" (BACT) control on lime kiln #2 was determined to be LAER (with a reduced allowable emission rate). Based on the current levels of emissions (see Table B-1), it is unlikely that any of the remaining facilities will seek to expand operations sufficient to trigger additional LAER controls. Other than an unlikely second nonattainment new source review project on the Resolute Forest Products facility in the proposed York nonattainment area, it is improbable that this same area will see reduced emissions from being designated "nonattainment" for the 2008 ozone NAAQS.

The CAA requires that RACT be applied to major stationary sources of NO_X and VOCs located in ozone nonattainment areas. A major source is considered any source with the potential to emit 100 tons per year or more of NO_X or VOCs. Three facilities underwent RACT reviews as part of the 1997 Ozone NAAQS nonattainment review process:

(1) Bowater, Inc. (now Resolute Forest Products, Title V permit # 2440-0005);
(2) Cytec Carbon Fibers, LLC (Title V permit # 2440-0097); and
(3) Georgia Pacific Wood Products, LLC (now closed, with Title V permit # 2440-0026 revoked).
*There are no Control Technology Guidance (CTG) or other major non-CTG sources located in

[13] Information in Table B-1 and Figures B-1 and B-2 reflects data received from facility emission statements submitted by the facilities in the 1997 8-hour ozone Metrolina nonattainment area.

York County.
No additional emission reductions from RACT will be obtained by designating this same area as "nonattainment" for the 2008 Ozone NAAQS.

Existing state regulations will be able to address VOC and NO_X emissions from both existing and new sources in this area and the state as a whole. South Carolina has a robust minor source construction permitting program which includes review of aggregation of projects and major source thresholds. Our SIP-approved PSD program requires BACT for all new major sources (and major modifications to existing major sources) of VOC and NO_X. Further, South Carolina has state regulations in place that require BACT level controls on facilities emitting greater than 100 tpy of VOCs and NO_X. South Carolina Regulation 61-62.1, Standard 5.1 (State only) requires BACT level controls for sources in South Carolina with actual VOC emissions over 100 tpy. South Carolina Regulation 61-62.1, Standard 5.2 (State only) requires BACT level controls for sources in South Carolina with actual NO_x emissions over 100 tpy. Standard 5.2 also requires that sources replacing burners install low-NO_X burners. These regulations **will be sufficient to control emission increases and allow continued measured ozone level reductions.**

Table B-1: Facility Submitted NO_X & VOC Emissions in Proposed York County nonattainment area

2010 Facility Emissions (tons per year)			
NAME	**PERMIT #**	**2010 NO_x**	**2010 VOC**
RESOLUTE (ABIBOW)	2440-0005	1603.20	1108.89
CYTEC CF	2440-0097	49.40	32.90
INCHEM CORP	2440-0062	36.80	14.70
SAMUEL SS	2440-0187	6.37	0.35
TEREX LC	2440-0139	6.22	16.37
NATION F	2440-0039	5.80	22.00
ATLAS C	2440-0179	4.35	0.36
WINTHROP	2440-0084	4.19	0.30
BOGGS	9900-0338	3.72	6.79
PBI PP	2440-0181	1.59	23.65
SUNBELT	2440-0136	1.34	0.07
POLYMER P	2440-0086	< 1	<1
SCHAEFFLER-III &VI	2440-0150	0.44	23.82
HARRELL	2440-0109	0.40	1.40
SENTURY R	2440-0094	0.35	0.02
INTEGRATED PS	2440-0055	0.33	2.64
CARAUSTAR	2440-0076	0.24	0.02
AQUA SOL	2440-0192	0.24	82.68
TEREX HP	2440-0184	0.19	6.51
AMER ROLL	2440-0167	0.18	2.85
AVA	2440-0108	0.13	0.02
WIKOFF	2440-0016	0.10	4.20
THOMAS-CAROL	9900-0490	0.09	0.01
REA # 67	9900-0033	0.07	1.31
GREENE F	2440-0169	0.06	0.00
CEMEX CM	2440-0047	0.03	0.05
ATOTECH	2440-0106	0.03	0.00
CONCRETE SC	9900-0403	0.01	0.00
CL&D	2440-0143	0.01	12.55
MARTIN M	2440-0003	0.00	0.00
QUEEN CP	2440-0038	0.00	5.00
GENERAL C	2440-0114	0.00	0.00
CABINET C	2440-0124	0.00	0.91
OLDCASTLE-MID.	2440-0142	0.00	36.02
DMP	2440-0145	0.00	5.50
CATOES	2440-0146	0.00	0.59
OLDCASTLE-CEL	2440-0170	0.00	0.00
SEM P	2440-0198	0.00	8.39
READY MIX #104	9900-0202	0.00	0.00
THOMAS-CAR	9900-0296	0.00	0.00
PARKWAY CP	9900-0358	0.00	0.00
STEVENSON W	9900-0482	0.00	0.10

The charts in Figures B-1 and B-2 identify Resolute Forest Products as the major emitter of both NO_X and VOC in the proposed York County nonattainment area. Other sources are listed in Table B-1.

Figure B-1: 2010 Facility Submitted NO_X Emissions from Emissions Statements

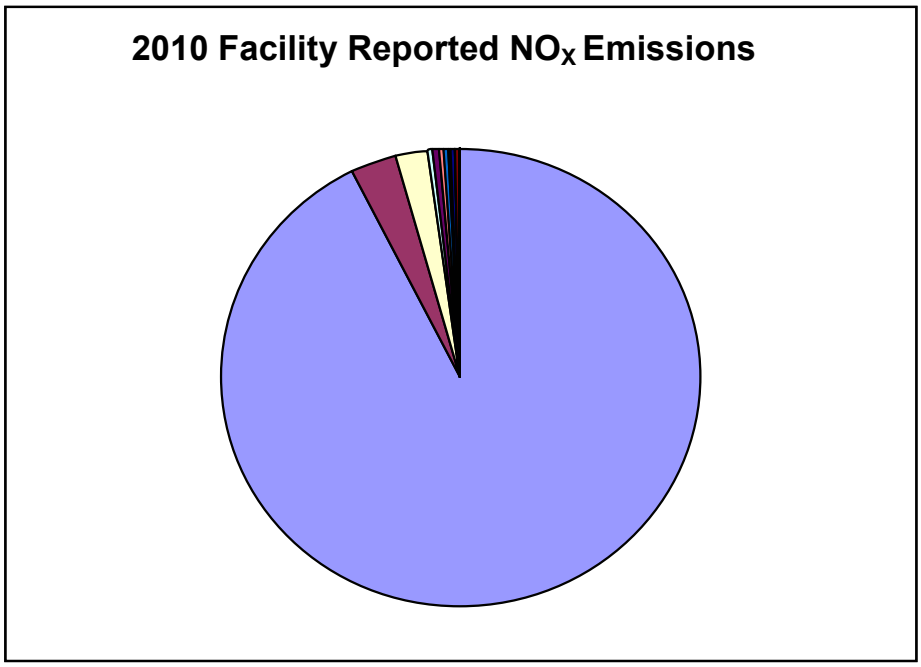
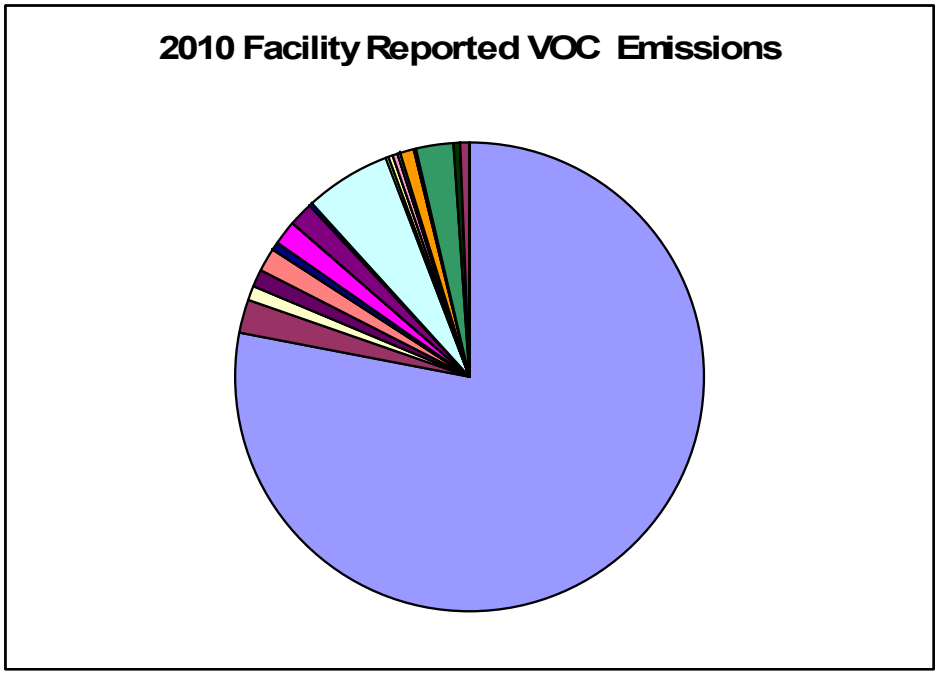


Figure B-2: 2010 Facility Submitted VOC Emissions from Emissions Statements



Reasonable Further Progress (RFP)

Section 182(b)(1) of the CAA mandates a 15 percent VOC emission reduction, accounting for growth, in the first six years after the baseline year (2002) for moderate and above ozone nonattainment areas. Thus, for the York County portion of the Metrolina 1997 8-hour ozone nonattainment area, a RFP analysis between 2002 and 2008 was required. The Department was further required to show continued progress from 2008 through the attainment date.

VOC Insignificance

In December 2009, the EPA Region 4 informed the Department they would not support a finding of VOC insignificance for the 1997 8-hour ozone York County nonattainment area. The Department continues to disagree with the EPA's position on VOC insignificance noting our review of the VOC insignificance criteria found in 40 CFR 93.109(k) indicates that the York County portion of the Metrolina 1997 8-hour ozone nonattainment area meets the criteria for VOC insignificance. Emission estimates indicate highway mobile VOC is a small percentage of the total VOC emissions inventory and highway mobile VOC emissions are projected to decrease in the future, notwithstanding vehicle miles traveled (VMT) increases. However, as a result, the RFP SIP, originally submitted in 2007 was amended (April 2010) with a 2008 VOC motor vehicle emissions budget (MVEB).

NO_X SIP Call

In October 1998, the EPA issued the "Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone" (63 FR 57356; October 27, 1998), commonly called the "NO_X SIP Call." The NO_X SIP Call created the NO_X Budget Trading Program, an emissions allowance trading program designed to reduce the amount of ozone that crosses state lines by limiting NO_X emissions from utilities and large industrial sources in the eastern United States.

The NO_X Budget Trading Program was effective in reducing NO_X emissions: By the end of 2008, ozone season emissions dropped by 62 percent from 2000 at all sources subject to the NO_X SIP Call[14]. South Carolina's NO_X budget for sources subject to the NO_X SIP Call was reduced from a baseline of 156,137 tons to 128,524 tons. This reflects a drop in overall, summertime NO_X emissions of 18 percent.

It follows that the York County portion of the Metrolina 1997 8-hour ozone nonattainment area benefited from these overall reductions, since it is part of the larger NO_X SIP Call area. The NO_X Budget Trading Program also reduced local emissions. The one source at the facility subject to the NO_X SIP Call in the portion of York County in the Metrolina nonattainment area, Resolute Forest Products, reduced ozone season NO_X emissions from 36 tons in 2003, the first year of the NO_X Budget Trading Program, to 14 tons in 2008, the final year of the NO_X Budget Trading Program.

In 2005, the EPA issued the Clean Air Interstate Rule ("CAIR") (70 FR 25162; May 12, 2005), which was intended to supplant the NO_X SIP Call. The DC Court of Appeals subsequently remanded CAIR to the EPA, which has developed the Cross State Air Pollution Rule (CASPR) as a replacement. However, on December 30, 2011, the DC Court of Appeals stayed CSAPR pending further review. The case, EME *Homer City v. EPA*, is scheduled for oral argument in March 2012.

Control of VOC Emissions from Sources Subject to CTG

In accordance with 40 CFR Part 51, Subpart X, Section 51.912 pertaining to moderate nonattainment areas under the 8-hour ozone NAAQS, the State is required to submit to the EPA an amendment to the SIP that includes the identification and implementation of "reasonably available control technology"

[14] EPA, NO_X Budget Trading Program: 2008 Highlights, October 2009, page 3, Available at http://www.epa.gov/airmarkets/progress/NBP_4/NBP_2008_Highlights.pdf, last accessed May 13, 2011.

(RACT). The SIP amendment must meet the NO_X and VOC RACT requirements in Sections 172(c)(1), 182(a)(2)(A), 182(b)(2), and 182(f) of the CAA.

In performing its analysis to meet the requirements at 182(b)(2), the State must submit a revision to its implementation plan to include RACT provisions for each category of VOC sources in the area covered by CTG document[15] issued by the EPA. The EPA published the initial list of these source categories in the *Federal Register* on March 23, 1995. Since then, the EPA has revised the list several times.

In its August 31, 2007, the RACT/Reasonably Available Control Measures (RACM) SIP and the Rock Hill-Fort Mill Area Transportation Study (RFATS) 1997 8-Hour Ozone Attainment Demonstration for the Metrolina nonattainment area was submitted by the Department. The analysis determined that there were no CTG sources located within the York County portion of the Metrolina nonattainment area (for the Group I and II source categories).

States are required to continue to address the following CTGs in their SIPs. Since the Department's aforementioned August 31, 2007, SIP submittal, determination and availability of the following CTGs have been finalized and addressed via negative declaration letters[16] along with Notices of General Public Interest published in the *South Carolina State Register*, and submitted to the EPA for approval.

Group III (Paper, Film, and Foil Coatings, Metal Furniture Coating and Large Appliance Coatings)
Final Rule - October 9, 2007 72 FR 57215
SIPs due - October 9, 2008

- The Department published a notice of intent to amend the SIP and an announcement of a 30-day comment period and public hearing in the *South Carolina State Register* on December 26, 2008. At the conclusion of the public comment period, a public hearing was offered on February 3, 2009. No comments from the public were received, nor was a public hearing requested. Therefore the final Amendment to the SIP took effect upon publication of the aforementioned notice in the *South Carolina State Register* on December 26, 2008.

Group IV (Miscellaneous Metal Products Coatings, Plastic Parts Coatings, Auto and Light Duty Truck Assembly Coatings, Fiberglass Boat Manufacturing, Miscellaneous Industrial Adhesives)
Final Rule – October 7, 2008 73 FR 58481
SIPs due – October 7, 2009

- The Department published a notice of intent to amend the SIP to address the Group IV CTG and an announcement of a 30-day comment period and public hearing in the *South Carolina State Register* on May 22, 2009. At the conclusion of the public comment period, a public hearing was offered on June 30, 2009. No comments from the public were received, nor was a public hearing requested. Therefore the final Amendment to the SIP took effect upon publication of the aforementioned notice in the *South Carolina State Register* on May 22, 2009.

[15] The CTG documents are prepared via CAA Section 183(e) which directs EPA to list regulation categories of consumer and commercial products that account for at least 80 percent of the VOC emissions in areas that violate the NAAQS for ozone. The CAA further directs EPA to divide the list of categories to be regulated into four groups.
[16] Mr. Steckel letter dated March 25, 2006, *Sample Language for Negative Declaration for use with 8-hour Ozone Reasonably Available Control Technology-State Implementation Plan (RACT SIP) Certification*.

In addition to noticing each of the remaining Group III and IV CTG applicability in the *South Carolina State Register* and the state's subsequent negative declaration letters to the EPA for the Group III and IV CTG sources, the Department performed an additional analysis for sources in the York County portion of the Metrolina 1997 8-hour ozone nonattainment area in the spring of 2011, in preparation of the aforementioned Redesignation and Maintenance Plan for the 1997 8-hour ozone NAAQS. As a result of this analysis, the Department has confirmed that its original analysis and subsequent re-examination of sources in the York County portion of the Metrolina nonattainment area are not subject to any of the CTG Rule requirements.

On November 28, 2011, the EPA published a direct final approval of the Department's RACT analysis as well as acknowledgement of the Department's negative declaration letters in the *Federal Register* (76 FR 72844). Therefore, in consultation, both the EPA and the Department have acknowledged that VOC emissions in both the existing York County portion of the Metrolina nonattainment area for the 1997 8-hour ozone NAAQS and in the EPA's proposed nonattainment area for the 2008 ozone NAAQS are already being controlled to the extent practicable. Furthermore, a new nonattainment designation will not trigger additional/more stringent requirements for CTG.

Emissions Data within the EPA Proposed Nonattainment Counties

As stated by EPA in their December 8, 2011, correspondence, "Table 3 shows emissions of NO_X and VOC (given in tons per year (type)) for violating and nearby counties that we considered for inclusion in the Charlotte-Gastonia-Salisbury, NC-SC area."[17] The EPA has proposed to designate a portion of York County, including the Catawba Indian Nation Reservation, nonattainment. The EPA appears to have misinterpreted the contribution of the proposed area because it used whole county data in their Table 3 and not partial county data for the portion of York County proposed nonattainment for the 2008 ozone NAAQS. This misinterpretation significantly exaggerates any alleged contributions the proposed partial York County area might make to air quality in the Charlotte area. In this response, wherever possible, the Department instead uses the relevant partial York County data rather than whole County data.

Comparison of emissions data provided from the EPA in April 2004 (the year represented by the data is not specified, herein after will be referred to as "2004 TSD")[18] and the 2011 TSD (the data represents the year 2008), show that NO_X and VOC emissions have decreased significantly in the Charlotte area counties proposed as nonattainment for the 2008 ozone NAAQS (Table B-2). Based on the amount of NO_X and VOC emitted, in 2004 the EPA designated a portion of York County nonattainment as contributing to a violation in the Charlotte area. In 2004, the EPA stated the total York County NO_X emissions to be 12,271 tpy. In 2011, the EPA stated the NO_X emissions for all of York County to be 7,031 tpy, ***a decrease of 43 percent.*** In 2004, the EPA stated the total county VOC emissions to be 16,584 tpy. For 2011, the total VOC emissions for all of York County are only 11,840 tpy, ***a decrease of 29 percent***. Although partial York County data is not provided by the EPA, it can be inferred from the marked decrease in emissions for York County, in its entirety, that partial York County emissions decreased significantly as well. Also, note that the percentage of reductions in both NO_X and VOC emissions in York County far exceeded the reduction in emissions for the remainder of the proposed Charlotte-Gastonia-Salisbury, NC-SC nonattainment area.

[17] December 8, 2011, EPA letter to South Carolina Governor Nikki Haley, with enclosed Technical Support Document, herein after referred to as "2011 TSD."

[18] April 2004, U.S. EPA Technical Support for State and Tribal Air Quality Designations and Classifications for the 1997 8-hour ozone NAAQS, herein after referred to as "2004 TSD."

Table B-2: Full County Emission Reductions from 2004 TSD to 2011 TSD

Emission Reductions from 2004 TSD to 2011 TSD						
	NO_x (tpy)			VOC (tpy)		
County	**2004 TSD**	**2011 TSD**	Percent (%) Reduction	**2004 TSD**	**2011 TSD**	Percent (%) Reduction
York, SC	12,271	7,031	**42.7**	16,584	11,840	**28.6**
Cabarrus	7,104	5,361	24.5	8,472	9,074	-7.1
Gaston	24,901	13,002	47.8	15,405	7,326	52.4
Iredell	11,719	10,261	12.4	16,454	10,815	34.3
Lincoln	2,973	2,097	29.5	4,423	3,320	24.9
Mecklenburg	30,404	27,275	10.3	35,341	33,412	5.5
Rowan	12,246	7,117	41.9	11,295	9,834	12.9
Union	5,120	5,190	-1.4	7,998	7,748	3.1
Total all NC counties	94,467	70,303	**25.6**	99,388	81,529	**18.0**

A decrease in emissions for York County, specifically the proposed nonattainment portion of York County is documented through the 2006 "retirement" of 2,493 tons of NO_X and 1,686 tons of VOCs when the former Celanese Acetate - Celriver Plant, now owned by Greens of Rock Hill, facility in the York County portion of the Metrolina 1997 8-hour ozone nonattainment area closed. The emissions could have been "banked" for future offsetting purposes. Retiring these emissions demonstrated South Carolina's commitment to improving air quality. Even with retiring this significant amount of emissions from the York County portion of the Metrolina 1997 8-hour ozone nonattainment area, modeling conducted indicated that the improvement to ozone levels in the Charlotte, North Carolina area was insignificant **(0.2 ppb)**.

In 2011, both South Carolina and North Carolina[19] submitted emissions data to the EPA in Redesignation Demonstration and Maintenance Plans for the Metrolina 1997 8-hour ozone nonattainment area. Using the information submitted in the respective states Redesignation Demonstration and Maintenance Plans, the following tables, B-2 and B-4, show a comparison of 2010 emissions in tons per day (tpd), for the EPA proposed nonattainment counties, **including partial York County, South Carolina**. For detailed discussion on how the emissions inventories were developed, see the corresponding appendices in the respective state submittals.

As represented by Table B-3, the proposed nonattainment portion of York County, including the Catawba Indian Nation Reservation, accounts for only 8.5 percent (20.97 tpd) of total NO_X emissions in 2010. Furthermore, in terms of on-road NO_X emissions, partial York County ranks sixth of the eight counties, with only 8.0 percent (12.05 tpd) of total on-road NO_X emissions (Table B-4). In addition, Table B-3 shows that NO_X emissions are projected to continue to decrease (39 percent) throughout the maintenance plan period. The on-road NO_X emissions are projected to decrease 63 percent during the same period.

[19] Revisions to NC SIP, submitted November 2, 2011, Redesignation Demonstration and Maintenance Plan for the 1997 Charlotte-Gastonia-Rock Hill, NC-SC 1997 8-hour Ozone Nonattainment Area

Table B-3: Total Man-Made NO_x Emissions for EPA's Proposed Nonattainment Counties (tpd)

Total Man-Made NO_x Emissions for EPA's Proposed Nonattainment Counties (tpd)					
County	**2010**	**2013**	**2016**	**2019**	**2022**
York, SC (partial)	20.97	17.28	14.87	13.49	12.86
Cabarrus	18.84	15.75	13.34	11.22	10.12
Gaston	40.68	21.82	18.47	16.87	13.94
Iredell (partial)	13.29	11.57	10.32	9.40	8.88
Lincoln	7.82	6.61	5.57	4.80	4.32
Mecklenburg	101.19	81.71	68.65	59.53	57.06
Rowan	23.02	16.09	13.20	11.54	10.67
Union	19.60	16.49	14.14	12.00	10.50
Total all NC counties	224.44	170.04	143.69	125.36	115.49

Table B-4: 2010 On-Road NO_x Emissions for EPA's Proposed Nonattainment Counties (tpd)

2010 On-Road NO_x Emissions for EPA's Proposed Nonattainment Counties (tpd)	
County	**On-Road Emissions**
Mecklenburg	69.21
Cabarrus	14.48
Gaston	13.64
Union	13.26
Rowan	12.96
York (partial)	**12.05**
Iredell (partial)	8.91
Lincoln	5.80

As represented by Table B-5, partial York County is sixth of eight counties in terms of total VOC emissions, and next to last in terms of both on-road VOC emissions and overall mobile VOC emissions. Partial York County accounts for only 8.7 percent (15.30 tpd) of total VOC emissions, and 5.5 percent (3.92 tpd) of on-road mobile VOC emissions (Table B-6). As is the case with NO_X, Table B-5 also shows that man-made VOC emissions are projected to continue to decrease (9.3 percent) throughout the maintenance plan period. The on-road VOC emissions are projected to decrease 45 percent during the same period.

The EPA, in its December 8, 2011, letter to South Carolina, did not mention the contribution of biogenic VOC emissions to the overall VOC emissions. Because of the magnitude of biogenic VOC emissions in the York County area, it would be negligent to overlook their significance. The biogenic VOC emissions (calculated for 2007 using met data) were 17,374 tpy for the whole York County. The 2008 man-made VOC emissions for the whole York County were 11,840 tpy. Biogenic VOC emissions are responsible for 60 percent of all VOC emissions in York County, and biogenic VOC emissions are 47 percent greater than man-made VOC emissions. Note that whole York County data were used because partial York County biogenic VOC emissions data were unavailable. Also, 2007 biogenic VOC data were the latest available and biogenic VOC emissions vary very little from year to year. Therefore, it is appropriate to compare 2007 biogenic VOC emissions with 2008 man-made VOC emissions.

Table B-5: Total Man-Made VOC Emissions for EPA's Proposed Nonattainment Counties (tpd)

Total Man-Made VOC Emissions for EPA's Proposed Nonattainment Counties (tpd)					
County	**2010**	**2013**	**2016**	**2019**	**2022**
York, SC (partial)	15.30	14.36	13.92	13.77	13.87
Cabarrus	15.53	13.81	12.78	12.18	11.91
Gaston	15.77	13.72	12.76	12.34	12.18
Iredell (partial)	9.05	7.90	7.19	6.69	6.40
Lincoln	7.86	7.23	6.80	6.60	6.52
Mecklenburg	75.62	66.32	60.29	57.86	57.51
Rowan	16.80	15.64	14.92	14.60	14.60
Union	20.73	19.39	18.58	18.39	18.48
Total all NC counties	161.36	144.01	133.32	128.66	127.60

Table B-6: 2010 On-Road VOC Emissions for EPA's Proposed Nonattainment Counties (tpd)

2010 On-Road VOC Emissions for EPA's Proposed Nonattainment Counties (tpd)	
County	**On-Road Emissions**
Mecklenburg	30.42
Cabarrus	7.54
Union	7.46
Rowan	6.32
Gaston	6.24
Iredell (partial)	5.51
York (partial)	**3.92**
Lincoln	3.21

The small contribution of partial York County to the NO_X and VOC emissions to the Charlotte-Gastonia-Salisbury NC-SC area further supports a designation of "attainment" for the entire York County. Back trajectories show that most exceedance days for the Charlotte area monitors coincide with winds from the north further supporting that the influence of the emissions from partial York County area to the Charlotte areas violations are minimal to nonexistent. The reduction in emissions for the proposed York County nonattainment area between the 2004 TSD and the 2011 TSD, back trajectory evidence, the relatively minimal VOC and NO_X emissions, and the projected continuing decline in emissions (Tables B-3 and B-5) support the conclusion that York County, in its entirety, including the Catawba Indian Nation Reservation, be designated "attainment" for the 2008 ozone NAAQS. (See Appendix B)

Population Density and Degree of Urbanization

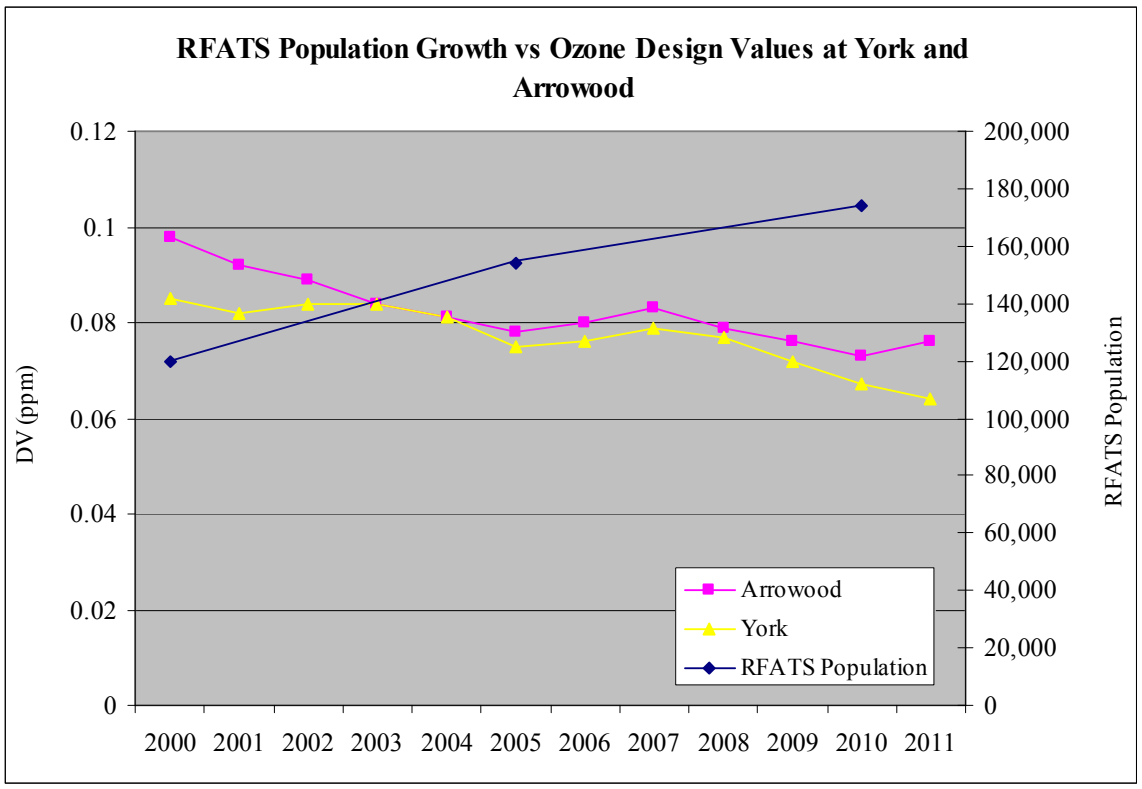
Table 4 from the EPA's 2011 TSD shows population and growth for each county in the Charlotte-Gastonia-Salisbury Combined Statistical Area (CSA), including the entire York County. EPA appears to have again misinterpreted the data in Table 4 because they used whole county data and not partial county data for York County. Since only part of the county is being proposed as nonattainment, it would be appropriate and more representative to use data for that area only. The 2010 population of the portion of York County, including the Catawba Indian Nation Reservation, that EPA has proposed as nonattainment is 173,881 (see *email – RFATS 2010 population*, Appendix B), not 226,073 as included on Table 4. The population for the proposed nonattainment area represents only 8.5 percent of the total population of those counties listed in Table 4 that are included in the EPA proposed nonattainment counties.

Between 2000 and 2005, the population of RFATS grew from 119,505 (see *email-RFATS 2000*

population-Appendix B) to 153,900 (see *email-RFATS 2005 population*, Appendix B), a 28.8 percent increase (5.7 percent annual average). However, in the most recent five-year period (2006 – 2010), the population grew at less than half that rate, from 153,900 to 173,881, a 13 percent increase (2.6 percent annual average). The rate of population growth has dropped more than 50 percent in the most recent five-year period.

It should be noted that while the RFATS MPO has experienced this population growth, the ozone design values in the Charlotte area, including the York County ozone monitor, have steadily decreased. If an area with dense population growth is an indicator to appropriately include as part of a nonattainment area, then you would expect the results of that growth to also be indicated through ozone monitoring design values. Figure B-3, clearly shows the increase in population versus the **decrease in ozone design values**. Because the population is for the RFATS MPO, the Department chose to only show design values from the two closest ozone monitors (York CMS and Arrowood).

Figure B-3: RFATS Population Growth versus Ozone Design Values



This information is further supported by analyzing the city of Rock Hill, South Carolina, residential building permits as provided by http://www.city-data.com/city/Rock-Hill-South-Carolina.html. The City of Rock Hill is the largest municipality contained within the South Carolina portion of the proposed nonattainment area. Between 2000 and 2010, the city of Rock Hill issued 6,185 single family residential building permits. Between 2007 and 2010 Rock Hill issued only 970 permits or 15.7 percent of the total for the decade. An even distribution would predict 36.4 percent of the permits for this time period.

The population for the portion of York County relative to the rest of EPA's proposed nonattainment area, the continued decrease in the ozone design values, regardless of the population growth, as well as the slowing of population growth and development, further supports the conclusion that York County, in its

entirety, including the Catawba Indian Nation Reservation, be designated "attainment."

Traffic VMT Data and Commuting Patterns

York County residents comprise only 5.0 percent of Mecklenburg County's workforce. Not all of the York County residents commuting to Mecklenburg County reside within the proposed nonattainment portion of York County, including the Catawba Indian Nation Reservation. Therefore, it is reasonable to assume the workforce from the York County portion of the EPA proposed nonattainment area is less than 5.0 percent. Of workers residing in Mecklenburg County, 4,217 or 1.2 percent commute to jobs in York County. As it is unlikely that all of the Mecklenburg County residents commuting to York County work in the proposed nonattainment portion of the county, including the Catawba Indian Nation Reservation, the number of Mecklenburg County commuters working in that portion could be less than 4,217.

In 2004, one of the EPA's reasons for designating a portion of York County nonattainment was that 94 percent of all the people in York County commute to work. However, only 5 percent of the total Mecklenburg County workers actually come from York County. We believe that in 2004, the EPA severely overstated the contribution of York County commuters to Charlotte's ozone concentrations. The EPA considered York County, in its entirety, for number of people commuting. This misrepresentation suggested a significant contribution where none exists. For further support of this conclusion refer to the Monitoring Data Trends, Scale and Concentration Gradient, and Back Trajectory discussions in Section A. Factors 1 and 3 - Air Quality Data and Meteorology.

Table 5 from the EPA's 2011 TSD shows VMT for all counties in the Charlotte-Gastonia-Salisbury CSA. Table B-7 shows VMT comparison for only those counties included in the EPA proposed nonattainment area, including partial York County. In its 2011 TSD, the EPA states that VMT of greater than 1,790 million miles supports a preliminary conclusion that the counties contribute to nonattainment.

Using projected 2011 VMT for both York County and partial York County from Metrolina model runs done by the Charlotte Department of Transportation (CDOT) in 2009, a ratio was developed to apply to 2008 full York County VMT in order to estimate 2008 partial York County VMT to provide a more accurate comparison. Using this process 2008 VMT was estimated at 1,611 million miles.

In a conference call on February 16, 2012, EPA questioned why 2010 partial county VMT from the Redesignation Demonstration and Maintenance Plan submitted in 2011 was not used. In response to this inquiry, a second ratio was developed based on Metrolina model data from the 2011 submission (see Appendix B). The Department already had 2010 annual average daily VMT (AADVMT) for the partial county from CDOT, which was used in developing the maintenance plan budgets. The Department requested and received 2010 whole York County AADVMT from the same model run from CDOT to determine a ratio using 2010 data which resulted in partial county VMT of 1,653 million miles (See Appendix B for a detailed explanation of this calculation).

As previously referenced, the EPA has identified a VMT of greater than 1790 million miles as "contribute to nonattainment." The 2010 partial county VMT of 1653 million miles is well below the VMT the EPA established that would support the conclusion that a county/partial county is contributing to nonattainment of the Charlotte area and represents just 6.8 percent of the proposed area's VMT. Therefore, this further supports the conclusion that York County, in its entirety, including the Catawba Indian Nation Reservation, should be designated "attainment."

Table B-7: VMT Data

EPA Proposed Nonattainment Counties	2008 VMT (million miles)	Percentage (%) VMT
Mecklenburg, NC	11,315	46.6
Iredell, NC (partial)	2,558	10.5
Gaston, NC	2,347	9.7
Cabarrus, NC	1,982	8.2
Rowan, NC	1,816	7.5
Union, NC	1,791	7.4
EPA's cutoff for 2008 VMT that supports an area contributing to nonattainment	*1,790*	
York, SC (partial)	1,653	6.8
Lincoln, NC	805	3.3
Area wide:	24, 267	100

Local Emission Control Efforts

The Rock Hill area of South Carolina has been actively involved with numerous emission reduction programs that impact both mobile and stationary sources. Because of the area's efforts in these projects, air quality in the region has steadily improved. Below is a list of projects that are being planned or have been implemented in the Rock Hill area and show the areas commitment to emission reduction strategies.

- Sustainable Environment for Quality of Life (SEQL) evolved into a regional visioning effort known as CONNECT. The effort built on work already accomplished in local communities and identified 6 core values. By highlighting common values and principles, it is believed that we can work collectively to protect our assets for the future and expand our opportunities for sustainable growth. The City of Rock Hill, RFATS, as well as the Catawba Indian Nation and the Catawba Council of Government (COG) are working on a Sustainable Communities Initiative Grant that will help the region to implement the CONNECT program. CONNECT supports families and communities in ways that also sustain quality of life and the environment. Goals of the program are to provide sustainable, well managed growth for quality of life, preserving the environment and maintaining the efficiency of infrastructure investment, a safe and healthy environment with good air and water quality, and a strong, diverse economy that provides jobs throughout the region.

- The Catawba Indian Nation Reservation, which has been specifically included in the EPA proposed nonattainment area, is completing an Energy Efficiency and Conservation Block Grant application and has received other energy grants. They plan to retrofit three tribal buildings and target reservation residences with seminars, energy audits, and retrofits. They are also seeking training for tribal members to do audits and retrofits.

- The City of Rock Hill was awarded the 2010 Palmetto State Greenest Fleet for their commitment to improving air quality, reducing dependence on foreign oil and saving taxpayers' dollars by utilizing a wide array of alternative fuels and technologies. The city offset 122,103 gallons of gasoline equivalents and 1,158.4 tons of greenhouse gas emissions by using ethanol (E85) in 109 of its vehicles, biodiesel (B20) in 87 of its light and heavy duty vehicles, compressed natural gas in two light duty vehicles, six low speed electric vehicles, and auxiliary power battery units in 24 police cruisers.

- The RFATS MPO is participating in the Charlotte Region High Occupancy Vehicle (HOV) lane study for I-77. In addition, several emission reducing projects have received Congestion Mitigation & Air Quality Improvement Programs (CMAQ). Specific projects include traffic signal synchronization and controller upgrades on all major arterial roadways within the City of Rock Hill, priority intersection improvement projects as reflected in RFATS Congestion Management Plan (CMP), the incorporation of alternative fuel vehicles and targeted fueling stations, and bike/pedestrian projects supporting high activity locations. Between 2008 and 2011, RFATS CMAQ Improvement Programs reduced NO_X emissions by 1,787 tons and VOC emissions by 1,189 tons.

- Launched spring 2006, *Clean Air Works!* is a project of the Regional Air Quality Board, in collaboration with the City of Charlotte, Mecklenburg County, Charlotte Area Transit System (CATS), the Charlotte Chamber of Commerce, the Centralina COG, and the Catawba Regional COG. The project engages employers in the effort to improve air quality by providing them with tools to help their employees take control of their commutes, and by assisting in retooling operations and maintenance activities to reduce emissions. SC participants included Resolute Forest Products (largest facility in the RFATS nonattainment area has reduced over 20,000 pounds of NO_X per month since 2006), York Technical College, Winthrop University, CIGNA, and the *Rock Hill Herald*.

- RFATS completed a comprehensive Major Investment Study (MIS) in 2007 that resulted in the identification of a locally preferred alternative for a rapid transit option that would link up with the Charlotte Area Transit System's Blue Line Light Rail Station in South Charlotte. Although this is a longer term initiative, the City of Rock Hill, York County and the Town of Fort Mill are actively working on land use coordination along the preferred alignment of US 21. This action is designed to preserve and protect this corridor for the eventual incorporation of a Bus Rapid Transit system.

- RFATS is currently undertaking a feasibility study assessing the potential for a new Catawba River Bridge Crossing. This facility would provide a direct connection between highly traveled corridors that serve Rock Hill, Fort Mill and the northeastern portion of York County (i.e., the identified high growth areas within the MPO). This type of transportation system upgrade would result in a more balanced distribution of area traffic flow; lessen unnecessary vehicle idling and provide a much needed secondary route to the interstate during peak driving periods and emergency management situations.

- The City of Rock Hill and the CATS, jointly support an Express Commuter Bus Service (known as the Rock Hill Express) that provides transportation from Downtown Rock Hill to the Charlotte Transportation Center, Monday through Friday during the morning and evening peak driving periods. This service has been in operation for approximately 8 years and frequently runs at near capacity.

- Pennies for Progress: The *Pennies for Progress* programs were initiated by York County to provide the citizens with a safer and more efficient roadway system. On August 2, 2011, the citizens of York County approved the 'Pennies for Progress 3' program, with 82 percent of the voters in favor. The City of Rock Hill and York County Pennies for Progress included wording in contracts that address idling by contractors during performance of work.

- In 2011, York County Natural Gas Authority installed a public access compressed natural gas (CNG) filling station at their headquarters on Main Street in Rock Hill.

- In 2011, the City of Rock Hill installed a time fill and fast fill CNG filling station at the new operations center.

- The City of Rock Hill has electric vehicle charging stations at Manchester Meadows, Cherry Park, the airport, the downtown parking deck, and the operations center which are available to the public.

- In 2011, Lake Wylie Marina (located in the EPA proposed nonattainment area) repowered its 2000 Wiggins "Marina Bull" forklift by installing a new Tier 2 certified diesel engine. The marina was awarded $11,057.96 from the ARRA DERA grant and leveraged it with $1,228.66 for a total project of $12,286.62. This engine repower will result in emissions reductions of 1.8 tons of NO_X and 0.14 tons of $PM_{2.5}$ over the lifetime of the equipment.

- In 2010, Sutton Construction Company (located in York County) repowered a Caterpillar 140G Motor Grader by installing a new Tier 1 compliant engine. Sutton was awarded $26,617.61 from the ARRA DERA grant. This engine repower will result in emissions reductions of 3.6 tons of NO_X and 0.3 tons of $PM_{2.5}$ over the lifetime of the equipment.

- The Catawba COG, Rock Hill Clean and Green, York County Government, City of Rock Hill, Palmetto State Clean Fuels Coalition, and SEQL collaborated with the Department on a gas can exchange held in 2004. A total of 110 old cans were turned in and replaced with newer, environmentally friendly cans.

- York County held a lawn mower exchange in 2006, 2007, and 2009. In 2009, a total of 54 gas powered mowers were exchanged resulting in the potential emission reduction of 6.40 pounds per year of NO_X. Through public/private partnership funding, many participants were offered a subsidy of approximately $100.00 off of the reduced cost of an electric lawnmower with a gas-powered trade-in.

- South Carolina has two current school bus retrofit projects, a Santee Cooper Supplemental Environmental Project (SEP) project that involves installation of diesel particulate filters, and a Clean School Bus USA grant involving installations of diesel oxidation catalysts, crankcase ventilation systems, and anti-idling hardware. The 2007 Clean School Bus USA grant provided a plug-in hybrid electric bus with an emission compliant diesel engine fueled with ultra-low sulfur diesel in Rock Hill School District 3.

- The Department's B2 (Breathe Better) program is an anti-idling/clean air campaign. The goal of B2 is to help protect the health and safety of children by reducing harmful vehicle emissions around school campuses. Solutions involve the efforts of students, faculty, administration, staff, local government and community partners working together. The Breathe Better anti-idling program has been implemented at the following schools in York County:
  - York Comprehensive High School
  - Clover High School
  - Crowders Creek Elementary School
  - Gold Hill Middle School
  - Orchard Park Elementary School
  - Riverview Elementary School
  - Springfield Elementary School
  - Springfield Middle School
  - Sugar Creek Elementary School
  - St. Anne's Catholic School

- Westminster Catawba Christian School
- Dutchman Creek Middle School
- Ebenezer Ave Elementary School
- Ebinport Elementary School
- India Hook Elementary School
- Mt. Gallant Elementary School
- Mt. Holly Elementary School
- Oakdale Elementary School
- Richmond Drive Elementary
- Rock Hill High School
- Sullivan Middle School
- York Road Elementary School

- As part of the National Clean Diesel Campaign, York Technical College received a grant to retrofit non-road equipment with diesel oxidation catalysts. The catalysts will be installed on 50 vehicles, including backhoes, bulldozers, motor graders, and others from the fleets of the City of Rock Hill, the South Carolina Department of Transportation (SCDOT), and York County.

- The City of Rock Hill and York County jointly support a demand response transportation service known as York County Access. This service, frequently referred to as "Dial-A-Ride," arranges for vehicles to pick-up and drop-off passengers within rural York County and the City of Rock Hill.

- In 2006, Duke Energy launched a pilot program to subsidize public transportation costs for Charlotte area employees as part of the company's commitment to the environment and its ongoing efforts to help reduce ozone related emissions. The pilot program provided subsidies and incentives around bus transit, carpools, and vanpools for full time and part time employees who work at the following Duke Energy locations: Catawba Nuclear Station (York, SC), Customer Contact Center (University Research Park), McGuire Nuclear Station (Huntersville, NC), and uptown Charlotte.

- South Carolina's citizens are informed on a daily basis during ozone forecasting season as to the predicted quality of the air so that they may take actions as appropriate to better protect their health. EnviroFlash has been configured and activated for South Carolina's Catawba region. The Catawba region includes York, Chester, and Lancaster counties. The Department has also created a Twitter account for the region to get the ground-level ozone forecast. Commuters are also notified of ground-level ozone alerts via SCDOT roadside signs.

- Based on traffic studies, York County staff updated zoning and subdivision regulations to require sidewalks and lower thresholds for requiring deceleration and left-hand turn lanes into developments.

- In 2011, York County, the City of Rock Hill, and the SCDOT partnered to construct approximately 1 mile of sidewalk along urban, cut-through streets in a residential area containing an elementary school to connect existing sidewalk networks to new sidewalk being constructed on SC 322.

- Methods of improving bicycle access to major York County Government facilities are being pursued through requests for bicycle racks adjacent to municipal parking lots.

- Additional multi-use path sites are being identified to connect existing bicycle routes to planned locations of the Carolina Thread Trail, with the ultimate goal of increasing bicycle commuting between rural and urban areas.

- Funding from the Southeast Biofuels Infrastructure Grant provided seven new alternate fuel stations; two located in York County.

- York County replaced an old compacter with a newer, cleaner roller compacter. The total project cost was $131,000.

- Resolute Forest Products held several awareness events annually during the ozone season. The most recent event included the sale of compact fluorescent light (CFLs) and electric lawn mowers, and gas cap checks/replacement. Carpool matching and rewards program and anti-idling efforts are ongoing.

C. Factor 4: Geography/topography (mountain ranges or other air basin boundaries)

Section C corresponds to the factor related to geography/topography (mountain ranges or other air basin boundaries) in the EPA's December 4, 2008, memorandum.

The EPA's 2011 TSD stated this factor did not play a significant role in this evaluation. Information describing the overall topography of South Carolina was submitted to the EPA in the original ozone boundary recommendation[20] and should be referenced by the EPA. South Carolina will not be providing additional data at this time.

D. Factor 5: Jurisdictional boundaries

Section D corresponds to the factor related to jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Reservations, MPOs) in the EPA's December 4, 2008, memorandum.

The Department is proposing that York County, in its entirety, including the Catawba Indian Nation Reservation be designated attainment for the 2008 8-hour ozone NAAQS.

As previously stated, the EPA should defer to state recommendations for designating areas for any of the NAAQS. South Carolina's experience with the Metrolina nonattainment area has demonstrated the challenges and complexities of multi-state nonattainment area designations. It is quite apparent that the nonattainment designation and the time spent fulfilling its obligations are not what has improved air quality, but instead the process has consumed significant local, state, and federal resources that would have been better utilized for real air quality improvements.

Tribal Consultation

Department staff has had numerous conversations with representatives of the Catawba Indian Nation Reservation regarding the EPA's proposed nonattainment designation of partial York County to include the Catawba Indian Nation Reservation. Representatives of the Catawba Indian Nation Reservation are aware of the air quality issues we face and are both active and committed to finding ways to voluntarily reduce emissions. The Department has committed to placing a special purpose ozone monitoring station within the boundaries of the Catawba Indian Nation Reservation.

Core Based Statistical Areas

The EPA's designation guidance[21] for the 2008 8-hour ozone NAAQS recommended examining the 5

[20] March 10, 2009, South Carolina Ozone Nonattainment Boundary Recommendations

[21] EPA memorandum from Robert J. Meyers, December 4, 2008, Area Designations for the 2008 Ozone National Ambient Air Quality Standards

factors with respect to the larger of the CSA or Core Based Statistical Area (CBSA) associated with the violating monitor because certain factors used to establish CSAs and CBSAs are similar to the factors EPA is using in their technical analysis to determine if a nearby area is contributing to a violation of the 2008 ozone NAAQS. The EPA's TSD included a similar approach required by Congress in 1990 for areas classified as serious or above for the 1-hour ozone standard and the EPA used the same basic approach in the designation process for the 1997 ozone NAAQS.

The term CBSA is a collective term for both metropolitan and micropolitan statistical areas (metro and micro areas). Metro and micro areas are geographic entities defined by the U.S. Office of Management and Budget (OMB) for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics**.**

According to the OMB, the definition of a metropolitan area for statistical purposes includes the collection, tabulation, and publication of data by federal agencies for geographic areas to facilitate the uniform use and comparability of data on a national scale. The Department asserts that designating areas under the NAAQS is indeed a nonstatistical program.

CBSA boundaries are based on city and county populations in urbanized areas, with "outlying counties" being included in the CBSA contingent upon their commuting patterns into the central counties. Under the standards, the county (or counties) that contains the largest city becomes the "central county" (counties), along with any adjacent counties that have at least 50 percent of their populations in the urbanized area surrounding the largest city. The Department has stated in the past and we reiterate with this submittal, that Congress intent for use of CSA/CBSA as a presumptive boundary was for those areas designated as serious or above.

For EPA to default to a presumptive boundary for "consistency" purposes stifles the creativity to improve air quality as expeditiously as possible to bring clean air to the public. EPA's broad-brush approach discourages initiatives by local areas, counties, and states to be proactive. Further, for EPA to default to its presumptive boundaries rather than allowing the use of its published criteria significantly changes Congressional intent and EPA's guidelines to a "presumptive norm." Over the last decade, local areas have focused on those emission reduction strategies that make sense and actually benefit the local area. Areas implemented local strategies that probably would not have been implemented had the area been required to focus on those "traditional" prescriptive measures.

E. Additional Supporting Information

Stakeholder Involvement and Support (Appendix C)

On January 18, 2012, in a letter from Governor Nikki Haley to EPA Administrator Lisa Jackson, Governor Haley expressed her strong disagreement with the EPA preliminary decision to include the urbanized portion of York County in the Charlotte, North Carolina nonattainment designations for the 2008 8-hour ozone standard and urged the EPA to consider the Department's additional evidence and exclude York County from the nonattainment area.

On January 17, 2012, in a letter to the Air Docket from Dale Herendeen, Resolute Forest Products, Catawba Operations, Resolute Forest Products expressed its continuing support for South Carolina's boundary recommendation submitted October 11, 2011, requesting that all of South Carolina be designated attainment for the 2008 ozone NAAQS. This facility employs approximately 800 people and is located inside the 1997 8-hour ozone Metrolina nonattainment area. This facility was required to undergo the long and complicated process of Nonattainment New Source Review in 2006. Two of the major units were required to undergo LAER review, obtain offsets, and install NO_X CEMs. The offsets

increased the capital cost of the project by 5 percent with no financial return. The facility has also undergone PSD review. In addition, the facility promotes and has implemented voluntary emission reductions with employees and other local stakeholders.

On January 27, 2012, in a letter to Ms. Gwendolyn Keyes Fleming, Regional Administrator for EPA Region 4, the RFATS MPO Policy Committee supported the Departments recommendation to designate all of York County, South Carolina as attainment with the 2008 ozone standard.

On February 2, 2012, the Board of Directors of the Catawba Regional COG in South Carolina adopted a resolution requesting the EPA follow the Department's recommendation to designate all of York County as attainment for the 2008 ozone standard. A copy of this resolution was sent to Ms. Lisa Jackson, EPA Administrator on February 16, 2012.

F. Conclusion

Based on the Department's further review and assessment of the five factors (Sections A through D) as well as additional supporting information (Section E) the Department stands firm in its conclusion that it is appropriate for the EPA to designate York County, in its entirety, including the Catawba Indian Nation Reservation, "attainment" for the 2008 ozone NAAQS.

The Department has shown throughout this documentation that York County does not significantly contribute to a violation of the 2008 ozone NAAQS in the Charlotte-Gastonia-Salisbury, NC-SC CSA/CBSA. This conclusion is based on: air quality and meteorology data including back trajectory and spatial analysis showing that Charlotte is contributing to the majority of its ozone violations; the small amount of emissions from sources in the partial York County area; this area has VMT of only 1,653 million miles when EPA has used 1,790 million miles of VMT as "contributing to nonattainment"; the ozone monitoring station in York County is attaining the 2008 8-hour ozone NAAQS; the significant reduction in emissions since the 2004 designations to include the retirement of 2,500 tons of NO_X from a closed facility in this partial York County; "zeroing out" these 2,500 tons of NO_X only reduced ozone concentrations at one ozone monitor on the outskirts of the region by 0.2 ppb; and, the projected continuing decline in emissions.

It is for the reasons detailed in the attached documentation, that South Carolina disagrees with the rationale and data that the EPA used in its proposed modification to the Department's recommended designation request. **Therefore, South Carolina again formally requests that York County, in its entirety, including the Catawba Indian Nation Reservation be designated "attainment" for the 2008 8-hour ozone NAAQS.**

Appendix A
Factor 1 & 3 Justification
Air Quality Data and Meteorology

Air Quality Data and Meteorology:

This information is presented based on conversations and consultation between US Environmental Protection Agency (EPA) Region 4 staff and the South Carolina Department of Health and Environmental Control (SCDHEC or Department) staff on February 9 and 15, 2012. During these consultation meetings, the EPA requested additional information and rationale on air quality data and meteorology information expected to be used in the Department's response to the EPA's proposed modification to the State's recommended designation request for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS). The information presented here explains how the Department arrived at its back trajectory analysis and ozone concentration gradient map to include the automated trajectory script to develop the back trajectory maps, as well as resources supporting the Department's application of spatial analysis (more specifically kriging) in their assessment of ambient air quality. The Department believes that this data is essential in supporting its claim that the aforementioned portion of York County does not contribute to a violation of the 2008 ozone NAAQS in the Charlotte-Gastonia-Salisbury, NC-SC CSA/CBSA. This assertion is based primarily on a back trajectory analysis (see below) that indicates that all of the Charlotte area monitors are being impacted by local plumes from Charlotte or are indicative of stagnation with recirculation. The Department believes that the back trajectory analysis in conjunction with the spatial analysis of ozone design values suggest that ozone concentrations decrease rapidly from the southern side of Charlotte to York County, again indicating that EPA's proposed portion of York County does not contribute to a violation of the 2008 ozone NAAQS.

Electronic Mail Correspondence and Resources:

http://www.epa.gov/airtrends/specialstudies/dsisurfaces.pdf, accessed 2/15/2012
http://support.esri.com/en/knowledgebase/gisdictionary/term/kriging
http://www.epa.gov/ozonedesignations/1997standards/documents/tsd/ch6.pdf, accessed 2/15/2012

Background on South Carolina's Back Trajectory Analysis

Thirty-six hour back trajectories were run using the HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory) model for each of the ozone monitoring sites in the Charlotte metropolitan area on days when the monitors had exceedances of the ozone standard (daily maximum 8-hour average greater than 0.075 ppb). Coordinates for each monitoring site along with the daily maximum ozone 8-hour averages were obtained from the Environmental Protection Agency (EPA) Air Quality System database.

The back trajectories were run using the NAM (North American Mesoscale Model) Eta Data Assimilation System (EDAS) 40 kilometer grid at four different vertical heights (10 meters, 300 meters, 500 meters, and 1000 meters). Back trajectory meteorological files are downloaded from the National Oceanic and Atmospheric Administration (NOAA) Air Resources Laboratory website (ftp://arlftp.arlhq.noaa.gov/pub/archives/edas40).

Back trajectories were run beginning at 20 Coordinated Universal Time (or 1600 Eastern Daylight Savings Time) which is typically thought to be the hour of maximum ozone production. This hour was selected so the Department of Health and Environmental Control (Department) could determine areas the air mass moved through on days with high ozone averages. The trajectories are run for 36 hours to include the position of the air mass during the previous day's morning rush hour.

Once the trajectories and maps were created, the maps were categorized into different scenarios for each monitoring site to describe the different meteorological conditions that occurred on each exceedance day.

Automated Trajectory Script

The script below was modified from a version obtained from NOAA/North Carolina Department of Environment and Natural Resources (NCDENR). This script reads meteorological files downloaded from the NOAA ARL ftp site and runs daily back trajectories for the site(s) selected at four heights for thirty-six hours. Italicized text are parts of the code that refers to the Department's internal hard drives and will need to be changed in order to run the code on computers outside of the Air Data Analysis and Support Section servers.

```
# Auto_traj.tcl
# the next line restarts using wish \
# exec wish "$0" "$@"

# sample tcl script to demonstrate how multiple
# trajectory calculations can be performed by
# dynamically creating the model's input control
# file in a loop, then executing the model, creating
# a different named output file with each execution.
# This script should be modified to vary the parameters
# required for the simulation.

set site_name Various
set threshold 34.1
```

```
set hour 20

foreach {site_name Start_lat Start_lon year month day }

{

file mkdir ./Output/${site_name}
file mkdir ./Output/${site_name}/images

set Run_hours "-36"
set Start_hgt "10"
set Start_hgt2 "300"
set Start_hgt3 "500"
set Start_hgt4 "1000"
set Traj_path  "C:/hysplit4/exec"
set Start_time "$year $month $day $hour"
set Vert_coord "0"
set Top_model  "10000.0"
set Meteo_path "D:/Met/EDAS40ARL/20$year/"

if { $month == "01" } {
  set mm jan
  set mmp feb
  set mmn feb
}
if { $month == "02" } {
  set mm feb
  set mmp jan
  set mmn mar
}
if { $month == "03" } {
  set mm mar
  set mmp feb
  set mmn apr
}
if { $month == "04" } {
  set mm apr
  set mmp mar
  set mmn may
}
if { $month == "05" } {
  set mm may
  set mmp apr
  set mmn jun
}
if { $month == "06" } {
  set mm jun
  set mmp may
  set mmn jul
}
```

```
if { $month == "07" } {
  set mm jul
  set mmp jun
  set mmn aug
}
if { $month == "08" } {
  set mm aug
  set mmp jul
  set mmn sep
}
if { $month == "09" } {
  set mm sep
  set mmp aug
  set mmn oct
}
if { $month == "10" } {
  set mm oct
  set mmp sep
  set mmn nov
}
if { $month == "11" } {
  set mm nov
  set mmp oct
  set mmn dec
}
if { $month == "12" } {
  set mm dec
  set mmp nov
  set mmn nov
}

if { $day <= "15" } {
  set Meteo_file1 "edas.${mmp}${year}.002"
  set Meteo_file2 "edas.${mm}${year}.001"
  set Meteo_file3 "edas.${mm}${year}.002"
}
if { $day > "15" } {
  set Meteo_file1 "edas.${mmn}${year}.001"
  set Meteo_file2 "edas.${mm}${year}.001"
  set Meteo_file3 "edas.${mm}${year}.002"
}

#be sure to set the output_path variable to where you want the files to go
set Output_path "./Output/${site_name}/"
set Output_path2 "c:/hysplit4/boundaries/Output/${site_name}/"
set Traj_lev 1
set Output_base "${site_name}_bck_traj_20${year}${month}${day}${hour}"
set Output_base2 "${site_name}_bck_traj_20${year}${month}${day}${hour}"
set Start_time "$year $month $day $hour"
set Start_loc "$Start_lat $Start_lon $Start_hgt"
```

```
set Start_loc2 "$Start_lat $Start_lon $Start_hgt2"
set Start_loc3 "$Start_lat $Start_lon $Start_hgt3"
set Start_loc4 "$Start_lat $Start_lon $Start_hgt4"
set Output_file "${Output_base}.txt"

  file delete Control
  set f [open Control w]
  puts $f "$Start_time"
  puts $f "4"
  puts $f "$Start_loc"
  puts $f "$Start_loc2"
  puts $f "$Start_loc3"
  puts $f "$Start_loc4"
  puts $f "$Run_hours"
  puts $f "$Vert_coord"
  puts $f "$Top_model"
  puts $f "3"
  puts $f "$Meteo_path"
  puts $f "$Meteo_file1"
  puts $f "$Meteo_path"
  puts $f "$Meteo_file2"
  puts $f "$Meteo_path"
  puts $f "$Meteo_file3"
  puts $f "$Output_path"
  puts $f "$Output_file"
  close $f

  exec "$Traj_path/hyts_std.exe"
    #incr hour

#  generate postcript images
  exec C:/hysplit4/exec/trajplot -a0 -f1 -i${Output_path}/${Output_file} -jarlmap -k1 -l6 -m0 -
o${Output_path}/images/${Output_base2}.ps -v1 -z50

#  See if you can make this loop and append the string.
 set var [open test w]
 puts $var "convert ${Output_path2}images/${Output_base2}.ps
${Output_path2}images/${Output_base2}.png"
 close $var
### } ;#end hour foreach loop


### } ;#end day-specific loop

#} ;#end height loop

#} ;#end site foreach loop

destroy
exit 0
```

Geographic Information System (GIS) Options used for Gradient Map

The information below represents the options used in generation the gradient map (Figure A5). These options are the default values used in ArcGIS to develop the kriged surface. After the kriged surface was generated, a prediction error surface was developed and analyzed to determine if changes to the model inputs were necessary to refine the kriged surface.

DatasetOzoneMonitors_'2011DesignValuesSCandNC$'
TypeFeature Class
Data field'2011DesignValuesSCandNC$'.DesignValue
Records 63

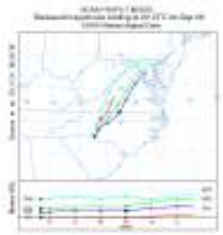
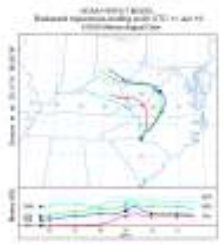
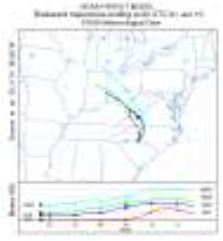
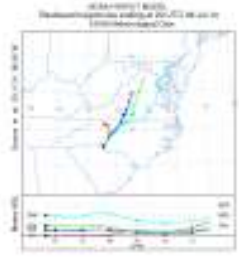
-MethodKriging
Type Simple
Output typePrediction
-Dataset #1
Trend typeNone
-Transformation Normal Score Transformation
Approximation Direct
-Searching neighborhoodStandard
Type Standard
Neighbors to include 10
Include at least 2
Sector typeFour and 45 degree
Angle0
Major semiaxis1.360867234141961
Minor semiaxis1.360867234141961
-Variogram Covariance
Number of lags 12
Lag size0.16442823852433214
Nugget0
Measurement error % 100
ShiftON No
-Model type Stable
Parameter 0.9505859375000001
Range 1.360867234141961
Anisotropy No
Partial sill 0.988395876965288

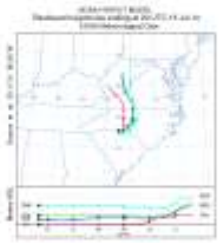
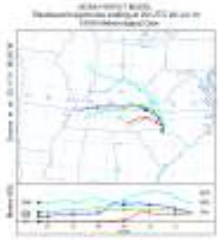
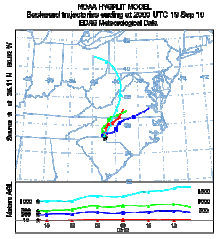
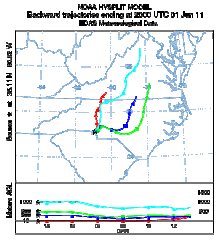
Arrowood ozone monitoring station back trajectory analysis:

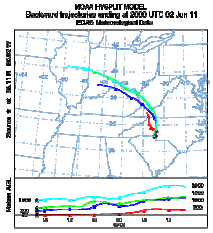
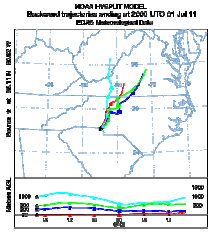
A series of back trajectories were analyzed to specifically examine transport regimes at Arrowood (37-119-1005). Arrowood (37-119-1005) is located on the south side of Charlotte in Mecklenburg County and is the closest North Carolina monitor to York County. Ozone concentrations at Arrowood (37-119-1005) exceeded the ozone standard on thirteen days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was preformed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the Arrowood site (37-119-1005) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were two distinct transport scenarios for Arrowood (37-119-1005), Arrowood Scenario A and Arrowood Scenario B.

The back trajectories on ten of the thirteen ozone exceedance days show a general flow from the north (see Arrowood Scenario A). This, by far, was the most common transport regime on high ozone days. The second transport scenario (see Arrowood Scenario B) involved stagnation, indicating little air movement. The back trajectories below are broken up between these two scenarios. The first nine back trajectory analyses (Arrowood Scenario A) show the most common high ozone transport regime. Arrowood Scenario B includes the back trajectories for the remaining three days. The back trajectories in Arrowood Scenario B indicate recirculation along with stagnation.

Arrowood Scenario A (Charlotte Transport):

	**September 4, 2009:** The back trajectories indicated transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were mostly sunny to partly cloudy with temperatures in the mid 80s. The surface observations indicated calm winds for some of the hours.
	**June 11, 2010:** The back trajectory analysis showed transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were partly cloudy with temperatures in the upper 80s. Winds were generally out of the north much like the back trajectories.
	**June 21, 2010:** The back trajectory analysis showed transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were mostly sunny with temperatures in the lower to mid 90s. Winds were calm or from the north.
	**July 8, 2010:** The back trajectory analysis showed a northerly flow from the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures near 100 degrees. Surface winds were from the north and northeast.

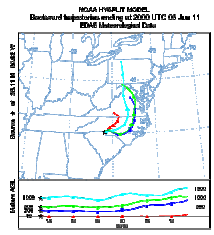
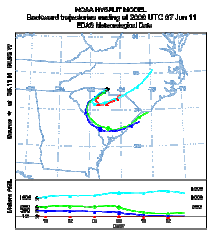
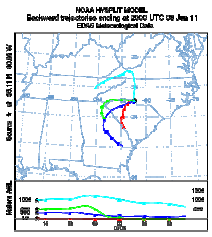
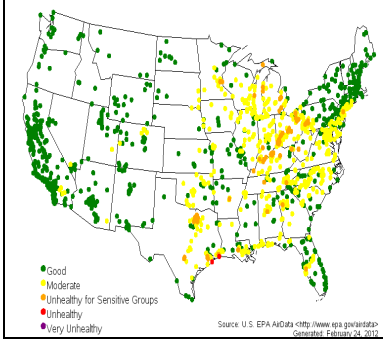
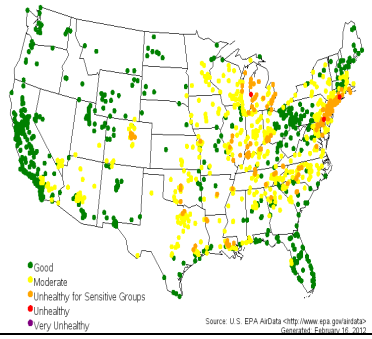
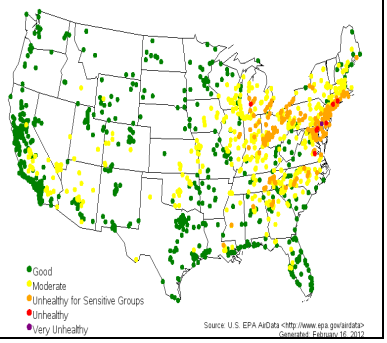
	**July 15, 2010:** The back trajectory analysis showed a northerly transport into the Charlotte metropolitan area then a northeast and an easterly transport through the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were mainly from the east.
	**July 22, 2010:** The back trajectory analysis showed a northerly flow through the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Winds were calm or from the north.
	**September 19, 2010:** The back trajectory analysis showed a northerly transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were mostly clear with temperatures near 90. Surface winds were light and variable.
	**June 1, 2011:** The back trajectory analysis showed mainly a north and northeasterly transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures in the lower to mid 90s. Surface winds were generally from the north and northeast.

	**June 2, 2011:** The back trajectory analysis showed a northerly transport through the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were calm or mainly from the north.
	**July 1, 2011:** The back trajectory analysis showed a northerly transport through the Charlotte metropolitan area to the Arrowood monitor. Skies were party cloudy with temperatures near 90. Surface winds were from the north and northwest.

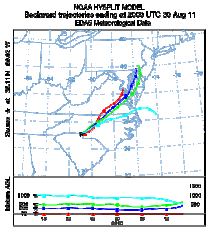
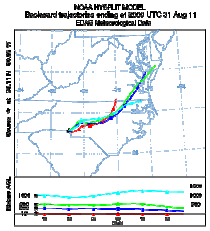
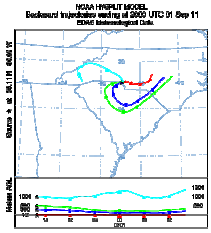
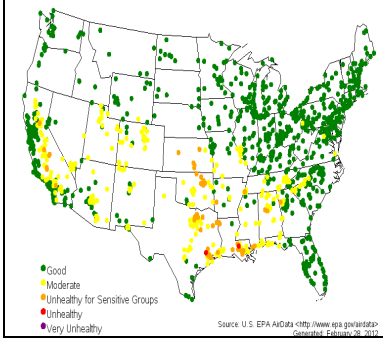
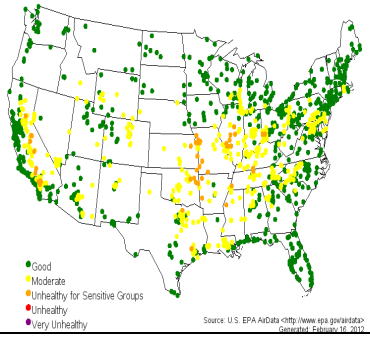
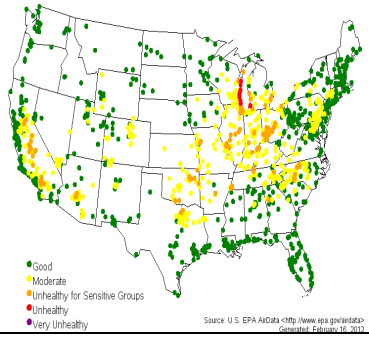
Arrowood Scenario B (Stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

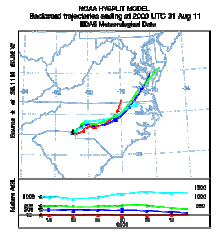
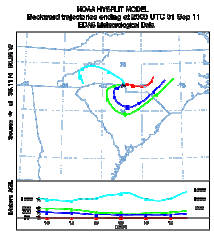
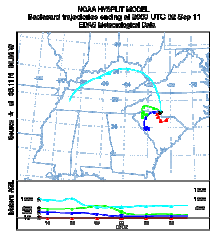
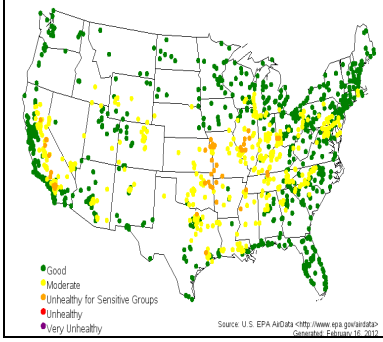
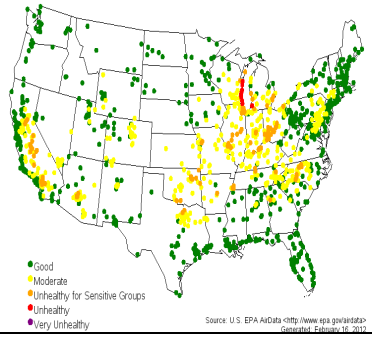
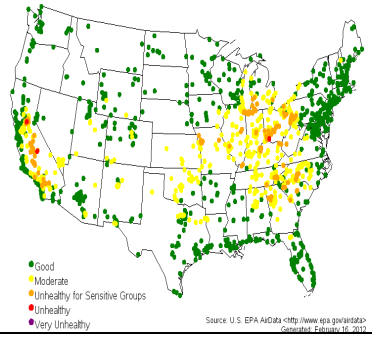
June 8, 2011: The back trajectory analysis showed stagnation and some recirculation. The trajectories are short and recurve, indicating recirculation. The air movement before this stagnation event was from the north. Skies were partly to mostly sunny with temperatures in the lower to mid 90s. Surface winds were mainly light and variable which is typical for stagnation events.

6/6/2011	6/7/2011	Exceedance Day
		
		

September 1, 2011: The back trajectory analysis showed short trajectories with a recirculation pattern, indicating a stagnation event. On the previous days, air had moved southward through the Charlotte area and into South Carolina. The back trajectory analysis shows air being circulated back up into the Charlotte area during the stagnation event. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were calm, light, and variable, typical of a stagnation event.

8/30/2011	8/31/2011	Exceedance Day
		
		

September 2, 2011: The back trajectory analysis showed short trajectories at the lower three levels which indicated a stagnation event. This particular stagnation event began on the day before, allowing the ozone precursors more time to sit over the Charlotte area. Skies were party cloudy with temperatures in the mid 90s. Winds were mainly light and variable, typical of a stagnation event.

8/31/2011	9/1/2011	Exceedance Day
		
		

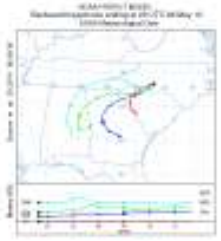
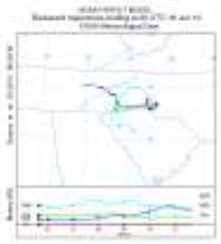
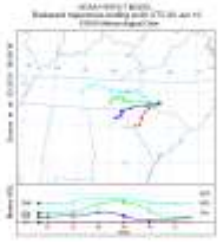
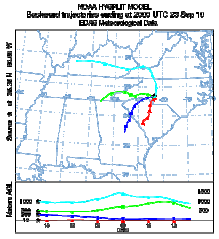
The back trajectory studies show ozone exceedances are caused by local sources in and near the Charlotte metropolitan area. Ozone concentrations at Arrowood (37-119-1005) exceed the standard when there is transport from the north. The exceptions to this rule are stagnation events; however, the trajectories on previous days indicate that the air mass moved southward over the Charlotte metropolitan area before it slowly returns northward on these stagnation days. The ozone regional maps also indicate that ozone exceedances are common on a regional scale when stagnation is occurring in the Charlotte metropolitan area. The back trajectory analysis adds further weight to the argument that York County has little impact on ozone exceedances at Arrowood (37-119-1005).

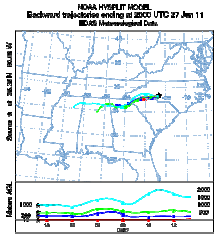
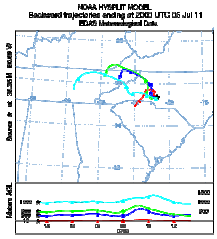
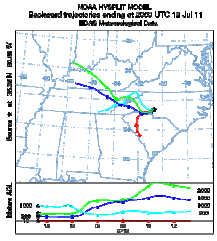
County Line ozone monitoring station back trajectory analysis:

A series of back trajectories were analyzed to specifically examine transport regimes at County Line (37-119-1009). County Line (37-119-1009) is located just northeast of Charlotte in Mecklenburg County. Ozone concentrations at County Line (37-119-1009) exceeded the ozone standard on twenty-three days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was performed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the County Line site (37-119-1009) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were three distinct transport scenarios for County Line (37-119-1009), County Line Scenario A, County Line Scenario B, and County Line Scenario C.

The back trajectories on seven of the twenty-three ozone exceedance days show an air mass crossing the Charlotte metropolitan area before reaching County Line (37-119-1009) (see County Line Scenario A). Scenario A shows air generally moving in from the west or southwest, across the Charlotte metropolitan area before ending up at County Line (37-119-1009). The second transport scenario (see County Line Scenario B) involved stagnation, indicating little air movement. In many cases, Scenario B shows recirculation of the same air mass back across the Charlotte metropolitan area before reaching County Line. Finally, the third transport scenario (see County Line Scenario C) shows transport from outside of the Charlotte metropolitan area to County Line (37-119-1009). Scenario C generally shows transport of air from the northeast, northwest, or from the north, making it to the County Line (37-119-1009) before it crosses the Charlotte metropolitan area. County Line Scenario C suggests that the ozone precursor plume is originating from somewhere else besides the Charlotte metropolitan area. The back trajectories below are broken up between these three scenarios.

County Line Scenario A (Charlotte Transport):

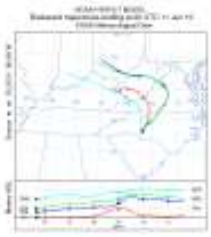
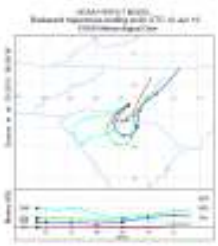
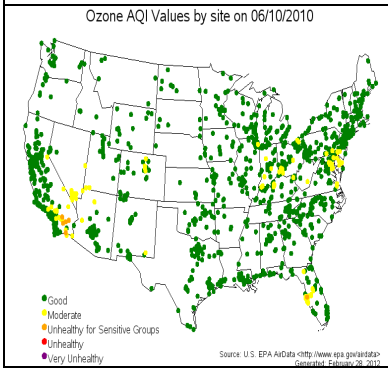
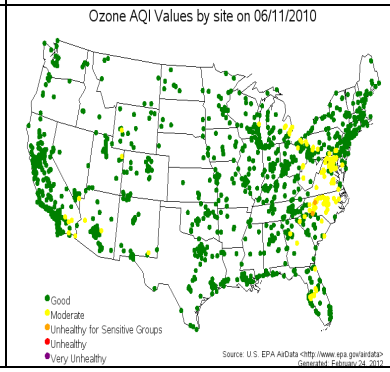
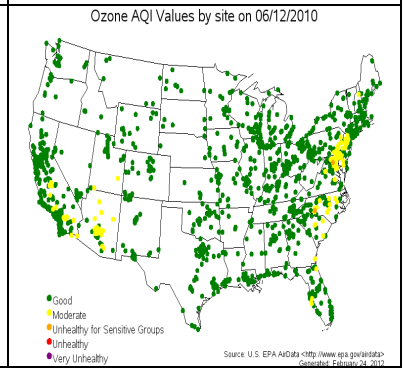
	**May 6, 2010:** The back trajectory analysis shows air moving up from the south and southwest, through the Charlotte metropolitan area to the County Line monitor. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were southwesterly.
	**June 16, 2010:** The back trajectory analysis shows short trajectories indicating slow air movement. Most of the trajectories show air flowing through the Charlotte metropolitan area before ending up at the County Line monitor. Skies were partly cloudy with temperatures near 90 degrees. Surface winds were light or from the southwest.
	**June 23, 2010:** The back trajectory analysis shows short trajectories at the three lower levels. The trajectories indicate air moving from the west and southwest, through the Charlotte metropolitan area to the County Line monitor. Skies were party cloudy with temperatures in the mid to upper 90s. Surface winds were mainly from the west, southwest.
	**September 23, 2010:** The back trajectory analysis shows short trajectories at the three lower levels. The trajectories indicate air moving up from the south and southwest, through the Charlotte area to the County Line monitor. Skies were mostly sunny with temperatures in the lower 90s. Surface winds were light and from the south, southwest.

	**June 27, 2011:** The back trajectory analysis shows air moving in from the west, through the Charlotte metropolitan area to the County Line monitor. Skies were partly cloudy with temperatures in the lower 90s. Surface winds from the southwest.
	**July 5, 2011:** The back trajectory analysis shows short trajectories in the lower three levels. The trajectories show air moving in from the west, southwest, and northwest, crossing through the Charlotte metropolitan area before ending up at the County Line monitor. Skies were partly to mostly cloudy with temperatures in the upper 80s. Surface winds were light and from the west and southwest.
	**July 12, 2011** The back trajectory analysis shows a short trajectory at the lowest level with longer trajectories at the three higher levels. All of the trajectories indicate air moving through the Charlotte metropolitan area before ending up at County Line. Skies were partly cloudy with temperatures in the mid to upper 90s. Surface winds were west and southwest.

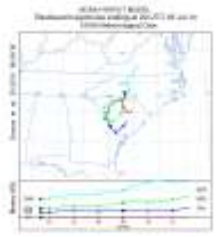
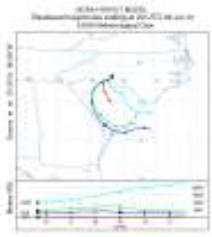
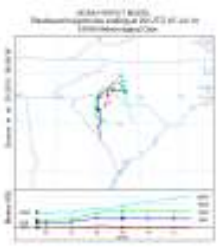
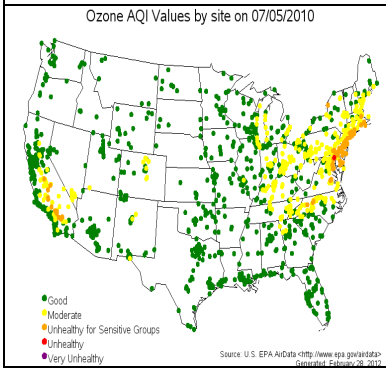
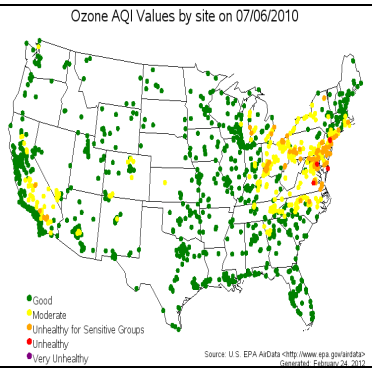
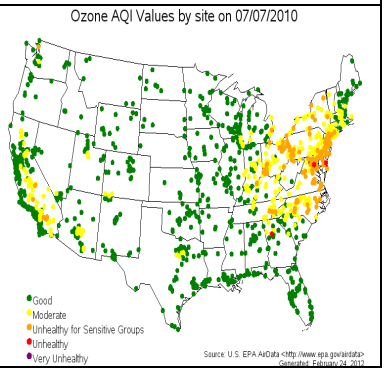
County Line Scenario B (Stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

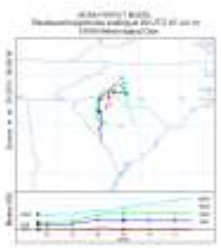
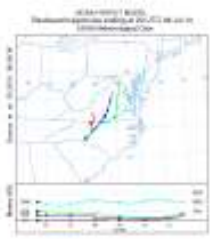
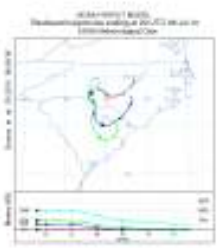
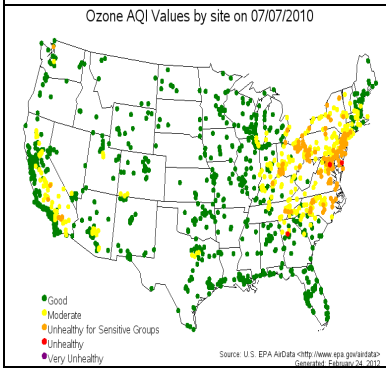
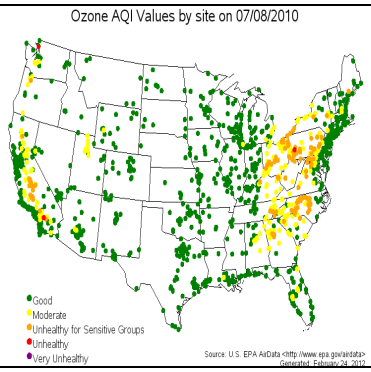
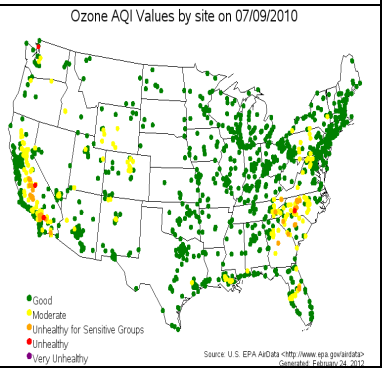
June 12, 2010: The back trajectory analysis shows stagnation with recirculation across the Charlotte area. On the previous day, air moved down from the north, through the Charlotte metropolitan area. On June 12 stagnation occurred with air being recirculated back up through Charlotte to the County Line monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Surface winds were mainly from the southwest.

6/10/2010	6/11/2010	Exceedance Day
		
		

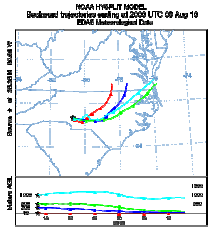
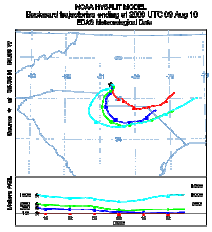
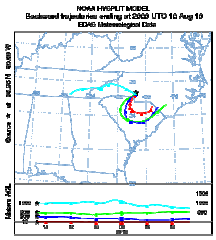
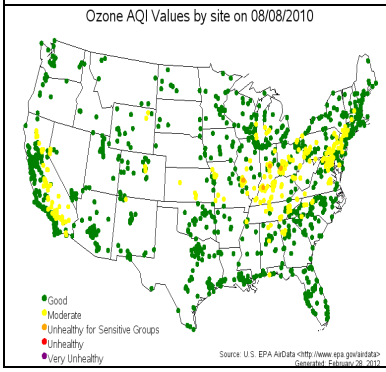
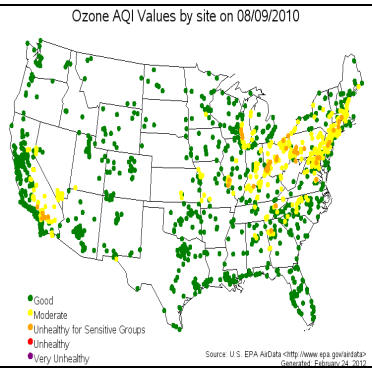
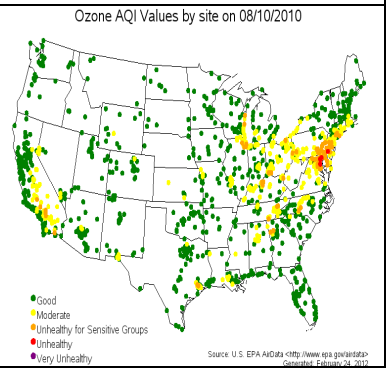
July 7, 2010: The back trajectory analysis shows stagnation across the Charlotte area. On previous days, stagnation was also occurring across the area. On July 7, back trajectories were short indicating little air movement. Skies were partly to mostly sunny with temperatures in the upper 90s. Surface winds were calm or light from the west.

7/5/2010	7/6/2010	Exceedance Day
		
		

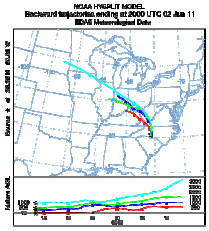
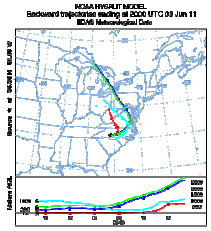
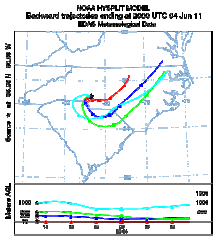
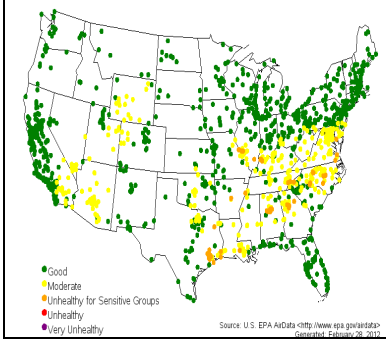
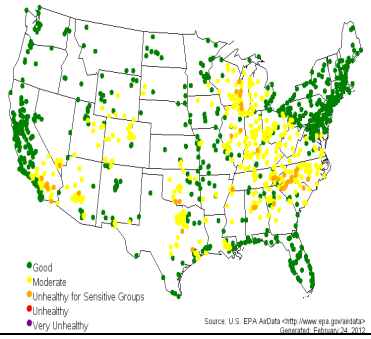
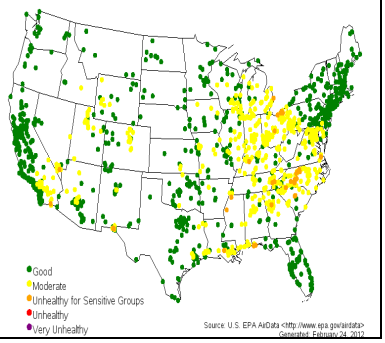
July 9, 2010: The back trajectory analysis shows stagnation with recirculation across the area. On the previous day, trajectories indicated air moving down from the north, across Charlotte and into South Carolina. On July 9th, the trajectories show stagnation with air being recirculated back up through Charlotte to the County Line monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Surface winds were calm or light from the southwest.

7/7/2010	7/8/2010	Exceedance Day
		
		

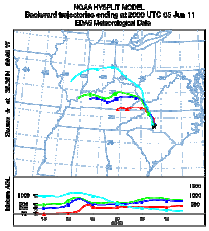
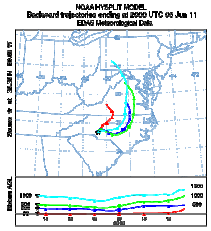
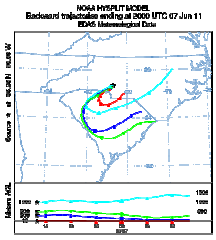
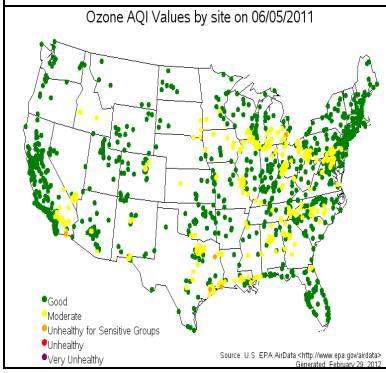
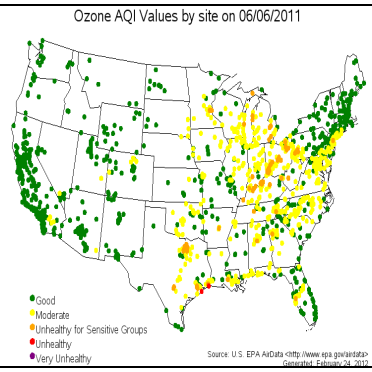
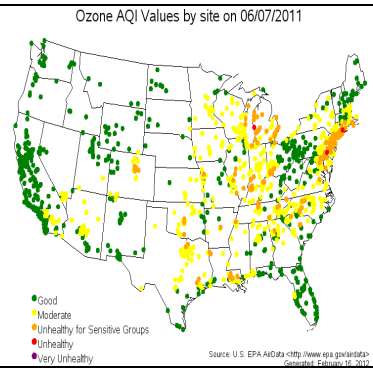
August 10, 2010: The back trajectory analysis shows stagnation with recirculation at the three lower levels. On previous days, trajectories indicated air moving southward from the northeast then becoming stagnant on August 9 with stagnation continuing and recirculation on August 10. The air had traveled southward through Charlotte into South Carolina. On August 10, the trajectories show the same air mass being recirculated back up through Charlotte before ending up at County Line. Skies were partly to mostly cloudy with temperatures in the mid 90s. Surface winds were from the southwest.

8/8/2010	8/9/2010	Exceedance Day
		
		

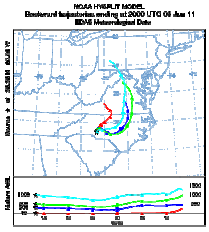
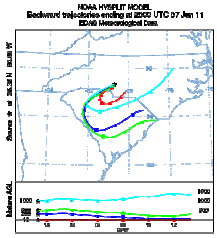
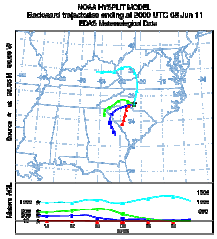
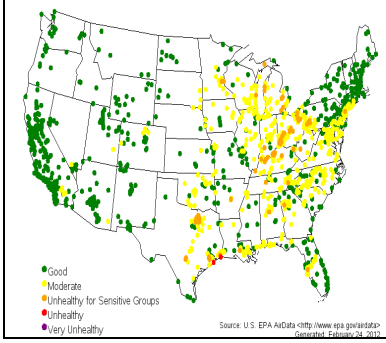
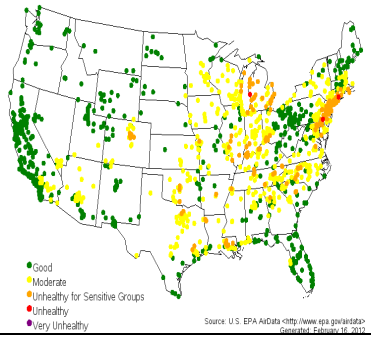
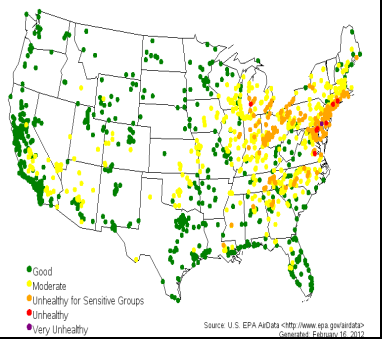
June 4, 2011: The back trajectory analysis shows stagnation with recirculation across the area. On the previous day, the trajectories show air moving southward from the Mid-Atlantic. On June 4, the trajectories show air stagnating and recirculating back up through Charlotte to the County Line monitor. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were calm or light and from the southwest.

6/2/2011	6/3/2011	Exceedance Day
		
		

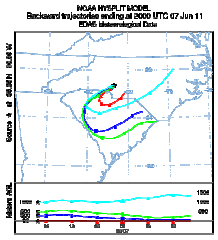
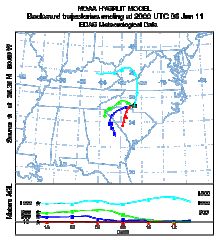
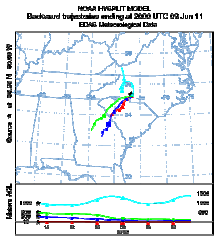
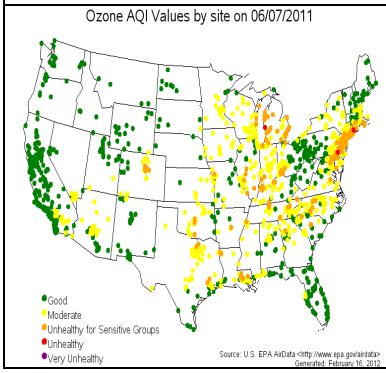
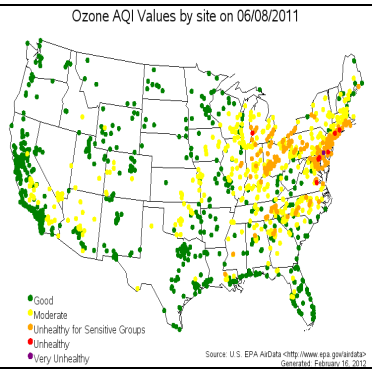
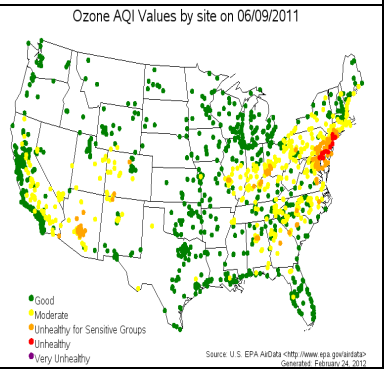
June 7, 2011: The back trajectory analysis shows stagnation and recirculation across the area. On the previous day, the trajectories show air moving southward from the Mid-Atlantic through the Charlotte metropolitan area then down into South Carolina. On June 7, the trajectories show stagnation with air being recirculated back up through the Charlotte metropolitan area to the County Line monitor. Skies were partly to mostly sunny with temperatures near 90. Surface winds were from the southwest.

6/5/2011	6/6/2011	Exceedance Day
		
		

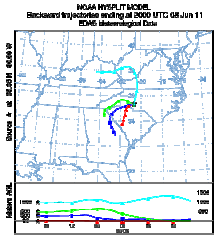
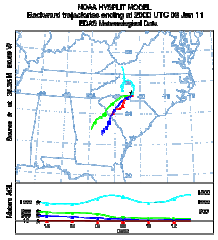
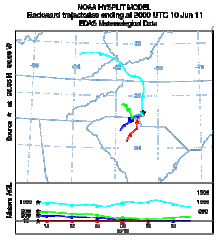
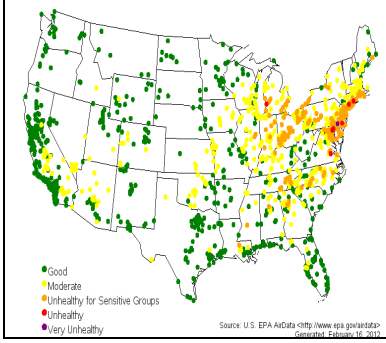
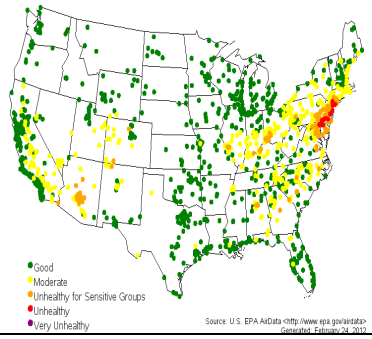
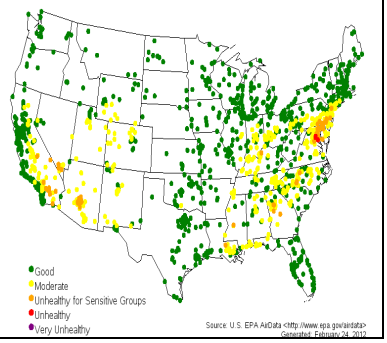
June 8, 2011: The back trajectory analysis show short trajectories, indicating stagnation. On the previous day, stagnation had already begun. On June 8, trajectories show air moving up through the Charlotte metropolitan area to the County Line monitor. Skies were partly to mostly sunny with temperatures in the lower to mid 90s. Surface winds were light and from the west.

6/6/2011	6/7/2011	Exceedance Day
		
		

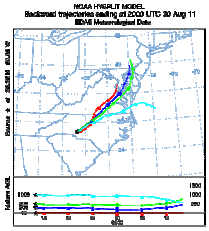
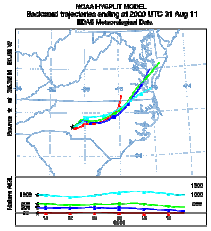
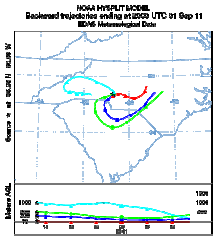
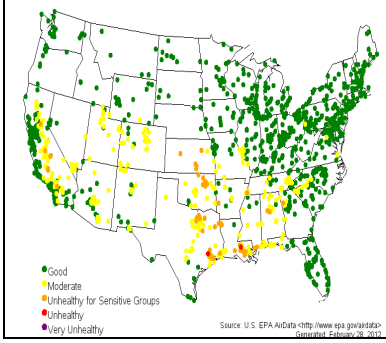
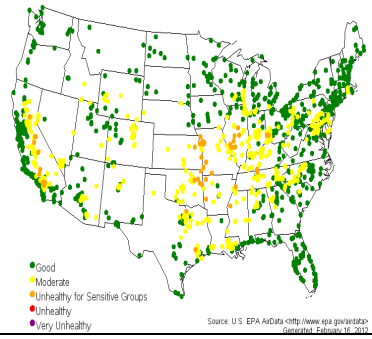
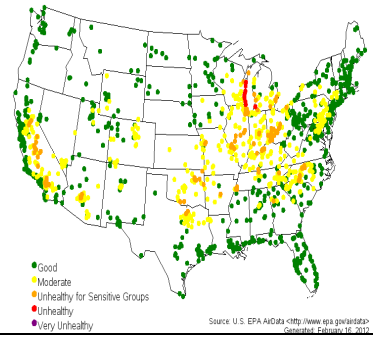
June 9, 2011: The back trajectory analysis shows a continuation of the stagnation event from the previous two days. The trajectories show air moving up from South Carolina, across the Charlotte metropolitan area to the County Line monitor. Skies were partly to mostly cloudy with thunderstorms. Temperatures started out in the lower 90s then fell into the 70s after the storms. Surface winds were strong and gusty around the time of the thunderstorms. Otherwise, surface winds were variable.

6/7/2011	6/8/2011	Exceedance Day
		
		

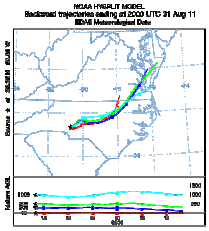
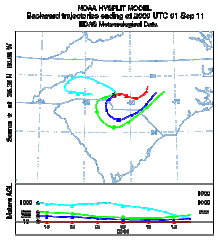
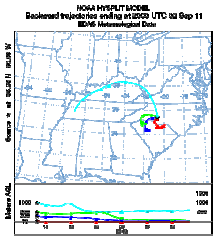
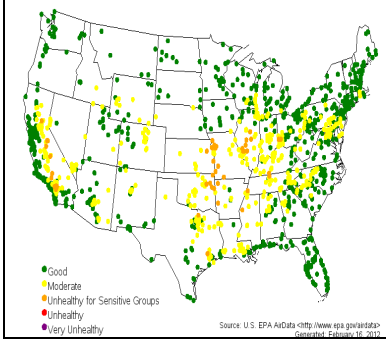
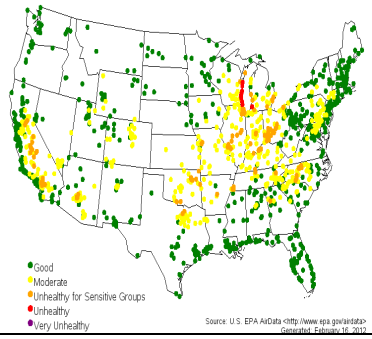
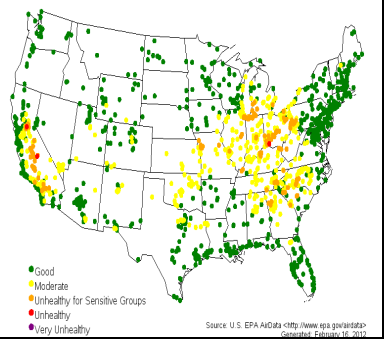
June 10, 2011: The back trajectory analysis shows short trajectories at the lower three levels, indicating a continuation of the stagnation event. The short trajectories show air moving across the Charlotte metropolitan area before ending up at the County Line monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were from the southwest.

6/8/2011	6/9/2011	Exceedance Day
		
		

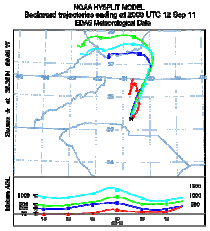
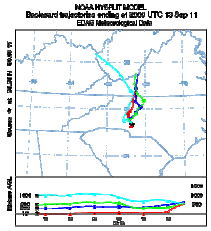
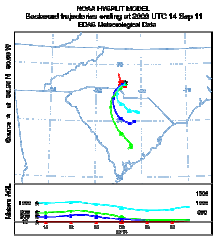
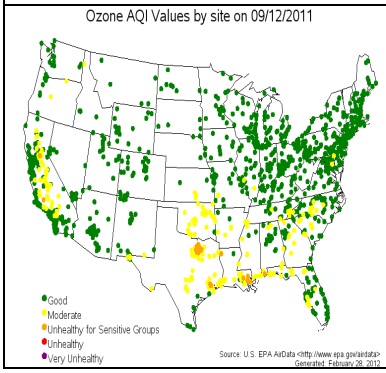
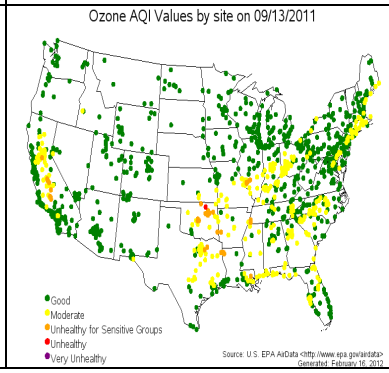
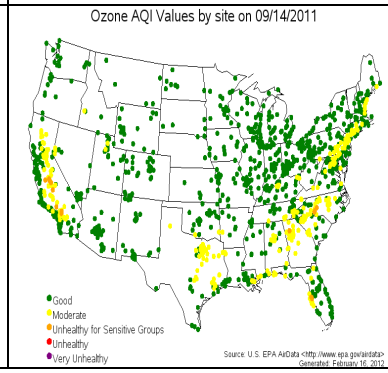
September 1, 2011: The back trajectory analysis shows stagnation with recirculation across the area. On previous days, air had moved out of the Mid-Atlantic area into the Charlotte metropolitan area. On September 1, the trajectories show air moving back up through the Charlotte metropolitan area to the County Line monitor. Skies were mostly sunny with temperatures in the lower 90s. Surface winds were light and variable.

8/30/2011	8/31/2011	Exceedance Day
		
		

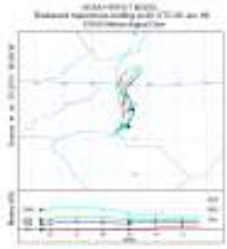
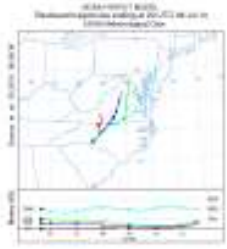
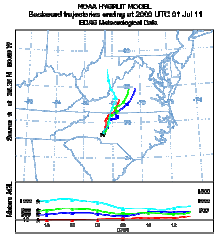
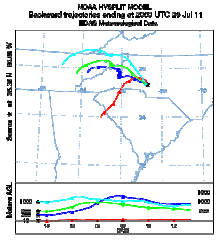
September 2, 2011: The back trajectory analysis shows short trajectories at the three lower levels, indicating that the stagnation on September 1 continued. The very short trajectories show air moving across the Charlotte metropolitan area to the County Line monitor. Skies were partly to mostly cloudy and became cloudy with a thunderstorm late. Surface winds were mainly from the west, northwest.

8/31/2011	9/1/2011	Exceedance Day
		
		

September 14, 2011: The back trajectory analysis shows short trajectories out of the south, indicating stagnation. On the previous day, trajectories indicated air moving southward into the Charlotte metropolitan area. On September 14, the trajectories show air being recirculated back northward through the Charlotte metropolitan area to the County Line monitor. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were calm or light and variable.

9/12/2011	9/13/2011	Exceedance Day
		
		

County Line Scenario C (non-Charlotte Transport)

	**June 25, 2009:** The back trajectory analysis shows air movement from north to south across central North Carolina to the County Line monitor. Skies were partly cloudy with temperatures in the upper 80s to near 90. Surface winds were mainly from the west.
	**July 8, 2010:** The back trajectory analysis shows air moving southward from the Mid-Atlantic, through central North Carolina, to the County Line monitor. Skies were partly to mostly sunny with temperatures near 100 degrees. Surface winds were generally from the northeast.
	**July 1, 2011:** The back trajectory analysis shows air moving southward from the Mid-Atlantic, through central North Carolina, to the County Line monitor. Skies were partly cloudy with temperatures near 90. Surface winds were from the north and northwest.
	**July 29, 2011:** The back trajectory analysis shows air moving from the west and northwest to the County Line monitor. Skies were mostly sunny with temperatures in the upper 90s. Surface winds were variable.

The back trajectory studies show ozone exceedances are caused by either local sources in and

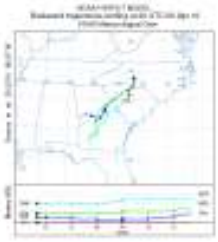
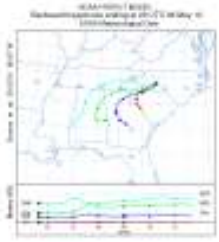
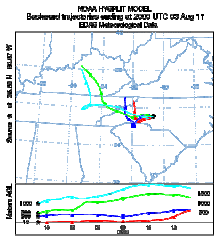
near the Charlotte metropolitan area or are transported in from the northwest, north, or northeast to County Line (37-119-1009). Ozone concentrations at County Line (37-119-10009) exceed the standard when air is transported from the Charlotte metropolitan area to County Line (37-119-1009) from a west, southwest flow or from stagnation and recirculation. Ozone exceedances can also occur at County Line (37-119-1009) when air masses move from the north to south across the Mid-Atlantic and central North Carolina to County Line (37-119-1009). These back trajectory analyses add further weight to the argument that York County has little impact on the ozone exceedances at the Charlotte monitors.

Enochville ozone monitoring station back trajectory analysis:

A series of back trajectories were analyzed to specifically examine transport regimes at Enochville (37-159-0022). Enochville (37-159-0022) is located just north of Charlotte in Rowan County. Ozone concentrations at Enochville (37-159-002) exceeded the ozone standard on fifteen days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was performed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the Enochville site (37-159-0022) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were three distinct transport scenarios for Enochville (37-159-0022), Enochville Scenario A, Enochville Scenario B, and Enochville Scenario C.

The back trajectories on four of the fifteen ozone exceedance days show an air mass crossing the Charlotte metropolitan area before ending up at Enochville (37-159-0022) (see Enochville Scenario A). In most of these cases, air is transported in from the west or southwest, crossing the Charlotte metropolitan area before ending up at Enochville (37-159-0022). The second transport scenario (see Enochville Scenario B) involved northerly transport with stagnation. In these cases, air was transported southward through central North Carolina down into the Charlotte metropolitan area then stagnating before recirculating to Enochville (37-159-0022). The third transport scenario (see Enochville Scenario C) shows transport from the north to Enochville (37-159-0022), indicating little if any transport from the Charlotte metropolitan area to Enochville (37-159-0022). Finally, the last scenario shows a typical stagnation event across the area. (see Scenario D). Some of these stagnation events had air moving in from the north or northeast into the Carolinas before stagnating and recirculating back through the Charlotte metropolitan area before ending up at Enochville (37-159-0022). The back trajectories below are broken up between these three scenarios.

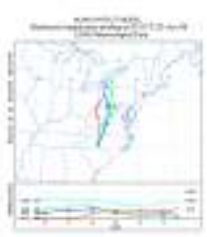
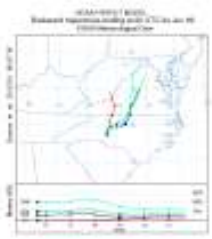
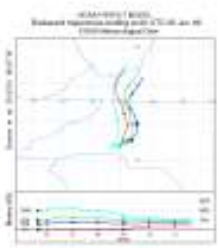
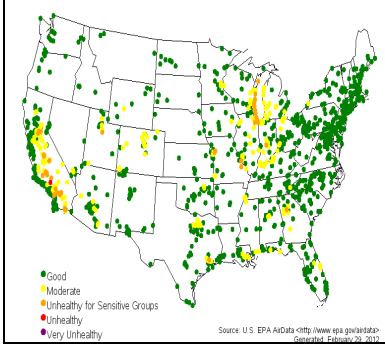
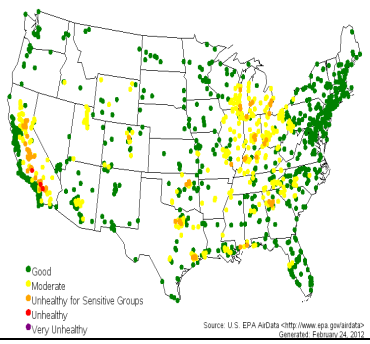
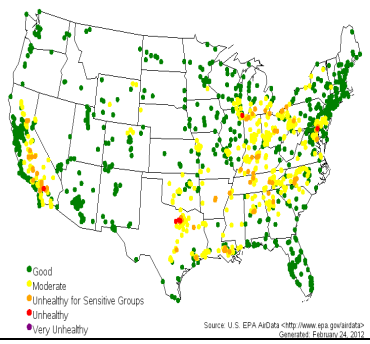
Enochville Scenario A (Charlotte transport):

	**June 26, 2009:** The back trajectory analysis shows short trajectories at the three lower levels. The trajectories show air moving in from the west, through the Charlotte metropolitan area to the Enochville monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Surface winds were variable.
	**April 2, 2010:** The back trajectory analysis shows transport from the south and southwest, through the Charlotte metropolitan area to Enochville. Skies were clear with temperatures in the mid 80s. Surface winds were from the south and southwest.
	**May 6, 2010:** The back trajectory analysis shows transport from the south and southwest, through the Charlotte metropolitan area to Enochville. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were south and southwest.
	**August 3, 2011:** The back trajectory analysis shows short trajectories, indicating slow air movement. The trajectories indicate air moving from west to east across the Charlotte metropolitan area to the Enochville monitor. Skies were partly to mostly cloudy with temperatures in the upper 90s. Surface winds were variable.

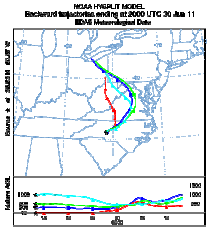
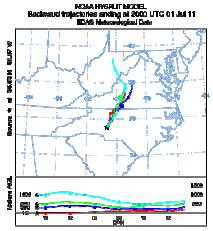
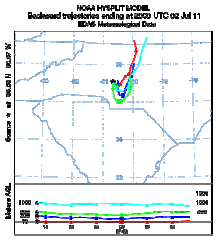
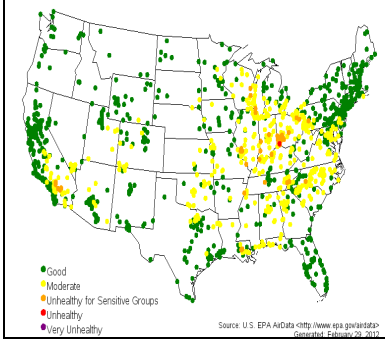
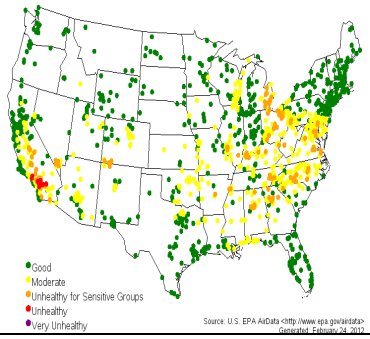
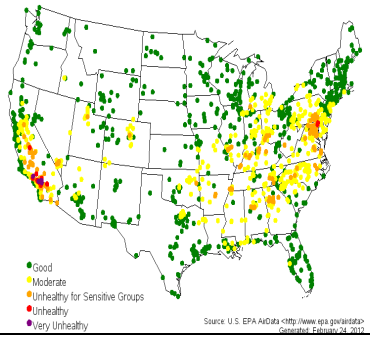
Enochville Scenario B (Northerly stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

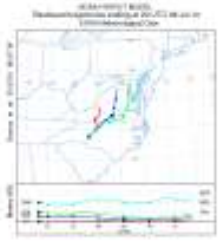
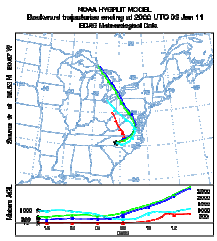
June 25, 2009: The back trajectory analysis shows a northerly transport with stagnation. The analysis indicates that air parcels moved southward out of Virginia into central North Carolina then stagnated near the Charlotte metropolitan area before ending up at Enochville. Skies were partly cloudy with temperatures near 90. Surface winds were west and southwest.

6/23/2009	6/24/2009	Exceedance Day
		
		

July 2, 2011: The back trajectory analysis shows a northerly transport with stagnation. The analysis indicates that air parcels moved southward across central North Carolina into the Charlotte metropolitan area before stagnating then moving to the Enochville monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Surface winds were light and variable.

6/30/2011	7/1/2011	Exceedance Day
		
		

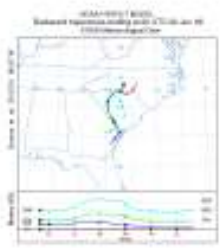
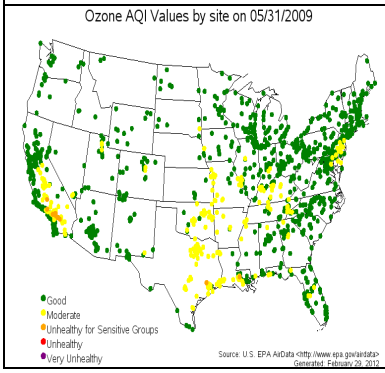
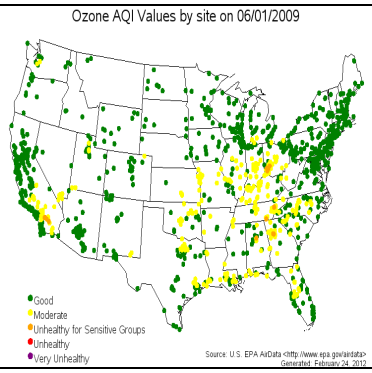
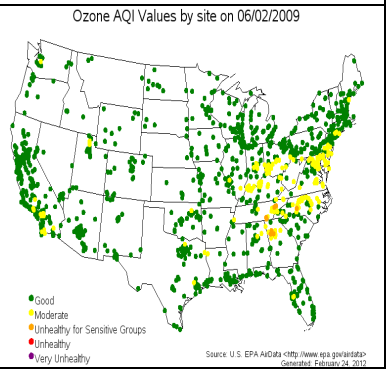
Enochville Scenario C (non-Charlotte transport):

	**July 8, 2010:** The back trajectory analysis shows a northerly transport from the Mid-Atlantic southward through central North Carolina, to the Enochville monitor. This analysis shows little if any impact on Enochville from the Charlotte metropolitan area. Skies were partly to mostly sunny with temperatures near 100 degrees. Surface winds were mainly from the northeast with some southeasterly component late in the day.
	**June 3, 2011:** The back trajectory analysis shows a northerly transport into North Carolina with a more northeasterly transport to the Enochville monitor. This analysis shows little if any impact on Enochville from the Charlotte metropolitan area. Skies were partly cloudy with temperatures in the upper 80s. Surface winds were calm or from the northeast.

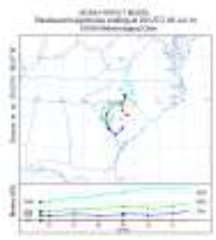
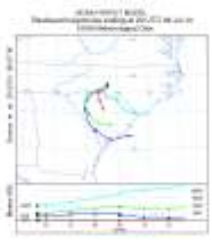
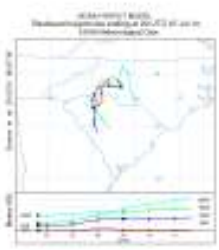
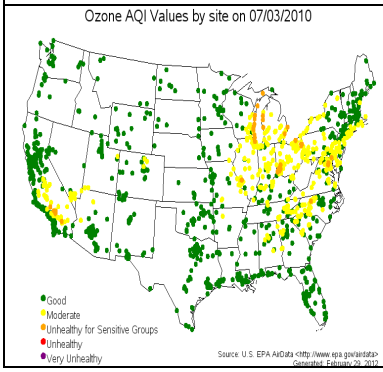
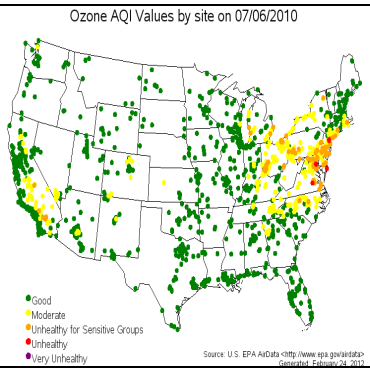
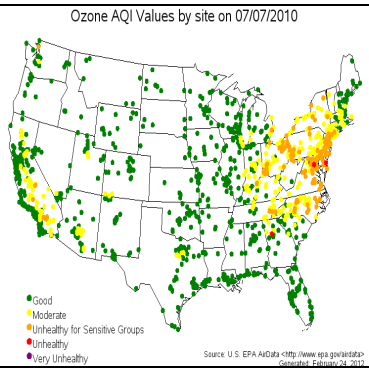
Enochville Scenario D (Stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

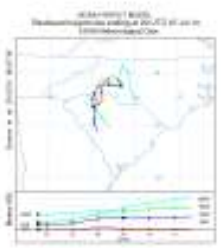
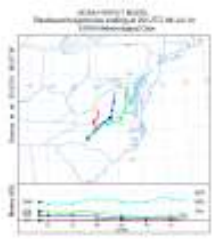
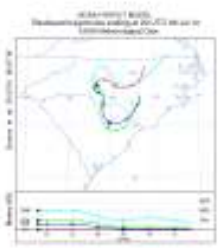
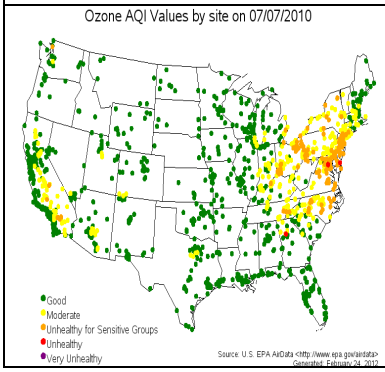
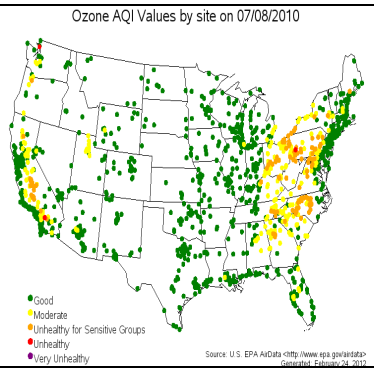
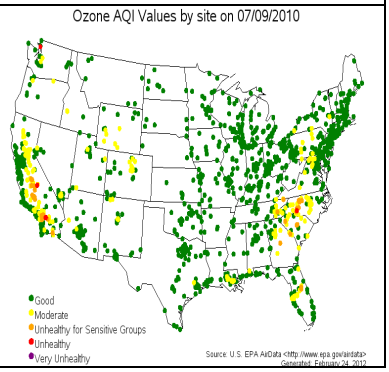
June 2, 2009: The back trajectory analysis shows stagnation across the area. On the previous day, trajectories showed air moving southwestward from the Mid-Atlantic to the Enochville monitor. On June 2, the trajectories show air moving back northward, through the Charlotte metropolitan area to the Enochville monitor. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were mainly from the southwest.

5/31/2009	6/1/2009	Exceedance Day
		
		

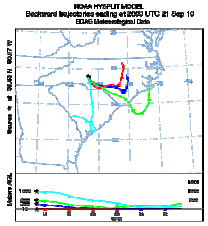
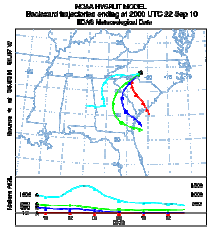
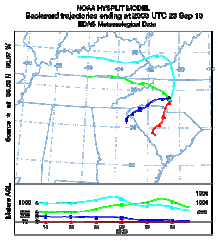
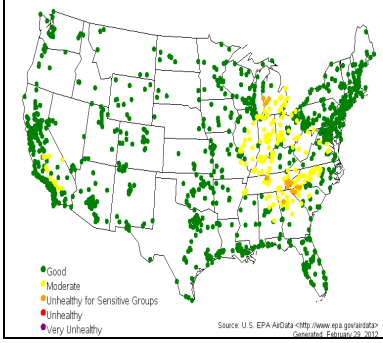
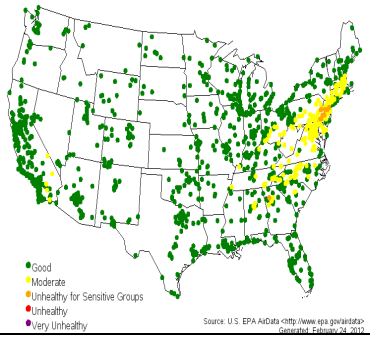
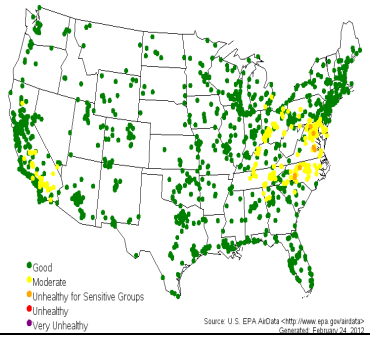
July 7, 2010: The back trajectory analysis shows stagnation across the area. On the previous days, trajectories also showed stagnation across the area. Skies were partly cloudy to mostly sunny with temperatures in the upper 90s. Surface winds were light and from the west or west, southwest.

7/5/2010	7/6/2010	Exceedance Day
		
		

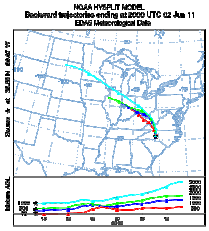
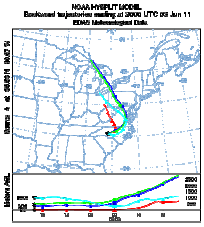
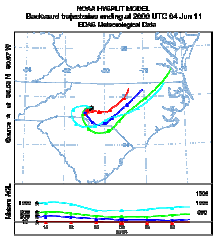
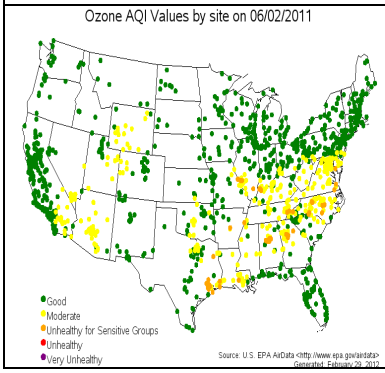
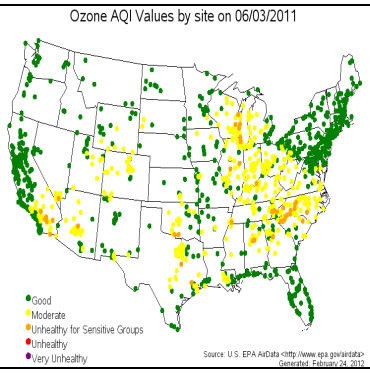
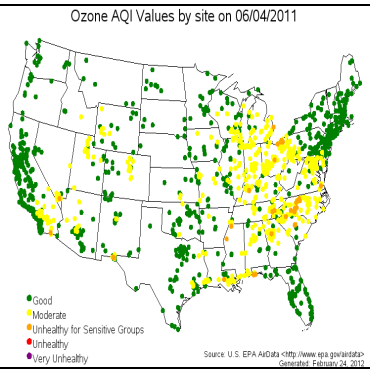
July 9, 2010: The back trajectory analysis shows stagnation across the area. On the previous day, trajectories showed air moving southward from the Mid-Atlantic to the Enochville monitor. On July 9 the trajectories show stagnation over the area with little impact from the Charlotte metropolitan area. Skies were partly to mostly cloudy with temperatures in the lower to mid 90s. Surface winds light and variable.

7/7/2010	7/8/2010	Exceedance Day
		
		

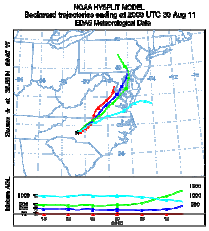
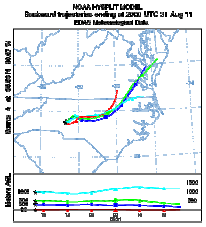
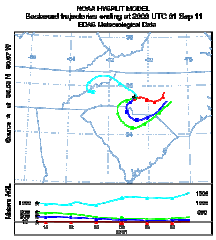
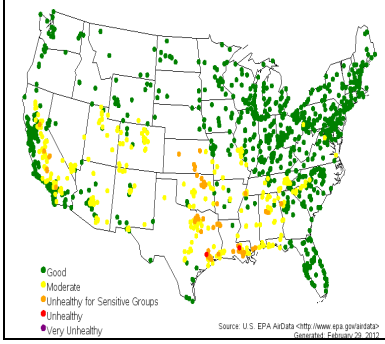
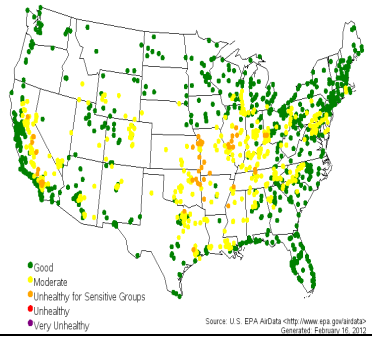
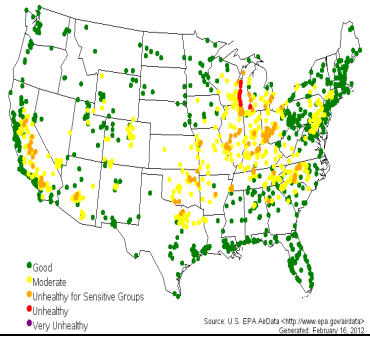
September 23, 2010: The back trajectory analysis shows stagnation across the area. On the previous days, trajectories also showed stagnation across the area. On September 23 the lower two back trajectories show short trajectories from the southwest, through the Charlotte metropolitan area to the Enochville monitor. Skies were mostly sunny with temperatures in the lower 90s. Surface winds were light and variable or from the southwest.

9/21/2010	9/22/2010	Exceedance Day
		
		

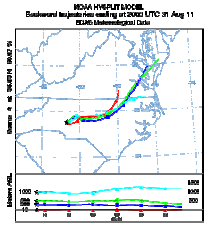
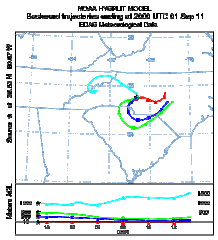
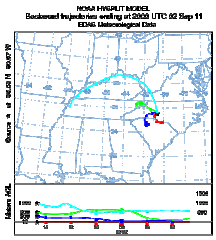
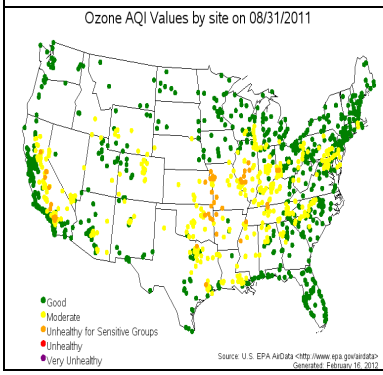
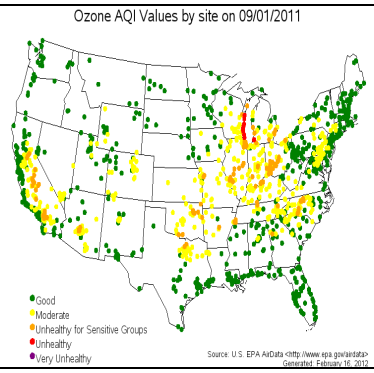
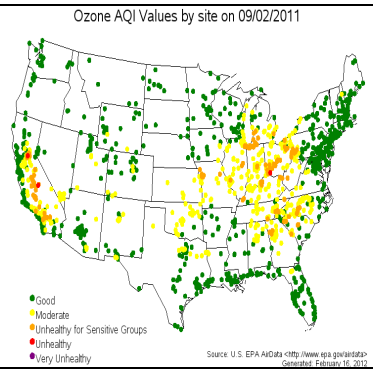
June 4, 2011: The back trajectory analysis shows stagnation across the area with some recirculation. On the previous day, trajectories showed air moving southward from the Mid-Atlantic through east-central North Carolina to the Enochville monitor. On June 4 the trajectories show stagnation with air recirculating through Charlotte to the Enochville monitor. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were calm or from the west, southwest.

6/2/2011	6/3/2011	Exceedance Day
		
		

September 1, 2011: The back trajectory analysis shows stagnation across the area with recirculation. On the previous day, trajectories showed air moving southward from the Mid-Atlantic through east-central North Carolina before ending up at Enochville. On September 1 the trajectories show air parcels stagnating and being recirculated back up through the Charlotte metropolitan area. Skies were partly to mostly sunny with temperatures near 90. Surface winds were light and variable.

8/30/2011	8/31/2011	Exceedance Day
		
		

September 2, 2011: The back trajectory analysis shows stagnation at the lower three levels. On the previous day, stagnation had already set up across the area. The short trajectories on September 2 indicate very little movement in air with the air mass moving slowly across the Charlotte metropolitan area before ending up at Enochville. Skies were partly cloudy with temperatures in the mid 90s. Surface winds were variable then gusty due to a thunderstorm late in the day.

8/31/2011	9/1/2011	Exceedance Day
		
		

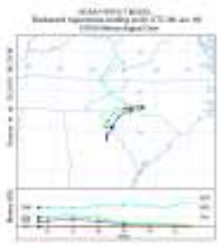
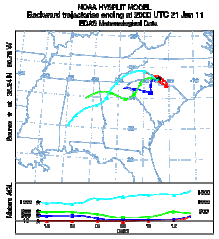
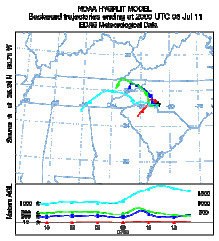
The back trajectory studies show ozone exceedances are caused by either local sources in and near the Charlotte metropolitan area or are transported in from the north without much influence from the Charlotte metropolitan area. Ozone concentrations at Enochville (37-159-0022) also exceed the standard during stagnation events. Most of these stagnation events are preceded with air moving in from the north then stagnating over the Carolinas with the plume moving back across the Charlotte metropolitan area before ending up at Enochville (37-159-0022). These back trajectory analyses add further weight to the argument that York County has little impact on the ozone exceedances at the Charlotte monitors.

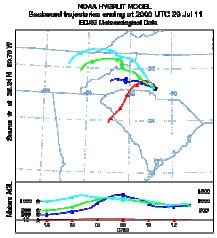
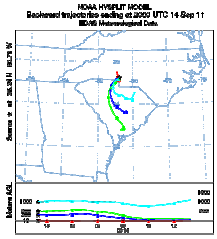
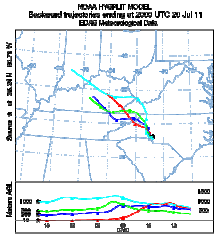
Garinger ozone monitoring station back trajectory analysis:

A series of back trajectories were analyzed to specifically examine transport regimes at Garinger (37-119-0041). Garinger (37-119-0041) is located just northeast of Charlotte in Mecklenburg County. Ozone concentrations at Garinger (37-119-0041) exceeded the ozone standard on twenty-one days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was performed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the Garinger site (37-119-0041) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were three distinct transport scenarios for Garinger (37-119-0041), Garinger Scenario A, Garinger Scenario B, and Garinger Scenario C.

The back trajectories on seven of the twenty-one ozone exceedance days show an air mass crossing the Charlotte metropolitan area to Garinger (37-119-0041) (see Garinger Scenario A). In most of these cases, air was transported into the Charlotte metropolitan area from the west or southwest, before ending up at Garinger (37-119-0041). The second transport scenario (see Garinger Scenario B) involved stagnation, indicating little air movement. In many cases, on previous days leading up to the stagnation event, the air moved southward out of the Mid-Atlantic into the Carolinas then recirculated back up through the Charlotte metropolitan area as the stagnation occurred. Finally, the third transport scenario (see Garinger Scenario C) shows transport from outside of the Charlotte metropolitan area to Garinger (37-119-0041). The last scenario generally shows transport of air from the northeast, northwest, or from the north, making it to Garinger (37-119-0041) before it crosses the Charlotte metropolitan area. This suggests that the ozone precursor plume is originating from somewhere else besides the Charlotte metropolitan area. The back trajectories below are broken up between these three scenarios.

Garinger Scenario A (Charlotte Transport):

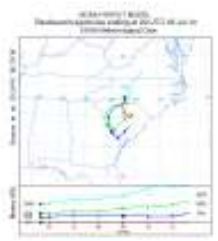
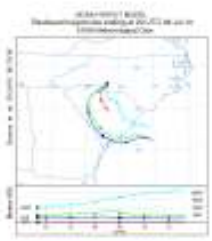
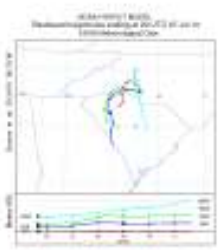
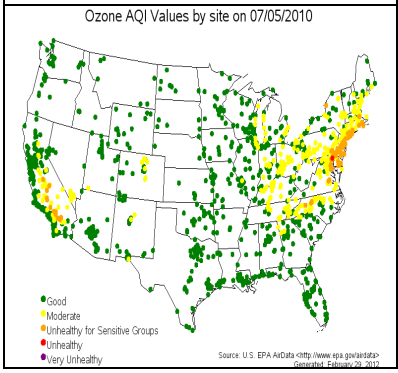
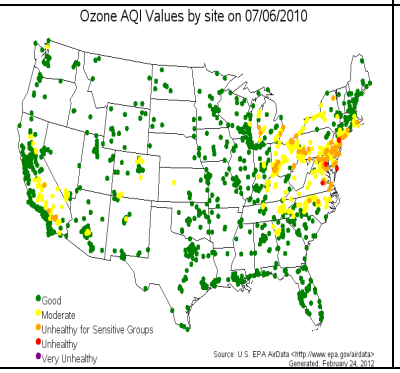
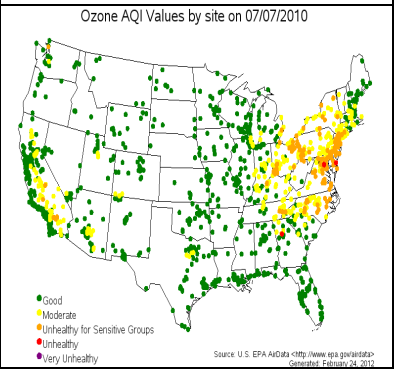
	**June 26, 2009:** The back trajectory analysis shows short trajectories at the three lower levels. Trajectories indicate that air moved from the west and southwest, through the Charlotte metropolitan area to the Garinger monitor. Skies were partly cloudy with temperatures in the lower 90s. Surface winds were calm or from the west, southwest.
	**June 23, 2010:** The back trajectory analysis shows transport from the west and southwest, through the Charlotte metropolitan area to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the mid to upper 90s. Surface winds from the southwest.
	**June 21, 2011:** The back trajectory analysis shows very little transport at the lowest level with westerly and southwesterly transport at the middle levels. The middle layer trajectories show air moving across the Charlotte metropolitan area to the Garinger monitor. Skies were party cloudy with temperatures in the middle and upper 90s. Surface winds were mainly from the southwest.
	**July 5, 2011:** The back trajectory analysis shows very little air movement at the lower level with a westerly and northwesterly transport in the other levels. All of the levels indicate air moving through the Charlotte metropolitan area to the Garinger monitor. Skies were partly to mostly cloudy with temperatures in the upper 80s. Surface winds were mainly from the west or west, northwest.

	**July 29, 2011:** The back trajectory analysis shows short trajectories which all cross the Charlotte metropolitan area before ending up at the Garinger monitor. Skies were partly to mostly sunny with temperatures in the upper 90s. Surface winds were light but sometimes from the north and from the west, northwest.
	**September 14, 2011:** The back trajectory analysis shows short trajectories indicating air flow from the south, through the Charlotte metropolitan area to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the upper 80s. Surface winds were light and variable and sometimes from the south.
	**July 20, 2011:** The back trajectory analysis shows long trajectories, indicating good transport from the northwest into the Charlotte metropolitan area then to the Garinger monitor. The trajectories indicate that air moved across the Charlotte metropolitan area before reaching the Garinger monitor. Skies were partly cloudy with temperatures in the lower and mid 90s. Surface winds were calm or light and variable.

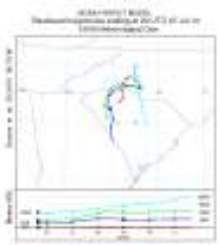
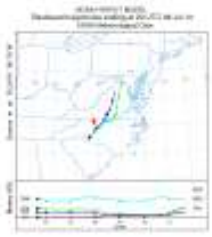
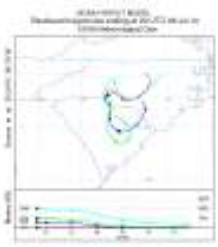
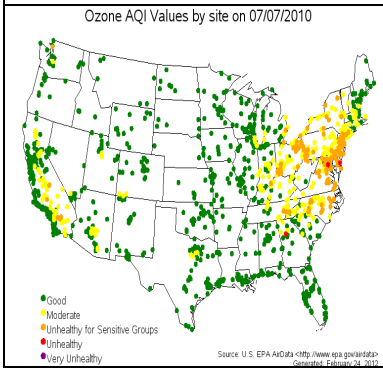
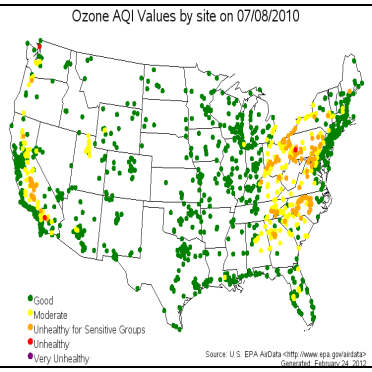
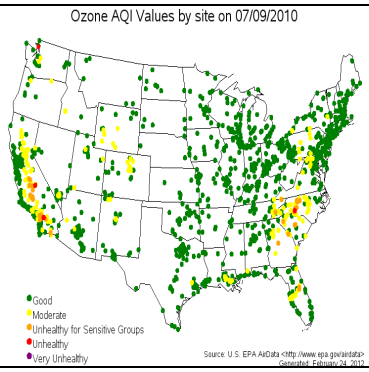
Garinger Scenario B (Stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

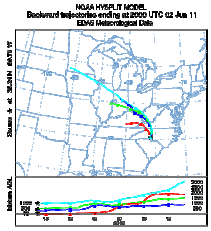
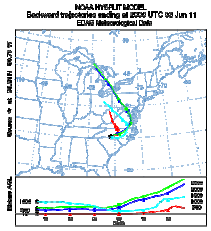
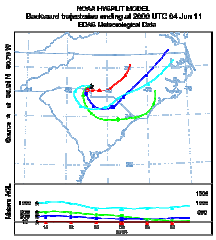
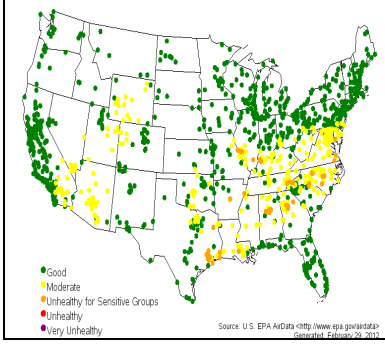
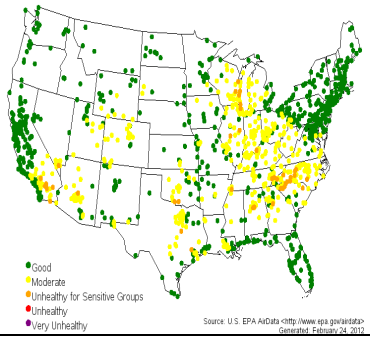
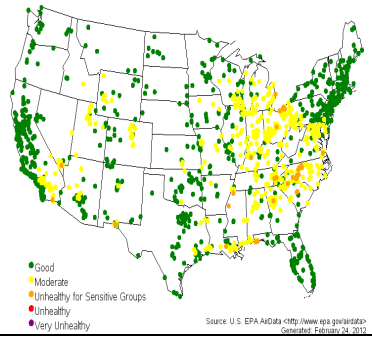
July 7, 2010: The back trajectory analysis shows stagnation across the area with the trajectories crossing through the Charlotte area before reaching the Garinger monitor. Skies were mostly sunny with temperatures in the upper 90s. Surface winds were calm or were light and from the west.

7/5/2010	7/6/2010	Exceedance Day
		
		

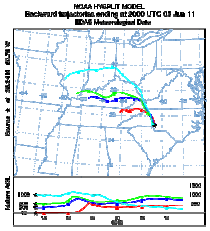
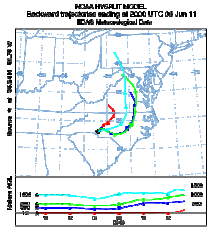
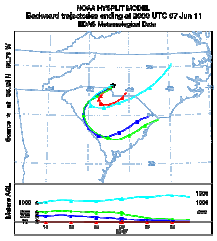
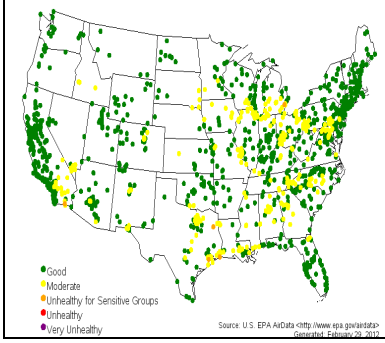
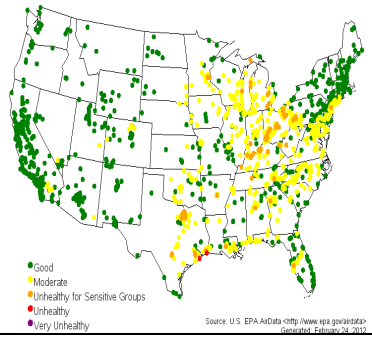
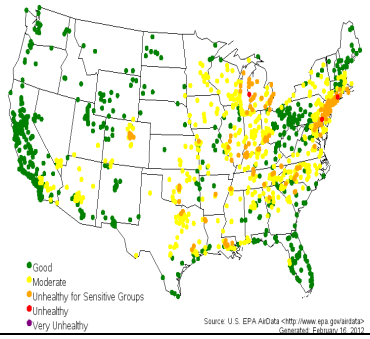
July 9, 2010: The back trajectory analysis shows stagnation across the area with trajectories crossing the Charlotte metropolitan area before reaching the Garinger monitor. Skies were partly cloudy with temperatures in the lower to middle 90s. Surface winds were calm or light and from the west, southwest.

7/7/2010	7/8/2010	Exceedance Day
		
		

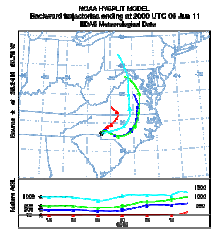
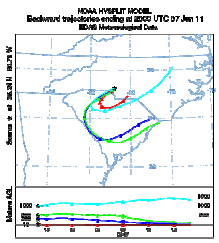
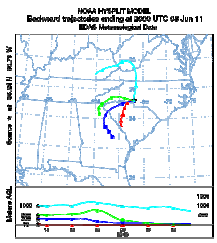
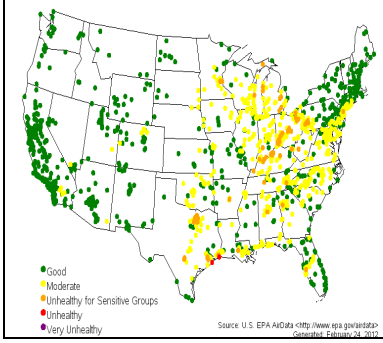
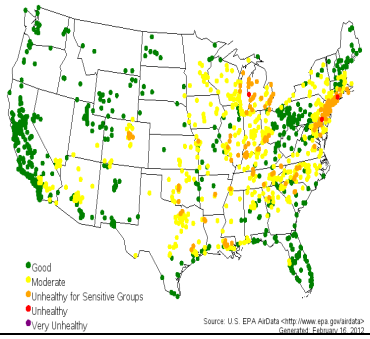
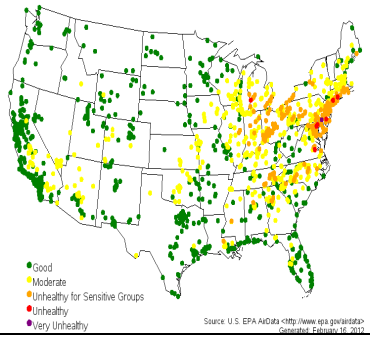
June 4, 2011: The back trajectory analysis shows stagnation with recirculation. On the previous day, back trajectories show that air was transported southward from the Mid-Atlantic, through the Charlotte metropolitan area. The back trajectories on June 4 show the same air mass being recirculated back up across the Charlotte metropolitan area to the Garinger monitor. Skies were party cloudy with temperatures in the upper 80s. Surface winds light and variable and sometimes from the west, southwest.

6/2/2011	6/3/2011	Exceedance Day
		
		

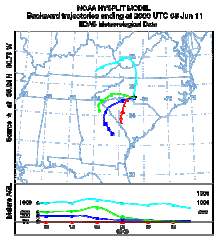
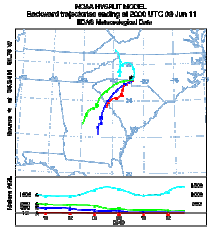
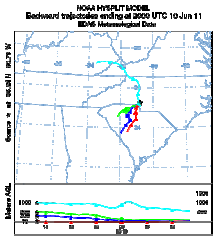
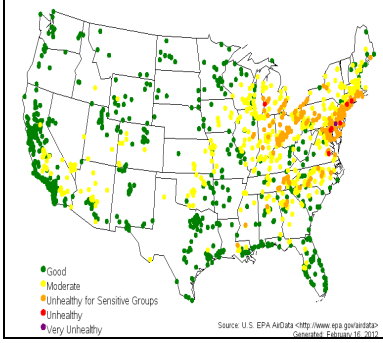
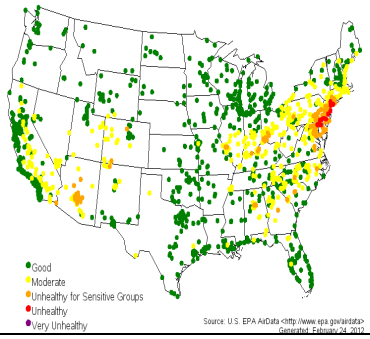
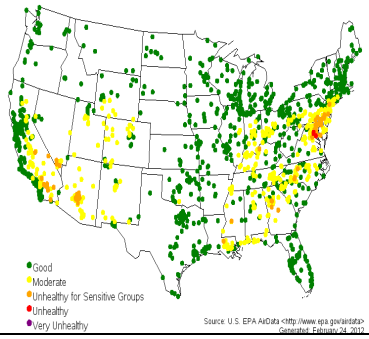
June 7, 2011: The back trajectory analysis shows stagnation with recirculation. On the previous day, back trajectories show that air was transported southward from the Mid-Atlantic, through the Charlotte metropolitan area. The back trajectories on June 7 show the same air mass being recirculated back up across the Charlotte metropolitan area to the Garinger monitor. Skies were mostly sunny with temperatures around 90. Surface winds were mainly from the west, southwest.

6/5/2011	6/6/2011	Exceedance Day
		
		

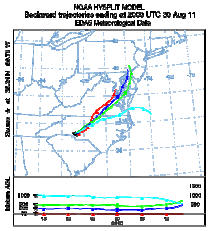
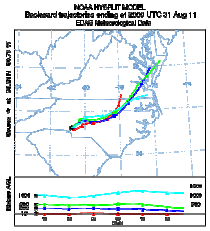
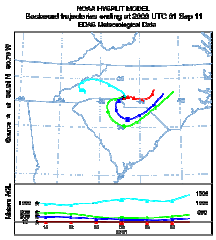
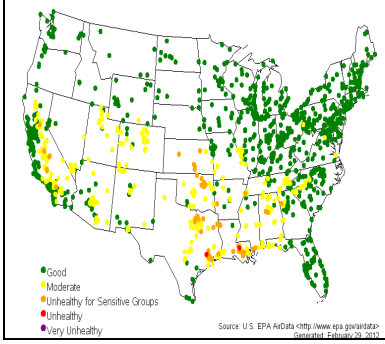
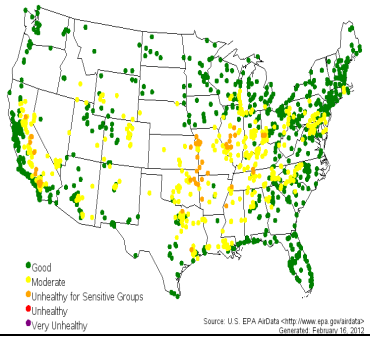
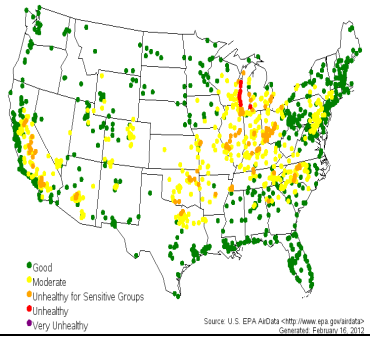
June 8, 2011: The back trajectory analysis shows a continuation of stagnation across the area from the previous day. The trajectories are short and mainly from the south or from the southwest. The lower three levels indicate that air moved across the Charlotte metropolitan area to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the lower to mid 90s. Surface winds calm or light and variable.

6/6/2011	6/7/2011	Exceedance Day
		
		

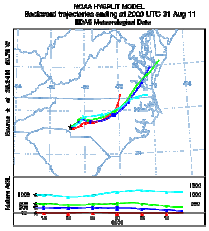
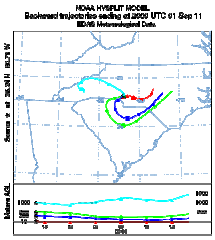
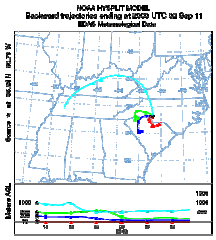
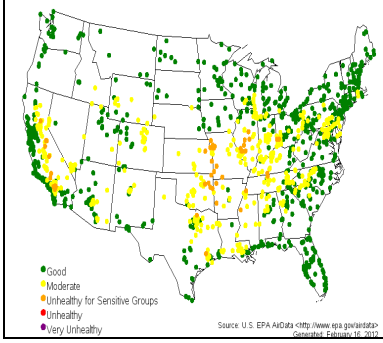
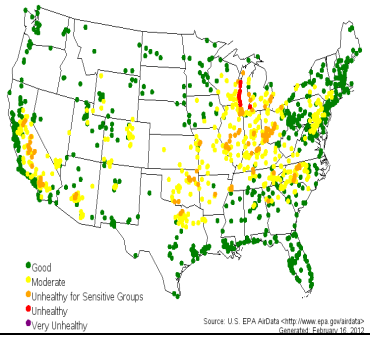
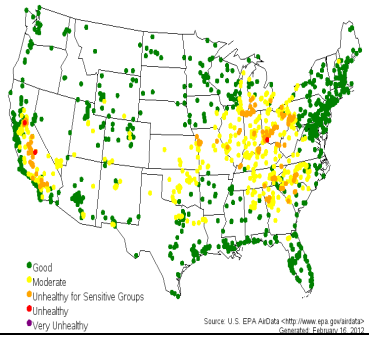
June 10, 2011: The back trajectory analysis shows a continuation of stagnation across the area from the previous days. The trajectories are short and mainly from the south and southwest. The lower three levels indicate that air moved across the Charlotte metropolitan area to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds light and variable.

6/8/2011	6/9/2011	Exceedance Day
		
		

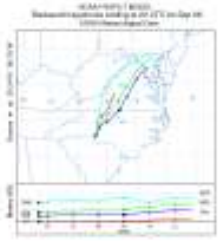
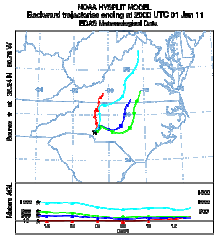
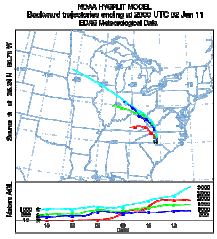
September 1, 2011: The back trajectory analysis shows stagnation with recirculation. On the previous day, back trajectories show that air was transported southward from the Mid-Atlantic, through the Charlotte metropolitan area. The back trajectories on September 1 show the same air mass being recirculated back up across the Charlotte metropolitan area to the Garinger monitor. Skies were mostly sunny with temperatures in the lower 90s. Surface winds were calm or light and variable.

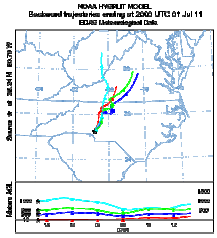
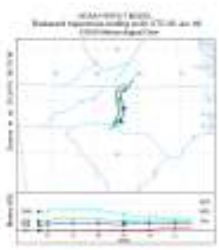
8/30/2011	8/31/2011	Exceedance Day
		
Ozone AQI Values by site on 08/30/2011 	Ozone AQI Values by site on 08/31/2011 	Ozone AQI Values by site on 09/01/2011 

September 2, 2011: The back trajectory analysis shows a continuation of stagnation across the area from the previous days. The trajectories are short and mainly from the southwest or southeast. The lower three levels indicate that air moved across the Charlotte metropolitan area to the Garinger monitor. Skies were partly cloudy with temperatures in the mid 90s. Surface winds mainly light and variable.

8/31/2011	9/1/2011	Exceedance Day
		
		

Garinger Scenario C (non-Charlotte Transport):

	**September 4, 2009:** The back trajectory analysis shows transport from the Mid-Atlantic southward through central North Carolina to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the mid 80s. Surface winds were calm or from the northeast and northwest.
	**July 8, 2010:** The back trajectory analysis shows transport from the Mid-Atlantic, southward through central North Carolina to the Garinger monitor. Skies were mostly sunny with temperatures around 100 degrees. Surface winds were mainly from the northeast.
	**June 1, 2011:** The back trajectory analysis shows short trajectories indicating slow air movement. Trajectories indicated transport from the northeast and from the north, through the Charlotte metropolitan area to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the mid 90s. Surface winds were from the northwest and northeast.
	**June 2, 2011:** The back trajectory analysis shows long trajectories indicating fast air movement from the northwest to the southeast. The trajectories show air movement from the due north to the south as air moved to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were calm or from the northwest and northeast.

	**<u>July 1, 2011:</u>** The back trajectory analysis shows transport from the north to the Garinger monitor. Skies were partly to mostly sunny with highs in the lower 90s. Surface winds were light or from the northwest.
	**<u>June 25, 2009:</u>** The back trajectory analysis shows transport from the north to the Garinger monitor. Skies were partly to mostly sunny with temperatures in the upper 80s to lower 90s. Surface winds were from the west, northwest, and southwest.

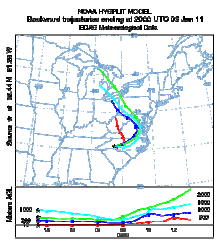
The back trajectory studies show ozone exceedances are caused by either local sources in and near the Charlotte metropolitan area or are transported in from the northwest, north, or northeast to Garinger (37-119-0041). Ozone concentrations at Garinger (37-119-0041) exceed the standard when air is transported from the Charlotte metropolitan area to Garinger (37-119-0041) form a west, southwest flow or from stagnation and recirculation. Ozone exceedances can also occur at Garinger (37-119-0041) when air masses move from the north to south across the Mid-Atlantic and central North Carolina to Garinger (37-119-0041). These back trajectory analysis add weight to the argument that York county is contributing little to the ozone exceedances at the Charlotte monitors.

Lincoln ozone monitoring station back trajectory analysis:

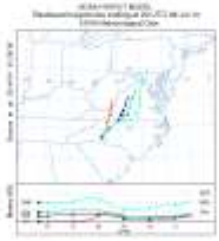
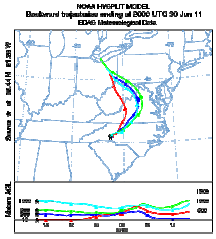
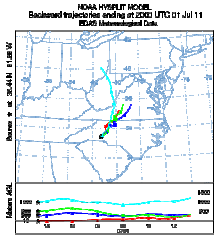
A series of back trajectories were analyzed to specifically examine transport regimes at Lincoln (37-109-0004). Lincoln (37-109-0004) is located northwest of Charlotte in Lincoln County. Ozone concentrations at Lincoln (37-109-0004) exceeded the ozone standard on eight days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was performed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the Lincoln site (37-109-0004) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were four distinct transport scenarios for Lincoln (37-109-0004), Lincoln Scenario A, Lincoln Scenario B, and Lincoln Scenario C.

The back trajectories on two ozone exceedance days show air masses moving west to east then recirculating back through the Charlotte metropolitan area before ending up at Lincoln (37-1009-0004) (see Lincoln Scenario A). The second transport scenario (see Lincoln Scenario B) involved air parcels moving in from the north to Lincoln (37-109-0004) without ever passing through the Charlotte metropolitan area. The third transport scenario (see Lincoln Scenario C) shows transport from the north before the air mass stagnates across the area. There does seem to be some recirculation as the air mass stagnates in the Charlotte metropolitan area. These trajectories suggest ozone precursors were transported from both the Mid-Atlantic and the Charlotte metropolitan area to Lincoln (37-1009-0004). The back trajectories below are broken up between these three scenarios.

Lincoln Scenario A (Charlotte Transport):

	**May 7, 2010:** The back trajectory analysis shows transport from the west towards the Charlotte metropolitan area. The trajectories show air moving through the Charlotte metropolitan area before ending up at the Lincoln monitor. Skies were mostly sunny with temperatures in the upper 80s. Surface winds were mainly from the southwest.
	**June 3, 2011:** The back trajectory analysis shows a northerly transport along with air moving through the Charlotte metropolitan area before ending up at the Lincoln monitor. Skies were partly to mostly cloudy with temperatures in the upper 80s. Surface winds were calm or light and variable.

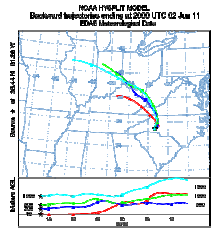
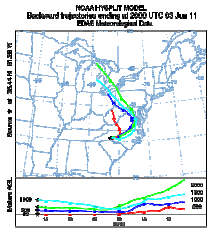
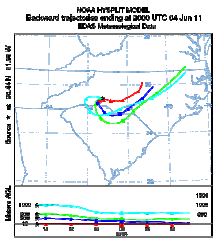
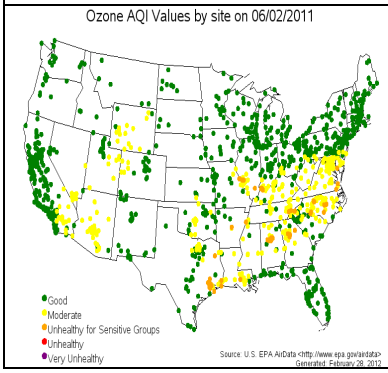
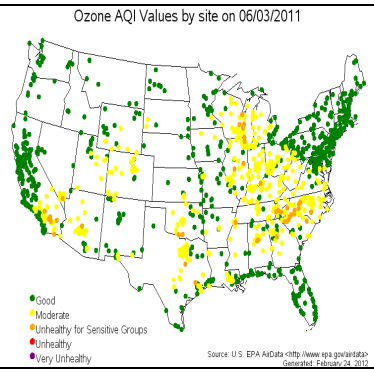
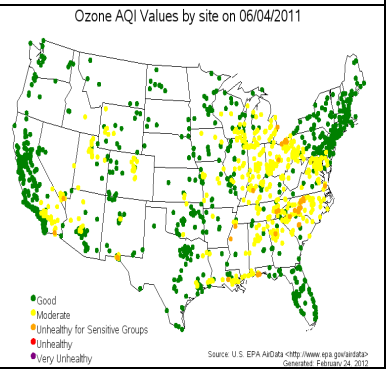
Lincoln Scenario B (non-Charlotte Transport):

	**July 8, 2010:** The back trajectory analysis shows air being transported southward from the mid-Atlantic through central North Carolina before ending up at the Lincoln monitor. These trajectories indicate that the ozone precursor plume did not cross the Charlotte metropolitan area before ending up at Lincoln. Skies were partly cloudy with temperatures in the upper 90s. Surface winds were mainly from the northeast.
	**June 30, 2011:** The back trajectory analysis shows air being transported southward from the Mid-Atlantic through central North Carolina before ending up at the Lincoln monitor. These trajectories indicate that the ozone precursor plume did not cross the Charlotte metropolitan area before ending up at Lincoln. Skies were partly to mostly sunny with temperatures near 90 degrees. Surface winds were calm or light and from the north.
	**July 1, 2011:** The back trajectory analysis shows air being transported southward from the Mid-Atlantic through central North Carolina before ending up at the Lincoln monitor. These trajectories indicate that the ozone precursor plume did not cross the Charlotte metropolitan area before ending up at Lincoln. Skies were partly to mostly sunny with temperatures near 90. Surface winds were light and from the north and north, northwest.

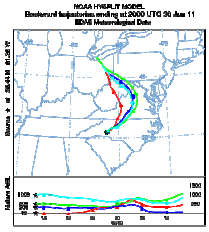
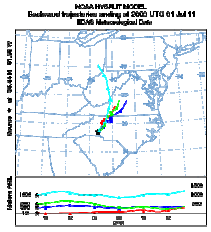
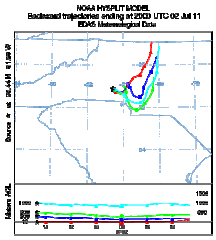
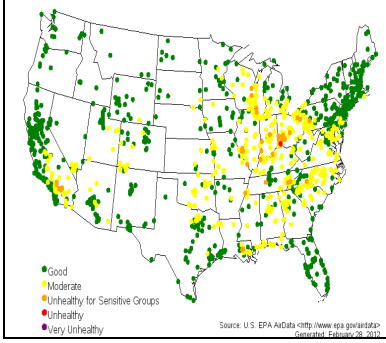
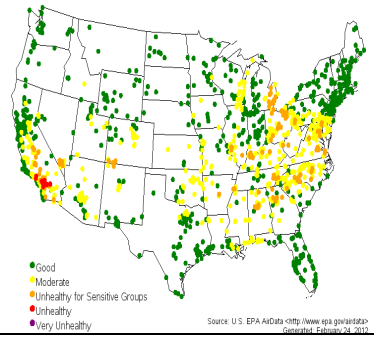
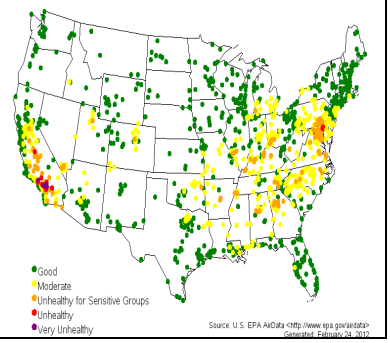
Lincoln Scenario C (Stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

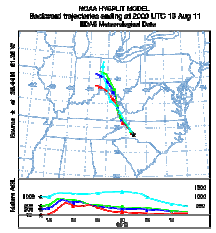
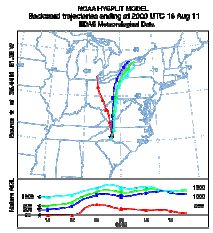
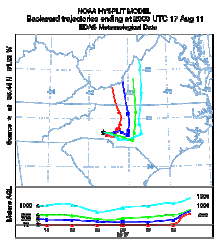
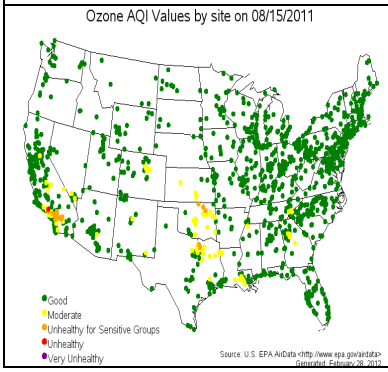
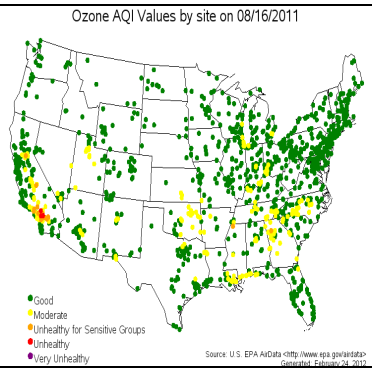
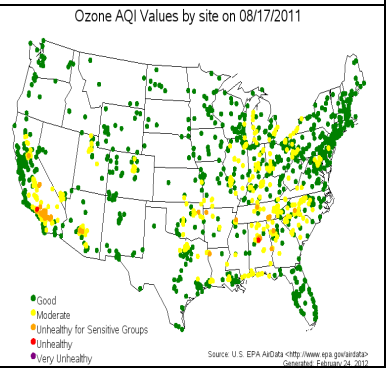
June 4, 2011: The back trajectory analysis shows stagnation with some recirculation. On the previous day, trajectories show air moving southward out of the Mid-Atlantic into North Carolina. On June 4, the trajectories show air stagnating and recirculating back up through the Charlotte metropolitan area and to the Lincoln monitor. Skies were partly cloudy with temperatures in the upper 80s. Surface winds were calm or light and variable.

6/2/2011	6/3/2011	Exceedance Day
		
		

July 2, 2011: The back trajectory analysis shows stagnation across the area. The trajectories are short and from the north with some recirculation back through the Charlotte metropolitan area before ending up at the Lincoln monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Surface winds were calm or light and variable.

6/30/2011	7/1/2011	Exceedance Day
		
		

August 17, 2011: The back trajectory analysis shows a northerly transport with stagnation and some recirculation. The trajectories show air moving southward then moving through the Charlotte metropolitan area before ending up at the Lincoln monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were calm or light and from the southeast.

8/15/2011	8/16/2011	Exceedance Day
		
		

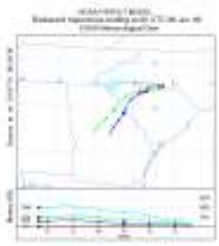
The back trajectory studies show ozone exceedances are caused by either local sources in and near the Charlotte metropolitan area or a combination of a northerly transport along with the Charlotte metropolitan area plume. Some of the trajectories with a northerly flow show almost no influence from the Charlotte metropolitan area to Lincoln (37-109-0004). These back trajectory analyses add further weight to the argument that York County has little impact on the ozone exceedances at the Charlotte monitors.

Monroe ozone monitoring station back trajectory analysis:

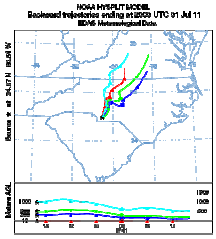
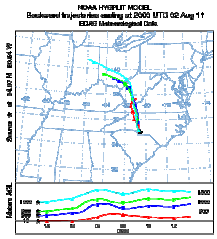
A series of back trajectories were analyzed to specifically examine transport regimes at Monroe (37-179-0003). Monroe (37-179-0003) is located southeast of Charlotte in Union County. Ozone concentrations at Monroe (37-179-0003) exceeded the ozone standard on three days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was performed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the Monroe site (37-179-0003) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were two distinct transport scenarios for Monroe (37-179-0003), Monroe Scenario A and Monroe Scenario B.

The back trajectories on one of the three ozone exceedance days show an air mass moving from the southwest then west to east before crossing the Charlotte metropolitan area to Monroe (37-179-0003) (see Monroe Scenario A). The second transport scenario (see Monroe Scenario B) shows air moving in from the north, northeast or north, northwest before ending up at Monroe (37-179-0003). Scenario B indicates that the plume may have just clipped the Charlotte metropolitan area before ending up at Monroe (37-179-0003).

Monroe Scenario A (Charlotte transport):

	**June 26, 2009:** The back trajectory analysis shows air moving from the southwest then west to east across the Charlotte metropolitan area before ending up at the Monroe monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Surface winds were variable or from the southwest.

Monroe Scenario B (non-Charlotte transport):

	**July 1, 2011:** The back trajectory analysis shows air moving southward out of the Mid-Atlantic through central North Carolina to the Monroe monitor. The plume may have clipped the Charlotte metropolitan area before ending up at the Monroe monitor. Skies were party cloudy with temperatures near 90. Surface winds were light and from the north or north, northwest.
	**August 2, 2011:** The back trajectory analysis shows air moving southward out of the Ohio River Valley into western Virginia and through central North Carolina before ending up at the Monroe monitor. The plume may have clipped the Charlotte metropolitan area before ending up at the Monroe monitor. Skies were partly cloudy with temperatures in the mid to upper 90s. Surface winds were light and from the north or north, northwest.

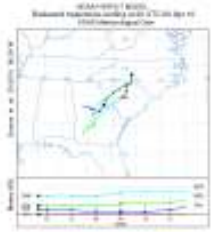
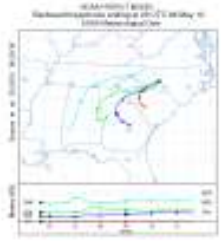
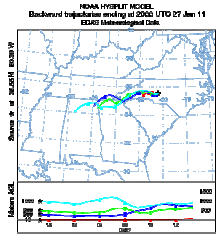
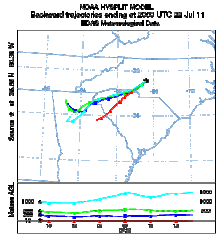
The back trajectory studies show ozone exceedances are caused by either local sources in and near the Charlotte metropolitan area or are transported in from the northwest, north, or northeast to Monroe (37-179-0003). Ozone concentrations at Monroe (37-179-0003) exceed the standard when air is transported from the Charlotte metropolitan area to Monroe (37-179-0003) from a west, southwest flow or when the air mass is moving southward, possibly clipping the Charlotte metropolitan area before ending up at Monroe (37-179-0003). These back trajectory analyses add further weight to the argument that York County has little impact on the ozone exceedances at the Charlotte monitors.

Rockwell ozone monitoring station back trajectory analysis:

A series of back trajectories were analyzed to specifically examine transport regimes at Rockwell (37-159-0021). Rockwell (37-159-0021) is located well northeast of Charlotte in Rowan County. Ozone concentrations at Rockwell (37-159-0021) exceeded the ozone standard on seventeen days from 2009 through 2011. In order to get a better understanding of the transport issues that may have been involved on these exceedance days, a back trajectory analysis was performed on the days when the exceedances occurred. The back trajectories were run at four different vertical levels, beginning at the Rockwell site (37-159-0021) for each of the exceedance days. Back trajectories were run for 36 hours starting at 20 UTC on the day of the exceedance. On high ozone days, there were three distinct transport scenarios for Rockwell (37-159-0021), Rowan Scenario A, Rowan Scenario B, Rowan Scenario C, and Rowan Scenario D.

The back trajectories on four of the seventeen ozone exceedance days show an air mass crossing the Charlotte metropolitan area before ending up at Rockwell (37-159-0021) (see Rockwell Scenario A). In most of these cases, air was transported from the west or southwest through the Charlotte metropolitan area before ending up at Rockwell (37-159-0021). The second transport scenario (see Rockwell Scenario B) involved northerly stagnation, indicating air moving in from the north then stagnating and recirculating back across the Charlotte area before ending up at Rockwell (37-159-0021). The third transport scenario (see Rockwell Scenario C) shows transport from outside of the Charlotte metropolitan area to Rockwell (37-159-0021). This scenario shows little impact on Rockwell from the Charlotte metropolitan area. Finally the last scenario (see Rockwell Scenario D) shows stagnation across the area with many of the trajectories also showing recirculation through the Charlotte metropolitan area to Rockwell (37-159-0021). Many of these stagnation events occur after air is transported southward into the Carolinas from the Mid-Atlantic. The air then stagnates and recirculates back northward across the Charlotte metropolitan area to Rockwell (37-159-0021).

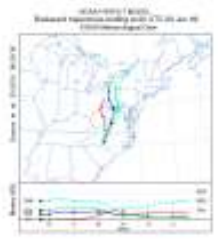
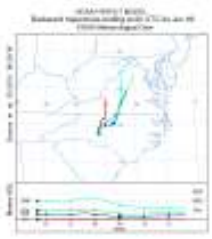
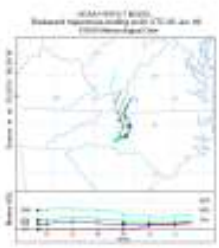
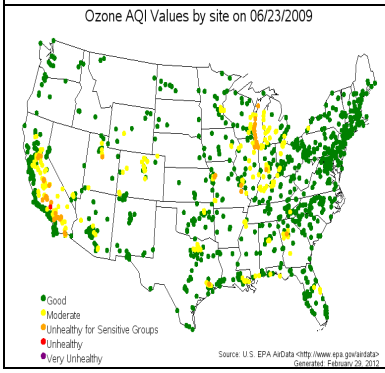
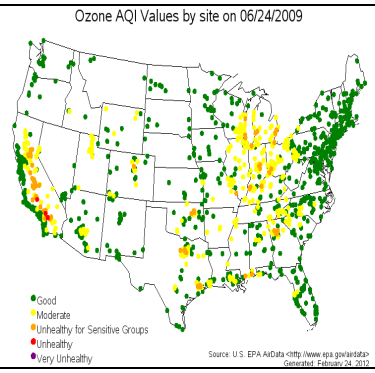
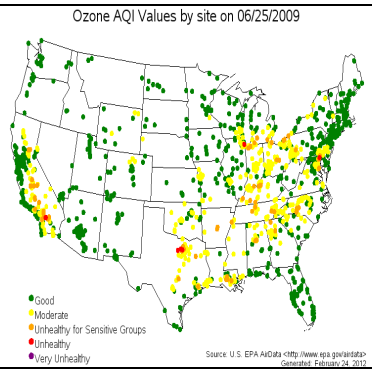
Rockwell Scenario A (Charlotte transport):

	**April 2, 2010:** The back trajectory analysis shows air flowing in from the south and southwest up through the Charlotte metropolitan area to the Rockwell monitor. Skies were mostly sunny with temperatures in the mid 80s. Surface winds were mainly from the southwest.
	**May 6, 2010:** The back trajectory analysis shows air flowing in from the south and southwest up through the Charlotte metropolitan area to the Rockwell monitor. Skies were mostly sunny with temperatures in the upper 80s. Surface winds were from the southwest.
	**June 27, 2011:** The back trajectory analysis shows air flowing from west to east, crossing the Charlotte metropolitan area before ending up at the Rockwell monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were from the southwest.
	**July 22, 2011:** The back trajectory analysis shows air moving from the southwest to the northeast, crossing the Charlotte metropolitan area before ending up at the Rockwell monitor. Skies were partly to mostly sunny with temperatures in the mid to upper 90s. Surface winds were from the west, southwest.

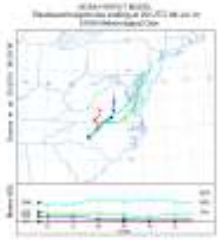
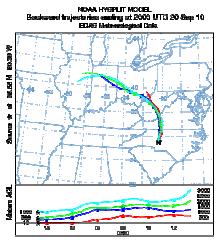
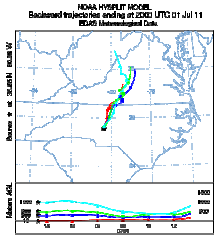
Rockwell Scenario B (Northerly stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

June 25, 2009: The back trajectory analysis shows air moving southward out of western Virginia into central North Carolina before stagnating near the Charlotte metropolitan area. The air moves through the Charlotte metropolitan area before ending up at the Rockwell monitor. Skies were partly cloudy with temperatures in the upper 80s to near 90. Surface winds variable or from the west.

6/23/2009	6/24/2009	Exceedance Day
		
		

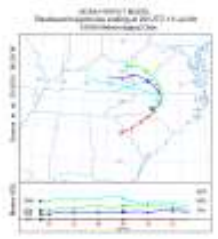
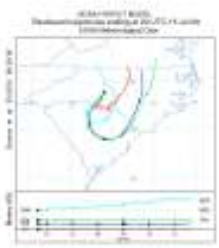
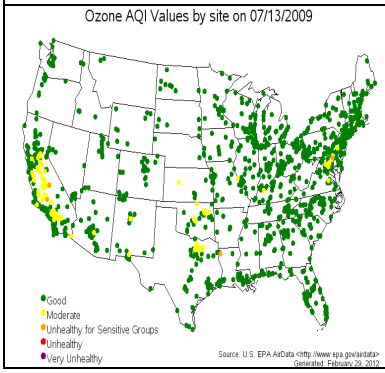
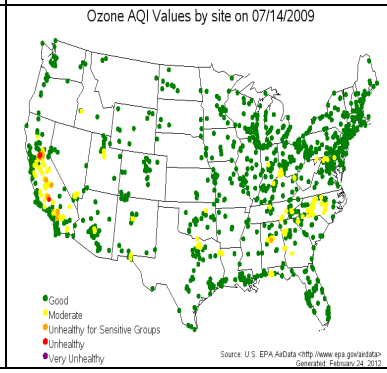
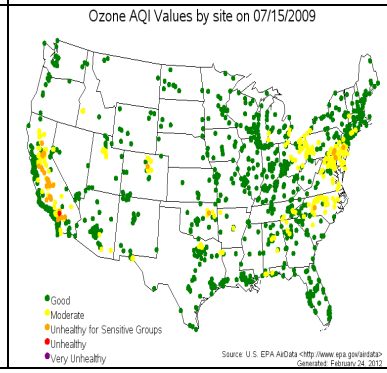
Rockwell Scenario C (non-Charlotte transport):

	**July 8, 2010:** The back trajectory analysis shows air moving southward from the Mid-Atlantic through central North Carolina before ending up at the Rockwell monitor. These trajectories show little if any impact on Rockwell from the Charlotte metropolitan area. Skies were partly to mostly sunny with temperatures around 100 degrees. Surface winds were light and variable.
	**September 20, 2010:** The back trajectory analysis shows air moving rapidly southeastward then southward from the Ohio River Valley into western Virginia through central North Carolina before reaching the Rockwell monitor. These trajectories indicate transport from well outside the local area with little if any influence from the Charlotte metropolitan area. Skies were mostly clear with temperatures in the lower 90s. Surface winds were calm or variable.
	**July 01, 2011:** The back trajectory analysis shows air moving southward from Virginia through central North Carolina before ending up at the Rockwell monitor. The trajectories show little if any impact from the Charlotte metropolitan area on the Rockwell monitor. Skies were partly to mostly sunny with temperatures near 90 degrees. Surface winds were mainly from north and northwest.

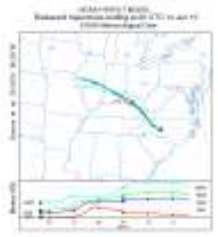
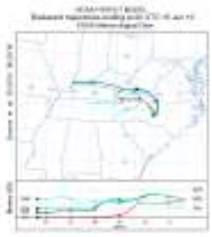
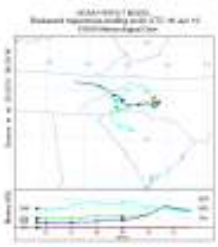
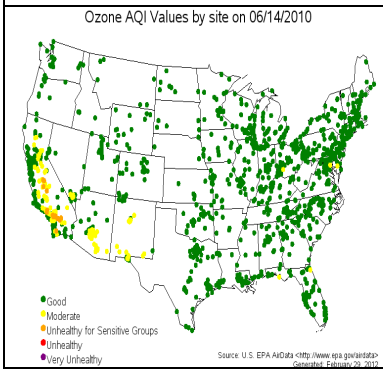
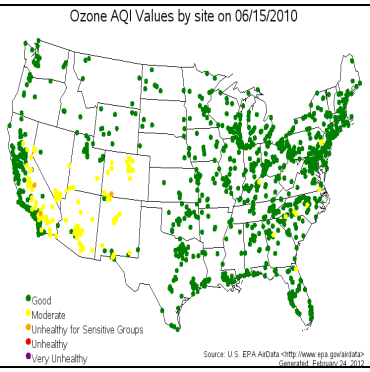
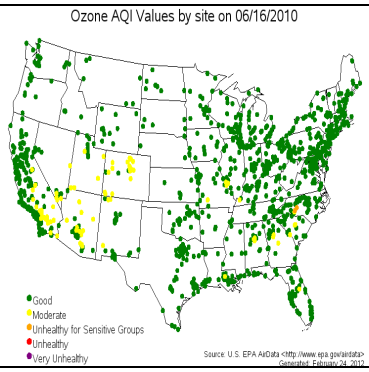
Rockwell Scenario D (Stagnation):

To show that this was a stagnation event pared with potential transport from areas outside of the Charlotte metropolitan area, the day of the exceedance plus the trajectories from the proceeding two days are shown.

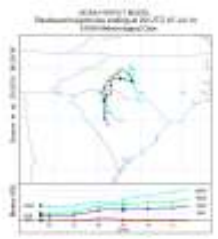
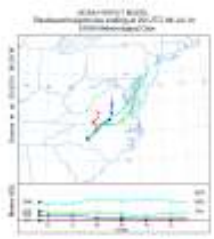
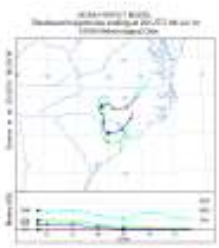
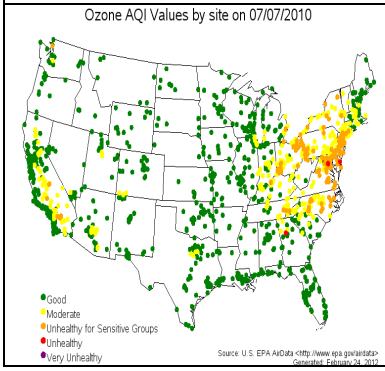
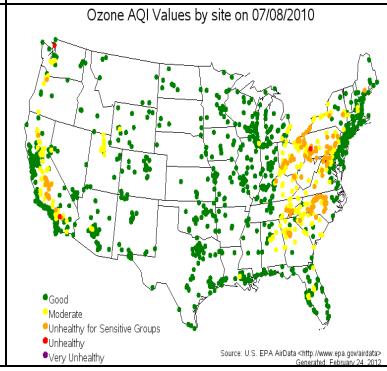
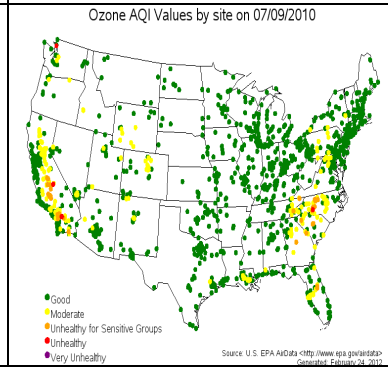
July 15, 2009: The back trajectory analysis shows air stagnating across the area. On the previous day, trajectories showed air moving down from the Mid-Atlantic into the Carolinas. On July 15 the trajectories indicate air stagnating and recirculating back up through the Charlotte metropolitan area before reaching the Rockwell monitor. Skies were partly to mostly cloudy with temperatures in the upper 80s to near 90. Surface winds were mainly from the southwest.

7/13/2009	7/14/2009	Exceedance Day
		
		

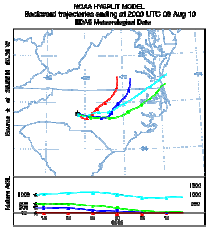
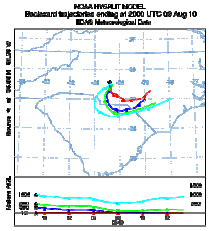
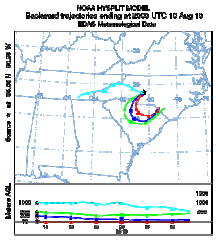
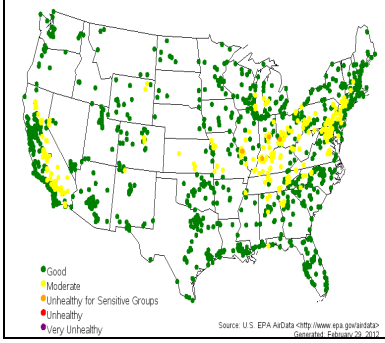
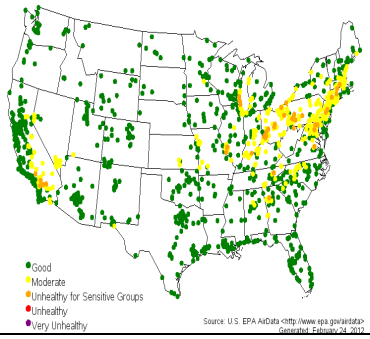
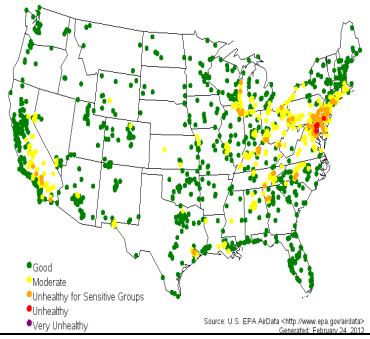
June 16, 2010: The back trajectory analysis shows air moving in from the west and stagnating across the area. The analysis does show some transport from the Charlotte metropolitan area to the Rockwell monitor. Skies were partly cloudy with temperatures near 90. Surface winds were light and mainly from the southwest.

6/14/2010	6/15/2010	Exceedance Day
		
		

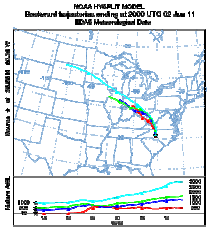
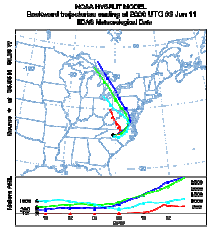
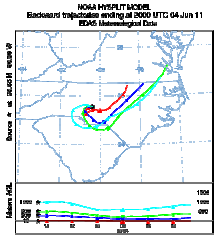
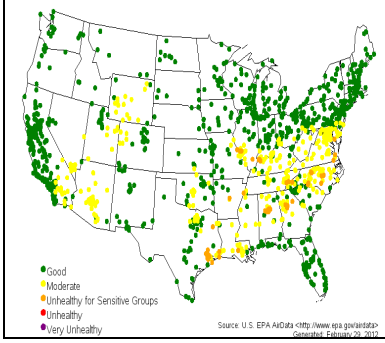
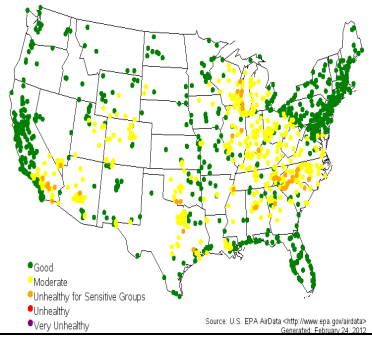
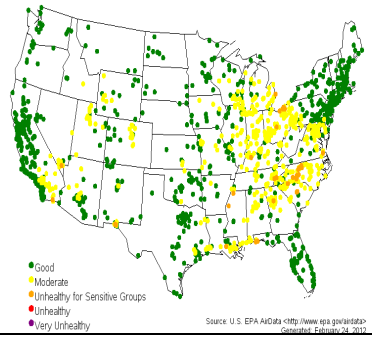
July 9, 2010: The back trajectory analysis shows air stagnating across the area. On the previous day, the trajectories showed air moving down the east coast into eastern North Carolina. On July 9 this air mass stagnated across the area. These trajectories show little impact from the Charlotte metropolitan area on the Rockwell monitor. Skies were partly to mostly sunny but became mostly cloudy in the afternoon. Surface winds were light and variable.

7/7/2010	7/8/2010	Exceedance Day
		
		

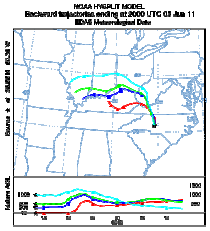
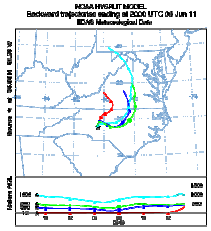
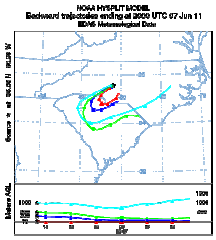
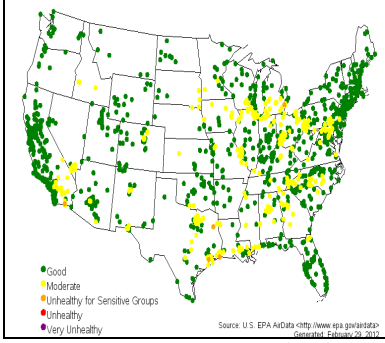
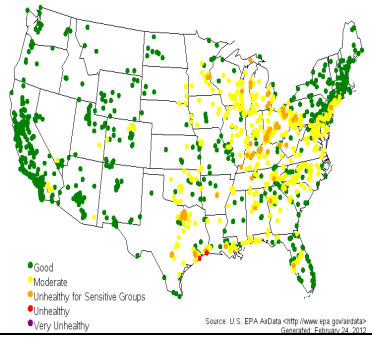
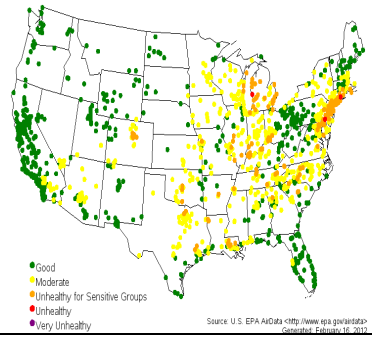
August 10, 2010: The back trajectory analysis shows air stagnating across the area. On the previous days, air had come down from the Mid-Atlantic and stagnated across the Carolinas. On August 10 the trajectories showed stagnation with air recirculating back up through the Charlotte metropolitan area before reaching the Rockwell monitor. Skies were partly to mostly cloudy with temperatures in the mid 90s. Surface winds were mainly from the south, southwest or southwest.

8/8/2010	8/9/2010	Exceedance Day
		
		

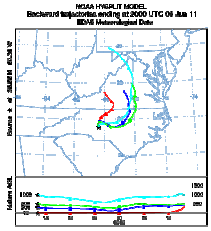
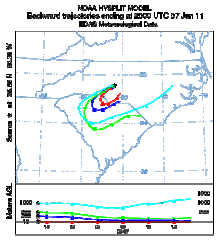
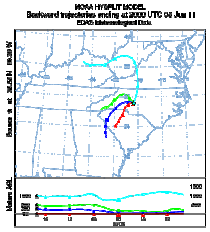
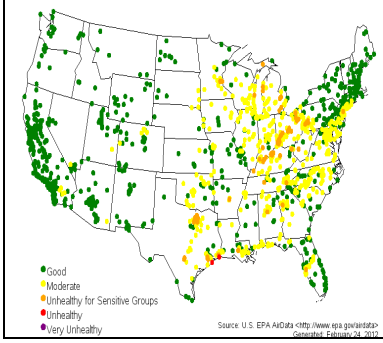
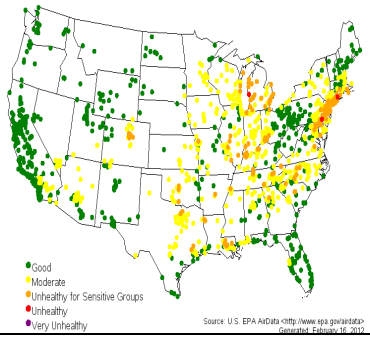
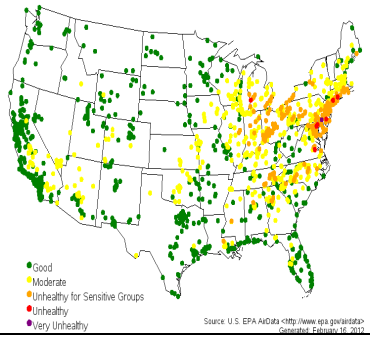
June 4, 2011: The back trajectory analysis shows air moving southwest ward from eastern North Carolina then stagnating and recirculating through the Charlotte metropolitan area before ending up at the Rockwell monitor. Skies were partly cloudy with temperatures in the upper 80s. Surface winds were calm or light and from the southwest.

6/2/2011	6/3/2011	Exceedance Day
		
		

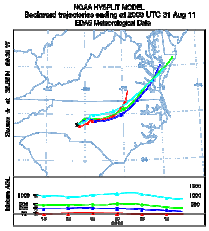
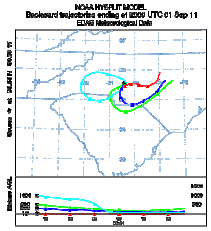
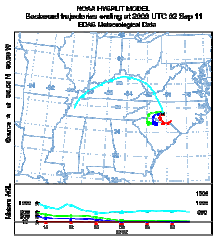
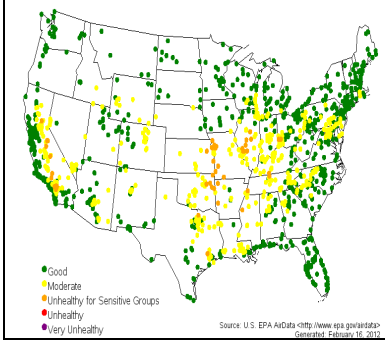
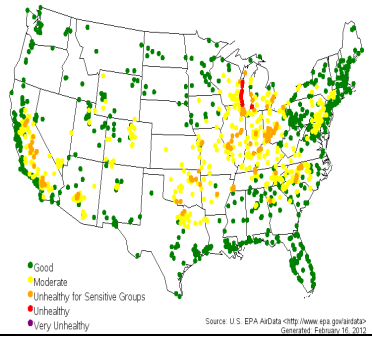
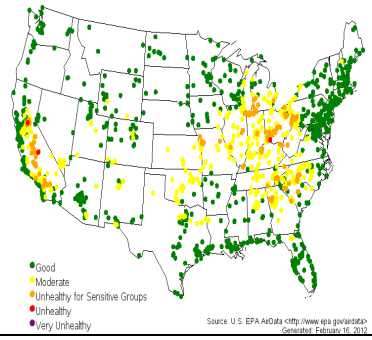
June 7, 2011: The back trajectory analysis shows air stagnating and recirculating across the area. On the previous day, trajectories indicated air moving southward from Virginia and central North Carolina. On June 7 the trajectories show air recirculating back up through the Charlotte metropolitan area to the Rockwell monitor. Skies were partly to mostly sunny with temperatures near 90. Surface winds were mainly from the southwest.

6/5/2011	6/6/2011	Exceedance Day
		
		

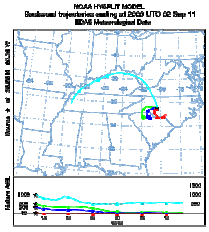
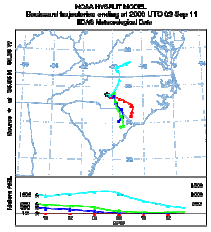
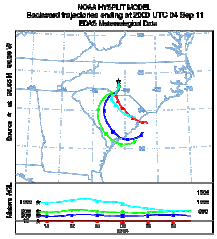
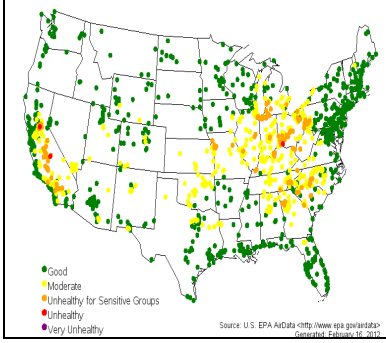
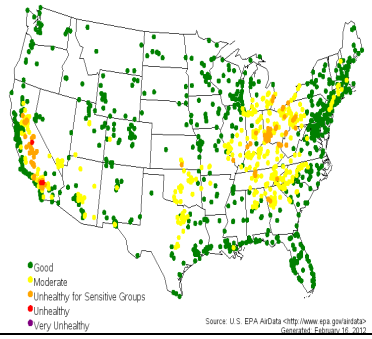
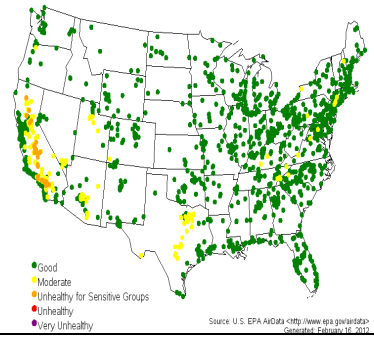
June 8, 2011: The back trajectory analysis shows the same stagnation event from June 7 continuing. Trajectories are short and mainly form the south and southwest, moving through the Charlotte metropolitan area before ending up at the Rockwell monitor. Skies were partly cloudy with temperatures in the lower 90s. Surface winds were light and variable or light and from the southwest.

6/6/2011	6/7/2011	Exceedance Day
		
		

September 2, 2011: The back trajectory analysis shows air stagnating across the area at the three lower levels. On previous days, air had moved southward into the Carolinas from the Mid-Atlantic with some recirculation back through the Charlotte metropolitan area. The short trajectories on September 2 indicate air slowly moving back through the Charlotte metropolitan area before ending up at the Rockwell monitor. Skies were partly cloudy becoming cloudy later in the day with a thunderstorm. Surface winds were variable but gusty during the thunderstorm.

8/31/2011	9/1/2011	Exceedance Day
		
		

September 4, 2011: The back trajectory analysis shows air continuing to stagnate across the area. The trajectories do show air moving northward out of South Carolina, through the Charlotte metropolitan area to the Rockwell monitor. Skies were partly to mostly cloudy with temperatures in the upper 80s. Surface winds were mainly from the southeast.

9/2/2011	9/3/2011	Exceedance Day
		
		

The back trajectory studies show ozone exceedances are caused by either local sources in and near the Charlotte metropolitan area either by being transported in from the west and southwest to Rockwell (37-159-0021) or through stagnation events. Other back trajectories show situations where the Charlotte metropolitan area has little impact on ozone concentrations at Rockwell (37-159-0021). In these cases air moves southward out of the Mid-Atlantic and central or eastern North Carolina to Rockwell (37-159-0021). These back trajectory analyses add further weight to the argument that York County has little impact on the ozone exceedances at the Charlotte monitors.

Appendix B
Factor 2 Justification
Emissions and Emissions-Related Data

Partial Inventory Data:

This information is presented based on conversations and consultation between US Environmental Protection Agency (EPA) Region 4 staff and the South Carolina Department of Health and Environmental Control (SCDHEC or Department) staff on February 9, 2012. During this consultation meeting, the EPA requested additional information and rationale on Emission Inventory Data expected to be used in the Department's response to the EPA's proposed modification to the State's recommended designation request for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS). The information presented here explains how the Department arrived at its partial county emissions inventory and population data for the portion of York County proposed by EPA as nonattainment for the 2008 8-hour ozone NAAQS, to include a rationale and calculations, as well as electronic mail correspondence outlining the sources of the data used. The Department believes that this data is essential in supporting its claim that the aforementioned portion of York County does not contribute to a violation of the 2008 ozone NAAQS in the Charlotte-Gastonia-Salisbury, NC-SC CSA/CBSA. This assertion is based primarily on the *more recent, partial county data* outlined in the Department's response. The Department believes that using full county data is a gross misrepresentation of the data used to address the factors to ultimately make this important designation decision, especially considering the EPA has itself proposed to designate only a portion of York County.

Electronic Mail Correspondence Related to Data Acquisition:

Email: February 13, 2012, Maeve Mason, SCDHEC to Lynorae Benjamin, USEPA Region 4 – Reference to Emissions Inventory Development for the Rock Hill-Fort Mill Transportation Study (RFATS) Redesignation and Maintenance Plan submitted May 31, 2011.

Email: May 22, 2009, Janice Godfrey, Environmental Engineer, NC DENR to Leslie Coolidge, SCDHEC – 2011 Budgets

Email: May 26, 2009, Joe, McLelland, Charlotte Department of Transportation to Leslie Coolidge, SCDHEC – 2011 and 2012 VMT and Speeds

Email: May 1, 2007, Leslie Coolidge, SCDHEC to Frances Thomas, Planning Director, City of Rock Hill – 2000 York Nonattainment Area Population

Email: February 10, 2012, Leslie Coolidge, SCDHEC to David Hooper, RFATS Coordinator, City of Rock Hill – 2010 York Nonattainment Area Population

Email: February 13, 2012, Leslie Coolidge, SCDHEC to David Hooper, RFATS Coordinator, City of Rock Hill – 2011 York Nonattainment Area Population

Email: February 17, 2012, Anna Gallop, Charlotte Department of Transportation to Leslie Coolidge, SCDHEC – 2010 York County VMT and Speeds

A. Calculation of Partial York County 2008 Vehicle Miles Traveled (VMT)

The Metrolina model county-level VMT data in Table 1 was provided to the Charlotte interagency consultation group by Janice Godfrey of North Carolina Department of Environment and Natural Resources (NCDENR) on May 22, 2009. The York County VMT was included in a file of Metrolina county-level VMT developed for calculation of 2011 budgets for the resubmission of the Attainment Demonstration for the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS).

The Partial York County VMT data shown on Table 2 was provided to the South Carolina Department of Health and Environmental Control (SCDHEC or Department) by Joe McLelland of the Charlotte Dept of Transportation (CDOT) on May 26, 2009.

Table 1: VMT Data from VMT and Speed Table for Nonattainment Area Counties, 2009

VMT and Speed Summary - By County					
2011 York VMT	0601-0900	0901-1500	1501-1800	0001-0600 1801-2400	
York	**AM Peak**	**Midday**	**PM Peak**	**Night**	**24 Hour**
Rural Interstate	243,537	280,617	267,726	157,726	949,606
Rural Principal Arterial	34,932	37,726	37,194	18,296	128,148
Rural Minor Arterial	166,025	212,958	185,592	128,988	693,564
Rural Major Collector	100,564	130,824	114,113	75,701	421,202
Rural Minor Collector	10,613	13,450	11,134	7,270	42,466
Rural Local	174,272	234,695	201,530	130,222	740,720
Urban Interstate	223,198	264,676	245,009	148,137	881,020
Urban Other Freeway/Xprway	19,570	29,559	23,318	12,855	85,301
Urban Principal Arterial	229,101	333,458	258,393	196,998	1,017,950
Urban Minor Arterial	195,342	281,516	225,062	157,645	859,565
Urban Collector	60,072	79,771	70,918	37,632	248,393
Urban Local	174,492	282,572	205,143	145,288	807,494
County	1,631,717	2,181,824	1,845,132	1,216,758	**6,875,431**

Table 2: VMT and Speed Data for Partial York County, 2009

2011		**DAILY**	
York NonAttainment	**Miles**	**VMT**	**Spd**
Rural Interstate	24.9	941,430	62.0
Rural Principal Art.	6.6	86,514	44.8
Rural Minor Art.	26.5	289,199	39.5
Rural Major Collect.	54.1	285,061	41.7
Rural Minor Collect.	9.4	33,785	22.5
Rural Local		357,617	26.9
Urban Interstate	18.5	878,660	61.9

Urban Frwy/Exprwy	3.1	82,795	40.6
Urban Principal Art.	53.5	913,029	34.4
Urban Minor Art.	84.8	734,931	34.4
Urban Collector	64.7	231,402	23.9
Urban Local		697,748	24.3
Rural		1,993,605	43.3
Urban		3,538,565	34.5
County		**5,532,170**	37.2

Calculation of Partial County VMT Contribution

The following formula was originally used to provide a ratio for estimating the portion of 2008 York County VMT that should be attributed to the proposed nonattainment area:

- 2011 York County nonattainment area daily VMT/2011 York County daily VMT = the fraction of York County daily VMT attributable to the proposed York nonattainment area
- 5,532,170/6,875,431 = 0.8046 (or 80 percent)

The December 2011, Environmental Protection Agency (EPA) Technical Support Document supplied a 2008 VMT for all of York County of 2,002 million miles. Applying the aforementioned ratio (0.8046) to the 2008 VMT, the Department estimated a partial county VMT for 2008:

- 2,002 x 0.8046 = 1,611 million miles for partial York County for 2008.

This calculation and information was shared with the EPA Region 4 staff during a consultation meeting on February 9, 2012. However, based on follow-up discussions, EPA Region 4 staff discussed its concerns with this approach; questioning why the 2010 VMT from the redesignation/maintenance plan was not used.

Based on this EPA concern, the Department applied the same rationale, but instead used data developed for the redesignation/maintenance plan. The Department obtained 2010 annual average daily VMT (AADVMT) from the Metrolina model from CDOT on March 3, 2011. This data is shown in Table 3. On February 17, 2012, during conversations with CDOT, the Department requested 2010 whole York County data from the same Maintenance Plan model run from CDOT. This data is shown in Table 4.

Table 3: 2010 VMT and Speed Data for Partial York County, 2011

	AM Peak		**Midday**		**PM Peak**		**Night**		**DAILY**
2010	**VMT**	**Spd**	**VMT**	**Spd**	**VMT**	**Spd**	**VMT**	**Spd**	**VMTassn**
Rural Interstate	241,701	57	281,780	66	267,887	58	156,450	65	947,818
Rural Principal Art.	24,294	38	26,126	54	26,639	40	11,906	58	88,965
Rural Minor Art.	69,492	36	91,390	38	78,222	33	57,184	46	296,287
Rural Major Collect.	64,730	40	84,868	45	74,449	39	48,555	49	272,602
Rural Minor Collect.	8,071	20	10,251	22	9,026	14	5,439	31	32,787
Rural Local	86,802	27	126,624	27	105,812	28	64,874	27	384,112

Urban Interstate	224,233	56	266,933	63	249,241	59	147,122	63	887,529
Urban Frwy/Exprwy	22,100	41	34,213	43	25,670	40	16,112	45	98,095
Urban Principal Art.	198,097	30	292,454	34	225,320	29	167,218	40	883,089
Urban Minor Art.	178,520	30	268,069	33	207,788	29	153,477	40	807,853
Urban Collector	62,067	24	91,957	24	73,342	18	41,627	33	268,993
Urban Local	157,506	24	264,677	24	186,802	24	133,773	25	742,758
Rural	495,089		621,039		562,036		344,408		2,022,572
Urban	842,523		1,218,304		968,162		659,330		3,688,318
County	1,337,612		1,839,342		1,530,198		1,003,738		5,710,890

Table 4: 2010 VMT and Speed Data for York County, 2011

2010			
York	**Miles**	**VMTassn**	**Spd**
Rural Interstate	24.9	947,818	60.9
Rural Principal Art.	16.8	120,487	47.7
Rural Minor Art.	107.8	683,293	45.7
Rural Major Collect.	100.7	400,086	43.9
Rural Minor Collect.	12.7	41,114	21.9
Rural Local		741,756	27.1
Urban Interstate	18.5	887,529	60.0
Urban Frwy/Exprwy	3.1	98,095	42.2
Urban Principal Art.	57.1	965,513	33.5
Urban Minor Art.	104.1	901,648	32.8
Urban Collector	72.0	306,412	24.2
Urban Local (est)		822,112	24.1
Urban HOV	0.0	0	0.0
Rural		2,934,554	41.1
Urban		3,981,309	33.1
County		6,915,863	36.1

Using the same formula above but instead applying the 2010 partial county AADVMT (5,710,890) and the whole county York County AADVMT (6,915,863), the Department determined that 82.6 percent of the York County VMT was attributed to the partial county for that model run. Applying this ratio to the aforementioned 2008 VMT data in EPA's December 2011 TSD, the partial county estimated 2008 VMT is 1,653 million miles (which is higher than the originally estimated 1,611 million miles, but lower than the 1,790 million miles EPA states "supports a contribution to nonattainment.")

- 5,710,890/6,915,863 = 0.8257 (or 82.6 percent)
- 2,002 x 0.8257 = 1,653 million miles for partial York County for 2008.

B. Calculation of Partial York County Population

RFATS population (as referenced as the Partial York County population) has been supplied by RFATS. Because RFATS is the lead transportation planning agency for the area and is

responsible for providing socio-economic data for planning purposes, the population estimate provided by RFATS is accepted as valid.

The RFATS population estimate provided by RFATS for 2000 is 119,505, confirmed by Francis Thomas of RFATS on May 1, 2007 (attached). The RFATS population estimate for 2005 is 153,900. It was provided by David Hooper of RFATS on February 14, 2012 (attached). The RFATS population estimate provided by RFATS for 2010 is 173,881, confirmed by David Hooper of RFATS on February 13, 2012.

Mathias, Melinda <mathiamc@dhec.sc.gov>

Re: 120Day Ozone Consultation Follow Up & Emission Statement Clarification

1 message

Nacosta Ward <Ward.Nacosta@epamail.epa.gov> **Tue, Feb 14, 2012 at 4:40 PM**
To: Lynorae Benjamin <Benjamin.Lynorae@epamail.epa.gov>
Cc: "Mason, Maeve" <masonmr@dhec.sc.gov>, "Barnes, Lynn" <barnesls@dhec.sc.gov>, Beverly Banister <Banister.Beverly@epamail.epa.gov>, "Brown, Robbie" <brownrj@dhec.sc.gov>, Carol Kemker <Kemker.Carol@epamail.epa.gov>, "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, Dianna Smith <Smith.Dianna@epamail.epa.gov>, "Flynn, Thomas" <flynntj@dhec.sc.gov>, "Hughes, Jennifer R." <hughesjr@dhec.sc.gov>, Jane Spann <Spann.Jane@epamail.epa.gov>, "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, "Monroe, Michael" <monroemc@dhec.sc.gov>, "Reece, Myra C." <reecemc@dhec.sc.gov>, Richard Wong <Wong.Richard@epamail.epa.gov>, Rick Gillam <Gillam.Rick@epamail.epa.gov>, "Roberts, L. Nelson" <robertln@dhec.sc.gov>, ScottR Davis <Davis.ScottR@epamail.epa.gov>, "Shealy, Renee" <shealyrg@dhec.sc.gov>

Attached is the data that we pulled from the 2008 NEI for the Charlotte-Gastonia-Salisbury, NC-SC CSA. This data is what we used in to develop our TSDs, which is the topic of Thursday's call.

(See attached file: Charlotte Emission Data by category.xlsx)

Have a wonderful day!
Nacosta C. Ward, Environmental Scientist
U. S. Environmental Protection Agency, Region 4 | Air, Pesticides & Toxics Management Division
Air Planning Branch/Regulatory Development Section
61 Forsyth Street, SW, Atlanta, GA 30303-8960
email: ward.nacosta@epa.gov | voice: (404) 562-9140 | facsimile: (404) 562-9019

(Embedded image moved to file: pic09734.jpg)

Healthier Families, Cleaner Communities, A Stronger America
40 Years of Achievements and Milestones
http://www.epa.gov/40th

From: Lynorae Benjamin/R4/USEPA/US
To: "Mason, Maeve" <masonmr@dhec.sc.gov>
Cc: "Barnes, Lynn" <barnesls@dhec.sc.gov>, Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie" <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA, "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, Dianna Smith/R4/USEPA/US@EPA, "Flynn, Thomas" <flynntj@dhec.sc.gov>, "Hughes, Jennifer R."

<hughesjr@dhec.sc.gov>, Jane Spann/R4/USEPA/US@EPA, "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, "Monroe, Michael" <monroemc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA, "Reece, Myra C." <reecemc@dhec.sc.gov>, Richard Wong/R4/USEPA/US@EPA, Rick Gillam/R4/USEPA/US@EPA, "Roberts, L. Nelson" <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA, "Shealy, Renee" <shealyrg@dhec.sc.gov>
Date: 02/14/2012 12:48 PM
Subject: Re: 120Day Ozone Consultation Follow Up & Emission Statement Clarification

Hi Maeve,

We can use 1-866-299-3188 access code 4045629040 for both calls. Thanks for the reminder about the table. We will send to you shortly, no later than the end of today.... we have all been in meetings all morning and about to start the next round of them now.

I hope your day is going well.

Lynorae Benjamin, Chief
Regulatory Development Section
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303
phone: 404-562-9040
facsimile: 404-562-9019

From: "Mason, Maeve" <masonmr@dhec.sc.gov>
To: Lynorae Benjamin/R4/USEPA/US@EPA
Cc: Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie" <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA, "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, Dianna Smith/R4/USEPA/US@EPA, "Flynn, Thomas" <flynntj@dhec.sc.gov>, "Hughes, Jennifer R." <hughesjr@dhec.sc.gov>, Jane Spann/R4/USEPA/US@EPA, "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA, "Reece, Myra C." <reecemc@dhec.sc.gov>, Rick Gillam/R4/USEPA/US@EPA, "Roberts, L. Nelson" <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA, "Shealy, Renee" <shealyrg@dhec.sc.gov>, Richard Wong/R4/USEPA/US@EPA, "Barnes, Lynn" <barnesls@dhec.sc.gov>, "Monroe, Michael" <monroemc@dhec.sc.gov>
Date: 02/14/2012 12:40 PM
Subject: Re: 120Day Ozone Consultation Follow Up & Emission Statement Clarification

Lynorae,

I think that both these dates/times will work for us. To review:

Met Data Call - Wed, 2/15 at 2:30 p.m. (SCDHEC staff this will be in room 3151)
Emission Data Call - Thurs, 2/16 at 2:00 p.m. (SCDHEC staff this will be in the Wallace room)

Can you provide call-in numbers for both calls? Also, any word on the data tables?

Look forward to talking more later this week. Thanks,
--
Maeve S.R. Mason, Manager
Regulation & SIP Management
Bureau of Air Quality, SCDHEC
2600 Bull Street
Columbia, SC. 29201
803.898.2230

On Mon, Feb 13, 2012 at 6:29 PM, Lynorae Benjamin <Benjamin.Lynorae@epamail.epa.gov> wrote:
>
> Hi Maeve,
>
> We could do the call on meteorology data from 2:30 p.m. to 3:30 p.m. on
> Wednesday, February 15, 2012. Please confirm that this will work for
> you all and we will send a call-in number. Thanks. I will send a
> note shortly for the data meeting.
>
> I hope your day is going well.
>
> Lynorae Benjamin, Chief
> Regulatory Development Section
> U.S. Environmental Protection Agency, Region 4
> 61 Forsyth Street, S.W.
> Atlanta, Georgia 30303
> phone: 404-562-9040
> facsimile: 404-562-9019
>
>
>
>
> From: "Mason, Maeve" <masonmr@dhec.sc.gov>
> To: Lynorae Benjamin/R4/USEPA/US@EPA
> Cc: Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie"
> <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA,
> "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, "Hughes,
> Jennifer R." <hughesjr@dhec.sc.gov>, Jane
> Spann/R4/USEPA/US@EPA, "Mathias, Melinda C."
> <mathiamc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA,
> "Reece, Myra C." <reecemc@dhec.sc.gov>, Rick
> Gillam/R4/USEPA/US@EPA, "Roberts, L. Nelson"
> <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA,
> "Shealy, Renee" <shealyrg@dhec.sc.gov>, Dianna

> Smith/R4/USEPA/US@EPA, "Flynn, Thomas"
<flynntj@dhec.sc.gov>
> Date: 02/13/2012 04:01 PM
> Subject: Re: 120Day Ozone Consultation Follow Up & Emission
Statement
> Clarification
>
>
>
> Lynorae,
>
> Tommy has been included in this response. He is available on
> Wednesday and Thursday afternoons this week.
>
> As for the partial county data - please again refer to the "tables" on
> the pages I already referenced. For ease, I have scanned and attached
> these pages. The plans in their entirety are also available here:
> http://www.scdhec.gov/environment/baq/Metrolina-SC_Redesignation/
>
http://www.ncair.org/planning/Metrolina/Metrolina_Redesignation_SIP_Narrative_11-2-2011.pdf

>
>
> As for the detail on how the emission inventory was developed, please
> see the corresponding Appendices that the pages I gave mention (I
> believe both reference USEPA's EGAS model).
>
> We look forward to receiving the data from you as soon as possible.
> Thanks.
> –
> Maeve S.R. Mason, Manager
> Regulation & SIP Management
> Bureau of Air Quality, SCDHEC
> 2600 Bull Street
> Columbia, SC. 29201
> 803.898.2230
>
>
> On Mon, Feb 13, 2012 at 12:55 PM, Lynorae Benjamin
> <Benjamin.Lynorae@epamail.epa.gov> wrote:
>> Thanks Maeve. We are setting the meeting up to discuss the
> meteorology
>> up as soon as we coordinate schedules. We have Renee's availability
>> from the email she sent Scott but we also thought it would be helpful
> to
>> have Tommy's availability. Can you help with that... Also, we
will
>> send the tables shortly. Nacosta is out sick today and has the
> master
>> file that we used. Also, thanks for pointing us to the
> redesignation
>> for the rationale. We looked at that in preparation for our meeting
>> with you all in N. Augusta and still have questions... perhaps you
> could
>> send us the figures and tables you all developed to help us see the
> math
>> and try to distinguish where we differ in data. We can discuss more

> on
>> the call that we set up to discuss the data.
>>
>> I hope your day is going well.
>>
>> Lynorae Benjamin, Chief
>> Regulatory Development Section
>> U.S. Environmental Protection Agency, Region 4
>> 61 Forsyth Street, S.W.
>> Atlanta, Georgia 30303
>> phone: 404-562-9040
>> facsimile: 404-562-9019
>>
>>
>>
>>
>> From: "Mason, Maeve" <masonmr@dhec.sc.gov>
>> To: Lynorae Benjamin/R4/USEPA/US@EPA
>> Cc: Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie"
>> <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA,
>> "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, "Hughes,
>> Jennifer R." <hughesjr@dhec.sc.gov>, Jane
>> Spann/R4/USEPA/US@EPA, "Mathias, Melinda C."
>> <mathiamc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA,
>> "Reece, Myra C." <reecemc@dhec.sc.gov>, "Roberts, L.
> Nelson"
>> <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA,
>> "Shealy, Renee" <shealyrg@dhec.sc.gov>, Rick
>> Gillam/R4/USEPA/US@EPA
>> Date: 02/13/2012 12:46 PM
>> Subject: Re: 120Day Ozone Consultation Follow Up & Emission
> Statement
>> Clarification
>>
>>
>>
>> Lynorae,
>>
>> We look forward to being able to set up the call. Just as an
>> FYI...Renee has already been in contact with Scott Davis about
setting
>> something up (I think maybe separately) to discuss the back
>> trajectories. We'd all like to know what each other did in terms of
>> developing this factor's response.
>>
>> Speaking of being on the same page...any way we can get the tables
you
>> used in developing Emissions Data, page 6/7 (percentages of NOx and
>> VOC Emissions in particular) for factor 2. That would really help -
>> especially given the time crunch.
>>
>> For a rationale/justification on our using/calculating partial county
>> data - please refer to the respective emission inventory sections of
>> the Redesignation Demonstration and Maintenance Plan requests for
both
>> NC (dated November 2, 2011, Section 3.3.2, page 25) and SC (dated May
>> 31, 2011, Section III.C.2, page 21). A description of what was done

>> for VMT and population are forthcoming - hopefully later this
>> afternoon.
>>
>> Thanks, look forward to the call(s).
>> –
>> Maeve S.R. Mason, Manager
>> Regulation & SIP Management
>> Bureau of Air Quality, SCDHEC
>> 2600 Bull Street
>> Columbia, SC. 29201
>> 803.898.2230
>>
>>
>> On Fri, Feb 10, 2012 at 6:35 PM, Lynorae Benjamin
>> <Benjamin.Lynorae@epamail.epa.gov> wrote:
>>>
>>> Thanks Maeve. It was good to see you all yesterday. Nacosta will
>>> follow up with EPA availability for a call for some time next week.
>>> One question I have is will Tommy Flynn also be available for the
>> times
>>> you listed or should we touch bases with him separately. We had
>>> questions about the meteorological data that you presented
yesterday.
>>>
>>> I hope your day is going well.
>>>
>>> Lynorae Benjamin, Chief
>>> Regulatory Development Section
>>> U.S. Environmental Protection Agency, Region 4
>>> 61 Forsyth Street, S.W.
>>> Atlanta, Georgia 30303
>>> phone: 404-562-9040
>>> facsimile: 404-562-9019
>>>
>>>
>>>
>>>
>>> From: "Mason, Maeve" <masonmr@dhec.sc.gov>
>>> To: Jane Spann/R4/USEPA/US@EPA, Lynorae
>>> Benjamin/R4/USEPA/US@EPA, Carol Kemker/R4/USEPA/US@EPA,
>>> Beverly Banister/R4/USEPA/US@EPA, ScottR
>>> Davis/R4/USEPA/US@EPA, Nacosta Ward/R4/USEPA/US@EPA
>>> Cc: "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, "Brown,
>>> Robbie" <brownrj@dhec.sc.gov>, "Shealy, Renee"
>>> <shealyrg@dhec.sc.gov>, "Hughes, Jennifer R."
>>> <hughesjr@dhec.sc.gov>, "Roberts, L. Nelson"
>>> <robertln@dhec.sc.gov>, "Coolidge, Leslie N."
>>> <coolidln@dhec.sc.gov>, "Reece, Myra C."
>>> <reecemc@dhec.sc.gov>
>>> Date: 02/10/2012 03:57 PM
>>> Subject: 120Day Ozone Consultation Follow Up & Emission
>> Statement
>>> Clarification
>>>
>>>
>>>
>>> Good afternoon,

>>>
>>> I just wanted to followup on yesterday's meeting. We appreciate you
>>> making the time. We think the discussion was productive in terms of
>>> highlighting our perspectives as well as opportunities for clarity.
>>>
>>> As promised, please find attached:
>>> 1) The sign-in sheet/record of meeting,
>>> 2) The powerpoint slides from the meeting (to include the back
>>> trajectories and gradient map), and
>>> 3) The rational/documentation for the emission statements
requirement
>>> associated with the 1997 8-hour ozone redesignation and maintenance
>> plan
>>> request.
>>>
>>> As indicated yesterday, we would like to have a follow-up call with
>> you
>>> as soon as possible to address/discuss the questions we had on the
>> data
>>> presented in Factor 2 of your TSD information (December 8, 2011).
>> Given
>>> the approaching deadline to have our responses to you (Feb 29), we'd
>>> like to schedule this call as soon as possible. Do either of these
>>> dates/times work for a call: Wednesday 2/15 at 2:30 p.m., or Friday
>> 2/17
>>> anytime?
>>>
>>> We have been able to obtain the NEI data from the link provided, but
>> as
>>> discussed and in the interest of time, we would very much like for
> you
>>> to provide us with the table you indicated that you used in
>> calculating
>>> the information provide on Factor 2: Emissions Data, page 6/7
>>> (percentages of NOx and VOC Emissions in particular) just so that we
>> can
>>> be sure we are all on the same page.
>>>
>>> In the meantime, we are working hard to provide you with the
> technical
>>> explanation of how we arrived at our partial county data/information
>> as
>>> well as how we derived the back trajectories. We hope to have this
>>> information soon (prior to Feb 29).
>>>
>>> Thank you again. We look forward to hearing from you.
>>>
>>> –
>>> Maeve S.R. Mason, Manager
>>> Regulation & SIP Management
>>> Bureau of Air Quality, SCDHEC
>>> 2600 Bull Street
>>> Columbia, SC. 29201
>>> 803.898.2230
>>> (See attached file: Ppt for EPA 120 day Meeting_20120209.ppt)(See
>>> attached file: EPAR4_SC_Ozone120DayConsult_20120209.pdf)(See
attached

>>> file: Summary of Emission Statements Requirement for EPAR4.doc)
>>
>>
> (See attached file: NC 2010 Emissions Data.pdf)(See attached file: SC
> 2010 Emissions Data.pdf)

2 attachments

pic09734.jpg
22K

Charlotte Emission Data by category.xlsx
15K

- **South Carolina Air Pollution Control Regulation 61-62.2 - *Prohibition of Open Burning***

The revision (June 25, 2004) of R. 61-62.2, *Prohibition of Open Burning*, includes a ban of certain open burning during the ozone season for additional control of NO_x emissions.

c. VOC Regulations: South Carolina Air Pollution Control Regulation 61-62.5, Standard No. 5 - *Volatile Organic Compounds*

This regulation contains requirements for controlling VOCs.

d. Emissions Inventory: South Carolina Regulation 61-62.1, *Definitions and General Requirements*, Section III - Emissions Inventory

This regulation requires the submittal of emissions inventory information by affected sources.

e. Reasonably Available Control Measures (RACM)

Reasonably Available Control Measures is a broadly defined term referring to technologies and other measures that can be used to control pollution; includes Reasonably Available Control Technology and other measures.

The EPA's final 1997 8-hour ozone NAAQS implementation rule in 40 CFR 51.912(d), pursuant to section 172(c)(1) of the CAA, requires the attainment demonstration SIP submittal to include "a SIP revision demonstrating that it has adopted all RACM necessary to demonstrate attainment as expeditiously as practicable and to meet any RFP requirements." In addition, the EPA's RACM policy indicates that areas should consider all candidate measures that are potentially available, including any that have been suggested for the particular nonattainment area. Although areas should consider all available measures, areas need only adopt measures if they are both economically and technologically feasible and will contribute to timely attainment or are necessary for RFP. Measures that might be available but would not advance attainment or contribute to RFP need not be considered RACM. A number of emissions controls programs were implemented in South Carolina following the CAA Amendments of 1990, and substantial further emissions reductions have since occurred in the state as well as the Metrolina nonattainment area. SCDHEC intends to continue to investigate and, where appropriate, adopt additional measures that would reduce emissions of ozone precursors even further. Such measures may help the state in the future as it maintains the 1997 8-hour ozone NAAQS. The source categories emitting the vast preponderance of ozone precursor emissions in the state are already subject to control requirements.

C. Emissions Inventory

There are two basic approaches used to demonstrate continued maintenance. The first is the comparison of a projected emissions inventory with a baseline emissions inventory. The second approach involves complex analysis using gridded dispersion modeling. The approach used by the SCDHEC is the comparison of emissions inventories for the years 2010 and 2022.

For the maintenance demonstration, the base year of 2010 was chosen since it is a year that falls within the attaining design value period of 2008-2010 and some emissions inventory data was already developed for this year. The maintenance demonstration is made by comparing the 2010 baseline emissions inventory to the 2022 projected emissions inventory. The baseline emissions inventory represents an emission level for a period when the ambient air quality standard was not violated, 2008-

2010. If the projected emissions remain at or below the baseline emissions, continued maintenance is demonstrated and the ambient air quality standard should not be violated in the future. In addition to comparing the final year of the plan, all of the interim years are compared to the 2010 baseline to demonstrate that these years are also expected to show continued maintenance of the 1997 8-hour ozone NAAQS.

The emissions inventories are comprised of four major types of sources: point, area, on-road mobile, and non-road mobile. The projected emissions inventories have been estimated using projected rates of growth in population, traffic, economic activity, and other parameters. Naturally occurring, or biogenic, emissions are not included in the emissions inventory comparison, as these emissions are outside the State's span of control.

The NCDAQ has developed a maintenance plan for the North Carolina portion of the Metrolina nonattainment area. For emissions summaries for the North Carolina portion of the Metrolina nonattainment area, refer to the Redesignation Demonstration and Maintenance Plan submitted by the NCDAQ.

1. Emission Inventories

There are four different man-made emission inventory source classifications: (1) point, (2) area, (3) on-road mobile, and (4) nonroad mobile sources.

Point sources are those larger industrial or commercial stationary facilities that must have Title V permits issued by the SCDHEC Bureau of Air Quality (BAQ). These sources have the potential to emit more than 100 tons of NO_x or VOC. The source emissions are tabulated from data collected by direct on-site measurements of emissions or mass balance calculations utilizing emission factors from the EPA's AP-42. There are usually several emission sources for each facility. Emission data is collected for each point source at a facility and the data is entered into an in-house database system. For the projected year's inventory, point sources are adjusted by growth factors based on Standard Industrial Classification codes. The growth factors are generated using the EPA's Economic Growth Analysis System version 5.0 (E-GAS 5.0) program. A complete description of how these inventories were developed is discussed in detail in Appendix A.

Area sources are those stationary sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., smaller industrial facilities, dry cleaners, service stations, etc.). For area sources, emissions are estimated by multiplying an emission factor by some known indicator of collective activity such as production, number of employees, or population. These types of emissions are estimated on the county level. For the projected year's inventory, area source emissions are changed by population growth, projected production growth, or when applicable, by E-GAS 5.0 growth factors. A complete description of how these inventories were developed is discussed in detail in Appendix B.

For on-road mobile sources, the EPA mobile model MOVES2010a is used to generate emissions. MOVES can be used to estimate exhaust and evaporative emissions as well as brake and tire wear emissions from all types of on-road vehicles. The estimation of emissions involves multiplying an activity level by an emission factor, and is all done within the model. The activity level used by MOVES2010a is vehicle miles traveled (VMT). For the future years' inventories, the MOVES 2010a mobile model takes into consideration expected federal tailpipe standards, fleet turnover, and new fuels. A complete description of how these inventories were developed is discussed in detail in Appendix C.

Nonroad mobile sources are equipment that can move but do not use the roadways, i.e., lawn mowers, construction equipment, railroad locomotives, aircraft, etc. The emissions from this category are calculated using the EPA's NONROAD2008a non-road mobile model, with the exception of the railroad locomotives and aircraft engine. The railroad locomotive and aircraft engine emissions are estimated by multiplying an activity level by an emission factor. These emissions are also estimated at the county level. For the projected years' inventories, the emissions are estimated using the EPA's NONROAD2008a non-road mobile model, E-GAS 5.0 growth factors, or projected landing and take off data for aircraft. A complete description of how these inventories were developed is discussed in detail in Appendix D.

2. Summary of Emissions

The tables below contain the estimated emissions from all of the emission source sectors, i.e., point, area, on-road mobile, and nonroad mobile for the York County portion of the Metrolina nonattainment area. Additionally, the sum total of these man-made emissions for the York County portion of the Metrolina nonattainment area is tabulated in Table III-1. For emissions summaries for the North Carolina portion of the Metrolina nonattainment area, refer to the Redesignation Demonstration and Maintenance Plan submitted by the NCDAQ.

Table III-1 Point Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 2.07	2.06	2.2	2.34	2.49
NO_x Emissions (tons/day)					
York*	✓ 4.54	4.64	4.91	5.19	5.48

* Portion of York County within the Metrolina nonattainment area

Table III-2 Area Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 7.1645	7.3870	7.5672	7.7027	7.8311
NO_x Emissions (tons/day)					
York*	✓ 1.1733	1.2219	1.2665	1.3183	1.3641

* Portion of York County within the Metrolina nonattainment area

Table III-3 On-Road Mobile Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 3.92	3.14	2.61	2.29	2.14
NO_x Emissions (tons/day)					
York*	✓ 12.05	8.73	6.52	5.16	4.42

* Portion of York County within the Metrolina nonattainment area

Table III-4 Nonroad Mobile Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 2.149	1.776	1.541	1.438	1.407
NO_x Emissions (tons/day)					
York*	✓ 3.209	2.686	2.174	1.817	1.595

* Portion of York County within the Metrolina nonattainment area

Table III-5 Total Man-Made Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 15.30	14.36	13.92	13.77	13.87
NO_x Emissions (tons/day)					
York*	✓ 20.97	17.28	14.87	13.49	12.86

* Portion of York County within the Metrolina nonattainment area

3. Maintenance Demonstration

As discussed above, maintenance is demonstrated when the future years total man-made emissions are less than the 2010 baseline emissions. The following table summarizes the VOC and NO_x emissions for the York County portion of the Metrolina nonattainment area. The difference between the base year (2010) and the final year (2022) illustrates that the continued maintenance of the 1997 8-hour ozone NAAQS is expected.

Although there is a slight increase in VOC emissions between 2019 and 2022, the SCDHEC does not believe this is inconsistent with the maintenance demonstration. First, the 2022 emissions are still below the baseline emissions for 2010. There are significantly more VOC emissions in the atmosphere than NO_x emissions and a vast majority of the total VOC emissions come from biogenic, or natural, sources, which cannot be controlled. Therefore a slight increase in man-made VOC emissions in 2022 will not result in an increase in ozone formation. As noted earlier, this area is NO_x limited for ozone.

Table III-6 Maintenance Demonstration

Year	VOC TPD	NO_x TPD
2010	15.30	20.97
2013	14.36	17.28
2016	13.92	14.87
2019	13.77	13.49
2022	13.87	12.86
Difference from 2010 to 2022	-1.43	-8.11

The difference between the attainment level of emissions (2010) from all man-made sources and the projected level of emissions from all man-made sources in the York County portion of the Metrolina nonattainment area is considered the "safety margin." The safety margin for each projected year is listed below in Table III-7.

Table III-7 Safety Margin

Year	VOC TPD	NOx TPD
2010	N/A	N/A
2013	-0.94	-3.69
2016	-1.38	-6.10
2019	-1.53	-7.48
2022	-1.43	-8.11

3.3.2 Emission Inventories

There are four different man-made emission inventory source classifications: (1) stationary point, (2) area, (3) on-road mobile and (4). nonroad mobile sources.

Point sources are those stationary sources that require an air permit to operate. In general, these sources have a potential to emit more than 5 tons per year of a criteria pollutant or its precursors from a single facility. The source emissions are tabulated from data collected by direct on-site measurements of emissions or mass balance calculations utilizing emission factors from the USEPA's AP-42 or stack test results. There are usually several emission sources for each facility. Emission data is collected for each point source at a facility and the data is entered into an in-house database system. For the projected years' inventory, point sources are adjusted by growth factors based on Standard Industrial Classification codes generated using growth patterns obtained from County Business Patterns. For the electric generating utility sources, the estimated projected future year emissions were based on information provided by the utility company. For the sources that report to the USEPA's Clean Air Markets Division, the actual 2010 average summer day emissions were used. For the other Title V sources, the 2009 data was used which was the latest data available. For the small sources that only report emissions every 5 years, the most recently reported data was used and assumed to be equivalent to 2009 emissions since these sources do not vary much from year to year. The 2009 emissions data was grown to 2010 using the USEPA's EGAS model. The NCDAQ believes the estimated 2010 emissions are representative of what was emitted in 2010.

For detailed discussion on how the point sources emission inventory was developed, see Appendix B.1. A summary of the point source emissions are presented in Table 3-3 and Table 3-4. The emissions are presented in a ton per summer day basis.

Table 3-3. Point Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	0.90 ✓	0.95	1.01	1.11	1.16
Gaston	23.48 ✓	8.58	7.75	7.92	6.02
Iredell*	3.28 ✓	3.54	3.79	4.04	4.28
Lincoln	0.59 ✓	0.65	0.68	0.74	0.81
Mecklenburg	1.35 ✓	1.39	1.48	1.58	1.68
Rowan	7.04 ✓	3.38	2.87	3.07	3.32
Union	0.33 ✓	0.35	0.38	0.40	0.44
Total	36.97 ✓	18.84	17.96	18.86	17.71

*Iredell County emissions for nonattainment area only

Table 3-4 Point Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	1.14	1.25	1.35	1.46	1.54
Gaston	1.28	1.19	1.35	1.47	1.54
Iredell*	0.86	0.94	1.03	1.09	1.16
Lincoln	0.93	1.03	1.12	1.24	1.32
Mecklenburg	3.24	3.52	3.82	4.05	4.31
Rowan	3.72	4.08	4.48	4.87	5.25
Union	1.36	1.49	1.61	1.72	1.85
Total	12.53	13.50	14.76	15.90	16.97

*Iredell County emissions for nonattainment area only

Area sources are those stationary sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., dry cleaners, service stations, etc.). For area sources, emissions are estimated by multiplying an emission factor by some known indicator of collective activity such as production, number of employees, or population. These types of emissions are estimated on the county level. For the projected year's inventory, area source emissions are changed by population growth, projected production growth, or estimated employment growth. For detailed discussion on how the area source emission inventory was developed, see Appendix B.2. A summary of the area source emissions are presented in Table 3-5 and Table 3-6. The emissions are presented in a ton per summer day basis.

Table 3-5. Area Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	0.59	0.60	0.61	0.62	0.63
Gaston	0.73	0.75	0.77	0.79	0.80
Iredell*	0.20	0.20	0.20	0.20	0.20
Lincoln	0.23	0.23	0.22	0.22	0.22
Mecklenburg	5.25	5.31	5.37	5.44	5.50
Rowan	0.50	0.50	0.50	0.51	0.51
Union	0.66	0.65	0.64	0.65	0.64
Total	8.16	8.24	8.31	8.43	8.50

*Iredell County emissions for nonattainment area only

Table 3-6. Area Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	5.12 ✓	5.10	5.14	5.31	5.49
Gaston	6.33 ✓	6.32	6.38	6.56	6.73
Iredell*	2.06 ✓	2.14	2.19	2.27	2.35
Lincoln	2.78 ✓	2.91	2.97	3.08	3.19
Mecklenburg	25.76 ✓	26.26	25.82	26.47	27.18
Rowan	4.87 ✓	5.16	5.27	5.45	5.63
Union	8.80 ✓	9.27	9.58	10.13	10.67
Total	55.72 ✓	57.16	57.35	59.27	61.24

*Iredell County emissions for nonattainment area only

For highway mobile sources, the USEPA's Motor Vehicle Emission Simulator (MOVES) mobile model is run to generate emissions. The MOVES model includes the road class vehicle miles traveled (VMT) as an input file and can directly output the estimated emissions. For the projected years' inventories, the highway mobile sources emissions are calculated by running the MOVES mobile model for the future year with the projected VMT to generate emissions that take into consideration expected Federal tailpipe standards, fleet turnover and new fuels. For detailed discussion on how the on-road mobile emission inventory was developed, see Appendix B.3. A summary of the on-road mobile source emissions are presented in Table 3-7 and Table 3-8. The emissions are presented in a ton per summer day basis.

Table 3-7. On-road Mobile Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	14.48 ✓	11.81	9.79	7.90	6.95
Gaston	13.64 ✓	10.18	8.10	6.61	5.76
Iredell*	8.91 ✓	7.09	5.75	4.69	4.00
Lincoln	5.80 ✓	4.73	3.85	3.16	2.69
Mecklenburg	69.21 ✓	52.08	41.47	33.82	32.00
Rowan	12.96 ✓	10.06	8.03	6.41	5.46
Union	13.26 ✓	10.97	9.44	7.90	6.81
Total	138.26 ✓	106.92	86.43	70.49	63.67

*Iredell County emissions for nonattainment area only

Table 3-8. On-road Mobile Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	7.54	6.05	5.04	4.18	3.63
Gaston	6.24	4.67	3.72	3.08	2.69
Iredell*	5.51	4.32	3.55	2.95	2.53
Lincoln	3.21	2.52	2.05	1.69	1.44
Mecklenburg	30.42	22.91	18.32	15.20	13.65
Rowan	6.32	4.82	3.84	3.10	2.60
Union	7.46	6.03	5.06	4.27	3.67
Total	66.70	51.32	41.58	34.47	30.21

*Iredell County emissions for nonattainment area only

Nonroad mobile sources, also referred to as off-road mobile sources, are equipment that can move but do not use the roadways, i.e., lawn mowers, construction equipment, railroad locomotives, aircraft, etc. The emissions from this category are calculated using the USEPA's NONROAD2008a model, with the exception of the railroad locomotives and aircraft engine. The railroad locomotive and aircraft engine emissions are estimated by taking activity data, such as landings and takeoffs, and multiply by an emission factor. These emissions are also estimated at the county level. For the projected years' inventories, the emissions are estimated using the USEPA's NONROAD2008a model, projected landing and takeoff data for aircraft and national fuel use from the Energy Information Administration for locomotives. For detailed discussion on how the nonroad mobile emission inventory was developed, see Appendix B.4. A summary of the nonroad mobile source emissions are presented in Table 3-9 and Table 3-10. The emissions are presented in a ton per summer day basis.

Table 3-9. Nonroad Mobile Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	2.87	2.39	1.93	1.59	1.38
Gaston	2.83	2.31	1.85	1.55	1.36
Iredell*	0.90	0.74	0.58	0.47	0.40
Lincoln	1.20	1.00	0.82	0.68	0.60
Mecklenburg	25.38	22.93	20.33	18.69	17.88
Rowan	2.52	2.15	1.80	1.55	1.38
Union	5.35	4.52	3.68	3.05	2.61
Total	41.05	36.04	30.99	27.58	25.61

*Iredell County emissions for nonattainment area only

Table 3-10. Nonroad Mobile Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	1.73	1.41	1.25	1.23	1.25
Gaston	1.92	1.54	1.31	1.23	1.22
Iredell*	0.62	0.50	0.42	0.38	0.36
Lincoln	0.94	0.77	0.66	0.59	0.57
Mecklenburg	16.20	13.63	12.33	12.14	12.37
Rowan	1.89	1.58	1.33	1.18	1.12
Union	3.11	2.60	2.33	2.27	2.29
Total	26.41	22.03	19.63	19.02	19.18

*Iredell County emissions for nonattainment area only

3.3.3 Summary of Emissions

The sum totals of the man-made emissions for the Metrolina nonattainment area are tabulated in Tables 3-11 though 3-14. The emission summaries for York County, South Carolina came from the SCDHEC redesignation demonstration and maintenance plan.

Table 3-11 Total Man-Made NOx Emissions for the North Carolina Portion of the Metrolina Nonattainment Area (tons/day)

County	2010	2013	2016	2019	2022
Cabarrus	18.84	15.75	13.34	11.22	10.12
Gaston	40.68	21.82	18.47	16.87	13.94
Iredell*	13.29	11.57	10.32	9.40	8.88
Lincoln	7.82	6.61	5.57	4.80	4.32
Mecklenburg	101.19	81.71	68.65	59.53	57.06
Rowan	23.02	16.09	13.20	11.54	10.67
Union	19.60	16.49	14.14	12.00	10.50
Total	224.44	170.04	143.69	125.36	115.49

* Iredell County emissions for nonattainment area only.

Table 3-12 Total Man-Made VOC Emissions for the North Carolina Portion of the Metrolina Nonattainment Area (tons/day)

County	2010	2013	2016	2019	2022
Cabarrus	15.53	13.81	12.78	12.18	11.91
Gaston	15.77	13.72	12.76	12.34	12.18
Iredell*	9.05	7.90	7.19	6.69	6.40
Lincoln	7.86	7.23	6.80	6.60	6.52
Mecklenburg	75.62	66.32	60.29	57.86	57.51
Rowan	16.80	15.64	14.92	14.60	14.60
Union	20.73	19.39	18.58	18.39	18.48
Total	161.36	144.01	133.32	128.66	127.60

* Iredell County emissions for nonattainment area only.

Table 3-13 Total Man-Made NOx Emissions for South Carolina Portion of the Metrolina Nonattainment Area – York County, South Carolina (tons/day)

County	2010	2013	2016	2019	2022
Point	4.54	4.64	4.91	5.19	5.48
Area	1.17	1.22	1.27	1.32	1.36
On-Road Mobile	12.05	8.73	6.52	5.16	4.42
Nonroad Mobile	3.21	2.69	2.17	1.82	1.60
Total	20.97	17.28	14.87	13.49	12.86

* York County emissions for nonattainment area only.

Table 3-13 Total Man-Made VOC Emissions for South Carolina Portion of the Metrolina Nonattainment Area – York County, South Carolina (tons/day)

County	2010	2013	2016	2019	2022
Point	2.07	2.06	2.20	2.34	2.49
Area	7.16	7.39	7.57	7.70	7.83
On-Road Mobile	3.92	3.14	2.61	2.29	2.14
Nonroad Mobile	2.15	1.78	1.54	1.44	1.41
Total	15.30	14.37	13.92	13.77	13.87

* York County emissions for nonattainment area only.

3.3.4 Maintenance Demonstration

As discussed above, maintenance is demonstrated when the future years total man-made emissions are less than the 2010 baseline emissions. The following tables summarize the VOC and NOx emissions for the entire Metrolina nonattainment area and the North Carolina portion, respectively. The difference between the base year and the final year for both scenarios illustrates that the continued maintenance of the 1997 8-hour ozone NAAQS is expected.

From: "Godfrey, Janice" <janice.godfrey@ncdenr.gov>
To: "Haynes, Eldewins" <ehaynes@ci.charlotte.nc.us>, "Arellano, Terry C" <tarellano@ncdot.gov>, Bernie Yacobucci <berniey@cityofgastonia.com>, 'BettyWhitley' <admin@rockyriverrpo.org>, Bjorn Hansen <BHansen@centralina.org>, "Cook, Robert (Planning)" <rwcook@ci.charlotte.nc.us>, "'Craig.Gresham@kimley-horn.com'" <Craig.Gresham@kimley-horn.com>, "'DanaStoogenke (dstoogenke@rockyriverrpo.org)'" <dstoogenke@rockyriverrpo.org>, "Thomas, Dan" <danthomas@ncdot.gov>, "'dhooper@ci.rock-hill.sc.us'" <dhooper@ci.rock-hill.sc.us>, "'Diane Janicki (E-mail)'" <janickiDK@dot.state.sc.us>, "Keilson, David P" <dpkeilson@ncdot.gov>, "Edward.Dancausse@fhwa.dot.gov" <Edward.Dancausse@fhwa.dot.gov>, "'FThomas@ci.rock-hill.sc.us'" <FThomas@ci.rock-hill.sc.us>, "Gallup, Anna" <agallup@ci.charlotte.nc.us>, "'george.bridgers@ncmail.net'" <george.bridgers@ncmail.net>, "Gibbs, Tim" <tgibbs@ci.charlotte.nc.us>, "'Hank Graham (E-mail) ' (hankg@cityofgastonia.com)" <hankg@cityofgastonia.com>, "Heather.Hildebrandt@ncmail.net" <Heather.Hildebrandt@ncmail.net>, "Alavi, J S" <jalavi@ncdot.gov>, "'janice.godfrey@ncmail.net'" <janice.godfrey@ncmail.net>, "Dayton, Jeff" <jeff.dayton@ncturnpike.org>, "Harris, Jennifer" <jennifer.harris@ncturnpike.org>, John Burris <jburris@HNTB.com>, "'KeithMelton (keith.melton@dot.gov)'" <keith.melton@dot.gov>, "Laura.Boothe@ncmail.net" <Laura.Boothe@ncmail.net>, "Dosse, Linda" <ldosse@ncdot.gov>, "Leslie N. Coolidge" <CoolidLN@dhec.sc.gov>, "loretta.barren@fhwa.dot.gov" <loretta.barren@fhwa.dot.gov>, 'LynoraeBenjamin' <Benjamin.Lynorae@epa.gov>, "McDonald, David" <dmcdonald@ci.charlotte.nc.us>, "McLelland, Joe" <jwmclelland@ci.charlotte.nc.us>, "Smith, Mark G" <mgsmith@ncdot.gov>, Michael Juras <jurasms@dhec.sc.gov>, "pconrad@mblsolution.com" <pconrad@mblsolution.com>, "Rebecca Yarbrough (E-mail)(ryarbrough@centralina.org)" <ryarbrough@centralina.org>, "Rhodes, Leslie" <Leslie.Rhodes@mecklenburgcountync.gov>, "Schmidt, Derry A" <daschmidt@ncdot.gov>, "Ransom, Shannon J" <sransom@ncdot.gov>, "'smith.dianna@epa.gov'" <smith.dianna@epa.gov>, "S. Franklin" <sfranklin@hntb.com>, "Steinman, Norman" <nsteinman@ci.charlotte.nc.us>, 'Steven Liu' <Steven.liu@ncmail.net>, "Thomas, Earlene W" <ewthomas@ncdot.gov>, Tim Padgett <Tim.Padgett@kimley-horn.com>, "Vicki.Chandler@ncmail.net" <Vicki.Chandler@ncmail.net>, "Wendy Bell(wbell@catawbacog.org)" <wbell@catawbacog.org>, "Wong, Vincent" <vincentw@cityofgastonia.com>
CC: "Chandler, Vicki" <vicki.chandler@ncdenr.gov>, "Liu, Steven" <steven.liu@ncdenr.gov>, "Burleson, Joelle" <joelle.burleson@ncdenr.gov>
Date: 5/22/2009 3:24 PM
Subject: 2011 budgets
Attachments: Metrolina_MOBILE_settings_MVEBs_2011.doc; AQ_2011_090303 (from Joe).xls

Please see the attached input parameters for Mobile6.2 that we are proposing be used for the 2011 budget calculations. We can discuss on the next IC call. Let me know if you have any questions.
Janice

Note: My e-mail address has changed to Janice.Godfrey@ncdenr.gov

Janice Godfrey, Environmental Engineer
NC DENR, Division of Air Quality
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From: Haynes, Eldewins [mailto:ehaynes@ci.charlotte.nc.us]
Sent: Tuesday, May 05, 2009 2:23 PM
To: Arellano, Terry C; Bernie Yacobucci; 'Betty Whitley'; Bjorn Hansen; Cook, Robert (Planning); 'Craig.Gresham@kimley-horn.com'; 'Dana Stoogenke (dstoogenke@rockyriverrpo.org)'; Thomas, Dan; 'dhooper@ci.rock-hill.sc.us'; 'Diane Janicki (E-mail)'; Keilson, David P; Edward.Dancausse@fhwa.dot.gov; 'FThomas@ci.rock-hill.sc.us'; Gallup, Anna; 'george.bridgers@ncmail.net'; Gibbs, Tim; 'Hank Graham (E-mail) ' (hankg@cityofgastonia.com); Haynes, Eldewins; Heather.Hildebrandt@ncmail.net; Alavi, J S; 'janice.godfrey@ncmail.net'; Dayton, Jeff; Harris, Jennifer; John Burris; 'Keith Melton (keith.melton@dot.gov)'; Laura.Boothe@ncmail.net; Dosse, Linda; Leslie N. Coolidge; loretta.barren@fhwa.dot.gov; 'Lynorae Benjamin'; McDonald, David; McLelland, Joe; Smith, Mark G; Michael Juras; pconrad@mblsolution.com; Rebecca Yarbrough (E-mail) (ryarbrough@centralina.org); Rhodes, Leslie; Schmidt, Derry A; Ransom, Shannon J; 'smith.dianna@epa.gov'; S. Franklin; Steinman, Norman; 'Steven Liu'; Thomas, Earlene W; Tim Padgett; Vicki.Chandler@ncmail.net; Wendy Bell (wbell@catawbacog.org); Wong, Vincent
Cc: Keyes-House, Jennifer
Subject: Metrolina IC Meeting for 2035 LRTP and Conformity
Importance: High

Folks,

This is a reminder of the meeting of the Charlotte regional transportation planning partners to discuss issues related to the LRTP and conformity update processes that will be held on Tuesday, May 12, from 10:30 am until 12 noon. Attached are the following:

* Meeting Agenda

* Draft meeting notes from the April 14 "2nd kickoff" meeting

* Latest Draft Conformity Consensus Plan

* Latest Draft Conformity Process Schedule

For those convening in Charlotte, we will meet in the CDOT Small Conference Room
6th Floor, Charlotte-Mecklenburg Government Center 600 E. 4th St., Charlotte. Please let Jennifer Keys know if you will be attending the meeting in person. Jennifer can be contacted at 704.336.3893 or via e-mail at jhouse@ci.charlotte.nc.us<mailto:jhouse@ci.charlotte.nc.us>.

Call-in accommodations are noted on the attached agenda.

Please forward this correspondence to any others who were not included in this e-mail message that should receive this notice.

Please note that, unless stated otherwise, our IC meetings will be held on the 2nd Tuesday each month. Please mark your calendar accordingly!

Eldewins M. Haynes, Air Quality Specialist
Charlotte DOT
600 East Fourth Street
Charlotte, NC 28202
phone: 704-336-7621
Fax: 704-336-4400
Click here to help air quality and save
money<http://www.charmeck.org/Departments/Transportation/Guzzle+Savings%2c+Not+Gasoline.htm>

From: "McLelland, Joe" <jwmclelland@ci.charlotte.nc.us>
To: "'Leslie N. Coolidge'" <CoolidLN@dhec.sc.gov>
Date: 5/26/2009 5:20 PM
Subject: RE: York Co. Non-Attainment - VMT and Speeds 2011, 2012
Attachments: York_NonAttain_AQ_VMT_Speed_2011_2012_090225b.xlsx

Leslie.
Attached is an update of the earlier spreadsheet with daily VMT and speeds calculated.
Joe

From: Leslie N. Coolidge [mailto:CoolidLN@dhec.sc.gov]
Sent: Tuesday, May 26, 2009 2:52 PM
To: McLelland, Joe
Subject: York Co. Non-Attainment - VMT and Speeds 2011, 2012

Joe,

You'd sent 2011 and 2012 VMT and speeds for peak hours, midday and night,, would it be possible to also get a 24-hour average speed for 2011 and 2012 for each of the road types?

thanks!
Leslie

Air Assessment and Planning Section
SCDHEC- Bureau of Air Quality
2600 Bull St.
Columbia, SC 29201
(803) 898-3208
(803) 898-4487 FAX
coolidln@dhec.sc.gov

BAQ- "A Best Workplace for Commuters"

File attachment: York_NonAttain_AQ_VMT_Speed_2011_2012_090225b.xlsx/xl/printerSettings/printerSettings1.bin
The file attached to this email was removed
because the file name is not allowed.

From: <FThomas@ci.rock-hill.sc.us>
To: "Leslie N. Coolidge" <CoolidLN@dhec.sc.gov>
CC: <BARNESBK.COLUMB31.DHEC4005@dhec.sc.gov>, <MATHIAMC.COLUMB31.DHEC4005@dh...
Date: 5/1/2007 12:56 PM
Subject: Re: York Nonattainment Area Population

Leslie,

That number is correct for 2000.

Frances

Frances M. Thomas
Planning Director
Planning Services Department
City of Rock Hill
PO Box 11706
155 Johnston Street
Rock Hill, SC 29731

(803) 329-7087 (Phone)
(803) 329-7228 (Fax)

"Leslie N. Coolidge" <CoolidLN@dhec.sc .gov>
To: <FThomas@ci.rock-hill.sc.us>
cc: "Brian Barnes" <BARNESBK.COLUMB31.DHEC4005@dhec.sc.gov>, "Melinda C. Mathias" <MATHIAMC.COLUMB31.DHEC4005@dhec.sc.gov>
Subject: York Nonattainment Area Population
05/01/2007 11:02 AM

Frances,

We are looking over the calculations for the SIP - I have in my notes that Bjorn had given me a population of 119,505 for RFATS for the year 2000, back in 2005. Do you have that figure, or does that number sound right to you?

thanks!
Leslie

Leslie Coolidge
Air Assessment and Planning Section
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BAQ- "A Best Workplace for Commuters"

Coolidge, Leslie N. <coolidln@dhec.sc.gov>

Confirm 2010 population estimate

2 messages

Coolidge, Leslie N. <coolidln@dhec.sc.gov> **Fri, Feb 10, 2012 at 1:26 PM**
To: "DHooper@cityofrockhill.com" <dhooper@cityofrockhill.com>

Hi David,

I believe I got this figure from you over the phone back in December and wanted to confirm it in writing - the 2010 population estimate for RFATS is 173,881, right?

Thanks,
Leslie

--
Leslie Coolidge
Air Quality Standards & Assessment Section
SCDHEC - Bureau of Air Quality
2600 Bull St
Columbia SC 29201
(803)898-3208
(803)898-4487 FAX
coolidln@dhec.sc.gov

To reduce vehicle miles traveled (VMT) and emissions from mobile sources, I bike to work.

DHooper@cityofrockhill.com <DHooper@cityofrockhill.com> **Mon, Feb 13, 2012 at 6:57 AM**
To: "Coolidge, Leslie N." <coolidln@dhec.sc.gov>

Hi Leslie,

Correct -- 2010 RFATS population is 173,881

David F. Hooper

Transportation Planner / RFATS Coordinator
City of Rock Hill
P.O. Box 11706
155 Johnston Street
Rock Hill, SC 29731

(803) 326-3897 Telephone
(803) 329-5511 Fax
email: dhooper@cityofrockhill.com

Hours 7:00am to 4:00pm Monday Through Friday

From: "Coolidge, Leslie N." <coolidln@dhec.sc.gov>
To: "DHooper@cityofrockhill.com" <dhooper@cityofrockhill.com>
Date: 02/10/2012 01:27 PM
Subject: Confirm 2010 population estimate

[Quoted text hidden]

"Email correspondence along with any related attachments to and from this address may be subject to the South Carolina Freedom of Information Act and may be disclosed to third parties in accordance with applicable law."

Coolidge, Leslie N. <coolidln@dhec.sc.gov>

Fwd: population - p.s.

4 messages

Coolidge, Leslie N. <coolidln@dhec.sc.gov> **Mon, Feb 13, 2012 at 3:44 PM**
To: "DHooper@cityofrockhill.com" <dhooper@cityofrockhill.com>

If we could have any estimates you have by tomorrow that would be great. Also, do you happen to know when 2011 population estimates (RFATS or full county estimates) can be expected? [it's for discussion with EPA about attainment status...]

Thanks again,
Leslie

---------- Forwarded message ----------
From: **Coolidge, Leslie N.** <coolidln@dhec.sc.gov>
Date: Mon, Feb 13, 2012 at 3:30 PM
Subject: population
To: "DHooper@cityofrockhill.com" <dhooper@cityofrockhill.com>

David,

Do you have RFATS population estimates for any other years between 2000 and 2012? We'd especially be interested in 2004 if you have that.

Thanks!
Leslie

--
Leslie Coolidge
Air Quality Standards & Assessment Section
SCDHEC - Bureau of Air Quality
2600 Bull St
Columbia SC 29201
(803)898-3208
(803)898-4487 FAX
coolidln@dhec.sc.gov

To reduce vehicle miles traveled (VMT) and emissions from mobile sources, I bike to work.

--
Leslie Coolidge
Air Quality Standards & Assessment Section
SCDHEC - Bureau of Air Quality
2600 Bull St
Columbia SC 29201
(803)898-3208
(803)898-4487 FAX
coolidln@dhec.sc.gov

To reduce vehicle miles traveled (VMT) and emissions from mobile sources, I bike to work.

DHooper@cityofrockhill.com <DHooper@cityofrockhill.com> **Tue, Feb 14, 2012 at 11:09 AM**
To: "Coolidge, Leslie N." <coolidln@dhec.sc.gov>

Leslie,

As a follow-up to my voice message -- please give me a call regarding next steps.

David F. Hooper
Transportation Planner / RFATS Coordinator
City of Rock Hill
P.O. Box 11706
155 Johnston Street
Rock Hill, SC 29731

(803) 326-3897 Telephone
(803) 329-5511 Fax
email: dhooper@cityofrockhill.com

Hours 7:00am to 4:00pm Monday Through Friday

From: "Coolidge, Leslie N." <coolidln@dhec.sc.gov>
To: "DHooper@cityofrockhill.com" <dhooper@cityofrockhill.com>
Date: 02/13/2012 03:44 PM
Subject: Fwd: population - p.s.

[Quoted text hidden]

"Email correspondence along with any related attachments to and from this address may be subject to the South Carolina Freedom of Information Act and may be disclosed to third parties in accordance with applicable law."

DHooper@cityofrockhill.com <DHooper@cityofrockhill.com> **Tue, Feb 14, 2012 at 11:47 AM**
To: coolidln@dhec.sc.gov

Leslie,

As a follow-up to our discussion -- the base year 2005 RFATS population was 153,900

David F. Hooper
Transportation Planner / RFATS Coordinator
City of Rock Hill
P.O. Box 11706
155 Johnston Street
Rock Hill, SC 29731

(803) 326-3897 Telephone
(803) 329-5511 Fax
email: dhooper@cityofrockhill.com

Hours 7:00am to 4:00pm Monday Through Friday

----- Forwarded by David Hooper/Rock-Hill on 02/14/2012 11:32 AM -----

From: David Hooper/Rock-Hill
To: "Coolidge, Leslie N." <coolidln@dhec.sc.gov>
Date: 02/14/2012 11:09 AM
Subject: Re: Fwd: population - p.s.

[Quoted text hidden]

Coolidge, Leslie N. <coolidln@dhec.sc.gov> **Tue, Feb 14, 2012 at 12:04 PM**
To: "Roberts, L. Nelson" <robertln@dhec.sc.gov>

2005 RFATS pop in writing... I'm adding it to the H drive

[Quoted text hidden]

Coolidge, Leslie N. <coolidln@dhec.sc.gov>

VMT question

2 messages

Coolidge, Leslie N. <coolidln@dhec.sc.gov> **Fri, Feb 17, 2012 at 1:55 PM**
To: "Gallup, Anna" <agallup@ci.charlotte.nc.us>

Thanks, that would be great!

Hi Leslie,

Hope you're doing well. I'm out of the office at the moment but did get your voice and e-mails. We should be able to provide VMT for all of York County based on the previous data. I'm finishing up other AQ stuff this afternoon but might be able to get to it, assuming no new runs are required. I'll check when I get back in the office and get back to you.

Anna
--
Leslie Coolidge
Air Quality Standards & Assessment Section
SCDHEC - Bureau of Air Quality
2600 Bull St
Columbia SC 29201
(803)898-3208
(803)898-4487 FAX
coolidln@dhec.sc.gov

To reduce vehicle miles traveled (VMT) and emissions from mobile sources, I bike to work.

Gallup, Anna <agallup@ci.charlotte.nc.us> **Fri, Feb 17, 2012 at 3:04 PM**
To: "Coolidge, Leslie N." <coolidln@dhec.sc.gov>
Cc: "McLelland, Joe" <jwmclelland@ci.charlotte.nc.us>

Leslie,

Attached is the 2010 VMT for all of York County from the same run Joe used to provide the York NA VMT.

Have a good weekend,

Anna

Anna H. Gallup, PE

Program Manager, Metrolina Regional Model

Senior Transportation Planner, Charlotte DOT

Office 704.336.8034 Mobile 704.582.3858 Fax 704.336.4400

From: Coolidge, Leslie N. [mailto:coolidln@dhec.sc.gov]
Sent: Friday, February 17, 2012 1:55 PM
To: Gallup, Anna
Subject: VMT question

[Quoted text hidden]

VMTSpeeds_AllYorkCo_120217.xlsx
15K

Appendix C
Consultation & Stakeholder Comments

Consultation:

Meeting Minutes: February 9, 2012, Record of Meeting between SCDHEC and EPA Region 4

Email Exchange: February 2012, Follow Up to Consultation

Stakeholder Comment Letters:

Letter: January 17, 2012, Dale Herendeen, Resolute Forest Products – Catawba Operations to Docket ID No. EPA-HQ-OAR-2008-0476 supporting SCDHEC Boundary Recommendation

Letter: January 18, 2012, Nikki Haley, Governor, to US EPA Administrator to reaffirm SCDHEC Boundary Recommendation

Letter: January 24, 2012, Joseph Kernell, County Administrator, Greenville County, SC to Docket ID No. EPA-HQ-OAR-2008-0476 supporting SCDHEC Boundary Recommendation

Letter: January 27, 2012, Rock Hill-Fort Mill Transportation Study (RFATS) Policy Committee to Regional Administrator supporting SCDHEC Boundary Recommendation

Resolution: February 2, 2012, Catawba Regional Council of Government, supporting SCDHEC Boundary Recommendation

Record of Meeting

February 9, 2012

SC DHEC & APTMD RE: York County Ozone Designation

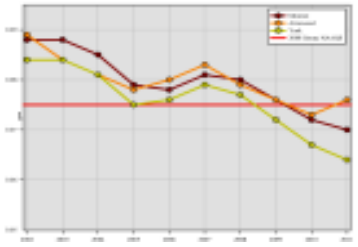
Name	Organization	Contact Info
Jane Spann	EPA R4	404 5629029
Lynorae Benjamin	EPA R4	404 5629040
Maeve SR Mason	SCDHEC	masonmr@dhec.sc.gov 803.898.2230
Melinda Mathias	SCDHEC	mathiamc@dhec.sc.gov 803-898-3269
Robbie Brown	SCDHEC	brownj@dhec.sc.gov 803-898-4105
Renee Shealy	SCDHEC	Shealyrg@dhec.sc.gov 803-898-4299
Carol Kemker	EPA R4	kemker.carol@epa.gov 404-562-8975
Beverly Banister	EPA R4	banister.beverly@epa.gov 404-562-9326
Jennifer Hughes	SCDHEC	hughesjr@dhec.sc.gov 803-641-7670
Scott Davis	EPA R4	davis.scottr@epa.gov 404-562-9127
Nacosta C. Ward	EPA R4	ward.nacosta@epa.gov 404.562.9140

2008 8-Hour Ozone NAAQS 120 Day Response to Proposed Designations

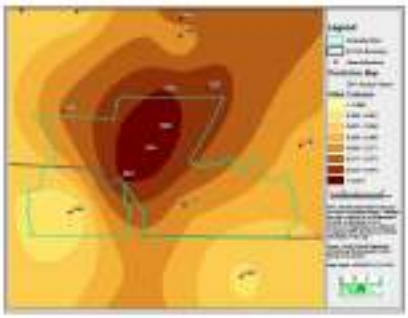
EPA R4 & SCDHEC
February 9, 2012
North Augusta

Factor 1 – Air Quality Data & Factor 3 – Meteorology

2002-2011 Ozone Design Values



Ozone Concentration Gradient Based on 2011 Ozone Design Values



The Arrowood monitor back trajectories on ozone exceedance days

2009 through 2011

NOAA HYSPLIT Model Back Trajectories from EDAS Meteorological Data

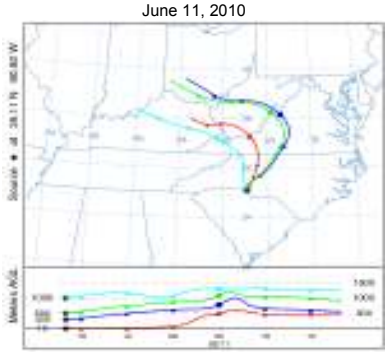
Arrowood Scenario A

Northerly Transport
Local Charlotte plume

September 4, 2009

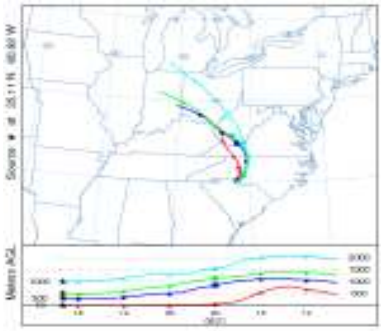
September 4, 2009: The back trajectories indicated transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were mostly sunny to partly cloudy with temperatures in the mid 80s. The surface observations indicated calm winds for some of the hours.

June 11, 2010



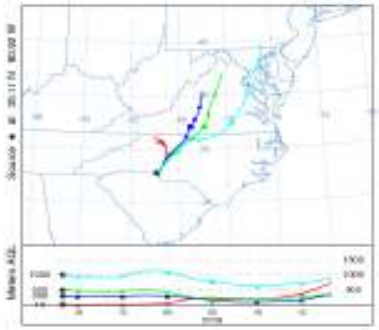
June 11, 2010: The back trajectory analysis showed transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were partly cloudy with temperatures in the upper 80s. Winds were generally out of the north much like the back trajectories.

June 21, 2010



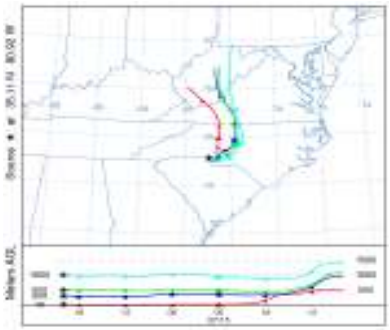
June 21, 2010: The back trajectory analysis showed transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were mostly sunny with temperatures in the lower to mid 90s. Winds were calm or from the north.

July 8, 2010



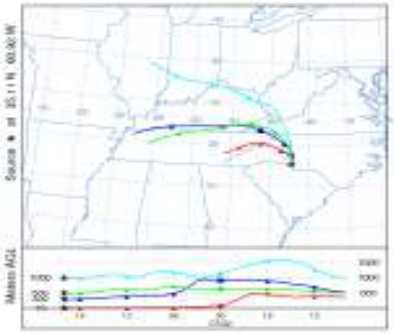
July 8, 2010: The back trajectory analysis showed a northerly flow from the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures near 100 degrees. Surface winds were from the north and northeast.

July 15, 2010



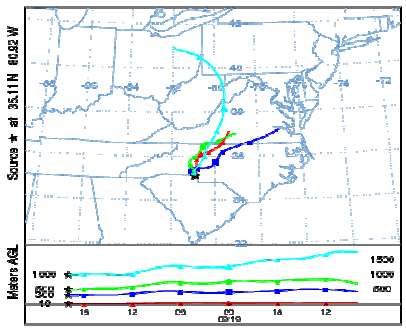
July 15, 2010: The back trajectory analysis showed a northerly transport into the Charlotte metropolitan area then a northeast and an easterly transport through the Charlotte metropolitan area into the Arrowood monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were mainly easterly.

July 22, 2010



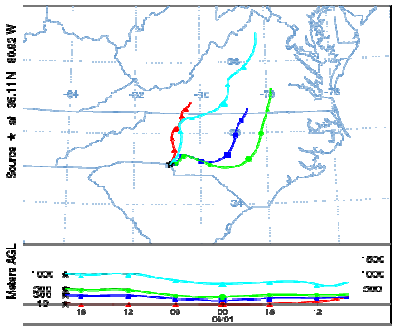
July 22, 2010: The back trajectory analysis showed a northerly flow through the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly cloudy with temperatures in the lower 90s. Winds were calm or from the north.

September 19, 2010



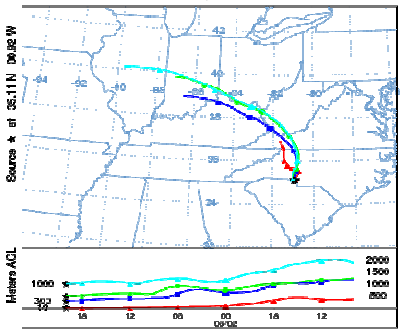
September 19, 2010: The back trajectory analysis showed a northerly transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were mostly clear with temperatures near 90. Surface winds were light and variable.

June 1, 2011



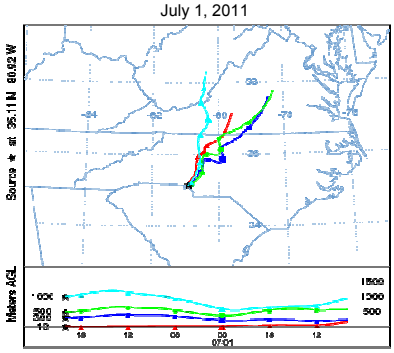
June 1, 2011: The back trajectory analysis showed mainly a north and northeasterly transport from the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures in the lower to mid 90s. Surface winds were generally from the north and northeast.

June 2, 2011



June 2, 2011: The back trajectory analysis showed a northerly transport through the Charlotte metropolitan area to the Arrowood monitor. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were calm or mainly from the north.

July 1, 2011

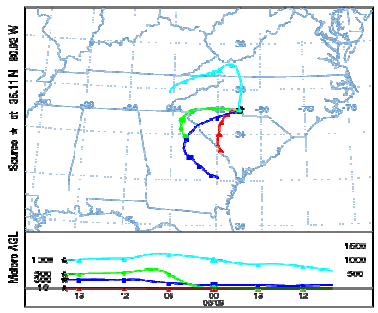


July 1, 2011: The back trajectory analysis showed a northerly transport through the Charlotte metropolitan area to the Arrowood monitor. Skies were party cloudy with temperatures near 90. Surface winds were from the north and northwest.

Arrowood Scenario B

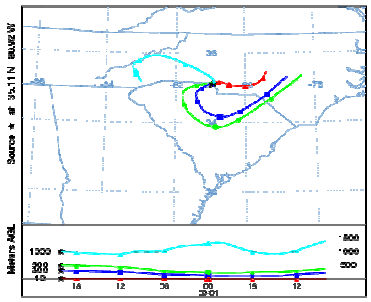
Stagnation and re-circulation
Local Charlotte plume

June 8, 2011



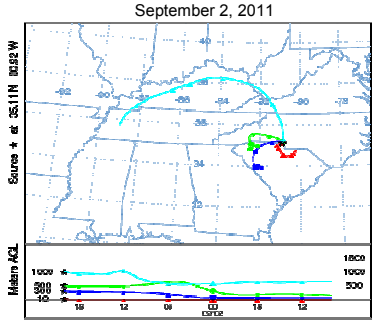
June 8, 2011: The back trajectory analysis showed stagnation and some recirculation. The trajectories are short and recurve, indicating recirculation. The air movement before this stagnation event was from the north. Skies were partly to mostly sunny with temperatures in the lower to mid 90s. Surface winds were mainly light and variable which is typical for stagnation events.

September 1, 2011



September 1, 2011: The back trajectory analysis showed short trajectories with a recirculation pattern, indicating a stagnation event. On the previous days, air had moved southward through the Charlotte area and into South Carolina. The back trajectory analysis shows air being circulated back up into the Charlotte area during the stagnation event. Skies were partly to mostly sunny with temperatures in the lower 90s. Surface winds were calm, light, and variable, typical of a stagnation event.

September 2, 2011



September 2, 2011: The back trajectory analysis showed short trajectories at the lower three levels which indicated a stagnation event. This particular stagnation event began on the day before, allowing the ozone precursors more time to sit over the Charlotte area. Skies were party cloudy with temperatures in the mid 90s. Winds were mainly light and variable, typical of a stagnation event.

Factor 2 – Emissions & Emissions-Related Data

Factor 4: Geography/topography

This factor did not play a significant role in this evaluation

Factor 5: Jurisdictional boundaries

Mathias, Melinda <mathiamc@dhec.sc.gov>

Re: 120Day Ozone Consultation Follow Up & Emission Statement Clarification

1 message

Nacosta Ward <Ward.Nacosta@epamail.epa.gov> **Tue, Feb 14, 2012 at 4:40 PM**
To: Lynorae Benjamin <Benjamin.Lynorae@epamail.epa.gov>
Cc: "Mason, Maeve" <masonmr@dhec.sc.gov>, "Barnes, Lynn" <barnesls@dhec.sc.gov>, Beverly Banister <Banister.Beverly@epamail.epa.gov>, "Brown, Robbie" <brownrj@dhec.sc.gov>, Carol Kemker <Kemker.Carol@epamail.epa.gov>, "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, Dianna Smith <Smith.Dianna@epamail.epa.gov>, "Flynn, Thomas" <flynntj@dhec.sc.gov>, "Hughes, Jennifer R." <hughesjr@dhec.sc.gov>, Jane Spann <Spann.Jane@epamail.epa.gov>, "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, "Monroe, Michael" <monroemc@dhec.sc.gov>, "Reece, Myra C." <reecemc@dhec.sc.gov>, Richard Wong <Wong.Richard@epamail.epa.gov>, Rick Gillam <Gillam.Rick@epamail.epa.gov>, "Roberts, L. Nelson" <robertln@dhec.sc.gov>, ScottR Davis <Davis.ScottR@epamail.epa.gov>, "Shealy, Renee" <shealyrg@dhec.sc.gov>

Attached is the data that we pulled from the 2008 NEI for the Charlotte-Gastonia-Salisbury, NC-SC CSA. This data is what we used in to develop our TSDs, which is the topic of Thursday's call.

(See attached file: Charlotte Emission Data by category.xlsx)

Have a wonderful day!
Nacosta C. Ward, Environmental Scientist
U. S. Environmental Protection Agency, Region 4 | Air, Pesticides & Toxics Management Division
Air Planning Branch/Regulatory Development Section
61 Forsyth Street, SW, Atlanta, GA 30303-8960
email: ward.nacosta@epa.gov | voice: (404) 562-9140 | facsimile: (404) 562-9019

(Embedded image moved to file: pic09734.jpg)

Healthier Families, Cleaner Communities, A Stronger America
40 Years of Achievements and Milestones
http://www.epa.gov/40th

From: Lynorae Benjamin/R4/USEPA/US
To: "Mason, Maeve" <masonmr@dhec.sc.gov>
Cc: "Barnes, Lynn" <barnesls@dhec.sc.gov>, Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie" <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA, "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, Dianna Smith/R4/USEPA/US@EPA, "Flynn, Thomas" <flynntj@dhec.sc.gov>, "Hughes, Jennifer R."

<hughesjr@dhec.sc.gov>, Jane Spann/R4/USEPA/US@EPA, "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, "Monroe, Michael" <monroemc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA, "Reece, Myra C." <reecemc@dhec.sc.gov>, Richard Wong/R4/USEPA/US@EPA, Rick Gillam/R4/USEPA/US@EPA, "Roberts, L. Nelson" <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA, "Shealy, Renee" <shealyrg@dhec.sc.gov>
Date: 02/14/2012 12:48 PM
Subject: Re: 120Day Ozone Consultation Follow Up & Emission Statement Clarification

Hi Maeve,

We can use 1-866-299-3188 access code 4045629040 for both calls. Thanks for the reminder about the table. We will send to you shortly, no later than the end of today.... we have all been in meetings all morning and about to start the next round of them now.

I hope your day is going well.

Lynorae Benjamin, Chief
Regulatory Development Section
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303
phone: 404-562-9040
facsimile: 404-562-9019

From: "Mason, Maeve" <masonmr@dhec.sc.gov>
To: Lynorae Benjamin/R4/USEPA/US@EPA
Cc: Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie" <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA, "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, Dianna Smith/R4/USEPA/US@EPA, "Flynn, Thomas" <flynntj@dhec.sc.gov>, "Hughes, Jennifer R." <hughesjr@dhec.sc.gov>, Jane Spann/R4/USEPA/US@EPA, "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA, "Reece, Myra C." <reecemc@dhec.sc.gov>, Rick Gillam/R4/USEPA/US@EPA, "Roberts, L. Nelson" <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA, "Shealy, Renee" <shealyrg@dhec.sc.gov>, Richard Wong/R4/USEPA/US@EPA, "Barnes, Lynn" <barnesls@dhec.sc.gov>, "Monroe, Michael" <monroemc@dhec.sc.gov>
Date: 02/14/2012 12:40 PM
Subject: Re: 120Day Ozone Consultation Follow Up & Emission Statement Clarification

Lynorae,

I think that both these dates/times will work for us. To review:

Met Data Call - Wed, 2/15 at 2:30 p.m. (SCDHEC staff this will be in room 3151)
Emission Data Call - Thurs, 2/16 at 2:00 p.m. (SCDHEC staff this will be in the Wallace room)

Can you provide call-in numbers for both calls? Also, any word on the data tables?

Look forward to talking more later this week. Thanks,
--
Maeve S.R. Mason, Manager
Regulation & SIP Management
Bureau of Air Quality, SCDHEC
2600 Bull Street
Columbia, SC. 29201
803.898.2230

On Mon, Feb 13, 2012 at 6:29 PM, Lynorae Benjamin <Benjamin.Lynorae@epamail.epa.gov> wrote:
>
> Hi Maeve,
>
> We could do the call on meteorology data from 2:30 p.m. to 3:30 p.m. on
> Wednesday, February 15, 2012. Please confirm that this will work for
> you all and we will send a call-in number. Thanks. I will send a
> note shortly for the data meeting.
>
> I hope your day is going well.
>
> Lynorae Benjamin, Chief
> Regulatory Development Section
> U.S. Environmental Protection Agency, Region 4
> 61 Forsyth Street, S.W.
> Atlanta, Georgia 30303
> phone: 404-562-9040
> facsimile: 404-562-9019
>
>
>
>
> From: "Mason, Maeve" <masonmr@dhec.sc.gov>
> To: Lynorae Benjamin/R4/USEPA/US@EPA
> Cc: Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie"
> <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA,
> "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, "Hughes,
> Jennifer R." <hughesjr@dhec.sc.gov>, Jane
> Spann/R4/USEPA/US@EPA, "Mathias, Melinda C."
> <mathiamc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA,
> "Reece, Myra C." <reecemc@dhec.sc.gov>, Rick
> Gillam/R4/USEPA/US@EPA, "Roberts, L. Nelson"
> <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA,
> "Shealy, Renee" <shealyrg@dhec.sc.gov>, Dianna

> Smith/R4/USEPA/US@EPA, "Flynn, Thomas"
<flynntj@dhec.sc.gov>
> Date: 02/13/2012 04:01 PM
> Subject: Re: 120Day Ozone Consultation Follow Up & Emission
Statement
> Clarification
>
>
>
> Lynorae,
>
> Tommy has been included in this response. He is available on
> Wednesday and Thursday afternoons this week.
>
> As for the partial county data - please again refer to the "tables" on
> the pages I already referenced. For ease, I have scanned and attached
> these pages. The plans in their entirety are also available here:
> http://www.scdhec.gov/environment/baq/Metrolina-SC_Redesignation/
>
http://www.ncair.org/planning/Metrolina/Metrolina_Redesignation_SIP_Narrative_11-2-2011.pdf

>
>
> As for the detail on how the emission inventory was developed, please
> see the corresponding Appendices that the pages I gave mention (I
> believe both reference USEPA's EGAS model).
>
> We look forward to receiving the data from you as soon as possible.
> Thanks.
> –
> Maeve S.R. Mason, Manager
> Regulation & SIP Management
> Bureau of Air Quality, SCDHEC
> 2600 Bull Street
> Columbia, SC. 29201
> 803.898.2230
>
>
> On Mon, Feb 13, 2012 at 12:55 PM, Lynorae Benjamin
> <Benjamin.Lynorae@epamail.epa.gov> wrote:
>> Thanks Maeve. We are setting the meeting up to discuss the
> meteorology
>> up as soon as we coordinate schedules. We have Renee's availability
>> from the email she sent Scott but we also thought it would be helpful
> to
>> have Tommy's availability. Can you help with that... Also, we
will
>> send the tables shortly. Nacosta is out sick today and has the
> master
>> file that we used. Also, thanks for pointing us to the
> redesignation
>> for the rationale. We looked at that in preparation for our meeting
>> with you all in N. Augusta and still have questions... perhaps you
> could
>> send us the figures and tables you all developed to help us see the
> math
>> and try to distinguish where we differ in data. We can discuss more

> on
>> the call that we set up to discuss the data.
>>
>> I hope your day is going well.
>>
>> Lynorae Benjamin, Chief
>> Regulatory Development Section
>> U.S. Environmental Protection Agency, Region 4
>> 61 Forsyth Street, S.W.
>> Atlanta, Georgia 30303
>> phone: 404-562-9040
>> facsimile: 404-562-9019
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>> From: "Mason, Maeve" <masonmr@dhec.sc.gov>
>> To: Lynorae Benjamin/R4/USEPA/US@EPA
>> Cc: Beverly Banister/R4/USEPA/US@EPA, "Brown, Robbie"
>> <brownrj@dhec.sc.gov>, Carol Kemker/R4/USEPA/US@EPA,
>> "Coolidge, Leslie N." <coolidln@dhec.sc.gov>, "Hughes,
>> Jennifer R." <hughesjr@dhec.sc.gov>, Jane
>> Spann/R4/USEPA/US@EPA, "Mathias, Melinda C."
>> <mathiamc@dhec.sc.gov>, Nacosta Ward/R4/USEPA/US@EPA,
>> "Reece, Myra C." <reecemc@dhec.sc.gov>, "Roberts, L.
> Nelson"
>> <robertln@dhec.sc.gov>, ScottR Davis/R4/USEPA/US@EPA,
>> "Shealy, Renee" <shealyrg@dhec.sc.gov>, Rick
>> Gillam/R4/USEPA/US@EPA
>> Date: 02/13/2012 12:46 PM
>> Subject: Re: 120Day Ozone Consultation Follow Up & Emission
> Statement
>> Clarification
>>
>>
>>
>> Lynorae,
>>
>> We look forward to being able to set up the call. Just as an
>> FYI...Renee has already been in contact with Scott Davis about
setting
>> something up (I think maybe separately) to discuss the back
>> trajectories. We'd all like to know what each other did in terms of
>> developing this factor's response.
>>
>> Speaking of being on the same page...any way we can get the tables
you
>> used in developing Emissions Data, page 6/7 (percentages of NOx and
>> VOC Emissions in particular) for factor 2. That would really help -
>> especially given the time crunch.
>>
>> For a rationale/justification on our using/calculating partial county
>> data - please refer to the respective emission inventory sections of
>> the Redesignation Demonstration and Maintenance Plan requests for
both
>> NC (dated November 2, 2011, Section 3.3.2, page 25) and SC (dated May
>> 31, 2011, Section III.C.2, page 21). A description of what was done

>> for VMT and population are forthcoming - hopefully later this
>> afternoon.
>>
>> Thanks, look forward to the call(s).
>> –
>> Maeve S.R. Mason, Manager
>> Regulation & SIP Management
>> Bureau of Air Quality, SCDHEC
>> 2600 Bull Street
>> Columbia, SC. 29201
>> 803.898.2230
>>
>>
>> On Fri, Feb 10, 2012 at 6:35 PM, Lynorae Benjamin
>> <Benjamin.Lynorae@epamail.epa.gov> wrote:
>>>
>>> Thanks Maeve. It was good to see you all yesterday. Nacosta will
>>> follow up with EPA availability for a call for some time next week.
>>> One question I have is will Tommy Flynn also be available for the
>> times
>>> you listed or should we touch bases with him separately. We had
>>> questions about the meteorological data that you presented
yesterday.
>>>
>>> I hope your day is going well.
>>>
>>> Lynorae Benjamin, Chief
>>> Regulatory Development Section
>>> U.S. Environmental Protection Agency, Region 4
>>> 61 Forsyth Street, S.W.
>>> Atlanta, Georgia 30303
>>> phone: 404-562-9040
>>> facsimile: 404-562-9019
>>>
>>>
>>>
>>>
>>> From: "Mason, Maeve" <masonmr@dhec.sc.gov>
>>> To: Jane Spann/R4/USEPA/US@EPA, Lynorae
>>> Benjamin/R4/USEPA/US@EPA, Carol Kemker/R4/USEPA/US@EPA,
>>> Beverly Banister/R4/USEPA/US@EPA, ScottR
>>> Davis/R4/USEPA/US@EPA, Nacosta Ward/R4/USEPA/US@EPA
>>> Cc: "Mathias, Melinda C." <mathiamc@dhec.sc.gov>, "Brown,
>>> Robbie" <brownrj@dhec.sc.gov>, "Shealy, Renee"
>>> <shealyrg@dhec.sc.gov>, "Hughes, Jennifer R."
>>> <hughesjr@dhec.sc.gov>, "Roberts, L. Nelson"
>>> <robertln@dhec.sc.gov>, "Coolidge, Leslie N."
>>> <coolidln@dhec.sc.gov>, "Reece, Myra C."
>>> <reecemc@dhec.sc.gov>
>>> Date: 02/10/2012 03:57 PM
>>> Subject: 120Day Ozone Consultation Follow Up & Emission
>> Statement
>>> Clarification
>>>
>>>
>>>
>>> Good afternoon,

>>>
>>> I just wanted to followup on yesterday's meeting. We appreciate you
>>> making the time. We think the discussion was productive in terms of
>>> highlighting our perspectives as well as opportunities for clarity.
>>>
>>> As promised, please find attached:
>>> 1) The sign-in sheet/record of meeting,
>>> 2) The powerpoint slides from the meeting (to include the back
>>> trajectories and gradient map), and
>>> 3) The rational/documentation for the emission statements
requirement
>>> associated with the 1997 8-hour ozone redesignation and maintenance
>> plan
>>> request.
>>>
>>> As indicated yesterday, we would like to have a follow-up call with
>> you
>>> as soon as possible to address/discuss the questions we had on the
>> data
>>> presented in Factor 2 of your TSD information (December 8, 2011).
>> Given
>>> the approaching deadline to have our responses to you (Feb 29), we'd
>>> like to schedule this call as soon as possible. Do either of these
>>> dates/times work for a call: Wednesday 2/15 at 2:30 p.m., or Friday
>> 2/17
>>> anytime?
>>>
>>> We have been able to obtain the NEI data from the link provided, but
>> as
>>> discussed and in the interest of time, we would very much like for
> you
>>> to provide us with the table you indicated that you used in
>> calculating
>>> the information provide on Factor 2: Emissions Data, page 6/7
>>> (percentages of NOx and VOC Emissions in particular) just so that we
>> can
>>> be sure we are all on the same page.
>>>
>>> In the meantime, we are working hard to provide you with the
> technical
>>> explanation of how we arrived at our partial county data/information
>> as
>>> well as how we derived the back trajectories. We hope to have this
>>> information soon (prior to Feb 29).
>>>
>>> Thank you again. We look forward to hearing from you.
>>>
>>> –
>>> Maeve S.R. Mason, Manager
>>> Regulation & SIP Management
>>> Bureau of Air Quality, SCDHEC
>>> 2600 Bull Street
>>> Columbia, SC. 29201
>>> 803.898.2230
>>> (See attached file: Ppt for EPA 120 day Meeting_20120209.ppt)(See
>>> attached file: EPAR4_SC_Ozone120DayConsult_20120209.pdf)(See
attached

>>> file: Summary of Emission Statements Requirement for EPAR4.doc)
>>
>>
> (See attached file: NC 2010 Emissions Data.pdf)(See attached file: SC
> 2010 Emissions Data.pdf)

2 attachments

pic09734.jpg
22K

Charlotte Emission Data by category.xlsx
15K

- **South Carolina Air Pollution Control Regulation 61-62.2 - *Prohibition of Open Burning***

The revision (June 25, 2004) of R. 61-62.2, *Prohibition of Open Burning*, includes a ban of certain open burning during the ozone season for additional control of NO_x emissions.

c. VOC Regulations: South Carolina Air Pollution Control Regulation 61-62.5, Standard No. 5 - *Volatile Organic Compounds*

This regulation contains requirements for controlling VOCs.

d. Emissions Inventory: South Carolina Regulation 61-62.1, *Definitions and General Requirements*, Section III - Emissions Inventory

This regulation requires the submittal of emissions inventory information by affected sources.

e. Reasonably Available Control Measures (RACM)

Reasonably Available Control Measures is a broadly defined term referring to technologies and other measures that can be used to control pollution; includes Reasonably Available Control Technology and other measures.

The EPA's final 1997 8-hour ozone NAAQS implementation rule in 40 CFR 51.912(d), pursuant to section 172(c)(1) of the CAA, requires the attainment demonstration SIP submittal to include "a SIP revision demonstrating that it has adopted all RACM necessary to demonstrate attainment as expeditiously as practicable and to meet any RFP requirements." In addition, the EPA's RACM policy indicates that areas should consider all candidate measures that are potentially available, including any that have been suggested for the particular nonattainment area. Although areas should consider all available measures, areas need only adopt measures if they are both economically and technologically feasible and will contribute to timely attainment or are necessary for RFP. Measures that might be available but would not advance attainment or contribute to RFP need not be considered RACM. A number of emissions controls programs were implemented in South Carolina following the CAA Amendments of 1990, and substantial further emissions reductions have since occurred in the state as well as the Metrolina nonattainment area. SCDHEC intends to continue to investigate and, where appropriate, adopt additional measures that would reduce emissions of ozone precursors even further. Such measures may help the state in the future as it maintains the 1997 8-hour ozone NAAQS. The source categories emitting the vast preponderance of ozone precursor emissions in the state are already subject to control requirements.

C. Emissions Inventory

There are two basic approaches used to demonstrate continued maintenance. The first is the comparison of a projected emissions inventory with a baseline emissions inventory. The second approach involves complex analysis using gridded dispersion modeling. The approach used by the SCDHEC is the comparison of emissions inventories for the years 2010 and 2022.

For the maintenance demonstration, the base year of 2010 was chosen since it is a year that falls within the attaining design value period of 2008-2010 and some emissions inventory data was already developed for this year. The maintenance demonstration is made by comparing the 2010 baseline emissions inventory to the 2022 projected emissions inventory. The baseline emissions inventory represents an emission level for a period when the ambient air quality standard was not violated, 2008-

2010. If the projected emissions remain at or below the baseline emissions, continued maintenance is demonstrated and the ambient air quality standard should not be violated in the future. In addition to comparing the final year of the plan, all of the interim years are compared to the 2010 baseline to demonstrate that these years are also expected to show continued maintenance of the 1997 8-hour ozone NAAQS.

The emissions inventories are comprised of four major types of sources: point, area, on-road mobile, and non-road mobile. The projected emissions inventories have been estimated using projected rates of growth in population, traffic, economic activity, and other parameters. Naturally occurring, or biogenic, emissions are not included in the emissions inventory comparison, as these emissions are outside the State's span of control.

The NCDAQ has developed a maintenance plan for the North Carolina portion of the Metrolina nonattainment area. For emissions summaries for the North Carolina portion of the Metrolina nonattainment area, refer to the Redesignation Demonstration and Maintenance Plan submitted by the NCDAQ.

1. Emission Inventories

There are four different man-made emission inventory source classifications: (1) point, (2) area, (3) on-road mobile, and (4) nonroad mobile sources.

Point sources are those larger industrial or commercial stationary facilities that must have Title V permits issued by the SCDHEC Bureau of Air Quality (BAQ). These sources have the potential to emit more than 100 tons of NO_x or VOC. The source emissions are tabulated from data collected by direct on-site measurements of emissions or mass balance calculations utilizing emission factors from the EPA's AP-42. There are usually several emission sources for each facility. Emission data is collected for each point source at a facility and the data is entered into an in-house database system. For the projected year's inventory, point sources are adjusted by growth factors based on Standard Industrial Classification codes. The growth factors are generated using the EPA's Economic Growth Analysis System version 5.0 (E-GAS 5.0) program. A complete description of how these inventories were developed is discussed in detail in Appendix A.

Area sources are those stationary sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., smaller industrial facilities, dry cleaners, service stations, etc.). For area sources, emissions are estimated by multiplying an emission factor by some known indicator of collective activity such as production, number of employees, or population. These types of emissions are estimated on the county level. For the projected year's inventory, area source emissions are changed by population growth, projected production growth, or when applicable, by E-GAS 5.0 growth factors. A complete description of how these inventories were developed is discussed in detail in Appendix B.

For on-road mobile sources, the EPA mobile model MOVES2010a is used to generate emissions. MOVES can be used to estimate exhaust and evaporative emissions as well as brake and tire wear emissions from all types of on-road vehicles. The estimation of emissions involves multiplying an activity level by an emission factor, and is all done within the model. The activity level used by MOVES2010a is vehicle miles traveled (VMT). For the future years' inventories, the MOVES 2010a mobile model takes into consideration expected federal tailpipe standards, fleet turnover, and new fuels. A complete description of how these inventories were developed is discussed in detail in Appendix C.

Nonroad mobile sources are equipment that can move but do not use the roadways, i.e., lawn mowers, construction equipment, railroad locomotives, aircraft, etc. The emissions from this category are calculated using the EPA's NONROAD2008a non-road mobile model, with the exception of the railroad locomotives and aircraft engine. The railroad locomotive and aircraft engine emissions are estimated by multiplying an activity level by an emission factor. These emissions are also estimated at the county level. For the projected years' inventories, the emissions are estimated using the EPA's NONROAD2008a non-road mobile model, E-GAS 5.0 growth factors, or projected landing and take off data for aircraft. A complete description of how these inventories were developed is discussed in detail in Appendix D.

2. Summary of Emissions

The tables below contain the estimated emissions from all of the emission source sectors, i.e., point, area, on-road mobile, and nonroad mobile for the York County portion of the Metrolina nonattainment area. Additionally, the sum total of these man-made emissions for the York County portion of the Metrolina nonattainment area is tabulated in Table III-1. For emissions summaries for the North Carolina portion of the Metrolina nonattainment area, refer to the Redesignation Demonstration and Maintenance Plan submitted by the NCDAQ.

Table III-1 Point Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 2.07	2.06	2.2	2.34	2.49
NO_x Emissions (tons/day)					
York*	✓ 4.54	4.64	4.91	5.19	5.48

* Portion of York County within the Metrolina nonattainment area

Table III-2 Area Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 7.1645	7.3870	7.5672	7.7027	7.8311
NO_x Emissions (tons/day)					
York*	✓ 1.1733	1.2219	1.2665	1.3183	1.3641

* Portion of York County within the Metrolina nonattainment area

Table III-3 On-Road Mobile Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 3.92	3.14	2.61	2.29	2.14
NO_x Emissions (tons/day)					
York*	✓ 12.05	8.73	6.52	5.16	4.42

* Portion of York County within the Metrolina nonattainment area

Table III-4 Nonroad Mobile Source Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 2.149	1.776	1.541	1.438	1.407
NO_x Emissions (tons/day)					
York*	✓ 3.209	2.686	2.174	1.817	1.595

* Portion of York County within the Metrolina nonattainment area

Table III-5 Total Man-Made Emissions

County	2010	2013	2016	2019	2022
VOC Emissions (tons/day)					
York*	✓ 15.30	14.36	13.92	13.77	13.87
NO_x Emissions (tons/day)					
York*	✓ 20.97	17.28	14.87	13.49	12.86

* Portion of York County within the Metrolina nonattainment area

3. Maintenance Demonstration

As discussed above, maintenance is demonstrated when the future years total man-made emissions are less than the 2010 baseline emissions. The following table summarizes the VOC and NO_x emissions for the York County portion of the Metrolina nonattainment area. The difference between the base year (2010) and the final year (2022) illustrates that the continued maintenance of the 1997 8-hour ozone NAAQS is expected.

Although there is a slight increase in VOC emissions between 2019 and 2022, the SCDHEC does not believe this is inconsistent with the maintenance demonstration. First, the 2022 emissions are still below the baseline emissions for 2010. There are significantly more VOC emissions in the atmosphere than NO_x emissions and a vast majority of the total VOC emissions come from biogenic, or natural, sources, which cannot be controlled. Therefore a slight increase in man-made VOC emissions in 2022 will not result in an increase in ozone formation. As noted earlier, this area is NO_x limited for ozone.

Table III-6 Maintenance Demonstration

Year	VOC TPD	NO_x TPD
2010	15.30	20.97
2013	14.36	17.28
2016	13.92	14.87
2019	13.77	13.49
2022	13.87	12.86
Difference from 2010 to 2022	-1.43	-8.11

The difference between the attainment level of emissions (2010) from all man-made sources and the projected level of emissions from all man-made sources in the York County portion of the Metrolina nonattainment area is considered the "safety margin." The safety margin for each projected year is listed below in Table III-7.

Table III-7 Safety Margin

Year	VOC TPD	NOx TPD
2010	N/A	N/A
2013	-0.94	-3.69
2016	-1.38	-6.10
2019	-1.53	-7.48
2022	-1.43	-8.11

3.3.2 Emission Inventories

There are four different man-made emission inventory source classifications: (1) stationary point, (2) area, (3) on-road mobile and (4). nonroad mobile sources.

Point sources are those stationary sources that require an air permit to operate. In general, these sources have a potential to emit more than 5 tons per year of a criteria pollutant or its precursors from a single facility. The source emissions are tabulated from data collected by direct on-site measurements of emissions or mass balance calculations utilizing emission factors from the USEPA's AP-42 or stack test results. There are usually several emission sources for each facility. Emission data is collected for each point source at a facility and the data is entered into an in-house database system. For the projected years' inventory, point sources are adjusted by growth factors based on Standard Industrial Classification codes generated using growth patterns obtained from County Business Patterns. For the electric generating utility sources, the estimated projected future year emissions were based on information provided by the utility company. For the sources that report to the USEPA's Clean Air Markets Division, the actual 2010 average summer day emissions were used. For the other Title V sources, the 2009 data was used which was the latest data available. For the small sources that only report emissions every 5 years, the most recently reported data was used and assumed to be equivalent to 2009 emissions since these sources do not vary much from year to year. The 2009 emissions data was grown to 2010 using the USEPA's EGAS model. The NCDAQ believes the estimated 2010 emissions are representative of what was emitted in 2010.

For detailed discussion on how the point sources emission inventory was developed, see Appendix B.1. A summary of the point source emissions are presented in Table 3-3 and Table 3-4. The emissions are presented in a ton per summer day basis.

Table 3-3. Point Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	0.90 ✓	0.95	1.01	1.11	1.16
Gaston	23.48 ✓	8.58	7.75	7.92	6.02
Iredell*	3.28 ✓	3.54	3.79	4.04	4.28
Lincoln	0.59 ✓	0.65	0.68	0.74	0.81
Mecklenburg	1.35 ✓	1.39	1.48	1.58	1.68
Rowan	7.04 ✓	3.38	2.87	3.07	3.32
Union	0.33 ✓	0.35	0.38	0.40	0.44
Total	36.97 ✓	18.84	17.96	18.86	17.71

*Iredell County emissions for nonattainment area only

Table 3-4 Point Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	1.14	1.25	1.35	1.46	1.54
Gaston	1.28	1.19	1.35	1.47	1.54
Iredell*	0.86	0.94	1.03	1.09	1.16
Lincoln	0.93	1.03	1.12	1.24	1.32
Mecklenburg	3.24	3.52	3.82	4.05	4.31
Rowan	3.72	4.08	4.48	4.87	5.25
Union	1.36	1.49	1.61	1.72	1.85
Total	12.53	13.50	14.76	15.90	16.97

*Iredell County emissions for nonattainment area only

Area sources are those stationary sources whose emissions are relatively small but due to the large number of these sources, the collective emissions could be significant (i.e., dry cleaners, service stations, etc.). For area sources, emissions are estimated by multiplying an emission factor by some known indicator of collective activity such as production, number of employees, or population. These types of emissions are estimated on the county level. For the projected year's inventory, area source emissions are changed by population growth, projected production growth, or estimated employment growth. For detailed discussion on how the area source emission inventory was developed, see Appendix B.2. A summary of the area source emissions are presented in Table 3-5 and Table 3-6. The emissions are presented in a ton per summer day basis.

Table 3-5. Area Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	0.59	0.60	0.61	0.62	0.63
Gaston	0.73	0.75	0.77	0.79	0.80
Iredell*	0.20	0.20	0.20	0.20	0.20
Lincoln	0.23	0.23	0.22	0.22	0.22
Mecklenburg	5.25	5.31	5.37	5.44	5.50
Rowan	0.50	0.50	0.50	0.51	0.51
Union	0.66	0.65	0.64	0.65	0.64
Total	8.16	8.24	8.31	8.43	8.50

*Iredell County emissions for nonattainment area only

Table 3-6. Area Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	5.12 ✓	5.10	5.14	5.31	5.49
Gaston	6.33 ✓	6.32	6.38	6.56	6.73
Iredell*	2.06 ✓	2.14	2.19	2.27	2.35
Lincoln	2.78 ✓	2.91	2.97	3.08	3.19
Mecklenburg	25.76 ✓	26.26	25.82	26.47	27.18
Rowan	4.87 ✓	5.16	5.27	5.45	5.63
Union	8.80 ✓	9.27	9.58	10.13	10.67
Total	55.72 ✓	57.16	57.35	59.27	61.24

*Iredell County emissions for nonattainment area only

For highway mobile sources, the USEPA's Motor Vehicle Emission Simulator (MOVES) mobile model is run to generate emissions. The MOVES model includes the road class vehicle miles traveled (VMT) as an input file and can directly output the estimated emissions. For the projected years' inventories, the highway mobile sources emissions are calculated by running the MOVES mobile model for the future year with the projected VMT to generate emissions that take into consideration expected Federal tailpipe standards, fleet turnover and new fuels. For detailed discussion on how the on-road mobile emission inventory was developed, see Appendix B.3. A summary of the on-road mobile source emissions are presented in Table 3-7 and Table 3-8. The emissions are presented in a ton per summer day basis.

Table 3-7. On-road Mobile Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	14.48 ✓	11.81	9.79	7.90	6.95
Gaston	13.64 ✓	10.18	8.10	6.61	5.76
Iredell*	8.91 ✓	7.09	5.75	4.69	4.00
Lincoln	5.80 ✓	4.73	3.85	3.16	2.69
Mecklenburg	69.21 ✓	52.08	41.47	33.82	32.00
Rowan	12.96 ✓	10.06	8.03	6.41	5.46
Union	13.26 ✓	10.97	9.44	7.90	6.81
Total	138.26 ✓	106.92	86.43	70.49	63.67

*Iredell County emissions for nonattainment area only

Table 3-8. On-road Mobile Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	7.54	6.05	5.04	4.18	3.63
Gaston	6.24	4.67	3.72	3.08	2.69
Iredell*	5.51	4.32	3.55	2.95	2.53
Lincoln	3.21	2.52	2.05	1.69	1.44
Mecklenburg	30.42	22.91	18.32	15.20	13.65
Rowan	6.32	4.82	3.84	3.10	2.60
Union	7.46	6.03	5.06	4.27	3.67
Total	66.70	51.32	41.58	34.47	30.21

*Iredell County emissions for nonattainment area only

Nonroad mobile sources, also referred to as off-road mobile sources, are equipment that can move but do not use the roadways, i.e., lawn mowers, construction equipment, railroad locomotives, aircraft, etc. The emissions from this category are calculated using the USEPA's NONROAD2008a model, with the exception of the railroad locomotives and aircraft engine. The railroad locomotive and aircraft engine emissions are estimated by taking activity data, such as landings and takeoffs, and multiply by an emission factor. These emissions are also estimated at the county level. For the projected years' inventories, the emissions are estimated using the USEPA's NONROAD2008a model, projected landing and takeoff data for aircraft and national fuel use from the Energy Information Administration for locomotives. For detailed discussion on how the nonroad mobile emission inventory was developed, see Appendix B.4. A summary of the nonroad mobile source emissions are presented in Table 3-9 and Table 3-10. The emissions are presented in a ton per summer day basis.

Table 3-9. Nonroad Mobile Source NOx Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	2.87	2.39	1.93	1.59	1.38
Gaston	2.83	2.31	1.85	1.55	1.36
Iredell*	0.90	0.74	0.58	0.47	0.40
Lincoln	1.20	1.00	0.82	0.68	0.60
Mecklenburg	25.38	22.93	20.33	18.69	17.88
Rowan	2.52	2.15	1.80	1.55	1.38
Union	5.35	4.52	3.68	3.05	2.61
Total	41.05	36.04	30.99	27.58	25.61

*Iredell County emissions for nonattainment area only

Table 3-10. Nonroad Mobile Source VOC Emissions (tons per day)

County	2010	2013	2016	2019	2022
Cabarrus	1.73	1.41	1.25	1.23	1.25
Gaston	1.92	1.54	1.31	1.23	1.22
Iredell*	0.62	0.50	0.42	0.38	0.36
Lincoln	0.94	0.77	0.66	0.59	0.57
Mecklenburg	16.20	13.63	12.33	12.14	12.37
Rowan	1.89	1.58	1.33	1.18	1.12
Union	3.11	2.60	2.33	2.27	2.29
Total	26.41	22.03	19.63	19.02	19.18

*Iredell County emissions for nonattainment area only

3.3.3 Summary of Emissions

The sum totals of the man-made emissions for the Metrolina nonattainment area are tabulated in Tables 3-11 though 3-14. The emission summaries for York County, South Carolina came from the SCDHEC redesignation demonstration and maintenance plan.

Table 3-11 Total Man-Made NOx Emissions for the North Carolina Portion of the Metrolina Nonattainment Area (tons/day)

County	2010	2013	2016	2019	2022
Cabarrus	18.84	15.75	13.34	11.22	10.12
Gaston	40.68	21.82	18.47	16.87	13.94
Iredell*	13.29	11.57	10.32	9.40	8.88
Lincoln	7.82	6.61	5.57	4.80	4.32
Mecklenburg	101.19	81.71	68.65	59.53	57.06
Rowan	23.02	16.09	13.20	11.54	10.67
Union	19.60	16.49	14.14	12.00	10.50
Total	224.44	170.04	143.69	125.36	115.49

* Iredell County emissions for nonattainment area only.

Table 3-12 Total Man-Made VOC Emissions for the North Carolina Portion of the Metrolina Nonattainment Area (tons/day)

County	2010	2013	2016	2019	2022
Cabarrus	15.53	13.81	12.78	12.18	11.91
Gaston	15.77	13.72	12.76	12.34	12.18
Iredell*	9.05	7.90	7.19	6.69	6.40
Lincoln	7.86	7.23	6.80	6.60	6.52
Mecklenburg	75.62	66.32	60.29	57.86	57.51
Rowan	16.80	15.64	14.92	14.60	14.60
Union	20.73	19.39	18.58	18.39	18.48
Total	161.36	144.01	133.32	128.66	127.60

* Iredell County emissions for nonattainment area only.

Table 3-13 Total Man-Made NOx Emissions for South Carolina Portion of the Metrolina Nonattainment Area – York County, South Carolina (tons/day)

County	2010	2013	2016	2019	2022
Point	4.54	4.64	4.91	5.19	5.48
Area	1.17	1.22	1.27	1.32	1.36
On-Road Mobile	12.05	8.73	6.52	5.16	4.42
Nonroad Mobile	3.21	2.69	2.17	1.82	1.60
Total	20.97	17.28	14.87	13.49	12.86

* York County emissions for nonattainment area only.

Table 3-13 Total Man-Made VOC Emissions for South Carolina Portion of the Metrolina Nonattainment Area – York County, South Carolina (tons/day)

County	2010	2013	2016	2019	2022
Point	2.07	2.06	2.20	2.34	2.49
Area	7.16	7.39	7.57	7.70	7.83
On-Road Mobile	3.92	3.14	2.61	2.29	2.14
Nonroad Mobile	2.15	1.78	1.54	1.44	1.41
Total	15.30	14.37	13.92	13.77	13.87

* York County emissions for nonattainment area only.

3.3.4 Maintenance Demonstration

As discussed above, maintenance is demonstrated when the future years total man-made emissions are less than the 2010 baseline emissions. The following tables summarize the VOC and NOx emissions for the entire Metrolina nonattainment area and the North Carolina portion, respectively. The difference between the base year and the final year for both scenarios illustrates that the continued maintenance of the 1997 8-hour ozone NAAQS is expected.

Appendix C
Stakeholder Comments

January 17, 2012

Air Docket
Attention Docket ID No. EPA-HQ-OAR-2008-0476
United States Environmental Protection Agency
Mail Code 6102T
1200 Pennsylvania Ave., NW.
Washington, DC 20460

RE: *Federal Register* – Vol. 76, No. 244/Tuesday, December 20, 2011
EPA Responses to State and Tribal 2008 Ozone Designation Recommendations: Notice of Availability and Public Comment Period

To Whom It May Concern:

Resolute Forest Products – Catawba Operations wishes to express its continuing support for South Carolina's boundary recommendation submitted October 11, 2011, requesting that all of South Carolina be designated attainment for the 2008 ozone National Ambient Air Quality Standards (NAAQS). Neither South Carolina nor North Carolina recommended that any portion of York County be designated nonattainment. We do not support EPA's proposal to include part of York County in a Charlotte-Gastonia-Salisbury 8-hour ozone nonattainment area.

Resolute Forest Products – Catawba Operations is located approximately 8 miles southeast of Rock Hill, South Carolina. The facility produces coated paper and market pulp. At the site, we employ approximately 800 people.

There have been significant and continuing reductions in ozone levels measured in the Mecklenburg-York area. Recent data collected from all air quality monitors in the State of South Carolina demonstrates that South Carolina is meeting the 2008 ozone NAAQS, including the York County monitor, which has a 2011 design value of 0.064 ppm. Current ozone design values are much further below the 2008 NAAQS than were with the design values at the time of the 1997 ozone NAAQS designations. In the past, modeling has shown that York County NOx emissions have no significant impact on ozone generation in Mecklenburg County.

Our facility is located inside the current Charlotte-Gastonia-Rock Hill, NC-SC 8-hour ozone nonattainment area. We recognize that air quality has a direct impact on the public's health, environment, economy, and quality of life. People (and industries) across the state are aware of the air quality issues they face, and are both active and committed to finding ways to voluntarily reduce emissions. These efforts, along with state and federal measures, will lead to continued multi-pollutant reductions. A nonattainment designation and the required documentation and checklist process that follow do not improve air quality; it is the hard work and dedication of all air quality partners that lead to these continued improvements.

Because of our location, we were required to undergo a Nonattainment New Source Review (NANSR) in 2006 in order to maintain the viability of this facility: we must continue to modernize or risk obsolescence. This process was long and complicated and the outcome was uncertain until the end, despite cooperation by the North and South Carolina regulatory agencies and the EPA. As a result of this permitting action, two of our major units were required to undergo Lowest Achievable Emission Rate (LAER) review, obtain offsets, and install NO_x Continuous Emission Monitoring Systems (CEMs). The offsets increased the capital cost of the project by 5% with no financial return. Our facility has also undergone earlier Prevention of Significant Deterioration (PSD) review, all leading to emission reductions. In addition to our regulatory mandates we have worked with our facility, our employees, and other local stakeholders to identify and implement voluntary education and emission reduction measures to reduce ozone precursors.

The state regulatory agencies are charged with carrying out requirements of the Clean Air Act; the EPA should defer to those states' recommendations for designating areas for any of the NAAQS. We urge you to consider the ramification that a nonattainment designation here would have. The portion of York County that EPA has proposed for nonattainment has already undergone Reasonable Available Control Technology (RACT) and NANSR analysis. An Inspection and Maintenance (I&M) program is not feasible or required on mobile sources, and any new industry locating in this area would be subject to the applicable regulations in place such as PSD, Maximum Achievable Control Technology (MACT), New Source Performance Standards (NSPS), and the control of volatile organic compounds (VOC) prescribed in SC Regulation 61-62.5, Standards 5 and 5.1, all of which address ozone precursors (either as a primary or secondary reduction). As a result, very little emission reductions are left to be had in this area. Moreover, a nonattainment designation and the time spent fulfilling its regulatory obligations do not improve air quality, but instead the process has consumed significant local, state, and federal resources that would have been better utilized for real air quality improvements.

We understand the Department of Health and Environmental Control is preparing a response to EPA's December 8, 2011, preliminary boundary recommendations that will further support a decision that all of South Carolina be designated attainment. Resolute Forest Products – Catawba Operations repeats its continuing support of South Carolina's boundary recommendation for state-wide ozone NAAQS attainment. The science clearly supports the designation of attainment for all of South Carolina. Thank you for the opportunity to provide these comments.

Sincerely,

Dale Herendeen
Resolute Forest Products – Catawba Operations
PO Box 7, Catawba, SC, 29704

cc: Myra Reece, Chief, BAQ, SCDHEC
Gwendolyn Keyes Fleming, Regional Administrator, Region 4, U.S. EPA
Beverly Banister, Director, Air Pesticides, Toxics, & Toxics Management Division, Region 4, U.S. EPA

State of South Carolina
Office of the Governor

NIKKI R. HALEY
GOVERNOR

1205 PENDLETON STREET
COLUMBIA 29201

January 18, 2012

Lisa P. Jackson
Administrator
United States Environmental Protection Agency Headquarters
1200 Pennsylvania Avenue, NW
Mail Code 1101A
Washington, D.C. 20460

Dear Administrator Jackson,

I am writing to express my strong disagreement with the Environmental Protection Agency's (EPA) preliminary decision to include the urbanized portion of York County in the Charlotte, North Carolina nonattainment designation for the 2008 eight-hour ozone standard. I hope to provide this feedback in a spirit of partnership between our state and your agency; a partnership that is appropriately deferential to state expertise and responsibility for environmental issues.

Recent data collected from all air quality monitors in the State of South Carolina demonstrate that South Carolina is meeting the 2008 ozone standard. South Carolina's Department of Health and Environmental Control (SC DHEC) will be submitting updated information that confirms the original assessment and recommendation that York County, in its entirety, be designated as having attained for the ozone standard.

While I appreciate the challenges and complexities of multi-state environmental monitoring, ultimate implementation of the Clean Air Act is left to states, leaving the bulk of the knowledge and expertise in the state agencies charged with these efforts. This preliminary decision, like so many others made throughout the current administration, is part of a central planner's approach to what are fundamentally state and regional issues. SC DHEC has committed to meeting all environmental standards in the statutorily required time and provides sound evidence indicating that the current grouping of York County and Charlotte, North Carolina, in a single non attainment area is premature.

I strongly urge the EPA to consider SC DHEC's additional evidence and exclude York County from the Charlotte, North Carolina nonattainment area. If you have questions or concerns about

this information, please do not hesitate to contact Myra Reece, SC DHEC Air Quality Bureau Chief, at 803.898.4123.

My very best,

Nikki R. Haley

NRH/jdb

Greenville County

Office of the Administrator

Joseph M. Kernell
County Administrator
jkernell@greenvillecounty.org
(864) 467-7105
www.greenvillecounty.org

January 24, 2012

Gwendolyn Keyes Fleming
Regional Administrator
U.S. EPA, Region 4
Atlanta Federal Center
61 Forsyth Street
Atlanta, GA 30303-8960

RE: Docket EPA-HQ-OAR-2008-0476

Dear Ms. Keyes Fleming:

Thank you for allowing local governments to submit comments on EPA's intent to make designations with respect to the 2008 ground level ozone standards.

Greenville County is in support of the South Carolina Department of Health and Environmental Control (SCDHEC) October 11, 2011, letter in which the "...Department recommends that each county of the entire State of South Carolina be designated "attainment" for the 2008 8-hour ozone NAAQS...." Your December 8, 2011, indicates EPA's intent "to designate the Spartanburg Area as unclassifiable/attainment" and that EPA will "consider 2009-2011 air quality data in the final designation decisions for this area..." It is our understanding that SCDHEC has validated and certified the data for the 2011 ozone season with its letter issued on December 9, 2011.

In light of the above, Greenville County is pleased with SCDHEC's recommendation and EPA's intent to designate the Upstate SC, including the counties of Spartanburg, Greenville, and Anderson, as an "attainment" area with the 2008 8-hour ozone NAAQS.

Greenville County is committed to educate its residents on the actions they can take to improve air quality. To be successful in this endeavor, however, it takes the commitment of the federal government in establishing national standards to address vehicles' fuel efficiency and power plant pollution generation as well as providing the necessary funds to continue improving air quality at the local level.

If you have any questions, please do not hesitate to contact Sandra Yúdice at (864) 467-7409 or me.

Sincerely,

Joseph M. Kernell
County Administrator

Cc: Myra Reece, Chief, Bureau of Air Quality, SCDHEC
Melone Long, Assistant County Administrator for Planning
John Owings, Manager, Current Planning

RFATS
Rock Hill - Fort Mill Area Transportation Study

January 27, 2012

Ms. Gwendolyn Keyes Fleming
Regional Administrator
Region 4
U.S. Environmental Protection Agency
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-3104

Re: Attainment Recommendation for 2008 Ozone Standard for York County, SC

Dear Regional Administrator Fleming:

The Policy Committee of the Rock Hill-Fort Mill Area Transportation Study (RFATS) has reviewed the available information regarding the 2008 8-hour ozone standard and the process to implement the new standard as outlined by EPA on September 22, 2011. We understand that the South Carolina Department of Health & Environmental Control (SCDHEC) submitted a revised ozone designation recommendation and other relevant technical information supporting the designation of all of York County for the new, more protective ozone standard of 0.075ppm.

The RFATS Policy Committee has demonstrated a continued commitment to improving air quality and the environment by actively working with DHEC, EPA, and other federal and state partners in planning for and implementing transportation projects focused on reducing vehicular emissions and improving the efficiency and safety of the regional transportation system – which has produced a measurable, beneficial impact to air quality in York County, SC.

With this in mind, the RFATS Policy Committee would request that the U.S. Environmental Protection Agency follow the recommendation of the South Carolina Department of Health & Environmental Control and designate all of York County, South Carolina as attainment with the 2008 ozone standard.

RFATS Chairman

Danny P Funderburk

Honorable Danny Funderburk, Mayor, Town of Fort Mill

RFATS Vice-Chairman

Honorable George Sheppard, Mayor, City of Tega Cay

Honorable Sarah Nuckles, SCDOT Commissioner

Honorable R. Wes Hayes, Senator, SC Legislature

Honorable Ralph Norman, Representative, SC Legislature

Honorable Doug Echols, Mayor, City of Rock Hill

Honorable David Bowman, Councilmember, York County Council

Honorable Dr. Britt Blackwell, Chairman, York County Council

Honorable Bill Harris, Tribal Chief, Catawba Indian Nation

Honorable Kathy Pender, Councilmember, City of Rock Hill

Honorable Jim Reno, Councilmember, City of Rock Hill

Catawba Regional
Council of Governments

February 16, 2012

Ms. Lisa Jackson, Administrator
United States Environmental Protection Agency
USEPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Mail Code: 1101A
Washington, DC 20460

Dear Ms. Jackson:

Enclosed please find a resolution from the Board of Directors of the Catawba Regional Council of Governments in South Carolina. The Board requests reconsideration of a recent decision by EPA to include the eastern portion of York County, SC in the greater Charlotte nonattainment area for the 2008 ozone standard.

Per the resolution, air quality monitors throughout South Carolina (including York County) are in compliance with the national ambient air quality standard for the 2008 ozone standard.

Our state environmental agency, the Department of Health and Environmental Control (DHEC), also recommended that the entire State of South Carolina, including eastern York County, be included in the state's attainment area for the 2008 ozone standard.

Thank you for your full consideration of this request. We would be happy to answer any questions you may have in this matter.

For the Board of Directors,

Randy Imler
Executive Director

Enclosure

cc: SC DHEC

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Catawba Regional
Council of Governments

RESOLUTION

WHEREAS air quality across the country continues to improve and air quality at all monitors in South Carolina is in compliance with the national ambient air quality standard for the 2008 ozone standard; and

WHEREAS the South Carolina Department of Health and Environmental Control recommended that the entire state of South Carolina, including all of York County, be designated as attainment for the 2008 ozone standard; and

WHEREAS the U. S. Environmental Protection Agency has proposed that a portion of York County, South Carolina be included with the Charlotte, North Carolina nonattainment area for the 2008 ozone standard; and

WHEREAS the Clean Air Act identifies that air pollution prevention is the primary responsibility of state and local governments; and

WHEREAS the South Carolina Department of Health and Environmental Control will be providing the technical support documentation demonstrating that emissions from York County are not significantly contributing to ozone concentrations in Charlotte, North Carolina; and

WHEREAS York County through the Catawba Regional Council of Governments has demonstrated their continued commitment to improving air quality and the environment by working with the Charlotte region on numerous initiatives to include the development of a regional plan to guide sustainable, well managed growth for quality of life that provides for a safe and healthy environment with good air and water quality and a strong, diverse economy that provides jobs throughout the region.

NOW, THEREFORE, BE IT RESOLVED, That the Board of the Catawba Regional Council of Governments does hereby request that the U. S. Environmental Protection Agency follow the recommendation of the South Carolina Department of Health and Environmental Control and designate all of York County, South Carolina as attainment with the 2008 ozone standard.

ADOPTED this 2nd day of February 2012 at Rock Hill, South Carolina by the Catawba Regional Council of Governments.

Dora T. Martin-Jennings

Dora Martin-Jennings, Chair

Serving Chester, Lancaster, Union, & York Counties

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