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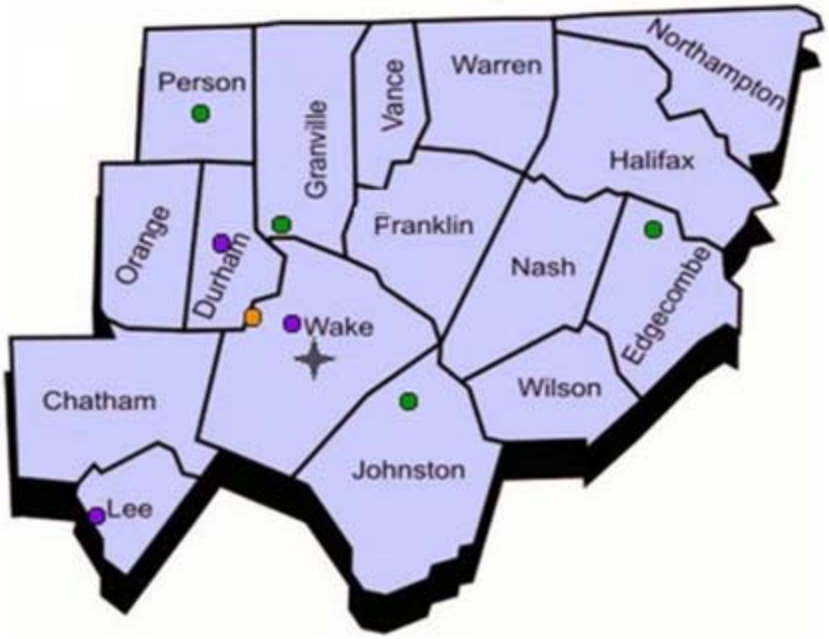
2016-2017 Annual Monitoring Network Plan for the North Carolina Division Of Air Quality

Volume 2

Site Descriptions by Division of Air Quality Regional Office and Metropolitan Statistical Area

D. The Raleigh Monitoring Region



July 1, 2016

Table of Contents

List of Figures

List of Tables

D. The Raleigh Monitoring Region

The Raleigh monitoring region of North Carolina, shown in Figure D1, consists of six sections: (1) the Durham-Chapel Hill metropolitan statistical area, MSA, (Chatham, Durham, Orange and Person counties), (2) the northeastern Piedmont (Granville, Halifax, Northampton, Vance and Warren counties), (3) the Raleigh MSA (Franklin, Johnston and Wake counties), (4) the Rocky Mount MSA (Edgecombe and Nash counties), (5) the Wilson micropolitan statistical area (Wilson County) and (6) the Sanford micropolitan statistical area (Lee County).

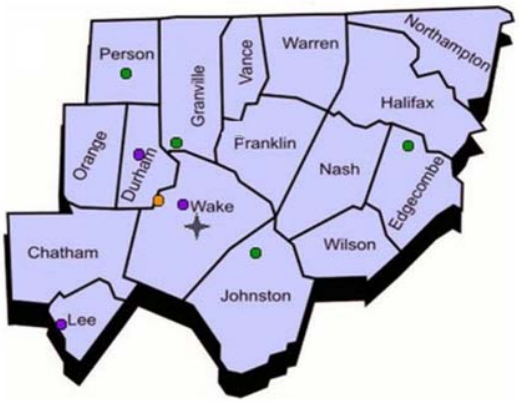


Figure D1. The Raleigh monitoring region
The dots show the approximate locations of most of the monitoring sites in this region.

(1) Durham-Chapel Hill MSA

The Durham-Chapel Hill MSA consists of four counties: Chatham, Durham, Orange and Person. The major metropolitan areas are the cities of Durham and Chapel Hill. The North Carolina Division of Air Quality, DAQ, currently operates two monitoring sites in the Durham-Chapel Hill MSA. These sites are located at the Durham Armory in Durham (Durham County), and Bushy Fork (Person County). Starting on January 1, 2017, DAQ in cooperation with Duke Energy Progress will begin operating a third site in Semora (Person County). The locations of these monitors are shown in Figure D2. The seasonal ozone monitor in Pittsboro in Chatham County was shut down on October 31, 2015, at the end of ozone season, and the rotating sulfur dioxide monitor was shut down on February 4, 2015.

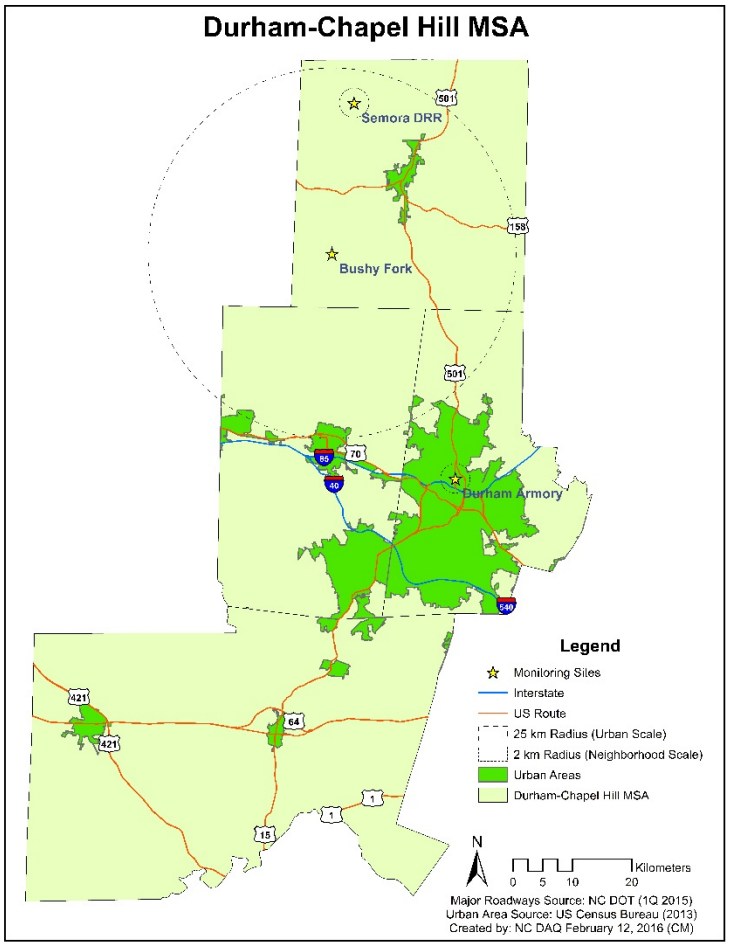


Figure D2. Location of monitors in the Durham-Chapel Hill MSA.

At the Durham Armory site the DAQ operates a seasonal ozone monitor, a one-in-three day fine particle FRM monitor, a continuous low volume PM_{10} monitor and a continuous fine particle monitor. The site, as well as views looking north, northeast, east, southeast, south, southwest, west and northwest, is shown in Figure D3 through Figure D11. This fine-particle monitoring site is the design value site for the MSA. On Jan. 1, 2011, the DAQ started operating a low volume PM_{10} monitor at the site to meet minimum PM_{10} monitoring requirements in the Durham-Chapel Hill MSA and to provide $PM_{10-2.5}$ data. In May 2015 this monitor was changed to a continuous low volume PM_{10} monitor.

Figure D3. The Durham Armory ozone, sulfur dioxide and particle monitoring site

Figure D4. Looking north from the Durham Armory site

Figure D5. Durham Armory site looking northwest

Figure D6. Durham Armory site looking northeast

Figure D7. Looking east from the Durham Armory site

Figure D8. Looking west from the Durham Armory site

Figure D10. Durham Armory site looking southeast

Figure D9. Durham Armory site looking southwest

Figure D11 Looking south from the Durham Armory site

At the Bushy Fork site, the DAQ operates a seasonal ozone monitor. A special purpose sulfur dioxide monitor operated for 12 months from June 2014 through May 2015 to provide background sulfur dioxide concentrations for Person County to support modeling requirements for the sulfur dioxide national ambient air quality standard, NAAQS. A picture of the site as well as views looking north, east, south and west are provided in Figure D12 through Figure D16.

Figure D12. Bushy Fork ozone monitoring site

Figure D13. Bushy Fork site looking north

Figure D14. Bushy Fork site looking west

Figure D15. Bushy Fork site looking east

Figure D16. Bushy Fork site looking south

At the Semora DRR site, DAQ proposes to operate a source-oriented sulfur dioxide monitor to meet the requirements in the 2010 sulfur dioxide data requirements rule. The monitor will operate for a minimum of three years from 2017 to 2019 to ensure that ambient air in the proximity of the Duke Energy Progress Roxboro plant meets the national ambient air quality standards. An aerial view of the proposed site in relationship to the Roxboro facility as well as views looking north, east, south and west from the proposed location are provided in Figure D17 through Figure D21. ---

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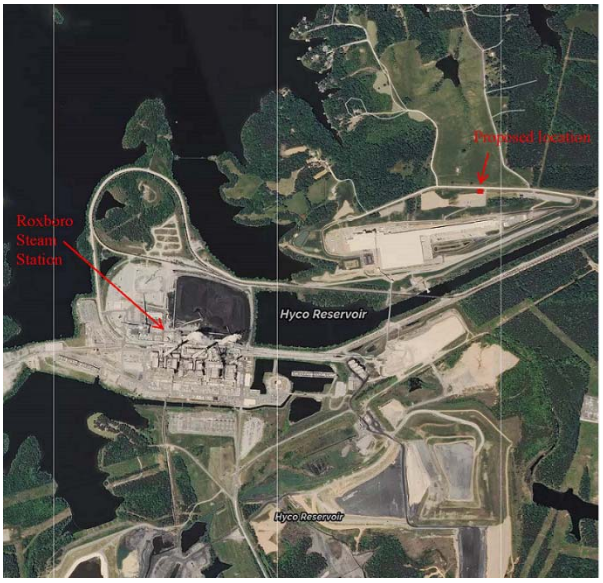


Figure D17. Aerial view showing the location of the proposed Semora DRR monitoring station

Figure D18. Looking north from the proposed Semora DRR monitoring station

Figure D20. Looking east from the proposed Semora DRR location

Figure D19. Looking west from the proposed Semora DRR location

Figure D21. Looking south from the proposed Semora DRR location

In 2008 EPA expanded the **lead** monitoring network to support the lower lead NAAQS of 0.15 micrograms per cubic meter. On Dec. 27, 2010, the EPA revised the monitoring requirements to focus on fence line monitoring located at facilities that emit 0.5 tons or more of lead per year and at National Core, NCore, monitoring sites. These changes to the lead monitoring network requirements did not require any lead monitoring in the Durham-Chapel Hill MSA. This MSA does not have an NCore monitoring station. Also, the Duke Progress Energy Roxboro electricity

generating facility emitted 122.4 pounds of lead in 2014, well below the 0.5 ton threshold. In addition, modeling performed in 2009 indicated the concentrations of lead in ambient air around the facility are less than 0.01 micrograms per cubic meter, which is far enough below the NAAQS that no fence-line monitoring is required for this facility.

At this time the MSA is required to operate two **ozone** monitors – one at the Durham Armory and one at Bushy Fork. Beginning in 2017, seasonal ozone monitoring will start on March 1 instead of April 1.

The 2010 **nitrogen dioxide** monitoring requirements currently require the Durham-Chapel Hill MSA to monitor for nitrogen dioxide because its population exceeded the 500,000 threshold in 2009. Thus, DEQ is required to operate a near roadway monitor. In 2013 due to lack of funds, the United States Environmental Protection Agency, EPA, revised the regulation to require near road monitors in MSAs with less than one million people to start operating on Jan. 1, 2017. However, on May 15, 2016, the EPA proposed eliminating the requirement to monitor for nitrogen dioxide in areas with populations below one million.[1] Accordingly, and with the concurrence of EPA Region 4, DAQ placed a hold on planning activities for the Durham site. DAQ understands the EPA plans on completing the associated final rule before Jan. 1, 2017, and continues to follow this issue. DAQ will adjust plans, if needed, as further information becomes available from the EPA.

In the technical assistance document EPA recommends placing near road monitoring stations along road segments with the highest average annual daily traffic values adjusted for fleet mix. Sites should also be evaluated based on congestion patterns, roadway design, terrain and meteorology. Preliminary analysis of the segments in the Durham-Chapel Hill MSA with the highest average annual daily traffic adjusted for fleet mix are shown in Table D 1 and Table D2.

[1] Revision to the Near-Road NO2 Minimum Monitoring Requirements, Federal Register, Vol. 81, No. 94 Monday, May 16, 2016, p. 30224, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2016-05-16/pdf/2016-11507.pdf.

Table D 1. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Durham-Chapel Hill Metropolitan Statistical Area Using Published NCDOT Data

Station	Route	Location	Station	Percent Passenger	2013 AADT	Fleet Equivalent AADT
Station	**Route**	**Location**	**Station**	**Percent Passenger**	**2014 AADT**	**Fleet Equivalent AADT**
(A)1011	I-40	From Exit 282 To Exit 283	09MC0030	90%	180,000	342,000
(B)947	I-40	From Exit 281 To Exit 282	09MC0030	90%	174,000	330,600
(C)547	I-40	From Exit 280 To Exit 281	09MC0030	90%	162,000	307,800
(D)553	I-40	From Exit 279 To Exit 280	10MC0005	94%	156,000	240,240
(E)942	I-40	From Exit 273 To Exit 274	09MC0028	90%	120,000	228,000
941	I-40	From Exit 274 to Exit 276	09MC0028	90 %	117,000	222,300
(G)6	I-85	From Exit 160 To Exit 161	09MC0069	88%	103,000	214,240
(I)91	I-85	From Exit 161 To Exit 163	09MC0069	88%	99,000	205,920
(J)5	I-85	From Exit 157 To Exit 160	09MC0069	88%	98,000	203,840
(F)727	I-40	From Exit 278 To Exit 279	10MC0005	94%	128,000	197,120
202	I-85	From Exit 174B to Exit 174	09MC0069	88 %	94,000	195,520
(H)940	I-40	From Exit 276 To Exit 278	10MC0005	94%	126,000	194,040

Table D2. Fleet Equivalent Average Annual Daily Traffic for Road Segments in the Durham-Chapel Hill Metropolitan Statistical Area Using Microwave Radar Data

		2013 Traffic Monitor Data			2014 Traffic Monitor Data		
Route	**Location**	**Percent Passenger**	**AADT**	**Fleet Equivalent AADT**	**Percent Passenger**	**AADT**	**Fleet Equivalent AADT**
(B)I-40	Exit 281 to 282	95	157,673	235,806	95	152,803	221,736
(C)I-40	Exit 280 to 281	97	147,546	185,472	97	147,934	183,947
(D)I-40	Exit 279 to 280	97	127,371	167,573	98	137,153	166,776
(F)I-40	Exit 278 to 279	98	137,314	167,224	96	118,952	156,811
(H)I-40	Exit 276 to 278	97	114,740	143,302	97	117,298	145,941
(E)I-40	Exit 273 to 274	97	111,733	140,247	97	105,718	132,735
(K)I-40	Exit 274 to 276	98	101,687	121,505	98	109,205	130,830
(L)I-40	Exit 270 to 273	96	83,527	113,511	96	86,083	117,350

The locations of these segments are shown with lettered symbols in Figure D22. They stretch from the eastern part of Durham County into central Orange County with heaviest fleet adjusted average annual daily traffic being along I-40 near the Durham-Wake County line. Because the highest ranked sites are within two miles of the Raleigh near road monitoring site off of Triple Oak Road along I-40 between Exit 283 and Exit 284 and have similar traffic counts and heavy duty vehicle make-up, the DAQ requests a waiver for the near road Durham-Chapel Hill monitoring site, if the EPA does not finalize its proposal to eliminate near-road monitoring in areas with less than 1 million people. The waiver request is in Section 2 of Volume I of the network plan.

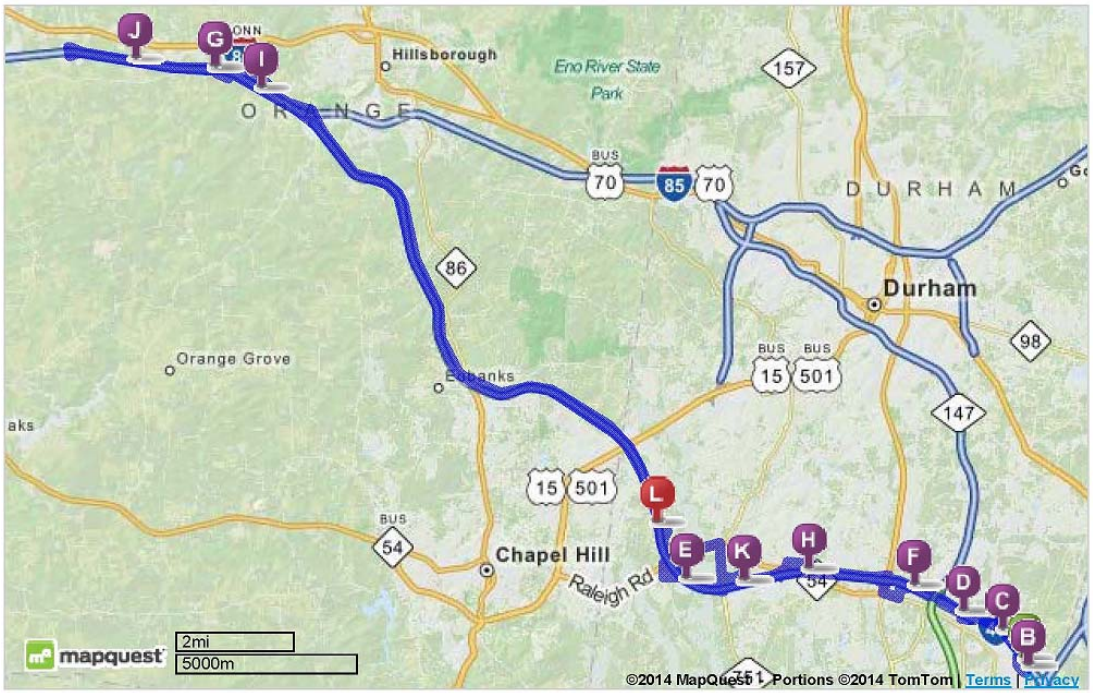


Figure D22. Locations of segments with highest fleet adjusted AADT in the Durham-Chapel Hill MSA

The 2010 **sulfur dioxide monitoring** requirements added additional monitoring in this MSA. Because of power generating facilities located in Person and Chatham counties and a large population base, a population-weighted emission index, PWEI, population exposure monitor was added at the Armory site. Figure D23 shows the location of the PWEI monitor relative to where people lived based on the 2000 census. Figure D24 shows the distribution of sulfur dioxide emissions among the counties in the MSA. The closest permitted source of sulfur dioxide to the Armory site is Carolina Sunrock, located 3.25 kilometers southeast of the site, as shown in Figure D25. Carolina Sunrock reported emitting 5.4 tons of sulfur dioxide in 2011. As mentioned earlier an additional source-oriented sulfur dioxide monitor is required in this MSA by Jan. 1, 2017.

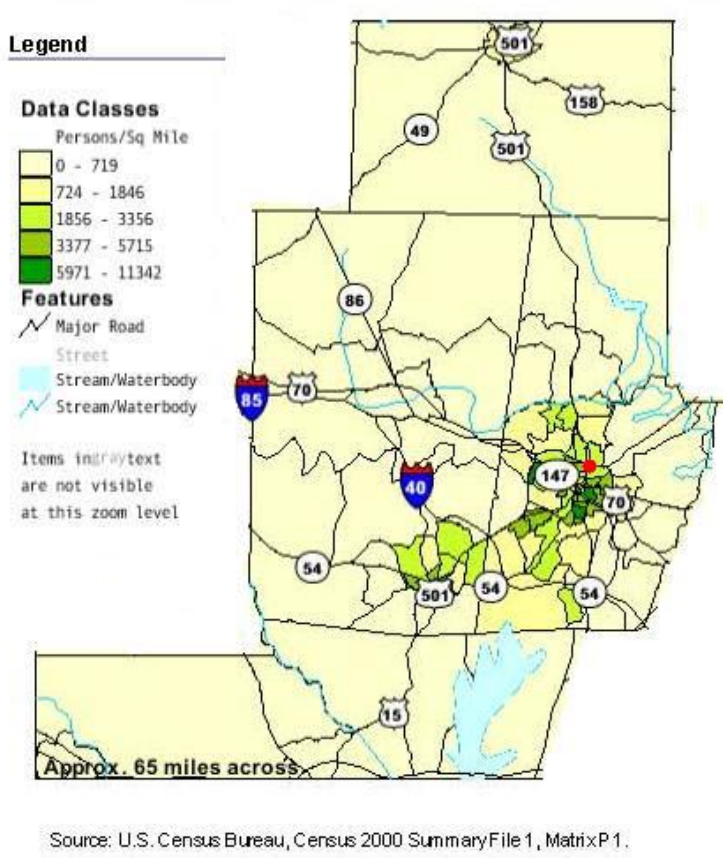


Figure D23. Location of Durham-Chapel Hill PWEI monitor in relationship to centers of population in 2000

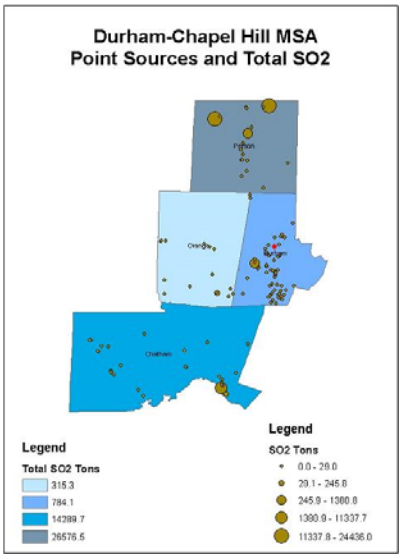


Figure D24. Location of the Durham-Chapel Hill PWEI sulfur dioxide monitor (red dot) in relationship to sulfur dioxide sources

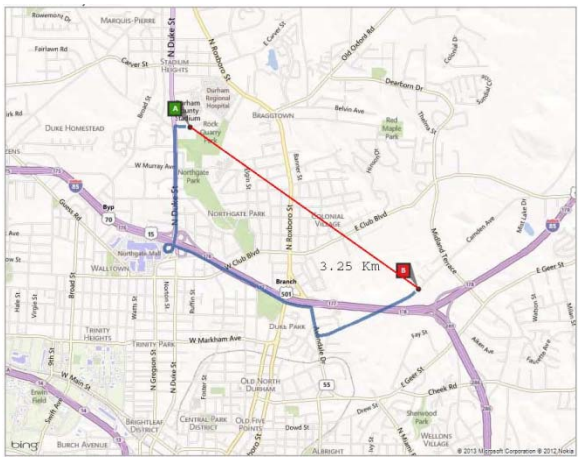


Figure D25. Location of the Armory monitoring site (A) in relationship to Carolina Sunrock (B)

Changes to the **carbon monoxide monitoring** requirements did not add additional monitoring to this MSA because the population is less than one million.

(2) The Northeastern Piedmont

The northeastern Piedmont consists of five counties: Granville, Halifax, Northampton, Vance and Warren. There is not an MSA in these counties; however, Henderson micropolitan statistical area is located in Vance County and the Roanoke Rapids micropolitan statistical area consists of Halifax and Northampton counties. The DAQ currently operates one monitoring site in the northeastern piedmont. This site is located at Butner (Granville County). The location of this monitoring site is shown in Figure D26.

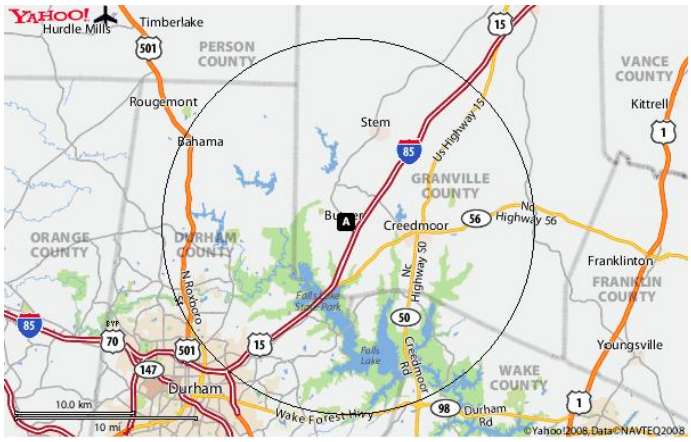


Figure D26. Location of the Butner monitoring site

A is the Butner ozone monitoring site. The circle around the site approximates the urban scale (4 to 50 Km).

At the **Butner** site, 37-077-0001, the DAQ operates a seasonal ozone monitor. A picture of the site as well as views looking north, east, south and west are provided in Figure D27 through Figure D35. The

Butner site was established as the downwind site for the Durham-Chapel Hill MSA when the wind is from the primary direction during the season of highest ozone concentrations.

Figure D27. The Butner ozone monitoring site

Figure D28. Looking north from the Butner site

Figure D30. Looking northeast from the Butner site

Figure D29. Looking northwest from the Butner site

Figure D31. Looking east from the Butner site

Figure D32. Looking west from the Butner site

Figure D34. Looking southeast from the Butner site

Figure D33. Looking southwest from the Butner site

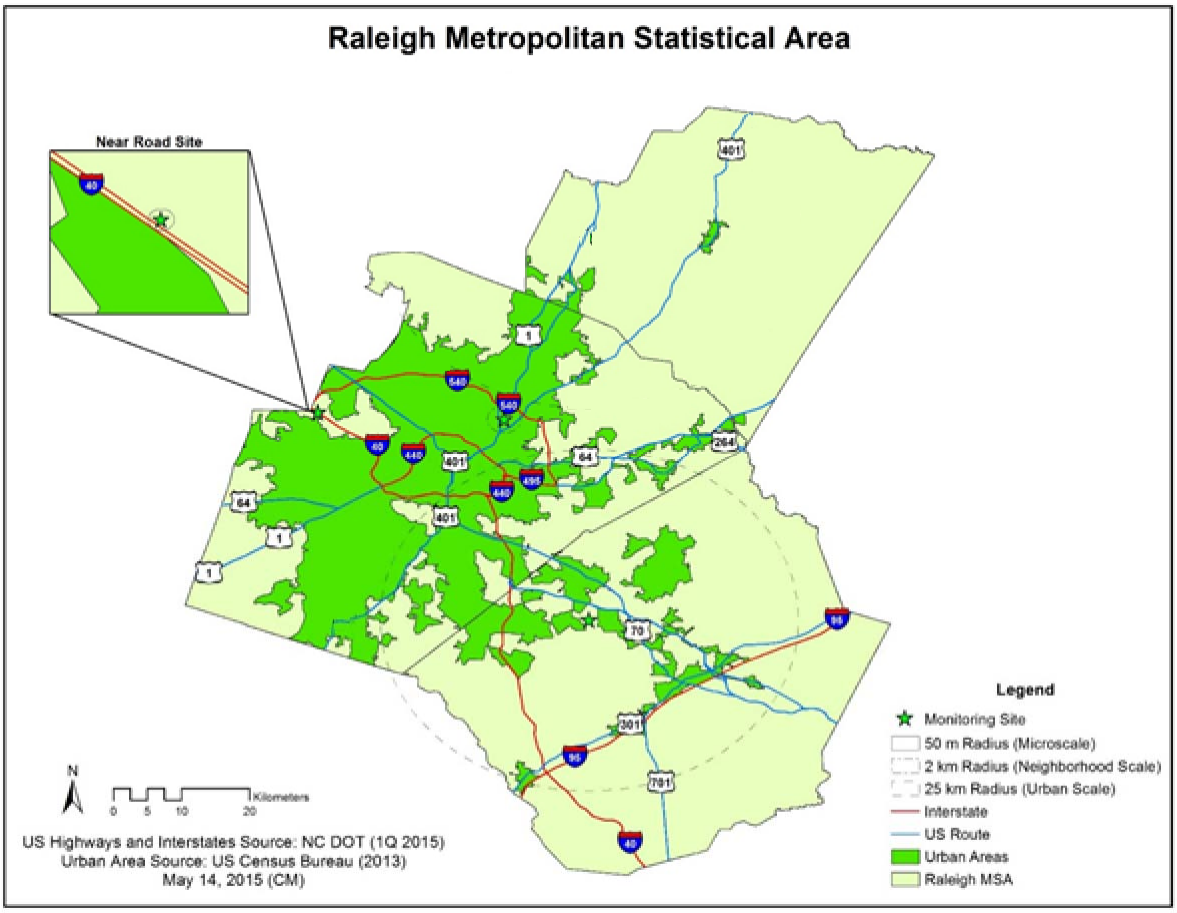
Figure D35. Looking south from the Butner site

This area was not required to add any lead monitors because of the 2010 changes made to the **lead monitoring** requirements. There are no facilities here that emit 0.5 ton or more of lead per year.

New **ozone monitoring** requirements will not require additional monitoring in the northeastern Piedmont. The area does not have any MSAs that are required by 40 CFR 58 Appendix D to conduct population exposure monitoring in urban areas. The northeastern Piedmont did not add monitors as a result of the 2010 **nitrogen dioxide** monitoring requirements because it does not have any roads exceeding the traffic threshold and does not have any MSAs that trigger nitrogen dioxide monitoring requirements. The northeastern piedmont will also not add sulfur dioxide monitors because of the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in this area. This area will also not be required to do carbon monoxide monitoring as a result of the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

(3) The Raleigh MSA

As shown in Figure D36, the Raleigh MSA consists of three counties: Franklin, Johnston and Wake. The major metropolitan areas include Raleigh and Cary. The DAQ currently operates three monitoring sites in the Raleigh MSA. These sites are located at West Johnston (Johnston County) and Millbrook and Triple Oak (Wake County). The ozone monitors at Franklinton and Fuquay were shut down on Oct. 31, 2015.



Millbrook multipollutant site, center, neighborhood scale; Triple Oak nitrogen dioxide monitor, furthest west, micro scale; and West Johnston ozone and particle monitors, furthest east, urban scale.

Figure D36. Monitoring sites located in the Raleigh MSA.

At the **West Johnston** site, 37-101-0002, the DAQ operates a seasonal ozone monitor and a one-in-three day fine particle FRM monitor. The West Johnston ozone site was established as the upwind site for the Raleigh MSA when the wind is from the secondary direction during the season of highest ozone concentrations. This site is one of two ozone-monitoring sites in the MSA. 40 Code of Federal Regulations, CFR, 58 Appendix D requires the Raleigh MSA to have two ozone monitoring sites. The West Johnston fine particle site is the second fine particle monitoring site in the MSA because the Raleigh MSA has a population over 1 million people and is currently required to have three fine particle monitors. The North Carolina Division of Air Quality is planning on adding a continuous fine particle monitor at the site in 2016 that will eventually replace the FRM monitor. A picture of the site and views looking north, east, south and west are provided in Figure D37 through Figure D41.

Figure D37. The West Johnston ozone and fine particle monitoring site

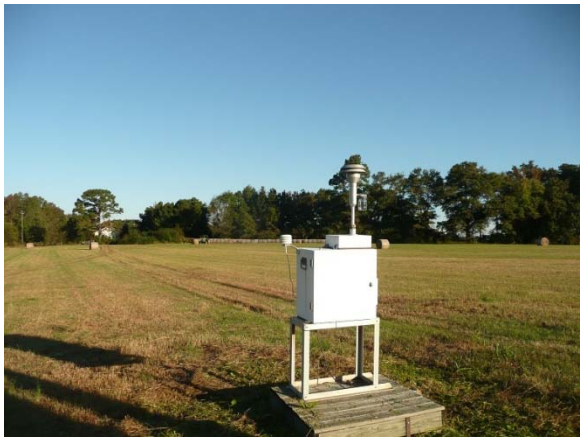


Figure D38. Looking North from the West Johnston Site

Figure D40. Looking east from the West Johnston site

Figure D39. Looking West from the West Johnston Site

Figure D41. Looking south from the West Johnston site

At the **Millbrook** site, 37-183-0014, the DAQ operates year-round ozone, one-in-three-day fine particle FRM, one-in-three-day manual SASS and URG fine particle speciation, continuous BAM fine particle, one-in-three day PM_{10} and $PM_{10-2.5}$, a collocated one-in-six day PM_{10}, nitrogen dioxide and trace-level sulfur dioxide, carbon monoxide and reactive oxide of nitrogen monitors. The DAQ also operates continuous fine particle monitors for sulfate, nitrate and black carbon and a meteorological station at this site. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure D42 through Figure D50. The Millbrook site is an NCORE, National Community Representative, site so the probe for the reactive oxide of nitrogen monitor at this site was installed on a 10-meter tower in late 2010. Dec. 27, 2011, the DAQ began analyzing the low volume PM_{10} filters for lead on a one-in-six-day schedule to meet the 2010 monitoring requirements for lead monitoring at NCore sites. This lead monitoring ended on April 30, 2016. In 2013 the DAQ added a carbonyl sampler to the site to support a shale gas development background monitoring study in Lee County. The DAQ has monitored for VOCs at Millbrook since July 14, 2004, on a 1-in-6-day schedule.

Figure D42. Millbrook NCore monitoring site

Figure D43. Looking north from the Millbrook site

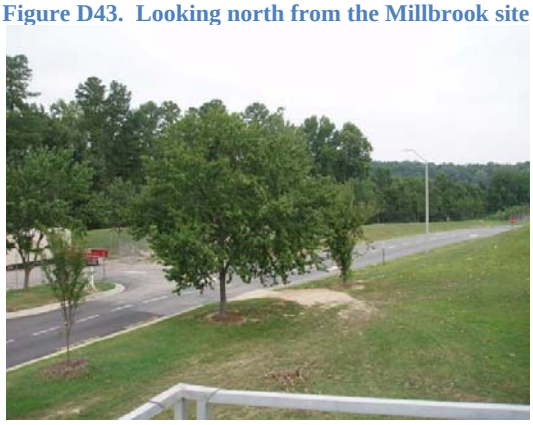


Figure D44. Looking northwest from the Millbrook site

Figure D45. Looking west from the Millbrook site

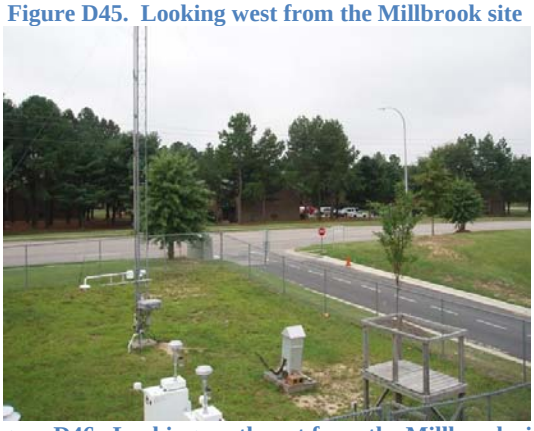


Figure D46. Looking southwest from the Millbrook site

Figure D47. Looking northeast from the Millbrook site

Figure D48. Looking east from the Millbrook site

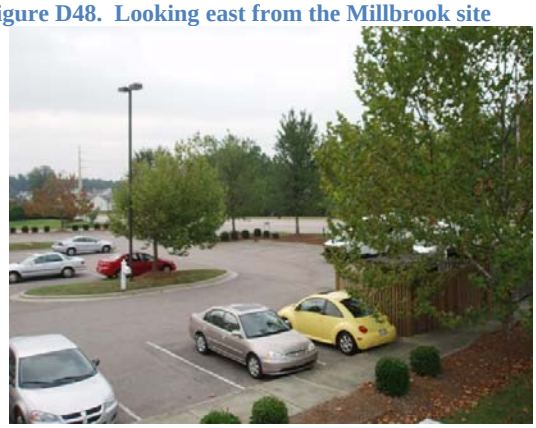


Figure D49. Looking southeast from the Millbrook site

Figure D50. Looking south from the Millbrook site

At the **Triple Oak** site, 37-183-0021, the DAQ operates a near road nitrogen dioxide monitor with a photolytic convertor. The monitor started operating on Jan. 8, 2014. A picture of the site as well as views looking north, east, south and west are provided in Figure D51 through Figure D55. In 2017, the DAQ will add a carbon monoxide monitor and a fine particle monitor to the site.

Figure D51. The Triple Oak near road nitrogen dioxide monitoring site, 37-183-0021

Figure D52. Looking north from the Triple Oak site

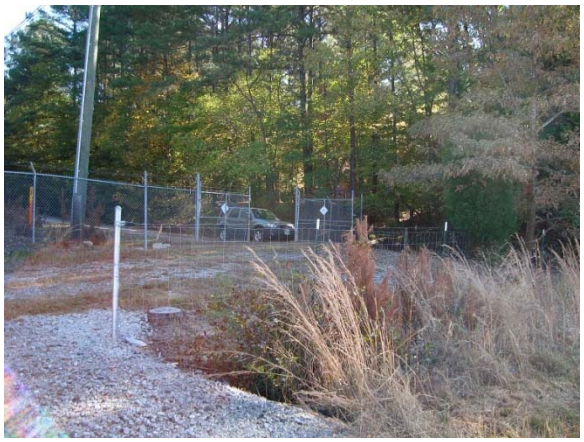


Figure D53. Looking east from the Triple Oak site

Figure D54. Looking west from the Triple Oak site

Figure D55. Looking south from the Triple Oak site

As a result of the December 2010 changes to the **lead monitoring** requirements,[2] the DAQ began lead monitoring at the Raleigh Millbrook monitoring site on Dec. 27, 2011, using the low-volume PM_{10} monitor already at the site. This lead monitoring ended on April 30, 2016, when new monitoring regulations became effective.[3] The Raleigh MSA does not have any permitted facilities located within its bounds that emit 0.5 ton or more per year of lead so no other lead monitoring was required.

Changes to the **ozone monitoring** requirements in 2015 did not require additional monitoring in the Raleigh MSA. The MSA currently meets the minimum number of monitors required by 40 CFR 58 Appendix D for population exposure monitoring in urban areas. Seasonal ozone monitoring will start on March 1 instead of April 1 beginning in 2017.

Due to the 2010 **nitrogen dioxide** monitoring requirements, DAQ added two nitrogen dioxide monitors to the Raleigh MSA. Because its population exceeds the 500,000 threshold, it is required to have a near road monitor starting Jan. 1, 2014. The near road monitoring station was placed on the west bound side of I-40 between Exit 283 and 284. This location was approved by the EPA in 2012. The Raleigh MSA has over 1 million people so it is also required to have a community or area-wide monitor. This monitor is located at the Raleigh Millbrook NCore monitoring site. The monitor was scheduled to start operating on Jan. 1, 2013. The DAQ asked for permission to delay installing the monitor so that a photolytic nitrogen dioxide monitor could be installed at the site. The photolytic nitrogen dioxide monitor is more selective for nitrogen dioxide but because it was approved as an equivalent method in 2012 the DAQ could not purchase it and have it up and operational by the Jan. 1, 2013, scheduled start date. The DAQ began monitoring for nitrogen dioxide at Millbrook on Dec. 10, 2013.

The 2010 **sulfur dioxide monitoring** requirements did not require additional sulfur dioxide monitors in the Raleigh MSA because there are no large sources of sulfur dioxide in the MSA. This MSA will be required to add a carbon monoxide monitor as a result of the changes to the **carbon monoxide monitoring** requirements. Near road carbon dioxide monitoring is required in MSAs greater than one

[2] Revisions to the Lead Ambient Air Monitoring Requirements, Federal Register, Vol. 75, No. 247, Monday, December 27, 2010, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1.

[3] Revisions to Ambient Monitoring Quality Assurance and Other Requirements, Federal Register, Vol. 81, No. 59, Monday, March 28, 2016, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf.

million people starting Jan. 1, 2017. On Jan. 1, 2017, the DAQ will also be required to add a fine particle monitor at the Triple Oak near road monitoring site.

(4) Rocky Mount MSA

The Rocky Mount MSA consists of two counties: Edgecombe and Nash. The major metropolitan area is the City of Rocky Mount. The DAQ currently operates one monitoring site in the Rocky Mount MSA, located in Edgecombe County at Leggett as shown in Figure D56.

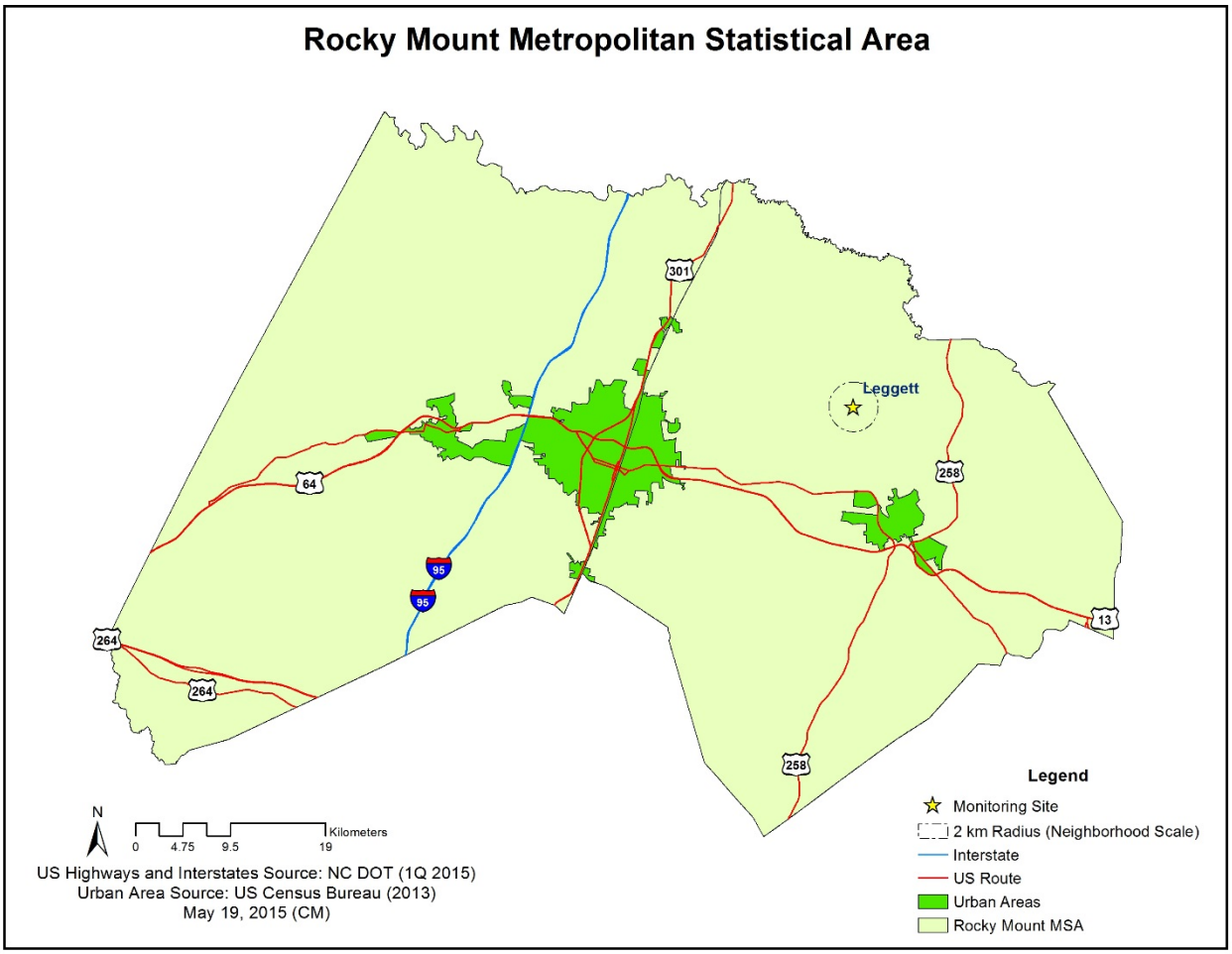


Figure D56. Monitoring site location in the Rocky Mount MSA

At the **Leggett** site, the DAQ operates a seasonal ozone monitor and a non-regulatory continuous fine particle monitor. The ozone monitor is required for the MSA. In April 2011, the DAQ added a continuous fine particle monitor to the site to enable real time fine particle air quality index reporting and fine particle forecasting. Figure D57 through Figure D65 show the site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest.

Figure D57. Leggett seasonal ozone and air quality index monitoring site

Figure D58. Looking north from the Leggett site

Figure D59. Looking northeast from the Leggett site

Figure D60. Looking northwest from the Leggett site

Figure D61. Looking west from the Leggett site

Figure D62. Looking southwest from the Leggett site

Figure D63. Looking east from the Leggett site

Figure D64. Looking southeast from the Leggett site

Figure D65. Looking south from the Leggett site

Changes made to the **lead monitoring** requirements in December 2010 did not require additional monitoring in the Rocky Mount MSA. The MSA does not have an NCore monitoring site and does not have any permitted facilities located within its bounds that emit 0.5 tons or more of lead per year. [4]

[4] Data obtained from the DAQ emission inventory database available on the worldwide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&county_code=065&year=2014&sorting=103&overridetype=All&pollutant=153.

2015 changes to the **ozone monitoring requirements** are not expected to require additional monitoring in the Rocky Mount MSA. The MSA already has the minimum number of monitors required by 40 CFR 58 Appendix D for population exposure monitoring in urban areas. The seasonal ozone monitor may begin a month earlier on March 1 instead of April 1 beginning in 2016 or 2017.

The 2010 **nitrogen dioxide monitoring** requirements did not add any monitors to the Rocky Mount MSA because its population is less than 500,000. Additional monitors will also not be needed to meet the 2010 sulfur dioxide monitoring requirements because there are no large sources of sulfur dioxide in the MSA. This area will also not need any carbon monoxide monitors due to the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

(5) The Wilson Micropolitan Statistical Area

The Wilson Micropolitan Statistical Area consists of Wilson County. There currently is no Metropolitan Statistical Area in Wilson County; however, the Wilson Micropolitan Statistical Area is located here. The Wilson area is growing and may someday eventually be large enough to become an MSA. The DAQ currently does not operate any monitoring sites in the Wilson Micropolitan Statistical Area.

The Wilson Micropolitan Statistical Area was impacted by changes made to the **lead monitoring** requirements in December 2010 because it has a permitted facility located within its bounds that emits more than 0.5 tons per year of lead.[5] Saint-Gobain Containers, LLC, reported 2009 lead emissions of 0.84 tons. The DAQ requested and received a waiver for Saint-Gobain based on the results of modeling. Model results indicate the maximum ambient lead concentration in the ambient air at and beyond the fence line is 0.015 micrograms per cubic meter, well below the 0.075 micrograms per cubic meter (50 percent of the NAAQS) threshold for monitoring. The EPA renewed the waiver in 2015 based on 2011 National Emission Inventory emissions of 0.53 tons of lead. The waiver is good until 2020.[6] In 2014 Ardagh Glass, the former Saint Gobain Containers, reported 495.1 pounds of lead emissions.[7]

Changes to the **ozone monitoring** requirements in 2015 did not require additional monitoring in the Wilson Micropolitan Statistical Area. As long as it is not an MSA, it does not have to meet population exposure monitoring requirements for urban areas. The Wilson Micropolitan Statistical Area was not reclassified as an MSA in February 2013 when the MSA classifications were revised. The next scheduled revision for MSA classifications is in 2023; however, sometimes the Office of Management and Budget adjusts classifications between the scheduled revisions.

The Wilson Micropolitan Statistical Area was not required by the 2010 **nitrogen dioxide monitoring** rule to do any nitrogen dioxide monitoring. Its population is less than 500,000 and the annual average daily traffic measured on its roadways is below the threshold for monitoring. It also is not required to do sulfur

[5] Data obtained from the DAQ emission inventory database available on the worldwide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&county_code=195&year=2009&sorting=103&overridetype=All&pollutant=153.

[6] 2015 State of North Carolina Ambient Air Monitoring Network Plan, The U. S. EPA Region 4 Comments and Recommendations, p7, available at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7440.

[7] Data obtained from the DAQ emission inventory database available on the worldwide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&year=2014&county_code=195&findfacility=2589

dioxide monitoring by the 2010 **sulfur dioxide monitoring** rule because the population is too small and the sulfur dioxide emissions are too low to trigger PWEI monitoring. This area is also not required to do carbon monoxide monitoring by the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

(6) The Sanford Micropolitan Statistical Area

The Sanford Micropolitan Statistical Area consists of Lee County. The DAQ started a monitoring site in the Sanford Micropolitan Statistical Area in November 2013. The location of the site is shown in Figure D66. The Blackstone monitoring station supports a special study to monitor baseline ambient air near potential shale gas development areas in Lee County.[8] Ozone monitoring started on Nov. 1, 2013 and a continuous fine particle monitor started Jan. 1, 2014. In December 2014 the DAQ added a sulfur dioxide monitor and nitrogen dioxide monitor. The site also monitors for volatile organic and carbonyl toxic compounds and hydrocarbons. Figure D67 through Figure D71 shows the site and views looking north, east, south and west.

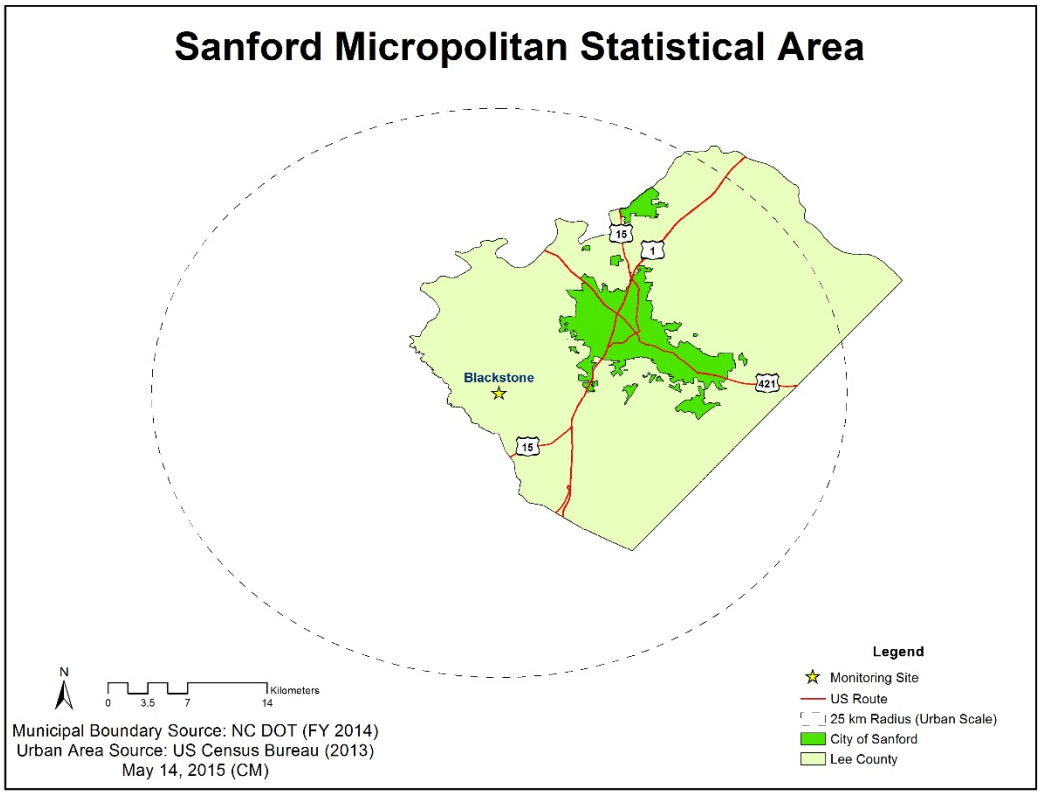


Figure D66. Monitoring site location in the Sanford micropolitan statistical area

[8] Department of Environment and Natural Resources, Division of Air Quality, Project Plan for Baseline Ambient Air Monitoring near Potential Shale Gas Development Zones in Lee County, NC, Feb. 19, 2013. Available on the world wide web at http://daq.state.nc.us/news/shale/DAQ_Project_Plan.pdf.

Figure D67. Blackstone shale gas development monitoring site

Figure D68. Looking north from the Blackstone site

Figure D70. Looking east from the Blackstone site

Figure D69. Looking west from the Blackstone site

Figure D71. Looking south from the Blackstone site

The Sanford micropolitan statistical area was not required to do any lead monitoring as a result of the changes made to the **lead monitoring** requirements in December 2010. There are no facilities located within its bounds that emit more than 0.5 tons per year of lead.[9]

Changes to the **ozone monitoring** requirements in 2015 did not require additional ozone monitoring in the Sanford micropolitan statistical area. As long as it is not an MSA, it does not have to meet population exposure monitoring requirements for urban areas.

The Sanford micropolitan statistical area was not required by the 2010 **nitrogen dioxide monitoring** rule to do any nitrogen dioxide monitoring. Its population is less than 500,000 and the annual average daily traffic measured on its roadways is below the threshold for monitoring. It also is not required by the 2010 **sulfur dioxide monitoring** rule to do sulfur dioxide monitoring because the population is too small and the sulfur dioxide emissions are too low to trigger PWEI monitoring. This area is also not required to do carbon monoxide monitoring by the changes to the **carbon monoxide monitoring** requirements because the population is under one million.

[9] Data obtained from the DAQ emission inventory database.

Appendix D.1 Annual Network Site Review Forms for 2015

Pittsboro (site was shut down)

Durham Armory in Durham

Bushy Fork

Butner

Franklinton (site was shut down)

West Johnston in Johnston County

Millbrook in Raleigh

Fuquay (site was shut down)

Triple Oak Road in Cary

Springfield Road in Rocky Mount (2012)

Leggett

Blackstone in Lee County

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Pittsboro	**AQS Site # 37-037-0004**
Street Address-325 Russett Run Rd		**City Pittsboro**
Urban Area Not in an Urban Area	**Core-based Statistical Area** Durham, NC	
Enter Exact		
Longitude -79.15995	**Latitude** 35.7574	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** / **Explanation: Orthophoto**
Elevation Above/below Mean Sea Level (in meters)		**400**

Name of nearest road to inlet probe Russett Run Rd. ADT 0 Year latest available0

Comments: Low traffic road; traffic volume data not available

Distance of site to nearest major road (m) 620.00 Direction from site to nearest major road W

Name of nearest major road US HWY 15-501 ADT 16000 Year latest available2013

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) _____ Direction ___
Distance between site and drip line of water tower (m) _____	Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☒ Ozone (O_3)	☐ General/Background ☐ Highest Concentration ☐ Max O3 Concentration ☒ Population Exposure ☐ Source Oriented ☐ Transport ☒ Upwind Background ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ☒ Urban ☐ Regional	☒ SLAMS ☐ SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.44

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) .8

Distance of outer edge of probe inlet from other gas monitoring probe inlets > 0.25 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 600 Direction from probe to nearest traffic lane W

Site Review Form Calendar Year 2015

OZONE MONITOR RECOMMENDATIONS:

1) Maintain current monitor status? Yes ☐ *No ☒ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒-

*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☒

*4) Relocate monitor? Yes ☐ No ☒

Comments: This site will be shut-down in 2015.

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☒ SO_2 (NAAQS) ☐ SO_2 (trace-level)	☒ General/Background ☐ Highest Concentration ☐ Population Exposure ☐ Source Oriented ☐ Transport ☒ Upwind Background ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ☒ Urban ☐ Regional	☒ SLAMS ☒ SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.44

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) 0.8

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 600 Direction from probe to nearest traffic lane W

SULFUR DIOXIDE MONITOR RECOMMENDATIONS:

1) Maintain current monitor status? Yes ☐ *No ☒ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒-

*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☒

*4) Relocate monitor? Yes ☐ No ☒

Comments: This site will be shut-down in 2015.

Date of Last Site Pictures 2013 New Pictures Submitted? Yes ☐ No ☒

Reviewer C. Marshall Cannon Date December 7, 2015

Ambient Monitoring Coordinator RAT Date December 7, 2015

Revised 2015-12-07

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Durham Armory	**AQS Site # 37-063-0015**
Street Address 801 Stadium Dr.		**City** Durham
Urban Area DURHAM	**Core-based Statistical Area** Durham, NC	

Enter Exact		**Method of Measuring**	
Longitude -78.9040	**Latitude** 36.0329		
In Decimal Degrees	In Decimal Degrees	___	**Explanation: Google Maps**
Elevation Above/below Mean Sea Level (in meters)		**109**	

Name of nearest road to inlet probe Stadium Dr. ADT _____ Year latest available _____

Comments: Stadium Dr.has no count available

Distance of site to nearest major road (m) 130.00 Direction from site to nearest major road W

Name of nearest major road Duke St (501) ADT 35000 Year 2013

Comments: None

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track	(m) _____Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) 43 Direction SSE

Distance between site and drip line of water tower (m) _____Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Durham Armory is propsed to have major construction activities. Construction was to begin in the Fall of 2015, but no contract has been awarded yet.

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☒ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_x (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☒ Population ExposureSO2 O3 ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☒ UrbanSO2 O3 ☐ Regional_____	☒ SLAMS SO2 O3 ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____ ☐ Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.87

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☒
Actual measured distance from outer edge of probe to supporting structure (meters) _____

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☒

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 45 Direction from probe to nearest traffic lane N

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☒ PM10-2.5 FRM ☒ PM10-2.5 BAM ☐ PM10 Lead (PB) ☒ PM2.5 Cont. (TEOM) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure TEOM PM10-25 FRM PM10-25 BAM ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood TEOM PM10-25 FRM PM10-25 BAM ☐ Urban _____ ☐ Regional _____	☒ SLAMS TEOM PM10-25 FRM PM10-25 BAM ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE _____ ☐ SUPPLEMENTAL SPECIATION _____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) _____
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 3.0 Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☒ No ☐ NA ☐
Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☒ No ☐ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site? *Yes ☒ (answer *'d questions) No ☐ NA ☐
* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☒ No ☐ Give actual (meters) 2.1
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☒ No ☐ Give actual (meters) 0.1

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes ☐ No ☐
Give actual (meters) _____
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) _____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒
*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 45 Direction from probe to nearest traffic lane N

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)
*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒-
*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☒
*4) Relocate site? Yes ☐ No ☒

Comments: The Durham Armory is going to have construction activity in the future. There is no activity schedule yet. The Armory is working with DAQ to attempt to accommodate the sampling station and meet EPA siting requirements. This may or may not be possible. DAQ may have to relocate the site, but would prefer not. No probes are on the top of the building in 2015.

Date of Last Site Pictures 11/17/2014 New Pictures Submitted? Yes ☐ No ☒
Reviewer Roy Doster Date 11/5/2015
Ambient Monitoring Coordinator Rik Tebeau DateNovember 19, 2015

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Bushy Fork	**AQS Site # 37-145-0003**
Street Address-NC Highway 49		**City Roxboro, NC**
Urban Area ROXBORO	**Core-based Statistical Area** Durham, NC	
Enter Exact		
Longitude -79.0922	**Latitude** 36.3069	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	___ **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		200.00

Name of nearest road to inlet probe Nc Hwy. 49 ADT 3300 Year latest available 2014

Distance of ozone probe to nearest traffic lane (m) 180 Direction from ozone probe to nearest traffic lane SSE

Comments: _____

Name of nearest major road NC Hwy. 49 ADT 3300 Year latest available 2014

Distance of site to nearest major road (m) 180.00 Direction from site to nearest major road SSE

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) _____ Direction ___
Distance between site and drip line of water tower (m) _____	Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☒General/Background ☐Highest Concentration ☐Max O3 Concentration ☐Population Exposure ☐Source Oriented ☐Transport ☐Upwind Background ☐Welfare Related Impacts	☐Micro ☐Middle ☐Neighborhood ☒Urban ☐Regional	☒SLAMS ☐SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐

Give actual measured height from ground (meters) 4.00

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) 1.50

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2015

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective: _____) No ☐

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☐

*4) Relocate site? Yes ☐ No ☐

Comments: _____

Date of Last Site Pictures: November 4, 2015 New Pictures Submitted? Yes ☐ No ☒

Reviewer KLT Date: November 20, 2015

Ambient Monitoring Coordinator RAT Date: December 3, 2015

Instructions:

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Butner	**AQS Site # 37-077-0001**
Street Address-800 Central Avenue		**City Butner**
Urban Area BUTNER	**Core-based Statistical Area** None	
Enter Exact		
Longitude -78.7681	**Latitude** 36.1412	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Orthophoto**
Elevation Above/below Mean Sea Level (in meters)		129.00

Name of nearest road to inlet probe West G St. (No Traffic Count Available) ADT _____ Year latest available ____

Distance of ozone probe to nearest traffic lane (m) 88 Direction from ozone probe to nearest traffic lane SE

Comments: Distance and direction to West G St.

Name of nearest major road I-85 ADT 32000 Year latest available 2014

Distance of site to nearest major road (m) 2800.00 Direction from site to nearest major road SE

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 1875 Direction to RR NE ☐NA
Distance of site to nearest power pole w/transformer	(m) 58 Direction SSW
Distance between site and drip line of water tower (m) 245 Direction from site to water tower NE ☐NA	

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Location is wastewater treatment plant

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☐General/Background ☒Highest Concentration ☐Max O3 Concentration ☐Population Exposure ☐Source Oriented ☐Transport ☐Upwind Background ☐Welfare Related Impacts	☐Micro ☐Middle ☐Neighborhood ☒Urban ☐Regional	☒SLAMS ☐SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐
Give actual measured height from ground (meters) 4.00

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) 1.50

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2015

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective: _____) No ☐

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☐

*4) Relocate site? Yes ☐ No ☐

Comments: _____

Date of Last Site Pictures: November 3, 2014 New Pictures Submitted? Yes ☐ No ☒

Reviewer Jimmy Reske Date: December 2, 2015

Ambient Monitoring Coordinator Rik Tebeau Date: December 3, 2015

Instructions:

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** JW-West Johnson	**AQS Site # 37-101-0002**
Street Address 1338 Jack Road		**City** Clayton
Urban Area CLAYTON	**Core-based Statistical Area** Raleigh, NC	

Enter Exact		
Longitude -78.4622	**Latitude** 35.59095	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** / **Explanation: Google Maps**
Elevation Above/below Mean Sea Level (in meters)		**82**

Name of nearest road to inlet probe Jack Rd (SR 1557) ADT 1700 Year latest available 2013

Comments: None

Distance of site to nearest major road (m) 2010.00 Direction from site to nearest major road NNE

Name of nearest major road US Highway 70 Bypass ADT 25000 Year 2014

Comments: None

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

Distance of site to nearest power pole w/transformer (m) ____ Direction N

Distance between site and drip line of water tower (m) _____ Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_x (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☒ General/Background ☐ Highest Concentration ☐ Max O3 Concentration ☒ Population Exposure ☐ Source Oriented ☐ Transport ☒ Upwind Background ☐ Welfare Related Impacts ____	☐ Micro ☐ Middle ☐ Neighborhood ☒ Urban ☐ Regional	☒ SLAMS ☐ SPM **Monitor Network Affiliation** ☐ NCORE ☐ Unofficial PAMS

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.40

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) 0.80

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) ____ Direction from probe to tree ___ *Height of tree (m) ____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 20 Direction from probe to nearest traffic lane SW

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Monitor Type
☒ NA ☐ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) _____

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Monitor Type
☒ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ TSP Pb	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Background_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) ☐ < 2 m _____ ☐ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from probe to supporting structure (meters) _____ Yes ☐ No ☐

Entire inlet opening of collocated PM-10, TSP or TSP Pb Samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ NA ☐
Actual measured distance (X) including entire inlet openings of both (all) collocated probe inlets (meters) _____

Distance (Y) between outer edge of any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☒ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (TEOM) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☒ General/Background ☐ Highest Concentration ☒ Population Exposure ☐ Source Oriented ☐ Transport ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☒ Neighborhood ☐ Urban ☐ Regional	☒ SLAMS ☐ SPM **Monitor Network Affiliation** ☐ NCORE ☐ SUPPLEMENTAL SPECIATION **Monitor NAAQS Exclusion** ☐ NONREGULATORY

Probe inlet height (from ground) ☐ < 2 m ☒ 2-7m ☐ 7-15 m ☐ > 15 m
Actual measured distance from probe inlet to ground (meters) 2
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1 Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☐ No ☐ NA ☒
Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) ____
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) ____

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes ☐ No ☐
Give actual (meters) ____
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) ____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) ____ Direction from probe to tree ____ *Height of tree (m) ____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒
*Identify obstacle ____ Distance from probe inlet (m) ____ Direction from probe inlet to obstacle ____
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐
Distance of probe to nearest traffic lane (m) ____ Direction from probe to nearest traffic lane ____

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)
*2) Change monitoring objective? Yes ☐ (enter new objective ____) No ☐
*3) Change scale of representativeness? Yes ☐ (enter new scale ____) No ☐
*4) Relocate site? Yes ☐ No ☒

Comments: None

Date of Last Site Pictures 10/22/14 New Pictures Submitted? Yes ☐ No ☒

Reviewer Roy Doster Date November 5, 2015

Ambient Monitoring Coordinator Rik Tebeau Date November 9, 2015

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Millbrook	**AQS Site # 37-183-0014**
Street Address 3801 Spring Forest Road		**City** Raleigh
Urban Area RALEIGH	**Core-based Statistical Area** Raleigh, NC	
Enter Exact		
Longitude -78.574167	**Latitude** 35.85611	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**GPS** **Explanation: GPS**
Elevation Above/below Mean Sea Level (in meters)		90

Name of nearest road to inlet probe Spring Forest Road ADT 18000 Year latest available 2013

Comments: As of 11/4/15, 2013 is the most recent AADT. Spring Forest Road is 40m South of the site buildings.

Distance of site to nearest major road (m) 614.00 Direction from site to nearest major road W

Name of nearest major road Capital Blvd/Hwy 1 ADT 49000 Year 2014 Comments: _____

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

Distance of site to nearest power pole w/transformer (m) ____ Direction N

Distance between site and drip line of water tower (m) _____ Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☒ SO_2 (trace-level) ☒ NO_x (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☒ Hydrocarbon ☒ Air Toxics ☐ HSCO (Not Micro) ☒ CO (trace-level)	☒ General/Background CO ☐ Highest Concentration_____ ☒ Max O3 Concentration CO, O3 ☒ Population Exposure CO,SO2,O3 ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☒ Middle CO ☒ Neighborhood SO2, NO2,O3 ☐ Urban_____ ☐ Regional_____	☒ SLAMS CO,SO2,NO2,O3 ☐ SPM **Monitor Network Affiliation** ☒ NCORE CO,SO2,NO2,O3 ☐ Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) SO2(4.9),NO2 represented by NOX(5.14),O3(4.9),Hydrocarbons(4.7), Air Toxics-Aldehyde(3.08), CO(4.9)

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) SO2(1.3),NO2 represented by NOX(1.35),O3(1.3),Hydrocarbons(1.3),Air Toxics-Aldehyde(.95), CO(1.3)

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☒ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☒ *No ☐
*Distance from probe to tree (m) SO2 (10.1),NO2 represented by NOx (13.70),O3 (10),Hydrocarbons (12.1),Air Toxics-Aldehyde(12.5), CO (10) Direction from probe to tree ENE *Height of tree (m) 33.00

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle tree(as described above) Distance from probe inlet (m) see above Direction from probe inlet to obstacle ENE
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☒

Distance of probe to nearest traffic lane (m) Air Toxics-Aldehyde (39) is the nearest probe to Spring Forest Road
Direction from probe to nearest traffic lane S

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☒ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☒ Population Exposure NOy ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood NOy ☐ Urban_____ ☐ Regional_____	☒ SLAMS NOy_____ ☐ SPM_____ **Monitor Network Affiliation** ☒ NCORE NOy

Probe inlet height (from ground) 10-15 m? Yes ☒ No ☐
Actual measured distance from probe inlet to ground (meters) 10.70

Distance of outer edge of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 7.40

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☒ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☒ *No ☐
*Distance from probe to tree (m) 11.40 Direction from probe to tree ENE *Height of tree (m) 33.00

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle tree(as described above) Distance from probe inlet (m) 11 Direction from probe inlet to obstacle ENE
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☒ No ☐

Distance of probe to nearest traffic lane (m) 40 Direction from probe to nearest traffic lane S

Parameters	Monitoring Objective	Scale	Monitor Type
☒ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ TSP Pb	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Background_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) ☐ < 2 m _____ ☐ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from probe to supporting structure (meters) _____ Yes ☐ No ☐

Entire inlet opening of collocated PM-10, TSP or TSP Pb Samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ NA ☐

Actual measured distance (X) including entire inlet openings of both (all) collocated probe inlets (meters) _____

Distance (Y) between outer edge of any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☒ PM2.5 FRM ☒ PM10 FRM ☒ PM10 Cont. (BAM) ☒ PM10-2.5 FRM ☒ PM10-2.5 BAM ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (TEOM) ☒ PM2.5 Cont. (BAM) ☒ PM2.5 Spec. (SASS) ☒ PM2.5 Spec. (URG) ☒ PM2.5 Cont. Spec.	☐ General/Background ☐ Highest Concentration ☒ Population Exposure PM2.5/PM10, BAM2.5 ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood PM2.5/PM10, BAM2.5 ☒ Urban _____ ☐ Regional _____	☒ SLAMS PM2.5/PM10 FRM,PM2.5/10 Cont. (BAM) ☒ SPM_PM2.5 SASS, URG,Cont. Spec. **Monitor Network Affiliation** ☒ NCORE PM2.5/PM10 FRM,PM2.5/10 Cont. (BAM) ☒ SUPPLEMENTAL SPECIATION PM2.5 SASS, URG,Cont. Spec. **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____

Actual measured distance from probe inlet to ground (meters) PM10 FRM (2.7), PM2.5 FRM (2.4),BAM (2.62),PM2.5 SASS(2.1), PM2.5 URG (2.3),PM2.5 Cont. Spec.=(Aeth (5.47),SO4 (4.74),NO3 (4.65))

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) PM10 FRM (2.1), PM2.5 FRM (2.1),PM2.5 SASS(2.1), PM2.5 URG (2.07), PM2.5 Cont. Spec.=(Aeth 1.15,SO4 0.85,NO3 0.85) Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater?	Yes ☒ No ☐ NA ☐
Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater?	Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site? *Yes ☒ (answer *'d questions) No ☐ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☒ No ☐ Give actual (meters) 4

*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☒ No ☐ Give actual (meters) 3

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☒ (answer *'d questions) No ☐ NA ☐

* Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes ☒ No ☐
Give actual (meters) 2.2

* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☒ No ☐ Give actual (meters)_____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☒ (answer *'d questions) No ☐ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other?	Yes ☒ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☒ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☒ *No ☐

*Distance from probe to tree (m) PM10 FRM (28.0),PM2.5 FRM (27),PM2.5FRM (COL)(26),PM2.5 FRM(27) URG (28),URG COL(30), SASS (26),BAM (28) Direction from probe to tree ENE *Height of tree (m) 33.00

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No☐

Distance of probe to nearest traffic lane (m) PM2.5 FRM (28) Direction from probe to nearest traffic lane S

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒-

*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☒

*4) Relocate site? Yes ☐ No ☒

Comments:

Date of Last Site Pictures 11/17/14 New Pictures Submitted? Yes ☐ No ☒

Reviewer Travis Funderburk Date 12/10/15

Ambient Monitoring Coordinator Rik Tebeau DateDecember 14, 2015

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Fuquay	**AQS Site # 37-183-0016**
Street Address-201 North Broad St.		**City Fuquay-Varina**
Urban Area Not in an Urban Area	**Core-based Statistical Area** Raleigh-Cary, NC	
Enter Exact		
Longitude -78.7926	**Latitude** 35.5972	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Orthophoto**
Elevation Above/below Mean Sea Level (in meters)		126.00

Name of nearest road to inlet probe Bengal Blvd. ADT 1400 Year latest available 2013
Distance of ozone probe to nearest traffic lane (m) 350 Direction from ozone probe to nearest traffic lane SE
Comments: _____
Name of nearest major road NC HWY 55 ADT 1400 Year latest available 2013
Distance of site to nearest major road (m) 450.00 Direction from site to nearest major road SW
Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) _____ Direction ___
Distance between site and drip line of water tower (m) _____	Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☐ General/Background ☒ Highest Concentration ☐ Max O3 Concentration ☐ Population Exposure ☒ Source Oriented ☐ Transport ☐ Upwind Background ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☒ Neighborhood ☐ Urban ☐ Regional	☒ SLAMS ☒ SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐
Give actual measured height from ground (meters) _____
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) 1.50

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2015

RECOMMENDATIONS:

1) Maintain current site status? Yes ☐ *No ☒ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective: _____) No ☐

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☒

*4) Relocate site? Yes ☐ No ☒

Comments: Site to be shut-down in 2015.

Date of Last Site Pictures: 2014 New Pictures Submitted? Yes ☐ No ☒

Reviewer C. Marshall Cannon Date: December 7, 2015

Ambient Monitoring Coordinator RAT Date: December 8, 2015

Instructions:

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Franklinton	**AQS Site # 37-069-0001**
Street Address-Howard Harris Rd.		**City Franklinton**
Urban Area RALEIGH	**Core-based Statistical Area** Raleigh-Cary, NC	
Enter Exact		**Method of Measuring**
Longitude -78.4638	**Latitude** 36.0961	
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		177.00

Name of nearest road to inlet probe Howard Harris Rd. ADT 0 Year latest available ____
Distance of ozone probe to nearest traffic lane (m) 87 Direction from ozone probe to nearest traffic lane E
Comments: _____
Name of nearest major road US 1 ADT _____ Year latest available _____
Distance of site to nearest major road (m) 486.00 Direction from site to nearest major road E
Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) _____ Direction ___
Distance between site and drip line of water tower (m) _____	Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☒General/Background ☐Highest Concentration ☐Max O3 Concentration ☐Population Exposure ☐Source Oriented ☐Transport ☐Upwind Background ☐Welfare Related Impacts	☐Micro ☐Middle ☐Neighborhood ☒Urban ☐Regional	☒SLAMS ☐SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐
Give actual measured height from ground (meters) 3.50
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) 1.10

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2015

RECOMMENDATIONS:

1) Maintain current site status? Yes ☐ *No ☒ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective: _____) No ☒

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☐

*4) Relocate site? Yes ☐ No ☒

Comments: Franklinton site to be shut-down in 2015.

Date of Last Site Pictures: 11/3/14 New Pictures Submitted? Yes ☐ No ☒

Reviewer KLT Date: November 20, 2015

Ambient Monitoring Coordinator RAT Date: December 3, 2015

Instructions:

If the annual network review has indicated that the monitoring objectives and scale of representativeness for the site have not changed and the siting criteria still meets those monitoring objectives and that scale of representativeness and there are no other reasons to modify the site in any way, check "Yes" to the question "Maintain current site status?" and skip the rest of the recommendations section.

If the annual network review has indicated that the monitoring objectives, scale of representativeness, or siting criteria have changed for some reason or there is another reason to modify the site in some way, check "No" to the question "Maintain current site status?" and complete the rest of the recommendations section. If the monitoring objective or scale of representativeness needs to be changed, check the "Yes" box and write in the new monitoring objective or scale of representativeness on the line. Otherwise check the "No" box. If the site needs to be relocated, check the "Yes" box. If the site needs to be shut down, write "Shut down" in the comments line. Also use the comments line to explain any change requested.

Check the site picture archive to find out when the last set of site pictures were taken and write the date down on the line. If the pictures are more than five years old or if something at the site has changed in the past year, take new site pictures. Changes that require new site pictures include additions, removals, or movement of monitors at the site, growth or removal of trees and other shrubs at the site, and construction of roads or buildings at or in the vicinity of the site.

Pictures of the site should at a minimum include at least one picture showing the site itself and pictures standing at the probe or inlet or as close as possible to the probe or inlet looking in the four compass directions (north, east, south, and west). If meteorological data are collected at the site, pictures standing at the meteorological tower looking southwest and northeast should also be included. Sometimes pictures looking at the site from the four compass directions are also helpful.

Be sure to correctly identify the pictures as to which compass direction they show. This documentation may be achieved by using good notes when taking the pictures, holding a compass in front of the camera, or placing a sign with the appropriate direction indicated somewhere in the picture. Label the pictures with the name of the site using the two digit logger ID (HC, JW, *etc.*), the direction (N, NE, E, SE, S, SW, W, NW), and the date taken (YYYYMMDD) and transfer the pictures to the group drive in the appropriate Incoming/Regional Office directory.

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Triple Oak	**AQS Site # 37-**183-0021
Street Address-2826 Triple Oak Road,		**City Cary-ETJ (Morrisville)**
Urban Area RALEIGH	**Core-based Statistical Area** Raleigh, NC	

Enter Exact		
Longitude -78.819654	**Latitude** 35.865106	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: orthophoto**

Elevation Above/below Mean Sea Level (in meters) 96

Name of nearest road to inlet probe Interstate 40 ADT 149000 Year 2014
Comments: Nearest road and nearest MAJOR road are the same
Distance of site to nearest major road (m) 19.30 Direction from site to nearest major road SW
Name of nearest major road I-40 ADT 149000 Year 2014
Comments: EPA maintains a continuous traffic counting camera/radar at the site, available 2014 data indicates an average daily count of 143,000 (roughly 300 days of data)

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer (m) _____ Direction ___

Distance between site and drip line of water tower (m) _____ Direction from site to water tower ___ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

1.9 km to NE-RDU airport runway. 320m to S-Triangle Factory Shops mall. 650m to N-multiple distribution warehouses. 620m to SE-I40 exit #284 (Airport Blvd) multiple hotels and restauraunts. 1.3km to NW-I40 exit #283 (I-540).

Parameters	Monitoring Objective	Scale	Monitor Type
☒NO_2 (Near Road only) ☐CO (Near Road only)	☐Highest Concentration_____ ☒Population Exposure_____ ☒Source Oriented_____ ☐Transport_____ ☐Welfare Related Impacts _____	☒Micro_____	☒SLAMS _____ ☒SPM_____

Probe inlet height (from ground) 2-7 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4.20
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 1.00
Distance of outer edge of probe inlet from other monitoring probe inlets > 0.25 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☒ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☒
*Distance from probe to tree (m) 8.00 Direction from probe to tree N *Height of tree (m) 35.00

Are there any obstacles to air flow? *Yes ☒ (answer *'d questions) No ☒
*Identify obstacle tree line running parallel to interstate Distance from probe inlet (m) 8 Direction from probe inlet to obstacle N
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☒

Distance of probe to nearest traffic lane (m) 20 Direction from probe to nearest traffic lane SW

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)
*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☐-
*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☐
*4) Relocate site? Yes ☐ No ☐

Comments:

Date of Last Site Pictures 2014 New Pictures Submitted? Yes ☐ No ☒
Reviewer Tim Skelding Date December 11, 2015
Ambient Monitoring Coordinator RAT Date December 11, 2015

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Leggett	**AQS Site # 37-065-0099**
Street Address 7589 NC 33 NW		**City** Tarboro
Urban Area Not in an Urban Area	**Core-based Statistical Area** Rocky Mount, NC	
Enter Exact		
Longitude -77.584358	**Latitude** 35.988278	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** **Explanation: Othophoto**
Elevation Above/below Mean Sea Level (in meters)		**20**

Name of nearest road to inlet probe NC 97 ADT 2500 Year latest available 2014

Comments: _____

Distance of site to nearest major road (m) 92.00 Direction from site to nearest major road SSE

Name of nearest major road NC 33 ADT 3500 Year 2014

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) ____ Direction N
Distance between site and drip line of water tower (m) _____	Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

NA

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_x (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☒ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☒ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☒ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____ ☐ Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 2.50

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) 0.80

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☒ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 92 Direction from probe to nearest traffic lane SSE

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Monitor Type
☒ NA ☐ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) _____

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ TSP Pb	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Background_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) ☐ < 2 m _____ ☐ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____

Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from probe to supporting structure (meters) _____ Yes ☐ No ☐

Entire inlet opening of collocated PM-10, TSP or TSP Pb Samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ NA ☐
Actual measured distance (X) including entire inlet openings of both (all) collocated probe inlets (meters) _____
Distance (Y) between outer edge of any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☐ PM10 Lead (PB) ☒ PM2.5 Cont. (TEOM) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☒ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE _____ ☐ SUPPLEMENTAL SPECIATION _____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.5

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) _____ Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater?	Yes ☐ No ☐ NA ☒
Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater?	Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) _____

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes ☐ No ☐
Give actual (meters) _____
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) _____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5?	*Yes ☐ (answer *'d questions) No ☒ NA ☐
* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other?	Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No☐

Distance of probe to nearest traffic lane (m) 92 Direction from probe to nearest traffic lane SSE

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☐-
*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☐
*4) Relocate site? Yes ☐ No ☒

Comments:

Date of Last Site Pictures 11/17/14 New Pictures Submitted? Yes ☐ No ☒

Reviewer Jimmy Reske Date December 7, 2015

Ambient Monitoring Coordinator RAT DateDecember 7, 2015

Site Review Form Calendar Year 2015

Site Information

Region RRO	**Site Name** Blackstone	**AQS Site # 37-105-0002**
Street Address 4110 BLACKSTONE RD		**City** SANFORD
Urban Area Not in an Urban Area	**Core-based Statistical Area** Sanford, NC	
Enter Exact		**Method of Measuring**
Longitude -79.28879	**Latitude** 35.43248	
In Decimal Degrees	In Decimal Degrees	**Interpolation** / **Explanation: Orthophoto**
Elevation Above/below Mean Sea Level (in meters)		**117**

Name of nearest road to inlet probe Blackstone Road ADT 355 Year latest available 2012

Comments: _____

Distance of site to nearest major road (m) 50.00 Direction from site to nearest major road E

Name of nearest major road Blackstone Road ADT 355 Year 2012

Comments: _____

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) _____ Direction to RR ___ ☒NA

Distance of site to nearest power pole w/transformer (m) 35 Direction SE

Distance between site and drip line of water tower (m) _____ Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

_____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☒ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☒ NO_x (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☒ Hydrocarbon ☒ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☒ General/Background SO2 NO2 O3 ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☒ Urban SO2 NO2 O3 ☐ Regional_____	☐ SLAMS _____ ☒ SPM SO2 NO2 O3 **Monitor Network Affiliation** ☐ NCORE_____ ☐ Unofficial PAMS_____

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.68

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) _____

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 50 Direction from probe to nearest traffic lane E

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Monitor Type
☒ NA ☐ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) _____

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m)_____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Monitor Type
☒ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ TSP Pb	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Background_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☐ NCORE_____

Probe inlet height (from ground) ☐ < 2 m _____ ☐ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) _____

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from probe to supporting structure (meters) _____ Yes ☐ No ☐

Entire inlet opening of collocated PM-10, TSP or TSP Pb Samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ NA ☐
Actual measured distance (X) including entire inlet openings of both (all) collocated probe inlets (meters) _____
Distance (Y) between outer edge of any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m)_____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2015

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (TEOM) ☒ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☒ General/Background _____ ☐ Highest Concentration _____ ☐ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood _____ ☐ Urban _____ ☐ Regional _____	☐ SLAMS _____ ☒ SPM_____ **Monitor Network Affiliation** ☐ NCORE _____ ☐ SUPPLEMENTAL SPECIATION _____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.5

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 0.8 Yes ☒ No ☐

Distance (Y) between outer edge of probe inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☒ No ☐ NA ☐

Distance (Y) between outer edge of all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☒ No ☐ NA ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☐ Give actual (meters) _____

*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) _____

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated speciation samplers inlets (X) within 2 to 4 m of each other? Yes ☐ No ☐
Give actual (meters) _____

* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) _____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☒ NA ☐

* Entire inlet opening of collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Yes ☐ No ☐

*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 50 Direction from probe to nearest traffic lane E

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒

*3) Change scale of representativeness? Yes ☐ (enter new scale _) No ☒

*4) Relocate site? Yes ☐ No ☒

Comments:

Date of Last Site Pictures 10/28/2014 New Pictures Submitted? Yes ☐ No ☒

Reviewer Steve Helms Date November 9, 2015

Ambient Monitoring Coordinator Rik Tebeau DateDecember 2, 2015

Appendix D-2. Scale of Representativeness

Each station in the monitoring network must be described in terms of the physical dimensions of the air parcel nearest the monitoring station throughout which actual pollutant concentrations are reasonably similar. Area dimensions or scales of representativeness used in the network description are:

a) Microscale - defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

b) Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

c) Neighborhood scale – defines concentrations within an extended area of a city that has relatively uniform land use with dimensions ranging from about 0.5 to 4.0 kilometers.

d) Urban scale - defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.

e) Regional Scale - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Closely associated with the area around the monitoring station where pollutant concentrations are reasonably similar are the basic monitoring exposures of the station.

There are six basic exposures:

a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.

b) Sites located to determine representative concentrations in areas of high population density.

c) Sites located to determine the impact on ambient pollution levels of significant sources or source categories.

d) Sites located to determine general background concentration levels.

e) Sites located to determine the extent of regional pollutant transport among populated areas.

f) Sites located to measure air pollution impacts on visibility, vegetation damage or other welfare-based impacts and in support of secondary standards.

The design intent in siting stations is to correctly match the area dimensions represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the station. The following relationship of the six basic objectives and the scales of representativeness are appropriate when siting monitoring stations:

Table D3. Site Type Appropriate Siting Scales

1. Highest concentration	Micro, middle, neighborhood (sometimes urban or regional for secondarily formed pollutants)
2. Population oriented	Neighborhood, urban
3. Source impact	Micro, middle, neighborhood
4. General/background & regional transport	Urban, regional
5. Welfare-related impacts	Urban, regional