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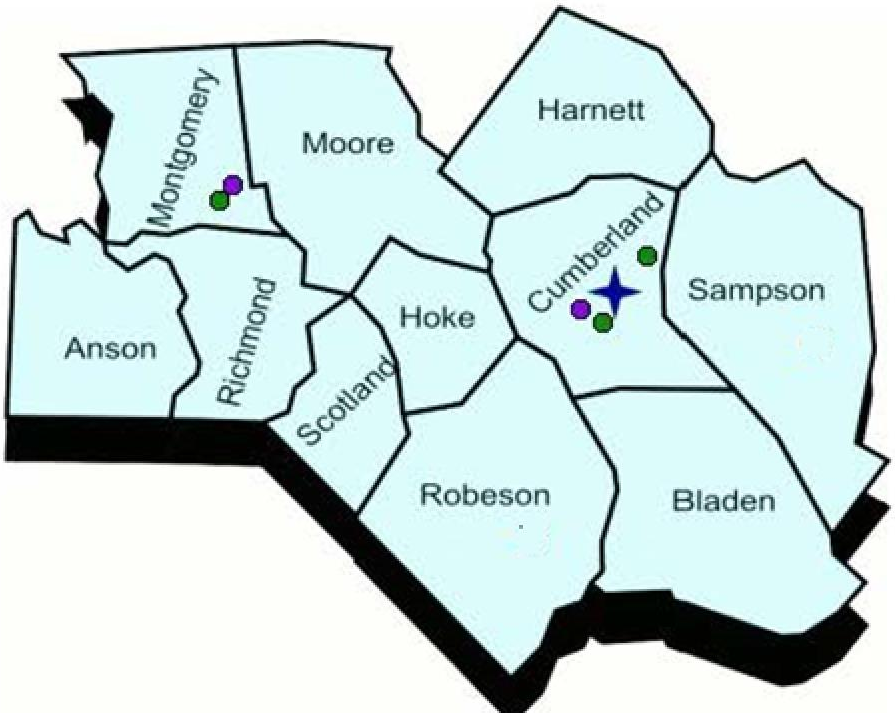
Director

2017-2018 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

E. The Fayetteville Monitoring Region



June 30, 2017

Nothing Compares℠
State of North Carolina | Department of Environmental Quality | Division of Air Quality
1641 Mail Service Center | 217 W. Jones Street, Suite 4000 | Raleigh, NC 27699-1641
919 707 8400 T

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E. The Fayetteville Monitoring Region

The Fayetteville monitoring region, shown in Figure E1, consists of three sections: (1) the non-Metropolitan Statistical Area, MSA, portion of the Fayetteville monitoring region - Bladen, Harnett, Montgomery, Moore, Richmond, Robeson, Sampson and Scotland counties, (2) the Fayetteville MSA, Cumberland and Hoke Counties and (3) the southeastern portion of the Charlotte-Gastonia-Concord MSA, Anson County, previously discussed as part of the Mooresville Monitoring Region in **Section C.**

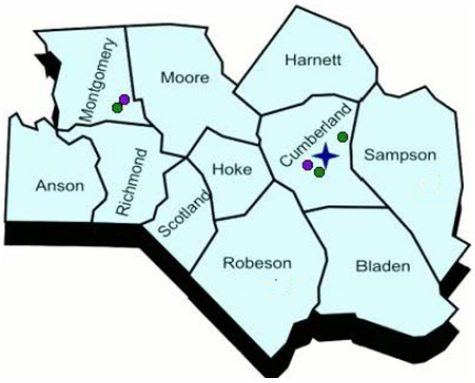


Figure E1. The Fayetteville monitoring region
The dots show the approximate locations of most of the monitoring sites in this region.

(1) The Non-MSA Portion of the Fayetteville Monitoring Region

The non-MSA portion of the Fayetteville monitoring region contains eight counties - Bladen, Harnett, Montgomery, Moore, Richmond, Robeson, Sampson and Scotland. It has no MSAs. The Southern Pines-Pinehurst Micropolitan Statistical Area is in Moore County. The Dunn Micropolitan Statistical Area is in Harnett County and the Lumberton Micropolitan Statistical Area is in Robeson County. The North Carolina Division of Air Quality, DAQ, currently operates one monitoring site in this area of the Sand Hills at Candor in Montgomery County. The location of the Candor monitoring site is shown in Figure E2.

Figure E2. Location of the Candor monitoring site
A is the Candor fine particle, air toxic and CASTNET monitoring site.
The circle approximates the neighborhood scale, 0.5 to 4 kilometers [Km].

At the Candor site, the DAQ operates a continuous fine particle beta attenuation monitor, BAM; a rotating every third year PM_{10} monitor; air toxics volatile organic compound and carbonyl monitors; and ambient temperature, relative humidity, wind speed and direction sensors. Table

E1 summarizes monitoring information for the site. Figure E3 through Figure E7 show the site and views looking north, east, south and west. The Candor site is collocated with a clear air status and trends network, CASTNET, site.

Table E1. Site Information Table for Candor

Site Name:	Candor			**AQS Site Identification Number**		37-123-0001	
Location:	136 Perry Drive, Candor, North Carolina						
CBSA:	Not in a CBSA			**CBSA #:**	00000	**Elevation**	173.1 meters
Latitude	35.2632	**Longitude**	-79.836613	**Datum:**	NAD83		

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
PM 2.5 local conditions, BAM	Met One BAM-1020 Mass Monitor w/VSCC, 170	EQPM-0308-170	1-hour	Year-round
PM10 total 0-10um STP	Met One Beta Attenuation BAM-1020	EQPM-0798-122	1-hour	Year-round, every third year
Volatile organic compounds	SS 6L- pressurized canister w/ cryogenic preconcentration: GC/MS	Not applicable	24-hour	Every sixth day, year-round
Carbonyl compounds	Silica-DNPH-CART-KI O3 Scrub HPLC, 202	Not applicable	24-hour	Every sixth day, year-round

Date Monitor Established	
PM 2.5 local conditions, continuous monitor, BAM	Aug. 1, 2013
PM10 total 0-10um STP, primary monitor	Feb. 16, 2011
Volatile organic compounds	Jan. 26, 2002
Carbonyl compounds	July 3, 2013

Nearest Road:	McCallum Rd	**Traffic Count:**	270	**Year of Count:**	2013

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
PM 2.5 local conditions, BAM	1079 meters	North northeast	SLAMS	Real-time data reporting. AQI reporting.
PM10 total 0-10um STP	1079 meters	North northeast	Special purpose	Prevention of significant deterioration, PSD, Modeling
Volatile organic compounds	1079 meters	North northeast	Non-regulatory	General background monitor
Carbonyl compounds	1079 meters	North northeast	Non-regulatory	General background monitor

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for Comparison to NAAQS**	**Proposal to Move or Change**
PM 2.5 local conditions, BAM	General background; welfare related impacts	Regional	Yes	None
PM10 total 0-10um STP	General background	Regional	Yes	None
Volatile organic compounds	General background	Regional	Not applicable	None
Carbonyl compounds	General background	Regional	Not applicable	None

	Meets Part 58 Requirements for:			
Parameter Name	**Appendix A**	**Appendix C**	**Appendix D**	**Appendix E**
PM 2.5 local conditions, BAM	Yes	Yes	Yes	Yes
PM10 total 0-10um STP	Yes	Yes	Not applicable	Yes
Volatile organic compounds	Yes	Not applicable	Not applicable	Yes
Carbonyl compounds	Yes	Not applicable	Not applicable	Yes

Parameter Name	**Probe Height in meters**	**Distance to Support**	**Distance to Trees**	**Obstacles**
PM 2.5 local conditions, FRM	2.46	> 2 meters	>20 meters	None
PM10 total 0-10um STP	3.17	2.87 meters	>20 meters	None
Volatile organic compounds	3.91	1.117 meters	> 20 meters	None
Carbonyl compounds	3.91	1.117 meters	> 20 meters	None

Each CASTNET dry deposition station measures:

- Weekly average atmospheric concentrations of sulfate, nitrate, ammonium, sulfur dioxide and nitric acid; and
- Hourly concentrations of ambient ozone levels.

The CASTNET meteorological equipment was transferred to the DAQ in 2012.

The Candor site is located on the eastern edge of the Uwharrie National Forest. In 2013 the DAQ added a beta attenuation monitor, BAM, and a one-in-six-day carbonyl sampler to support a background monitoring study. July 1, 2015, the BAM became the primary monitor at the site and the FRM was shut down.

Figure E3. The Candor CASTNET, air toxics, mercury deposition and particle monitoring site, 37-123-0001

Figure E4. Looking north from the Candor site

Figure E6. Looking east from the Candor site

Figure E5. Looking west from the Candor site

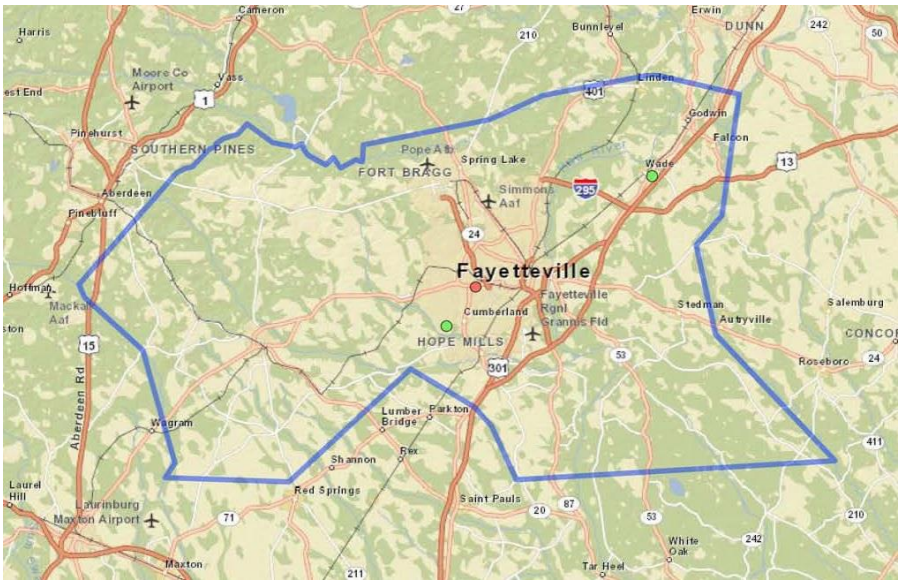
Figure E7. Looking south from the Candor site

There are no new monitoring requirements that will require additional monitoring in this area.

(2) The Fayetteville MSA

The Fayetteville MSA consists of two counties: Cumberland and Hoke. The major metropolitan area is the City of Fayetteville. The DAQ currently operates three monitoring sites in the Fayetteville MSA. These sites are all located in Cumberland County at William H. Owen

Elementary School and E. Melvin Honeycutt Elementary School in Fayetteville and at Wade. The Golfview site in Hope Mills was shut down on Oct. 31, 2014. The locations of these monitors are shown in Figure E8.



The Honeycutt ozone and sulfur dioxide monitoring site is the green dot to the south; the Wade ozone monitoring site is the green dot to the northeast the William Owen particle monitoring site is the red dot in the center.

Figure E8. Monitors located in the Fayetteville MSA

At the **Honeycutt** site, the DAQ operates a seasonal ozone monitor and a special purpose sulfur dioxide monitor that operates for 12 months every three years. DAQ established this site in April 2015. The DAQ discovered in February 2014 that the golf course where the Golfview monitoring station was located was closed and the property where the monitor was located was for sale. The property owner agreed to allow DAQ to continue using the site until the property sold. The property sold in August 2014 and the new owner requested the DAQ move the monitoring station as soon as possible. The DAQ investigated surrounding properties to identify a potential location for the monitoring station. The property abuts YMCA property on one side and city property on the other. The DAQ considered relocating the monitoring station about 100 meters southeast to the YMCA property, however, the YMCA never responded to the request. Thus, the DAQ worked with the school system to move the site to E. Melvin Honeycutt Elementary School at 4665 Lakewood Drive, Fayetteville, North Carolina. As shown in Figure E9, the school is located about 3.2 Kilometers northwest of the former Golfview location.

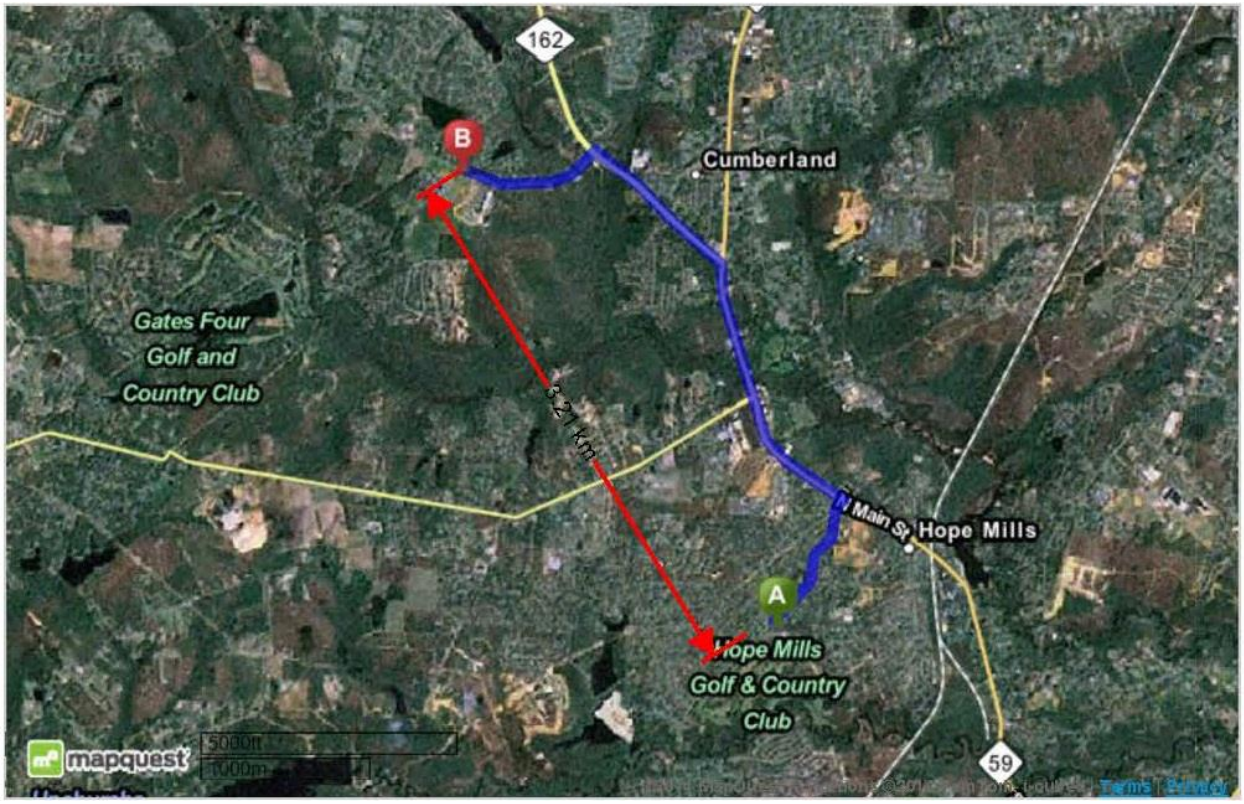


Figure E9. Location of Honeycutt site, B, relative to Golfview, A

Figure E10 through Figure E14 show the site and views looking north, east, south and west. Table E2 summarizes monitoring information for the site. The Honeycutt ozone site is the upwind site for the Fayetteville MSA. Sulfur dioxide monitoring occurs here every third year because the site is a good background site for obtaining data for Prevention of Significant Deterioration modeling requirements. This sulfur dioxide monitor operated May 2015 to May 2016 and will operate again in 2018. In July 2016, the U.S. Census Bureau, Population Division, estimated 380,389 people lived here.

Figure E10. Honeycutt ozone and sulfur dioxide monitoring site, 37-051-0010

Figure E11. Looking north from the Honeycutt site

Figure E12. Looking east from the Honeycutt site

Figure E13. Looking west from the Honeycutt site

Figure E14. Looking south from the Honeycutt site

Table E2. Site Information Table for Honeycutt

Site Name:	Honeycutt			**AQS Site Identification Number:**		37-051-0010	
Location:	4665 Lakewood Drive, Fayetteville, North Carolina			**CBSA:**	Fayetteville, NC	**CBSA #:**	22180
Latitude	35.00165	**Longitude**	-78.99075	**Datum:**		WGS84	
Elevation	59.1 meters						

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental with ultra violet photometry, 047	EQOA-0880-047	1-Hour	March 1 to Oct. 31
Sulfur dioxide	Instrumental with pulsed fluorescence, 060	EQSA-0486-060	1-Hour	Year-round; every third year

Date Monitor Established:		
	Ozone	May 9, 2015
	Sulfur dioxide	May 9, 2015

Nearest Road:	Lakewood Drive	**Traffic Count:**	13,000	**Year of Count:**	2014

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
Ozone	34 meters	North	SLAMS	Real-time AQI reporting and forecasting. Compliance w/NAAQS.
Sulfur dioxide	34 meters	North	Special purpose	Prevention of significant deterioration, PSD, modeling

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for Comparison to NAAQS**	**Proposal to Move or Change**
Ozone	Population exposure	Neighborhood	Yes	None
Sulfur dioxide	Population exposure General background	Neighborhood	Yes	None

Table E2. Site Information Table for Honeycutt

Parameter Name	Meets Part 58 Appendix A Requirements	Meets Part 58 Appendix C Requirements	Meets Part 58 Appendix D Requirements	Meets Part 58 Appendix E Requirements
Ozone	Yes	Yes	Yes	Yes
Sulfur dioxide	Yes	Yes	Not applicable	Yes
Parameter Name	**Probe Height in meters**	**Distance to Support**	**Distance to Trees**	**Obstacles**
Ozone	4.22 meters	1.2 meters	>20 meters	None
Sulfur dioxide	4.22 meters	1.5 meters	>20 meters	None

Because 40 CFR 58 Appendix D requires MSAs with more than 350,000 people to have two ozone monitors, this site is the second required ozone site for the Fayetteville MSA.

At the Wade site, 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 E15 through Figure E19. Table E3 summarizes monitoring information for the site. The Wade site was established as the downwind site for the Fayetteville MSA. 40 CFR 58 Appendix D currently requires the Fayetteville MSA to have two ozone monitoring sites.

Figure E15. Wade ozone monitoring Site, 37-051-0008

Figure E16. Looking north from Wade site

Figure E17. Looking west from the Wade site

Figure E18. Looking east from the Wade site

Figure E19. Looking south from the Wade site

Table E3. Site Information Table for Wade

Site Name:	Wade			**AQS Site Identification Number:**		37-051-0008			
Location:	7112 Covington Lane, Wade, North Carolina			**CBSA:**	Fayetteville, NC		**CBSA #:**	22180	
Latitude	35.158686	**Longitude**	-78.728035	**Datum:**	WGS84		**Elevation**	43 meters	

Table E3. Site Information Table for Wade

Parameter Name	Method	Method Reference ID	Sample Duration	Sampling Schedule
Ozone	Instrumental with ultra violet photometry, 047	EQOA-0880-047	1-Hour	March 1 to Oct. 31
Date Monitor Established:	Ozone			May 8, 1990
Nearest Road:	Covington Road	**Traffic Count:**	1300	**Year of Count:** 2014

Parameter Name	Distance to Road	Direction to Road	Monitor Type	Statement of Purpose
Ozone	87 meters	West	SLAMS	Compliance w/NAAQS. Real-time AQI reporting & forecasting.

Parameter Name	Monitoring Objective	Scale	Suitable for Comparison to NAAQS	Proposal to Move or Change
Ozone	Highest concentration	Urban	Yes	None

Parameter Name	Meets 40 CFR Part 58 Requirements for:			
	Appendix A	Appendix C	Appendix D	Appendix E
Ozone	Yes	Yes	Yes	Yes

Parameter Name	Probe Height in meters	Distance to Support	Distance to Trees	Obstacles
Ozone	4.22	1.2 meter	>20 meters	None

At the William Owen site, the DAQ operates a one-in-six-day fine particle FRM and continuous fine particle and PM_{10} monitors. Figure E20 shows the site. Table E4 summarizes monitoring information for the site. Views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure E21 through Figure E28. The meteorological tower with wind speed and wind direction sensors, ambient temperature sensors at 10 meters and 2 meters, rainfall and solar radiation sensors was shut down on Nov. 12, 2014. In mid-January 2016, the collocated high-volume PM_{10} monitors at the site were shut down and replaced with a low-volume continuous PM_{10} monitor. At the end of 2015 the well-impactor ninety-six, WINS, on the FRM was replaced with a very sharp cut cyclone, VSCC. This change was made because the VSCC is easier and less expensive to maintain. In mid-2017, a one-in-six-day collocated fine particle FRM will be added to the site.

Figure E20. The William Owen particle monitoring site

Table E4. Site Information Table for William Owen School

Site Name:	William Owen School			**AQS Site Identification Number**		37-051-0009	
Location:	4533 Raeford Road, Fayetteville, North Carolina						
CBSA:	Fayetteville, NC			**CBSA #:**	22180		
Latitude	35.041416	**Longitude**	-78.953112	**Datum:**	WGS84	**Elevation**	63 meters

Parameter Name	Method	Method Reference ID	Sample Duration	Sampling Schedule
PM 2.5 local conditions, FRM	R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC – Gravimetric Analysis	RFPS-1006-145	24-Hour	Every sixth day; year-round
PM 2.5 local conditions, BAM	Met One BAM-1022 Mass Monitor w/ VSCC	EQPM-1013-209	1-Hour	Year-round
PM10 total 0-10um STP, primary	Met One Beta Attenuation BAM-1020	EQPM-0798-122	1-Hour	Year-round

Date Monitor Established:	PM 2.5 local conditions, primary monitor	Jan. 1, 1999
	PM 2.5 local conditions, continuous monitor	Dec. 30, 2015
	PM10 total 0-10um STP, primary monitor	Jan. 1, 1999

Nearest Road:	Raeford Road	**Traffic Count:**	40,000	**Year of Count:**	2012

Parameter Name	Distance to Road	Direction to Road	Monitor Type	Statement of Purpose
PM 2.5 local conditions, primary	210 meters	North	SLAMS	Compliance w/NAAQS. AQI reporting.
PM 2.5 local conditions, continuous	210 meters	North	SLAMS	Real-time AQI reporting & forecasting.
PM10 total 0-10um STP, primary	210 meters	North	SLAMS	Compliance w/NAAQS.

Parameter Name	Monitoring Objective	Scale	Suitable for NAAQS Comparison	Proposal to Move or Change
PM 2.5 local conditions, primary	Population exposure	Urban	Yes	None
PM 2.5 local conditions, continuous	Population exposure	Urban	No	None
PM10 total 0-10um STP, primary	Population exposure	Urban	Yes	None

	Meets Part 58 Requirements for:			
Parameter Name	**Appendix A**	**Appendix C**	**Appendix D**	**Appendix E**
PM 2.5 local conditions, primary	Yes	Yes	Yes	Yes
PM 2.5 local conditions, continuous	Yes	Yes	Yes	Yes

Table E4. Site Information Table for William Owen School

PM10 total 0-10um STP, primary	Yes	Yes	Yes	Yes
Parameter Name	**Probe Height in meters**	**Distance to Support**	**Distance to Trees**	**Obstacles**
PM 2.5 local conditions, primary	2.38	> 2 meters	>20 meters	None
PM 2.5 local conditions, continuous	4.666	> 2 meters	>20 meters	None
PM10 total 0-10um STP, primary	2.64	2.38	>20 meters	None

Figure E21. Looking north from the William Owen site

Figure E24. Looking west from the William Owen site

Figure E22. William Owen Site looking northeast

Figure E25. William Owen Site looking southwest

Figure E23. William Owen site looking northwest

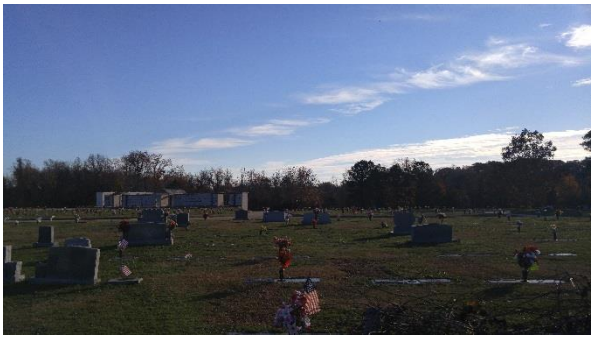


Figure E26. Looking east from the William Owen site

Figure E27. William Owen site looking southeast

Figure E28. Looking south from the William Owen site

Additional monitoring could be required in the Fayetteville MSA to comply with the 2010 **lead monitoring** requirements,[1] as revised in 2016[2]. In the 2014 toxics release inventory Fort Bragg calculated its fugitive lead emissions to the ambient air from its firing ranges using AP-42 emission factors and determined it emitted less than 0.5 tons. [3] DAQ requested a waiver from either placing a monitor at the fence line of the base or to doing modeling to show that the air beyond the fence line of the base is less than 50 percent of the standard. Because the emissions are lower than 0.5 tons, [4] the EPA is currently not requiring DAQ to do any lead monitoring. [5] There are no other new monitoring requirements that will require additional monitoring in this area.

[1] Revisions to Lead Ambient Air Monitoring Requirements, Federal Register, Vol. 75, No. 247, Monday, Dec. 27, 2010, p. 81126, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1.

[2] Revisions to Ambient Monitoring Quality Assurance and Other Requirements, Federal Register, Vol. 81, No. 59, Monday, March 28, 2016, p. 17248, available on the worldwide web at https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf.

[3] United States Environmental Protection Agency. 2014 Toxic Release Inventory, released March 2015, available on the worldwide web at https://iaspub.epa.gov/triexplorer/tri_release.chemical.

[4] United States Environmental Protection Agency. (2017). *TRI Explorer* (2015 Dataset (released March 2017)) [Internet database]. Retrieved from https://www.epa.gov/triexplorer, (May 04, 2017).

[5] United States Environmental Protection Agency. (2011). *FY 2011 State of North Carolina Ambient Air Monitoring Network Plan, U.S. EPA Region 4 Comments and Recommendations* (Oct. 20, 2011). Available on the worldwide web at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7843

Appendix E.1 Annual Network Site Review Forms for 2016

Candor

Honeycutt

Wade

William Owen in Fayetteville

Site Review Form Calendar Year 2017

Site Information

Region FRO	**Site Name** Candor	**AQS Site # 37-123-0001**
Street Address 136 Perry Dr		**City** Candor
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	
Enter Exact		
Longitude -79.836613	**Latitude** 35.2649	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** / **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		**173.1**

Name of nearest road to inlet probe McCallum Rd ADT 270 Year latest available 2013

Comments: _____

Distance of site to nearest major road (m) 1079.00 Direction from site to nearest major road NNE

Name of nearest major road McCallum Rd ADT 270 Year latest available2013

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 8787 Direction to RR ENE ☐NA
OPTIONAL Distance of site to nearest power pole w/transformer	(m) 10 Direction SSW
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.

None expected

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_2 (NAAQS) ☐ $HSNO_y$ ☐ O_3 ☐ NH_3 ☐ Hydrocarbon ☒ Air Toxics ☐ 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) 3.91

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) 1.11

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) 1079 Direction from probe to nearest traffic lane NNE

Site Review Form Calendar Year 2017

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. (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) 2.46
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) 1079 Direction from probe to nearest traffic lane NNE

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 12/9/15 New Pictures Submitted? Yes ☐ No ☒

Reviewer Jennifer McHone Sides Date 12/12/16

Ambient Monitoring Coordinator Mitchell Revels DateJanuary 12, 2017

Site Review Form Calendar Year 2017

Site Information

Region FRO	**Site Name** Honeycutt	**AQS Site # 37-051-0010**
Street Address 4665 Lakewood Dr		**City** Fayetteville
Urban Area FAYETTEVILLE	**Core-based Statistical Area** Fayetteville, NC	
Enter Exact		
Longitude -78.990536	**Latitude** 35.001803	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		**60.04**

Name of nearest road to inlet probe Fisher Road ADT 16000 Year latest available2014
Comments: Lakewood Dr - 13000 (2014)
Distance of site to nearest major road (m) 40.00 Direction from site to nearest major road NNE
Name of nearest major road Bingham Drive (NC 162) ADT 31000 Year latest available2014
Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track (m) _____ Direction to RR ___	☒ NA
OPTIONAL Distance of site to nearest power pole w/transformer	(m) 77 Direction E
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.

None expected

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) 4.22
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) 1.2
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) 34 Direction from probe to nearest traffic lane N

Site Review Form Calendar Year 2017

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: _____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ SO_2 (DRR) ☒ 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	☐ INDUSTRIAL ☐ SLAMS ☒ SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4.22

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) 1.5

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) 34 Direction from probe to nearest traffic lane N

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: SO2 shutdown 6/16 until 2018 for 3 yr cycle

Date of Last Site Pictures 12/3/15 New Pictures Submitted? Yes ☐ No ☒

Reviewer Jennifer McHone Sides Date December 7, 2016

Ambient Monitoring Coordinator Mitchell Revels Date January 12, 2017

Revised 2017-01-12

Site Review Form Calendar Year 2017

Site Information

Region FRO	**Site Name** Wade	**AQS Site # 37-051-0008**
Street Address-7112 Covington Road		**City Wade**
Urban Area FAYETTEVILLE	**Core-based Statistical Area** Fayetteville, NC	
Enter Exact		
Longitude -78.7281	**Latitude** 35.1587	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		151.00

Name of nearest road to inlet probe Covington Road ADT 130 Year latest available 2014

Distance of ozone probe to nearest traffic lane (m) 87 Direction from ozone probe to nearest traffic lane W

Comments: Dunn Road (US 301) - 1600 (2014); Wade-Steadman Road - 1300 (2014)

Name of nearest major road I-95 ADT 48000 Year latest available 2015

Distance of site to nearest major road (m) 792.00 Direction from site to nearest major road ESE

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 825 Direction to RR NW ☐ NA
OPTIONAL Distance of site to nearest power pole w/transformer	(m) 91 Direction W
Distance between site and drip line of water tower (m) 153 Direction from site to water tower NW	☐ 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.

none expected

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) 4.22

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) 1.20

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 2017

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: December 10, 2016 New Pictures Submitted? Yes ☐ No ☒

Reviewer Jennifer McHone Sides Date: 12/7/16

Ambient Monitoring Coordinator Mitchell Revels Date: January 12, 2017

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 2017

Site Information

Region FRO	**Site Name** William Owen	**AQS Site # 37-051-0009**
Street Address-4533 Raeford Road		**City Fayetteville**
Urban Area FAYETTEVILLE	**Core-based Statistical Area** Fayetteville, NC	
Enter Exact		**Method of Measuring**
Longitude -78.9531	**Latitude** 35.0414	
In Decimal Degrees	In Decimal Degrees	**Interpolation** | **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		63.70

Name of nearest road to inlet probe Raeford Road ADT Latest available42000 Year 2014

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

Comments: _____

Name of nearest major road Raeford Road ADT 42000 Year latest available 2014

Distance of site to nearest major road (m) 210.00 Direction from site to nearest major road N

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 837Direction to RR N ☐NA
OPTIONAL Distance of site to nearest power pole w/transformer	(m) 28 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.

None expected

Instructions:

Address: Sometimes local addresses change. Confirm the local address of the site using a 911 locator or the address used by the local utility company, community or county to identify the site location.

Urban Area: If the monitor is located within the bounds of an urban area (an incorporated area with a population of 10,000 or more people), select the appropriate urban area from the list. Otherwise select "Not in an Urban Area".

Core-Based Statistical Area (CBSA): If the monitor is located within a county that is part of a metropolitan statistical area (MSA) or a micropolitan statistical area (MiSA), then it is located within a core-based statistical area. If the monitoring station is located in a county included in a MSA or MiSA, select the appropriate CBSA from the list. Otherwise select "None".

Longitude and Latitude: The longitude and latitude should be entered in decimal degrees. Use a conversion program, such as http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html, to convert to decimal degrees.

Road Information: For the nearest road to the inlet probe, list whatever roadway that carries vehicles that is closest to the probe, whether or not it is a named or public road and even if the road has very little traffic. Use the comments space if necessary to describe the road or the source of the annual average daily traffic (AADT) counts. If the monitor is located near an unnamed, little used, private road, use the nearest major road space to list the closest named public road to the site. Include the distance and direction of the nearest major road from the site as well as the AADT if it is available. If the closest road is a small public road but there is a large major roadway such as an interstate highway, divided highway, major thoroughfare, etc., near the monitoring station use the nearest major road space to list the information about this major roadway. Include the distance and direction of the major road from the site as well as the AADT. The AADT for state roads can be obtained from the North Carolina Division of Transportation at http://www.ncdot.gov/travel/statemapping/trafficvolumemaps/default.html. For AADT values for local roadways contact the appropriate local governments.

Any Sources of Potential Bias: Use this space to record any information about the site that is not requested elsewhere. Especially note any changes to the site that occurred near the site in the past year, such as road construction, building construction, new businesses, businesses closing, or changes in traffic patterns, crops or other agricultural activities.

Site Review Form Calendar Year 2017

Parameters	Monitoring Objective	Scale	Monitor Type
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. (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_____ ☐ Nonregulatory_____ ☐ Supplemental Speciation _____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) ~2.2-2.5m
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☐ No ☒
Actual measured distance from outer edge of probe inlet to supporting structure (meters) NA

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): 0.25

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 ☐

Site Review Form Calendar Year 2017

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: December 4, 2015 New Pictures Submitted? Yes ☐ No ☒

Reviewer Jennifer McHone Sides Date: 12/16/16

Ambient Monitoring Coordinator Mitchell Revels Date: January 12, 2017

Instructions (continued):

Trees: The probe or inlet must be at least 10 meters or further from the drip line of trees. A distance of at least 20 meters between the probe and any tree or trees is preferred.

Obstacles: An obstacle is anything that restricts air flow. A tree can be an obstacle because it has branches and leaves that restrict the flow of air but a pole is not considered to be an obstacle. To avoid interference from obstacles, the probe or inlet must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path.

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.

Appendix E-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 E5. 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