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NORTH CAROLINA
Environmental Quality

# 2020-2021 Annual Monitoring Network Plan for the North Carolina Division of Air Quality
# Volume 2

## Site Descriptions by Metropolitan Statistical Area

## F. The Washington Monitoring Region

*July 2, 2020*

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# Table of Contents

2020-2021 Annual Monitoring Network Plan for the North Carolina Division of Air Quality ..... 1
List of Figures ..... 2
List of Tables ..... 3
F. The Washington Monitoring Region ..... 4
(1) The Greenville MSA ..... 4
(2) The Goldsboro MSA ..... 8
(3) The New Bern MSA ..... 9
(4) The Non-MSA Portion of the Washington Monitoring Region ..... 10
(5) The North Carolina Portion of the Virginia Beach-Norfolk-Newport News MSA ..... 18
Appendix F.1 Annual Network Site Review Forms for 2019 ..... 20
Appendix F-2. Scale of Representativeness ..... 29

# List of Figures

Figure F3. Aerial view of the Pitt Co Ag Center site ..... 4
Figure F1. The Washington monitoring region ..... 4
Figure F2. Locations of monitors in the Greenville MSA ..... 4
Figure F6. The Pitt Co Ag Center ozone and fine-particle monitoring site ..... 4
Figure F4. Pitt Co Ag Center site looking north ..... 5
Figure F5. Pitt Co Ag Center site looking west ..... 5
Figure F7. Pitt Co Ag Center site looking east ..... 5
Figure F8. Pitt Co Ag Center site looking south ..... 5
Figure F9. Comparison of BAM and FRM results at the Pitt Co Ag Center Site ..... 6
Figure F10. Ozone monitors surrounding the Goldsboro MSA (white circle) and probability of exceeding the 2015 ozone standard ..... 8
Figure F11. Map of ozone exceedance probability for the New Bern (white circle) MSA ..... 10
Figure F12. Location of the monitoring sites in the Non-MSA Portion of the Washington Monitoring Region ..... 11
Figure F13. Jamesville ozone, particle and sulfur dioxide monitoring site ..... 11
Figure F14. Looking north from the Jamesville site ..... 12
Figure F15. Looking northwest from the Jamesville site ..... 12
Figure F18. Looking west from the Jamesville site ..... 12
Figure F16. Looking northeast from the Jamesville site ..... 12
Figure F17. Looking east from the Jamesville site ..... 12
Figure F20. Looking southeast from the Jamesville site ..... 12
Figure F19. Looking southwest from the Jamesville site ..... 13

Figure F21. The Jamesville site looking south ..... 13
Figure F22. Location of the Bayview Ferry site (B) relative to the Aurora site (A) ..... 13
Figure F23. Bayview Ferry sulfur dioxide monitoring site ..... 14
Figure F24.The Bayview Ferry site looking north ..... 15
Figure F25. Looking west from the Bayview Ferry site ..... 15
Figure F26. Looking east from the Bayview Ferry site ..... 15
Figure F27. The Bayview Ferry site looking south ..... 15
Figure F28. New and old LCC monitoring site locations ..... 16
Figure F29. Lenoir Community College ozone monitoring site ..... 16
Figure F30. Looking north from the LCC site ..... 17
Figure F31. Looking northwest from the LCC site ..... 17
Figure F34. Looking west from the LCC site ..... 17
Figure F35. Looking southwest from the LCC site ..... 17
Figure F32. Looking northeast from the LCC site ..... 17
Figure F33. Looking east from the LCC site ..... 17
Figure F36. Looking southeast from the LCC site ..... 17
Figure F37. Looking south from the LCC site ..... 17

## List of Tables

Table F1. Site Table for Pitt County Agriculture Center ..... 7
Table F2. Site Type Appropriate Siting Scales ..... 29

# F. The Washington Monitoring Region

The Washington monitoring region, shown in Figure F1, has five areas. The Greenville metropolitan statistical area, or MSA, consists of Pitt County. The Goldsboro MSA consists of Wayne County. The New Bern MSA consists of Craven, Jones and Pamlico counties. The non-MSA portion of the Washington monitoring region consists of Beaufort, Bertie, Chowan, Dare, Greene, Hertford, Hyde, Lenoir, Martin, Pasquotank, Perquimans, Tyrrell and Washington counties. The Virginia Beach-Norfolk-Newport News MSA consists of Camden, Currituck and Gates counties.

**Figure F2. The Washington monitoring region**
The colored dots show the approximate locations of most of the monitoring sites in this region.

## (1) The Greenville MSA

The Greenville MSA consists of Pitt County. The principal city is Greenville. The North Carolina Division of Air Quality, or DAQ, operates one monitoring site in this MSA – a collocated ozone and fine-particle monitoring site, which began operating April 1, 2008, at the Pitt County Agricultural Center in Greenville. On Feb. 12, 2019, DAQ added a rainwater collection sampler to the site. Figure F2 shows the site location. Figure F3 through Figure F8 provide views of the site looking north, east, south and west from the site.

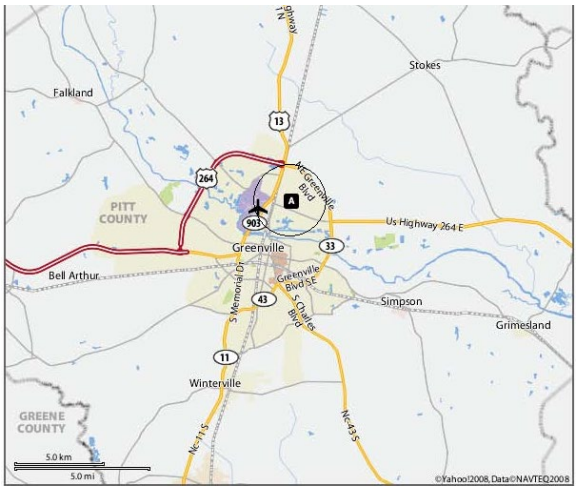



**Figure F3. Locations of monitors in the Greenville MSA**
A is the Pitt County Agriculture Center ozone and fine particle monitoring site. The circle represents the neighborhood scale of 4 Km.

**Figure F1. Aerial view of the Pitt Co Ag Center site**

**Figure F4. The Pitt Co Ag Center ozone and fine-particle monitoring site**

Figure F5. Pitt Co Ag Center site looking north

Figure F7. Pitt Co Ag Center site looking east

Figure F6. Pitt Co Ag Center site looking west

Figure F8. Pitt Co Ag Center site looking south

In 2016, DAQ relocated the site on the property due to the construction of a building near the original location. Details on the relocation are available in the 2016-2017 Network Plan, Volume I, Appendix F.[1] In 2016, DAQ also added a continuous fine particle monitor to the site. After collecting over two complete years of data, the BAM and FRM appear to agree as demonstrated by the data comparison for April 8, 2016, through June 30, 2019, shown in Figure F9. Thus, the division shut down the FRM monitor at the site on June 30, 2019, and made the BAM monitor the primary monitor on July 1, 2019. Table F1 summarizes site monitoring information.

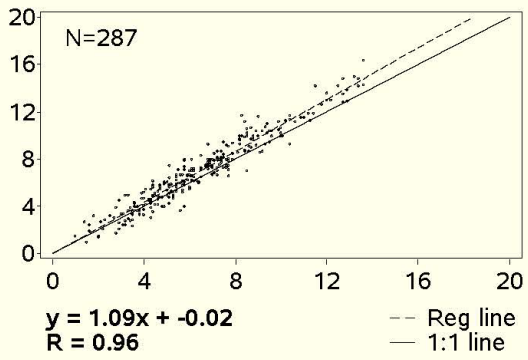
[1] The 2016-2017 Annual Monitoring Network Plan for the North Carolina Division of Air Quality, Volume I, Appendix F. Region 4 Requested Siting Information for the Pitt County Agricultural Center Site Relocation, July 1, 2016, available on the worldwide web at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=13150

# $PM_{2.5}$ Continuous Monitor Comparability Assessment

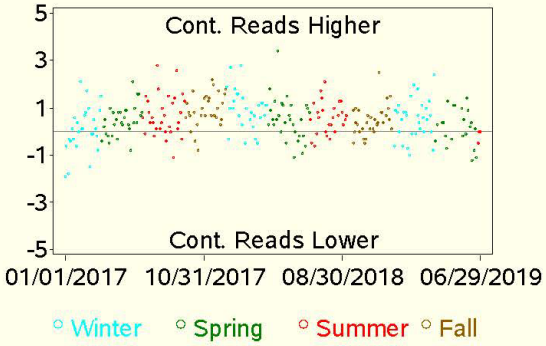
## Site 37-147-0006: Not in a City, NC

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (118,145), PM2.5 - Local Conditions (88101), POC=1
Cont: Met-One BAM W/PM2.5 VSCC - Beta Attenuation (733), Acceptable PM2.5 AQI & Speciation Mass (88502), POC=3

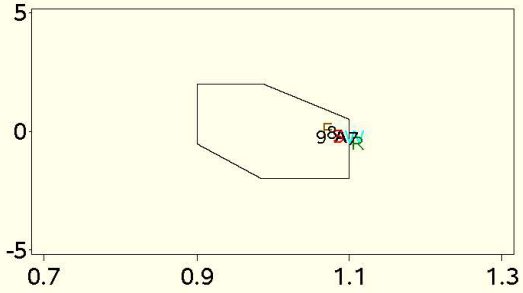
### Cont. (y) vs. FRM (x) ($\mu g/m^3$)




### Cont. minus FRM ($\mu g/m^3$)

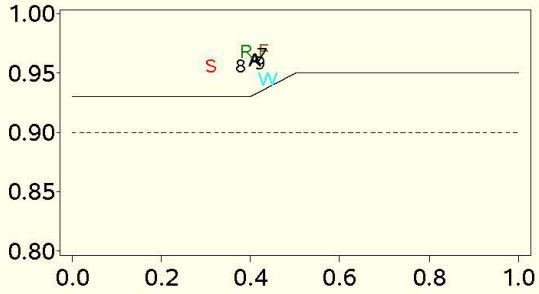



### Additive (y) vs. Multiplicative (x) Bias



**A=AllData,** 7=2017, 8=2018, 9=2019
W=Winter, R=Spring, S=Summer, F=Fall

### R (y) vs. FRM CCV (x)



**A=AllData,** 7=2017, 8=2018, 9=2019
W=Winter, R=Spring, S=Summer, F=Fall

### Mean Concentration ($\mu g/m^3$)

| Dataset | N | FRM | Cont | Ratio (Cont/FRM) |
|---|---|---|---|---|
| **AllData** | **287** | **6.4** | **7.0** | **1.09** |
| Winter | 85 | 5.6 | 6.1 | 1.09 |
| Spring | 82 | 6.8 | 7.2 | 1.06 |
| Summer | 60 | 7.7 | 8.3 | 1.08 |
| Fall | 60 | 6.0 | 6.7 | 1.12 |
| 2017 | 121 | 6.8 | 7.4 | 1.09 |
| 2018 | 115 | 6.1 | 6.7 | 1.10 |
| 2019 | 51 | 6.3 | 6.7 | 1.05 |

### Appendix A Statistics

| Dataset | N (all observations) | Bias | N (only >= 3 ug/m^3) | Bias |
|---|---|---|---|---|
| **AllData** | **287** | **8.7** | **263** | **8.8** |
| Winter | 85 | 8.7 | 71 | 10.6 |
| Spring | 82 | 5.6 | 77 | 5.8 |
| Summer | 60 | 8.3 | 58 | 7.4 |
| Fall | 60 | 13.4 | 57 | 11.9 |
| 2017 | 121 | 9.2 | 111 | 8.4 |
| 2018 | 115 | 9.7 | 108 | 10.4 |
| 2019 | 51 | 5.5 | 44 | 5.6 |

Data Source: EPA AQS Data Mart

Generated: May 2, 2020

**Figure F9. Comparison of BAM and FRM results at the Pitt Co Ag Center Site**

## Table F1. Site Table for Pitt County Agriculture Center

| | | | |
|---|---|---|---|
| **Site Name:** | Pitt County Agriculture Center | | |
| **AQS Site Identification Number** | 37-147-0006 | | |
| **Location:** | 403 Government Circle<br>Greenville, North Carolina | | |
| **CBSA:** | Greenville, NC | **CBSA #:** | 24780 |
| **Latitude** | 35.641276 | **Datum:** | WGS84 |
| **Longitude** | -77.360126 | | |
| **Elevation** | 7.9 meters | | |

| **Parameter Name** | **Method** | **Method Reference ID** | **Sample Duration** | **Sampling Schedule** |
|---|---|---|---|---|
| Ozone | Instrumental with Ultra Violet Photometry (047) | EQOA-0880-047 | 1-Hour | Mar. 1 to Oct. 31 |
| PM 2.5 local conditions, continuous | Met One BAM-1022 Mass Monitor w/ VSCC | EQPM-1013-209 | 1-Hour | Every Hour Year Round |

| | | |
|---|---|---|
| **Date Monitor Established:** | Ozone | April 1, 2008 |
| **Date Monitor Established** | PM 2.5 local conditions, continuous | April 8, 2016 |

| | | | |
|---|---|---|---|
| **Nearest Road:** | New Hope/Detention / Detention Drive | | |
| **Traffic Count:** | None available – estimated < 3100 | **Year of Count:** | 2012 |

| **Parameter Name** | **Distance to Road** | **Direction to Road** | **Monitor Type** | **Statement of Purpose** |
|---|---|---|---|---|
| Ozone | 236 meters | West | SLAMS | Real-time AQI reporting. Compliance w/NAAQS. |
| PM 2.5 local conditions, continuous | 236 meters | West | SLAMS | Real-time AQI reporting Compliance w/NAAQS |

| **Parameter Name** | **Monitoring Objective** | **Scale** | **Suitable for Comparison to NAAQS** | **Proposal to Move or Change** |
|---|---|---|---|---|
| Ozone | Population Exposure | Neighborhood | Yes | None |
| PM 2.5 local conditions, continuous | Population Exposure | Neighborhood | Yes | Became primary on 7/1/19 |

| **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 |
| PM 2.5 local conditions, continuous | Yes | Yes | Yes - No requirements | Yes |

| **Parameter Name** | **Probe Height (m)** | **Distance to Support** | **Distance to Trees** | **Obstacles** |
|---|---|---|---|---|
| Ozone | 3.78 | 1.11 meter | >20 meters | None |
| PM 2.5 local conditions, continuous | 5.13 | 2.31 meters | >20 meters | None |

The **lead monitoring network requirements** as modified in 2016[2] do not result in any lead monitors in the Greenville MSA. The Greenville MSA does not have any permitted facilities located within its bounds that emit 0.5 ton or more per year of lead.[3] Changes to the **ozone**

[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. (2018). *TRI Explorer* (2017 Dataset (released October 2018)) [Internet database]. Retrieved from https://www.epa.gov/triexplorer, (March 23, 2019).

**monitoring requirements** in 2015 did not result in more monitoring in the Greenville MSA. The MSA currently has the minimum number of monitors required by 40 CFR Part 58, Appendix D for population exposure monitoring in urban areas. Ozone monitoring began a month earlier on March 1 instead of April 1 starting in 2017. The 2010 **nitrogen dioxide monitoring requirements**[4] did not add nitrogen dioxide monitors in the Greenville MSA because the population is less than 1,000,000. The 2010 **sulfur dioxide ($SO_2$) monitoring requirements** also did not result in more monitoring in this area because there are no large sources of $SO_2$ in the MSA. The changes to the **carbon monoxide monitoring requirements** did not result in additional monitoring in this MSA because the population is less than one million.

## (2) The Goldsboro MSA

The Goldsboro MSA consists of Wayne County. The major metropolitan area is the City of Goldsboro. DAQ does not operate any monitoring sites in the Goldsboro MSA. The division shut down the fine-particle monitoring site located at Dillard Middle School on Dec. 31, 2015.

Currently, DAQ does not monitor for ozone in Goldsboro because there are ozone monitors in the neighboring counties of Johnston and Lenoir. Figure F10 shows the locations of these monitors as well as the Leggett and Pitt County monitors in relation to the Goldsboro MSA. Modeling also indicates that the probability of there being an exceedance of the 2015 ozone standard in the Goldsboro area is less than 40 percent. The surrounding ozone monitors should adequately characterize the ozone concentrations in the Goldsboro area.

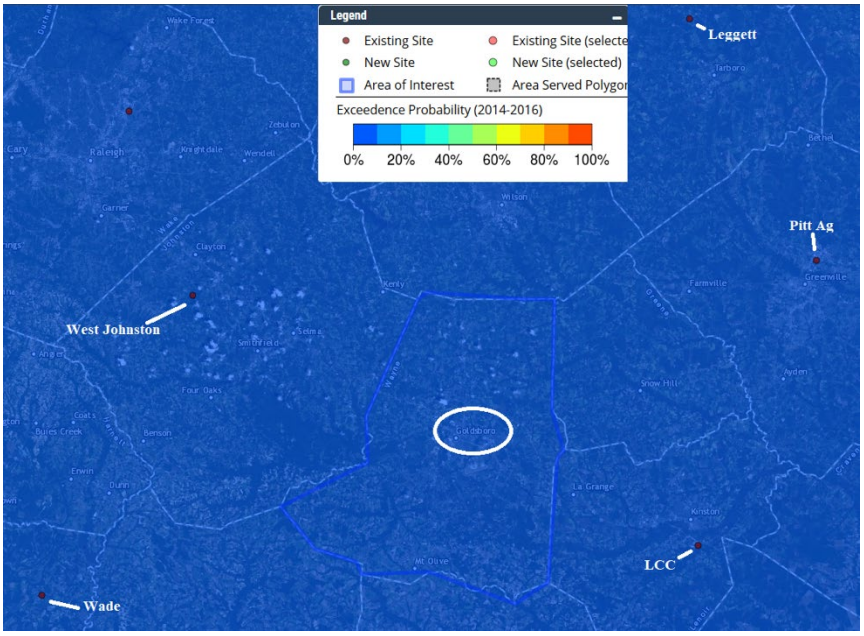



**Figure F10. Ozone monitors surrounding the Goldsboro MSA (white circle) and probability of exceeding the 2015 ozone standard**

[4] Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Federal Register**,** Vol. 75, No. 26, Feb. 9, 2010, available on the worldwide web at https://www3.epa.gov/ttn/naaqs/standards/nox/fr/20100209.pdf.

The **lead monitoring network** requirements, as modified in 2016,[5] did not add any lead monitors in the Goldsboro MSA. The Goldsboro MSA does not have any permitted facilities located within its bounds that emit 0.5 tons or more per year of lead.[6]

The 2010 **nitrogen dioxide monitoring requirements,**[7] as modified in 2016, also did not increase the number of monitors in the Goldsboro MSA because its population is less than 1,000,000. The 2010 **$SO_2$ monitoring requirements** did not result in additional $SO_2$ monitors because there are not enough emissions or people in the MSA to require PWEI monitoring. The 2011 changes to the **carbon monoxide monitoring requirements** also did not result in the addition of any carbon monoxide monitors because the population is less than one million.

### (3) The New Bern MSA

The New Bern MSA consists of three counties – Craven, Jones and Pamlico. DAQ currently does not operate any monitoring stations in the New Bern MSA. The current monitoring regulations do not require DAQ to operate any monitors in this area.

The **lead monitoring** network requirements, as modified in 2016,[8] do not require lead monitors in the New Bern MSA. The MSA does not have any permitted facilities located within its bounds that emit 0.5 tons or more of lead per year.[9]

The 2015 **ozone monitoring requirements** did not require adding an ozone monitor to the New Bern MSA. As shown in Figure F11, modeling indicates that the area has a low probability of exceeding the 2015 ozone standard. DAQ operates an ozone monitor just to the west of the MSA at Lenoir Community College (LCC), which has a similar probability of exceeding the standard as anywhere in the MSA. The U.S. Environmental Protection Agency operates a clean air status and trends network, or CASTNET, monitor just to the southeast of the MSA. These two monitors should adequately characterize ozone concentrations in this area.

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[5] 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.

[6] United States Environmental Protection Agency. (2018). *TRI Explorer* (2017 Dataset (released October 2018)) [Internet database]. Retrieved from https://www.epa.gov/triexplorer, (March 23, 2019).

[7] Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Federal Register**,** Vol. 75, No. 26, Feb. 9, 2010, available on the worldwide web at https://www3.epa.gov/ttn/naaqs/standards/nox/fr/20100209.pdf.

[8] 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.

[9] United States Environmental Protection Agency. (2018). *TRI Explorer* (2017 Dataset (released October 2018)) [Internet database]. Retrieved from https://www.epa.gov/triexplorer, (March 23, 2019).

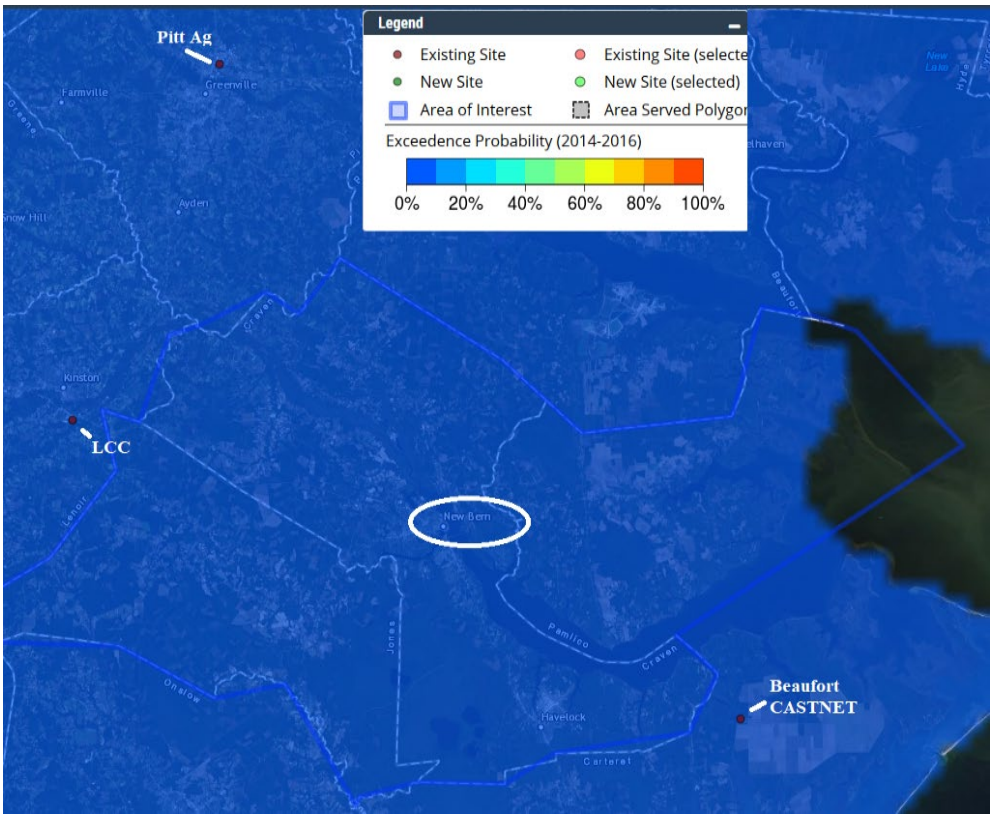


**Figure F11. Map of ozone exceedance probability for the New Bern (white circle) MSA**

This area also did not have to add any monitors to comply with the 2010 **nitrogen dioxide monitoring** requirements because it does not have any roadways that exceed the population threshold.[10] It also did not need to add monitors for the 2010 **$SO_2$ monitoring requirements** because there are no facilities in the MSA emitting large enough quantities of $SO_2$ to trigger source-oriented monitoring. This area will not need to add monitors to comply with the **changes to the carbon monoxide monitoring requirements** because the population is less than one million.

### (4) The Non-MSA Portion of the Washington Monitoring Region

The non-MSA Portion of the Washington monitoring region consists of 13 counties: Beaufort, Bertie, Chowan, Dare, Greene, Hertford, Hyde, Lenoir, Martin, Pasquotank, Perquimans, Tyrrell and Washington. No MSAs are located here. The Kill Devil Hills micropolitan statistical area, or MiSA, is in Dare County and the Washington MiSA is in Beaufort County. Pasquotank and Perquimans counties are included in the Elizabeth City MiSA. The Kinston MiSA is in Lenoir County. DAQ operates three monitoring sites in this area. These sites are located at Jamesville in Martin County, at Lenoir Community College in Lenoir County and at the Bayview Ferry in Beaufort County. Figure F12 shows the location of these monitoring sites.

[10] Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Federal Register**,** Vol. 75, No. 26, Feb. 9, 2010, available on the worldwide web at https://www3.epa.gov/ttn/naaqs/standards/nox/fr/20100209.pdf.

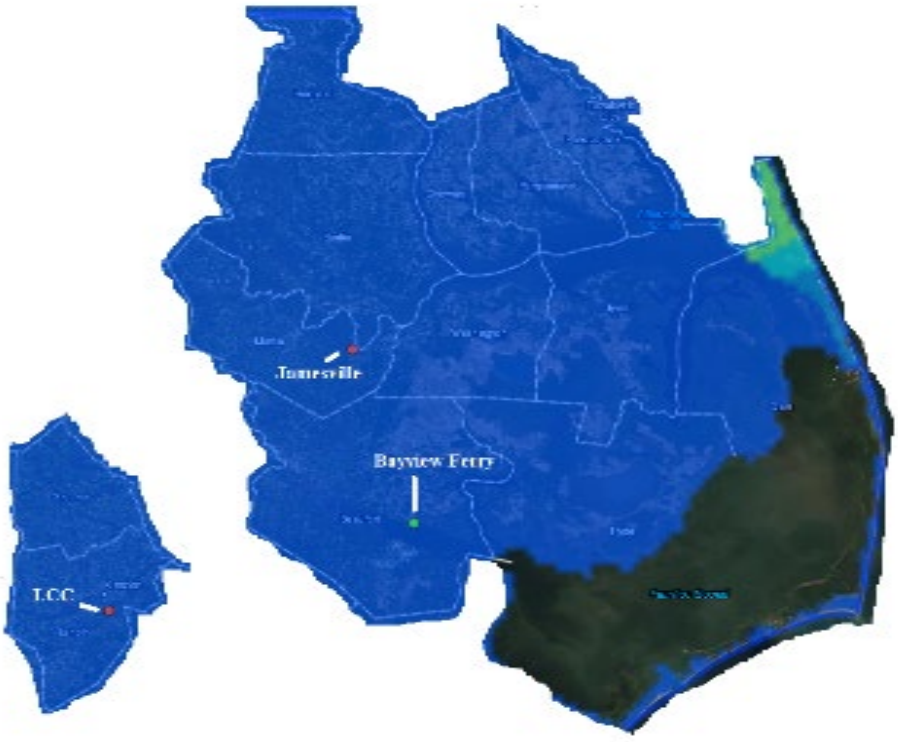


**Figure F12. Location of the monitoring sites in the Non-MSA Portion of the Washington Monitoring Region**

At the **Jamesville** site, 37-117-0001, DAQ operates a seasonal ozone monitor, a special purpose $SO_2$ monitor that operates for 12 months every three years and a special purpose $PM_{10}$ monitor that operates for 12 months every three years. Figure F13 through Figure F21 provide a view of the Jamesville site as well as views looking north, northeast, east, southeast, south, southwest, west and northwest from the site. DAQ shut down the fine-particle monitors at this site on Dec. 31, 2015.

**Figure F13. Jamesville ozone, particle and sulfur dioxide monitoring site**

Figure F14. Looking north from the Jamesville site

Figure F15. Looking northwest from the Jamesville site

Figure F16. Looking west from the Jamesville site

Figure F17. Looking northeast from the Jamesville site

Figure F18. Looking east from the Jamesville site

Figure F19. Looking southeast from the Jamesville site

Figure F20. Looking southwest from the Jamesville site

Figure F21. The Jamesville site looking south

At the **Bayview** Ferry site in Beaufort County, DAQ operates a $SO_2$ monitor. This site began operating in January 2011 to replace the Aurora $SO_2$ monitoring site. Figure F22 shows the locations of the two sites. In 2010, the PCS Phosphate manufacturing facility started logging near the Aurora $SO_2$ monitoring site, located on the fence line of their manufacturing facility. PCS rerouted the logging trucks so they no longer went by the monitoring station. They also indicated they did not plan to mine the area near the Aurora monitoring site until sometime around 2015. However, DAQ decided to relocate the monitor across the Pamlico River to the Bayview Ferry station because more people live there and this site is downwind of the PCS facility.

Figure F22. Location of the Bayview Ferry site (B) relative to the Aurora site (A)

Figure F23 to Figure F27 show the site and views looking north, east, south and west. This site is source-oriented, located downwind of the PCS Phosphate facility in Beaufort County. On July 1, 2016, the DAQ submitted a modelling analysis to the EPA demonstrating that this site is a suitable 1-hour $SO_2$ source-oriented monitoring site location to satisfy the data requirements rule for the PCS facility.[11]

**Figure F23. Bayview Ferry sulfur dioxide monitoring site**

[11] The NC Network Monitoring Plan Volume 1 Appendix K. PCS Phosphate, Inc.: Aurora Siting Analysis and Additional Site Information, July 1, 2016, available on the worldwide web at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=13149

Figure F24.The Bayview Ferry site looking north

Figure F26. Looking east from the Bayview Ferry site

Figure F25. Looking west from the Bayview Ferry site

Figure F27. The Bayview Ferry site looking south

At the **Lenoir Community College** site, 37-107-0004, DAQ operates a seasonal ozone monitor and a rotating special purpose $PM_{10}$ monitor that operates for 12 months every third year. In 2009, the college installed a screen between the monitoring site and nearby baseball field to block glare from an observatory from interfering with the people playing baseball. In 2010, the college also installed a large scoreboard. Thus, in 2011, the division moved the site to another location on the campus. Figure F28 shows the locations of the old monitoring site and the new monitoring site to the west. Figure F29 through Figure F37 provide a view of the monitoring site and views looking north, northeast, east, southeast, south, southwest, west and northwest. DAQ shut down the collocated meteorological tower measuring wind speed, wind direction, solar radiation, two-meter and 10-meter ambient temperature, relative humidity and rain fall on Nov. 3, 2014. The division shut down the fine particle monitor at this site at the end of 2013.

Figure F28. New and old LCC monitoring site locations

Figure F29. Lenoir Community College ozone monitoring site

Figure F30. Looking north from the LCC site

Figure F31. Looking northwest from the LCC site

Figure F32. Looking west from the LCC site

Figure F33. Looking southwest from the LCC site

Figure F34. Looking northeast from the LCC site

Figure F35. Looking east from the LCC site

Figure F36. Looking southeast from the LCC site

Figure F37. Looking south from the LCC site

The **lead monitoring** network requirements, as modified in 2016,[12] do not require lead monitors in this area of the Washington monitoring region. The non-MSA portion of the Washington monitoring region does not have any permitted facilities located within its bounds that emit 0.5 tons or more of lead per year.[13]

The 2015 **ozone-monitoring requirements** require monitoring to start one month earlier on March 1 instead of April 1 starting in 2017. The 2010 **nitrogen dioxide monitoring** requirements[14] did not result in additional monitoring in this area because there is not an MSA with a population of 1,000,000 or more and no roadways in this area exceed the traffic threshold. The 2010 **$SO_2$ monitoring** requirements did not increase the number of monitors in this area because the existing source-oriented monitor at Bayview is adequate and appropriately sited to serve as the required source-oriented monitor for the PCS Phosphate facility. The 2011 **changes to the carbon monoxide monitoring requirements** did not add additional monitors to the area because the population is under one million.

### (5) The North Carolina Portion of the Virginia Beach-Norfolk-Newport News MSA

The North Carolina portion of the Virginia Beach-Norfolk-Newport News MSA consists of three counties – Camden, Currituck and Gates. DAQ currently does not operate any monitoring sites in these counties. The division has an agreement with Virginia that Virginia will fulfill all North Carolina's monitoring requirements for the Camden, Currituck and Gates County portion of the Virginia Beach-Norfolk-Newport News MSA.[15]

The **lead monitoring** network requirements, as modified in 2016, [16] do not require any lead monitoring in these counties. These counties do not have any permitted facilities located within their bounds that emit 0.5 ton or more of lead per year.[17]

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[12] 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.
[13] United States Environmental Protection Agency. (2018). *TRI Explorer* (2017 Dataset (released October 2018)) [Internet database]. Retrieved from https://www.epa.gov/triexplorer, (March 23, 2019).
[14] Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Federal Register**,** Vol. 75, No. 26, Feb. 9, 2010, available on the worldwide web at https://www3.epa.gov/ttn/naaqs/standards/nox/fr/20100209.pdf.
[15] North Carolina - Virginia Monitoring Agreement, 05/09/2016, available at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7862.
[16] 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.
[17] United States Environmental Protection Agency. (2018). *TRI Explorer* (2017 Dataset (released October 2018)) [Internet database]. Retrieved from https://www.epa.gov/triexplorer, (March 23, 2019).

The 2015 **ozone monitoring requirements** did not add monitors to these counties. They are part of an MSA that already meets the population exposure monitoring requirements for urban areas.

This area is not required to add monitors to comply with the 2010 **nitrogen dioxide monitoring** requirements[18] because it does not have any roadways that exceed the traffic threshold. It also is not required to monitor by the 2010 **$SO_2$ monitoring requirements** because there are no facilities in these counties emitting large enough quantities of $SO_2$ to trigger source-oriented monitoring. This area will also not need to monitor to meet the **carbon monoxide monitoring requirements** because Virginia will meet those requirements.

[18] Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Federal Register**,** Vol. 75, No. 26, Feb. 9, 2010, available on the worldwide web at https://www3.epa.gov/ttn/naaqs/standards/nox/fr/20100209.pdf.

# Appendix F.1 Annual Network Site Review Forms for 2019

Pitt County Agricultural Center in Greenville

Jamesville

Bayview Ferry

Lenoir Community College in Kinston

# Site Review Form Calendar Year 2019

## Site Information

| | | |
|---|---|---|
| **Region** WARO | **Site Name** Pitt Ag | **AQS Site # 37-147-0006** |
| **Street Address** 403 Government Cir | | **City** Greenville |
| **Urban Area** GREENVILLE | **Core-based Statistical Area** Greenville, NC | |
| **Enter Exact** | | |
| **Longitude** -77.360126 | **Latitude** 35.641276 | **Method of Measuring** |
| In Decimal Degrees | In Decimal Degrees | **Interpolation** / **Explanation: Google Earth** |
| Elevation Above/below Mean Sea Level (in meters) | | 7.9 |

Name of nearest road to inlet probe New Hope Drive ADT _____ Year Choose an item _____

Comments: _____

Distance of site to nearest major road (m) 690.00 Direction from site to nearest major road WNW

Name of nearest major road Hwy 33 ADT 8200 Year 2018

Comments: _____

| | |
|---|---|
| Site located near electrical substation/high voltage power lines? | Yes ☒ No ☐ |
| Distance of site to nearest railroad track | (m) 789 Direction to RR WNW ☐NA |
| **OPTIONAL** 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.**

Construction planned 350 meters SSW, supposed to start in 2017 however no signs of construction yet

**ANSWER ALL APPLICABLE QUESTIONS**:

| Parameters | Monitoring Objective | Scale | Monitor Type |
|---|---|---|---|
| ☐ NA<br>☐ $SO_2$ (NAAQS)<br>☐ $SO_2$ (trace-level)<br>☐ $NO_2$ (NAAQS)<br>☐ $HSNO_y$<br>☒ $O_3$<br>☐ $NH_3$<br>☐ Hydrocarbon<br>☒ Air Toxics<br>☐ CO (trace-level) | ☐ General/Background_____<br>☐ Highest Concentration_____<br>☐ Max O3 Concentration_____<br>☒ Population Exposure_____<br>☐ Source Oriented_____<br>☐ Transport_____<br>☐ Upwind Background_____<br>☐ Welfare Related Impacts<br>_____ | ☐ Micro_____<br>☐ Middle_____<br>☐ Neighborhood_____<br>☒ Urban_____<br>☐ Regional_____ | ☒ SLAMS _____<br>☐ SPM_____<br>**Monitor Network Affiliation**<br>☐ NCORE_____<br>☐ Unofficial PAMS_____ |

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.78

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 ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 236 Direction from probe to nearest traffic lane W

# Site Review Form Calendar Year 2019

| Parameters | Monitoring Objective | Scale | Site Type |
|---|---|---|---|
| ☐ NA<br>Air flow < 200 L/min<br>☒ PM2.5 FRM<br>☐ PM10 FRM<br>☐ PM10 Cont. (BAM)<br>☐ PM10-2.5 FRM<br>☐ PM10-2.5 BAM<br>☒ PM2.5 Cont. (BAM) | ☐ General/Background _____<br>☐ Highest Concentration _____<br>☒ Population Exposure _____<br>☐ Source Oriented _____<br>☐ Transport _____<br>☐ Welfare Related Impacts _____ | ☐ Micro _____<br>☐ Middle _____<br>☐ Neighborhood _____<br>☒ Urban _____<br>☐ Regional _____ | ☒ SLAMS _____<br>☐ SPM_____<br><br>**Monitor NAAQS Exclusion**<br>☐ NONREGULATORY_____ |

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 5.13

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) 2.31 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 ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) 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 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 ☐ *Number of trees within 10 meters _____
*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 236 Direction from probe to nearest traffic lane W

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 FRM was shutdown 7/1/19 and the BAM was placed on the roof of the building Sept/Oct 2019.

Date of Last Site Pictures 12/17/19 New Pictures Submitted? Yes ☒ No ☐

Reviewer Jennifer McHone Sides Date 12/11/19

Ambient Monitoring Coordinator Jennifer McHone Sides Date December 18, 2019

# Site Review Form Calendar Year 2019

## Site Information

| | | |
|---|---|---|
| **Region** WARO | **Site Name** Jamesville | **AQS Site # 37-117-0001** |
| **Street Address** 1210 Hayes Street | | **City** Jamesville |
| **Urban Area** Not in an Urban Area | **Core-based Statistical Area** None | |
| **Enter Exact** | | |
| **Longitude** -76.9063 | **Latitude** 35.8106 | **Method of Measuring** |
| In Decimal Degrees | In Decimal Degrees | **Interpolation** / **Explanation: Google Earth** |
| Elevation Above/below Mean Sea Level (in meters) | | |

Name of nearest road to inlet probe Hayes Street ADT _____ Year Choose an item _____

Comments: Dead end road, unpaved; infrequent fram and maintenance traffic

Distance of site to nearest major road (m) 129.00 Direction from site to nearest major road SSW

Name of nearest major road US 64 ADT 7800 Year 2017

Comments: _____

| | |
|---|---|
| Site located near electrical substation/high voltage power lines? | Yes ☐ No ☒ |
| Distance of site to nearest railroad track | (m) 175 Direction to RR SSW ☐NA |
| **OPTIONAL** Distance of site to nearest power pole w/transformer | (m) 50 Direction NNE |
| 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.**

Site surrounded by cultivated cotton fields

**ANSWER ALL APPLICABLE QUESTIONS**:

| Parameters | Monitoring Objective | Scale | Monitor Type |
|---|---|---|---|
| ☐ NA<br>☒ $SO_2$ (NAAQS)<br>☐ $SO_2$ (trace-level)<br>☐ $NO_2$ (NAAQS)<br>☐ $HSNO_y$<br>☒ $O_3$<br>☐ $NH_3$<br>☐ Hydrocarbon<br>☐ Air Toxics<br>☐ CO (trace-level) | ☒General/Background_____<br>☐Highest Concentration_____<br>☐Max O3 Concentration_____<br>☐Population Exposure_____<br>☐Source Oriented_____<br>☐Transport_____<br>☐Upwind Background_____<br>☐Welfare Related Impacts<br>_____ | ☐Micro_____<br>☐Middle_____<br>☐<br>Neighborhood_____<br>☐Urban_____<br>☒Regional_____ | ☒SLAMS _____<br>☐SPM_____<br>**Monitor Network Affiliation**<br>☐NCORE_____<br>☐Unofficial PAMS_____ |

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4.50

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) 1.60

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 ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 129 Direction from probe to nearest traffic lane SSW

# Site Review Form Calendar Year 2019

| Parameters | Monitoring Objective | Scale | Site Type |
|---|---|---|---|
| ☐ NA<br>Air flow < 200 L/min<br>☐ PM2.5 FRM<br>☐ PM10 FRM<br>☒ PM10 Cont. (BAM)<br>☐ PM10-2.5 FRM<br>☐ PM10-2.5 BAM<br>☐ PM2.5 Cont. (BAM) | ☒ General/Background _____<br>☐ Highest Concentration _____<br>☐ Population Exposure _____<br>☐ Source Oriented _____<br>☐ Transport _____<br>☐ Welfare Related Impacts _____ | ☐ Micro _____<br>☐ Middle _____<br>☐ Neighborhood _____<br>☐ Urban _____<br>☒ Regional _____ | ☒ SLAMS rotating<br>☐ SPM_____<br><br>**Monitor NAAQS Exclusion**<br>☐ NONREGULATORY_____ |

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.44

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) 3.72 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 ☐

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) 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 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 ☐ *Number of trees within 10 meters _____
*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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) 129 Direction from probe to nearest traffic lane SSW

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: Rotating BAM ran until Mar/Apr 2019

Date of Last Site Pictures 12/11/19 New Pictures Submitted? Yes ☒ No ☐

Reviewer Samantha Mellott Date December 11, 2019

Ambient Monitoring Coordinator Jennifer McHone Sides DateDecember 13, 2019

# Site Review Form Calendar Year 2019

## Site Information

| | | |
|---|---|---|
| **Region** WARO | **Site Name** Bayview Ferry | **AQS Site # 37**-013-0151 |
| **Street Address**-229 Hwy 306 N | **City** Bath | |
| **Urban Area** Not in an Urban Area | **Core-based Statistical Area** None | |

| **Enter Exact** | | **Method of Measuring** | |
|---|---|---|---|
| **Longitude** -76.7399 | **Latitude** 35.4280 | | |
| In Decimal Degrees | In Decimal Degrees | Interpolation | **Explanation:** Google Earth |
| Elevation Above/below Mean Sea Level (in meters) | | 2 | |

Name of nearest road to inlet probe NC Hwy 306 ADT 200 Year latest available 2018

Comments: _____

Distance of site to nearest major road (m) 377.00 Direction from site to nearest major road N

Name of nearest major road NC Hwy 92 ADT 1600 Year latest available 2018

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) _____ 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.

Bayview ferry maintenance may cause very slight bias when occuring.

**ANSWER ALL APPLICABLE QUESTIONS:**

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

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 5.5

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) 1.35

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 ☐ *Number of trees within 10 meters 0.00

*Distance from probe to closest tree (m) 12.80 Direction from probe to tree E *Height of tree above probe (m) 13.76

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) 70 Direction from probe to nearest traffic lane NW

# Site Review Form Calendar Year 2019

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: _____

Date of Last Site Pictures 11/22/19 New Pictures Submitted? Yes ☒ No ☐

Reviewer Jennifer McHone Sides Date November 22, 2019

Ambient Monitoring Coordinator Jennifer McHone Sides Date December 13, 2019

Revised 2020-05-02

**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 2019

## Site Information

| | | |
|---|---|---|
| **Region** WARO | **Site Name** LCC | **AQS Site # 37-107-0004** |
| **Street Address** 231 Highway 58 South | | **City** Kinston |
| **Urban Area** KINSTON | **Core-based Statistical Area** Kinston, NC | |

| Enter Exact | | |
|---|---|---|
| **Longitude** -77.5669 | **Latitude** 35.2318 | **Method of Measuring** |
| In Decimal Degrees | In Decimal Degrees | **Interpolation** \| **Explanation: Google Earth** |
| Elevation Above/below Mean Sea Level (in meters) | | 15.00 |

Name of nearest road to inlet probe College Dr ADT _____ Year _____ ____

Distance of ozone probe to nearest traffic lane (m) 107 Direction from ozone probe to nearest traffic lane NNW

Comments: Campus road, a new unnamed road was built in 2017. There is no ADT available

Name of nearest major road US HWY 70 ADT 17000 Year 2018

Distance of site to nearest major road (m) 386.00 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) _____ Direction to RR ___ | ☒NA |
| **OPTIONAL** 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.

Cultivated fields on South side of site

**ANSWER ALL APPLICABLE QUESTIONS:**

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

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

Give actual measured height from ground (meters) 3.78

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) 1.02

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 ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (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 2019

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 11, 2019 New Pictures Submitted? Yes ☒ No ☐

Reviewer Jennifer McHone Sides Date: December 11, 2019

Ambient Monitoring Coordinator Jennifer McHone Sides Date: December 13, 2019

**Instructions:**

**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 F-2. Scale of Representativeness

The agency must describe each station in the monitoring network 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 about 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 match correctly 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 F2. 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 |