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# 2021-2022 Annual Monitoring Network Plan for the North Carolina Division of Air Quality

# Volume 2

# Site Descriptions by Metropolitan Statistical Area G. The Wilmington Monitoring Region



July 1, 2021



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#### G. The Wilmington Monitoring Region

The Wilmington monitoring region, shown in Figure G1, has four parts. The Wilmington metropolitan statistical area, or MSA, consists of New Hanover and Pender Counties. The North Carolina part of the Myrtle Beach-Conway-North Myrtle Beach MSA consists of Brunswick County. The Jacksonville MSA consists of Onslow County and the non-MSA portion of this monitoring region consists of Carteret, Columbus and Duplin Counties.



Figure G1. The Wilmington monitoring region
The red dots show the approximate
locations of the North Carolina Division of
Air Quality monitoring sites in this region.

#### (1) The Wilmington MSA

The Wilmington MSA consists of two counties: New Hanover and Pender. The City of Wilmington is the major metropolitan area. The North Carolina Division of Air Quality, or DAQ, currently operates one criteria pollutant monitoring site and one urban air toxics monitoring site in this MSA. The criteria-pollutant monitoring site is the Castle Hayne ozone and particle-monitoring site. The urban air toxics site is at Eagles Island, formerly known as the Battleship site.

At the Castle Hayne site, 37-129-0002, DAQ operates an ozone monitor and a continuous fine particle monitor. Figure G2 shows the site. Table G1 summarizes monitoring information for the site. Figure G3 through Figure G10 provide views looking north, northeast, east, southeast, south, southwest, west and northwest.



Figure G2. Castle Hayne ozone and particle monitoring site, 37-129-0002

**Table G1. Site Table for Castle Hayne** 

Name	Table G1.			Castle	Таупе								
MSA	Site Name:								ication N	umber:	37-129-000	)2	
Latitude   Station   12 meters   Method   12 meters   Method Reference   ID													
Parameter Name													
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Men   Men						]	EQOA-08	880-0	47 1	-Hour			
PM 2.5 local conditions, FEM		)-10			0X at 16.67				•				
Date   Monitor Established:   Ozone   My   Ozone	μm STP		LPM, 2	39		1	EQPM-0:	516-2	39 1	-Hour	every third	l year	
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Date Monitor Established         PM10 Total 0-10 μm STP         Aug. 1, 2016           Date Monitor Established:         PM 2.5 local conditions, federal equivalent method         July 1, 2017           Nearest Road:         Holly Shelter Road         Traffic Count:         3500         Year of Count:         2018           Parameter Name         Distance to Road         Traffic Count:         3500         Year of Count:         2018           Parameter Name         North northwest         SLAMS         Statement of Purpose           PM 2.5 local conditions, FEM         North northwest         SLAMS         Real-time AQI reporting. Compliance with the national ambient air quality standards (NAAQS)           PM 2.5 local conditions, FEM         Monitoring North northwest         SLAMS         Suitable to Compare to NAAQS         Proposal to Move or Change           Parameter Name         Monitoring Objective         Scale         Suitable to Compare to NAAQS         Proposal to Move or Change           PM 2.5 local conditions, FEM         Population exposure <th colsp<="" td=""><th></th><td></td><td></td><td></td><td>/SCC, 170</td><td></td><td>EQPM-0.</td><td>308-1</td><td>70 l</td><td>-Hour</td><td></td><td></td></th>	<th></th> <td></td> <td></td> <td></td> <td>/SCC, 170</td> <td></td> <td>EQPM-0.</td> <td>308-1</td> <td>70 l</td> <td>-Hour</td> <td></td> <td></td>					/SCC, 170		EQPM-0.	308-1	70 l	-Hour		
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Figure G3 Looking north from the Castle Hayne site



Figure G4. Looking northwest from the Castle Hayne site



Figure G5. Looking northeast from the Castle Hayne site



Figure G6. Looking east from the Castle Hayne site



Figure G7. Looking west from the Castle Hayne site



Figure G8. Looking southwest from the Castle Hayne site



Figure G9. Looking southeast from the Castle Hayne site



Figure G10. Looking south from the Castle Hayne site

DAQ completed one beta attenuation monitor, BAM, study in Dec. 2011. At that time, the division shut down the BAM and made the manual fine particle federal reference method, or FRM, monitor a state and local air monitoring station, or SLAMS. In 2012, DAQ installed another special purpose non-regulatory BAM and began a second BAM study at the site on Oct. 23, 2012. Comparisons for the BAM and FRM monitors are available from the United States Environmental Protection Agency, or EPA, at https://www.epa.gov/outdoor-air-qualitydata/pm25-continuous-monitor-comparability-assessments. On March 12, 2015, DAQ moved the FRM to the roof of the building and installed the BAM inside the building to help stabilize temperature and relative humidity to see if the two monitors would agree better under these conditions. Figure G11 provides the data comparison for Jan. 1, 2016, through June 30, 2017. Since DAO moved the BAM into the shelter, the BAM and FRM compare better at this site. Because of this improved agreement, the division made the BAM a SLAMS and the primary monitor at this site on Jan. 1, 2016. On Jan. 1, 2016, DAQ also made the FRM the collocated quality assurance monitor for the DAQ BAM 1020 monitoring network. However, the FRM and BAM data do not agree well enough to meet 40 CFR Part 58, Appendix A requirements, probably because the concentrations are so low, so the division shut down the collocated FRM at this site on June 30, 2017.

DAQ requires PM<sub>10</sub> data in the coastal area for Prevention of Significant Deterioration, or PSD, modeling for industrial expansion. Because DAQ shut down the PM<sub>10</sub> monitoring site in Jacksonville on Dec. 31, 2007, DAQ began manual one-in-six-day PM<sub>10</sub> monitoring at the Castle Hayne site in February 2008 to provide the necessary PM<sub>10</sub> data for PSD modeling for the coastal area. However, a wildfire next to the site forced the division to shut down the monitor on March 31, 2008. After appropriate firefighting and rains extinguished the wildfire, the division decided not to resume PM<sub>10</sub> monitoring at Castle Hayne because of the pending construction of the Titan Cement Facility across the street from the Castle Hayne site. Modeling results indicated that Titan would contribute over 10 percent of the national ambient air quality standard (NAAQS) to the PM<sub>10</sub> concentrations measured at Castle Hayne, making Castle Hayne an unsuitable site for obtaining background data to use for PSD modeling. Thus, DAQ located the PM<sub>10</sub> monitor at Kenansville in second quarter 2009. At the end of 2010, DAQ began operating the monitor on a one-in-three-year schedule and made the site one of six rotating background PM<sub>10</sub> sites for the state. The Kenansville site collected PM<sub>10</sub> data from August 2013 through July 2014. In 2016, Titan announced that they would not be building a cement facility in Castle Hayne. Since the Titan facility is no longer under consideration, DAQ collected PM<sub>10</sub> data at Castle Hayne from October 2016 to October 2017 and is collecting PM<sub>10</sub> data there from October 2020 through October 2021.

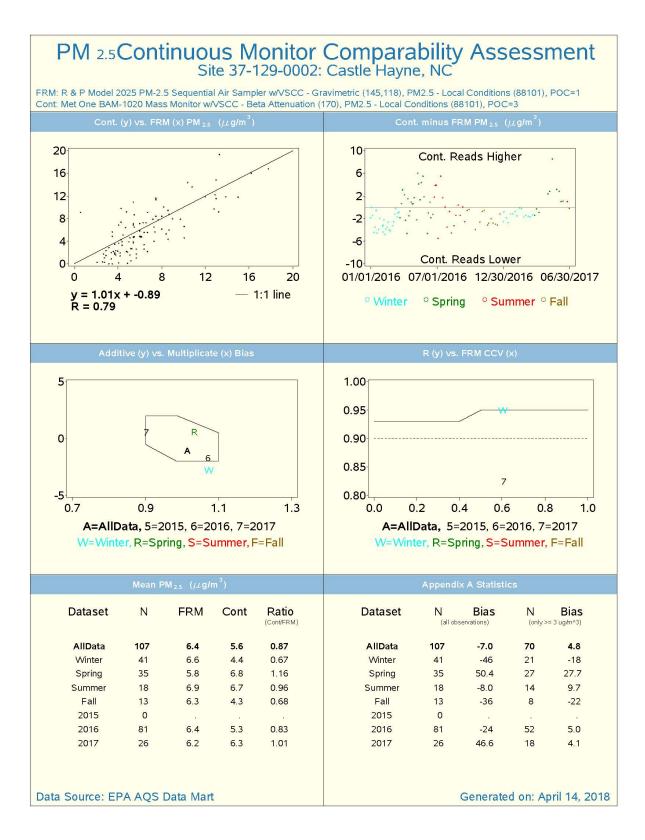


Figure G11. Comparison of BAM and FRM results at Castle Hayne after moving the BAM inside the building

When the Office of Management and Budget redefined the Wilmington MSA in February 2013, the estimated population of the Wilmington MSA dropped below 350,000. In July 2019, the United States Census Bureau estimated 297,533 people live in the Wilmington MSA. Thus, only one ozone monitor is required for the MSA if the ozone design value is above 85 percent of the NAAQS. The design value for 2018-2020 for Wilmington is at 83 percent of the standard. So currently, DAQ is not required to add additional ozone monitors in the MSA. As shown in Figure G12, the North Carolina Office of State Budget and Management projects the population in the Wilmington MSA will remain under 350,000 for at least the next decade.

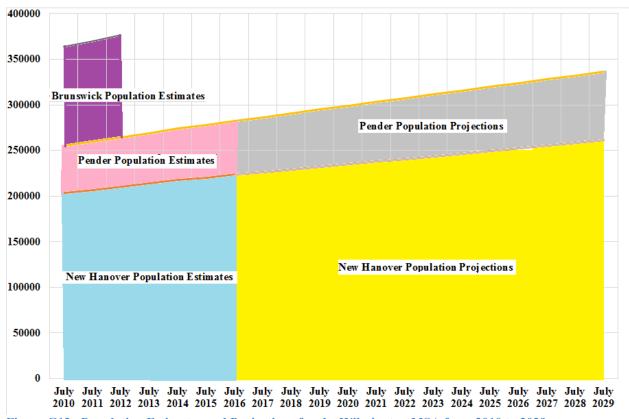


Figure G12. Population Estimates and Projections for the Wilmington MSA from 2010 to 2029
Estimates and projections are from the North Carolina Office of State Budget and Management, updated in September 2016

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<sup>&</sup>lt;sup>1</sup> Source: Cumulative Estimates of Resident Population Change and Rankings for Metropolitan Statistical Areas in the United States and Puerto Rico: April 1, 2010 to July 1, 2019, U.S. Census Bureau, Population Division, Released March 2020, available online at <a href="https://www.census.gov/newsroom/press-kits/2020/pop-estimates-county-metro.html">https://www.census.gov/newsroom/press-kits/2020/pop-estimates-county-metro.html</a>.

At the Eagles Island site, 37-129-0010, DAQ operates a year-round air toxics volatile organic compound sampler. The WIRO collects samples in stainless steel canisters and sends them to the Laboratory Analysis Branch (LAB) where the LAB analyzes them for 68 compounds using the Compendium Method for Toxic Organics 15. On Jan. 8, 2019, DAQ added a rainwater collection sampler to the site. Figure G13 through Figure G21 show the site and views looking north, northeast, east, southeast, south, southwest, west and northwest.



Figure G13. The Eagles Island urban air toxics monitoring site



Figure G14. Looking north from the Eagles Island site



Figure G15. Looking northeast from the Eagles Island site



Figure G16. Looking northwest from the Eagles Island site



Figure G17. Looking west from the Eagles Island site



Figure G18. Looking east from the Eagles Island site



Figure G19. Looking southeast from the Eagles Island site



Figure G20. Looking southwest from the Eagles Island site



Figure G21. Looking south from the Eagles Island site

In 2008, EPA expanded the **lead monitoring** network to support the lower lead NAAQS of 0.15 micrograms per cubic meter.<sup>2</sup> The 2010 changes to the lead monitoring requirements focused monitoring efforts on fenceline monitoring located at facilities that emit 0.5 ton or more of lead per year and at National Core, NCore, monitoring sites.<sup>3</sup> In 2016, the EPA removed the requirement for monitoring at NCore sites.<sup>4</sup> These changes to the lead monitoring network requirements did not require lead monitoring in the Wilmington MSA. The MSA has no permitted facilities that emit more than 0.5 tons per year of lead.<sup>5</sup>

Changes to **the ozone monitoring** requirements extended the ozone season a month. Beginning in 2017, the ozone season starts on March 1 instead of April 1.

The 2010 **nitrogen dioxide monitoring** rule does not require the Wilmington MSA to monitor for nitrogen dioxide. It is too small to require area-wide monitors or near-roadway monitoring.

<sup>&</sup>lt;sup>2</sup> National Ambient Air Quality Standards for Lead, Federal Register, Vol. 73, No. 219, \ Wednesday, Nov. 12, 2008, p. 66964, available on the worldwide web at <a href="https://www.gpo.gov/fdsys/pkg/FR-2008-11-12/pdf/E8-25654.pdf">https://www.gpo.gov/fdsys/pkg/FR-2008-11-12/pdf/E8-25654.pdf</a>.

<sup>&</sup>lt;sup>3</sup> 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 <a href="https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf/page=1">https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf/page=1</a>.

<sup>&</sup>lt;sup>4</sup> 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 <a href="https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf">https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf</a>.

<sup>&</sup>lt;sup>5</sup> Data obtained from the 2016 DAQ emission inventory database and the 2016 Toxics Release Inventory.

This MSA was also not required to do carbon monoxide monitoring because of the changes to the **carbon monoxide monitoring** requirements because the population is less than one million.

The 2010 **sulfur dioxide monitoring** rule has not required the Wilmington MSA to add additional sulfur dioxide monitors. The sulfur-dioxide monitor at the New Hanover site met the PWEI monitoring requirements for the MSA from 2011 through 2017. With the release of the 2014 National Emissions Inventory, a PWEI monitor was no longer required in this MSA so DAQ shut down the New Hanover site at the end of 2017.

#### (2) The Myrtle Beach-Conway-North Myrtle Beach MSA

The Myrtle Beach-Conway-North Myrtle Beach MSA consists of Brunswick County in North Carolina and Horry County in South Carolina. The principal cities are Myrtle Beach, Conway and North Myrtle Beach. The MSA has an estimated population as of July 2019 of 496,901 people, which requires it to have an ozone monitor. As shown in Figure G22, the South Carolina Department of Health and Environmental Control, or DHEC, started operating the Coastal Carolina ozone monitoring station on July 27, 2016.

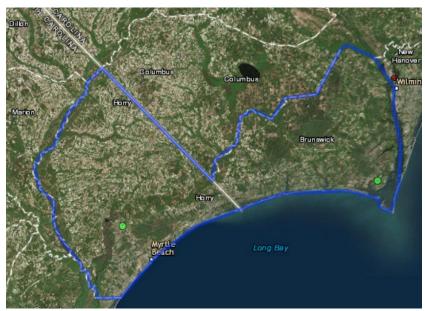


Figure G22. Monitoring sites in the Myrtle Beach-Conway-North Myrtle Beach MSA
The green dots show the locations of the Coastal Carolina ozone and the Southport DRR sulfur dioxide monitoring stations.

The Coastal Carolina ozone monitor in the Myrtle Beach area collected its first complete ozone design value in 2019. Its design value for 2017-2019 is at 86 percent of the NAAQS, requiring the MSA to have a second ozone monitor according to Appendix D of 40 CFR Part 58. Since this

Released March 2020, available online at <a href="https://www.census.gov/newsroom/press-kits/2020/pop-estimates-county-metro.html">https://www.census.gov/newsroom/press-kits/2020/pop-estimates-county-metro.html</a>.

<sup>&</sup>lt;sup>6</sup> Source: Cumulative Estimates of Resident Population Change and Rankings for Metropolitan Statistical Areas in the United States and Puerto Rico: April 1, 2010 to July 1, 2019, U.S. Census Bureau, Population Division,

design value is the first complete design value for the monitor and the 2019 design value is so close to the 85% threshold DAQ and DHEC are working with EPA Region 4 to determine the appropriate ozone monitoring for this MSA. The 2018-2020 ozone design value is less than the 85 percent threshold but does not meet the three-year completeness requirement of 90 percent. Since the 2020 census data are not yet available, DAQ has decided to delay the analysis requested by the EPA in the 2021-2022 network plan until next year. Currently, DAQ and DHEC have signed an official agreement regarding the monitoring responsibilities for the MSA. Section 4.1 of Appendix D to 40 CFR Part 58 allows the EPA flexibility in addressing ozone monitoring requirements as stated in paragraph b) below:

"b) Within an O<sub>3</sub> network, at least one O<sub>3</sub> site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area. More than one maximum concentration site may be necessary in some areas. Table D-2 of this appendix does not account for the full breadth of additional factors that would be considered in designing a complete O<sub>3</sub> monitoring program for an area. Some of these additional factors include geographic size, population density, complexity of terrain and meteorology, adjacent O<sub>3</sub> monitoring programs, air pollution transport from neighboring areas, and measured air quality in comparison to all forms of the O<sub>3</sub> NAAQS (i.e., 8-hour and 1-hour forms). Networks must be designed to account for all of these area characteristics. Network designs must be re-examined in periodic network assessments. Deviations from the above O<sub>3</sub> requirements are allowed if approved by the EPA Regional Administrator."

Besides the ozone monitoring site operated by DHEC, DAQ operates an industrial sulfur dioxide monitoring site, Southport DRR, in this MSA. In 2016, DAQ began working with CPI USA North Carolina Southport to establish a sulfur dioxide monitoring station in Southport, North Carolina, to characterize the ambient sulfur dioxide concentrations near the CPI facility as required by Special Order by Consent 2016-001.<sup>8</sup> The area chosen for placement of the monitor was selected using the results of modeling done as described in the technical assistance document for source-oriented monitoring<sup>9</sup> and was reported in an addendum to the 2016-2017 network plan. Figure G-23 provides an aerial view of the monitoring location.

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 $\underline{http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download\&documentId=6786.}$ 

<sup>&</sup>lt;sup>7</sup> Memorandum of Agreement (MOA) on Criteria Monitoring Between SCDHEC and NCDENR DAQ, July 1, 2015, Available on the worldwide web at

<sup>&</sup>lt;sup>8</sup> Special Order by Consent CPI USA North Carolina, LLC, SOC 2016-001, June 24, 2016, available on the worldwide web at <a href="https://files.nc.gov/ncdeq/Air+Quality/compliance/soc/CPI">https://files.nc.gov/ncdeq/Air+Quality/compliance/soc/CPI</a> USA NC Southport SOC 2016-001.pdf.

<sup>&</sup>lt;sup>9</sup> SO<sub>2</sub> NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, December 2013, Draft.

<sup>&</sup>lt;sup>10</sup> Appendix L. CPI Southport Siting Analysis and Additional Site Information, North Carolina Division of Air Quality, Sep. 1, 2016. Available on the worldwide web at <a href="http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=9275">http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=9275</a>.



Figure G-23. Aerial view showing the location of the Southport DRR monitoring station

DAQ assigned this monitor the Air Quality System, AQS, identification number 37-019-0005-42401-1. DAQ operates this monitor in collaboration with CPI Southport to ensure the air in the Southport area complies with the national ambient air quality standards for sulfur dioxide. The division operates the monitor following the DAQ Sulfur Dioxide DRR quality-assurance project plan and the monitor is part of the DAQ primary quality assurance organization. Figure G-24 through Figure G-32 show the site and views from the site looking north, northeast, east, southeast, south, southwest, west and northwest.



Figure G-24. Southport DRR sulfur dioxide monitoring site



Figure G-25. Southport DRR site looking north



Figure G-26. Southport DRR site looking northwest



Figure G-27. Southport DRR site looking northeast



Figure G-28. Southport DRR site looking east



Figure G-29. Southport DRR site looking west



Figure G-31. Southport DRR site looking southwest



Figure G-30. Southport DRR site looking southeast



Figure G-32. Southport DRR site looking south

The monitoring site is located 30 meters from the trees to the east. DAQ estimates the tallest trees to be 15 meters in height. The nearest road is Rob Gandy Boulevard located 83 meters to the south-southeast. This road does not have traffic count data; however, as shown in Figure G-33, secondary road number 1526, Jabbertown Road, further south than Rob Gandy Boulevard, had an average annual daily traffic count of 4,600 in 2014. The division expects traffic on Rob Gandy Boulevard to be less than that on Jabbertown Road. The probe height is 4.8 meters.

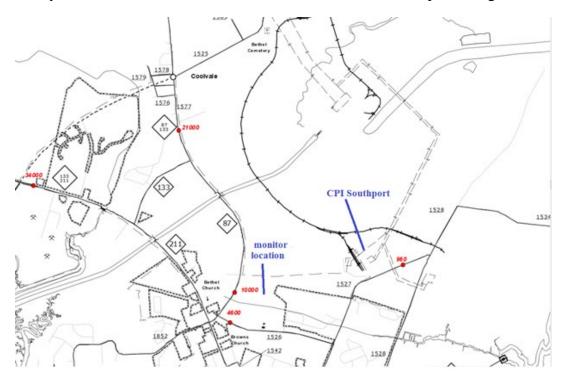


Figure G-33. 2014 Traffic count map (from NC DOT)

The AQS identification number and street address for the site is 37-019-0005 and 5538 Rob Gandy Blvd SE, Southport, NC 28461. The latitude and longitude is 33.942288 and -78.019265. The sampling and analysis method is AQS code 560, Thermo Electron 43i-TLE pulsed fluorescent instrument, EQSA-0486-060, and the operating schedule is hourly. The monitoring objective is source-oriented. Figure G-34 shows the location of the monitoring station relative to the population center of Brunswick County in the Southport area.

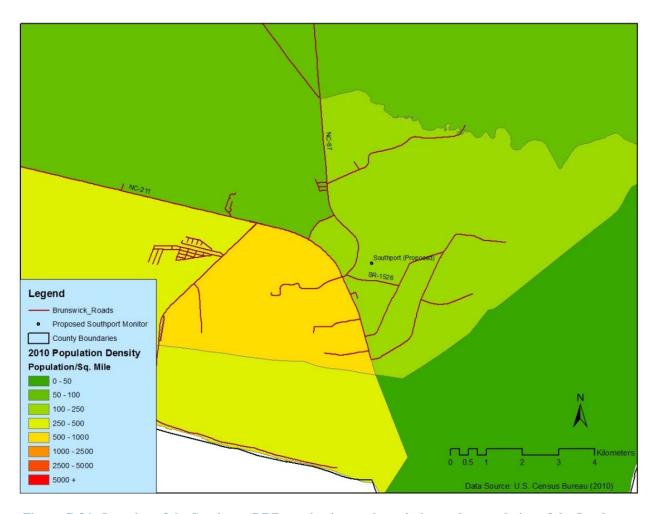
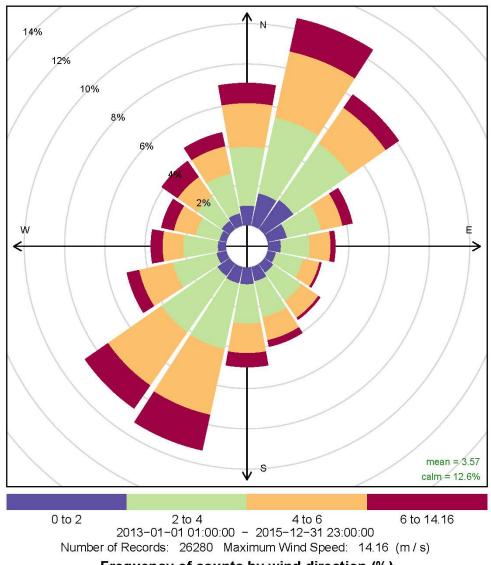


Figure G-34. Location of the Southport DRR monitoring station relative to the population of the Southport area in Brunswick County

Based on the wind rose in Figure G35, the Southport DRR monitoring station is located downwind of the CPI Southport plant. Figure G35 is a wind rose representing the 3-year period (2013 to 2015) for Wilmington, NC, surface meteorological data. As expected, the greatest frequency of occurrence or tendency of wind speed and direction occurred within the northeast quadrant. There is also a high frequency of wind speed and direction from the southwest, which is consistent with the direction of prevailing wind flow patterns for much of North Carolina. The high frequency of winds from the northeast direction likely coincides with colder ridge air masses to the north/northeast and coastal low-pressure systems off the coast during winter and early spring.

#### Wilmington International Airport (KILM) 2013–2015



Frequency of counts by wind direction (%)

Figure G35. Wind rose from the Wilmington International Airport for 2013 to 2015

The spatial scale of representativeness for the monitor is neighborhood based on the distance of the monitor from the source. The monitor is located approximately 600 meters southwest from the property line of the CPI Southport facility. This monitor is representative of the air quality downwind from the fenceline of the CPI Southport facility. Table G2 summarizes other factors DAQ evaluated when choosing the location for the monitoring station.

Table G2. Other considerations in site selection

Factor	Evaluation
Long-term Site Commitment	The property owner is willing to provide DAQ with a long-term lease agreement and does not plan to develop the current area any time in the next three years
Sufficient Operating Space	10-meter by 10-meter area free of brush and 70-meter by 150-meter area free of trees and buildings
Access and Security	The building will be located by a driveway onto the property off either a lumber road or the nearby Rob Gandy Boulevard so it has easy access.
Safety	DAQ obtained the appropriate electrical permits.
Power	Overhead powerlines are located 130 meters northwest of the site.
Environmental Control	DAQ placed the monitoring shelter with the door to the north so that sunlight will not shine in through the window and warm up the building.
Exposure	The monitoring station will be at least 30 meters from the driplines of trees and will not be near any trees or buildings that could be an obstacle to air flow.
Distance from Nearby Emitters	The only permitted facility within 0.5 miles of the location is CPI Southport. There are two other facilities that are within one mile:
	S & W Ready Mix Concrete, located at 1619 N Howe Street, 960 meters west southwest of the Southport DRR monitoring station, emitted 0.4 tons of PM10 and 0.4 tons of TSP in 2014.
	<b>Duke Energy Progress – Brunswick Plant</b> , located at 8470 River Road, 1500 meters north northeast of the Southport DRR monitoring station, emitted 1.9 tons of SO2, 12.6 tons of NOx, 0.3 tons of VOC, 3.3 tons of CO and 0.4 tons of TSP in 2014.
Proximity to Other Measurements	The Southport DRR monitoring station is located about 4.5 kilometers east of the Brunswick County Airport.

As stated in Appendix D to Volume 1 of this network plan, DAQ is planning on shutting this monitoring station down in third quarter 2021, after the area is redesignated as attainment/unclassifiable, because the CPI Southport facility ceased operations on March 31, 2021. With the facility no longer operating, there is no longer a need to continue operating this monitoring site.

Changes to the **lead monitoring network** requirements in 2010,<sup>11</sup> as revised in 2016,<sup>12</sup> did not result in additional monitoring in this MSA. Changes to the **ozone monitoring requirements** in 2015 did not require additional monitoring in the Myrtle Beach-Conway-North Myrtle Beach MSA other than the ozone monitor that is already required and the extension of the ozone season by one month.

This MSA is also not required to do nitrogen dioxide monitoring by the 2010 **nitrogen dioxide monitoring** requirements. It is too small to require area-wide monitors or near roadway monitoring. The 2010 **sulfur dioxide monitoring** requirements did not require the Myrtle Beach-Conway-North Myrtle Beach MSA to monitor for sulfur dioxide. However, the North Carolina Environmental Management Commission required the CPI USA North Carolina LLC to conduct monitoring downwind of their Southport facility. DAQ performed modeling demonstrating that the facility operating at its allowable emission limits would exceed the standard. The 2016-2017 Network Plan Volume 1, Appendix L. CPI Southport Siting Analysis and Additional Site Information provides more information on this facility and monitor. <sup>13</sup> The **changes to the carbon monoxide monitoring requirements** will not require this MSA to monitor for carbon monoxide because the population is less than one million.

#### (3) The Jacksonville MSA

The Jacksonville MSA consists of Onslow County. The principal city is Jacksonville. DAQ does not operate any monitoring stations in the Jacksonville MSA. DAQ shut down the Jacksonville particle-monitoring site on Dec. 31, 2007, because the measured concentrations were less than 80 percent of the NAAQS.

Changes to the **lead monitoring network** requirements in 2010,<sup>14</sup> as revised in 2016,<sup>15</sup> did not result in adding lead monitors to the MSA. Jacksonville had a permitted facility that emitted 0.5 tons or more per year of lead in 2009. <sup>16</sup> However, lead emissions at Camp Lejeune in 2010 were

<sup>&</sup>lt;sup>11</sup> 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 <a href="https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf/page=1">https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf/page=1</a>.

<sup>&</sup>lt;sup>12</sup> 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 <a href="https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf">https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf</a>.

<sup>&</sup>lt;sup>13</sup> Appendix L. CPI Southport Siting Analysis and Additional Site Information, North Carolina Division of Air Quality, Sep. 1, 2016. Available on the worldwide web at <a href="http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=9275">http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=9275</a>.

<sup>&</sup>lt;sup>14</sup> 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 <a href="https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1">https://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf#page=1</a>.

<sup>&</sup>lt;sup>15</sup> 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 <a href="https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf">https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf</a>.

<sup>&</sup>lt;sup>16</sup> United States Environmental Protection Agency. 2009 Toxic Release Inventory, released March 2010, available on the worldwide web at <a href="https://iaspub.epa.gov/triexplorer/tri">https://iaspub.epa.gov/triexplorer/tri</a> release.chemical.

below the 0.5-ton threshold. <sup>17</sup> The EPA concurred that actual emissions were less than 0.5 ton and did not require monitoring at the facility fenceline. <sup>18</sup> The lead emissions in 2019 are still below 0.5 ton. <sup>19</sup>

Changes to the **ozone monitoring requirements** did not result in additional monitoring in the Jacksonville MSA. Its population is above the threshold for requiring population exposure monitoring in urban areas but monitoring is not required because it does not have an ozone design value. Currently, DAQ does not monitor for ozone in Jacksonville because the ozone levels measured by the Castle Hayne monitor in New Hanover County indicate that the ozone concentrations on the coast are at 84 percent of the 2015 standard of 70 parts per billion. As shown in Figure G36, models consistently show low ozone levels in the Jacksonville MSA and that the probability of exceeding the standard in Jacksonville is less than 20 percent.

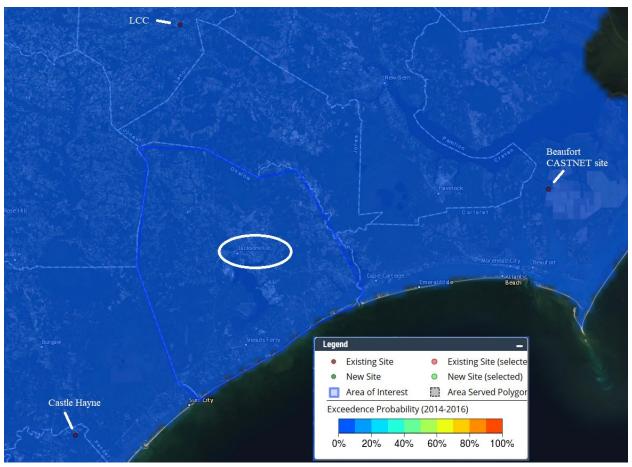


Figure G36. Probability of ozone exceeding the 2015 standard at least once in the Jacksonville MSA

<sup>17</sup> United States Environmental Protection Agency. 2010 Toxic Release Inventory, released March 2011, available on the worldwide web at https://iaspub.epa.gov/triexplorer/tri\_release.chemical.

<sup>&</sup>lt;sup>18</sup> 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 <a href="http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7843">http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=7843</a>
<sup>19</sup> United States Environmental Protection Agency. (2021). TRI Explorer (2019 Updated Dataset (released March 2021)) [Internet database]. Retrieved from <a href="https://www.epa.gov/triexplorer">https://www.epa.gov/triexplorer</a>, (May 1, 2021).

The Jacksonville MSA did not add nitrogen dioxide monitors to comply with the 2010 **nitrogen dioxide monitoring** requirements. It is too small to require area-wide monitors or near-roadway monitoring. The Jacksonville MSA also did not need to add monitors to comply with the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in the MSA and the population is not large enough to require a PWEI monitor. This MSA is also not required to do carbon monoxide monitoring by the changes to the **carbon monoxide monitoring** requirements because the population is less than one million people.

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

The non-MSA portion of the Wilmington monitoring region consists of three counties - Carteret, Columbus and Duplin. This area has no MSAs. DAQ currently operates one monitoring site here and the EPA operates a clean air status and trends network, CASTNET, site in Beaufort in Carteret County. The CASTNET network plan discusses the CASTNET sites. The CASTNET network plan is available at

http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=13138. This section further discusses the one DAQ site. The DAQ site is a Mercury Deposition Network, MDN, site at Lake Waccamaw State Park. The division shut down the Kenansville particle monitoring station Dec. 31, 2015.

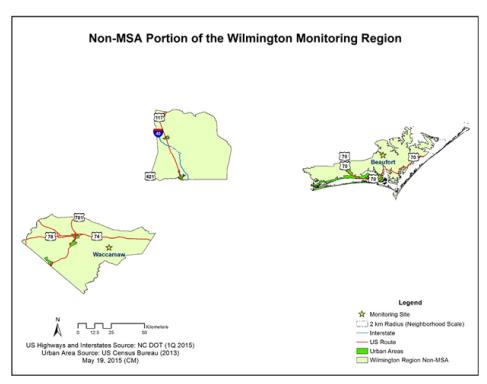


Figure G37. Monitoring site locations

At the **Lake Waccamaw** MDN site in Columbus County, DAQ operates a weekly mercury deposition monitor to measure total mercury, Hg, concentration and deposition in precipitation. The division upgraded the site to more modern equipment in 2014. Currently, DAQ is looking

for an alternate location for the site because of the growth of the nearby trees. Although the division wanted to collocated the MDN site at Castle Hayne, the Castle Hayne site did not meet the MDN siting criteria for a background site because it is too close to industrial sources. Figure G38 through Figure G46 provide a picture of the site as well as views looking north, northeast, east, southeast, south, west and northwest.



Figure G38. The Lake Waccamaw (NC08) MDN site



Figure G39. Looking north from the Lake Waccamaw MDN site



Figure G40. Looking northwest from the Lake Waccamaw MDN site



Figure G41. Looking northeast from the Lake Waccamaw MDN site



Figure G42. Looking east from the Lake Waccamaw MDN site



Figure G43. Looking west from the Lake Waccamaw MDN site



Figure G44. Looking southwest from the Lake Waccamaw MDN site



Figure G45. Looking southeast from the Lake Waccamaw MDN site



Figure G46. Looking south from the Lake Waccamaw MDN site

The 2010 **lead monitoring** requirements did not result in lead monitoring in these counties. No permitted facilities emitting 0.5 ton or more of lead per year are located in this area.<sup>20</sup> The new **ozone monitoring** requirements did not require additional monitoring in these counties. There is no MSA so population exposure monitoring requirements for urban areas do not apply. The 2010 **nitrogen dioxide** monitoring requirements also did not add monitors to these counties. These counties are too small to require area-wide monitors or near road monitoring. These counties did not need to add monitors to meet the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in them and their populations are too small to require a PWEI monitor. The changes to the **carbon monoxide monitoring** requirements did not require monitoring in these counties because their populations are under one million.

<sup>20</sup> ibid.

# **Appendix G.1 Annual Network Site Review Forms for 2020**

Castle Hayne

Eagles Island in Wilmington

Southport DRR

Lake Waccamaw MDN

# **Site Information**

Region_WIRO Site Name Castle Hayne				AQS Site # 37- <u>129</u> - <u>0002</u>				
Street Address-6028 Holly Shelter Road				City Castle Hayne				
Urban Area Not in an Urban Area Core-based Sta				Stati	stical Area V	Vilmington, 1	NC	
	Enter E	xact						
Latitude -77.838	<u>8611</u>	Longitude	34.36416	_		ethod of M		
In Decimal Degrees		In Decimal Deg			Other (explain)	Explanat	ion: <u>Goog</u>	le Earth
Elevation Above/below						8		
Name of nearest road to in	let probe	Holly Shelter Ro	<u>ad</u> ADT 38	800 Y	ear latest availabl	le <u>2019</u>		
Comments: No ADT Ava	<u>ilable</u>							
Distance of site to nearest	major roa	d (m) 4500.00 E	irection from	m site	to nearest major	road <u>WSW</u>		
Name of nearest major roa	d <u>I-40</u> A	DT <u>38000</u> Year	2019					
Comments:								
Site located near electrical	substation	n/high voltage po	wer lines?				Yes 🗌	No 🛛
Distance of site to neare	st railroa	d track			(m)	Direction		⊠NA
**OPTIONAL** Distar						(m)	_ Dire	ection
Distance between site and								<b>⊠</b> NA
Explain any sources of p						e, stacks, ver	its, railroad i	racks,
construction activities, f	ast food i	restaurants, and	swimming	g pool	lS.			
		8						
ANSWER ALL APPLIC	ADIFO	HESTIANS.						
Parameters Parameters		lonitoring Object	etive		Scale		Monitor Typ	e
_						,	•	
$\square$ NA $\square$ SO <sub>2</sub> (NAAQS)	_	eral/Background_			Micro	☐ SLA	.MS	
$\square$ SO <sub>2</sub> (trace-level)	High	nest Concentratio	n		Middle	SPM	1	
NO <sub>2</sub> (NAAQS)	Max	O3 Concentration	n	$\Box$		Monito	r Network	
☐HSNO <sub>y</sub>	⊠Рорі	ılation Exposure_		NI-:	-1.111	Affiliat		
	Sour	ce Oriented	_		ghborhood	NCC	ORE	
Hydrocarbon	Tran	sport			Urban		fficial PAMS	
Air Toxics	Upw	ind Background_			Regional		inciai i Aivio	
CO (trace-level)	☐ Welt	fare Related Impa	acts					
D 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		15 0 11 🗖				1 1 1 2		
Probe inlet height (from g					actual measured	-		
Distance of outer edge of	probe inte	et from horizontal	l (wall) and/o	or ver	rtical (root) suppor	rting structure	> 1 m? Yes	X No
Actual measured distance	from oute	er edge of probe t	o supporting	g struc	cture (meters) 2.0	0		
Distance of outer edge of				_	, , ,		s 🛛 No 🗌	NAΠ
Is probe > 20 m from the					answer *'d questie			
*Is probe > 10 m from the	e nearest t	ree drip line?	Yes □ *No	0 🔲 :	*Number of trees	within 10 met	ers	
*Distance from probe to o	losest tree	e (m) 7.00 Dire	ction from p	robe t	to tree W *Heigl	ht of tree abov	e probe (m)	
Are there any obstacles to							1 (/-	
*Identify obstacle	Distance	from probe inlet	(m)	Direc	tion from probe in	nlet to obstacle	e	
*Is distance from inlet pro		_						¬ No
					Protect		r-200. 2001	
Distance of probe to nearest traffic lane (m) 59 Direction from probe to nearest traffic lane NNW								

Parameters	Monitoring Objective	Scale	Site Type
□NA	General/Background	Micro	□SLAMS
Air flow < 200 L/min ☐ PM2.5 FRM			$\square$ SPM_PM-10 = T640X not BAM
PM10 FRM	Highest Concentration	Middle	Si W_I W-10 TO-OX NOT BAN
PM10 Cont. (BAM)	☑Population Exposure	Neighborhood	
☐ PM10-2.5 FRM	Source Oriented	Urban	Monitor NAAQS Exclusion
☐ PM10 <b>-</b> 2.5 BAM	Transport	Regional	NONREGULATORY
PM2.5 Cont. (BAM)	Welfare Related Impacts		
Probe inlet height (from	ground)		> 15 m
Actual measured distance	e from probe inlet to ground (meters)		
Distance of outer edge of	probe inlet from horizontal (wall) as	nd/or vertical (platform or	
Actual measured distance	e from outer edge of probe inlet to su	pporting structure (meters)	) $2.0$ Yes $\square$ No
D: 4 (201 4		1 2 1 1	1900
low volume monitor at the	ter edge of probe inlets of any low vo	olume monitor and any our	Yes ⊠ No □ NA □
	onitors (Two FRMs, FRM & BAM,	BAM & -	
BAM) Located at Site?	omitors (100 11 avis, 11 avi & Bi ivi,	*Yes ∐ (a	ınswer *'d questions) No 🛛 NA
* Entire inlet opening of	collocated PM 2.5 samplers (X) with	nin 2 to 4 m of	
each other?	conocated 1 Wi 2.5 samplets (A) with		No ☐ Give actual (meters)
	ampler inlets within 1 m vertically of		
			No Give actual (meters)
	nonitor collocated with a PM2.5 mon	itor at the *Yes 🛛 (	answer *'d questions) No \( \subseteq \text{NA}
site to measure PM10-2.5	) <i>?</i>		
	collocated PM10 and PM2.5sampler	rs for PM10-2.5 (X)	Yes ⊠ No □
within 2 to 4 m of each o			
	nd PM2.5 sampler inlets within 1 m v nearest tree drip line? Yes X	*No (answer *'d questi	Yes No No
-	•	_ ` .	
	e nearest tree drip line? Yes \( \begin{align*} \text{*} \\		
*Distance from probe to	closest tree (m) Direction fr	om probe to tree *H	eight of tree above probe (iii)
Are there any obstacles to	o air flow? *Yes [ (answer *'d que	stions) No 🛛	
	Distance from probe inlet (m)		et to obstacle
	obe to obstacle at least twice the heigh		
Distance of probe to near	rest traffic lane (m) 59 Direction f	rom probe to nearest traffi	c lane <u>NNW</u>
RECOMMENDATIONS			
1) Maintain current site s	tatus? Yes 🛛 *No 🗌 (answer *	'd questions)	
*2) Change monitoring o	bjective? Yes ☐ (enter new objective)	ctive No 🔲-	
	esentativeness? Yes [ (enter new		
	□ No □		
	_		
Comments: PM-10 is a To	1900 pr. (10 1810)		
Date of Last Site Pictures	11/16/2020 New Pictures Su	ıbmitted? Yes ☑ No ☐	
Reviewer Tony Sabetti			Date <u>December 18, 2020</u>
Ambient Monitoring Coo	rdinator Tony Sabetti		DateDecember 18, 2020

# **Site Information**

Region_WIRO Site Name Eagle Island			AQS Site # 37- <u>129</u> - <u>0010</u>			
Street Address-1 Battleship Road			City Wilmington			
Urban Area WILMINGTON Core-based Statistical Area Wilmington, NC					NC	
10 10 10 10 10 10 10 10 10 10 10 10 10 1	Enter E					
Latitude <u>-77.95</u>	<u>586389</u>	Longitude	<b>5</b> 2644		Mothed of N	T
In Decimal Degrees		34.235 In Decimal Degrees	53611	Other (expla	Method of M	tion: <u>Google Eart</u>
Elevation Above/below	Maan Sa			Other (expla	<u>шл   Ехріана</u> 5	tion: Google Lart
Name of nearest road to in			Ye	ar Choose an i	tem <u>s</u>	
Comments: No ADT Ava						
Distance of site to nearest		1 (m) 262.00 Direction f	om site	to nearest majo	or road <u>W</u>	
Name of nearest major roa	d <u>US HW</u>	VY 421 ADT 38000 Yes	r <u>2019</u>			
Comments:						
Site located near electrical	substation	hhigh voltage power line	?			Yes No 🛛
Distance of site to neare	1999			(m)	Direction	on to RR N
**OPTIONAL** Distar					(m)	Direction
Distance between site and						NA
Explain any sources of properties of construction activities, f					rage, stacks, ve	nts, railroad tracks,
construction activities, i	ast 1000 1	estaurants, and swimin	ing poo	15.		
ANSWER ALL APPLIC	CABLE QU	UESTIONS:				
Parameters	M	onitoring Objective		Scale		Monitor Type
□NA	Gene	ral/Background	-	Micro		AMS
$\square$ SO <sub>2</sub> (NAAQS)	_	ral/Background		Micro		AMS
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)	High	est Concentration		Middle	⊠SPN	1 UAT & GenX Dep.
$\square$ SO <sub>2</sub> (NAAQS)	High Max	est Concentration O3 Concentration			SPN Monito	M <u>UAT &amp; GenX Dep.</u> or Network Affiliation
□ SO <sub>2</sub> (NAAQS) □ SO <sub>2</sub> (trace-level) □ NO <sub>2</sub> (NAAQS) □ HSNO <sub>y</sub> □ O <sub>3</sub>	Higho	est Concentration		Middle	⊠SPN	M <u>UAT &amp; GenX Dep.</u> or Network Affiliation
□ SO <sub>2</sub> (NAAQS) □ SO <sub>2</sub> (trace-level) □ NO <sub>2</sub> (NAAQS) □ HSNO <sub>y</sub> □ O <sub>3</sub> □ NH <sub>3</sub>	Higho	est Concentration O3 Concentration lation Exposure		Middle Neighborhood_ Urban	Monito	M <u>UAT &amp; GenX Dep.</u> or Network Affiliation
□ SO <sub>2</sub> (NAAQS) □ SO <sub>2</sub> (trace-level) □ NO <sub>2</sub> (NAAQS) □ HSNO <sub>y</sub> □ O <sub>3</sub>	Higho	est Concentration O3 Concentration lation Exposure ce Oriented		Middle Neighborhood_	Monito	MUAT & GenX Dep.  or Network Affiliation  ORE
□ SO <sub>2</sub> (NAAQS) □ SO <sub>2</sub> (trace-level) □ NO <sub>2</sub> (NAAQS) □ HSNO <sub>y</sub> □ O <sub>3</sub> □ NH <sub>3</sub> □ Hydrocarbon	Higho	est Concentration O3 Concentration lation Exposure ce Oriented sport		Middle Neighborhood_ Urban	Monito	MUAT & GenX Dep.  or Network Affiliation  ORE
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g	Highe Max Popu Sourc Trans Upwi Welfa	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts 5 m? Yes No	Give	Middle Neighborhood_ Urban Regional e actual measur	Monito  Monito  NCo  Unco  red height from g	MUAT & GenX Dep.  Or Network Affiliation  ORE  official PAMS  cround (meters) 4.00
☐ SO <sub>2</sub> (NAAQS) ☐ SO <sub>2</sub> (trace-level) ☐ NO <sub>2</sub> (NAAQS) ☐ HSNO <sub>y</sub> ☐ O <sub>3</sub> ☐ NH <sub>3</sub> ☐ Hydrocarbon ☐ Air Toxics ☐ CO (trace-level)	Highe Max Popu Sourc Trans Upwi Welfa	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts 5 m? Yes No	Give	Middle Neighborhood_ Urban Regional e actual measur	Monito  Monito  NCo  Unco  red height from g	MUAT & GenX Dep.  Or Network Affiliation  ORE  official PAMS  cround (meters) 4.00
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g	Highe Max Popu Source Trans Upwi Welfa ground) 2-1 probe inles	est ConcentrationO3 Concentrationlation Exposureee Orientedsportind Backgroundare Related Impacts  5 m? Yes Not from horizontal (wall) a	Givend/or ve	Middle Neighborhood_ Urban Regional e actual measur	Monito  Monito  NCo  Unco  red height from goporting structure	MUAT & GenX Dep.  Or Network Affiliation  ORE  official PAMS  cround (meters) 4.00
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g Distance of outer edge of Actual measured distance	Higher Max Popu Source Trans Upwi Welfaround) 2-1 probe inlet	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts t from horizontal (wall) are edge of probe to support	Givend/or verting stru	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sup	Monitor   NCo	MUAT & GenX Dep.  or Network Affiliation  ORE  official PAMS  ground (meters) 4.00  c> 1 m? Yes ⊠ No
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g Distance of outer edge of Actual measured distance Distance of outer edge of	Highe Max Popu Source Trans Upwi Welfa round) 2-1 probe inlete	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts t from horizontal (wall) a r edge of probe to support t from other monitoring p	Givend/or verting stru	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sur cture (meters) ets > 1 m?	Monito  Monito  NCo  Unco  red height from goporting structure  0.000	MUAT & GenX Dep.  Or Network Affiliation  ORE  official PAMS  cround (meters) 4.00
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g Distance of outer edge of Actual measured distance	Higher Max Noppu Source Trans Upwi Welfa ground) 2-1 probe inlete	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts t from horizontal (wall) a r edge of probe to support t from other monitoring period of the control of the contr	Givend/or verting stru	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sup cture (meters) ets > 1 m? (answer *'d que	Monitor  Monitor  Monitor  NCo  Unco  red height from groporting structure  0.00  Your  estions)	MUAT & GenX Dep.  Or Network Affiliation  ORE  official PAMS  ground (meters) 4.00  e> 1 m? Yes ☒ No  es ☒ No ☐ NA ☐
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g Distance of outer edge of Actual measured distance Distance of outer edge of Is probe > 20 m from the	Higher Max Popur Source Trans Upwire Welfaround) 2-1 probe inlete from outer probe inlete nearest tree	est ConcentrationO3 Concentration	Givend/or verting structure in the interest of	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sur cture (meters) ets > 1 m? (answer *'d que *Number of tre	Monitor   NCo   Nc	MUAT & GenX Dep.  Or Network Affiliation  ORE  Official PAMS  Fround (meters) 4.00  E > 1 m? Yes No  ORS NO NA ORS NA ORS NO  Test No NA ORS
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g Distance of outer edge of Actual measured distance Distance of outer edge of Is probe > 20 m from the	Higher Max Popur Source Trans Upwing Welfaround) 2-1 probe inlete probe inlete nearest tree encarest tree closest tree	est ConcentrationO3 Concentration	Givend/or verting stru	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sup cture (meters) ets > 1 m? (answer *'d que *Number of tre et to tree	Monitor  Monitor  Monitor  NCo  Unco  red height from groporting structure  0.00  Your  estions)	MUAT & GenX Dep.  Or Network Affiliation  ORE  Official PAMS  Fround (meters) 4.00  E > 1 m? Yes No  ORS NO NA ORS NA ORS NO  Test No NA ORS
SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level) NO <sub>2</sub> (NAAQS) HSNO <sub>y</sub> O <sub>3</sub> NH <sub>3</sub> Hydrocarbon Air Toxics CO (trace-level)  Probe inlet height (from g Distance of outer edge of Actual measured distance Distance of outer edge of Is probe > 20 m from the *Is probe > 10 m from the	Higher Max Popur Source Trans Upwing Welfa Ground) 2-1 probe inlet from oute probe inlet nearest tree e nearest tree closest tree air flow?	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts t from horizontal (wall) a r edge of probe to support t from other monitoring per drip line? Yes  ce drip line? Yes  c	Give and/or versing structure ober inlered in the control of the c	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sur cture (meters) ets > 1 m? (answer *'d que *Number of tre the to tree No \(\sigma\)	monitor   No.00   You can be within 10 me   *Height of tree and the specific structure   You can be within 10 me   *Height of tree and the specific structure   You can be within 10 me   *Height of tree and the specific structure   You can be within 10 me   *Height of tree and the specific structure   You can be speci	MUAT & GenX Dep.  or Network Affiliation  ORE official PAMS  ground (meters) 4.00  c>1 m? Yes No  es No NA   ters above probe (m)
□ SO <sub>2</sub> (NAAQS) □ SO <sub>2</sub> (trace-level) □ NO <sub>2</sub> (NAAQS) □ HSNO <sub>y</sub> □ O <sub>3</sub> □ NH <sub>3</sub> □ Hydrocarbon □ Air Toxics □ CO (trace-level)  Probe inlet height (from g Distance of outer edge of □ Actual measured distance Distance of outer edge of Is probe > 20 m from the *Is probe > 10 m from the *Distance from probe to c Are there any obstacles to	Higher Max Popul Source Trans Upwing Welfaround) 2-1 probe inlet nearest tree enearest ene	est Concentration O3 Concentration lation Exposure ce Oriented sport ind Background are Related Impacts t from horizontal (wall) a r edge of probe to support from other monitoring per drip line? Yes   (m) Direction fi *Yes (answer *'d que from probe inlet (m) acle at least twice the hei	Givend/or versing structobe inless in the structobe in th	Middle Neighborhood_ Urban Regional e actual measur rtical (roof) sur cture (meters) ets > 1 m? (answer *'d que *Number of tre to tree No \bigsize ction from prob the obstacle pro	Monitor Monito	MUAT & GenX Dep.  or Network Affiliation  ORE official PAMS  ground (meters) 4.00  e> 1 m? Yes No  es No NA   ters above probe (m)  e

Parameters	Monitoring Objective	Scale	Site Type
NA	General/Background	Micro	SLAMS
Air flow < 200 L/min ☐ PM2.5 FRM	Highest Concentration	Middle	□SPM
PM10 FRM	Population Exposure	Neighborhood	
PM10 Cont. (BAM)	Source Oriented		77 1 21 100 7
PM10-2.5 FRM		Urban	Monitor NAAQS Exclusion
☐ PM10-2.5 BAM ☐ PM2.5 Cont. (BAM)	Transport	Regional	NONREGULATORY
	Welfare Related Impacts	 	
Probe inlet height (from a	ground) $\square \le 2$ m $\square \square \square$ 2-71 e from probe inlet to ground (meters)	m <u>4.6</u> 7-15 m	> 15 m
	f probe inlet from horizontal (wall) a		roof) supporting structure > 2 m <sup>9</sup>
	e from outer edge of probe inlet to su		
	ter edge of probe inlets of any low vo	olume monitor and any oth	er Yes No NA
low volume monitor at the	ne site = 1 m or greater? onitors (Two FRMs, FRM & BAM, 1	DAM &	
BAM) Located at Site?	olliors (Two FRIMS, FRIM & BAIM,	*Yes \(\Boxed{\operatorname{A}}\) (a	nswer *'d questions) No 🗌 NA
,	collegated DM 2.5 complete (V) with	in 2 to 4 m of	
each other?	collocated PM 2.5 samplers (X) with		No Give actual (meters)
	ampler inlets within 1 m vertically of		110 Give detail (meters)
			No ☐ Give actual (meters)
T 1 1 70 (10	11 11 11 D) 60 5		
site to measure PM10-2.5	nonitor collocated with a PM2.5 mon	attor at the <u>*Yes □</u> (	answer *'d questions) No 🗌 NA
	•	C P) (10.2.5.00)	1
within 2 to 4 m of each o	collocated PM10 and PM2.5sampler ther?	's 10r PM10-2.5 (X)	Yes No No
	nd PM2.5 sampler inlets within 1 m v	vertically of each other?	Yes ☐ No ☐
		*No [] (answer * 'd questi	
*Is probe > 10 m from th	e nearest tree drip line? Yes 🔲 *	*No   *Number of trees	within 10 meters
	closest tree (m) Direction fr		
	o air flow? *Yes [] (answer *'d que		
	Distance from probe inlet (m)obe to obstacle at least twice the height		
	obe to obstacle at least twice the heig	giii that the oostacle protitu	des above the probe? Tes No
Distance of probe to near	rest traffic lane (m) Direction	on from probe to nearest tr	raffic lane
RECOMMENDATIONS:			
	tatus? Yes   *No   (answer *	'd questions)	
*2) Change monitoring o	bjective? Yes [ (enter new objective)	etive ) No $\square$ -	
	esentativeness? Yes (enter new		
*4) Relocate site? Yes			
Comments:			
Date of Last Site Pictures	12/18/2020 New Pictures Su	ubmitted? Yes 🛛 No 🗌	
Reviewer Tony Sabetti			Date December 18, 2020
Ambient Monitoring Coor	rdinator Tony Sabetti		DateDecember 18, 2020

# **Site Information**

Region_WIRO	Site Name Southport DRR			<b>AQS Site # 37-</b> 019-0005			
Street Address-5538 R	ob Gandy Blvd SE City Southpo			<u>iport</u>	<u>t</u>		
Urban AreaChoose an item.Core-based Statistical Area Myrtle Beach-Conway					ch-Conway-North		
Myrtle Beach							
	Enter Exact Method of Measuring					suring	
<b>Latitude</b> 78.019263			3.94229444			G 1 F 1	
In Decimal Degrees	In Decimal			lain)		n: Google Earth	
Elevation Above/below		_	,	Cl.	9		
Name of nearest road to Comments:	iniei probe <u>Rot</u>	o Gai	ndy Biva ADT n/a Yea	ir Cnc	oose one	_	
Distance of site to neare	st major road (m	2) 3	60 00 Direction from si	to to no	earest major	road W	
Name of nearest major i	_				_	Todu <u>w</u>	
Comments:	oau <u>iiwy 87</u> A	ועו	<u>8100</u> Teal Choose one	<u> 2019</u>			
	-111 //-:	_1	-14			V D N- Z	
Site located near electric Distance of site to neare				10.5	Dinastian	Yes No No	
**OPTIONAL** Distar			(m) <u>7</u>			to RR NNE NA Direction	
Distance between site and					(m) e to water tow		
Explain any sources of							
tracks, construction acti					storage, stack	xs, vents, rannoau	
tracks, construction acti	vities, iast iood i	iesta	urants, and swimming p	0015.			
	<u> </u>						
ANSWER ALL APPLI	CABLE QUESTIC	ONS:					
ANSWER ALL APPLI Parameters			g Objective		Scale	Monitor Type	
Parameters	Moni	itorin	g Objective	     Пмі			
Parameters  SO <sub>2</sub> (DRR)	<b>Moni</b> General/Backgroun	itorin; nd	g Objective		cro	⊠INDUSTRIAL	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS)	Moni General/Backgroun Highest Concentra	itoring nd ation	g Objective	ШМі	cro ddle	⊠INDUSTRIAL □SLAMS	
	Moni General/Backgroun Highest Concentra Population Exposu	itoring nd ntion	g Objective	☐Mi   ☑Ne	cro ddle ighborhood	⊠INDUSTRIAL	
	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented	itoring nd ntion	g Objective	☐Mi   ☑Ne   ☐Ur	cro ddle ighborhood ban	⊠INDUSTRIAL □SLAMS	
	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport	itorin; nd ntion ure	g Objective	☐Mi   ☑Ne   ☐Ur	cro ddle ighborhood	⊠INDUSTRIAL □SLAMS	
Parameters   SO <sub>2</sub> (DRR)  SO <sub>2</sub> (NAAQS)  SO <sub>2</sub> (trace-level)   □	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun	nd ation are		☐Mi   ☑Ne   ☐Ur	cro ddle ighborhood ban	⊠INDUSTRIAL □SLAMS	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In	nd ntion artion are and	S	∏Mi ⊠Ne ∏Uri ∏Re	cro ddle ighborhood ban gional	⊠INDUSTRIAL □SLAMS □SPM	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In und) 2-15 m? Yes	nd ation are and	s No ☐ Give actual mea	Mi Ne Uri Re	cro ddle ighborhood ban gional eight from grou	SLAMS SPM  SPM  □ SPM	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In und) 2-15 m? Yes be inlet from horize	nd ation are	s No	Mi Ne Uri Re	cro ddle ighborhood ban gional eight from grou	SLAMS SPM	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)  Probe inlet height (from ground Distance of outer edge of productual measured distance from the source of the s	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In and) 2-15 m? Yes whe inlet from horized on outer edge of pro	nd ation ure and mpacts contal (obe to	S  No Give actual mea  (wall) and/or vertical (roof) supporting structure (meters	Mi Ne Uri Re	cro ddle ighborhood ban gional eight from grou	NDUSTRIAL SLAMS SPM SPM  Ind (meters) 4.8 I m? Yes ⊠ No □	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)  Probe inlet height (from ground Distance of outer edge of product of the content o	Moni General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In and) 2-15 m? Yes be inlet from horize on outer edge of pro-	nd ation are mpacts ontal (obe to gas m	s  No	Mil Mil Me	cro ddle ighborhood ban gional eight from grou ng structure > 1	SLAMS SPM  Ind (meters) 4.8 I m? Yes No	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)  Probe inlet height (from ground Distance of outer edge of production of the pro	General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In und) 2-15 m? Yes be inlet from horize m outer edge of pro- be inlet from other rest tree drip line?	nd ation are and apacts cobe to gas m Yes	S  No	Mi Ne Uri Re surred h supportis 1.8 5 m? question	cro ddle ighborhood ban gional eight from grou ng structure > 1 Yes	SINDUSTRIAL   SLAMS   SPM   SPM	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)  Probe inlet height (from ground probe in the second probe in the se	General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In and) 2-15 m? Yes be inlet from horize of outer edge of pro be inlet from other rest tree drip line? earest tree drip line?	nd ation are and apacts cobe to gas n Yes Pore	No Give actual mea (wall) and/or vertical (roof) supporting structure (meters nonitoring probe inlets > 0.2. No (answer *'d of the control	Mi Ne Uri Re	cro ddle ighborhood ban gional eight from grou ng structure > 1 Yes	INDUSTRIAL SLAMS SPM SPM  Ind (meters) 4.8 I m? Yes No  No NA NA	
Parameters  SO₂(DRR) SO₂(NAAQS) SO₂(trace-level)  Probe inlet height (from ground probe in the	General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In und) 2-15 m? Yes be inlet from horize on outer edge of pro be inlet from other rest tree drip line? earest tree (m) flow? *Yes [] (an	nd ation are and mpacts contal (obe to gas m Yes) Contact Cont	S  No	Mi Ne Uri Re Re Supporti Si 1.8 5 m? questior trees w	cro ddle ighborhood ban gional eight from grou ng structure > 1  Yes  as) ithin 10 meters ght of tree aboy	INDUSTRIAL SLAMS SPM SPM  Ind (meters) 4.8 I m? Yes No  No NA NA	
Parameters  SO <sub>2</sub> (DRR) SO <sub>2</sub> (NAAQS) SO <sub>2</sub> (trace-level)  Probe inlet height (from ground probe in the second probe in the se	General/Backgroun Highest Concentra Population Exposu Source Oriented Transport Upwind Backgroun Welfare Related In und) 2-15 m? Yes be inlet from horize m outer edge of pro be inlet from other rest tree drip line? est tree (m) flow? *Yes [] (and stance from probe in	nd ation are and mpacts cobe to gas m Yes Dire nswer inlet (	S No	Mi Ne Uri Re surred h supportis 1.8 5 m? question trees w *Hei	cro ddle ighborhood ban gional eight from grou ng structure > 1  Yes  as) ithin 10 meters ght of tree above	SINDUSTRIAL   SLAMS   SPM   SPM	

Southport 2020 Network Review

# 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 12/4/2020 New Pictures Submitted? Yes No Reviewer Tony Sabetti Date December 18, 2020 Ambient Monitoring Coordinator Tony Sabetti Date December 18, 2020 Revised 2021-05-11

#### **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 Information**

Region_WIRO Site Name Lake Waccamaw				AQS Site # 37				
Street Address-1866 State Park Drive			City La	ike Waccai	<u>naw</u>			
Urban Area Not in an Urban Area Core-based State				Statistical Arc	ea None	е		
	Enter E	xact						
Latitude <u>-78.47</u>	<u>77055</u>	Longitude	34.259233			od of Me		
In Decimal Degrees		In Decimal Deg		Other (ex	<u>rplain)</u> E	xplanati	on: Goog	gle Earth
Elevation Above/below						<u>15</u>		
Name of nearest road to in	let probe	State Park Drive	ADT	Year latest av	/ailable _			
Comments: No ADT Ava	<u>ilable</u>							
Distance of site to nearest	major road	d (m) 3000.00 D	Pirection fron	n site to nearest	major road	NE		
Name of nearest major roa	d Bella (	<u>Coola Road</u> ADT	<u>450</u> Year	<u> 2017</u>				
Comments:								
Site located near electrical	substation	n/high voltage po	wer lines?				Yes 🗌	No 🛛
Distance of site to neare				(m) _		Direction	to RR	_ \ \
**OPTIONAL** Distar						(m)	_ Dir	ection
Distance between site and								_NA
Explain any sources of					storage, st	tacks, ven	ts, railroad	tracks,
construction activities, f	ast food i	estaurants, and	swimming	pools.				
ANSWER ALL APPLIC	ARLE O	HESTIONS:						
Parameters		onitoring Objec	tive	Scale	2	I	Monitor Ty	pe
□NA								
$\square$ SO <sub>2</sub> (NAAQS)		eral/Background_		Micro	-		MS	
SO <sub>2</sub> (trace-level)	. =	est Concentration	20	Middle	_	SPM.	Mercury Do	eposition
∐NO <sub>2</sub> (NAAQS)	=	O3 Concentratio				Monitor	Network	
☐HSNO <sub>y</sub> ☐ O <sub>3</sub>	= -	lation Exposure_		Neighborhood		Affiliation	on	
NH <sub>3</sub>	. =	ce Oriented	-			NCO	RE	
Hydrocarbon	. =	sport		Urban		Unof	ficial PAMS	3
Air Toxics	. = -	ind Background_		Regional_			1101111 1 1 1111	<i></i>
CO (trace-level)	Welf	are Related Impa	ncts					
Probe inlet height (from g	round) 2	15 m <sup>2</sup> Vac M	No 🗆	Give actual me	ogurad baia	ht from an	ound (motor	2.00
Distance of outer edge of					_			
	probe fine	t 110111 110112011tai	(waii) aliu/o	i verticai (1001)	) supporting	3 structure	- 1 III 1 1 CS	M NO
Actual measured distance	from oute	er edge of probe to	o supporting	structure (mete	ers) 2.00			
Distance of outer edge of	probe inle	t from other mon	itoring probe	e inlets > 1 m?		Yes	s □ No □	NA 🛛
Is probe > 20 m from the	Is probe $> 20$ m from the nearest tree drip line? Yes $\square$ *No $\boxtimes$ (answer *'d questions)							
*Is probe > 10 m from the		-	<del>-</del>	×Number of			· ·	
*Distance from probe to o					*Height of	f tree above	e probe (m)	
Are there any obstacles to	air flow?	*Yes [ (answer	r *'d question	ns) No 🖂				
*Identify obstacle	Distance	from probe inlet	(m)I	Direction from p	probe inlet	to obstacle	_	
*Is distance from inlet pro	obe to obs	tacle at least twic	e the height t	hat the obstacle	e protrudes	above the p	probe? Yes	□ No
Distance of probe to near	est traffic	lane (m) 90 Di	irection from	probe to neare	st traffic la	ne <u>NE</u>		

2020 Lake Waccamaw Network Review

Revised 01/02/2020

Parameters	Monitoring Objective	Scale	Site Type
⊠ NA	Canaral/Backaraund	□Miono	□SLAMS
Air flow < 200 L/min	General/Background	Micro	□SPM
☐ PM2.5 FRM ☐ PM10 FRM	Highest Concentration	Middle	
PM10 Cont. (BAM)	Population Exposure	Neighborhood	
☐ PM10-2.5 FRM	Source Oriented	Urban	Monitor NAAQS Exclusion
☐ PM10-2.5 BAM	Transport	Regional	NONREGULATORY
PM2.5 Cont. (BAM)	☐Welfare Related Impacts		
Probe inlet height (from		n <u>4.6</u>	> 15 m
	e from probe inlet to ground (meters)		
	probe inlet from horizontal (wall) ar		
Actual measured distance	e from outer edge of probe inlet to su	pporting structure (meters)	) Yes ☐ No
Distance (Y) between our	ter edge of probe inlets of any low vo	olume monitor and any oth	er – – –
low volume monitor at the		name moment and any our	Yes No NA
	onitors (Two FRMs, FRM & BAM,	BAM & *Vac 🗖 (a	nswer *'d questions) No \( \subseteq NA
BAM) Located at Site?		rres □ (a	ilswer * d questions) No 🔲 NA
* Entire inlet opening of	collocated PM 2.5 samplers (X) with	nin 2 to 4 m of	
each other?		Yes	No Give actual (meters)
*Are collocated PM2.5 s	ampler inlets within 1 m vertically of		l v
		Yes L	No Give actual (meters)
Is a low-volume PM10 m	nonitor collocated with a PM2.5 mon	itor at the	
site to measure PM10-2.5		*Yes 🗆 (	answer *'d questions) No 🗌 NA
* Entire inlet opening of	collocated PM10 and PM2.5sampler	for PM10-2.5 (Y)	1
within 2 to 4 m of each o		31011 W110-2.3 (A)	Yes No No
	nd PM2.5 sampler inlets within 1 m v	rertically of each other?	Yes No No
Is probe > 20 m from the	nearest tree drip line? Yes -*	No (answer *'d question	ons)
*Is probe > 10 m from th	e nearest tree drip line? Yes 🔲 🔧	No ☐ *Number of trees	within 10 meters
	closest tree (m) Direction fr		
•	o air flow? *Yes 🗌 (answer *'d que		
	Distance from probe inlet (m)		
*1s distance from filet pr	obe to obstacle at least twice the heig	ant that the obstacle protru	des above the probe? Yes \( \) No
Distance of probe to near	rest traffic lane (m) Direction	on from probe to nearest tr	affic lane
RECOMMENDATIONS:			
	tatus?    Yes ⊠   *No □ (answer *	'd questions)	
	bjective? Yes $\square$ (enter new objective)	•	
	esentativeness? Yes (enter new	scale _) No [	
*4) Relocate site? Yes	□ No □		
Comments:			
Date of Last Site Pictures	<u>10/16/2020</u> New Pictures Su	ıbmitted? Yes 🛛 No 🗌	
Reviewer Tony Sabetti			Date <u>December 18, 2020</u>
Ambient Monitoring Coo	rdinator Tony Sabetti		DateDecember 18, 2020

#### **Appendix G-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) Micro-scale 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 G3. 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