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2017-2018 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

June 30, 2017

Nothing Compares℠

State of North Carolina | Department of Environmental Quality | Division of Air Quality
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G. The Wilmington Monitoring Region

The Wilmington monitoring region, shown in Figure G1, has four parts: (1) the Wilmington metropolitan statistical area, MSA, consisting of New Hanover and Pender Counties, (2) the North Carolina part of the Myrtle Beach-Conway-North Myrtle Beach MSA, consisting of Brunswick County, (3) the Jacksonville MSA, consisting of Onslow County and (4) the non-MSA portion of this monitoring region, consisting 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, DAQ, currently operates two criteria pollutant monitoring sites and one urban air toxics monitoring site in this MSA. The criteria pollutant monitoring sites are the Castle Hayne ozone and particle and the New Hanover sulfur dioxide monitoring sites. The urban air toxics site is at the Battleship.

At the **Castle Hayne** site, 37-129-0002, the DAQ operates an ozone monitor, a one-in-six-day collocated quality assurance fine particle monitor, a continuous fine particle monitor and rotating PM10 and sulfur dioxide monitors that operate every third year. 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

Site Name:	Castle Hayne			**AQS Site Identification Number:**	37-129-0002
Location:	6028 Holly Shelter Road, Castle Hayne, North Carolina				
MSA:	Wilmington, NC			**MSA #:**	9200
Latitude	34.364167	**Longitude**	-77.838611	**Datum:**	WGS84
Elevation	12 meters				

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental with ultra violet photometry, 047	EQOA-0880-047	1-Hour	March 1 to Oct. 31
Sulfur dioxide	Instrumental with pulsed fluorescence, 060	EQSA-0486-060	1-Hour	12 months, every third year
PM 2.5 local conditions, FRM	R & P Model 2025 PM2.5 Sequential w/VSCC – gravimetric analysis, 145	RFPS-0498-118	24-Hour	Every sixth day, year-round
PM10 Total 0-10 µm STP	R & P Model 2025 PM2.5 Sequential – gravimetric analysis, 127	RFPS-1298-127	24-Hour	12 months, every third year
PM 2.5 local conditions, FEM	Met One BAM w/VSCC, 170	EQPM-0308-170	1-Hour	Year-round

Date Monitor Established:	Ozone	Jan. 1, 1979
Date Monitor Established:	Sulfur dioxide	Jan. 1, 2005
Date Monitor Established:	PM 2.5 local conditions, federal reference method	July 1, 2002
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, 2016

Nearest Road:	Holly Shelter Road	**Traffic Count:**	5300	**Year of Count:**	2016

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
Ozone	62	North northwest	SLAMS	Real-time AQI reporting. Compliance w/NAAQS.
Sulfur dioxide	62	North northwest	SPM	PSD modeling, compliance w/NAAQS.
PM 2.5 local conditions, FRM	62	North northwest	SLAMS	AQI reporting. Compliance w/NAAQS.
PM10 Total 0-10 µm STP	62	North northwest	SPM	Industrial expansion monitoring for PSD modeling
PM 2.5 local conditions, FEM	62	North northwest	SLAMS	Real-time AQI reporting.

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable to Compare to NAAQS**	**Proposal to Move or Change**
Ozone	Population exposure	Urban	Yes	None
Sulfur dioxide	General/Background	Urban	Yes	Will start in 2017
PM 2.5 local conditions, FRM	Population exposure	Neighborhood	Yes	Ends 6/30/2017
PM10 Total 0-10 µm STP	General/Background	Neighborhood	Yes	Ends 10/31/2017
PM 2.5 local conditions, FEM	Population exposure	Neighborhood	No	None

	Meets Part 58 Requirements:			
Parameter Name	**Appendix A**	**Appendix C**	**Appendix D**	**Appendix E**
Ozone	Yes	Yes	Yes	Yes
Sulfur dioxide	Yes	Yes	No requirements	Yes
PM 2.5 local conditions, FRM	Yes	Yes	No requirements	Yes
PM10 Total 0-10 µm STP	Yes	Yes	No requirements	Yes
PM 2.5 local conditions, FEM	Yes	Yes	No requirements	Yes

Parameter Name	**Probe Height (m)**	**Distance to Support**	**Distance to Trees**	**Obstacles**
Ozone	4.5	2.0 meters	>20 meters	None
Sulfur dioxide	4.5	2.0 meters	>20 meters	None
PM 2.5 local conditions, FRM	5.0	2.03 meters	>20 meters	None
PM10 Total 0-10 µm STP	2.2	2.03 meters	>20 meters	None
PM 2.5 local conditions, FEM	5.0	2.03 meters	>20 meters	None

Figure G3 Looking north from the Castle Hayne site

Figure G6. Looking northeast from the Castle Hayne site

Figure G4. Looking northwest from the Castle Hayne site

Figure G7. Looking east from the Castle Hayne site

Figure G5. Looking west from the Castle Hayne site

Figure G8. Looking southeast from the Castle Hayne site

Figure G9. Looking southwest from the Castle Hayne site

Figure G10. Looking south from the Castle Hayne site

The DAQ completed one beta attenuation monitor, BAM, study in Dec. 2011. At that time, the BAM was shut down and the manual fine particle federal reference method, FRM, monitor became a state and local air monitoring station, SLAMS. In 2012, the DAQ installed another special purpose non-regulatory BAM and began a second BAM study at the site on Oct. 23, 2012. Current comparisons for the BAM and FRM monitors are available from the United States Environmental Protection Agency, EPA, at https://www.epa.gov/outdoor-air-quality-data/pm25-continuous-monitor-comparability-assessments. On March 12, 2015, the FRM was moved to the roof of the building and the BAM was installed inside the building to help stabilize temperature and relative humidity to see if the two monitors would agree better under these conditions. The data comparison for March 19, 2015, through April 1, 2017, is shown in Figure G11. Since the BAM was moved into the shelter, the BAM and FRM appear to be comparing better at this site. Because of this improved agreement, the DAQ made the BAM a SLAMS and the primary monitor at this site on Jan. 1, 2016. On Jan. 1, 2016, the 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 Appendix A requirements, so the DAQ plans to end the collocated FRM at this site on June 30, 2017.

The DAQ requires PM_{10} data in the coastal area for Prevention of Significant Deterioration, PSD, modeling for industrial expansion. Because the DAQ shut down the PM_{10} monitoring site in Jacksonville on Dec. 31, 2007, the DAQ began manual one-in-six day PM_{10} monitoring at the Castle Hayne site in February 2008 to provide the necessary PM_{10} data for PSD modeling for the coastal area. However, a wildfire next to the site forced the DAQ to shut down the monitor on March 31, 2008. After the wildfire was extinguished, the DAQ decided not to resume PM_{10} 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 NAAQS to the PM_{10} concentrations measured at Castle Hayne, making Castle Hayne an unsuitable site for obtaining background data to use for PSD modeling. Thus, the PM_{10} monitor was located at Kenansville in second quarter 2009. At the end of 2010, the DAQ began operating the monitor on a one-in-three-year schedule and made the site one of

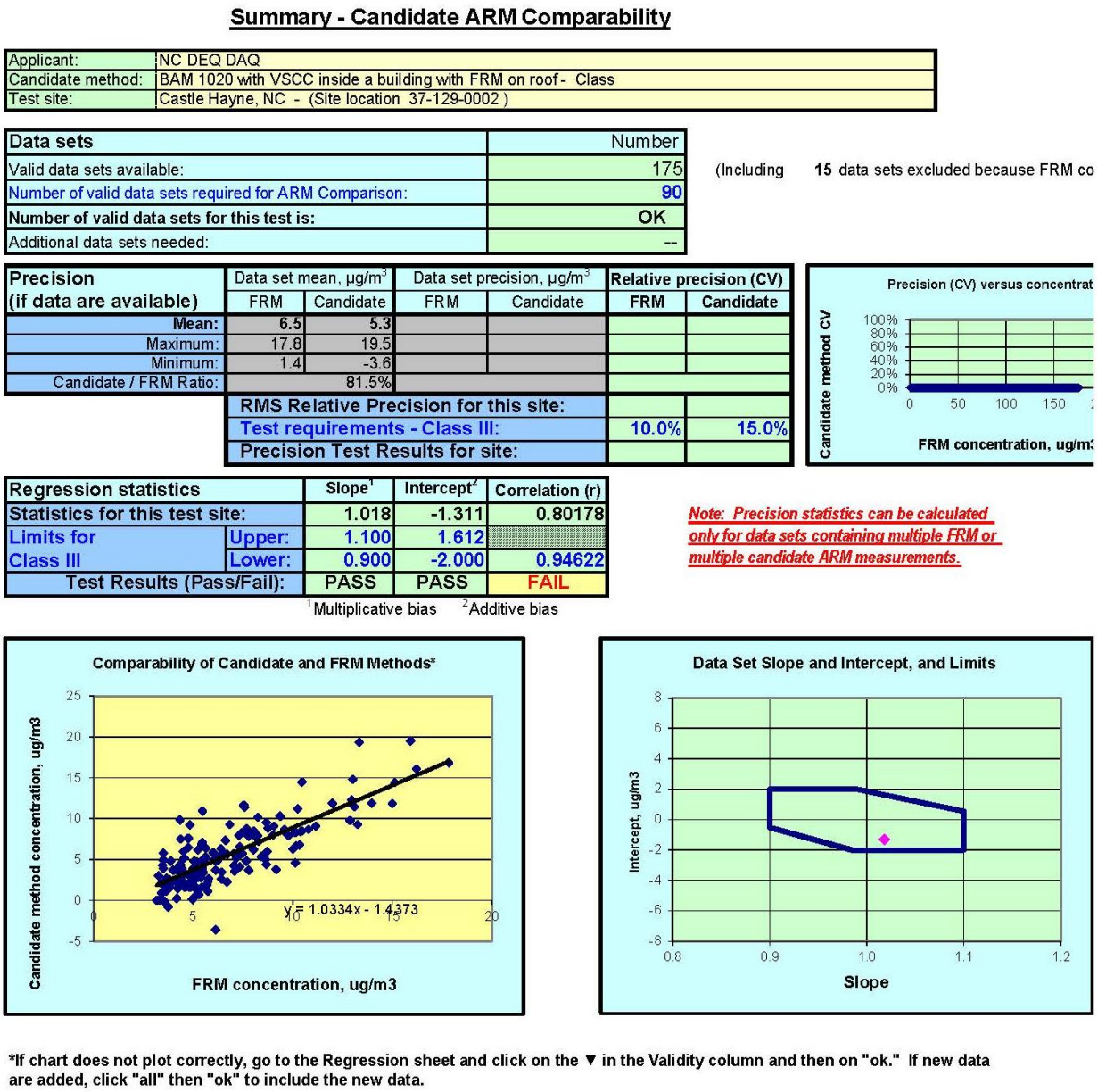

Figure G11. Comparison of BAM and FRM results at Castle Hayne after moving the BAM inside the building

six rotating background PM_{10} sites for the state. The Kenansville site collected PM_{10} 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 is collecting PM_{10} data at Castle Hayne from October 2016 to October 2017.

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 and was estimated to

be at 282, 573 in July 2016. 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 2014-2016 for Wilmington is at 86 percent of the standard so currently, no additional ozone monitors are needed in the MSA. As shown in Figure G12, the population in the Wilmington MSA is projected to remain under 350,000 for at least the next decade.

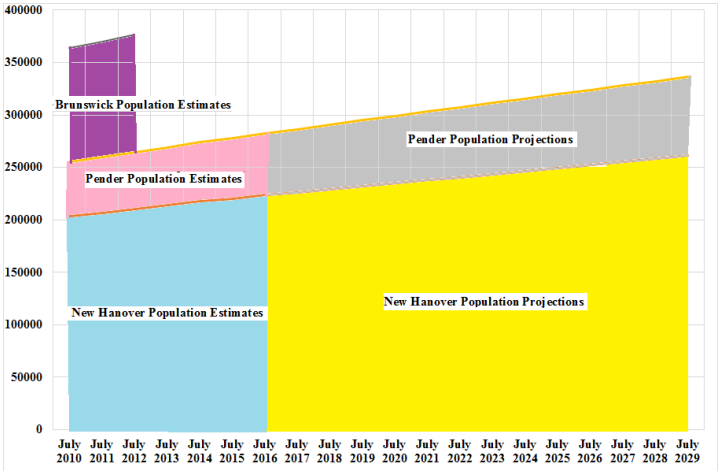

Figure G12. Population Estimates and Projections for the Wilmington MSA from 2010 to 2029
Estimates and projections are from the North Carolina Office of State Budget and Management, updated in September 2016

Sometime during 2020, the DAQ plans to add a rotating special purpose background sulfur dioxide monitor at the Castle Hayne site. This monitor will operate for 12 months every third year. It will provide background sulfur dioxide concentrations for the Wilmington area for prevention of significant deterioration modeling for industrial expansion.

At the **New Hanover** site, 37-129-0006, the DAQ operates a sulfur dioxide monitor. At the beginning of 2012, the shelter was moved approximately 200 feet across the field to maintain access to the site after the host facility closed. The site is shown in Figure G13. Views looking north, northeast, east, southeast, south, southwest, west and northwest are provided in Figure G14 through Figure G21.

Figure G13. New Hanover sulfur dioxide monitoring site, 37-129-0006

Figure G14. Looking north from the New Hanover site

Figure G15. New Hanover site looking northwest

Figure G16. New Hanover site looking northeast

Figure G17. New Hanover site looking east

Figure G18. Looking west from the New Hanover site

Figure G19. New Hanover site looking southwest

Figure G20. New Hanover site looking southeast

Figure G21. Looking south from the New Hanover site

The New Hanover site was established in 1994 to replace the Acme-Delco site in Columbus County, which was shut down in 1995. The Acme-Delco site was located about 15 miles west of the New Hanover site. The site was moved because industrial emissions had decreased in Columbus County and the measured sulfur dioxide concentrations had dropped over the previous 10 years. During the time when both monitors operated, the New Hanover site consistently measured higher concentrations of sulfur dioxide. On Jan. 1, 2013, the New Hanover site became the required population weighted emission inventory, PWEI, site for the Wilmington MSA. However, based on the 2014 National Emission Inventory[1] and 2016 population estimates,[2] the PWEI value for Wilmington is now under the 5,000-threshold for PWEI monitoring.

As shown in Figure G22, sulfur dioxide point source emissions have dramatically decreased in New Hanover County in the last eight years. Point source emissions dropped from 25,000 tons in 2008[3] to 240 tons in 2015.[4] Most of this decrease occurred because the Duke Energy Progress Sutton Steam Station converted from burning coal to using natural gas.[5] Additional reductions occurred with the closing of Southern States Chemical in 2010 and the addition of controls on other facilities.

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[1] 2014 National Emission Inventory, Version 1, All Sectors: National-County/Tribe aggregated, Released December 2016, available on the world wide web at https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data. Accessed Jan. 4, 2017.

[2] Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016, U.S. Census Bureau, Population Division, Released March 23, 2017, available on the world wide web at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.

[3] North Carolina Point Source Emission Report, available from the world wide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&year=2008&pollutant=264&county_code=129. Accessed May 12, 2017.

[4] North Carolina Point Source Emission Report, available from the world wide web at https://xapps.ncdenr.org/aq/ToxicsReport/ToxicsReportFacility.jsp?ibeam=true&year=2015&pollutant=264&county_code=129. Accessed May 12, 2017.

[5] Duke Energy Progress, *Sutton Plant implosion showcases Duke Energy transition to cleaner energy in the Carolinas*, Nov. 9, 2016, available on the worldwide web at https://news.duke-energy.com/releases/sutton-plant-implosion-showcases-duke-energy-transition-to-cleaner-energy-in-the-carolinas, accessed May 12, 2017.

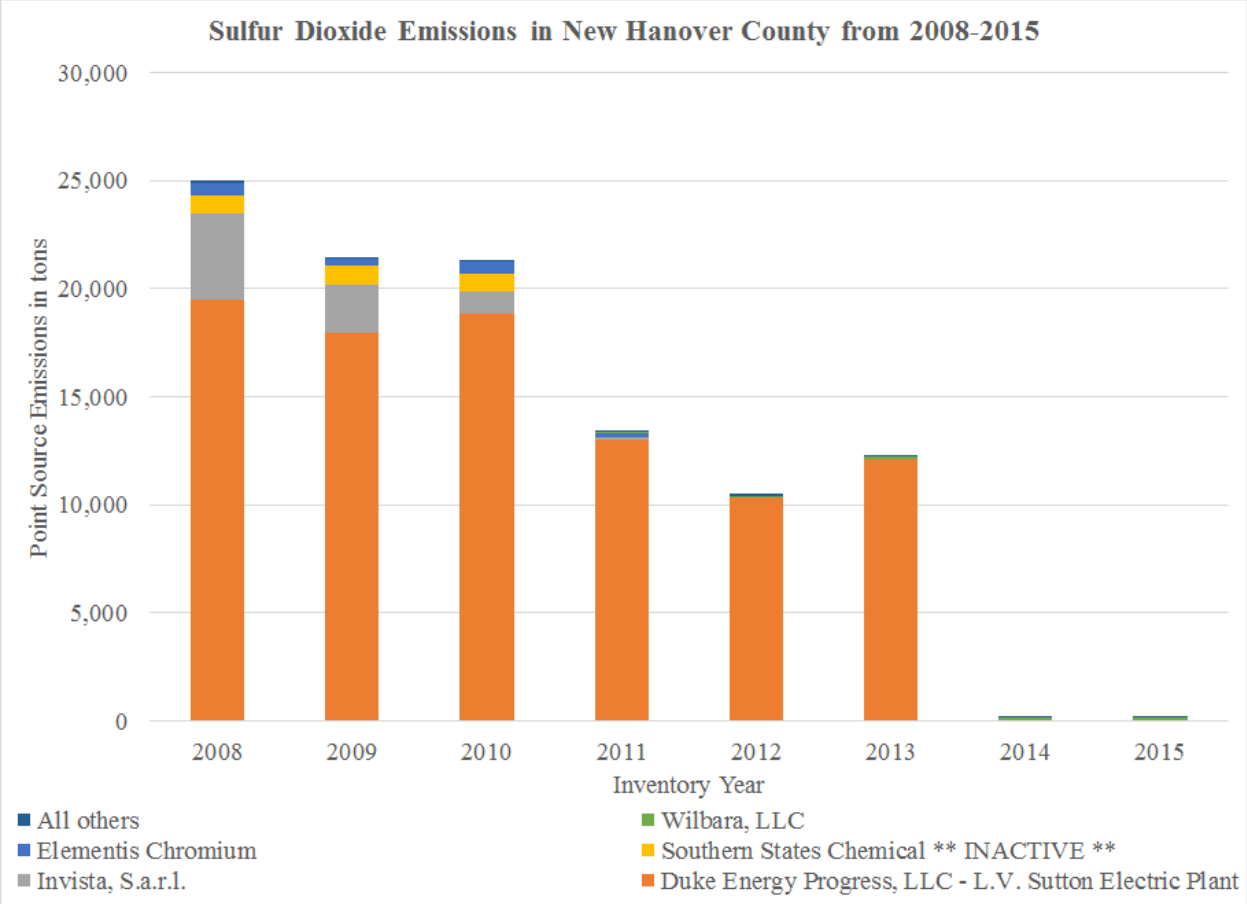

Figure G22, Sulfur dioxide point source emissions in New Hanover County

Due to the drastic reductions in emissions in New Hanover County the sulfur dioxide values measured at the New Hanover sulfur dioxide monitoring site have also decreased drastically as shown in Figure G23. Since late 2013 the measured concentrations at New Hanover have been less than 20 parts per billion. These drastic decreases in measured concentrations have resulted in the design value plummeting to less than 10 parts per billion as shown in Figure G24. The monitor has been attaining the standard for the last five years and is way below 80 percent of the NAAQS. The DAQ anticipates the concentrations at the New Hanover site will continue to be low into the future as the sulfur dioxide emissions in the county are under 300 tons and not expected to ever increase back to their former levels.

Since the property owner shut down operations at the site where the monitor is located, brush has begun to grow up and soon the monitor will no longer meet 40 CFR 58 Appendix E requirements. Due to the low measured concentrations at the site, the design value attaining the standard for five years and being less than 80 percent of the NAAQS, the reduced sulfur dioxide emissions in the county, the need for a PWEI monitor in the MSA going away and challenges maintaining the site, the DAQ plans to shut down the New Hanover sulfur dioxide monitor on Dec. 31, 2017, if the EPA concurs.

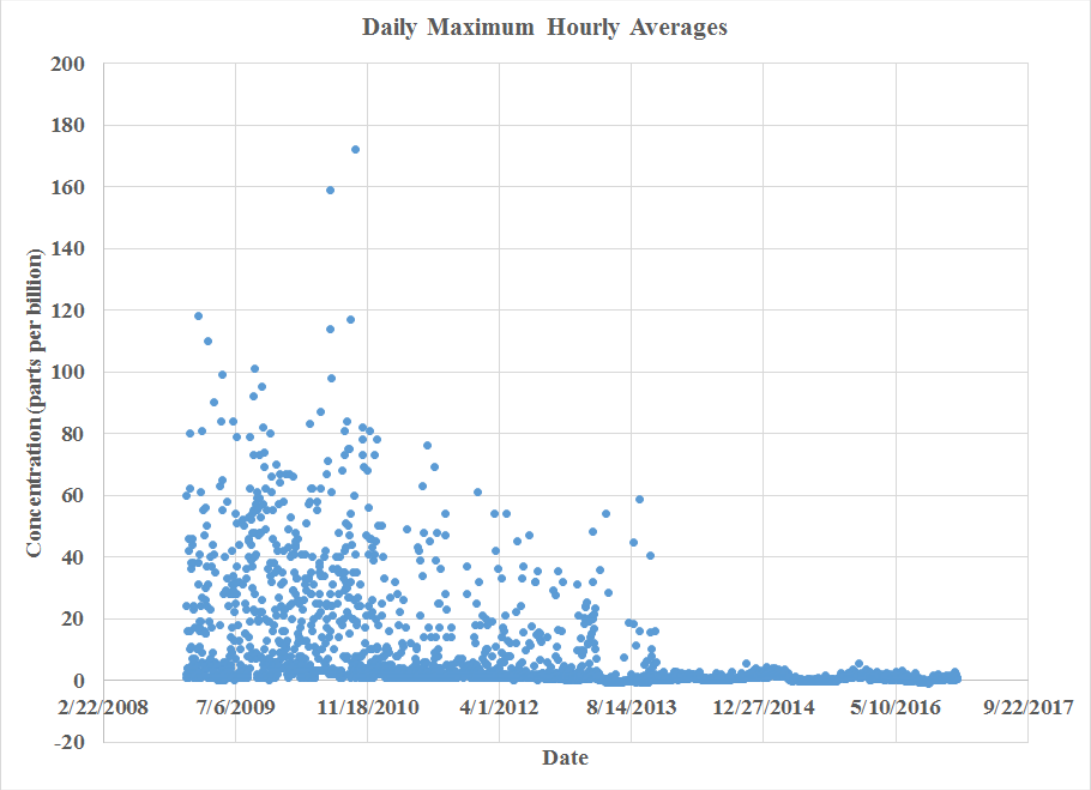

Figure G23. Plot of the maximum hourly average for each day from 2009 to 2016

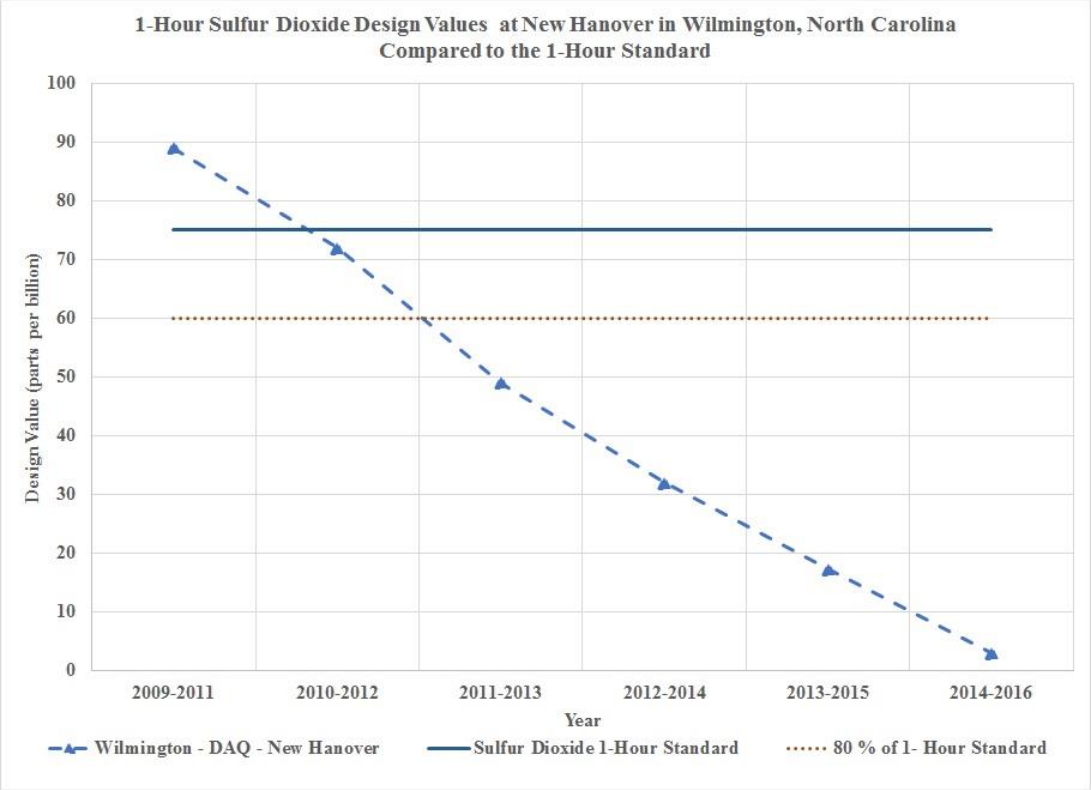

Figure G24. Recent design values measured at the New Hanover site

At the **Battleship** site, 37-129-0010, DAQ operates a year-round air toxics volatile organic compound sampler. Samples are collected in stainless steel canisters and sent to the Laboratory Analysis Branch where they are analyzed for 68 compounds using the Compendium Method for Toxic Organics 15. Figure G25 through Figure G33 show the site and views looking north, northeast, east, southeast, south, southwest, west and northwest.

Figure G25. The Battleship urban air toxics monitoring site

Figure G26. Looking north from the Battleship site

Figure G27. Looking northwest from the Battleship site

Figure G28. Looking northeast from the Battleship site

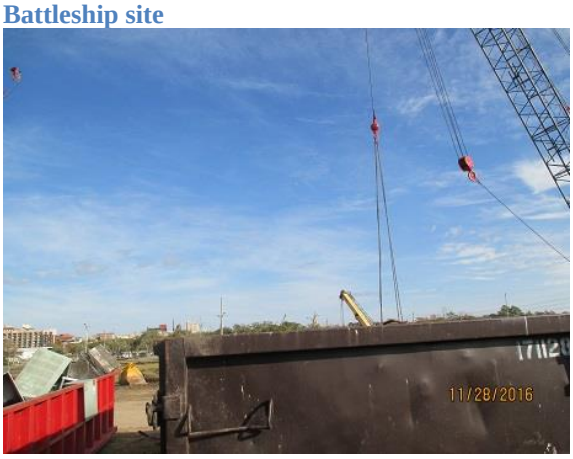

Figure G29. Looking east from the Battleship site

Figure G30. Looking west from the Battleship site

Figure G31. Looking southwest from the Battleship site

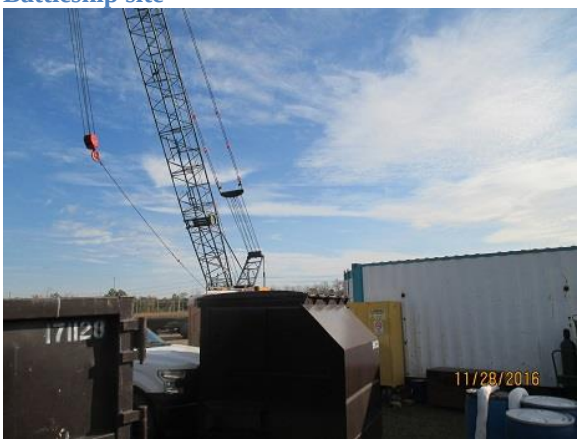

Figure G32. Looking southeast from the Battleship site

Figure G33. Looking south from the Battleship site

In 2008, EPA expanded the **lead monitoring** network to support the lower lead NAAQS of 0.15 micrograms per cubic meter.[6] The 2010 changes to the lead monitoring requirements focused

[6] 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 https://www.gpo.gov/fdsys/pkg/FR-2008-11-12/pdf/E8-25654.pdf.

monitoring efforts on fence line monitoring located at facilities that emit 0.5 tons or more of lead per year and at National Core, NCore, monitoring sites.[7] In 2016 the requirement for monitoring at NCore sites was removed.[8] 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.[9]

Changes to **the ozone monitoring** requirements extended the ozone season a month. In 2017 the ozone season started on March 1 instead of April 1.

The Wilmington MSA is not required by the 2010 **nitrogen dioxide monitoring** rule to have nitrogen dioxide monitors. It is too small to require area-wide monitors or near roadway monitoring. This MSA was also not required to do carbon monoxide monitoring as a result of the changes to the **carbon monoxide monitoring** requirements because the population is less than one million.

The Wilmington MSA has not been required by the 2010 **sulfur dioxide monitoring** rule to add additional sulfur dioxide monitors. The existing sulfur dioxide monitor at the New Hanover site meets the PWEI monitoring requirements for the MSA.

(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 2016 of 449,295 people, which requires it to have an ozone monitor.[10] The DAQ operates an industrial sulfur dioxide monitoring site, Southport DRR, in this MSA. As shown in Figure G34, the South Carolina Department of Health and Environmental Control, DHEC, started operating the Coastal Carolina ozone monitoring station on May 1, 2015. Currently, the DAQ and DHEC have signed an official agreement regarding the monitoring responsibilities for the MSA.[11]

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

[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] Data obtained from the DAQ emission inventory database.

[10] Source: Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016, U.S. Census Bureau, Population Division, Released March 23, 2017, available on the world wide web at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.

[11] Memorandum of Agreement (MOA) on Criteria Monitoring Between SCDHEC and NCDENR DAQ, July 1, 2015, Available on the worldwide web at http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=6786.

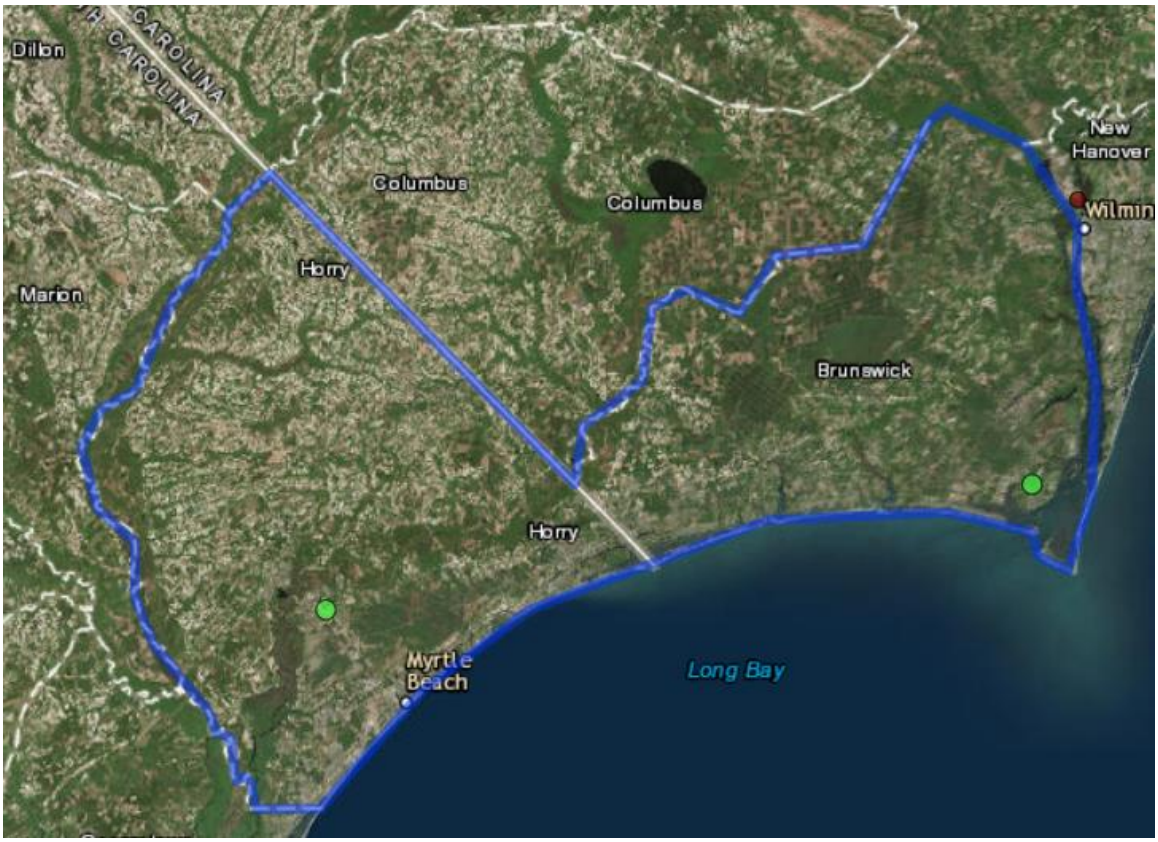

Figure G34. Monitoring sites in the Myrtle Beach-Conway-North Myrtle Beach MSA
The green dots show the locations of the Coastal Carolina ozone and the Southport DRR sulfur dioxide monitoring stations.

In 2016, the 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 the data requirements rule for sulfur dioxide.[12] The area chosen for placement of the monitor was selected using the results of modeling done as described in the technical assistance document[13] and was reported in an addendum to the 2016-2017 network plan.[14] An aerial view of the monitoring location is shown in Figure G-35.

[12] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052)(FRL-9928-18-OAR), 2015-20367.
[13] SO_2 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.
[14] 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 http://xapps.ncdenr.org/aq/documents/DocsSearch.do?dispatch=download&documentId=9275.

Figure G-35. Aerial view showing the location of the Southport DRR monitoring station

The Air Quality System, AQS, identification number for this monitor is 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 DAQ 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-36 through Figure G-39 show views from the site looking north, east, south and west.

Figure G-36. Southport DRR site looking north

Figure G-37. Southport DRR site looking east

Figure G-38. Southport DRR site looking west

Figure G-39. Southport DRR site looking south

The monitoring site is located 30 meters from the trees to the east. The tallest trees are estimated to be 15 meters in height. The nearest road is Rob Gandy Boulevard located approximately 70 meters to the south. This road does not have traffic count data; however, as shown in Figure G-40, 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 traffic on Rob Gandy Boulevard would be expected to be less than that on Jabbertown Road. The probe height is 3.6 meters.

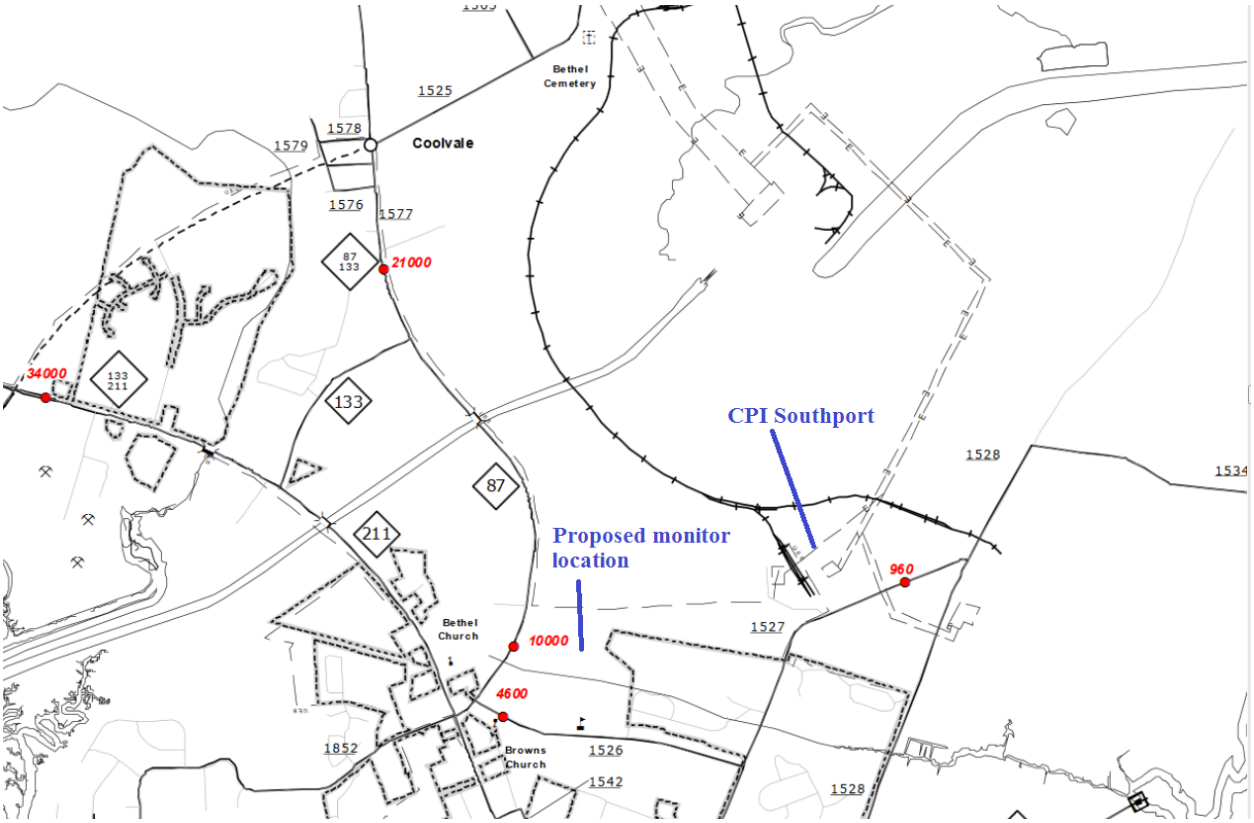

Figure G-40. 2014 Traffic count map (from NC DOT)

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 33.942222 and -78.019167. 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-41 shows the location of the monitoring station relative to the population center of Brunswick County in the Southport area.

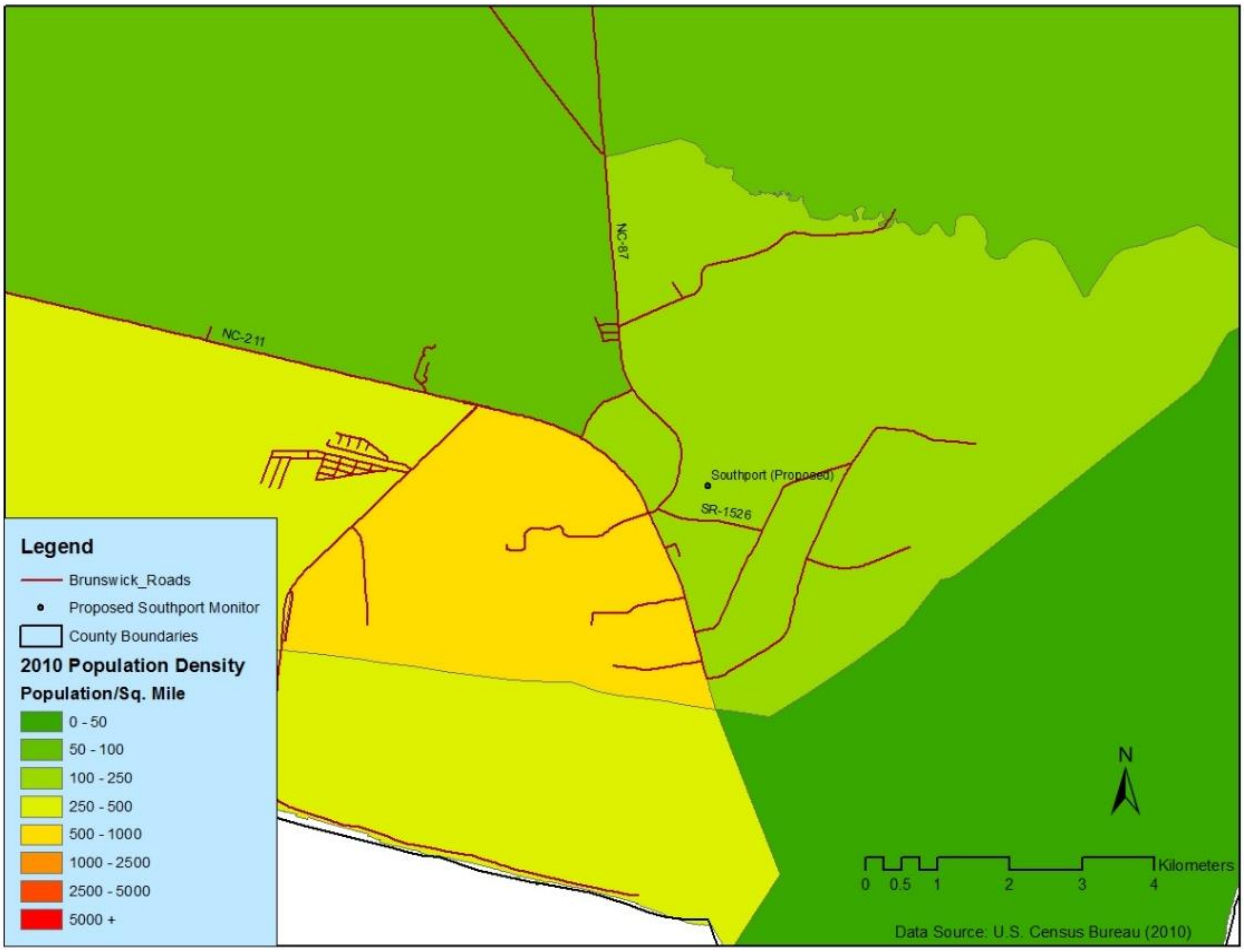

Figure G-41. Location of the Southport DRR monitoring station relative to the population of the Southport area in Brunswick County

Based on the wind rose in Figure G42, the Southport DRR monitoring station is located downwind of the CPI Southport plant. Figure G42 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.

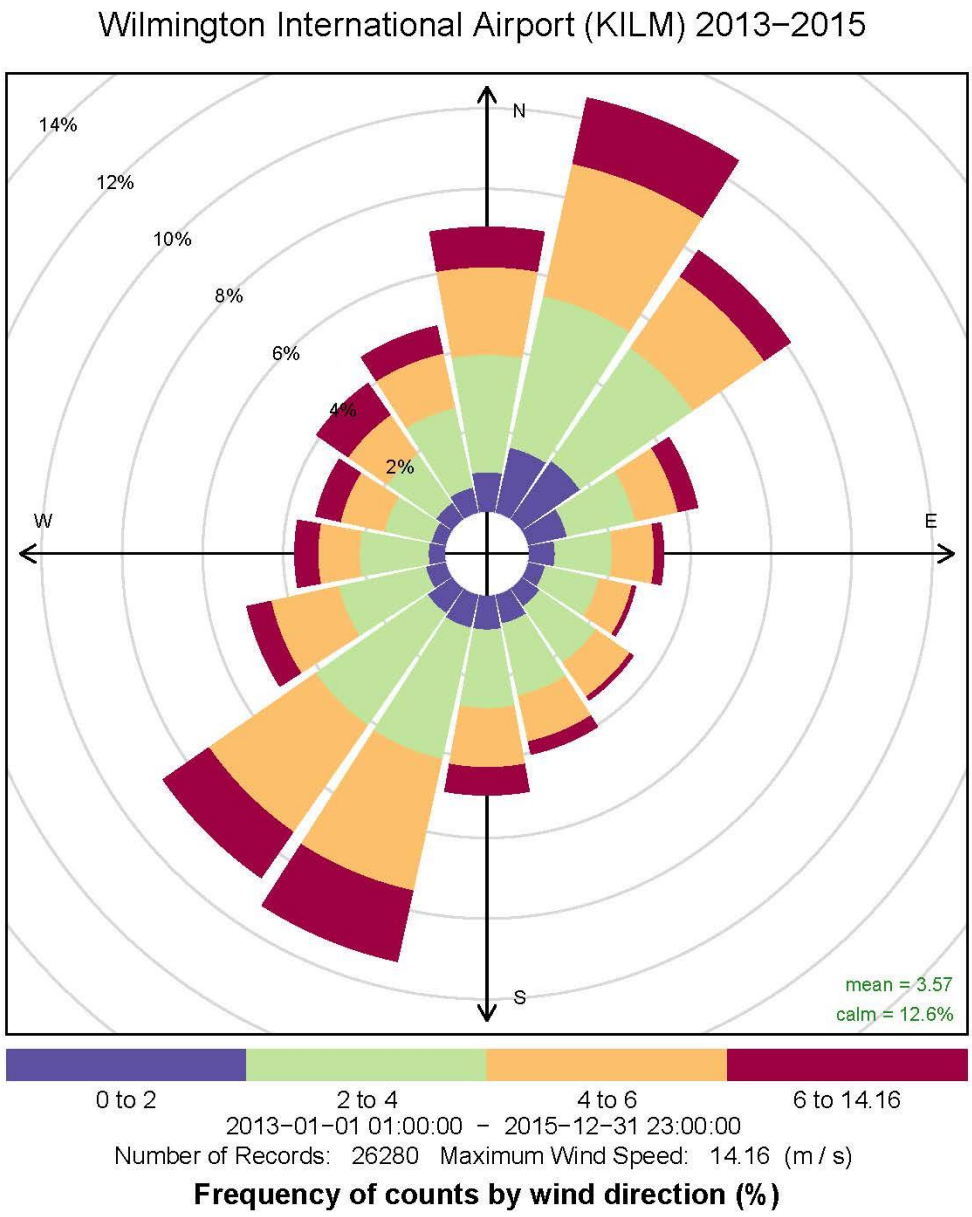

Figure G42. Wind rose from the Wilmington International Airport for 2013 to 2015

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 fence line 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 either off a lumber road or the nearby Rob Gandy Boulevard so it has easy access.
Safety	Appropriate electrical permits will be obtained.
Power	Overhead powerlines are located 130 meters northwest of the site.
Environmental Control	The monitoring shelter will be placed 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. **Duke Energy Progress – Brunswick Plant**, 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 and 40 kilometers south southwest of the New Hanover sulfur dioxide monitoring station.

Changes to the **lead monitoring network** requirements in 2010[15] as revised in 2016[16] did not result in additional monitoring in this MSA. Changes to the **ozone monitoring requirements** did

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

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 Myrtle Beach-Conway-North Myrtle Beach MSA was required to monitor for sulfur dioxide by the 2010 **sulfur dioxide monitoring** requirements because there is a facility in Brunswick County that will choose to monitor for sulfur dioxide rather than use modeling to demonstrate attainment under the data requirements rule. More information on this facility and monitor is provided in Appendix G-3. CPI Southport Siting Analysis and Additional Site Information. This MSA will not be required to monitor for carbon monoxide by the **changes to the carbon monoxide monitoring requirements** because the population is less than one million.

(3) The Jacksonville MSA

The Jacksonville MSA consists of Onslow County. The principal city is Jacksonville. The DAQ does not operate any monitoring stations in the Jacksonville MSA. The Jacksonville particle-monitoring site was shut down 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[17] as revised in 2016[18] 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. [19] However, lead emissions at Camp Lejeune in 2010 were below the 0.5-ton threshold. [20] The EPA concurred that actual emissions were less than 0.5 tons and did not require monitoring at the facility fence line.[21] The lead emissions in 2015 are still below 0.5 tons.[22]

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

[18] 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.

[19] United States Environmental Protection Agency. 2009 Toxic Release Inventory, released March 2010, available on the worldwide web at https://iaspub.epa.gov/triexplorer/tri_release.chemical.

[20] 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.

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

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

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, the 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 86 percent of the 2015 standard of 70 parts per billion. As shown in Figure G43, models consistently show low ozone levels in the Jacksonville MSA and lower probabilities of exceeding the standard in Jacksonville than at Castle Hayne.

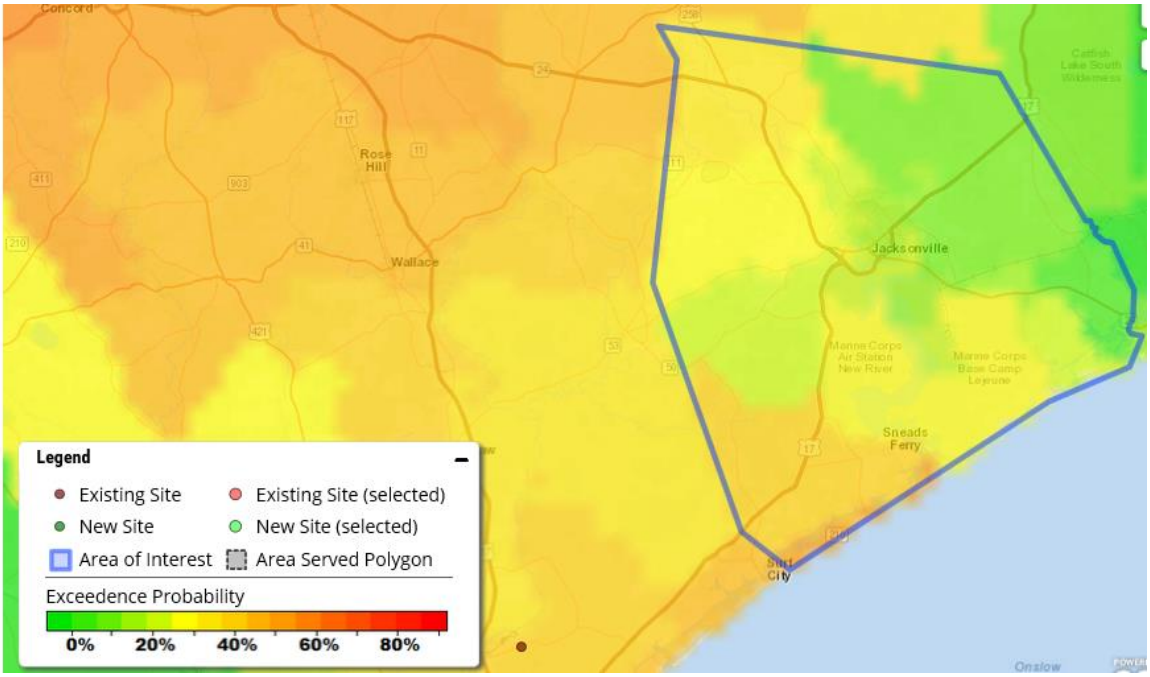

Figure G43. Probability of ozone exceeding the 2015 standard at least once in the Jacksonville MSA

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. The 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 sites are discussed in the CASTNET network plan available at https://www.epa.gov/sites/production/files/2017-04/documents/draft_castnet_2017_annual_network_plan.pdf. The one DAQ site is discussed

further here. The DAQ site is a Mercury Deposition Network, MDN, site at Waccamaw State Park. The Kenansville particle monitoring station was shut down Dec. 31, 2015.

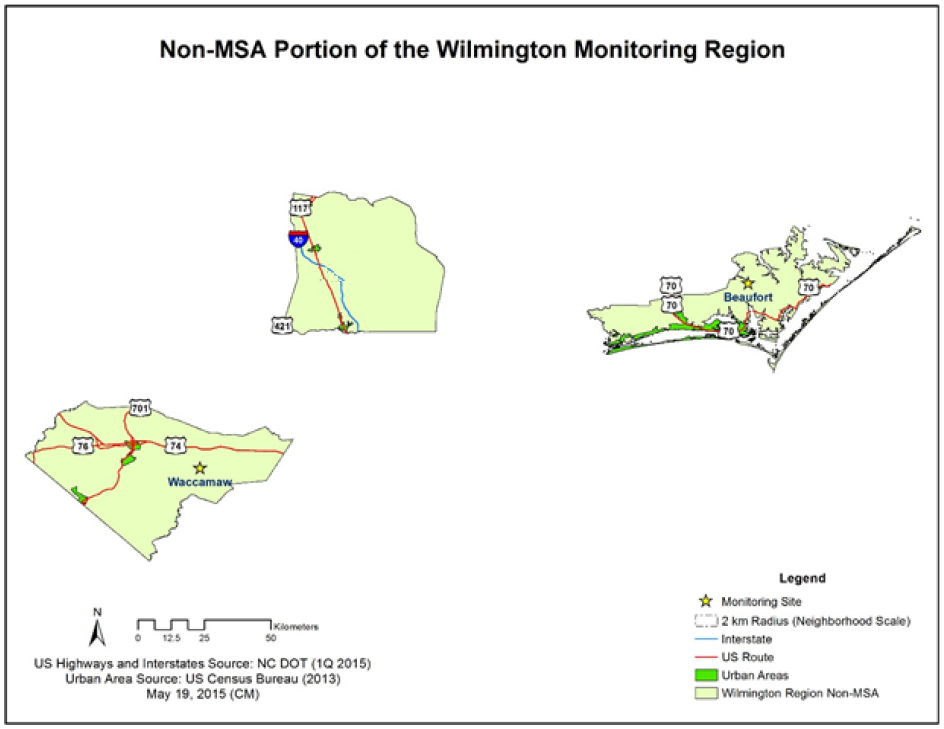

Figure G44. Monitoring site locations

At the **Waccamaw** MDN site in Columbus County, the DAQ operates a weekly mercury deposition monitor to measure total mercury, Hg, concentration and deposition in precipitation. The DAQ upgraded the site to more modern equipment in 2014. A picture of the site as well as views looking north, northeast, east, southeast, south, west and northwest are provided in Figure G45 through Figure G53.

Figure G45. The Waccamaw (NC08) MDN site

Figure G46. Looking north from the Waccamaw MDN site

Figure G49. Looking northeast from the Waccamaw MDN site

Figure G47. Looking northwest from the Waccamaw MDN site

Figure G50. Looking east from the Waccamaw MDN site

Figure G48. Looking west from the Waccamaw MDN site

Figure G51. Looking southeast from the Waccamaw MDN site

Figure G52. Looking southwest from the Waccamaw MDN site

Figure G53. Looking south from the Waccamaw MDN site

The 2010 **lead monitoring** requirements did not result in lead monitoring in this area. There are no permitted facilities that emit 0.5 tons or more of lead per year.[23] The new **ozone monitoring** requirements did not require additional monitoring in this area. There is no MSA here so population exposure monitoring requirements for urban areas do not apply. The 2010 **nitrogen dioxide** monitoring requirements also did not add monitors to this area. It is too small to require area-wide monitors or near road monitoring. This area did not need to add monitors to meet the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in this area and the population is too small to require a PWEI monitor. The changes to the **carbon monoxide monitoring** requirements did not require monitoring in this area because the population is under one million.

[23] *ibid*.

Appendix G.1 Annual Network Site Review Forms for 2016

Castle Hayne

New Hanover in Wilmington

Battleship in Wilmington

Southport DRR

Site Review Form Calendar Year 2016

Site Information

Region WIRO	**Site Name** Castle Hayne	**AQS Site # 37-129-0002**
Street Address 6028 Holly Shelter Road		**City** Castle Hayne
Urban Area Not in an Urban Area	**Core-based Statistical Area** Wilmington, NC	
Enter Exact		
Longitude -77.838611	**Latitude** 34.364167	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**Other (explain)** **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		12

Name of nearest road to inlet probe Holly Shelter Road ADT 5300 Year Choose an item 2016

Comments: _____

Distance of site to nearest major road (m) 4500.00 Direction from site to nearest major road W

Name of nearest major road Interstate 40 ADT 32000 Year 2015

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.

____

ANSWER ALL APPLICABLE QUESTIONS:

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

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 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) 2.0

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

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

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

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

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

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

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

Distance of probe to nearest traffic lane (m) 62 Direction from probe to nearest traffic lane NNW

Site Review Form Calendar Year 2016

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

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 5.0

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) 2.0 Yes ☒ No ☐

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

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

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

* Entire inlet opening of collocated PM 2.5 samplers (X) within 2 to 4 m of each other? Yes ☐ No ☒ Give actual (meters) 1.4

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

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

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

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

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

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

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

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

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

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

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

Distance of probe to nearest traffic lane (m) 62 Direction from probe to nearest traffic lane NNW

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: PM-10 Low Flow located on a separate platform, support to ground 0.27 meters, probe inlet 2.3 meters

Date of Last Site Pictures 12/15/2016 New Pictures Submitted? Yes ☒ No ☐

Reviewer Tony Sabetti Date December 16, 2016

Ambient Monitoring Coordinator Tony Sabetti DateDecember 16, 2016

Site Review Form Calendar Year 2016

Site Information

Region WIRO	**Site Name** New Hanover	**AQS Site # 37**-129-0006
Street Address-2400 Hwy 421 North	**City** Wilmington	
Urban Area Not in an Urban Area	**Core-based Statistical Area** Wilmington, NC	

Enter Exact		**Method of Measuring**	
Longitude -77.95663	**Latitude** 34.26955		
In Decimal Degrees	In Decimal Degrees	GPS	**Explanation:** ____
Elevation Above/below Mean Sea Level (in meters)		6	

Name of nearest road to inlet probe Hwy 421 ADT 25000 Year Choose one 2015

Comments: ____

Distance of site to nearest major road (m) 51 Direction from site to nearest major road W

Name of nearest major road Hwy 421 ADT 25000 Year Choose one 2015

Comments: ____

Site located near electrical substation/high voltage power lines?		Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 158 Direction to RR E	☐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.

____

ANSWER ALL APPLICABLE QUESTIONS:

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

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) 1.5

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

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

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

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

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

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

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

Distance of probe to nearest traffic lane (m) 51 Direction from probe to nearest traffic lane W

Site Review Form Calendar Year 2016

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 11/17/2016 New Pictures Submitted? Yes ☒ No ☐

Reviewer Tony Sabetti Date December 6, 2016

Ambient Monitoring Coordinator Tony Sabetti Date December 6, 2016

Revised 2016-12-06

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 2016

Site Information

Region WIRO	**Site Name** Battleship	**AQS Site # 37-129-0010**
Street Address 1 Battleship Road		**City** Wilmington
Urban Area WILMINGTON	**Core-based Statistical Area** Wilmington, NC	
Enter Exact		**Method of Measuring**
Longitude -77.95585	**Latitude** 34.23551	
In Decimal Degrees	In Decimal Degrees	**Other (explain)** **Explanation: Google Earth**
Elevation Above/below Mean Sea Level (in meters)		12

Name of nearest road to inlet probe Battleship Road ADT ____ Year Choose an item ____

Comments: ____

Distance of site to nearest major road (m) 255.00 Direction from site to nearest major road W

Name of nearest major road Hwy 421 ADT 38000 Year 2015

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.

____

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_2 (NAAQS) ☐ $HSNO_y$ ☐ O_3 ☐ NH_3 ☐ Hydrocarbon ☒ Air Toxics ☐ CO (trace-level)	☐ General/Background____ ☐ Highest Concentration____ ☐ Max O3 Concentration____ ☒ Population Exposure____ ☐ Source Oriented____ ☐ Transport____ ☐ Upwind Background____ ☐ Welfare Related Impacts ____	☐ Micro____ ☐ Middle____ ☒ Neighborhood____ ☐ Urban____ ☐ Regional____	☐ SLAMS ____ ☒ SPM____ **Monitor Network Affiliation** ☐ NCORE____ ☐ Unofficial PAMS____

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

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

Actual measured distance from outer edge of probe to supporting structure (meters) 1.20

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

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

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

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

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

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

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

Distance of probe to nearest traffic lane (m) 75 Direction from probe to nearest traffic lane S

Site Review Form Calendar Year 2016

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

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

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

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

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

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

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

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

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

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

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

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

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

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

RECOMMENDATIONS:

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

Comments:

Date of Last Site Pictures November 28, 2016 New Pictures Submitted? Yes ☒ No ☐

Reviewer Tony Sabetti Date December 9, 2016

Ambient Monitoring Coordinator Tony Sabetti DateDecember 9, 2016

Site Review Form Calendar Year 2016

Site Information

Region WIRO	**Site Name** Southport DRR	**AQS Site # 37-**019-0005
Street Address-5538 Rob Gandy Blvd SE	**City** Southport	
Urban Area Not in an Urban Area	**Core-based Statistical Area** Myrtle Beach-Conway-North Myrtle Beach	

Enter Exact		**Method of Measuring**	
Longitude 78.019265	**Latitude** 33.942288		
In Decimal Degrees	In Decimal Degrees	GPS	**Explanation:** _____
Elevation Above/below Mean Sea Level (in meters)		9	

Name of nearest road to inlet probe Rob Gandy Blvd ADT _____ Year Choose one _____

Comments: No Data Available

Distance of site to nearest major road (m) 360.00 Direction from site to nearest major road W

Name of nearest major road Hwy 87 ADT 8200 Year Choose one 2015

Comments: _____

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 700 Direction to RR NE ☐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.

_____

ANSWER ALL APPLICABLE QUESTIONS:

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

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4.8

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) 1.8

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

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

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

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

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

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

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

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

Site Review Form Calendar Year 2016

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 10/28/2016 New Pictures Submitted? Yes ☒ No ☐

Reviewer Tony Sabetti Date November 3, 2016

Ambient Monitoring Coordinator Tony Sabetti Date 11/3/16

Revised 2016-11-03

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.

Appendix G-2. Scale of Representativeness

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

a) 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 on the order of 4 to 50 kilometers.
e) Regional Scale - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

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

There are six basic exposures:

a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.
b) Sites located to determine representative concentrations in areas of high population density.
c) Sites located to determine the impact on ambient pollution levels of significant sources or source categories.
d) Sites located to determine general background concentration levels.
e) Sites located to determine the extent of regional pollutant transport among populated areas.
f) Sites located to measure air pollution impacts on visibility, vegetation damage or other welfare-based impacts and in support of secondary standards.

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

Table 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

Appendix G-3. CPI Southport Siting Analysis and Additional Site Information

CPI Southport SO_2 Modeling for Monitor Placement

Introduction

On June 22, 2010, the United States Environmental Protection Agency, EPA, revised the primary sulfur dioxide, SO_2, national ambient air quality standard, NAAQS, (75 FR 35520). The EPA promulgated a new 1-hour daily maximum primary SO_2 standard at a level of 75 parts per billion, ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

On May 13, 2014, the EPA proposed the data requirements rule, DRR, for the 1-Hour SO_2 NAAQS (79 FR 27445). The final DRR was promulgated on Aug. 21, 2015 (80 FR 51051) and required states to gather and submit to the EPA additional information characterizing SO_2 air quality in areas with larger sources of SO_2 emissions. In the DRR, air agencies have the choice to use either monitoring or modeling to characterize SO_2 air quality near priority SO_2 sources and submit the modeling and/or monitoring to the EPA on a schedule specified by the rule.

This analysis was conducted to identify a suitable 1-hour SO_2 source-oriented monitoring site location for the 2017-2019 monitoring period intended to satisfy the DRR for CPI Southport. Currently, the closest SO_2 monitor with a design value is about 40 kilometers north northeast of CPI Southport, located at 2400 US Highway 421 N, Wilmington, NC. The 1-hour monitored air concentration at this site based on 2012-2014 data is 32 ppb or 83.84 $\mu g/m^3$. However, the latest 2014 1-hour concentration has dropped to 3 ppb or 7.86 $\mu g/m^3$ due to the shutdown of several large sources of SO_2 in the area near the monitor.

CPI USA North Carolina - Southport Plant

CPI USA North Carolina - Southport Plant is located at 1281 Power House Drive Southeast in Southport, Brunswick County, North Carolina. CPI has two electricity generating units consisting of six watertube design boilers. CPI Southport is a cogeneration facility that primarily burns wood, coal and tire-derived fuel to produce steam. A portion of the steam is sold to Archer Daniels Midland for process use. The remainder of the steam is used to drive two identical turbine generator units to provide electricity that is sold to Duke Energy Progress.

The facility is a significant source of SO_2 emissions under the DRR since it emits more than the 2,000 tons per year threshold specified for determining which sources need to be evaluated in determining area NAAQS compliance designations. In addition, CPI Southport is one of the facilities included in the March 2, 2015, SO_2 Designation Consent Decree.

A part of the requirements for the DRR is the consideration of other sources of SO_2 emissions near the facility. Figure G54 shows the locations and magnitude of SO_2 emissions in the vicinity. As shown in the figure, there are no large sources nearby. There are two facilities near

CPI Southport that had been included in previous modeling. However, these very small emissions sources, less than two tons per year each, do not impact the receptor ranking and were not included in the modeling for monitor placement.

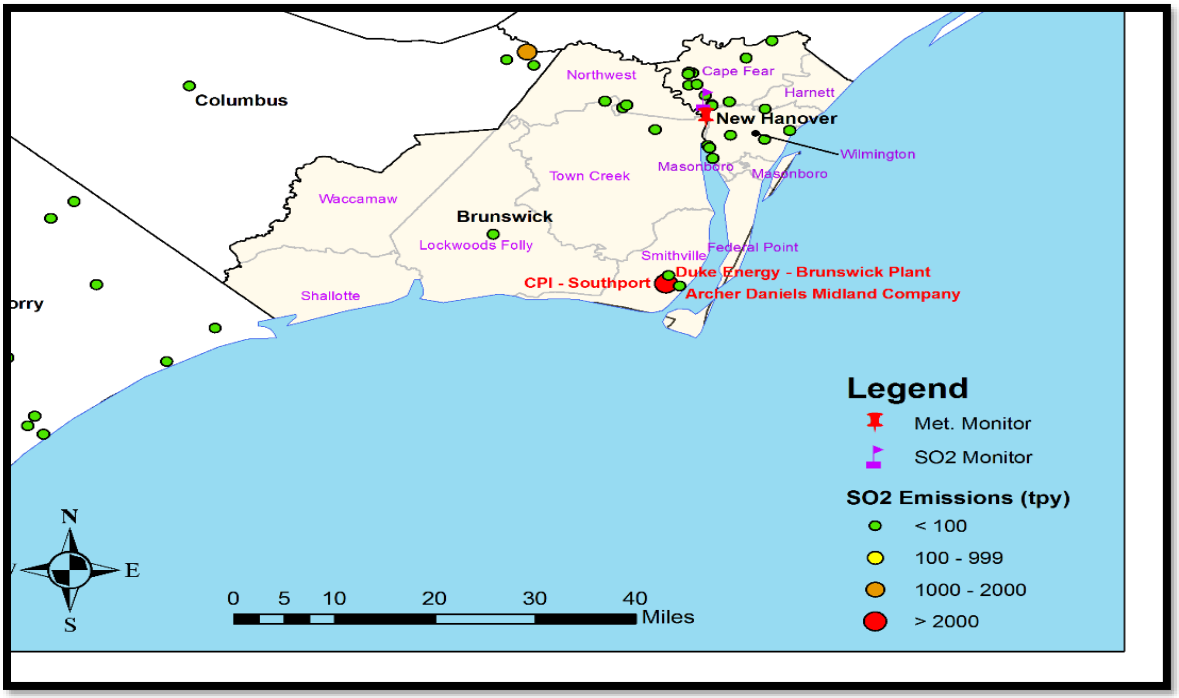

Figure G54. Sources of SO2 Emissions near CPI Southport

AERMOD Modeling

As described in the EPA SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document also known as the Monitoring TAD,[24] the North Carolina Division of Air Quality's, DAQ's, modeling followed the recommendations of the SO_2 NAAQS Designations Modeling Technical Assistance Document, also known as the Modeling TAD.[25] According to the Modeling TAD, given the source-oriented nature of SO_2, dispersion models are appropriate air quality modeling tools to predict the near-field concentrations. The AMS/EPA Regulatory Model, AERMOD, was used, as suggested in the Monitoring TAD. AERMOD is the preferred air dispersion model because it is capable of handling rural and urban areas, flat and complex terrain, surface and elevated releases and multiple sources, including, point, area and volume sources, to address ambient impacts for the designations process.

[24] SO_2 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.

[25] U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, *SO_2 NAAQS Designations Modeling Technical Assistance Document*, Draft, August 2016, available on the worldwide web at https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf, accessed on May 3, 2017

Three years (2013-2015) of hourly SO_2 continuous emissions monitor, CEM, data for each of the two stacks at the CPI facility were used in the modeling. Following the example in Appendix A of the Monitoring TAD, normalized emission rates were used as input to the model. Because of the linear scalability of emissions to modeled concentrations, the relative model results using normalized emissions can be used to predict the location of maximum concentration gradients. The CEM emissions rates were normalized by dividing each hour's rate by the highest overall rate over all stacks throughout the period. The location, size and orientation of the buildings relative to the stacks were input into BPIP-PRIME to calculate building parameters for AERMOD. Table G4 provides the stack parameters used in the modeling analysis.

Table G4. Parameters for CPI Southport SO2 Modeling for Monitor Placement

Source ID	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
	(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
UNIT1	221,576.9	3,760,059.2	7.62	60.35	449.82	22.49	2.64
UNIT2	221,579.2	3,760,099.0	7.62	60.35	449.82	22.49	2.64

As shown in Figure G55, receptors were spaced 100 meters apart along the fence line. A set of nested Cartesian grid receptors were generated extending outward from the fence line. The receptors were spaced 100 meters apart out to 3 km from the facility center, 500 meters apart from 3 to 5 km out and 1000 meters apart from 5 to 10 km out. Receptors were removed from the model if they were within the fence line of the facility or in areas not suitable for the placement of a permanent monitor such as open water. Figure G56 and Figure G57 are included to show the facility and modeling inputs.

Figure G55. Receptor Locations Near the CPI Southport Boundary Used in Modeling

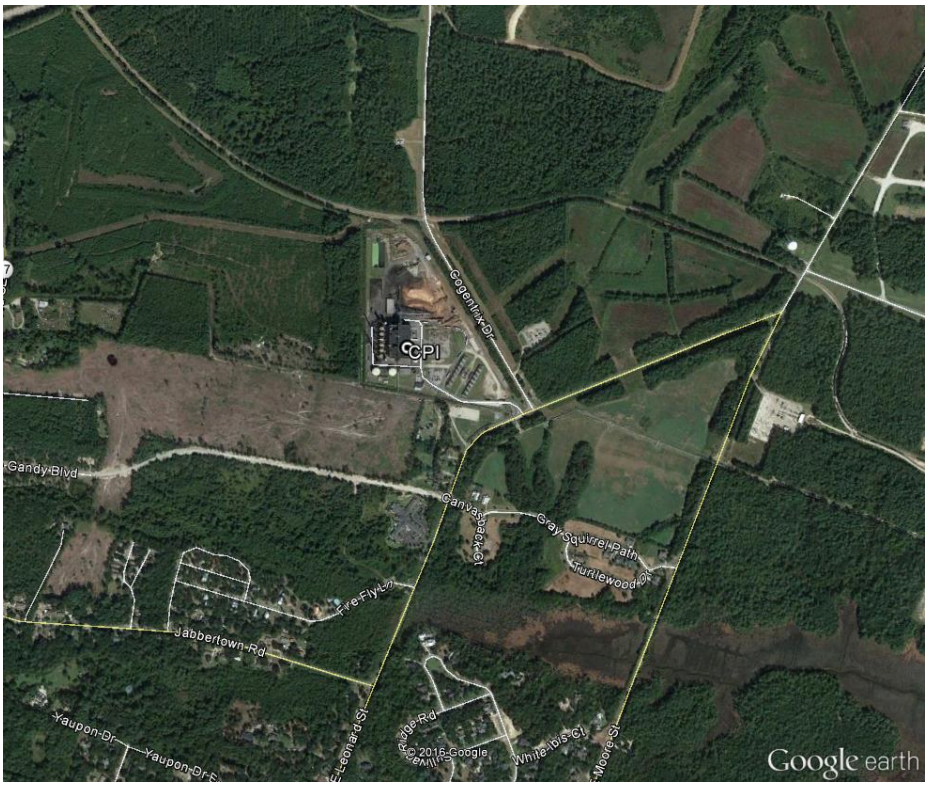

Figure G56. Aerial View of CPI Southport and Surrounding Areas

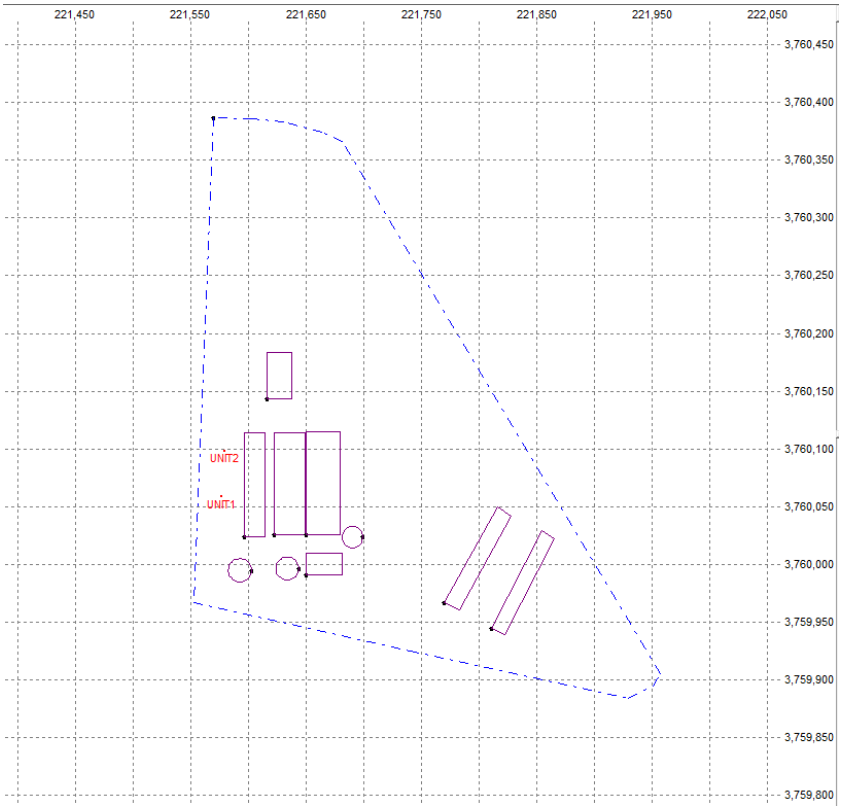

Figure G57. Locations in CPI Southport SO2 Modeling for Monitor Placement (UTM NAD 83 Coordinates in Meters, Zone 18)

Terrain data used in the analysis was obtained from the USGS Seamless Data Server at http://viewer.nationalmap.gov/viewer/. The 1 arc-second NED data was obtained in the GeoTIFF format and used in determining receptor elevations and hill heights using AERMAP. National Weather Service, NWS, Automated Surface Observation Station, ASOS, data for 2013 to 2015 (concurrent with the modeled emissions data) for the station located at Wilmington, NC, paired with upper air sounding data collected at Newport, NC, were used in the analysis. AERMinute was also used in processing the data to incorporate additional 1-minute wind data available for the Wilmington surface station.

Modeling Results and Ranking Methodology

Following the guidance outlined in Appendix A of the Monitoring TAD, normalized modeled impacts were used to determine suitable locations for installing an SO_2 monitor near CPI Southport. The three-year average of each year's 4th daily highest 1-hour maximum concentration (99th percentile of daily 1-hour maximum concentrations) was calculated for each receptor. This value is commonly referred to as the design value or DV. Because normalized emissions were used to calculate these values, the results are referred to as normalized design values or NDVs in this analysis. Figure G58 shows a contour plot of the NDVs for the receptors near CPI Southport.

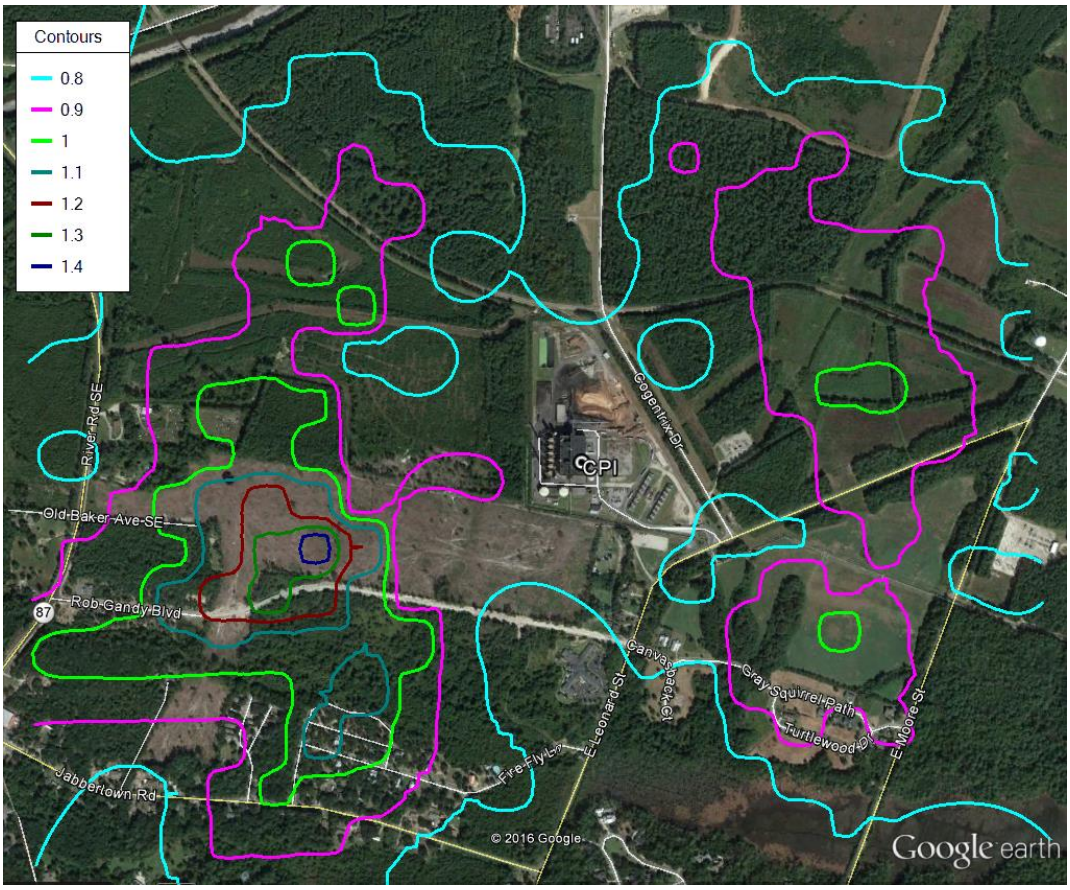

Figure G58. Modeled NDVs for CPI Southport

Based on Appendix A of the Monitoring TAD, the site selection process also needs to account for the frequency in which a receptor has the daily maximum concentrations. The frequency is the number of times each receptor was estimated to have the maximum daily 1-hour concentration. Figure G59 shows the results of the frequency analysis.

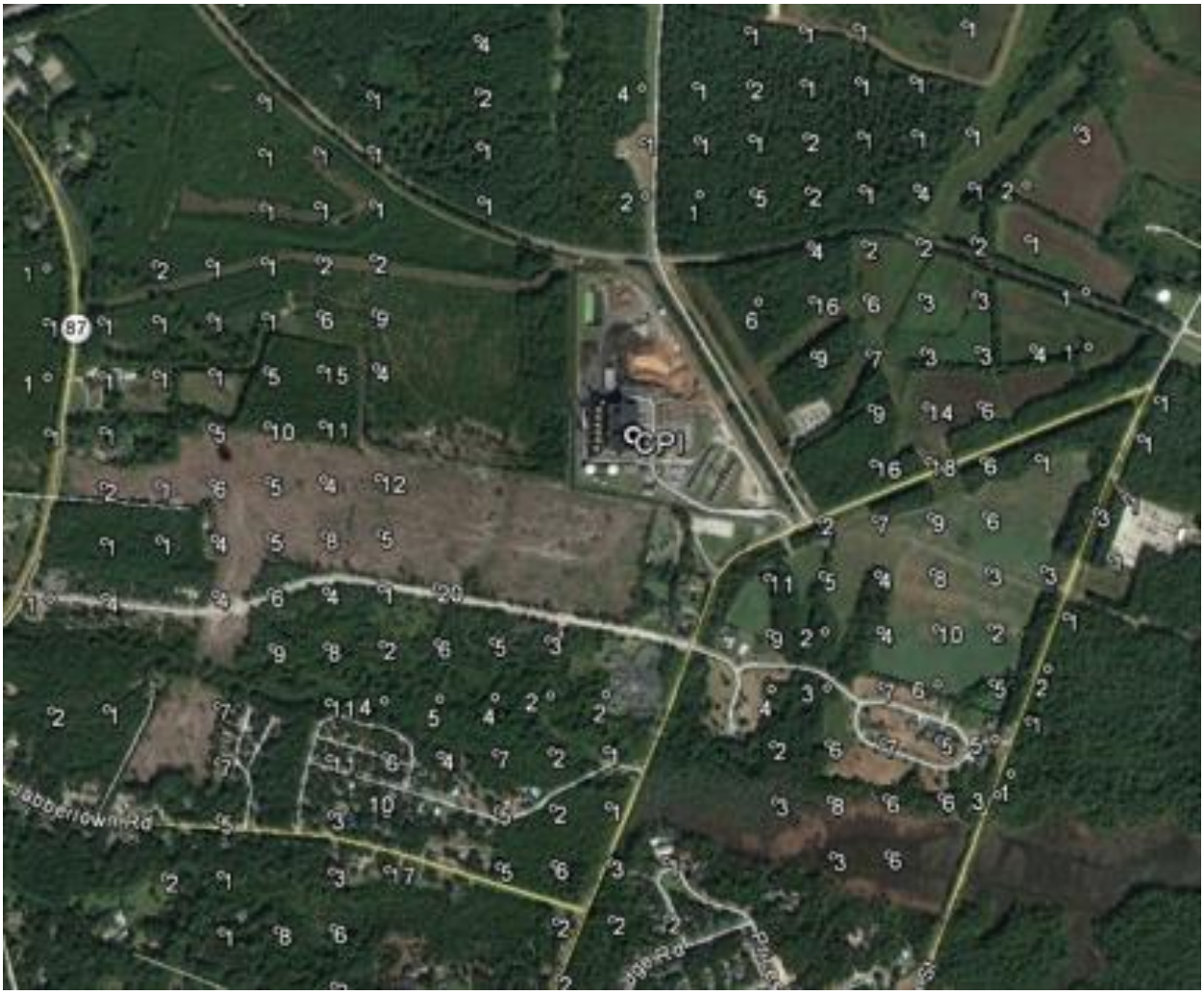

Figure G59. Frequency of Daily Maximum Concentrations for CPI Southport

Each receptor's frequency value was used with its NDV to create a relative prioritized list of receptor locations. This process is referred to in Appendix A of the Monitoring TAD as a scoring strategy. The list of receptors was developed through the following steps:

1. The NDVs were ranked from highest to lowest. Rank 1 means the highest NDV.
2. The frequencies for the 200 receptors were ranked from the highest to lowest. Rank 1 means the highest number of days having the daily maximum value.
3. The NDV rank and the frequency rank were added together to obtain a score.
4. The scores were ranked from lowest to highest. The receptors with the lowest scores were identified as the most favorable locations for the monitor.

Ranking Results and Discussion of Chosen Monitor Site

Figure G60shows the top ranked receptors. The chosen monitor location (marked with yellow pin), ranked 13th, resulted from a site visit conducted using information from the scoring strategy. This is the highest rated location that was in a clear area and for which DAQ received

written permission from the property owner to site a monitor. The top 30 ranked locations are provided in Table G5 with reasons why the other 29 locations were not selected. As shown in Figure G1, this site also provides a clear view of the facility.

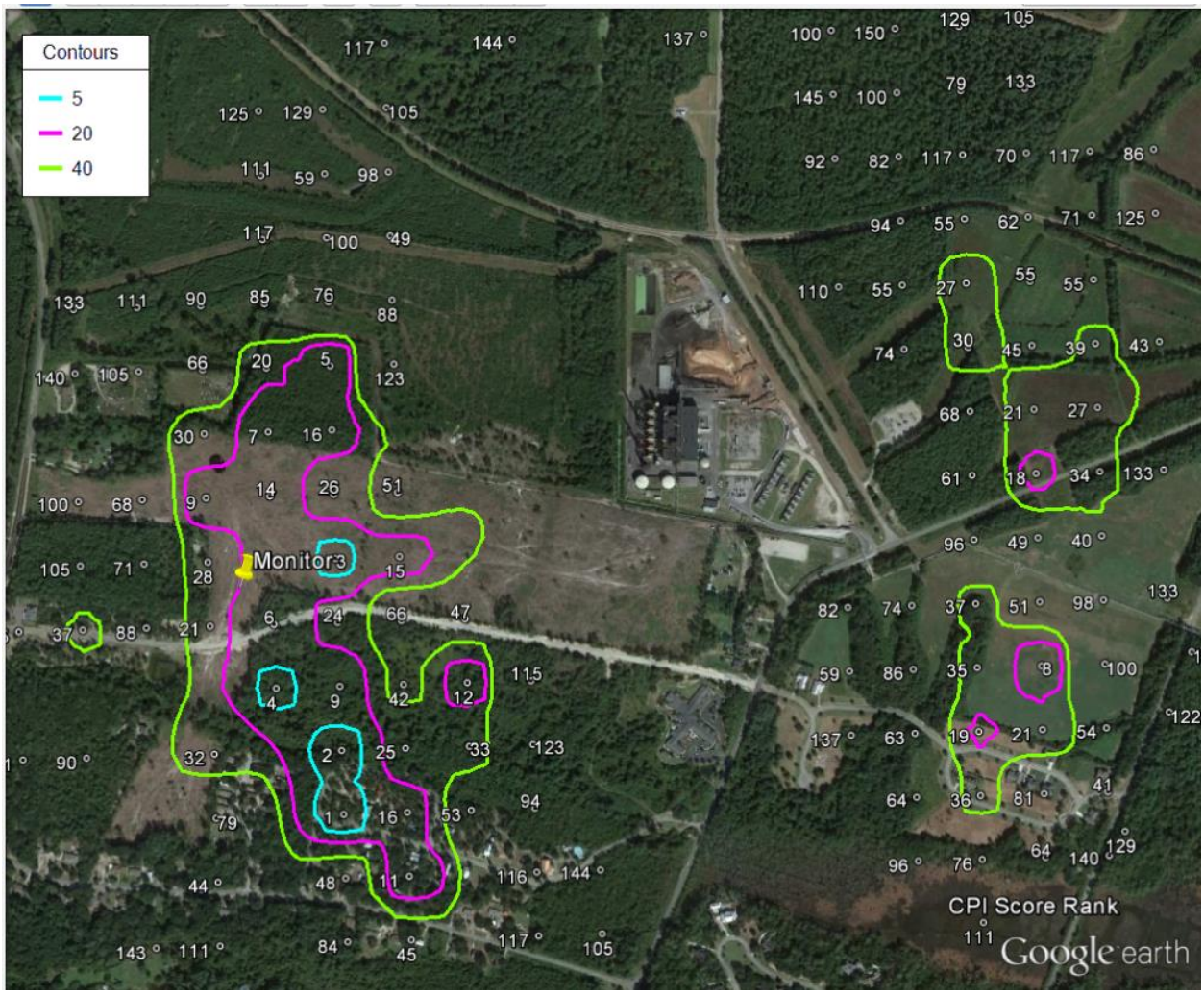

Figure G60. Locations of Top Ranked Receptors from Score Ranking for CPI Southport

Table G5. Selected Ranking Results from the CPI Southport SO_2 Modeling for Monitor Placement

Easting (m)	Northing (m)	Normalized Design Value (NDV)	NDV Rank	Freq. Count	Freq. Rank	Score	Score Rank	Comments on Location
221,100	3,759,500	1.14	10	11	9	19	1	Ownership
221,100	3,759,600	1.10	14	11	9	23	2	Trees
221,100	3,759,900	1.43	1	8	22	23	3	Ownership
221,000	3,759,700	1.08	18	9	16	34	4	Trees
221,100	3,760,200	1.02	29	15	6	35	5	Trees
221,000	3,759,800	1.34	2	6	34	36	6	Ownership
221,000	3,760,100	1.04	25	10	13	38	7	Trees
222,200	3,759,700	1.03	28	10	13	41	8	Trees
221,100	3,759,700	1.07	20	8	22	42	9	Trees
220,900	3,760,000	1.19	8	6	34	42	9	Ownership
221,200	3,759,400	0.98	36	10	13	49	11	Ownership
221,300	3,759,700	1.09	16	6	34	50	12	Trees
221,000	3,759,900	1.32	3	5	51	54	13	Selected location
221,000	3,760,000	1.24	6	5	51	57	14	Ownership
221,200	3,759,900	1.20	7	5	51	58	15	Ownership
221,100	3,760,100	0.96	50	11	9	59	16	Trees
221,200	3,759,500	1.04	25	6	34	59	16	Ownership
222,200	3,760,000	0.94	59	18	2	61	18	Ownership
222,100	3,759,600	0.98	36	7	27	63	19	Ownership
221,000	3,760,200	1.08	18	5	51	69	20	Trees
222,200	3,760,100	0.93	63	14	7	70	21	Ownership
222,200	3,759,600	0.98	36	6	34	70	21	Trees
220,900	3,759,800	1.28	4	4	66	70	21	Ownership
221,100	3,759,800	1.26	5	4	66	71	24	Ownership
221,200	3,759,600	1.18	9	4	66	75	25	Trees
221,100	3,760,000	1.14	10	4	66	76	26	Ownership
222,100	3,760,300	0.97	43	6	34	77	27	Trees
222,300	3,760,100	0.97	43	6	34	77	27	Ownership
220,900	3,759,900	1.13	13	4	66	79	28	Ownership
222,100	3,760,200	0.95	56	7	27	83	30	Trees
220,900	3,760,100	0.99	32	5	51	83	30	Ownership

Note to Table G5: Comments show reasons higher ranked locations were not selected. Ownership means that the landowners were identified as private individuals, who would not respond to our inquiries and where it was less likely a three-year dataset could be obtained.

Figure G61. View of CPI Southport from the Monitor Location

DAQ staff, in conjunction with CPI Southport staff and a representative from EPA Region 4, conducted an in-situ survey in the area around CPI Southport to select a suitable location for SO_2 monitor placement. When selecting adequate locations for the monitor, considerations were made regarding the availability of electrical power, security of the monitor, accessibility, proper instrument exposure and assurance of long-term use of the site. This last point was especially important, given the tight timelines in the rule. Most of the nearby clear area is privately-owned and there was no guarantee that we could keep the monitor there for at least three years to get a design value. DAQ believes that this location was the best available location since it is highly ranked, has available electric power, will be secure, is readily accessible and provides the correct exposure.

Region 4 Requested Information for Chosen Sites

In 2016, the 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 the data requirements rule for sulfur dioxide.[26] The area chosen for placement of the monitor was selected using the results of modeling done as described in the technical assistance document[27] and is reported earlier in this

[26] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard, Federal Register of Aug. 21, 2015, (80 FR 51052) (FRL-9928-18-OAR), 2015-20367.

[27] SO_2 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.

appendix. An aerial view of the Southport DRR monitoring location identified based on the earlier reported considerations is shown in Figure G-35.

The Air Quality System, AQS, identification number for this monitor is 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 DAQ operates the monitor following the DAQ quality assurance project plan and the monitor is part of the DAQ primary quality assurance organization. Figure G-36 through Figure G-39 show views from the Southport DRR site looking north, east, south and west.

The Southport DRR monitoring site is located 30 meters from the trees to the east. The tallest trees are estimated to be 15 meters in height. The nearest road is Rob Gandy Boulevard located approximately 70 meters to the south. This road does not have traffic count data; however, as shown in Figure G-40, 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 traffic on Rob Gandy Boulevard would be expected to be less than that on Jabbertown Road. The probe height is 3.6 meters.

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 33.942222 and -78.019167. 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-41 shows the location of the monitoring station relative to the population center of Brunswick County in the Southport area.

Based on the wind rose in Figure G42, the monitoring station is located downwind of the CPI Southport plant. Figure G42 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.

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 in the Myrtle Beach-Conway-North Myrtle Beach metropolitan statistical area and is representative of the air quality downwind from the fence line of the CPI Southport facility. The proposed monitoring site was provided to the public for comment during 30 days in August 2016 as an addendum to the 2016-2017 network monitoring plan. Table G2 summarizes other factors DAQ evaluated when

choosing the location for the monitoring station. Table G6 summarizes the EPA-required information for the Southport DRR site.

Table G6 The 2016-2017 Sulfur Dioxide Monitoring Network for the Myrtle Beach-Concord-North Myrtle Beach MSA [a]

AQS Site Id Number:	37-019-0005
Site Name:	Southport DRR
Street Address:	5538 Rob Gandy Blvd SE
City:	Southport
Latitude:	33.942222
Longitude:	-78.019167
MSA, CSA or CBSA represented:	Myrtle Beach-Concord-North Myrtle Beach
Monitor Type:	Industrial
Operating Schedule:	Hourly – every year
Statement of Purpose:	Maximum concentration site near the CPI-Southport Plant. Compliance w/NAAQS.
Monitoring Objective:	Source-oriented
Scale:	Neighborhood
Suitable for Comparison to NAAQS:	Yes
Meets Requirements of Part 58 Appendix A:	Yes
Meets Requirements of Part 58 Appendix C:	Yes: EQSA-0486-060
Meets Requirements of Part 58 Appendix D:	No – Data Requirements Rule
Meets Requirements of Part 58 Appendix E:	Yes
Proposal to Move or Change:	Monitoring started Oct. 18, 2016

[a] The monitor uses an instrumental pulsed fluorescence method using a Thermo Electron 43i-TLE, Air Quality System, AQS, method code 560.