

State of South Carolina: 5-Year Ambient Air Monitoring Network Assessment for the Year 2025



SC DEPARTMENT *of*
**ENVIRONMENTAL
SERVICES**

Bureau of Air Quality

July 1, 2025

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Executive Summary

On October 17, 2006, the Environmental Protection Agency (EPA) amended its ambient air monitoring regulations (40 CFR 58.10(e)) to include a requirement that the states and local monitoring agencies must conduct a network assessment once every five years:

“The state, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby states and tribes or health effects studies. The state, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The assessments are due every five years beginning July 1, 2010.”

This report serves as South Carolina’s 2025 5-Year Ambient Air Monitoring Network Assessment (Assessment) and contains an analysis of the South Carolina ambient air monitoring networks as of January 30, 2025, with a discussion of proposed changes to the networks to maintain air data quality, meet regulatory and state air monitoring objectives, and to adjust for resource and financial constraints.

For this Assessment, the S.C. Department of Environmental Services (Department) performed a technical review of the criteria pollutant ambient monitoring networks. The latest population data, meteorological parameters, emissions inventories data, historical data, and design value trends were used to review and assess the usefulness of the monitor placements and determine any future monitoring needs for the carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), lead, and PM₁₀ monitoring networks, which are smaller monitoring networks. The ozone and PM_{2.5} monitoring networks, which are larger networks, were reviewed using all data listed above, as well as application of Thiessen polygons using the Aeronautical Reconnaissance Coverage Geographic Information System (GIS). The GIS applications were used to obtain weighted scores as an indication of the value of each monitor. Finally, staff evaluated all information to determine any changes needed in the monitoring networks. The following summarizes all active, planned, and recommended changes for the next five years:

CO Monitoring Network

Because of the extremely low design values, the current South Carolina network consists of one CO monitor at the Parklane (45-079-0007) (NCore) Site. The North Carolina portion of the Charlotte-Concord-Gastonia, NC-SC MSA also has two operational CO monitors.

The Greenville-Anderson-Mauldin, SC MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000, a CO monitor would be required to be collocated at a near-road monitoring site in the MSA. The Department will begin the process of establishing a near-road site and installing a near-road CO monitor in the MSA when the population threshold is crossed and as resources are allowed.

SO₂ Monitoring Network

All required monitors are expected to have no changes in the upcoming 5 years. Should a change in population or design value trigger additional minimum monitoring requirements, the Department will begin the process of establishing monitors and/or monitoring sites to meet those requirements as resources are allowed.

The SPM rotational SO₂ monitor at York Landfill (45-091-0008) (Charlotte-Concord-Gastonia, NC-SC MSA) monitoring site will operate from January 1, 2024 to December 31, 2025. In 2026, the monitor will be moved to the Trenton (45-037-0001) monitoring site in the Augusta-North Augusta, GA-SC MSA and will remain there for 2026 and 2027. Rotational site locations past 2027 will be determined based on resource availability and need.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around the SO₂ probe. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

NO₂ Monitoring Network

The Greenville-Anderson-Mauldin MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000 an area-wide NO₂ monitor would be required in the MSA. Additionally, if the population crosses 1,000,000 a near-road NO₂ monitor would be required in the MSA. The Department will begin the process of establishing a near-road site and installing any additional NO₂ monitors required in the MSA when the population threshold is crossed and as resources are allowed.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around the NO₂ probe. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

Lead Monitoring Network

Currently, South Carolina does not have any lead monitors. South Carolina has no sources that exceed the thresholds set by the lead NAAQS.

There are no changes planned for the lead network at this time.

PM₁₀ Monitoring Network

The Greenville-Anderson-Mauldin, SC MSA is nearing 1,000,000 residents. If the population crosses 1,000,000 an additional PM₁₀ monitor would be required in the MSA. The Department will begin the process of adding a PM₁₀ monitor in the MSA when the population threshold is crossed and as resources are allowed.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around the PM₁₀ probe. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

PM_{2.5} Monitoring Network

The current PM_{2.5} network meets the PM_{2.5} minimum monitoring requirements and is adequate for protection of sensitive populations.

The Greenville-Anderson-Mauldin, SC MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000, the Greenville-Anderson-Mauldin MSA will be required to have three PM_{2.5} monitors. One of these monitors will be required to be collocated at a near-road NO₂ monitor, and one will be required to be sited in an at-risk community with poor air quality, particularly where there are anticipated effects from sources in the area. The Department will begin the process of establishing any additional PM_{2.5} monitors required in the MSA when the when the population threshold is crossed and as resources are allowed.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around both the PM_{2.5} Intermittent and Continuous probes. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

The Department began operating Teledyne T640 (method code 236) and T640X (method code 238) FEM monitors in 2020 to collect continuous PM_{2.5} data at multiple sites throughout the state. The T640X monitor has the ability to report both PM_{2.5} and PM₁₀ data, and both monitors are continuous. The Teledyne T640 and T640X FEM monitors showed a

significantly higher bias when compared to FRM samplers. On June 13, 2023, Teledyne released a data alignment firmware update that was meant to correct this bias and make the data collected by the T640 and T640X more comparable to the FRM samplers. On September 6, 2023, the Department applied this firmware update to all T640 and T640X monitors, which changed their method codes to 636 and 638, respectively. All data collected by the T640 and T640X monitors before the firmware update (method codes 236 and 238) have had a NAAQS Exclusion applied by EPA. The EPA, through AQS, back corrected all data collected prior to the firmware update. This data is listed under method codes 736 and 738. All data aligned T640 and T640X monitors (method codes 636 and 638), excluding those located at the Cape Romain, Coastal Carolina, and Chesterfield Monitoring Sites, have a NAAQS Exclusion applied for up to 23 months after the firmware update to evaluate the comparability of the new method code to the FRM samplers. The data quality will be addressed at the end of the NAAQS Exclusion time period, which will end September 6, 2025.

The Coastal Carolina monitoring site (45-051-0008) operates one SPM T640 monitor to measure PM_{2.5} population exposure in the Myrtle Beach-North Myrtle Beach-Conway, SC MSA. The monitor is not required, and the Department plans to remove the T640 before the end of 2025 and instead operate a non-FEM continuous PM_{2.5} monitor for solely AQI purposes.

Ozone Monitoring Network

The current ozone network meets state needs and protects sensitive populations. All MSAs meet the ozone minimum monitoring requirements except the Myrtle Beach-Conway-North Myrtle Beach, SC MSA and the Spartanburg, SC MSA. On July 21, 2023, OMB added Union County to the Spartanburg MSA, increasing the population of the MSA above 350,000 and triggering the requirement for an additional ozone monitor. In the Myrtle Beach-North Myrtle Beach-Conway MSA, the 2023 design value was 63 ppb, exceeding 85% of the NAAQS and triggering the requirement for an additional ozone monitor. As resources allow, the Department will continue to look for suitable locations to host ozone monitors in both MSAs.

Additionally, the Congaree Bluff Monitoring site has maintained a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2021. The waiver is due to be re-evaluated and renewed July 1, 2025. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

Acronyms

µg/m³ – Micrograms per cubic meter
AADT – Annual Average Daily Traffic
AQI – Air Quality Index
AQS – Air Quality System
CBSA – Core Based Statistical Area
CFR – Code of Federal Regulations
CI – Confidence Interval
CO – Carbon Monoxide
DJJ – Department of Juvenile Justice
DRR – Data Requirements Rule
EMP – Emissions Modeling Platform
EPA – Environmental Protection Agency
ESC – Employment Security Commission
F – Fahrenheit
FEM – Federal Equivalent Monitor
FR – Federal Regulation
FRM – Federal Reference Monitor
FS – Fire Station
GA – Georgia
GAEP – Georgia Environmental Protection Division
GIS – Geographical Information System
HAP – Hazardous Air Pollutants
JCI – Johnson Controls International
MCAQ – Mecklenburg County Air Quality
MOA – Memorandum of Agreement
MS – Middle School
MSA – Metropolitan Statistical Area
NAAQS – National Ambient Air Quality Standards
NATTS – National Air Toxics Trends Station
NC – North Carolina
NCDAQ – North Carolina Division of Air Quality
NCore – National Core multipollutant monitoring station
NEI – National Emissions Inventory
NO₂ – Nitrogen Dioxide
NO_x – Nitrogen Oxides

NO_y – NO_x and other oxidized species
NSFS – North Spartanburg Fire Station
O₃ – Ozone
OMB – Office of Management and Budget
PM₁₀ – Particulate Matter less than 10 microns
PM_{2.5} – Particulate Matter less than 2.5 microns
PPB – Parts per Billion
PPM – Parts per Million
PQAO – Primary Quality Assurance Organization
PTE – Potential to Emit
PWEI – Population Weighted Emissions Index
QA – Quality Assurance
RA – Regional Administrator
SC – South Carolina
SCDES or Department – South Carolina Department of Environmental Services
SCE&G – South Carolina Energy and Gas
SIP – State Implementation Plan
Site ID – Site Identification Number
SLAMS – State, Local, Air Monitoring Station
SO₂ – Sulfur Dioxide
SPM – Special Purpose Monitor
STN – Speciation Trends Network
SVOC – Semi-Volatile Organic Chemicals
TPY – Tons per Year
TSP – Total Suspended Particles
US – United States
VISTAS – Visibility Improvement State and Tribal Association of the Southeast
VOC – Volatile Organic Chemicals
VSCC – Very Sharp Cut Cyclone Tons Per Year

Introduction

Network Assessment Background

As required in 40 CFR 58.10, the Department submitted Assessments to the EPA for 2010, 2015, and 2020. For this 2025 Assessment, each monitoring network will be evaluated to determine the following:

Table 1: Network Assessment Questions

1. Does the network meet the monitoring objectives and spatial scales?
2. Are new monitoring sites are needed?
3. Are existing sites no longer needed and subject to termination?
4. Are there any new technologies appropriate for incorporation into the air monitoring network?
5. Does the network sufficiently support characterization of air quality in areas with large populations of susceptible individuals?
6. Would the discontinuance of a SLAMS monitor have an adverse impact on other data users or health studies?
7. Will changes to population-oriented sites affect PM _{2.5} ?
8. Is additional monitoring required for lead (Pb) sources according to the most recent National Emissions Inventory (NEI)?

The evaluation for the 5-year network assessment will consider the following information in the assessments:

1. Statewide and local level population statistics,
2. Statewide ambient air monitoring network pollutant concentration trends for the past five years,
3. Network suitability to measure the appropriate spatial scale of representativeness for selected pollutants,
4. Monitoring data spatial redundancy or gaps that need to be eliminated, and
5. Programmatic trends or shifts in emphasis or funding that lead toward different data needs.

As specified in this guidance¹, a network assessment consists of six steps detailed in Table 2. This document will utilize these steps in the technical assessment of South Carolina's ambient air monitoring network.

¹ Ambient Air Monitoring Network Assessment Guidance: Analytical Techniques for Technical Assessments of Ambient Air Monitoring Networks
(<http://www.epa.gov/ttn/amtic/files/ambient/pm25/datamang/network-assessment-guidance.pdf>)

Table 2: Steps to Conduct an Ambient Air Monitoring Network Assessment

Step	Description	Information Needed
1	Prepare or update a regional description, discussing important features that should be considered for network design.	Topography, climate, population, demographic trends, major emissions sources, and current air quality conditions
2	Prepare or update a network history that explains the development of the air monitoring network over time and the motivations for network alterations, such as shifting needs or resources.	Historical network specifications (e.g., number and locations of monitors by pollutant and by year in graphical or tabular format); history of individual monitoring sites
3	Perform statistical analyses of available monitoring data. These analyses can be used to identify potential redundancies or to determine the adequacy of existing monitoring sites.	Site correlations, comparisons to the National Ambient Air Quality Standards (NAAQS), trend analysis and spatial analysis
4	Perform situational analyses, which may be objective or subjective. These analyses consider the network and individual sites in more detail, taking into account research, policy, and resource needs.	Risk of future NAAQS exceedances, demographic shifts, requirements of existing state implementation plans (SIP), or maintenance plans, density or sparseness of existing networks
5	Suggest changes to the monitoring network on the basis of statistical and situational analyses and specifically targeted to the prioritized objectives and budget of the air monitoring program.	Reduction of number of sites for a selected pollutant, enhanced leveraging with other networks, and addition of new measurements at sites to enhance usefulness of data
6	Acquire the input of state and local agencies or stakeholders and revise recommendations as appropriate.	

The networks of all criteria pollutants are reviewed and assessed in this document, but due to the limitations of the analysis tools, only the ozone and PM_{2.5} networks will be analyzed using a scoring system implemented with GIS.

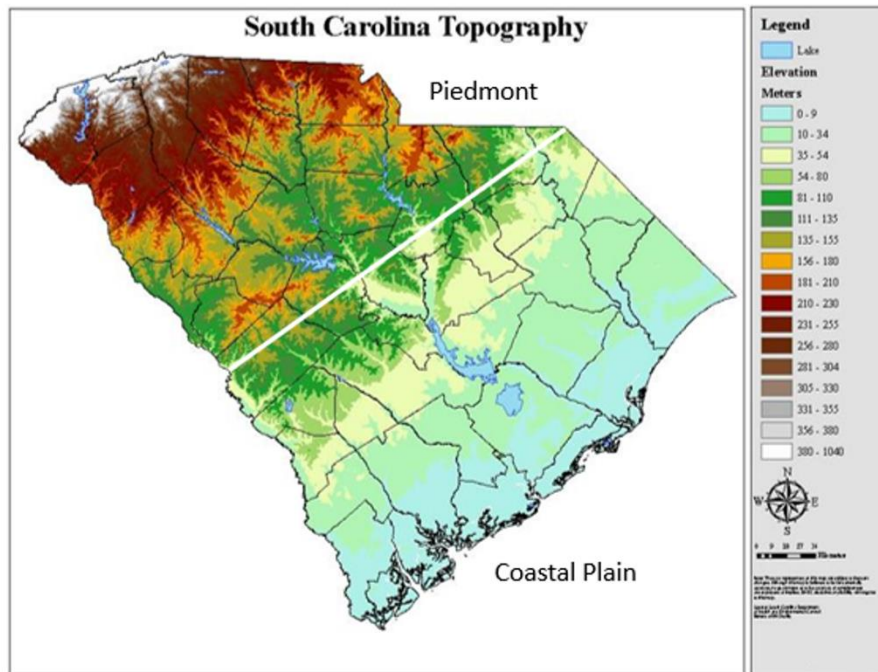
Non-criteria sampling is not required to be assessed as part of this review. The 2023 design value data, the 2023 estimated population from the U. S. Census Bureau and the 2020 NEI were used for the calculations.

South Carolina Information

Topography

The topography of South Carolina is divided into two distinct areas, commonly known as the Piedmont and the Coastal Plain.

Map 1: South Carolina Topography



The line of demarcation runs from the eastern boundary of Aiken County through central Chesterfield County to the North Carolina border. West of this line, elevations begin at about 300 feet and increase to over 1,000 feet in the extreme northwestern counties, culminating in isolated peaks of 2,000 to over 3,500 feet above mean sea level. East of the line, there is evidence of outcroppings from the lower Appalachians in a ridge of low hills and broken country between the Congaree River and the north fork of the Edisto River, and also in a hilly and rolling region in the upper Lynches River drainage basin between the Catawba-Wateree and the Great Pee Dee Rivers. In approximately one-third of the coastal plain (or what is commonly known as the upper coastal plain), the elevations decrease rather abruptly from 300 to 100 feet and continue to decrease to the coast. The major part of the coastal area is not over 60 feet above mean sea level. In this region of lower levels, to the eastward and southward, the great swamp systems of the state predominate.

The slope of the land from the mountains seaward is toward the southeast, and all of South Carolina's streams naturally follow that general direction to the Atlantic Ocean. The South Piedmont section of the state is on the eastern slope of the Appalachian Mountains, with the main ridge of the mountains about 30 miles west. To some extent, these

mountains act as a barrier for weather systems and tend to protect the area from the full force of the cold air masses during the winter months. The relatively flat areas of the Central Plains and the coastal region allow free air movement and are conducive to effective dispersion of pollutants.

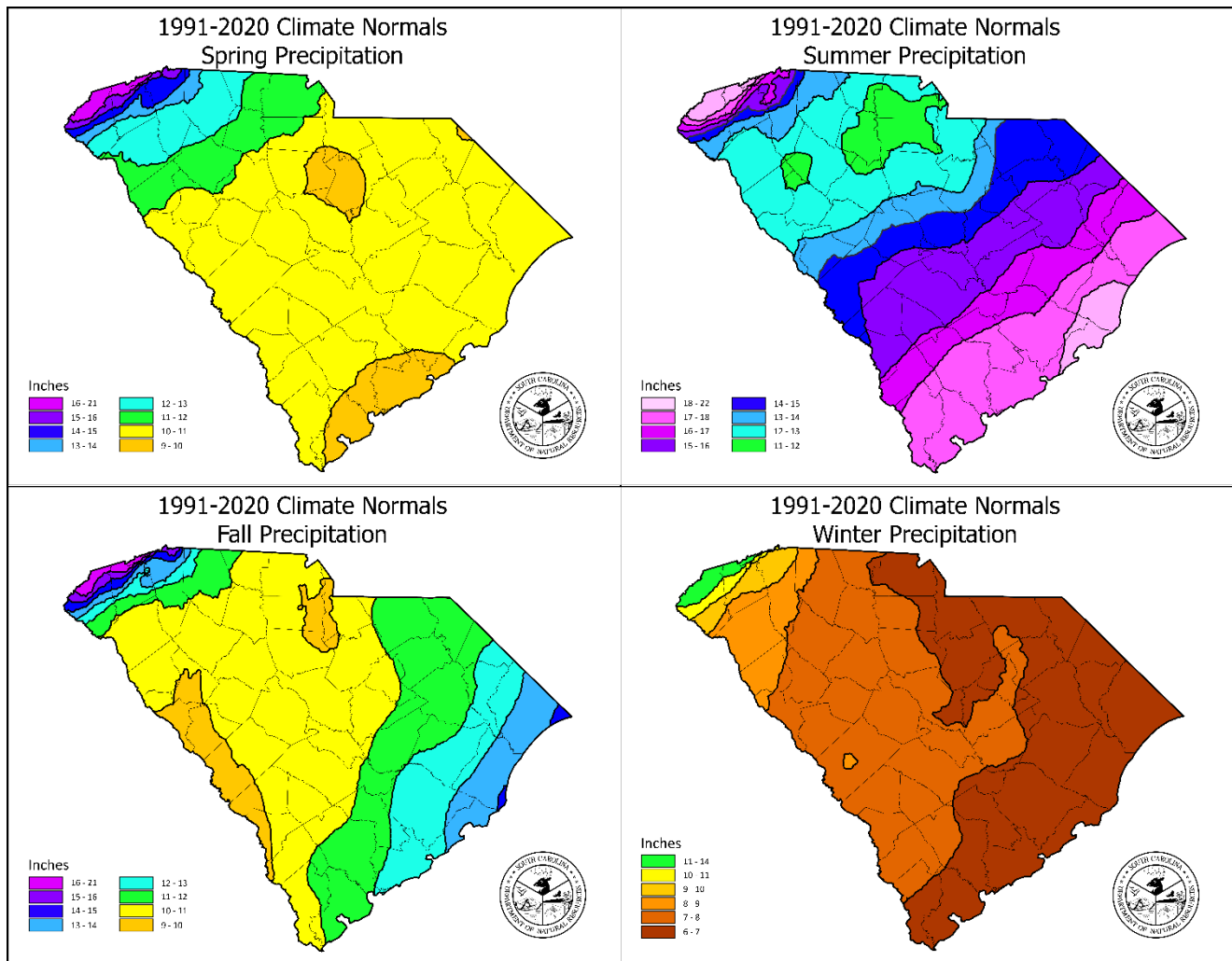
Climate

South Carolina has a humid, subtropical climate with generally hot summers and mild winters. During the summer, a semi-permanent high-pressure system in the northwestern Atlantic Ocean provides the state with a warm, moist, and unstable air mass. The southern extent of the Appalachian Mountains extends into the northwest part of the state. The high elevation in the state's Blue Ridge region tends to have less subtropical characteristics than the rest of the state. During the cool season (October through April), this mountain chain tends to block or delay many cold air masses approaching from the northwest. Cold air masses that rapidly cross the mountains are warmed as the air is heated by compression when air descends on the southeastern side of the mountain chain.

Wind speed and direction are of particular interest in South Carolina for evaluating pollution, emissions, and transport. The prevailing near-surface winds are typically either from the northeast or southwest direction due in large part to the presence and orientation of the Appalachian Mountains.

As shown in Map 2², precipitation varies slightly across the state. Due to the presence of the Appalachian Mountains, the extreme upstate tends to receive consistently high amounts of rainfall.

Map 2: Seasonal Precipitation Normals in South Carolina (1991-2020)

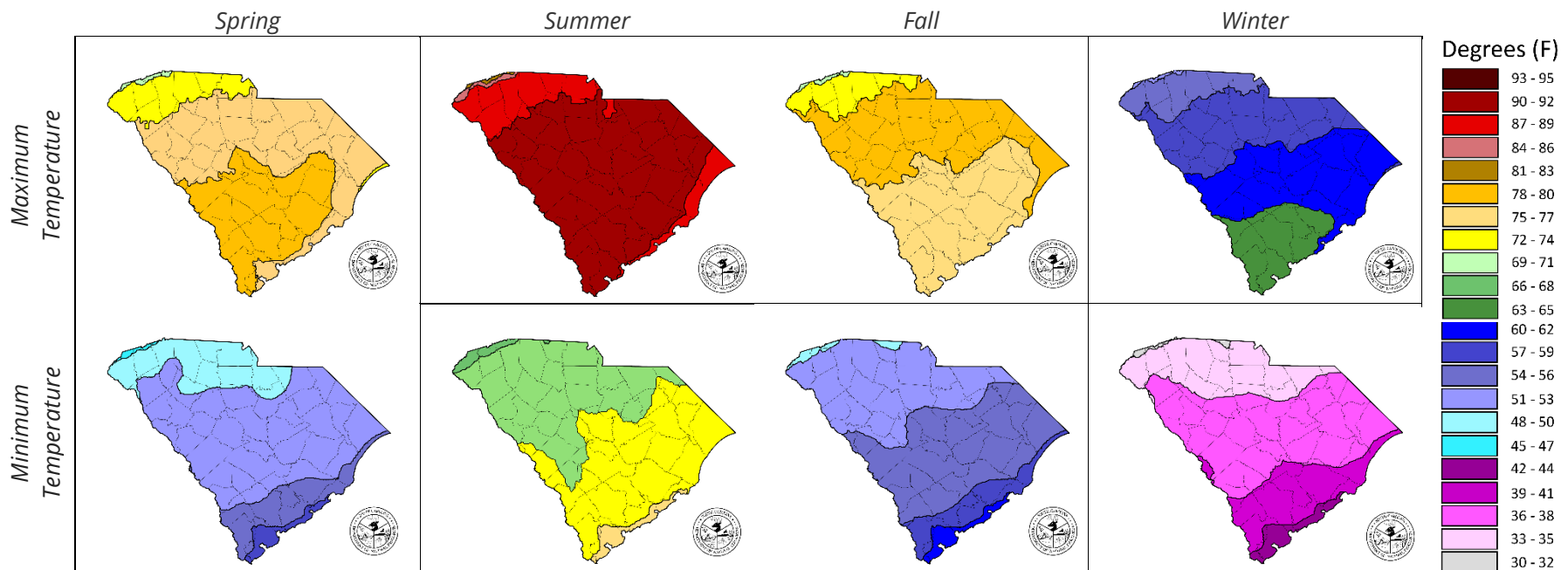


In the Lowcountry, tropical cyclones contribute to the precipitation during the summer and fall months. Extratropical cyclones contribute to precipitation during the fall, winter, and spring months. Severe weather can be a concern across the state during the spring months.

²Maps courtesy of the [South Carolina Department of Natural Resources](https://dnr.sc.gov/). The weather data was taken from the U. S. National Center for Environmental Information and was collected from 1991 to 2020.

Map 3³ indicates the 1991-2020 high and low seasonal temperature normals, or 30-year averages, across the State. Due to the higher elevations, the northwest part of the state tends to be slightly cooler than the southeast portion of the state. The state experiences overnight and morning temperature inversions, which can be particularly strong during the spring months when winds are calm, and skies are clear. These inversions prevent vertical mixing in the near-surface layer of the atmosphere and cause pollutants to be trapped near the ground. Daytime heating generally allows for better vertical mixing by afternoon hours when overnight temperature inversions do occur.

Map 3: South Carolina High and Low Seasonal Temperature Normals (1991-2020)

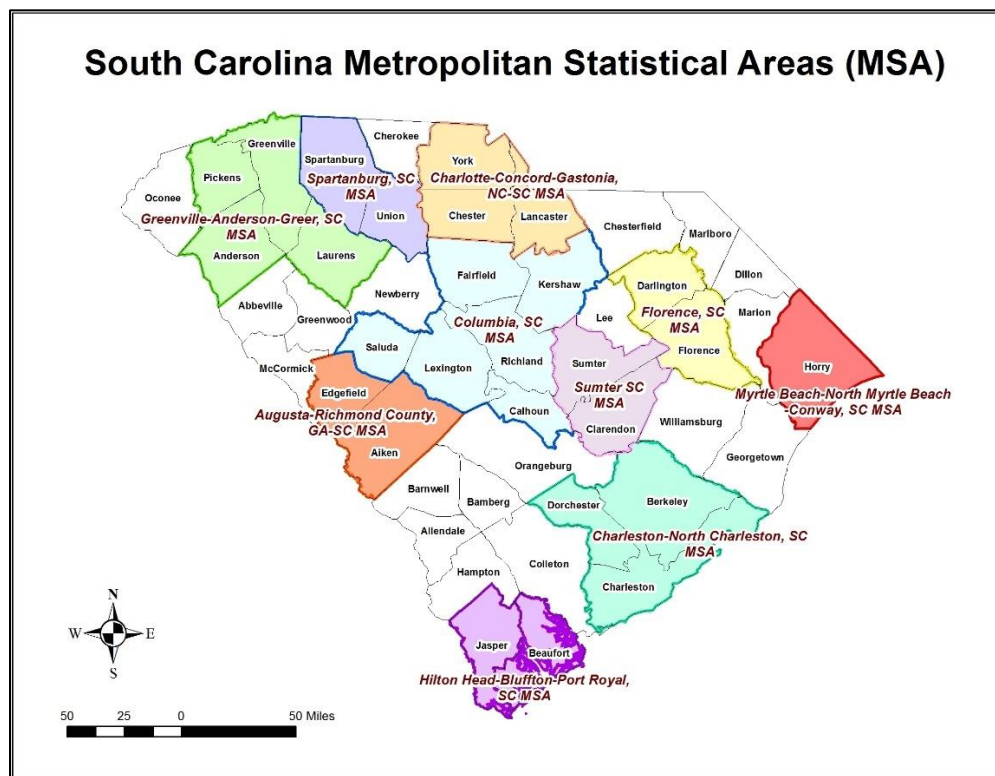


³ Maps courtesy of the [South Carolina Department of Natural Resources](https://dnr.sc.gov/). The weather data was taken from the U. S. National Center for Environmental Information and was collected from 1991 to 2020.

Metropolitan Statistical Areas and Regions of South Carolina

Metropolitan Statistical Areas (MSAs) are geographic entities defined by the United States Office of Management and Budget (OMB) and used as the basis for ambient air minimum monitoring requirements.

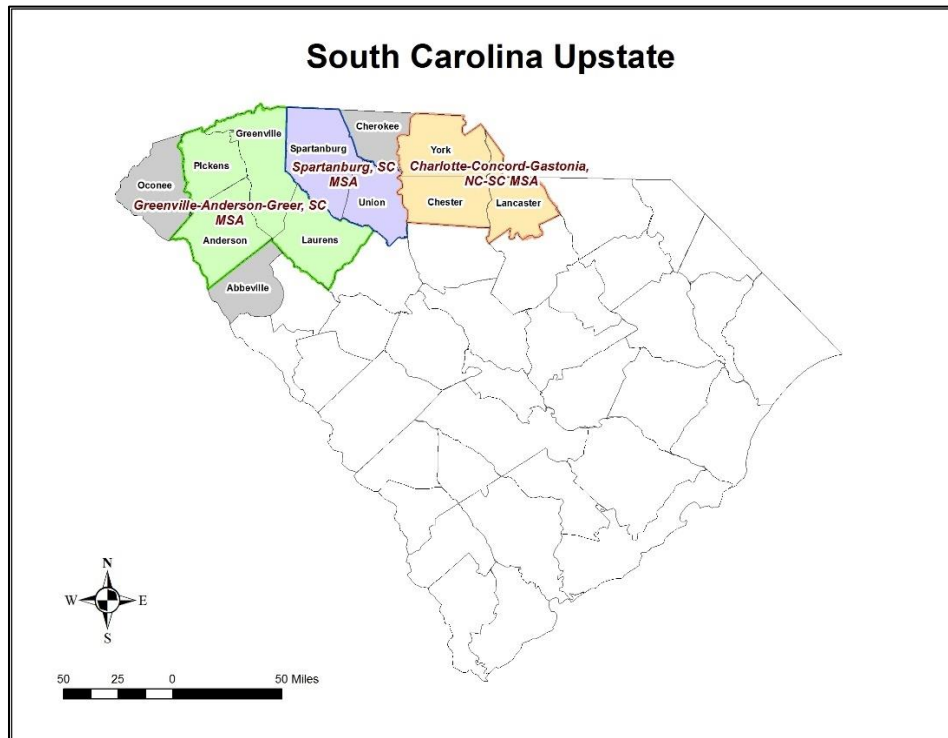
Map 4: South Carolina MSAs and Counties



An MSA contains a core urban area of 50,000 or more population and exhibits close economic ties to the surrounding areas. There are ten MSAs in the three regions of South Carolina (Map 4), with two of these being multi-state MSAs. Each region is discussed below.

The upper northwestern part of the state is known as the Upstate (Map 5) and includes three MSAs and three individual counties.

Map 5: The Upstate Area

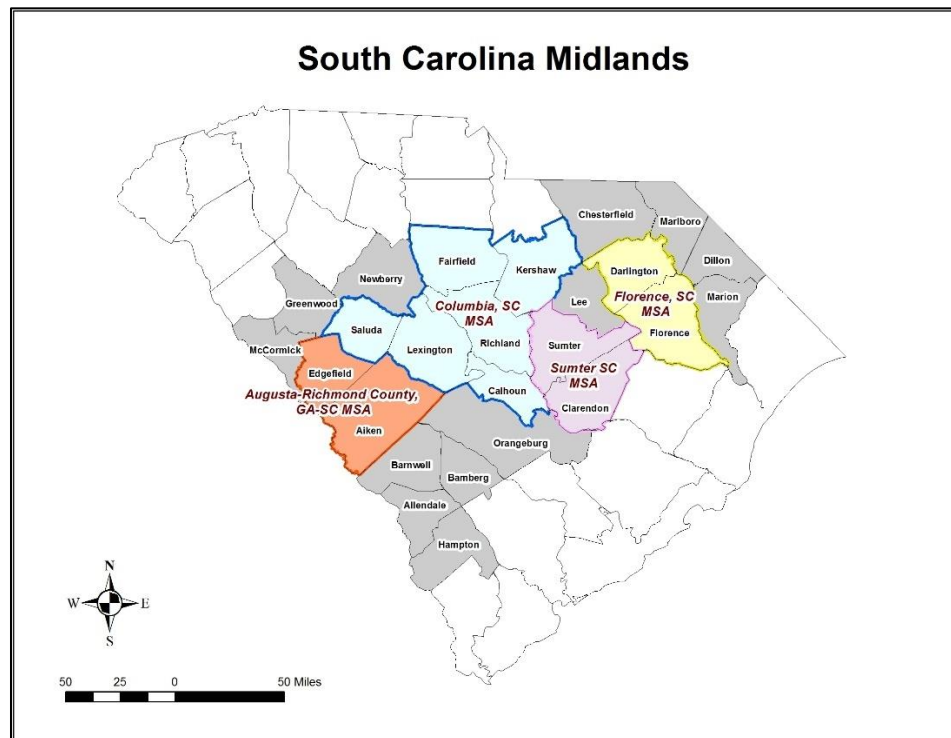


The largest MSA in this area is the Charlotte-Concord-Gastonia NC-SC MSA, which is a multi-state MSA. The North Carolina portion of this MSA includes Anson, Cabarrus, Gaston, Iredell, Lincoln, Mecklenburg, Rowan and Union Counties. The South Carolina portion of this MSA includes York, Chester, and Lancaster Counties. The principal cities in this MSA are Charlotte, Concord, and Gastonia in North Carolina and Rock Hill in South Carolina. The second largest MSA in the Upstate area is the Greenville-Anderson-Greer, SC MSA, which includes Greenville, Anderson, Laurens, and Pickens Counties, and the principal cities are Greenville, Anderson, and Greer. The final MSA in this area is the Spartanburg MSA, which includes Spartanburg and Union Counties, with the principal city being Spartanburg. The counties in the Upstate area that are not in an MSA include Abbeville, Cherokee, and Oconee.

The Midlands area (Map 6) runs diagonally through the middle of the state between the Upstate and the Lowcountry. There are four MSAs and thirteen individual counties in this region. The largest MSA in this area is the Columbia, SC MSA and includes Calhoun, Fairfield, Kershaw, Lexington, Richland, and Saluda Counties. The principal city is Columbia. The second largest MSA is the Augusta-Richmond County, GA-SC MSA, which includes Aiken and Edgefield Counties in South Carolina. The Georgia portion of this MSA includes Burke, Columbia, Lincoln, McDuffie, and Richmond Counties. The principal city in the Georgia portion of the MSA is Augusta-Richmond County. In the South Carolina portion of this MSA, Aiken, South Carolina is the principal city. The third largest MSA in the Midlands area is the Florence, SC MSA, which includes Florence and Darlington Counties, and the principal city is

Florence. The final MSA in this area is the Sumter, SC MSA. This MSA includes Sumter and Clarendon Counties. The principal city is Sumter. The counties not included in any MSAs in the Midlands area include Allendale, Bamberg, Barnwell, Chesterfield, Dillon, Greenwood, Hampton, Lee, Marion, Marlboro, McCormick, Newberry, and Orangeburg.

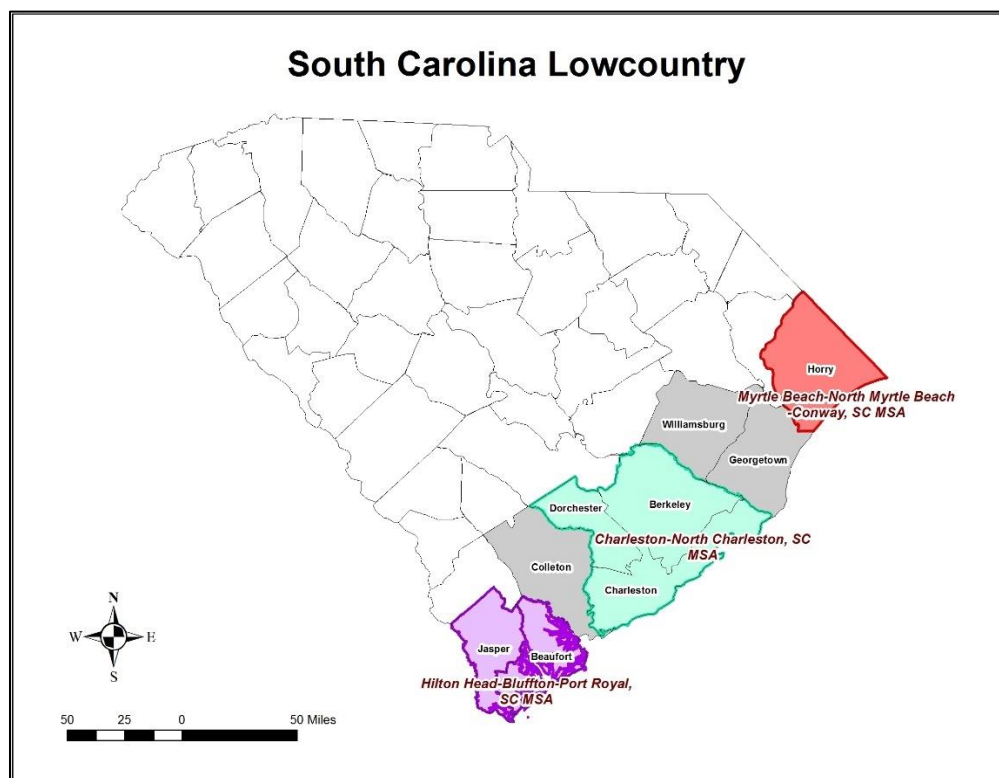
Map 6: The Midlands Area



The Lowcountry (Map 7) covers the coastal areas of South Carolina and includes three MSAs and three individual counties. The largest MSA is the Charleston-North Charleston, SC MSA, which includes Berkeley, Charleston, and Dorchester Counties. The principal cities are Charleston and North Charleston. The second largest MSA is the Myrtle Beach-North Myrtle Beach-Conway, SC MSA. The county in this MSA is Horry County, South Carolina. The principal cities are Myrtle Beach, Conway, and North Myrtle Beach, South Carolina. The final MSA is the Hilton Head-Bluffton-Port Royal, SC MSA. This includes Beaufort and Jasper Counties and encompasses the principal cities of Hilton Head Island, Bluffton, and Port Royal.

The counties not included in any MSA in the Lowcountry area include Colleton, Georgetown, and Williamsburg Counties.

Map 7: The Lowcountry Area



Sources of emissions

In 2024, there were over 200 Title V sources in South Carolina emitting one or more of the criteria pollutants (Map 8). These sources are scattered fairly uniformly across the state with some clustering near urbanized areas and along interstates.

South Carolina has three types of operating permits: state minor, conditional major, and Title V. The type of permit issued is dependent on potential emissions and limits: Potential emissions are calculated on 8,760 hours per year operation, maximum capacity, using worst case emitting material, and no emission controls. A facility can add emission controls or other operating limits (such as hours of operation) if those limits are an enforceable limit in the permit.

The types of operating permits South Carolina issues to facilities include:

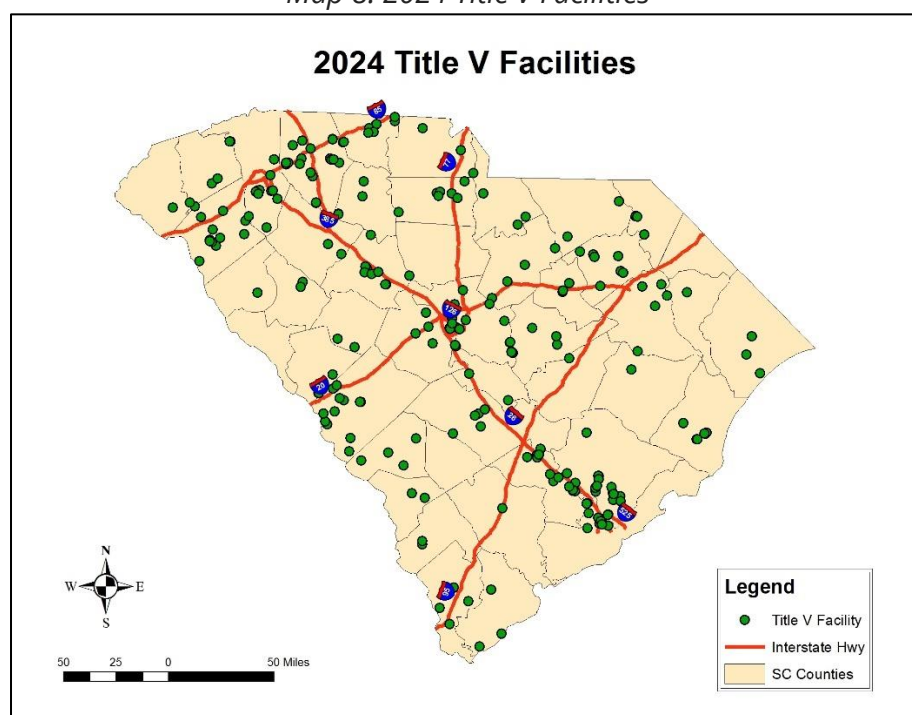
- Title V operating permits are issued to major sources, which directly emit, or have the potential to emit (PTE), greater than or equal to the major source threshold as defined by applicable federal or state regulations. This includes facilities with a PTE of 100 tons per year (tpy) or greater of any air pollutant, as defined in Section 302 of the Clean Air Act (most commonly the criteria pollutants PM₁₀, SO₂, NO_x, CO, and/or VOC), and facilities that can potentially emit 10 tons per year or more of a single hazardous air pollutant (HAP) or 25

tons per year or more of total HAPs. Facilities subject to Title V permitting program must also certify compliance with their operating permit each year.

- Conditional major operating permits are issued to sources that obtain a federally enforceable physical or operational limitation from the Department to limit or cap the source's PTE to avoid being defined as a major source. Facilities that have taken limits on their PTE also have reporting requirements related to their compliance.

- State minor operating permits are issued to facilities with a PTE below 100 tpy for criteria pollutants and below the 10 and 25 tpy limit for HAPs.

Map 8: 2024 Title V Facilities



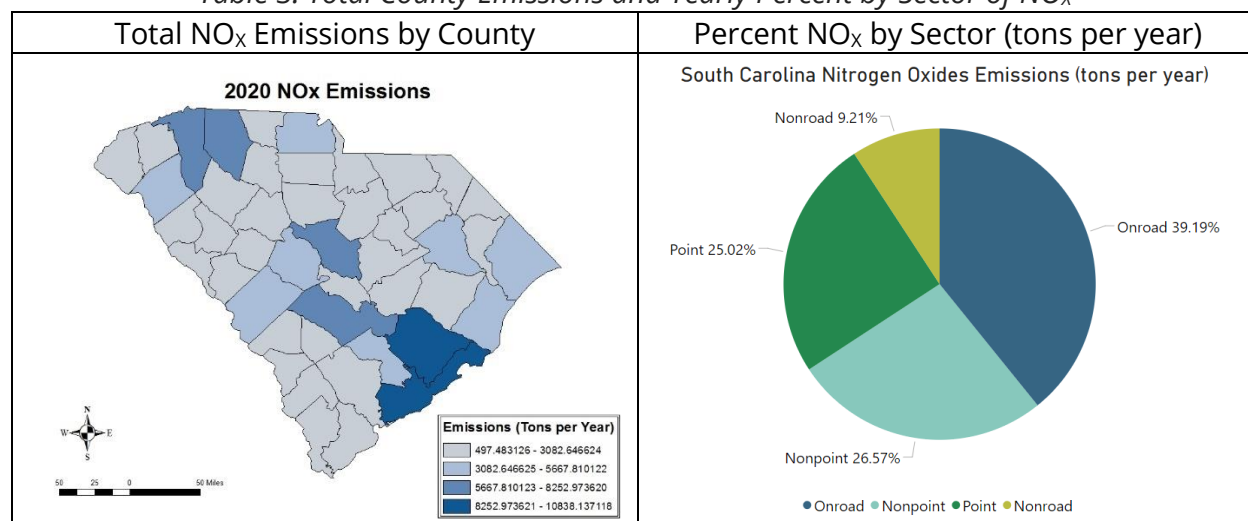
Listed below are maps and pie charts of total emissions for VOC, SO₂, NO_x, CO, lead, PM₁₀, and PM_{2.5} from the most recent NEI (2020)⁴. The maps show the total emissions for VOC, SO₂, NO_x, CO, lead, PM₁₀, and PM_{2.5} on a county-wide basis. The pie charts include the percentage emissions statewide for the sectors of on-road and non-road mobile, point, and non-point. The sector of on-road mobile sources of pollution includes most forms of transportation such as automobiles, trucks, and buses. The sector of non-road mobile sources includes a wide variety of internal combustion engines not associated with highway vehicles. Examples of non-road mobile sources include construction equipment,

⁴ 2020 NEI Data retrieved from EPA's 2020 National Air Emissions Inventory (NEI) Data webpage. The webpage can be found with the following link: <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>

lawn mowers, and boats. The point sector pollution refers to a source at a fixed point, such as an industrial boiler or storage tank, that emits air pollutants. In general, total emissions tend to be highest in those counties with higher populations where a large number of motor vehicles and facilities are located than in more rural counties.

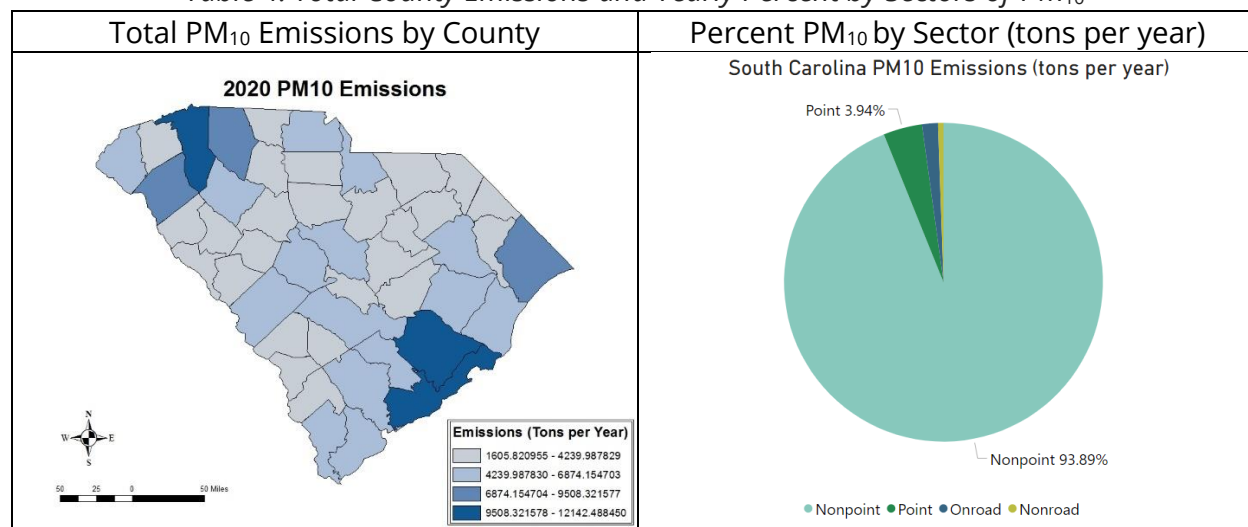
The total NO_x emissions were 127,711 tons. On-road and non-road mobile sources made up approximately 48 percent of the statewide NO_x emissions. Charleston and Berkley Counties (Charleston-North Charleston MSA) had the highest emissions.

Table 3: Total County Emissions and Yearly Percent by Sector of NO_x



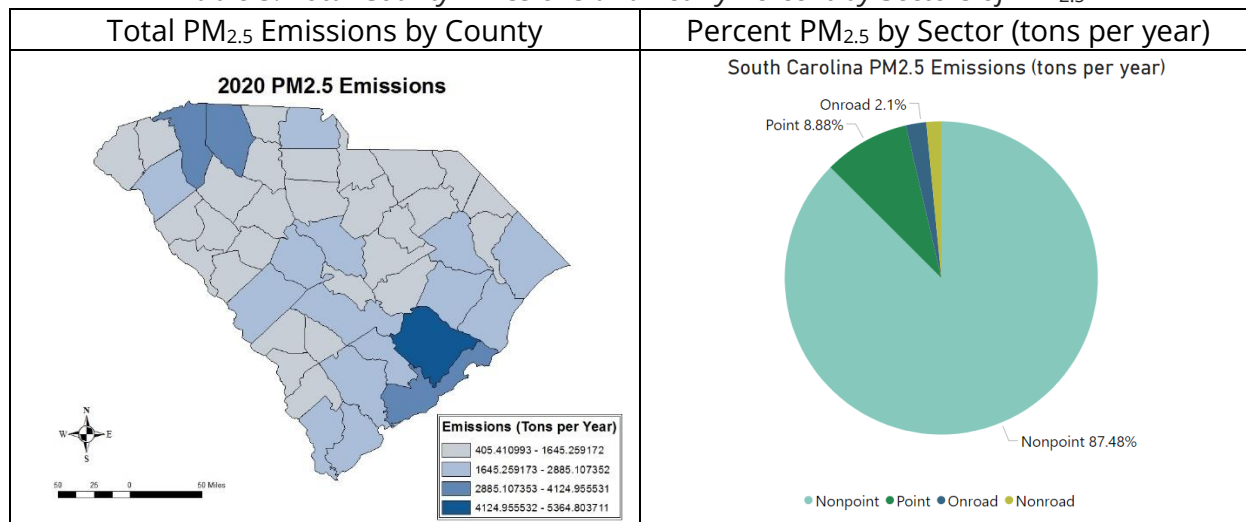
There were 209,790 tons of PM₁₀ emissions. Non-point sources made up approximately 94 percent of the total emissions. Berkeley and Charleston Counties (Charleston-North Charleston MSA) had the highest emissions, followed closely by Greenville County (Greenville-Anderson-Greer MSA).

Table 4: Total County Emissions and Yearly Percent by Sectors of PM₁₀



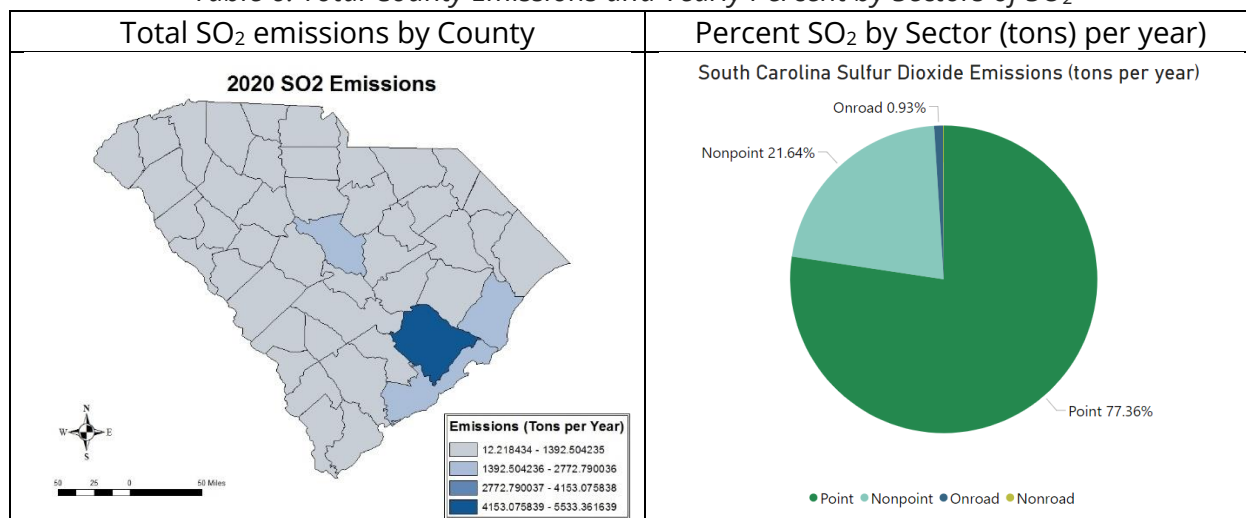
The total amount of PM_{2.5} emissions in South Carolina was 71,358 tons. The non-point sources account for 87 percent of the total emissions. Berkeley County (Charleston-North Charleston MSA) had the highest emissions.

Table 5: Total County Emissions and Yearly Percent by Sectors of PM_{2.5}



There were 18,805 tons of SO₂ emissions in South Carolina with point sources accounting for just over 77 percent of total emissions. Berkeley County (Charleston-North Charleston MSA) had the highest emissions.

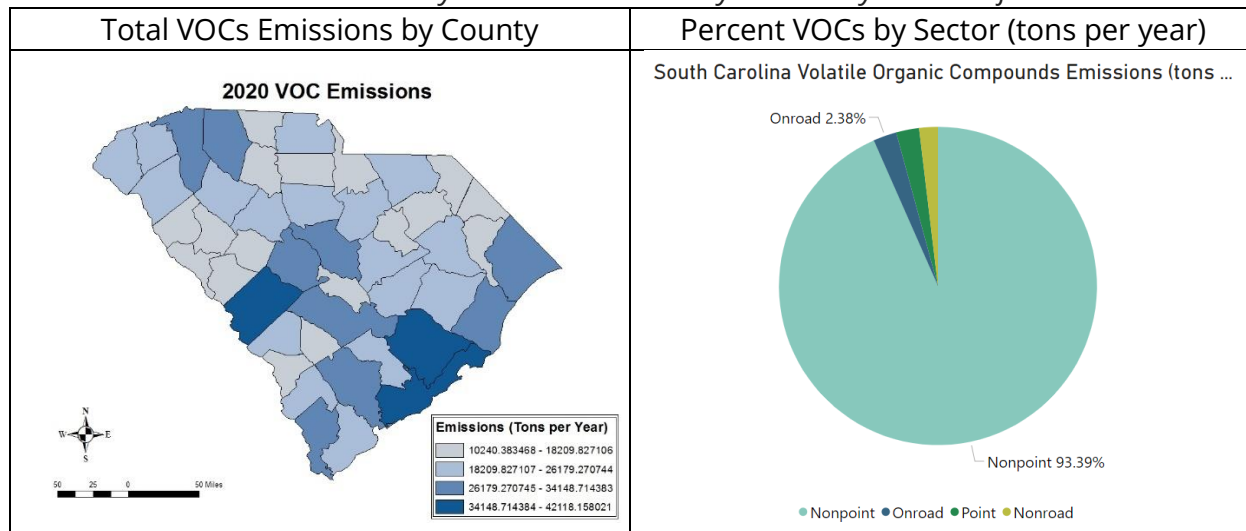
Table 6: Total County Emissions and Yearly Percent by Sectors of SO₂



Biogenic emissions from vegetation and soil are the largest contributors to VOC emissions nationally. In South Carolina, the 2020 biogenic emissions were 814,736 tons, which is 81 percent of all VOC emissions statewide.

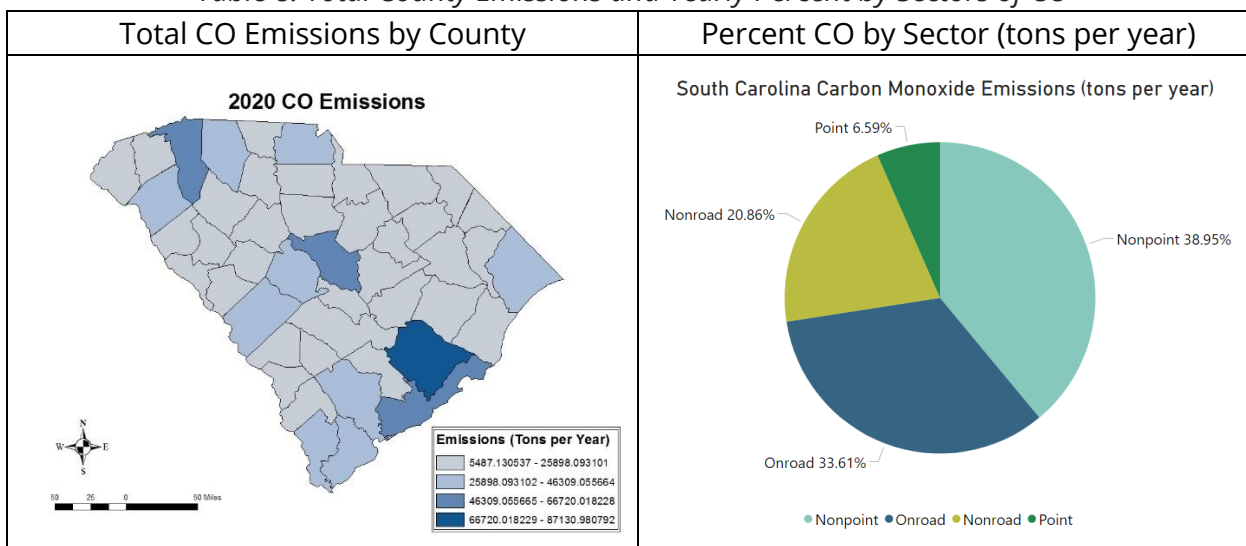
There were approximately 184,621 tons of anthropogenic VOCs emissions, with only 1.5 percent being from point sources. Berkeley County (Charleston-North Charleston MSA) had the highest anthropogenic VOC emissions.

Table 7: Total County Emissions and Yearly Percent by Sectors of VOCs



In 2014, there were 968,725 tons of CO emissions reported in South Carolina. On-road and non-road mobile sources combined to account for just over 54 percent of the total CO emissions. Berkeley County (Charleston-North Charleston MSA) had the highest emissions.

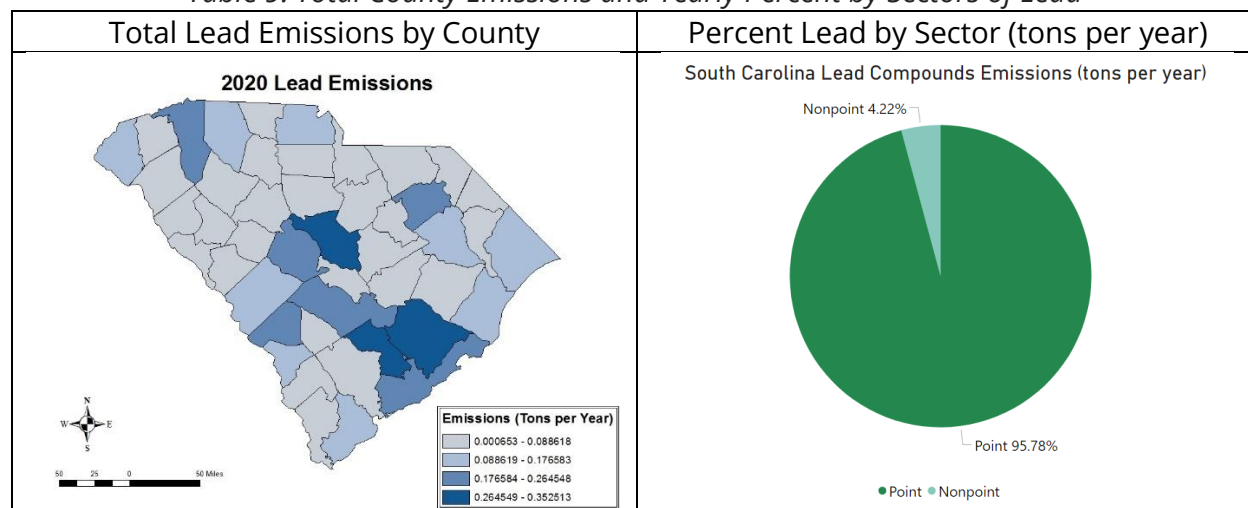
Table 8: Total County Emissions and Yearly Percent by Sectors of CO



The total lead emissions across South Carolina were 4.08 tons.

Point sources account for 96 percent of the lead emissions. Richland County (Columbia MSA) had the highest emissions.

Table 9: Total County Emissions and Yearly Percent by Sectors of Lead



Information for Analysis of South Carolina Ambient Air Monitoring Networks

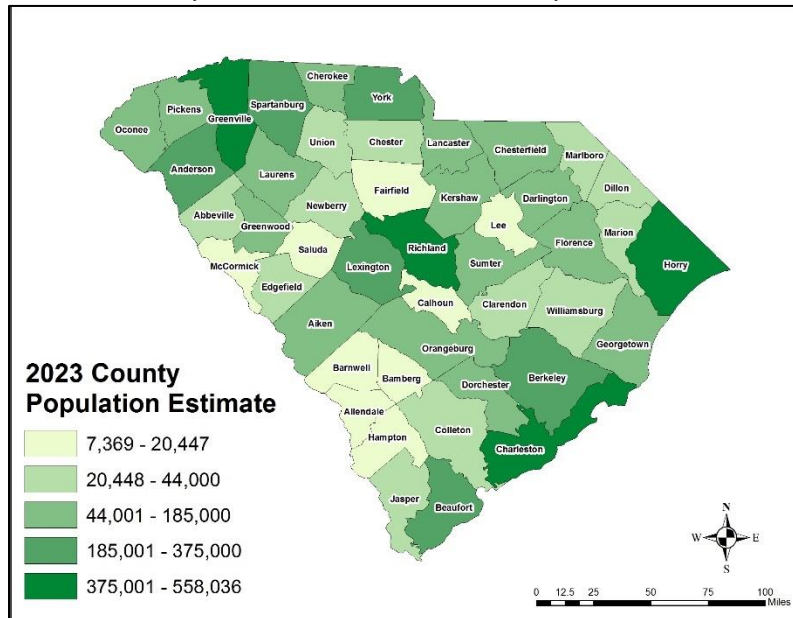
The following sections describes and analyzes each of South Carolina's criteria pollutant networks. First, general information that apply to all networks are discussed. This includes South Carolina's population and demographics, history of South Carolina air monitoring and current air quality, monitoring requirements for existing state implementation plans or maintenance plans, and implementation of new technologies.

Population, demographics and trends

According to the United States Census Bureau and the South Carolina Revenue and Fiscal Affairs Office ⁵, South Carolina had a 2023 estimated population of 5,373,555, which is a 4.7% percent increase since the 2020 estimated census. South Carolina is the twenty-third largest state in the United States, and the most populated counties in South Carolina (Map 9) are Greenville, Richland, Charleston, and Horry. These four counties form the core areas of each of their respective Metropolitan Statistical Area.

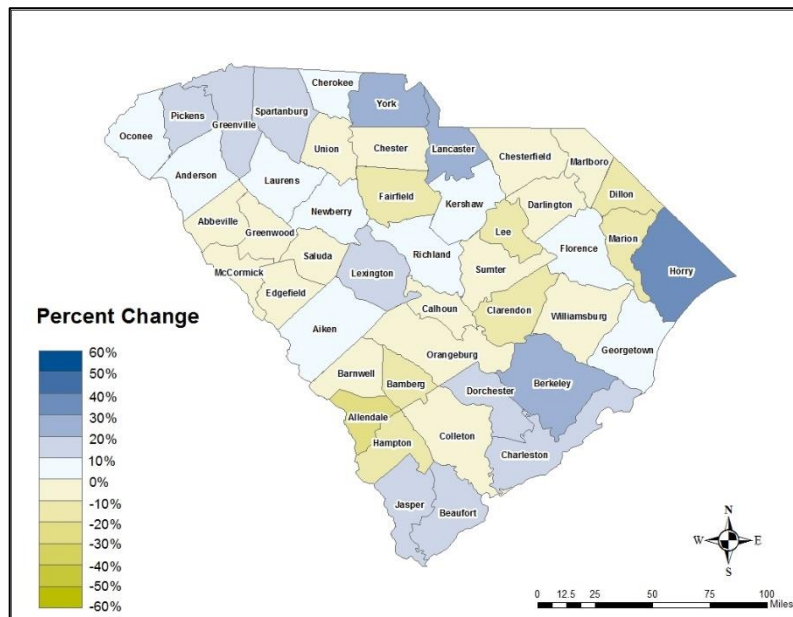
⁵ South Carolina Revenue and Fiscal Affairs Office. Population Data Downloads. <https://rfa.sc.gov/data-research/population-demographics/census-state-data-center/estimates-projections-dashboard/estimates-projections-data-downloads>

Map 9: South Carolina 2023 Population



Between the 2010 and 2020 U.S. Census, the total population of South Carolina increased by 10.66%, with the highest population growth occurring mainly in the counties along the coast and in the upstate of South Carolina and in the major urbanized areas of the state (Map 10)⁴. Population decreases were mainly seen in more rural areas of the state.

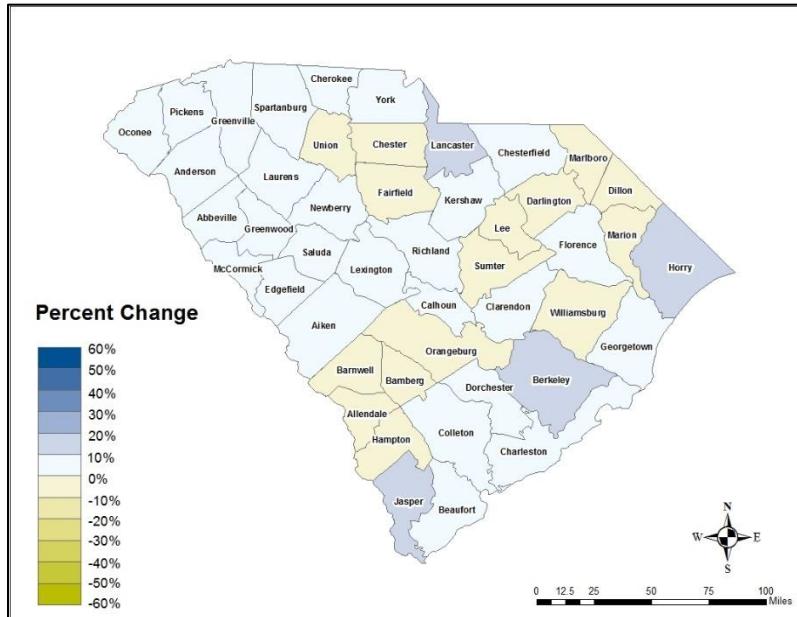
Map 10: South Carolina 2010-2020 Estimated Percent Change in Population



The map below (Map11) shows the percent change in population by county between 2020 and 2023⁴. Similarly to the 2010-2020 population change trends, the urban coastal regions

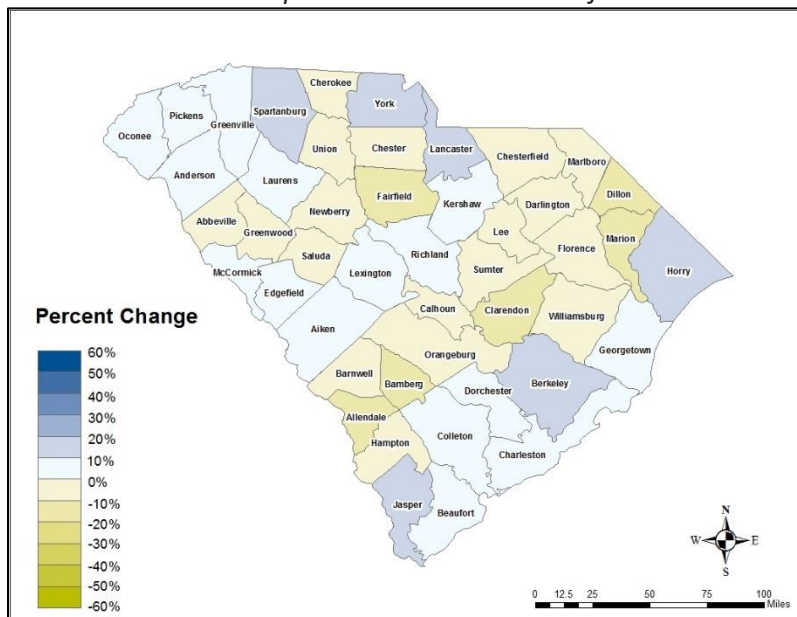
saw the largest population growth during the 2020-2023 time period. In contrast to the 2010-2020 trends, counties along the state's western border with Georgia marginally increased in population between 2020 and 2023. Rural counties in the eastern portion of the Midlands continued their trend of a slight decrease in population.

Map 11: South Carolina Population 2020-2023 Estimated Percent Change



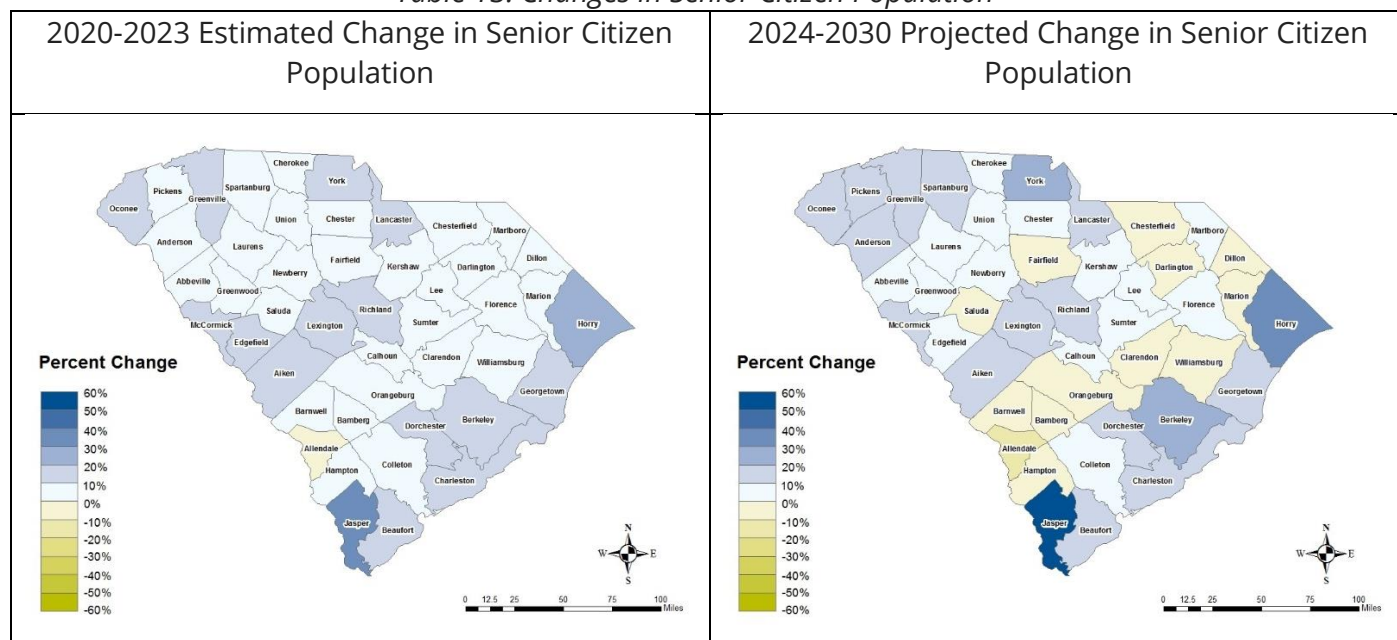
As Map 12 indicates, similar population trends are projected to continue through the year 2030, with additional growth in the urban coastal counties and the upstate area, and population loss in most Midlands counties.

Map 12: South Carolina Population 2024-2030 Projected Percent Change



Population data for senior citizens and children was also analyzed. This information may be indicative of sensitive populations. For senior citizens, the 2020-2023 and 2024-2030 demographic shift were examined. This data was also examined specifically for the ozone and PM_{2.5} FRM networks later in this Network Assessment.

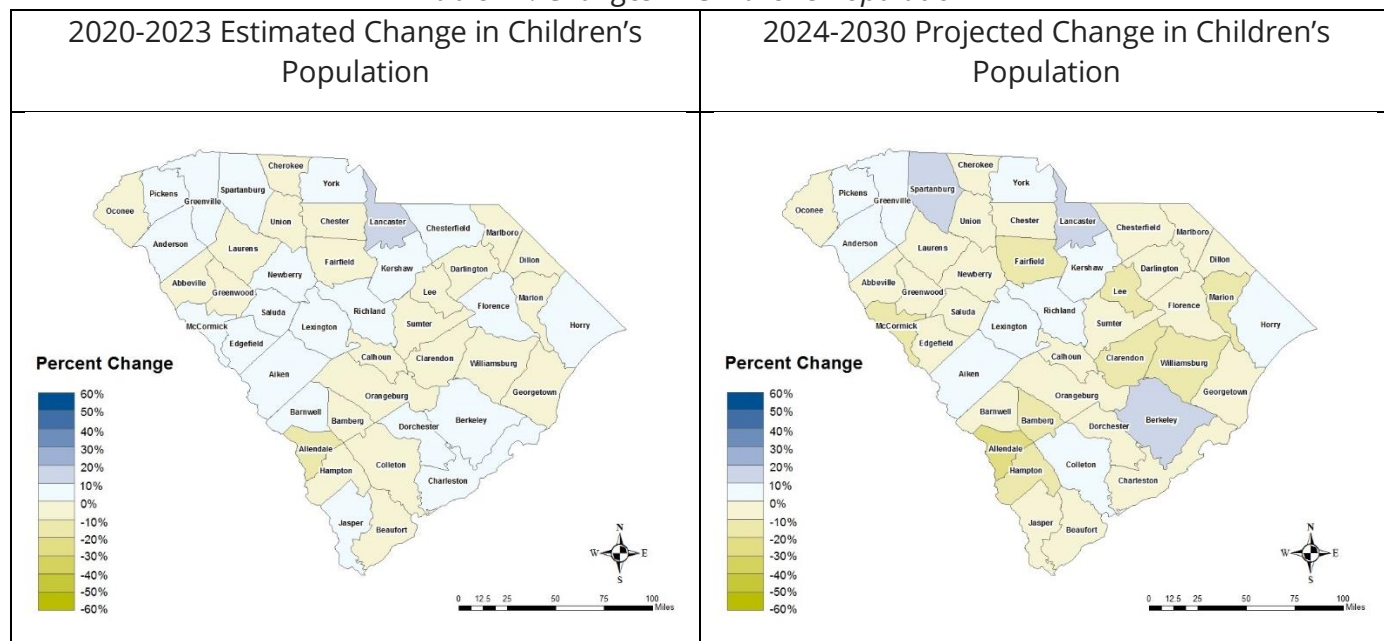
Table 13: Changes in Senior Citizen Population



Across the state senior populations increased between 2020 and 2023. Only one county, Allendale (not in an MSA), saw a decrease in senior population. The areas with the highest population change for senior citizens for 2020-2023 were in the Lowcountry in Jasper County (Hilton Head-Bluffton-Port Royal MSA) and Horry County (Myrtle Beach-Conway-North Myrtle Beach MSA). Senior populations are projected to grow in many areas of the state between 2024 and 2023, with the coastal and upstate areas experiencing the most growth. Jasper County (Hilton Head-Bluffton-Port Royal MSA) is expected to receive the vast majority of senior growth in South Carolina between 2024 and 2030, with a substantial 51% projected population growth in senior population.

For the children’s demographic, during 2020-2023, the majority of growth was seen in Lancaster County (Charlotte-Concord-Gastonia, NC-SC MSA). Additional growth was seen in urban areas and most counties within MSAs. During 2024-2030, Children’s population growth is expected to decrease across much of the state. It is projected that the majority of growth will be in Lancaster (Charlotte-Concord-Gastonia, NC-SC MSA), Spartanburg (Spartanburg MSA), and Berkeley (Charleston-North Charleston, MSA) Counties.

Table 14: Changes in Children's Population



History of South Carolina Air Monitoring and Current Air Quality Conditions

In 1970, Congress established the Clean Air Act, which underwent major revisions in 1977 and 1990. The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for ozone, particulate matter (PM_{2.5} and PM₁₀), sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. These six principal pollutants are known as the “criteria air pollutants”. Every five years, the NAAQS must be reviewed, and possibly, revised. In 2006, the ambient air monitoring regulations were revised to include a requirement for an annual ambient air monitoring network plan and periodic network assessments.

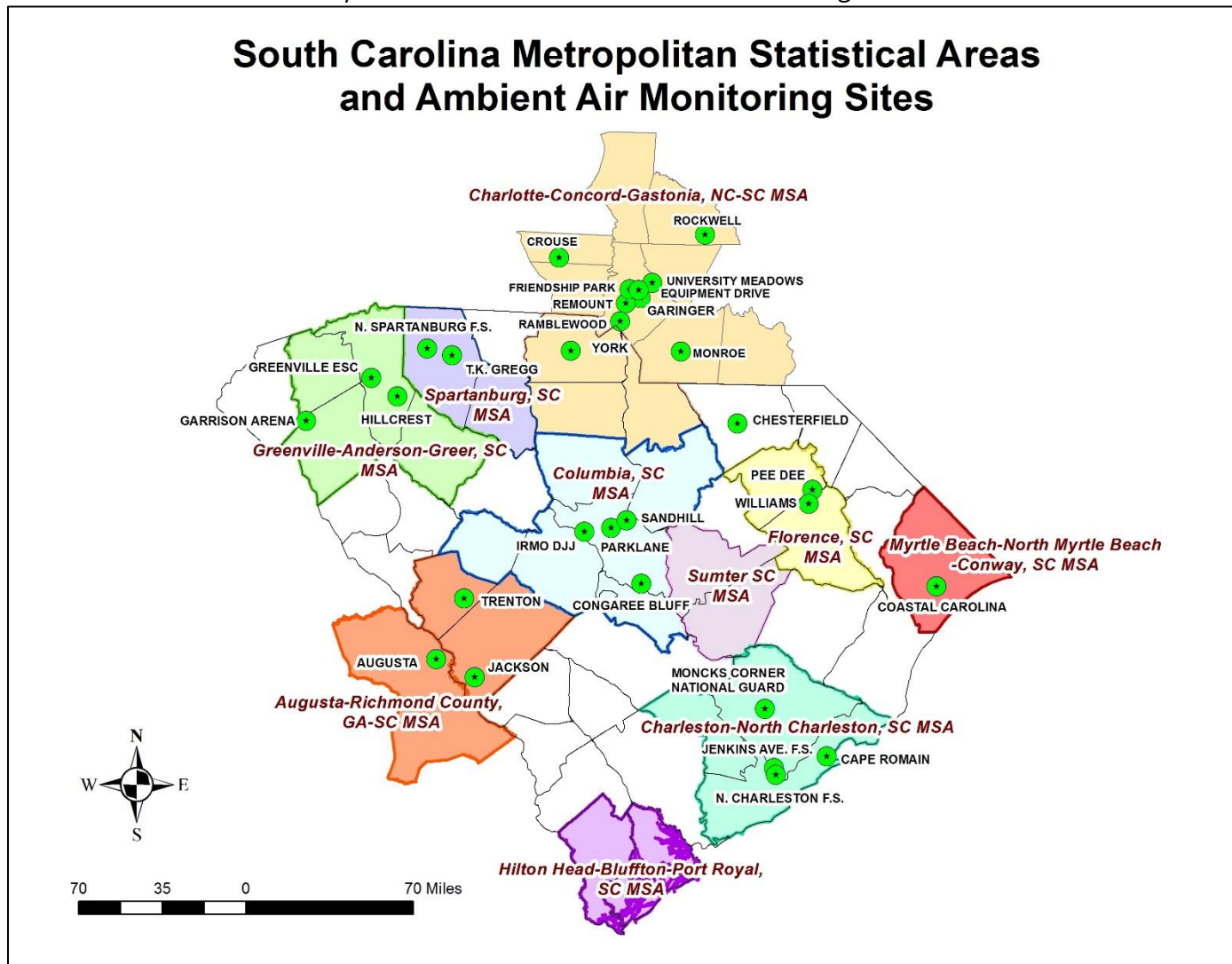
In South Carolina, the Department, or its predecessors, have operated an air quality monitoring network since 1959. Over time, the network has continually evolved to meet the requirements and needs of the Department’s Air Program and to comply with federal requirements.

As of April 2025, South Carolina had 20 ambient air monitoring sites, containing 59 monitors (Map 15). South Carolina maintains ambient air monitoring sites, with their associated monitors, to fulfill the federal minimum monitoring requirements in EPA regulation 40 CFR Part 58, Appendix D and associated Appendices.⁶ This requires each state to maintain a minimum number of monitors to properly characterize air quality and to meet any required objectives of the monitoring network. In general, these minimum requirements are based on the MSA population, emissions, and the 2023 ambient air

⁶ 40 CFR Part 58

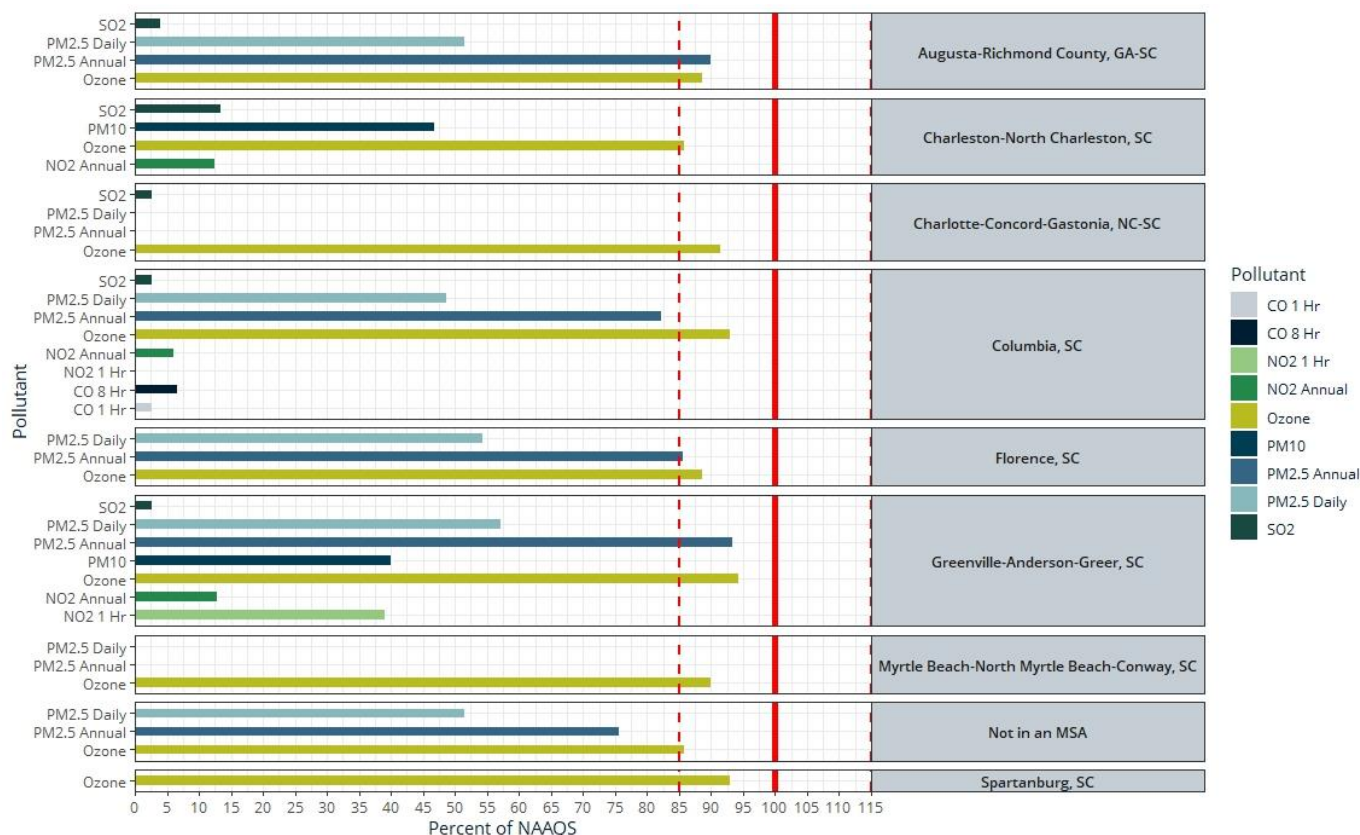
monitoring design values. South Carolina meets all minimum monitoring requirements or is in the process of establishing new monitors to meet those requirements.

Map 15: South Carolina Ambient Air Monitoring Sites



The quality of the ambient air is determined by the level of pollution. Currently, all South Carolina monitors have design values below the NAAQS. In Graph 1, the 2023 criteria pollutant design values recorded at South Carolina Monitoring Sites as the percentage of the standard for each criteria pollutant by MSA is presented. Pollutants which are listed in an MSA but have no bar next to them indicate that the pollutant is measured in the MSA, but there is not a valid 2023 design value for that pollutant.

Graph 1: 2023 Percent of Standard of Criteria Pollutants by MSA (South Carolina Monitors only)



The solid, red vertical line on the graph represents the standard. The dashed, red vertical lines on the graph depict ± 15 percent from the standard. For the purpose of this assessment, a monitor that had a design value within ± 15 percent of the standard was deemed to be of high importance in providing information concerning NAAQS compliance. Ozone concentrations in 2023 were approximately 85–95 percent of the ozone NAAQS. The PM_{2.5} annual concentrations across the state were approximately 75–90 percent of the NAAQS.

All analyses in this document use 2023 design values and were completed before the certification of the 2024 design values. The 2024 design values are included in the table

below for reference but are not used in any analysis. The 2023 design values can be found listed in their respective pollutant's section later in this Assessment.

2024 Criteria Pollutant Design Values

Site ID	County	Site Name	Ozone (ppm)	PM _{2.5} Annual (µg/m ³)	PM _{2.5} 24-hour (µg/m ³)	PM ₁₀ (# Expected Exceedances)	SO ₂ 1-hour (ppb)	NO ₂ 1-hour (ppb)	NO ₂ Annual (ppb)	CO 8-hour (ppm)	CO 1-hour (ppm)	Lead (µg/m ³)
003-0003	Aiken	Jackson Middle School	.061									
007-0006	Anderson	Garrison Arena	.063									
015-1002	Berkeley	Moncks Corner	.061									
019-0003	Charleston	Jenkins Avenue					9	33	6.02			
019-0046	Charleston	Cape Romain	.058									
025-0001	Chesterfield	Chesterfield	.061	7.3	18							
031-0003	Darlington	Pee Dee	.063									
037-0001	Edgefield	Trenton	.059	8.0	14							

Site ID	County	Site Name	Ozone (ppm)	PM _{2.5} Annual (µg/m ³)	PM _{2.5} 24-hour (µg/m ³)	PM ₁₀ (# Expected Exceedances)	SO ₂ 1-hour (ppb)	NO ₂ 1-hour (ppb)	NO ₂ Annual (ppb)	CO 8-hour (ppm)	CO 1-hour (ppm)	Lead (µg/m ³)
041-0003	Florence	Williams Middle School		7.8	13							
041-8003	Florence	Clarios Woods										0.0*
045-0015	Greenville	Greenville ESC		8.4	18	0	2	39	6.84			
045-0016	Greenville	Hillcrest Middle School	.065	7.8	18							
051-0008	Horry	Coastal Carolina	.062									
079-0007	Richland	Parklane	.061	7.4	13		2			0.60	0.95	
079-0021	Richland	Congaree Bluff	.057									
079-1001	Richland	Sandhill	.064					29	3.44			
083-0009	Spartanburg	North Spartanburg Fire Station	.068									

Site ID	County	Site Name	Ozone (ppm)	PM _{2.5} Annual (µg/m ³)	PM _{2.5} 24-hour (µg/m ³)	PM ₁₀ (# Expected Exceedances)	SO ₂ 1-hour (ppb)	NO ₂ 1-hour (ppb)	NO ₂ Annual (ppb)	CO 8-hour (ppm)	CO 1-hour (ppm)	Lead (µg/m ³)
083-0011	Spartanburg	T.K. Gregg		8.3	19							
091-0008	York	York County Landfill	.065									
* denotes design values that did not meet data completeness requirements												

Requirements of Existing State Implementation Plans or Maintenance Plans

State implementation plans and/or maintenance plans can include ambient air monitoring requirements beyond the minimum monitoring requirements found in 50 CFR Part 58. In South Carolina, there are ozone monitoring requirements to fulfill maintenance plans for past ozone nonattainment areas.

South Carolina currently operates an ozone monitor which assists with demonstrating compliance in York County for South Carolina's two ozone maintenance areas: one for the 1997 ozone NAAQS, and one for the 2008 ozone NAAQS.

1997 Ozone NAAQS

On April 30, 2004, the EPA designated the eastern portion of York County, including the Catawba Indian Nation, as a nonattainment area (69 FR 23858). On December 26, 2012, the area was redesignated as attainment and the first ten-year maintenance plan was approved (77 FR 75862). A second 10-year maintenance plan, which applies exclusively to the tribal lands of the Catawba Indian Nation, was submitted on July 10, 2020.

2008 Ozone NAAQS

On May 21, 2012, the EPA designated and classified a portion of York County as a marginal nonattainment area for the 2008 8-hour ozone NAAQS. Effective January 11, 2016 (80 FR 76865), the EPA redesignated the York County portion to attainment for the 2008 8-hour ozone NAAQS. As part of the redesignation action, the Department adopted, and the EPA approved, a maintenance plan which demonstrated continued attainment of the 2008 8-hour ozone NAAQS, as required under Clean Air Act section 175A. A second ten-year maintenance plan was submitted to the EPA on September 26, 2023.

For the 2015 ozone NAAQS, on November 16, 2017, all of South Carolina was designated as attainment/unclassifiable by the EPA (82 FR 54232).

Implementation of New Technologies

The Department has implemented a wide range of new technologies since the 2020 Network Assessment. All ozone monitors throughout the state have been replaced with newer equipment. This has resulted in increased reliability and less corrective maintenance cost. Along with the updated monitors, the Department added remote operation and automation to half of the gaseous monitoring sites in the network. This has resulted in increased data completeness and faster response to equipment issues in the field.

The Department replaced aging continuous PM_{2.5} and PM₁₀ monitors with new equipment. As with ozone, these have led to increased data completeness and fewer resources and costs associated with corrective maintenance. The new monitors, Teledyne T640 and T640X, use a new technology for quantitating PM_{2.5} and PM₁₀. During the testing phase, the Department has made changes that brought the monitors closer to the values obtained using the FRM method. The testing is on-going to inform future Departmental decisions regarding the PM monitoring network. One advantage to the T640X is simultaneous monitoring for both PM₁₀ and PM_{2.5}. Historically, two monitors were needed to measure

the pollutants separately. Because the T640X measures both PM₁₀ and PM_{2.5}, PM_{10-2.5} (PM coarse) is also calculated continuously rather than through multiple separate samples.

Looking forward, if the Department receives additional funding for equipment, plans are to automate gaseous parameters throughout the state. These include NO₂, SO₂, and CO. Remote and automated capability allows for streamlining, resource optimization, and improved data quality and completeness.

Construction on a new South Carolina Public Health and Environmental Laboratory began in 2024 and is expected to be completed in 2026.

Review of South Carolina Ambient Air Monitoring Networks

Carbon Monoxide (CO) Ambient Air Monitoring Network

Regulations – In 1971, the EPA established the primary and secondary CO NAAQS at 35 parts per million (ppm) for a 1-hour averaging period and 9 ppm for an 8-hr averaging period, not to be exceeded more than once a year. In 1985, the primary standard was retained, but the secondary standard was revoked. In 1994 and 2011, the primary standard was again retained. Currently, the primary CO NAAQS is set at 35 ppm for a 1-hour averaging period and 9 ppm for an 8-hr averaging period, not to be exceeded more than once a year.

The current CO minimum monitoring criteria found in Section 4.2 of 40 CFR Part 58, Appendix D has three requirements. Each requirement is population based or an NCore requirement. The requirements are as follows:

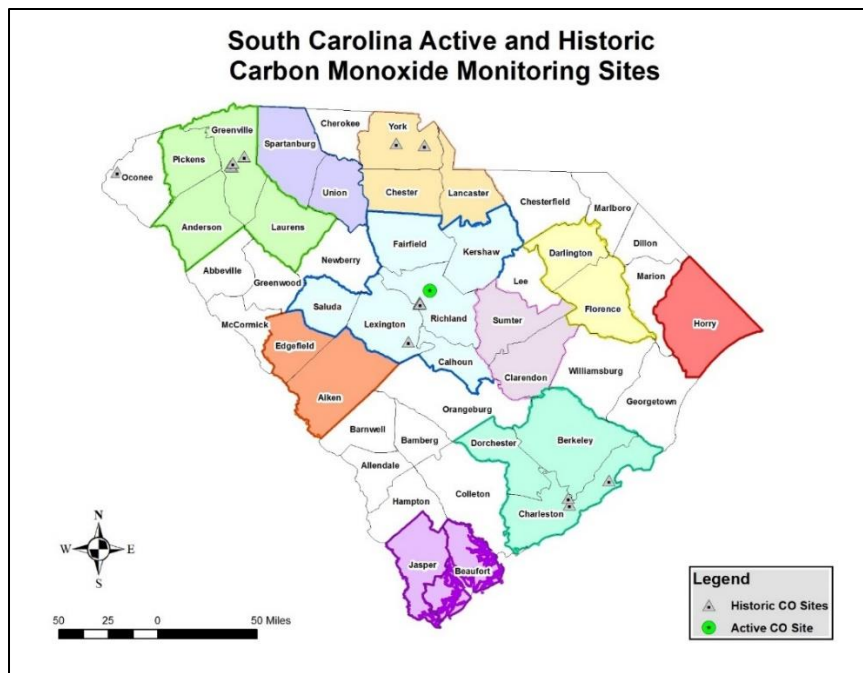
1. Near-road CO Monitors – Each state with MSAs having a population of 1,000,000 or more people must have one CO monitor collocated with one required near-road NO₂ monitor to be operational by January 1, 2017. The Charlotte-Concord-Gastonia, NC-SC MSA is the only MSA in South Carolina that meets the population requirement for a collocated CO monitor. The Mecklenburg County Air Quality office operates a CO monitor at the Remount Road (37-119-0045) near road Site in Charlotte, North Carolina.

2. NCore Requirement – Each NCore site in an MSA with a population of 500,000 or more must include a CO monitor. The Parklane (45-079-0007) Site in the Columbia, SC MSA is the NCore site for South Carolina and supports one CO monitor. The Garinger (37-119-0041) Site in Mecklenburg County is also an NCore site and supports a CO monitor.

3. Regional Administrator Required Monitoring –The Regional Administrators, in collaboration with states, may require additional CO monitors above the minimum number of monitors if they believe that the minimum monitoring requirements are not sufficient to meet monitoring objectives. South Carolina does not have any required Regional Administrator Required Monitoring.

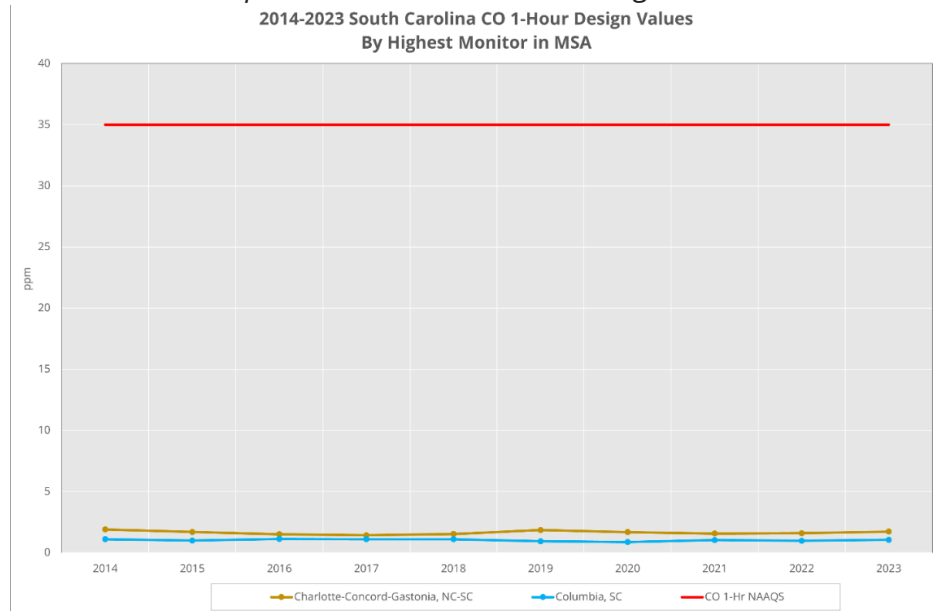
Historical and Current Monitors –Map 16 shows the historical and current South Carolina CO monitoring sites from 1973 to 2023. In the past 50 years, South Carolina has operated fifteen CO monitors. The Air Quality System (AQS) database indicates that in 1973, South Carolina started with one CO monitor in the Charlotte-Concord-Gastonia MSA.

Map 16: Active and Historic South Carolina CO Monitoring Locations- 2024



Design Value Trends and Comparison to the NAAQS – Graph 2 and Graph 3 shows the past 10 years of CO design values. Trends have steadily declined since the CO standards were first established, and the current CO design values are very low. The 2023 1-hour 2nd maximum concentration in South Carolina was 0.86 ppm, recorded at the Parklane Monitoring Site (45-079-0007) in the Columbia, SC MSA. The highest 2023 1-hour 2nd maximum concentration in a shared MSA was 2.05 ppm, recorded in the Charlotte-Concord-Gastonia, NC-SC MSA at the Remount Road Monitoring Site in North Carolina (37-119-0045).

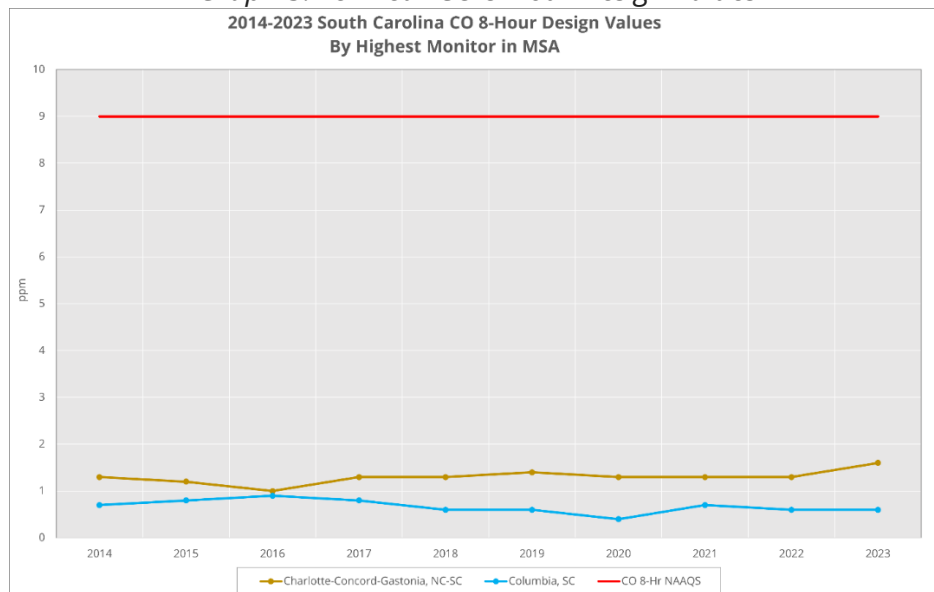
Graph 2: Ten Year CO 1-Hour Design Values



The 8-hour CO design values also lowered significantly since the establishment of the standard. Before 1985, there were some design values that exceeded the CO 8-hour NAAQS. Since the early 1980's, the CO design values have consistently dropped.

The 2023 8-hour 2nd maximum concentration in South Carolina was 0.6 ppm, recorded at the Parklane Monitoring Site (45-079-0007) in the Columbia, SC MSA. The highest 2023 8-hour 2nd maximum concentration in a shared MSA was 1.6 ppm, recorded in the Charlotte-Concord-Gastonia, NC-SC MSA at the Remount Road Monitoring Site in North Carolina (37-119-0045).

Graph 3: Ten Year CO 8-Hour Design Values



Risk of Future Exceedances – Table 10 contains calculations designed to predict the risk of a future NAAQS exceedance for CO based on 2019-2023 data. The purpose of this test is to see which sites are most likely to exceed the applicable NAAQS in the following three years based on previous data trends. Based on the last five years of monitoring data, there is a 90 percent confidence index that the CO monitors will not exceed 80 percent of the current NAAQS.

Table 10: CO Design Value Risk of Future Exceedance

Site ID and Name	Averaging Time	2019	2020	2021	2022	2023	Average	Standard Deviation	90% Upper Confidence Interval	Is 90%CI < 80% of NAAQS?
Parklane 450790007	1-hour	0.874	1.032	0.972	1.057	0.86	0.959	0.0896	1.044	Yes
	8-hour	0.6	0.4	0.7	0.6	0.6	0.58	0.1095	0.684	Yes

Density of Existing Network and Reduction of Number of Sites – The level of CO in South Carolina is very low. The CO monitoring network meets the minimum monitoring requirements and is adequate for protection of sensitive populations and to meet state needs. No reduction in sites can be made.

CO Network Current and Future Plans – Because of the extremely low design values, the current network consists of one CO monitor at the Parklane (45-079-0007) (NCore) Site. The North Carolina portion of the Charlotte-Concord-Gastonia NC-SC MSA also has two operational CO monitors.

The Greenville-Anderson-Mauldin MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000 a CO monitor would be required to be collocated at a near-road monitoring site in the MSA. The Department will begin the process of establishing a near-road site and installing a near-road CO monitor in the MSA when the population threshold is crossed and as resources are allowed.

Table 11: Current CO Ambient Air Monitoring Network and Recommended Optimizations

CO Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Columbia MSA						
Parklane 450790007	April 3, 1980	CO 42101 -1	Neighborhood	Population Exposure	NCore SLAMS	This monitor fulfills the Appendix D minimal NCore requirement. No planned changes.

Sulfur Dioxide (SO₂) Ambient Air Monitoring Network

Regulations – In 1971, the EPA set two primary NAAQS for sulfur oxides, measured as SO₂. The first primary standard was set at 0.14 ppm (365 micrograms per cubic meter (µg/m³)) based on an averaged 24-hour concentration, not to be exceeded more than once a year. The second primary standard was an annual arithmetic mean set at 0.03 ppm (80 µg/m³).

In 2010, those standards were revoked and replaced with a new 1-hour standard of 75 parts per billion (ppb) based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. Also, the EPA developed the population weighted emissions index (PWEI) to determine minimum monitoring requirements.

In 2015, the EPA issued the SO₂ Data Requirements Rule, which requires the states to identify and provide yearly data to characterize current air quality in areas with large sources of SO₂ emissions. In 2019, the primary standard was again reviewed and retained without revision. Currently, the primary SO₂ standard is set at 75 ppb based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. Also, a yearly PWEI calculation is used to determine minimum monitoring requirements, and a yearly report is submitted to EPA by the states to support the SO₂ Data Requirements Rule.

On December 27, 2024, the EPA revised the 3-hour secondary SO₂ standard to be an annual standard of 10 parts per billion averaged over three years. As of April 4, 2025, the 3-hour secondary SO₂ standard remains 10 parts per billion averaged over three years.

The SO₂ minimum monitoring criteria has three monitoring requirements. SO₂ monitoring is determined using total MSA populations and emissions. The three requirements are as follows:

1. Population Weighted Emissions Index (PWEI) – The PWEI is determined using the most current population of each MSA and the most recent level of SO₂ emissions for each county within the MSA. The emissions data is available from the National Emissions Inventory. For any MSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO₂ monitors are required. For any MSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO₂ monitors are required. For any MSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO₂ monitor is required.

Table 12 gives each MSA's 2023 estimated population, 2020 NEI SO₂ emissions, the calculated PWEI, and the minimum monitoring requirements. South Carolina is required to have two SO₂ monitors to fulfill the PWEI requirements.

Table 12: SO₂ Minimum Monitoring Requirements Based on the Population Weighted Emissions Index

CBSA	2023 CBSA Population	2020 CBSA SO₂ Emissions (tons)	PWEI	SO₂ Minimum Monitors Required
*Charlotte-Concord-Gastonia, NC-SC	2,805,115	6244.53	17,517	1
Greenville-Anderson-Greer, SC	975,480	603.99	589	0
Columbia, SC	858,302	2490.33	2,137	0
Charleston-North Charleston, SC	849,417	7502.77	6,373	1
*Augusta-Richmond County, GA-SC	629,429	3698.37	2,328	0
Florence, SC	199,630	776.35	155	0
Myrtle Beach-Conway-North Myrtle Beach, SC	397,478	167.20	66	0
Sumter, SC	104,165	246.51	26	0
Spartanburg, SC	383,327	275.77	106	0
Hilton Head Island-Bluffton-Port Royal, SC	232,523	323.65	75	0
The PWEI is calculated using the latest US Census population data and the latest NEI county level data.				

Currently, PWEI requirements are fulfilled with the SO₂ monitors operating at the Garinger High School (37-119-0041) (NCore) Site in Mecklenburg County, North Carolina (Charlotte-Concord-Gastonia, NC-SC MSA) and the Jenkins Avenue (45-019-0003) Site in Charleston County (Charleston-North Charleston MSA).

2. Regional Administrator Required Monitoring – The Regional Administrator may require additional SO₂ monitoring sites above the minimum number of monitors required by the PWEI in areas that have the potential to have high SO₂ concentrations, in areas impacted by sources which are not conducive to modeling, or in locations with susceptible and vulnerable populations that are not otherwise being monitored. South Carolina does not have any SO₂ Regional Administrator Required Monitoring.

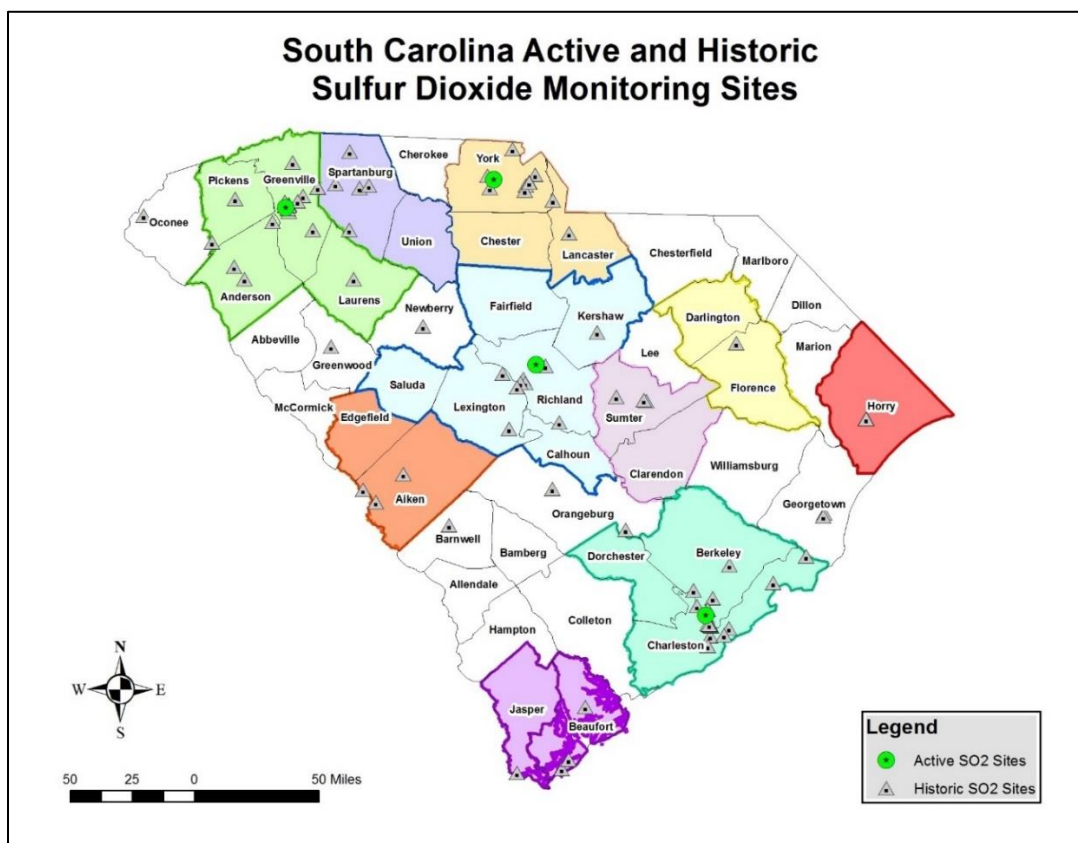
3. NCore Requirement – Each NCore site must include a SO₂ monitor. The Parklane (45-079-0007) Site in Columbia, South Carolina is the NCore site for South Carolina. The Garinger High School (37-119-0041) Site in Charlotte, North Carolina is also an NCore site.

The SO₂ Data Requirements Rule (DRR) requires air agencies to submit a yearly report on sources that have been identified as producing 2,000 or more tons of SO₂ emissions. There are three facilities within South Carolina that meet this requirement: New-Indy Catawba (formerly Resolute Industries), Sylvamo Eastover Mill (formerly International Paper –

Eastover), and (Dominion, formerly SCE&G) Wateree Station. Yearly reports are submitted to the EPA.

Historical and Current Monitors –According to AQS, there have been approximately 126 SO₂ monitors operational in South Carolina since 1970. Map 17 shows the location of all historic and active SO₂ monitors in the state. Historically, SO₂ monitors were mainly located in the larger MSAs, with a few monitors scattered in individual counties. There are four active SO₂ monitors within South Carolina in 2024/2025. First, the SO₂ monitors at the Jenkins Avenue (45-019-0003) (Charleston-North Charleston MSA) and the Parklane (45-079-0007) (Columbia MSA) monitoring sites fulfill the PWEI minimum and NCore monitoring requirements, respectively. The Greenville ESC (45-045-0015) monitoring site SO₂ monitor operates in a heavily industrialized area and provides needed data for population exposure. Finally, one monitor operates on a rotational basis to help provide data for areas of interest around the state and is currently located at the York Landfill monitoring site (45-091-0081) (Charlotte-Concord-Gastonia, NC-SC MSA).

Map 17: Active and Historic South Carolina SO₂ Monitor Locations- 2024



Also, there are two SO₂ monitors located in the North Carolina and Georgia counties which are part of the multi-state MSAs. The North Carolina portion of the Charlotte-Concord-Gastonia, NC-SC MSA has one operational SO₂ monitor at the Garinger High School (37-

119-0041) (NCore) Site in Mecklenburg County, which meets the shared PWEI requirements for the MSA. The Georgia portion of the Augusta-Richmond County, GA-SC MSA has one operational SO₂ monitor at the Augusta (13-245-0091) Site in Richmond County.

As Table 13 indicates, the SO₂ emissions have fallen significantly despite population increases. The exception to this trend is the Augusta-Richmond County, GA-SC MSA, where emissions have risen slightly.

Table 13: Changes in Population and SO₂ Emissions

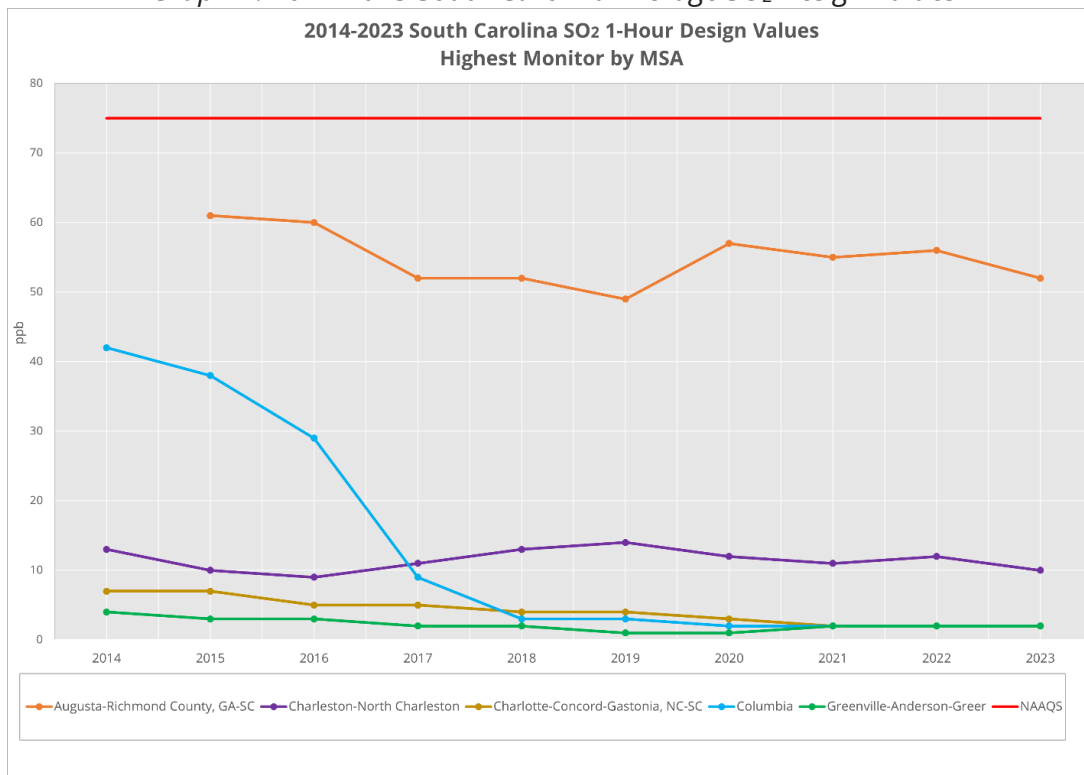
MSA	2018 Population	2023 Population	2014 NEI SO₂ Emissions	2020 NEI SO₂ Emissions
Charlotte-Concord-Gastonia, NC-SC MSA	2,569,213	2,805,115	7,624	6,244.53
Greenville-Anderson-Greer MSA	906,626	975,480	2,928	603.99
Columbia MSA	832,666	858,302	17,769	2,490.33
Charleston-North Charleston MSA	787,643	849,417	15,784	7,502.77
Augusta-Richmond County, GA-SC MSA	604,167	629,429	3,353	3,698.37
Florence, SC	205,087	199,630	22,643	776.35
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	480,891	397,478	4,837	167.20
Sumter, SC	140,290	104,165	3,498	246.51
Spartanburg MSA	341,298	383,327	386	275.77
Hilton Head Island-Bluffton-Port Royal, SC	204,961	232,523	3,982	323.65

The number of required monitors has also fallen. In the previous 5-Year Network Assessment submitted in 2020, the Columbia MSA was required by PWEI requirements to have an SO₂ monitor. Even with a population increase, the Columbia MSA SO₂ emissions fell by just over 85% between the 2014 NEI and the 2020 NEI. Due to this emissions reduction, the Columbia MSA no longer has a PWEI required monitor, and instead operates an SO₂ monitor because it houses the NCore monitoring site.

Design Value Trends and Comparison to the NAAQS –Currently, all SO₂ design values are below or well below the NAAQS. Graph 4 shows the ten-year trend of the highest SO₂ 1-hour design values in each MSA. In 2023, the highest SO₂ design value was 52 ppb reported from the Augusta (13-245-0091) monitoring site in the Augusta-North Augusta, GA-SC MSA.

Within the State of South Carolina, the highest SO₂ design value for that same year was 10 ppb at the Jenkins Avenue (45-019-0003) monitoring site in the Charleston-North Charleston MSA.

Graph 4: 2014-2023 South Carolina Average SO₂ Design Values



Risk of Future Exceedances – Table 14 contains calculations designed to predict the risk of a future NAAQS exceedance for SO₂ based on 2019-2023 data. The purpose of this test is to see which sites are most likely to exceed the applicable NAAQS in the following three years based on previous data trends. Based on the last five years of monitoring data, there is a 90 percent confidence index that the SO₂ monitors will not exceed 80 percent of the current NAAQS. York Landfill is not included in the table because it is a two-year rotational monitor which does not have long-term design value trends.

Table 14: SO₂ 1-Hour Design Value Risk of Future Exceedance

Site ID and Name	2019	2020	2021	2022	2023	Average	Standard Deviation	90% Upper Confidence Interval	Is 90%CI < 80% of NAAQS?
Jenkins Ave. 450190003	14	12	11	12	10	11.8	1.483	13.214	Yes
Greenville ESC 45040015	1	1	2	2	2	1.6	0.548	2.122	Yes
Parklane 450790007	2	2	2	2	2	2	0	2	Yes

Density of Existing Network and Reduction of Number of Sites - The levels of SO₂ in South Carolina are very low; the SO₂ monitoring network meets the minimum monitoring requirements, is adequate for protection of sensitive populations, and meets state needs. Of the four active SO₂ monitors in South Carolina, only two are required monitors. While the Greenville ESC and York Landfill monitors are not required monitors, they provide valuable information which is relevant to the Department, therefore there is no reduction planned for these sites.

SO₂ Monitoring Network Current and Future Plans – All required monitors are expected to have no changes in the upcoming 5 years. Table 15 shows that despite 2030 projected population growths, it is unlikely that any South Carolina MSA will exceed the PWEI thresholds to add any additional or reduce required monitors in the next 5 years. Should a change in population or design value trigger additional minimum monitoring requirements, the Department will implement additional monitors to meet those requirements as resources are allowed.

Table 15: Projected Future PWEI and Required Monitors

CBSA	Projected 2030 CBSA Population	2022v1 EMP SO ₂ Emissions Modeled for 2032 CBSA (tons)	Projected Future PWEI	Projected Monitors Required
*Charlotte-Concord-Gastonia, NC-SC	3,327,630	3,824	12,725.62	1
Greenville-Anderson-Greer, SC	1,064,098	557.42	593.15	0
Columbia, SC	880,460	2,374.42	2,090.58	0
Charleston-North Charleston, SC	912,993	7,831.20	7,149.83	1

*Augusta-Richmond County, GA-SC	657,523	2,964.48	2,431.77	0
Florence, SC	189,100	296.08	55.99	0
Myrtle Beach-Conway-North Myrtle Beach, SC	473,345	187.54	88.77	0
Sumter, SC	125,627	264.44	33.22	0
Spartanburg, SC	440,574	298.45	131.49	0
Hilton Head Island-Bluffton-Port Royal, SC	250,623	347.39	87.06	0
Projected 2030 CBSA population totals obtained from South Carolina Revenue and Fiscal Affairs Office. Population Data Downloads. https://rfa.sc.gov/data-research/population-demographics/census-state-data-center/estimates-projections-dashboard/estimates-projections-data-downloads 2032 modeled emissions data is from the 2022v1 EMP obtained at https://www.epa.gov/air-emissions-modeling/2022v1-emissions-modeling-platform				

The Greenville ESC (45-045-0015) SO₂ monitor will continue because of its long history and its importance to collecting SO₂ data in the upstate and in a heavily industrialized area. The remaining SPM rotational SO₂ monitor at York Landfill (45-091-0008) (Charlotte-Concord-Gastonia MSA) monitoring site will operate from January 1, 2024 to December 31, 2025. In 2026, the monitor will be moved to the Trenton (45-037-0001) monitoring site in the Augusta-North Augusta, GA-SC MSA and will remain there for 2026 and 2027. Rotational site locations past 2027 will be determined based on resource availability and need.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around the SO₂ probe. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

Table 16 summarizes the current SO₂ monitoring network and changes recommended for optimization.

Table 16: SO₂ Current Ambient Air Monitoring Network and Recommended Optimization

SO ₂ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Polluta nt	Scale	Objective	Desig- nation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
<i>Augusta 13-245-0091</i>		SO ₂	<i>Neighborhood</i>	<i>Population Exposure</i>		<i>Georgia monitor.</i>
Charleston-North Charleston, SC MSA						
Jenkins Ave. Fire Station 45-019-0003	February 14, 1969	SO ₂ 42401-1	Neighborhood	Population Exposure	SLAMS	This monitor fulfills the Appendix D SO ₂ PWEI minimum monitoring requirement for the MSA. No planned changes.
Charlotte-Concord-Gastonia, NC-SC						
<i>Garinger 37-119-0041</i>		SO ₂ 42401-1			SLAMS	<i>North Carolina monitor. This monitor fulfills the Appendix D SO₂ PWEI minimum monitoring requirement for the MSA.</i>
York Landfill 45-091-0008	February 27, 2017	SO ₂ 42401-1	Urban	Upwind Background	SPM	This monitor is on a 2-year rotation (2024-2025). In 2026, this monitor will be relocated to the Trenton (45-037-0001) monitoring site in the Augusta-North Augusta, GA-SC MSA.
Columbia, SC MSA						
Parklane 45-079-0007	April 3, 1980	SO ₂ 42401-1	Neighbor- hood	Population Exposure/ Other	NCore SLAMS	This monitor fulfills the Appendix D NCore minimum monitoring requirement for the State.
Florence, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Greenville-Anderson-Greer, SC MSA						
Greenville Employment	April 11, 2008	SO ₂ 42401-1	Neighbor- hood	Population Exposure	SLAMS	This monitors ambient SO ₂

SO₂ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Polluta nt	Scale	Objective	Desig- nation	Recommendations for Optimization
Security Commission 45-045-0015						concentrations in a heavily populated and industrialized area. A waiver request for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions has been requested for this site. No planned changes.
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sumter, SC						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spartanburg MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hilton Head Island-Bluffton-Port Royal, SC						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

NO₂, NO/NO_y Ambient Air Monitoring Network

Regulations – In 1971, the EPA set the primary NO₂ NAAQS at 53 ppb using the annual arithmetic average. In 1985 and 1996, this standard was retained without revision. In 2010, the NO₂ NAAQS was modified. The primary NO₂ NAAQS was retained without revision at 53 ppb using the annual arithmetic average, and a new hourly standard of 100 ppb was established using the 98th percentile, 1-hour daily maximum, averaged over 3 years. Also, a near-road NO₂ monitoring site requirement was added for MSAs having populations at or above 500,000 persons. This requirement was later modified to MSAs having populations at least 1,000,000 persons. The Charlotte-Concord-Gastonia MSA is the only South Carolina MSA that has at least 1,000,000 people.

Currently, the primary NO₂ NAAQS are a 1-hour standard at a level of 100 ppb based on the 3-year average of 98th percentile of the yearly distribution of 1-hour daily maximum concentrations and an annual standard set at a level of 53 ppb. This primary standard was retained without revision in 2018.

The four requirements for the minimum monitoring criteria are as follows:

1. Near-road NO₂ Monitors – Each state must have one microscale near-road NO₂ monitoring site in each MSA with a population of at least 1,000,000 or more persons. An additional near-road NO₂ monitoring site is required for any MSA with a population of 2,500,000 or more or in any MSA with a population of 1,000,000 or more that has one or more roadway segments with 250,000 or greater Annual Average Daily Traffic (AADT) counts. Before 2017, the Charlotte-Concord-Gastonia NC-SC MSA met the population requirement of at least 1,000,000 or more persons and established the Remount Road (37-119-0045) near-road Site in Charlotte, North Carolina. In 2017, this area had an estimated population that went over 2,500,000, which added another near-road NO₂ monitoring site requirement. The second near road NO₂ monitoring site is located at the Equipment Drive Monitoring site (37-119-0050), which was established and began operating on January 22, 2024.

2. Requirements for Area-wide NO₂ Monitoring – Each state must have one monitoring site in each MSA with a population of 1,000,000 or more persons which will monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales. The Garinger High School (37-119-0041) Site in Charlotte, North Carolina operates an area-wide NO₂ monitor at the neighborhood scale. The Rockwell (37-159-0021) Site in North Carolina also operates an SPM NO₂ monitor at the urban scale for the purpose of AQI reporting.

3. Regional Administrator Required Monitoring – The Regional Administrators, in collaboration with states, require a minimum of forty additional NO₂ monitoring sites above the minimum monitoring requirements (nationwide) in any area, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations. The Greenville ESC (45-045-0015) Site in the Greenville-Anderson-Greer MSA is a Regional Administrator Required Monitoring site.

4. NCore Requirement (NO/NO_y Monitoring) – Each NCore site must include a NO/NO_y monitor. The Parklane (45-079-0007) Site in Columbia, South Carolina is the NCore site within South Carolina. The Garinger (37-119-0041) Site in Charlotte, North Carolina is also an NCore site.

Historical and Current Monitors – Since 1969, there have been 87 NO₂ monitors located within South Carolina. The majority of the monitors were located in the heavily populated MSAs, with a few monitors sited in individual counties. Currently, within South Carolina, there are three NO₂ monitors and one NO/NO_y monitor. Map 18 shows the locations of both the historic and currently active South Carolina NO₂ and NO/NO_y monitors.

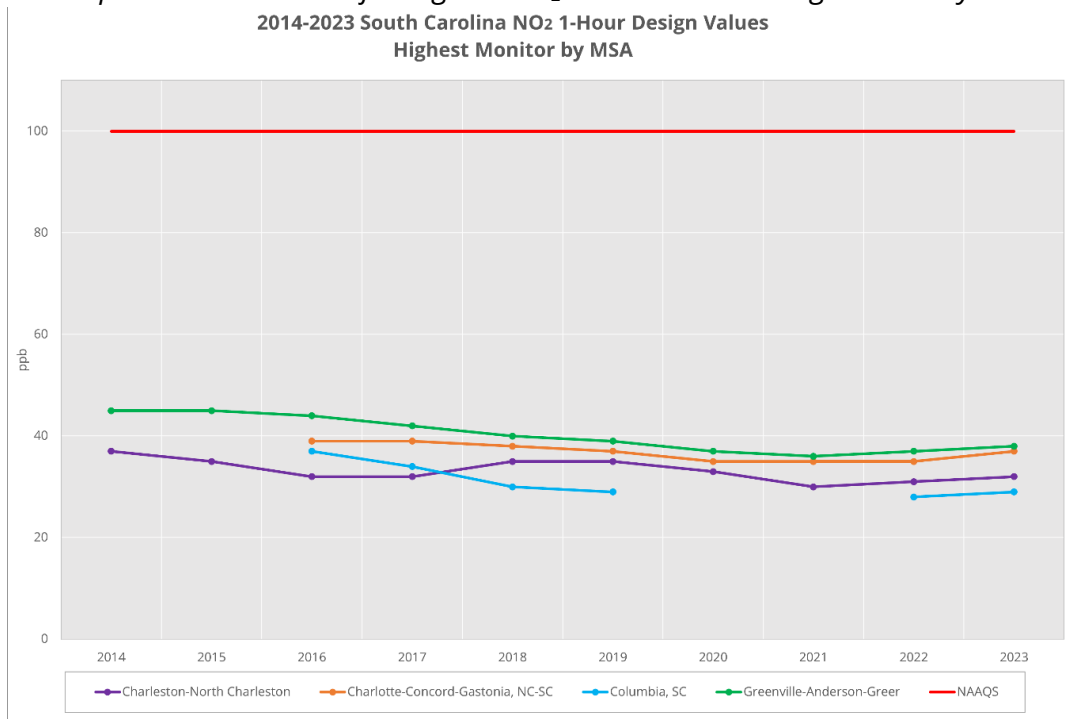
South Carolina Active and Historic Nitrogen Dioxide and NO/NOy Monitoring Sites

Legend

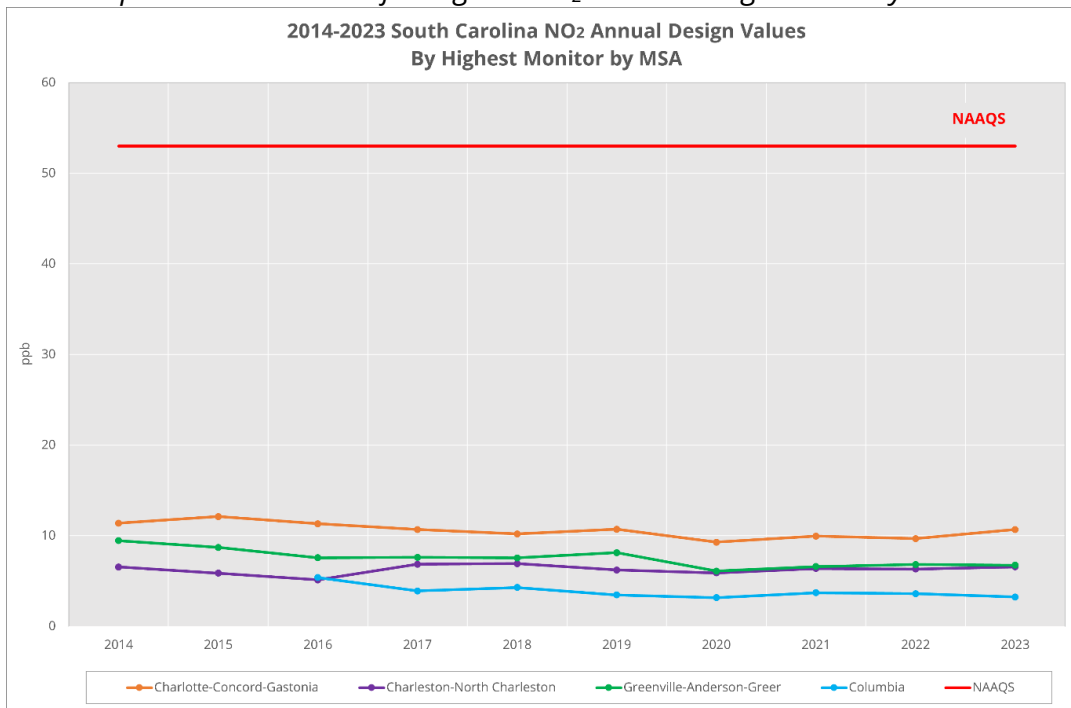
- Active NO/NO_y Site
- Active NO₂ Sites
- Historic NO₂ Sites

Design Value Trends and Comparison to the NAAQS –All NO₂ Annual and 1-Hour design values in South Carolina are below the NO₂ NAAQS and, for the last ten years, the trend has remained relatively the same. Graphs 5 and Graph 6 indicate that the Greenville-Anderson-Greer and Charlotte-Concord-Gastonia MSAs have had the highest NO₂ concentrations in the last ten years.

Graph 5: 10-Year Trend for Highest NO₂ 1-Hour 3-Year Design Values by MSA
2014-2023 South Carolina NO₂ 1-Hour Design Values
Highest Monitor by MSA



Graph 6: 10-Year Trend for Highest NO₂ Annual Design Values by MSA



Risk of Future Exceedances – Table 17 contains calculations designed to predict the risk of a future NAAQS exceedance for NO₂ based on 2019-2023 data. The purpose of this test is to see which sites are most likely to exceed the applicable NAAQS in the following three years

based on previous data trends. Based on the last five years of monitoring data, there is a 90 percent confidence index that the NO₂ monitors in South Carolina will not exceed 80 percent of the current NAAQS.

Table 17: NO₂ Design Value Risk of Future Exceedance

Site ID and Name	Averaging Time	2014	2015	2016	2017	2018	Average	Standard Deviation	90% Upper Confidence	Is 90%CI < 80% of
Jenkins Ave. 450190003	1-hour	35	33	30	31	32	32.20	1.7	33.8	Yes
	Annual	6.23	5.91	6.39		6.58	6.28	0.2	6.6	Yes
Greenville ESC 450450015	1-hour	39	37	36	37	38	37.40	1.0	38.4	Yes
	Annual	8.14	6.1	6.6	6.84	6.76	6.89	0.7	7.5	Yes
Sandhill 450791001	1-hour	34	30	29	28	29	30.00	2.1	32.0	Yes
	Annual	3.48	3.17	3.72	3.61	3.24	3.44	0.2	3.6	Yes

Density of Existing Network and Reduction of Number of Sites – The South Carolina NO₂ network has three NO₂ monitors and one NO/NO_y monitor.

The Greenville ESC (45-045-0015) site in the Greenville-Anderson-Greer MSA fulfills the Regional Administrator Required Monitoring. The Parklane (45-079-0007) site in the Columbia MSA fulfills the NO/NO_y NCore requirement for South Carolina. The NO₂ and NO/NO_y monitors required in the Charlotte-Concord-Gastonia are operated by the Mecklenburg County Air Quality (MCAQ) and the North Carolina Department of Environmental Quality Division of Air Quality (NCDAQ). All other NO₂ monitors in South Carolina are not required.

The Jenkins Avenue (45-019-0003) monitor in the Charleston-North Charleston MSA is an SPM monitor that is located in an urbanized and industrialized area and monitors for highest concentration.

The Sandhill (45-079-1001) (Columbia MSA) Site SPM NO₂ monitor historically has shown low NO₂ concentrations.

In the future, the Department may consider moving and/or putting the Sandhill NO₂ monitor onto a rotating schedule. At this time, there are no plans for termination of any of the NO₂ monitors, as the Department values the data produced at each site.

NO₂ Monitoring Network Current and Future Plans – The Greenville-Anderson-Mauldin MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000 an area-wide NO₂ monitor would be required in the MSA. Additionally, if the population crosses 1,000,000 a near-road NO₂ monitor would be required in the MSA.

The Department will begin the process of establishing a near-road site and installing any additional NO₂ monitors required in the MSA when the population threshold is crossed and as resources are allowed.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around the NO₂ probe. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

Table 18 shows the current NO₂ network and recommendations that it remain unchanged.

Table 18: NO₂ Current Ambient Air Monitoring Network

NO ₂ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Charleston-North Charleston, SC MSA						
Jenkins Ave. Fire Station 45-019-0003	February 14, 1969	NO ₂ 42602- 2	Neighborhood	Highest Concentrati on/Source Oriented	SPM	This monitor is responsible for source-oriented monitoring in a heavily populated and industrialized area. No planned changes.
Charlotte-Concord-Gastonia, NC-SC						
<i>Garinger 37-119-0041</i>		<i>NO₂ 42602</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Garinger 37-119-0041</i>		<i>NO_y</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Remount Rd. 37-119-0045</i>		<i>NO₂ 42602</i>	<i>Microscale</i>	<i>Highest Concentratio n</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Rockwell 37-159-0021</i>		<i>NO₂ 42602</i>	<i>Urban</i>	<i>General/Bac kground</i>	<i>SPM</i>	<i>North Carolina monitor</i>
<i>Equipment Drive 37-119-0050</i>		<i>NO₂ 42602</i>	<i>Microscale</i>	<i>Highest Concentratio n</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
Columbia, SC MSA						
Parklane 45-079-0007	April 3, 1980	NO/N O _y	Neighbor- hood	Population Exposure	NCore SLAMS	This monitor fulfills an Appendix D NCore requirement for the State. No planned changes.
Sandhill Experimental Station 45-079-1001	January 1, 1959	NO ₂ 42602- 1	Urban	General/Ba- ckground; Max Precursor Emissions	SPM	This monitor serves as an area-wide monitor for the Columbia area. In the future, this monitor may be moved or rotated.

NO ₂ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						No planned changes.
Florence, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Greenville-Anderson-Greer, SC MSA						
Greenville Employment Security Commission 45-045-0015	April 11, 2008	NO ₂ 42602- 1	Neighbor- hood	Population Exposure	SLAMS	This monitor fulfills the Appendix D RA-40 monitoring requirement for the State. A waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions has been requested for this site.
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spartanburg MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lead Ambient Air Monitoring Network

Regulations – In 1978, the EPA set a lead (Pb) NAAQS at 1.5 micrograms lead per cubic meter ($\mu\text{g}/\text{m}^3$) averaged over a calendar quarter measured as the lead concentration in total suspended particles. In 2008, the EPA revised this standard to a $0.15 \mu\text{g}/\text{m}^3$ of Pb in total suspended particles (Pb-TSP) or the lead concentration in particulate matter that is 10 micrometers or less (Pb-PM₁₀). The averaging time was a rolling 3-month period with a maximum (not-to-be-exceeded) form, evaluated over a 3-year period. In 2016, this NAAQS was retained without revision. Currently, the primary lead NAAQS is set at $0.15 \mu\text{g}/\text{m}^3$, using a rolling 3-month average that cannot be exceeded. To obtain a design value, this rolling 3-month average is averaged over 3 years.

There are three requirements for the minimum monitoring criteria. They are as follows:

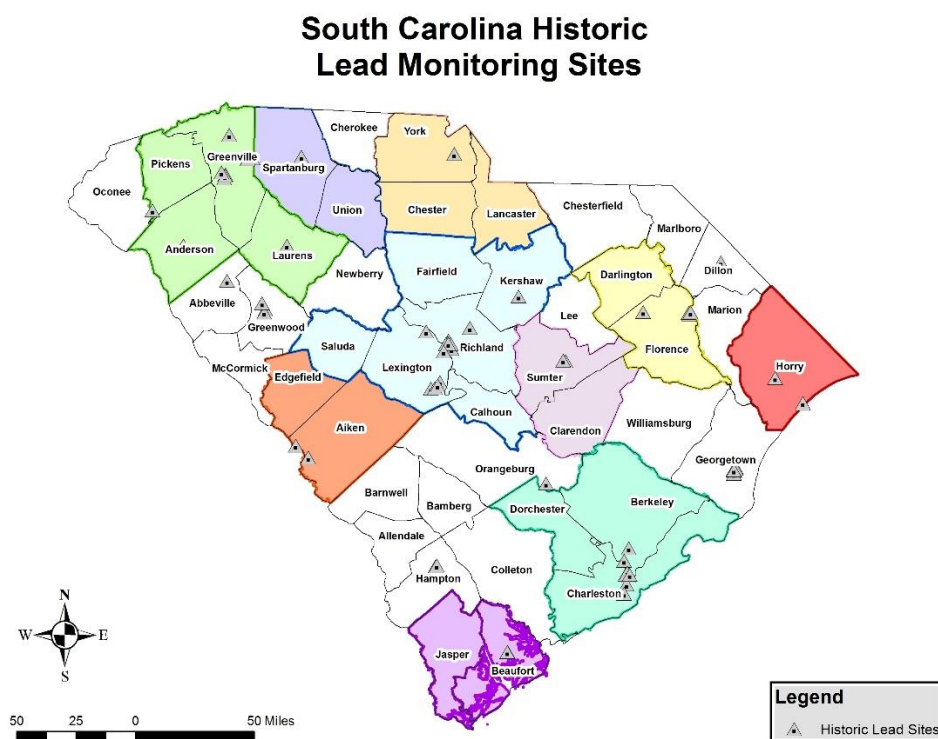
1. Non-airport lead source – The minimum monitoring criteria found in 40 CFR Part 58, Appendix D, Section 4.5 requires that there must be one source-oriented monitor located to measure the maximum lead concentration at each non-airport lead source which emits 0.050 or more tons per year. South Carolina does not have any sources that exceed these thresholds.

2. Airport lead source – There must be one source-oriented monitor located to measure the maximum lead concentration from each airport which emits 1.0 or more tons per year. South Carolina does not have any sources that exceed these thresholds.

3. Collocation requirement – The lead collocation requirement found in 40 CFR Part 58, Appendix A, Section 3.4.4. requires 15 percent of the primary monitoring (not counting non-source oriented NCore sites in the primary quality assurance organization (PQAO)) to be collocated and have at least one collocated monitor, if the total number of monitors is less than three. South Carolina has no lead monitors, and thus no lead collocation requirements.

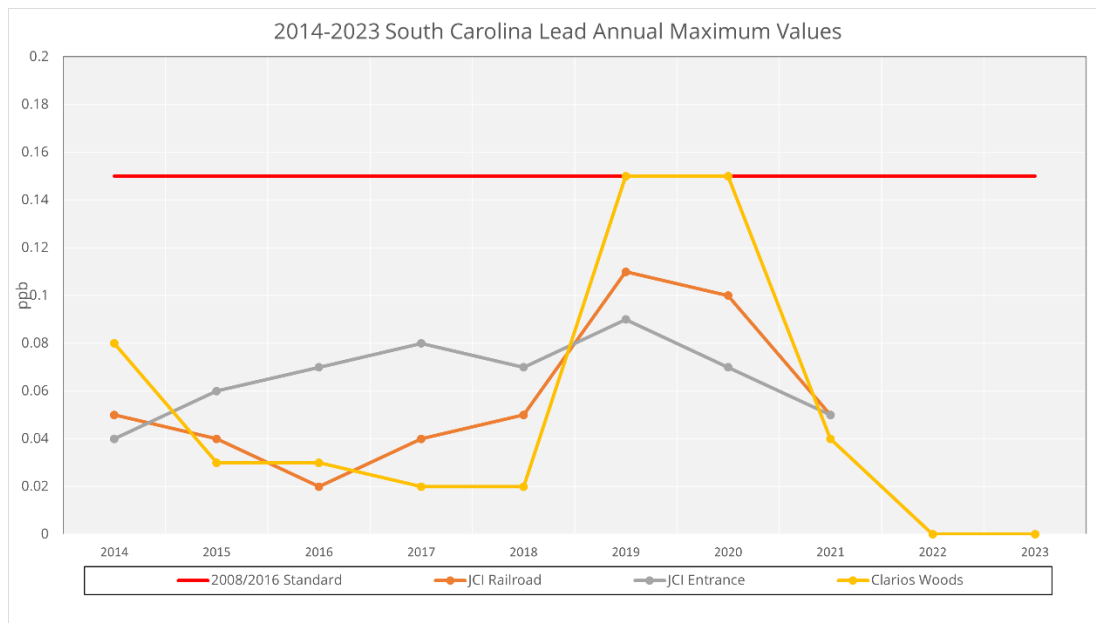
Historical and Current Monitors – Since 1966, there have been 72 lead monitors located within South Carolina (Map 19). The majority of the monitors have been clustered in the more industrialized areas.

Map 19: South Carolina Historical Lead Monitors



Maximum Value Trends and Comparison to the NAAQS – The yearly maximum values for lead have not exceeded the standard in the last ten years. The maximum yearly value was 0.15 $\mu\text{g}/\text{m}^3$ recorded at the Clarios Woods (45-041-8002) Site.

Graph 7: 2011-2019 Lead Yearly Maximum Values



Density of Existing Network and Reduction of Number of Sites – South Carolina does not have any lead monitors, so no reduction in monitoring sites is possible.

Lead Monitoring Network Current and Future Plans – Currently, South Carolina does not have any sources that exceed the thresholds set by the lead NAAQS. There are no changes planned for the lead network at this time.

Table 20: Current Lead Ambient Air Monitoring Network

Lead Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Design- nation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Charleston-North Charleston, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Charlotte-Concord-Gastonia, NC-SC						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Columbia, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Florence, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Greenville-Anderson-Greer, SC MSA						
	N/A	N/A	N/A	N/A	N/A	N/A
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spartanburg MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Remainder of State						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Particulate Matter less than 10 microns (PM₁₀) Ambient Air Monitoring Network

Regulations – In 1987, the first PM₁₀ NAAQS was set at the level of 150 µg/m³ for the 24-hour standard, not to be exceeded more than once per year on average over a 3-year period and 50 µg/m³ annual arithmetic mean, averaged over 3 years. In 2006, the 24-hour PM₁₀ was retained, but the annual PM₁₀ standard was revoked. In 2012 and 2024, this standard was retained without revision. Currently, the standard is set at 150 µg/m³ for the 24-hour standard, not to be exceeded more than once per year on average over a 3-year period.

The requirement for PM₁₀ are the minimum monitoring criteria based on the MSA population and PM₁₀ concentration. As Table 21 shows, the requirements from 40 CFR Part 58, Appendix D, Section 4.6, Table D-4 indicate the approximate number of PM₁₀ monitors required for each MSA. The low concentration areas are those for which ambient PM₁₀ data show ambient concentrations *less than* 80 percent of the PM₁₀ NAAQS. Medium concentration areas are those for which ambient PM₁₀ data show ambient concentrations *exceeding* 80 percent of the PM₁₀ NAAQS. High concentration areas are those for which ambient PM₁₀ data show ambient concentrations *exceeding* the PM₁₀ NAAQS by 20 percent or more.

Table 21: PM₁₀ Minimum Monitoring Requirements

<i>Table 15: PM₁₀ Minimum Monitoring Requirements (taken from Table D-4 of 40 CFR Part 58, Appendix D, Section 4.6)</i>			
Population Category	High Concentration	Medium Concentration	Low concentration
>1,000,000	6-10	4-8	2-4
500,000-1,000,000	4-8	2-4	1-2
250,000-500,000	3-4	1-2	0-1
100,000-250,000	1-2	0-1	0

All South Carolina MSAs have a long record of ambient concentrations less than 80 percent of the PM₁₀ NAAQS (low concentration).

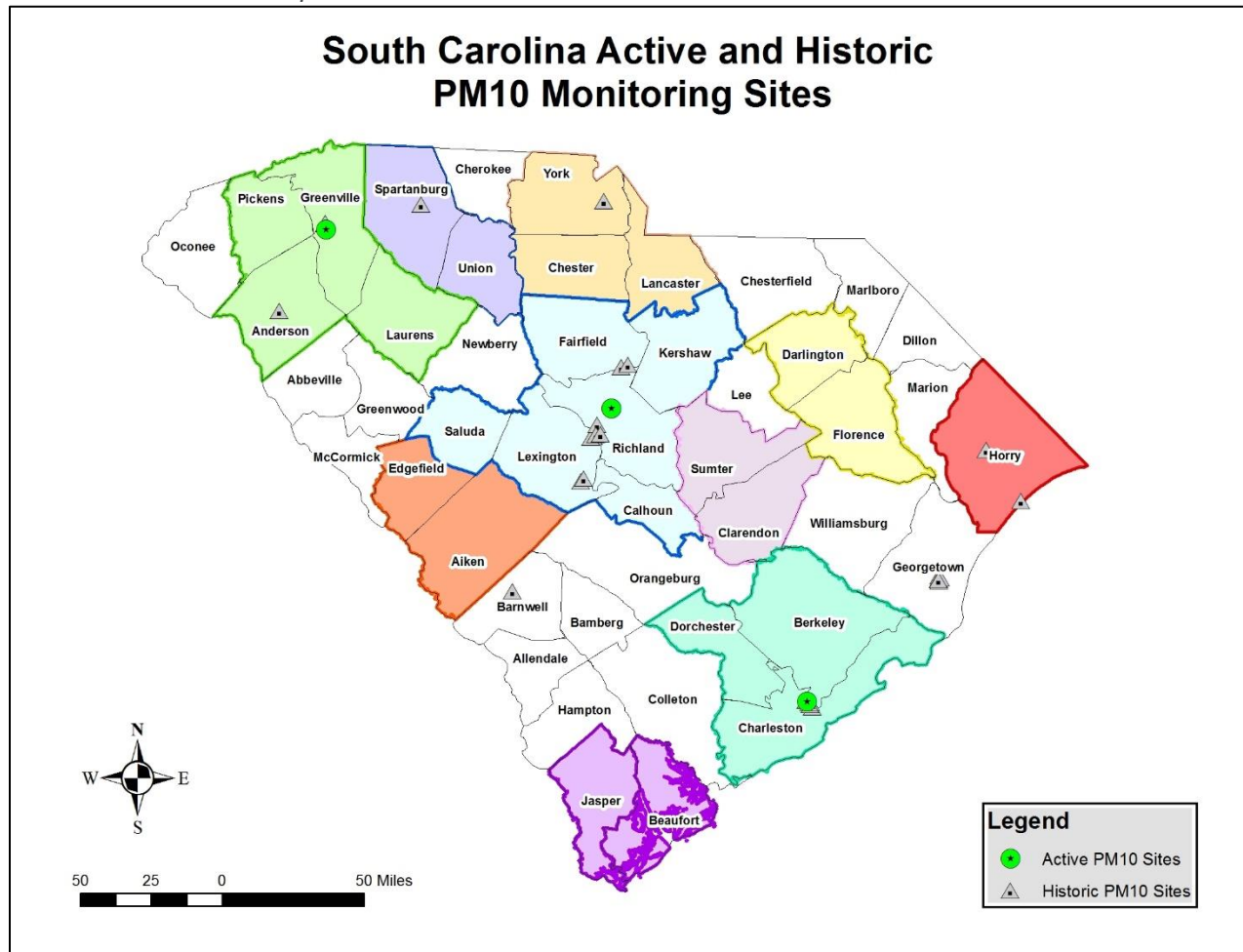
Table 22 below lists each MSA, the number of required PM₁₀ monitors, and the current PM₁₀ monitoring sites.

Table 22: South Carolina PM₁₀ Monitoring

MSA	MSA Population	PM₁₀	PM₁₀ Monitoring Sites
Charlotte-Concord-Gastonia, NC-SC MSA	2,805,115	2-4	Ramblewood Park (37-119-0047) Garinger (37-119-0041)
Greenville-Anderson-Greer MSA	975,480	1-2	Greenville ESC (45-045-0015)
Columbia MSA	858,302	1-2	Parklane (45-079-0007)
Charleston-North Charleston MSA	849,417	1-2	North Charleston F.S. (45-019-0020)
Augusta-Richmond County, GA-SC MSA	629,429	1-2	Augusta (13-245-0091)
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	397,478	0-1	none
Spartanburg MSA	383,327	0-1	none
Hilton Head Island-Bluffton-Port Royal MSA	232,523	0	none
Florence MSA	199,630	0	none
Sumter MSA	104,165	0	none

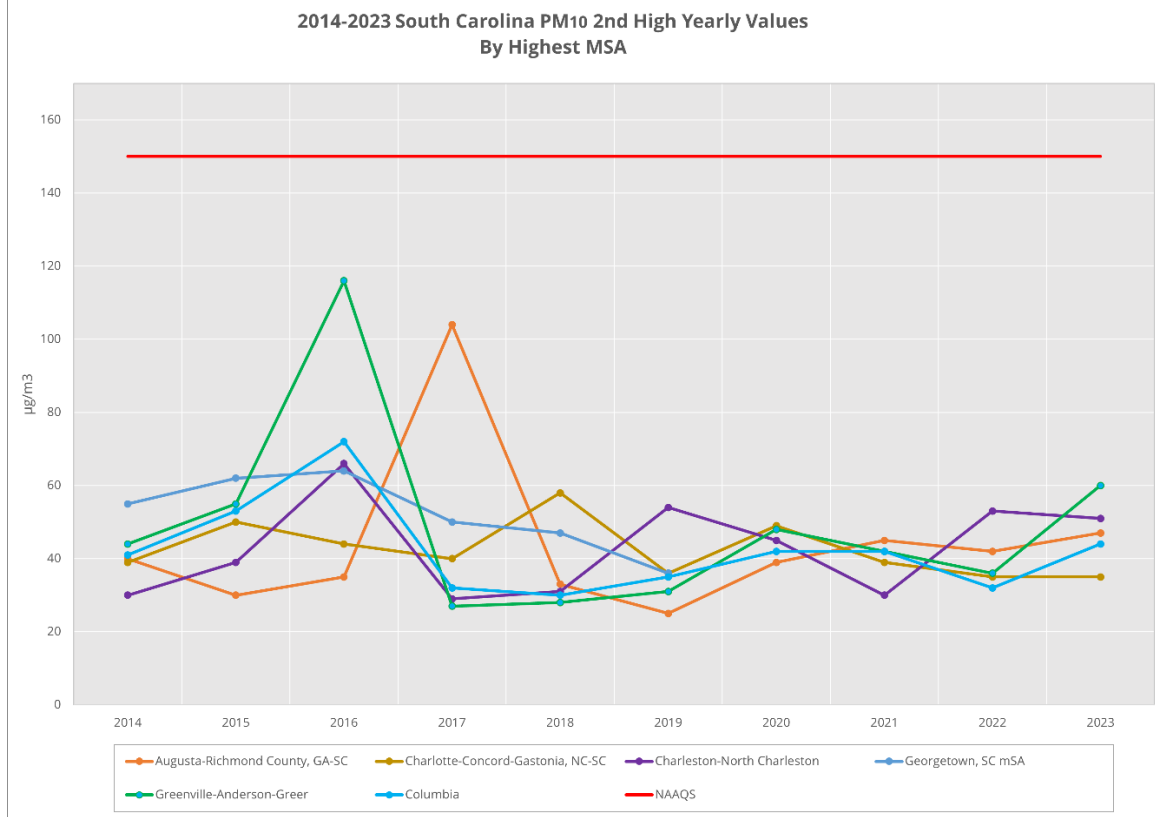
Historical and Current Monitors – Within South Carolina, there have been 60 PM₁₀ monitors since 1982. Currently, within South Carolina there are three PM₁₀ monitors operating in three MSAs (Map 20).

Map 20: South Carolina Active and Historical PM₁₀ Monitors



Design Value Trends and Comparison to the NAAQS – The PM₁₀ concentrations have historically been very low. In the last ten years, there have been no exceedances at PM₁₀ monitors in South Carolina. The highest PM₁₀ 2nd maximum daily value in 2023 was 60 µg/m³ recorded at the Greenville ESC Monitoring Site, which is well below the NAAQS.

Graph 8: 10-Year Trend for PM₁₀ 2nd Highest Maximum Value by MSA



Risk of Future Exceedances – Table 23 contains calculations designed to predict the risk of a future NAAQS exceedance for PM₁₀ based on 2019-2023 data. The purpose of this test is to see which sites are most likely to exceed the applicable NAAQS in the following three years based on previous data trends. The North Charleston Fire Station Monitoring Site and the Parklane Monitoring site are not included because they do not have a long enough data record to complete the calculation; both PM₁₀ monitors started operating in 2023. Based on the last five years of monitoring data, the last column indicates there is a 90 percent confidence index that the PM₁₀ monitor at Greenville ESC will not exceed 80 percent of the current NAAQS.

Table 23: PM₁₀ Risk of Future Exceedance PM₁₀ Risk of Future Exceedance

Site ID and Name	Averaging Time	2019	2020	2021	2022	2023	Average	Standard Deviation	90% Upper Confidence	Is 90%CI < 80% of NAAQS?
450450015 Greenville ESC	24-hour	31	48	42	36	60	43.4	11.26	54.136	Yes

Density of Existing Network and Reduction of Number of Sites – There are six PM₁₀ monitors in the PM₁₀ network which includes three PM₁₀ monitors within South Carolina, one PM₁₀ monitor in the Georgia portion of the Augusta-Richmond County, GA-SC MSA and two PM₁₀ monitors in the North Carolina portion of the Charlotte-Concord-Gastonia, NC-SC MSA. The PM₁₀ monitoring in the South Carolina MSAs meet the PM₁₀ minimum monitoring requirements, meet state needs, and is adequate for protection of sensitive populations. All monitors are required, therefore no reduction in number of sites can be made.

PM₁₀ Monitoring Network Current and Future Plans – As indicated in Table 24, the PM₁₀ monitoring network has six PM₁₀ monitors. The Greenville-Anderson-Mauldin MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000 an additional PM₁₀ monitor would be required in the MSA. The Department will begin the process of adding a PM₁₀ monitor in the MSA when the population threshold is crossed and as resources are allowed.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around the PM₁₀ probe. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document. Otherwise, there are no changes planned for this monitoring network.

Table 24: Current PM₁₀ Ambient Air Monitoring Network

PM₁₀ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
<i>Augusta 13-245-0091</i>		Continuous PM ₁₀	<i>Neighborhood</i>	<i>Population Exposure</i>		<i>Georgia monitor</i>
Charleston-North Charleston, SC MSA						
North Charleston Fire Station 45-019-0020	November 8, 2021	Continuous PM ₁₀ 81102-1	Neighborhood	Highest Concentration/ Population Exposure	SLAMS	This monitor replaced the Jenkins Ave. PM ₁₀ monitor in 2023 and currently fulfills the Appendix D PM ₁₀ minimum monitoring requirements for the MSA. No planned changes.

PM ₁₀ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Charlotte-Concord-Gastonia, NC-SC						
<i>Garinger</i> 371190041		Continuous PM ₁₀				<i>North Carolina</i> <i>monitor</i>
Columbia, SC MSA						
Parklane 45-079-0007	April 3, 1980	Continuous PM ₁₀ 81102-3	Neighborhood	Population Exposure	SLAMS	This monitor replaced the Cayce City Hall PM ₁₀ monitor in 2023 and currently fulfills the Appendix D PM ₁₀ minimum monitoring requirements for the MSA. No planned changes.
Florence, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Greenville-Anderson-Greer, SC MSA						
Greenville Employment Security Commission 45-045-0015	April 11, 2008	Continuous PM ₁₀ 81102-1	Neighborhood	Highest Concentration	SLAMS	This monitor fulfills the Appendix D PM ₁₀ minimum monitoring requirements for the MSA. A waiver request for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing from Obstructions has been submitted for this site. No planned changes.
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spartanburg MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Remainder of State						

PM ₁₀ Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Explanation of ArcGIS Methodology for Conducting Additional Statistical Analysis

The PM_{2.5} and ozone networks are larger, more spatially uniform monitoring networks. Therefore, an additional ArcGIS methodology to score and rank individual ambient air monitoring sites and create suitability maps was utilized. Although these methods have some drawbacks, as is discussed below, the Department determined these methodologies to be the best tools available to objectively assign values, score individual ambient air monitoring sites, and produce visual maps that aid in reviewing the network.

The ArcGIS methodology utilizes Thiessen (Voronoi) polygons that were created to divide the state into “areas of representation” and allocate each polygon to the nearest monitor. For this assessment, Thiessen polygons did not extend beyond the state boundary to capture ambient air monitoring sites in other states. Each polygon created consisted of the points closer to one particular site than any other site. The data for the emissions and population categories were aggregated by Thiessen polygons. Monitoring sites were then scored based on these aggregated values.

There are many limitations with using Thiessen polygons. These polygons are not a true indication of which site is most representative of the pollutant concentration in a given area. Meteorology (including pollutant transport), topography, and proximity to population or emission sources are not considered, so some areas assigned to a particular monitor may actually be better represented by a different monitor. Also, Thiessen polygons tend to give more weight to rural sites and those sites on the edges of urban areas or other monitor clusters.

Scoring Method Using Criteria and Weighting - The criteria and percent weighting used to score each ozone and PM_{2.5} FRM monitoring site are as follows: 2023 monitoring design values (25 percent), 2023 deviation from the NAAQS (20 percent), 2020 NEI area emissions (20 percent), 2024-2030 projected population change (15 percent), 2023 senior population (5 percent), 2023 children’s population (5 percent), and time of monitor in service as of January 2025 (5 percent). Each of the scores were compiled and the criteria produced a “ranked” score for each ambient air monitoring site. The following steps were used in developing the “score”:

1. The Thiessen polygon technique described above was used to divide the ambient air monitoring network into regions defined by polygons. Each polygon contains only one site and shows the land area centered on and nearest to the monitoring site.
2. The zonal statistics of each parameter are summarized for each Thiessen polygon and reported in a table. The centroid of the county determined the Thiessen polygon to which it belonged.
3. The tabular data for the appropriate parameter are then related to each ambient air monitoring site.
4. Each ambient air monitoring site was scored proportionately utilizing the formula $(\text{Value} - \text{Min}) / (\text{Max} - \text{Min})$.
5. The above steps are repeated for each parameter.
6. Scores for each category were multiplied by their weights listed above and weighted scores were summed for all the categories. Each site was ranked based on the total score using equal intervals between classifications and identified as "low," "medium" and "high" value. Final scores for ozone and PM_{2.5} monitors are represented in their respective sections.

Particulate Matter less than 2.5 microns (PM_{2.5}) Ambient Air Monitoring Network

Regulations – In July 1997, EPA determined that the PM NAAQS should be split into both particulate particles less than or equal to 10 micrometers (µm) (PM₁₀) and particulate particles less than or equal to 2.5 µm (PM_{2.5}). An annual PM_{2.5} standard of 15 µg/m³, based on the 3-year average of the annual arithmetic mean and a 24-hour PM_{2.5} standard of 65 µg/m³, based on the 3-year average of the 98th percentile of 24-hour PM_{2.5} concentrations were established. In 2006, the level of the annual PM_{2.5} standard was retained at 15 µg/m³ and the 24-hour PM_{2.5} standard was revised to 35 µg/m³. In 2012, the level of the annual PM_{2.5} standard was lowered to 12µg/m³ and the 24-hour PM_{2.5} standard was retained at 35 µg/m³. In April 2020, the EPA retained these standards without revision.

In January 2024, the primary annual PM_{2.5} NAAQS were revised to a limit of 9 µg/m³ and the 24-hour PM_{2.5} standard was retained at 35 µg/m³. As of January 2025, these limits remain.

The regulations that cover PM_{2.5} minimum monitoring requirements can be found in 40 CFR Part 58, Appendix D, Section 4.7 and Appendix A, Section 3.2.3. The six requirements found in 40 CFR Part 58, Appendix D, Section 4.7 are as follows:

1. Required PM_{2.5} SLAMS sites – The requirement in 40 CFR Part 58, Appendix D, Section 4.7 listed in Table 25 indicate a minimum number of required PM_{2.5} SLAMS sites for each MSA

which is based on MSA population and past design values. NCore sites can count towards minimum monitoring requirements.

Table 25: Table D-5 of Appendix D to Part 58. PM_{2.5} Minimum Monitoring Requirements

MSA population	Most recent 3-year design value $\geq 85\%$ of any PM_{2.5} NAAQS	Most recent 3-year design value $< 85\%$ of any PM_{2.5} NAAQS
>1,000,000	3	2
500,000-1,000,000	2	1
50,000-<500,000	1	0

At least one monitoring site must be sited in an area of expected maximum concentration. The MSAs with a population of 1,000,000 or more people (Charlotte-Concord-Gastonia MSA) must have at least one PM_{2.5} monitor that is collocated at a near-road NO₂ station. The Remount (37-11-0045) Site in Charlotte, North Carolina fulfills this part of the requirement. For areas with an additional required SLAMS, one monitor must be sited in an at-risk community with poor air quality, particularly where there are anticipated effects from sources in the area.

2. Continuous Requirement – This PM_{2.5} monitoring requirement for continuous monitors is associated with the required PM_{2.5} SLAMS monitoring requirement. This regulation stipulates the number of continuous PM_{2.5} monitors that must be collocated with the minimum required PM_{2.5} SLAMS monitors be equal to at least one-half (round up) of the minimum required PM_{2.5} SLAMS monitors in the MSA. Also, at least one required continuous monitor in each MSA must be collocated with one of the required FRM or FEM monitors, unless at least one of the required FRM/FEM monitors is itself a continuous FEM monitor, in which case, no collocation requirement applies.

In Table 26, the PM_{2.5} monitoring sites for each MSA are listed. The number of required minimum and required continuous monitors by MSA to comply with 40 CFR Part 58, Appendix D Section 4 is also shown. The sites that fulfilled these two minimum monitoring requirements have a star in front of the site name.

Table 26: 40 CFR Part 58, Appendix D, Section 4.7 PM_{2.5} Minimum Monitoring Requirements

PM_{2.5} Population Requirement	MSA	2023 Pop.	Site	Required Minimum Monitors	Required Continuous Monitors
>1,000,000	Charlotte- Concord- Gastonia	2,805,115	*Garinger [NC] (37-119- 0041)	3	2
			*Friendship Park [NC] (37- 119-0048)		
			*Remount [NC] (37-119- 0045)		
			Rockwell [NC] (37-159-0021)		
500,000- 1,000,000	Greenville- Anderson-Greer	975,480	*Greenville ESC (45-045- 0015)	2	1
			*Hillcrest (45- 045-0016)		
500,000- 1,000,000	Columbia	858,302	Irmo DJJ (45- 079-0022)	1	1
			*Parklane (45- 079-0007)		
500,000- 1,000,000	Charleston- North Charleston	849,417	*North Charleston Fire Station (45-019-0020)	1	1
			Cape Romain (45-019-0046)		
500,000- 1,000,000	Augusta- Richmond County, GA-SC	629,429	*Augusta [GA] (13-245-0091)	2	1
			*Trenton (45- 037-0001)		
50,000- <500,000	Myrtle Beach- Conway-North Myrtle Beach, SC-NC	397,478	Coastal Carolina (45-051-0008)	0	0

PM_{2.5} Population Requirement	MSA	2023 Pop.	Site	Required Minimum Monitors	Required Continuous Monitors
50,000- <500,000	Spartanburg	383,327	*T.K. Gregg (45-083-0011)	1	1
50,000- <500,000	Hilton Head Island-Bluffton- Port Royal	232,523		0	0
50,000- <500,000	Florence	199,630	*Williams MS (45-041-0003)	1	1
50,000- <500,000	Sumter	104,165		0	0
50,000- <500,000	Not in an MSA Chesterfield County	No requirement	Chesterfield (45-025-0001)	0	0
*This site fulfills the minimum monitoring requirement.					

3. Regional Background and Transport – It is required that at least one PM_{2.5} site must be established in each state to monitor for regional background and at least one PM_{2.5} site to monitor regional transport. The Cape Romain (45-019-0046) Site in Charleston County is the regional background site and the Chesterfield (45-025-0001) site in Chesterfield County is the regional transport site.

4. NCore Requirement – Each state is required to operate at least one NCore site which measures PM_{2.5} using both continuous and integrated/filter-based samplers. The Parklane (45-079-0007) Site in Columbia, South Carolina is the NCore site for South Carolina. The Garinger (37-119-0041) Site in Charlotte, North Carolina is also an NCore site.

5. Near-road PM_{2.5} Monitoring – The EPA required the collocation of one PM_{2.5} monitor with a near-road NO₂ monitor in urban areas having populations of 1,000,000 or more by January 1, 2017. The Charlotte-Concord-Gastonia, NC-SC MSA is the only MSA in South Carolina that currently meets the population requirement for a collocated PM_{2.5} monitor. The near-road monitoring requirement for the Charlotte-Concord-Gastonia, NC-SC MSA is being fulfilled at the Remount Road (37-119-0045) Site by the Mecklenburg County Air Quality Commission.

6. Speciation Monitoring – Chemical speciation monitoring is conducted at the Parklane (45-079-0007) Site and is part of the PM_{2.5} Speciation Trends Network (STN).

There are five requirements for PM_{2.5} monitors found in 40 CFR Part 58, Appendix A, Section 3.2.3-Collocated Quality Control Sampling Procedures for PM_{2.5}. They are as follows:

1. For each pair of collocated monitors, one sampler must be designated as the primary monitor and the other as the quality control monitor.
2. For each distinct monitoring method designation used for a primary monitor, the PQAO must have fifteen percent of the primary monitors of each method designation collocated (values of 0.5 and greater round up); and have at least one collocated quality control monitor (if the total number of monitors is less than three). The first collocated monitor must be a designated FRM monitor. The South Carolina primary monitors use either a Partisol 2025i PM_{2.5} Sequential Air Sampler w/ very sharp cut cyclone (VSCC) as the FRM method (method code 145) or a Teledyne T640 with Data Alignment Enabled as the FEM (method code 636).
3. A primary monitor designated as an EPA FRM shall be collocated with a quality control monitor having the same EPA FRM method designation.
4. For each primary monitor designated as an EPA FEM used by the PQAO, 50 percent of the monitors designated for collocation, or the first if only one collocation is necessary, shall be collocated with a FRM quality control monitor and 50 percent of the monitors shall be collocated with a monitor having the same method designation as the FEM primary monitor. If an odd number of collocated monitors is required, the additional monitor shall be an FRM quality control monitor.
5. Fifty percent of the collocated quality control monitors should be deployed at sites with annual average or daily concentrations estimated to be within plus or minus 20 percent of either the annual or 24-hour NAAQS and the remainder at the PQAOs discretion. If an organization has no sites with annual average or daily concentrations within ± 20 percent of the annual NAAQS or 24-hour NAAQS, 50 percent of the collocated quality control monitors should be deployed at those sites with the annual mean concentrations or 24-hour concentrations among the highest for all sites in the network and the remainder at the PQAO's discretion.

Table 27 lists the sites within South Carolina that fulfill the Appendix A requirements.

PQAO	Method	# Primary Monitors	Minimum # of Required Collocated Monitors	Actual Collocated Monitors	Sites with Collocated Monitors
SCDES	FRM Gravimetric w/VSCC (145)	8	1	3	Hillcrest (45-045-0016) Parklane (45-079-0007) N. Charleston F.S. (45-019-0020)
SCDES	Teledyne T640 (636)	3	1	1	Chesterfield (45-025-0001)
SCDES	Teledyne T640X (638)	0	0	0	N/A

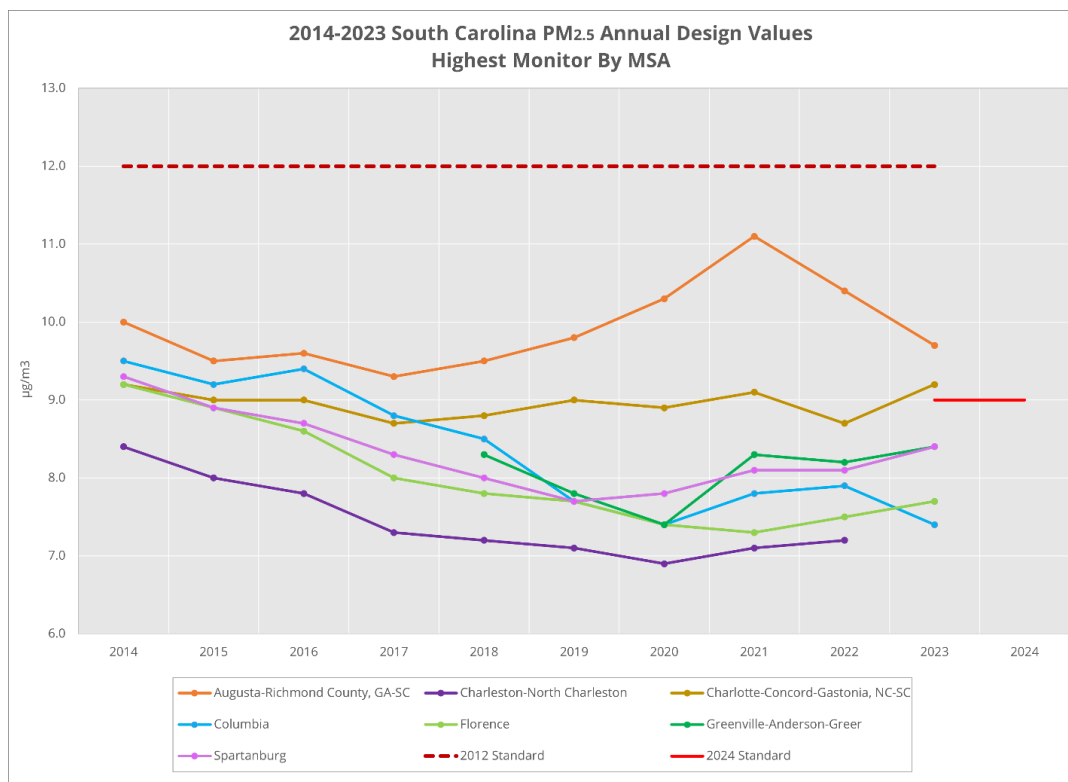
Map 21: Active and Historic South Carolina PM_{2.5} Monitors



In 2024, there were twenty-two PM_{2.5} monitors and one PM_{2.5} speciation monitor operating within South Carolina. Besides the sites within South Carolina that are indicated on the above map, there are PM_{2.5} monitors located at the Augusta Monitoring Site in the Augusta-Richmond County, GA-NC MSA and located at Garinger, Rockwell, Remount Road, and Friendship Park Monitoring Sites in the Charlotte-Concord-Gastonia, NC-SC MSA. The Catawba Indian Nation also operates one PM_{2.5} monitor within the Charlotte-Concord-Gastonia, NC-SC MSA.

Design Value Trends and Comparison to the NAAQS – The following graphs show the ten-year trends for the annual and 24-hour PM_{2.5} design value in each MSA. None of the monitors within South Carolina recorded 2023 design values that exceeded the 2024 Annual PM_{2.5} standard of 9 µg/m³. The highest annual design values throughout the years are found in the Augusta-Richmond County, GA-SC MSA. The highest 2023 design value shown on the graph was recorded at the Augusta Monitoring Site in Georgia: 9.7 µg/m³. In the Charlotte-Concord-Gastonia, NC-SC MSA, the Remount Road near-road monitor in North Carolina recorded the highest 2023 design value in the MSA: 9.2 µg/m³. The Georgia Environmental Protection Division and the North Carolina Department of Environmental Quality have submitted exceptional events demonstrations to address these high values. The state of South Carolina has designated all South Carolina counties as Attainment/Unclassifiable for the 2024 PM_{2.5} NAAQS.

Graph 9: Ten Year PM_{2.5} Annual Design Value Trends



Graph 10 indicates the ten-year PM_{2.5} 24-Hour design value trend graph. All of the South Carolina PM_{2.5} design values have been below the established NAAQS.

Graph 10: Ten Year PM_{2.5} 24-Hour Design Values

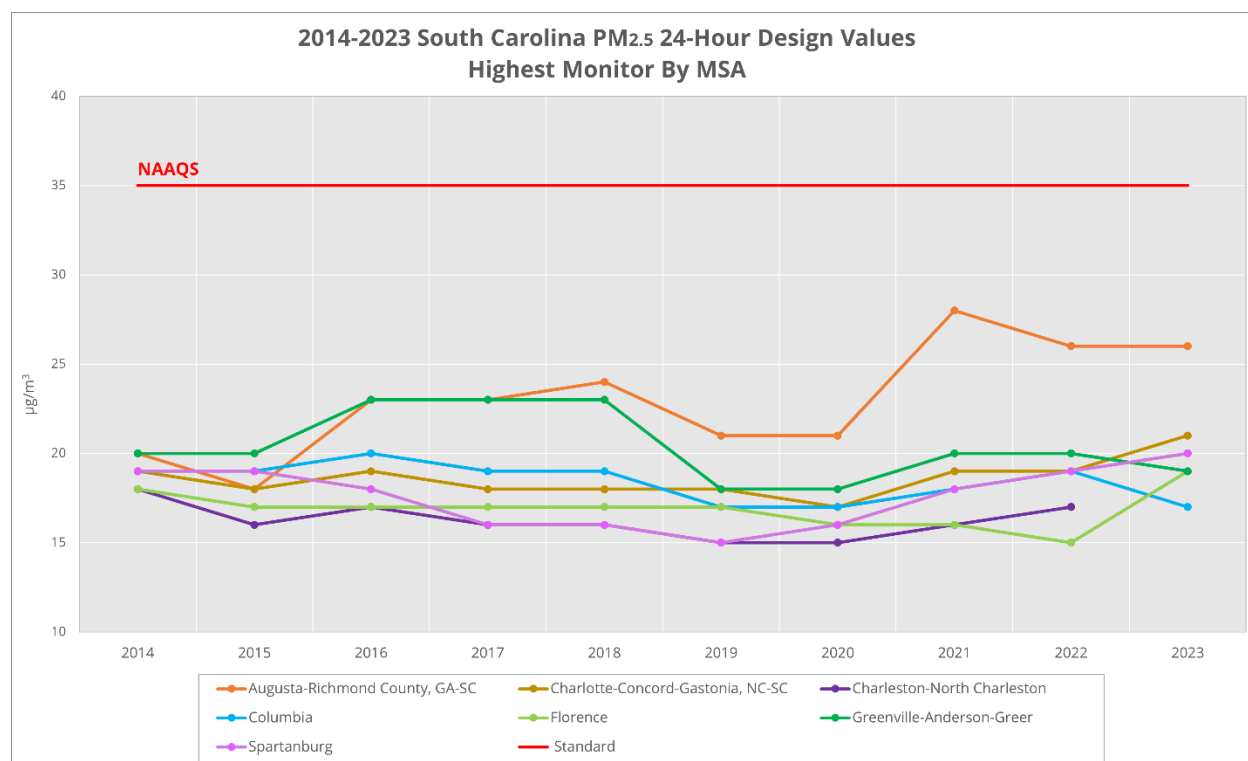


Table 28 lists the 2023 South Carolina PM_{2.5} annual and 24-hour design values. The highest valid annual design value for the State was 8.4 µg/m³ at both the Greenville ESC (45-063-0008) Monitoring Site and the Hillcrest (45-045-0016) Monitoring Site in the Greenville-Anderson-Greer MSA. The highest valid 24-hour design value was 20 µg/m³ at the T.K. Gregg (45-083-0011) Monitoring Site in the Spartanburg MSA.

Table 28: South Carolina 2023 PM_{2.5} Design Values

MSA	Site Name	Site ID	PM _{2.5} Annual (µg/m ³)	PM _{2.5} 24-hour (µg/m ³)
Augusta-Richmond County	Trenton	45-037-0001	8.1	18
Charleston-North Charleston	Cape Romain	45-019-0046	6.8*	17*
Charleston-North Charleston	N. Charleston F.S.	45-019-0020	8.3*	18*
Columbia	Irmo DJJ	45-079-0020	8.1*	22*
Columbia	Parklane	45-079-0007	7.4	17
Florence	Williams	45-041-0003	7.7	19
Greenville-Anderson-Greer	Greenville ESC	45-045-0015	8.4	19

MSA	Site Name	Site ID	PM _{2.5} Annual (µg/m ³)	PM _{2.5} 24-hour (µg/m ³)
Greenville-Anderson-Greer	Hillcrest	45-045-0016	7.9	19
Myrtle Beach-North Myrtle Beach-Conway	Coastal Carolina	45-051-0008	7.9*	23*
Spartanburg	T.K. Gregg	45-083-0011	8.4	20
Not in MSA	Chesterfield	45-025-0001	6.8	18
*denotes invalid design values that did not meet data completeness requirements. For the Coastal Carolina, Cape Romain, and Chesterfield monitoring sites, design values are considered incomplete because they have been in operation for less than 3 years.				

Risk of Future Exceedance – Table 29 contains calculations designed to predict the risk of a future NAAQS exceedance for PM_{2.5} based on 2014-2018 data. The purpose of this test is to see which sites are most likely to exceed the applicable NAAQS in the following three years based on previous data trends. Asterisks in the table indicate a design value that did not meet data completeness. Based on the last five years of monitoring data, the last column indicates that all sites except for Chesterfield have a 90% confidence index of exceeding 80% of the current annual PM_{2.5} standard. There is a 90% confidence index that no South Carolina sites will exceed 80% of the 24-Hour PM_{2.5} standard.

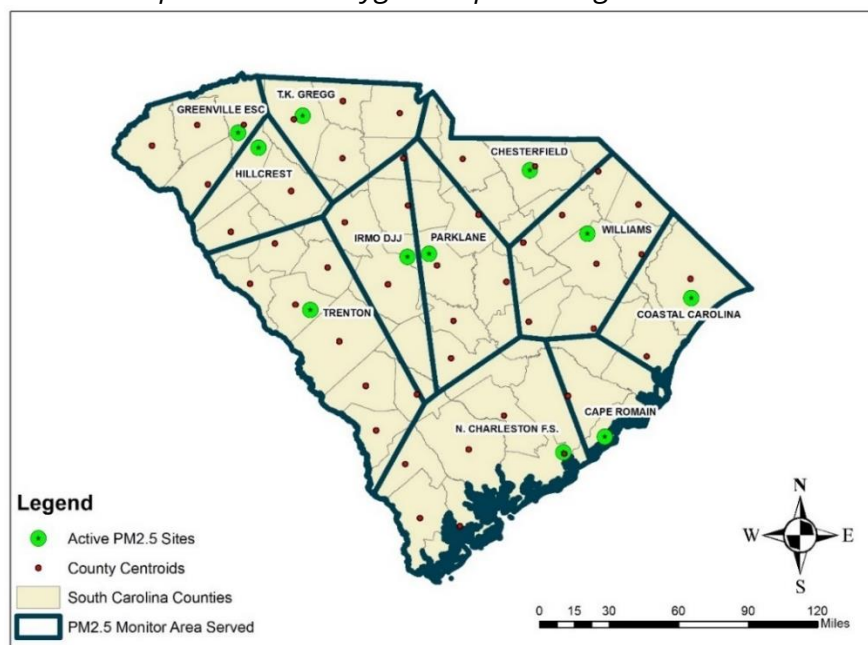
Table 29: PM_{2.5} Risk of Future Exceedance

Site ID and Name	Averaging Time	2019	2020	2021	2022	2023	Average	Standard Deviation	90% Upper Confidence	Is 90%CI < 80% of NAAQS?
Chesterfield 450250001	Annual	7	6.8	6.9	6.4	6.8	6.78	0.23	7.00	Yes
Trenton 450370001	Annual	7.7	7.3	7.5	7.5	8.1	7.62	0.30	7.91	No
Williams 450410003	Annual	7.7	7.4	7.3	7.2	7.7	7.46	0.23	7.68	No
Greenville ESC 450450015	Annual	7.8	7.4	8.1	8	8.4	7.94	0.37	8.29	No
Hillcrest 450450016	Annual	7.6	7.4	7.5	7.4	7.9	7.56	0.21	7.76	No
Parklane 450790007	Annual	7.6	7.1	7.2	6.9	7.4	7.24	0.27	7.50	No
T.K. Gregg 450830011	Annual	7.7	7.8	8.1	8.1	8.4	8.02	0.28	8.28	No

Site ID and Name	Averaging Time	2019	2020	2021	2022	2023	Average	Standard Deviation	90% Upper Confidence	Is 90%CI < 80% of NAAQS?
Chesterfield 450250001	24-Hour	14	14	15	14	18	15	1.73	16.65	Yes
Trenton 450370001	24-Hour	16	16	17	17	18	16.8	0.84	17.60	Yes
Williams 450410003	24-Hour	17	16	16	15	19	16.6	1.52	18.05	Yes
Greenville ESC 450450015	24-Hour	18	18	20	20	19	19	1.00	19.95	Yes
Hillcrest 450450016	24-Hour	16	16	16	17	19	16.8	1.30	18.04	Yes
Parklane 450790007	24-Hour	14	15	16	15	17	15.4	1.14	16.49	Yes
T.K. Gregg 450830011	24-Hour	15	16	18	19	20	17.6	2.07	19.58	Yes

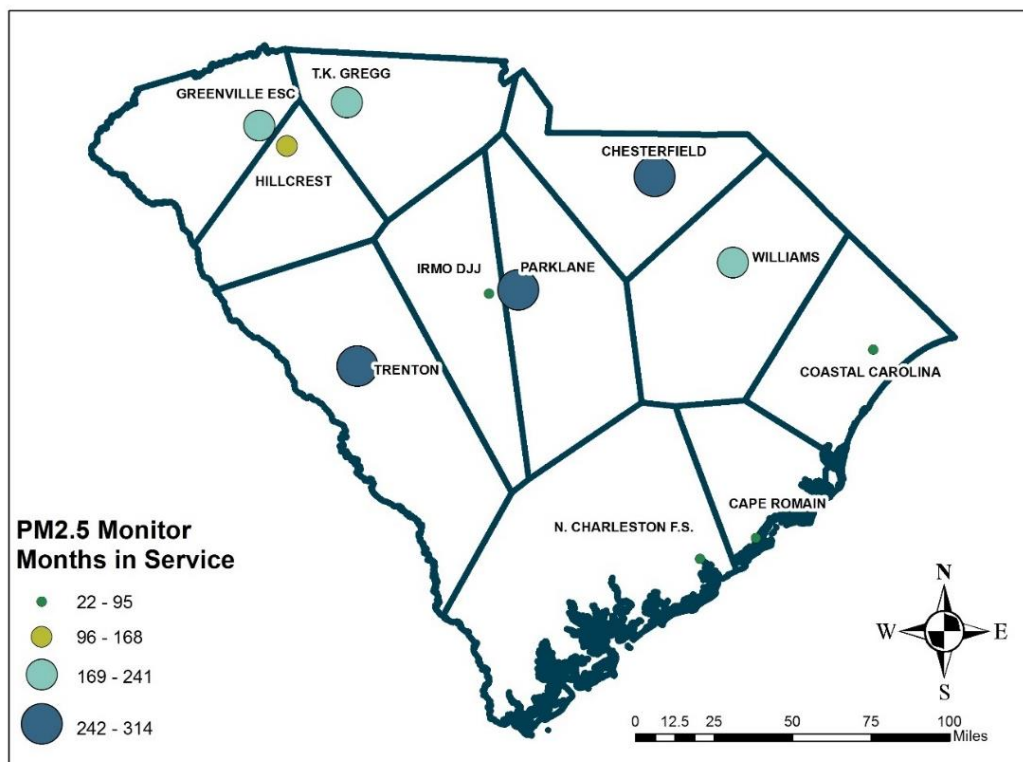
Area Served – Map 22 indicates the Thiessen polygons that were used to score each monitor. Each polygon represents one PM_{2.5} monitor. The centroid of each county determines the polygon with which its data will be associated.

Map 22: Ozone Polygons Representing Area Served



Monitors Time in Service – Monitors that have a long historical record are valuable for tracking trends. In this analysis, monitors were ranked based on the duration of their continuous measurement records. For the purposes of this evaluation, the most important monitors are those with the longest continuous trend record. Some monitoring sites have multiple PM_{2.5} monitors, and some of the monitors were non-FEM in the past, but the longest monitor record at each site was used in the final scoring.

Map 23: Time in Service of PM_{2.5} Monitors

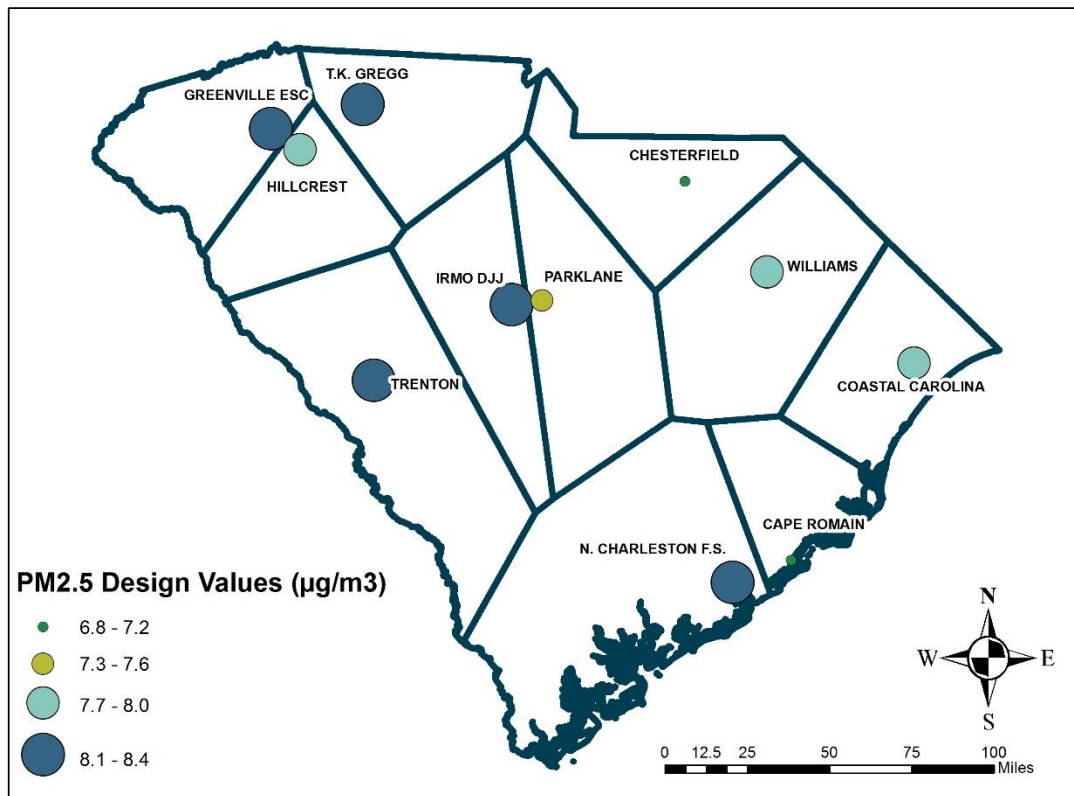


The PM_{2.5} monitors that have the longest time in service are located at the Chesterfield (45-025-0001) Monitoring Site in Chesterfield County, Parklane (45-079-0007) Monitoring Site in the Columbia MSA, and the Trenton (45-037-0001) Monitoring Site in the Augusta-Richmond County, GA-SC MSA.

Measured Concentrations – Individual monitors were ranked based on the concentration of pollutants they measure. Monitors that measure high concentrations or design values are ranked higher than monitors that measure low concentrations. The greater the design value, the higher the site rank. The Department used both valid and invalid 2023 annual design values for the PM_{2.5} sites to rank the ambient air monitoring sites. The annual design values were used because the South Carolina network often measures values closer to the annual standard than to the 24-hour standard for PM_{2.5}. Invalid design values were incorporated because they are the most recent measured concentrations available, and some sites have not been operating long enough to generate a valid 3 year design value.

The monitoring sites with the highest 2023 annual PM_{2.5} design values were located within some of the higher population MSAs in the state. The highest 2023 annual PM_{2.5} design values were both 8.4 µg/m³ recorded at the Greenville ESC (45-045-0015) and T.K. Gregg (45-083-0011) Monitoring Sites in the Greenville-Anderson-Greer and Spartanburg MSAs, respectively.

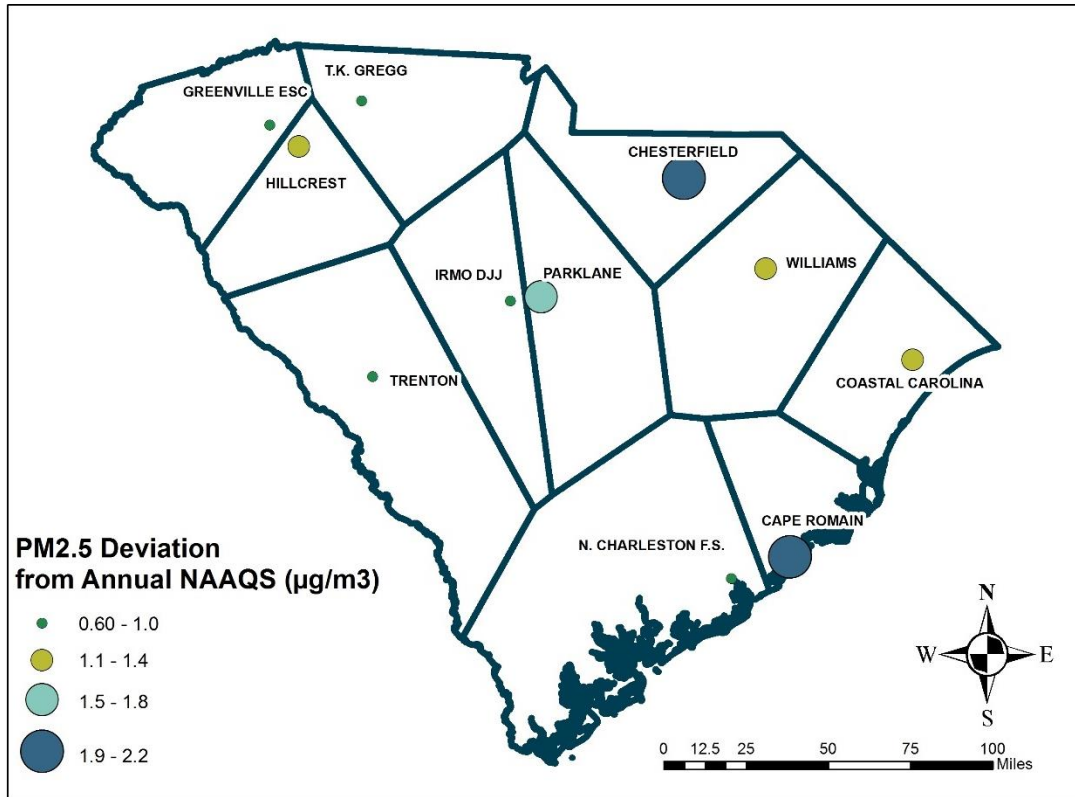
Map 24: 2023 Annual Design Values of PM_{2.5} Monitors



Deviation from NAAQS – Monitoring Sites measuring design values that are very close to the NAAQS exceedance threshold are ranked highest in this analysis. These sites may be considered more valuable for NAAQS compliance evaluation. Sites measuring concentrations well above or below the threshold do not provide as much information in terms of NAAQS compliance. This technique contrasts the difference between the standard and actual measurements or design values. Deviation was calculated from the annual PM_{2.5} NAAQS because measured concentrations are often closer to the annual NNAQS than the 24-hour NAAQS in South Carolina.

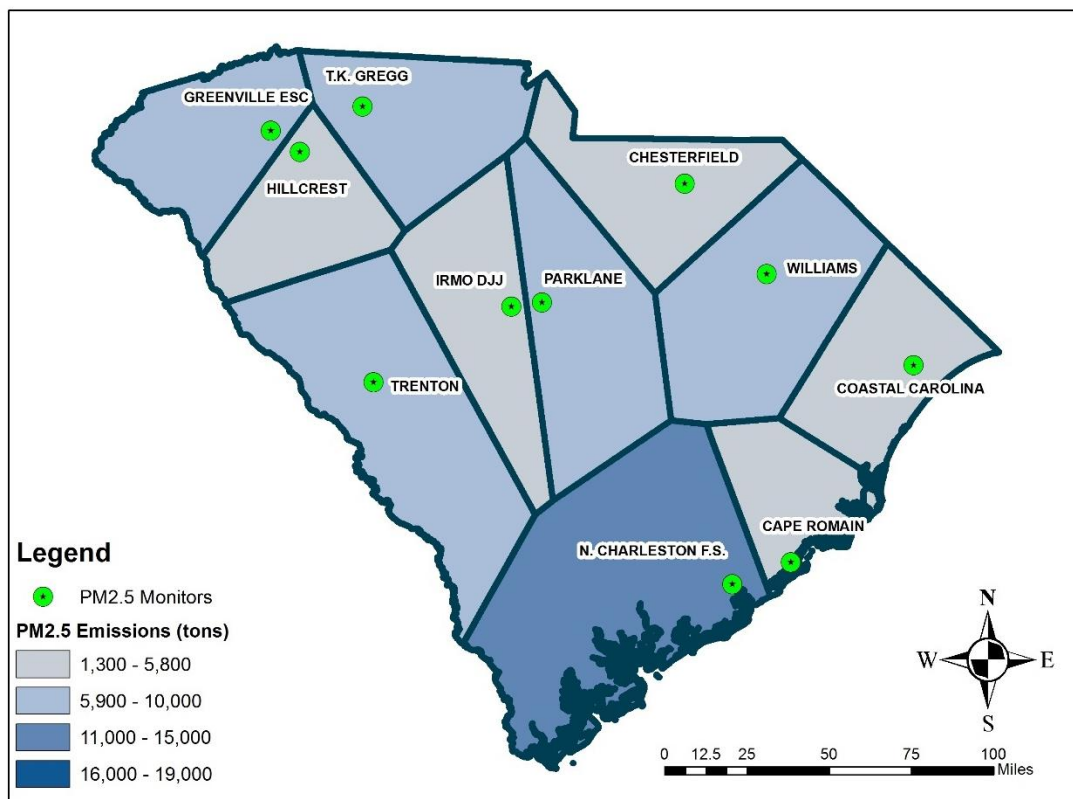
The monitoring sites with the highest deviation from the NAAQS were the Cape Romain (45-019-0046) Monitoring Site in the Charleston-North Charleston MSA and the Chesterfield (45-025-0001) Monitoring Site (not located in an MSA). These sites are both considered background monitoring sites, and they often have lower design values than monitoring sites located closer to densely populated areas.

Map 25: Deviation from the NAAQS of PM_{2.5} Monitors



PM_{2.5} Emissions inventory – 2020 NEI Emission inventory data were used to find locations where emissions of pollutants of concern are concentrated. This analysis can be scaled to various levels of complexity, depending on available resources. At the simplest level, county-level emissions patterns, such as those in the National Emission Inventory, can be compared with monitor locations. For measuring maximum precursor or primary emissions, monitors should be placed in those counties with maximum emission density. More complex methods use gridded emissions and/or species-weighted emissions, depending on their importance producing secondary pollutants of concern.

Map 26: PM_{2.5} Monitors Within the Areas of PM_{2.5} Emissions

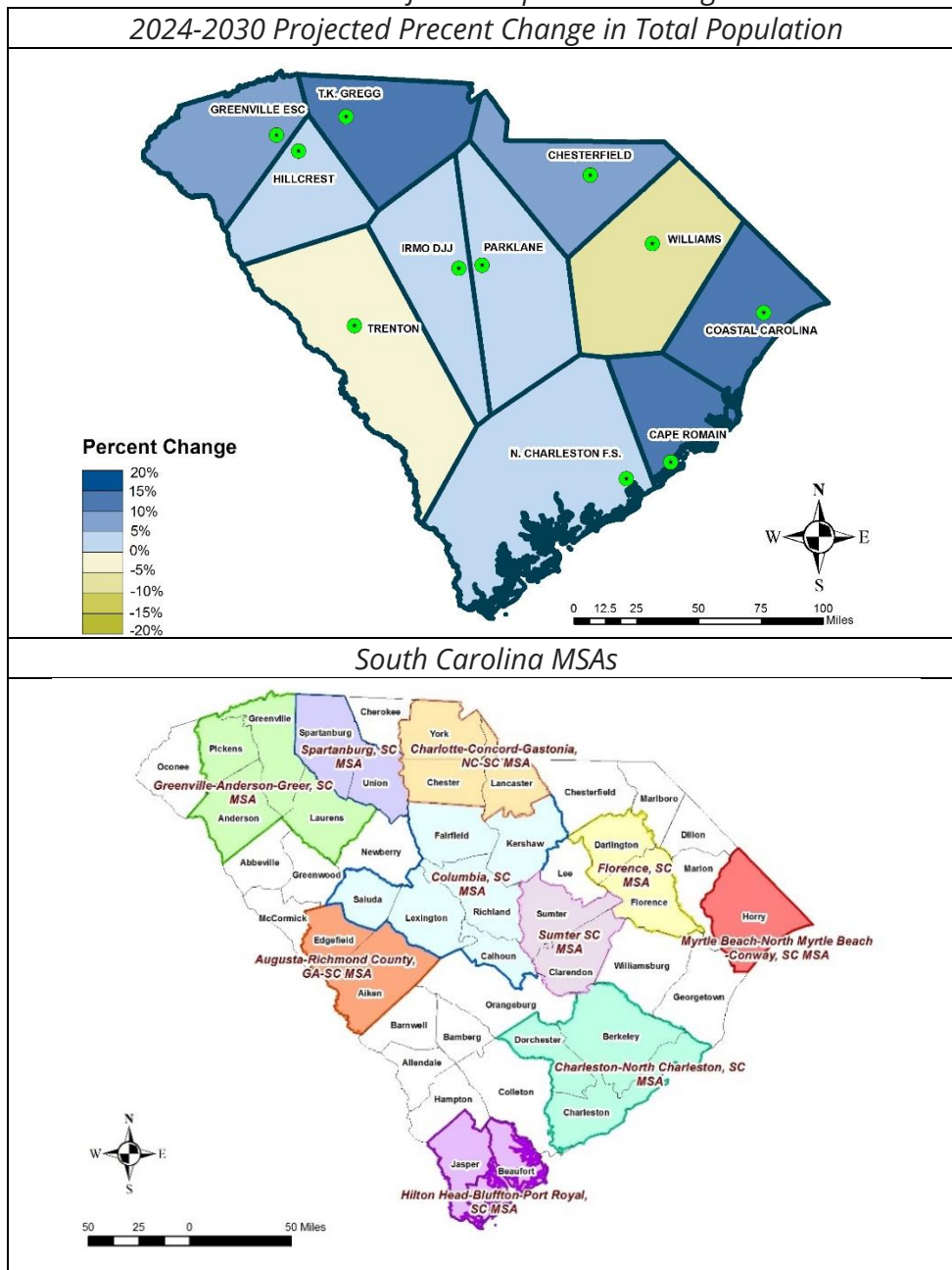


The monitoring sites were scored based on the total emissions being represented by each monitoring area (area served polygon). The monitoring site nearest the area of highest PM_{2.5} emissions was the North Charleston Fire Station (45-019-0020) Monitoring Site in the Charleston-North Charleston MSA.

Population change – High rates of population increase are associated with potential increased emissions activity and exposure. Sites were ranked on population change in the area of representation. Area of representation was estimated using the Thiessen polygons technique. The total population change at the county level whose centroid falls within the area of coverage of a PM_{2.5} monitoring site is assigned to that site. This technique gives more weight to sites in areas with high rates of population growth and large areas of representation.

Table 30: Projected Population Change

2024-2030 Projected Percent Change in Total Population

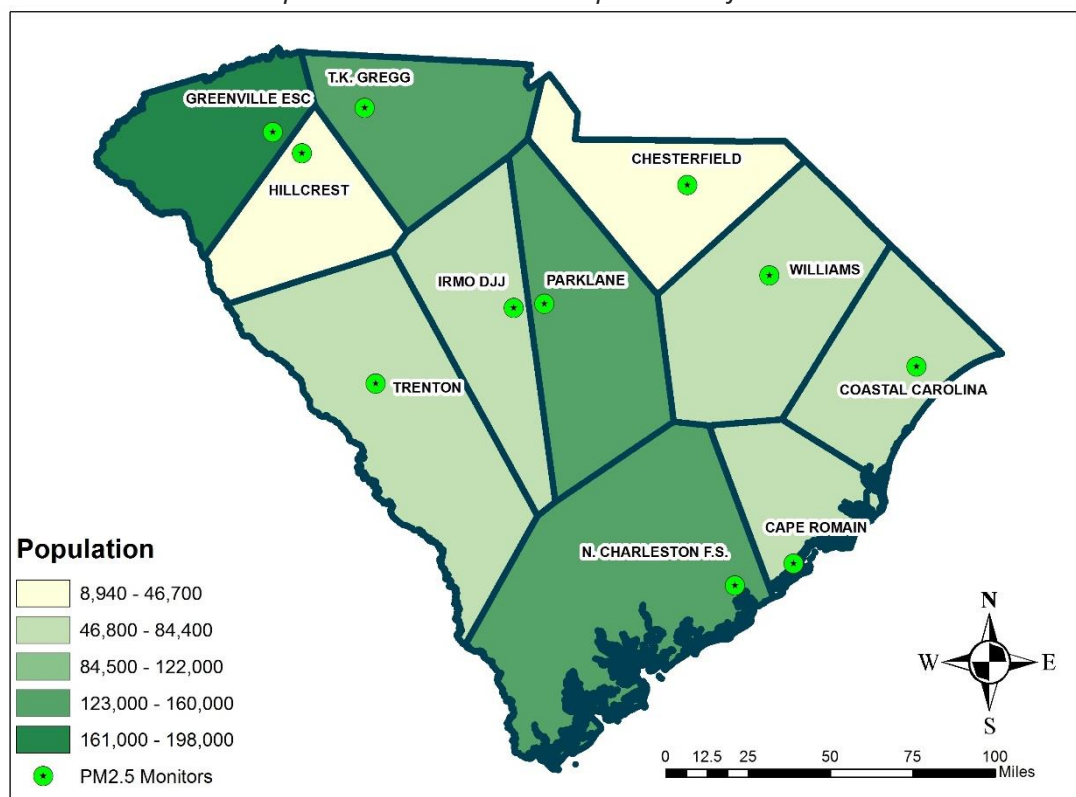


As can be seen when comparing the two maps above, the upstate area with the largest projected population changes represented by PM_{2.5} monitors were located around the T.K. Gregg (45-083-0011) Monitoring Site in the Spartanburg MSA. In the low country, the Cape Romain (45-019-0046) and Coastal Carolina (45-051-0008) Monitoring Sites are surrounded by the highest total projected population change. The counties that fall within these polygons that are expected to grow are Berkley, Georgetown, and Horry counties. The coastal areas tend to be “swept clean” with the sea breezes and typically have low PM_{2.5} concentrations.

Estimated Population for Children (ages 18 and below) – This test focuses on the current estimated total population of younger individuals represented by each ambient air monitoring site. Sites were ranked on the population below age eighteen in the area of representation. Areas with high populations of youth may be indicative of the effects of pollution on sensitive individuals. Area of representation was estimated using the Thiessen polygons technique. The population of a county whose center falls within the area of coverage of a monitor is assigned to that monitor.

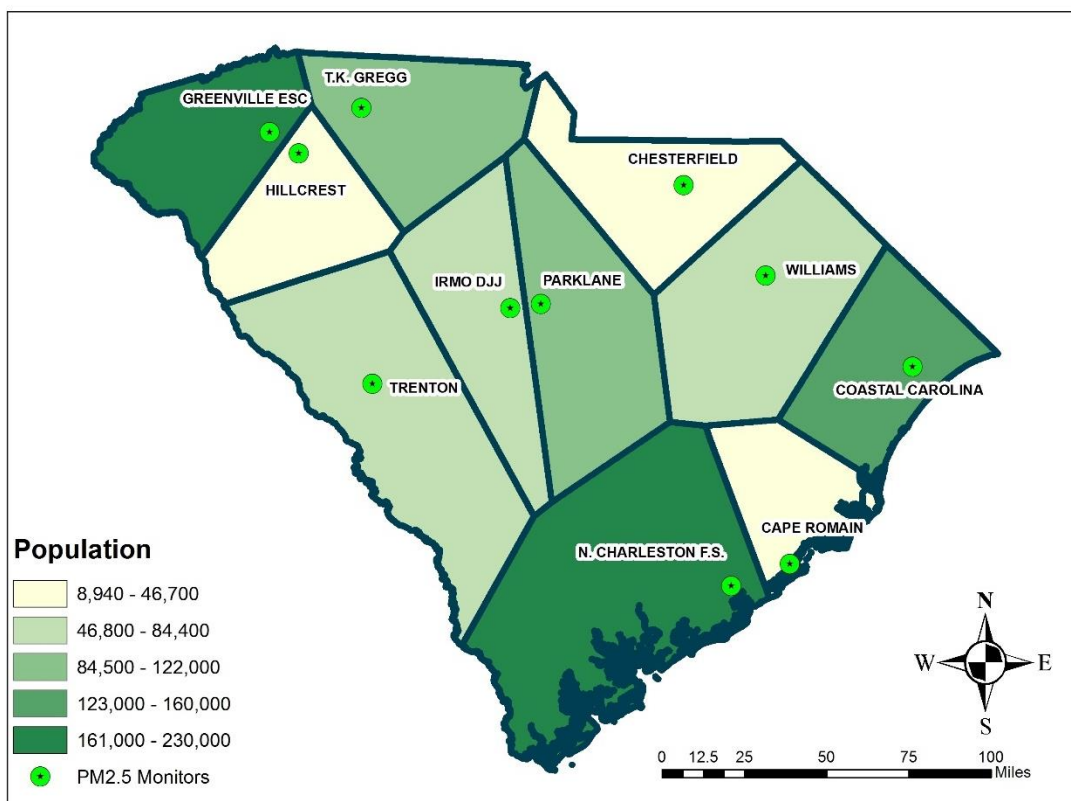
As Map 27 below indicates, the PM_{2.5} monitor at the Greenville ESC (45-045-0015) Monitoring Site (Greenville-Anderson-Greer MSA) represents the area with the highest estimated population of children.

Map 27: Estimated 2023 Population of Children



Estimated Population for age 65 and above – This test focuses on the current estimated total population of older individuals in the area represented by each ambient air monitoring site. Areas with high populations of older individuals indicate the potential for the effects of pollution on sensitive individuals. Sites once again were ranked on the population of older individuals in the area of representation. Areas of representation were estimated using the Thiessen polygons technique. The population of a county whose center falls within the area of coverage of a monitor is assigned to that monitor.

Map 28: Estimated 2023 Population of Senior Citizens

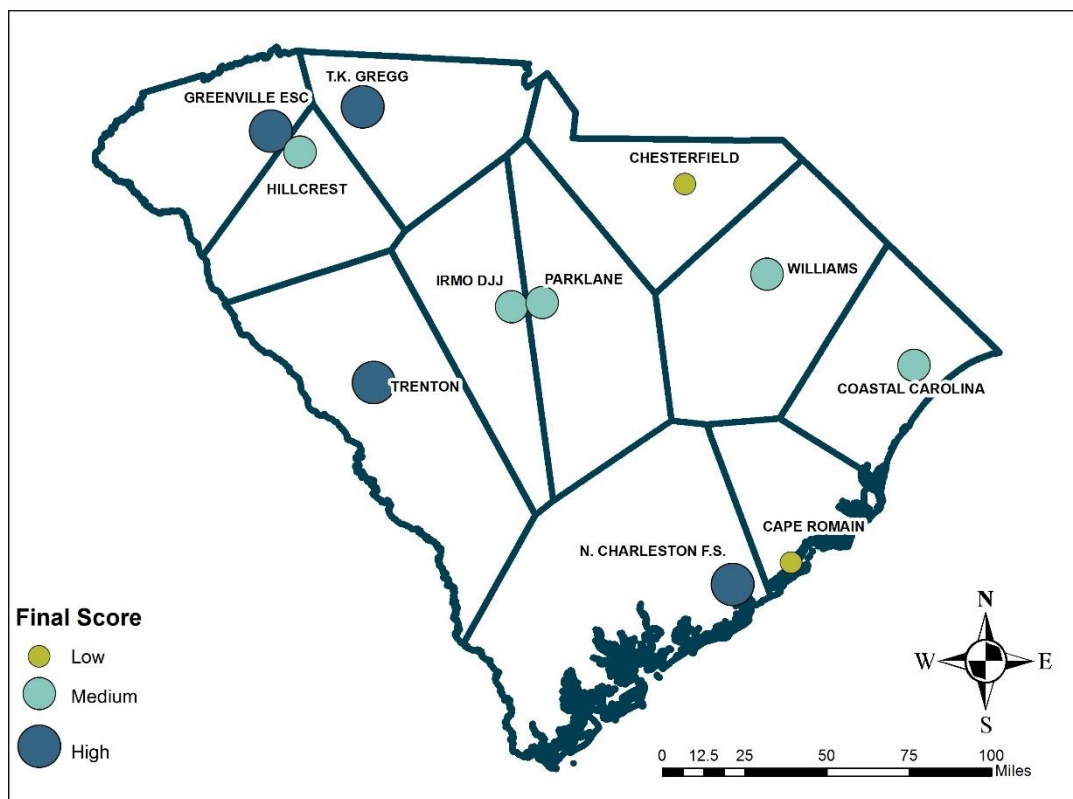


The highest estimated senior populations were in the Greenville and in the Charleston-North Charleston areas. Both of these areas have PM_{2.5} monitors. In the Upstate, the highest estimated senior population includes the area represented by the Greenville ESC (45-045-0015) Monitoring. The second area is represented by the PM_{2.5} monitor at the North Charleston Fire Station (45-019-0020) Monitoring Site.

Results of Scoring of Valuable PM_{2.5} Monitors – Based on the above criteria, the GIS analysis produced a final ranking for the PM_{2.5} monitoring networks of the most and the least valuable sites. As Map 30 below shows, the scoring results indicated that the most valuable monitors are the Greenville ESC (45-045-0015) Monitoring Site in the Greenville-Anderson-Greer MSA, the T.K. Gregg (45-083-0011) Monitoring Site in the Spartanburg MSA, the Trenton (45-037-0001) Monitoring Site in the Augusta-Richmond County, GA-SC MSA, and the North Charleston Fire Station (45-019-0020) Monitoring Site in the Charleston-North Charleston MSA.

The Chesterfield (45-025-0001) and Cape Romain (45-019-0046) Monitoring Sites had the lowest score, but the Department believes these monitors are very valuable. Although the score was low, the Chesterfield (45-025-0001) monitor is in a rural area and is the required regional transport monitor for the state. It is also a National Air Toxics Site (NATTS). The Cape Romain monitor is the required regional background monitor for the state and a Visibility Improvement State and Tribal Association of the Southeast (VISTAS) site used to identify sources that significantly impact visibility in Class I areas (such as the National Wildlife Refuge the monitor is located in).

Map 30: Final PM_{2.5} Scoring



Density of Existing Network and Reduction of Number of Sites – There are currently twenty-two continuous and sampler PM_{2.5} monitors and one PM_{2.5} speciation monitor operating within South Carolina. These current PM_{2.5} monitors fulfill all monitoring requirements for the state. The Department does not have any plans to reduce this number of sites.

PM_{2.5} Monitoring Network Current and Future Plans – The current PM_{2.5} network meets the PM_{2.5} minimum monitoring requirements and is adequate for protection of sensitive populations.

The Greenville-Anderson-Mauldin MSA is nearing 1,000,000 residents (see Table 15 for 2030 population estimates). If the population crosses 1,000,000, the Greenville-Anderson-Mauldin MSA will be required to have three PM_{2.5} monitors. One of these monitors will be required to be collocated at a near-road NO₂ monitor, and one will be required to be sited where there are anticipated effects from sources in the area. The Department currently operates two PM_{2.5} monitoring sites Greenville-Anderson-Mauldin MSA. The Department will begin the process of installing additional required monitors when the population threshold is crossed and as resources are allowed.

Additionally, the Greenville ESC (45-045-0015) Monitoring site has a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2024, which is due to be re-evaluated and renewed July 1, 2025. The obstructions prevent 270 degrees of continuous airflow around both the PM_{2.5} Intermittent and Continuous probes. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

The Department began operating Teledyne T640 (method code 236) and T640X (method code 238) FEM monitors in 2020 to collect continuous PM_{2.5} data at multiple sites throughout the state. The T640X monitor has the ability to report both PM_{2.5} and PM₁₀ data, and both monitors are continuous. The Teledyne T640 and T640X FEM monitors showed a significantly higher bias when compared to FRM samplers. On June 13, 2023, Teledyne released a data alignment firmware update that was meant to correct this bias and make the data collected by the T640 and T640X more comparable to the FRM samplers. On September 6, 2023, the Department applied this firmware update to all T640 and T640X monitors, which changed their method codes to 636 and 638, respectively. All data collected by the T640 and T640X monitors before the firmware update (method codes 236 and 238) have had a NAAQS Exclusion applied by EPA. The EPA, through AQS, back corrected all data collected prior to the firmware update. This data is listed under method codes 736 and 738. All data aligned T640 and T640X monitors (method codes 636 and 638), excluding those located at the Cape Romain, Coastal Carolina, and Chesterfield Monitoring Sites, have a NAAQS Exclusion applied for up to 23 months after the firmware update to evaluate the comparability of the new method code to the FRM samplers. The data quality will be addressed at the end of the NAAQS Exclusion time period, which will end September 6, 2025.

The Coastal Carolina monitoring site (45-051-0008) operates one SPM T640 monitor to measure PM_{2.5} population exposure in the Myrtle Beach-North Myrtle Beach-Conway, SC MSA. The monitor is not required, and the Department plans to remove the T640 before the end of 2025 and instead operate a non-FEM continuous PM_{2.5} monitor for solely AQI purposes.

There are no further changes planned for this monitoring network.

Table 31: Current PM_{2.5} Ambient Air Monitoring Network

PM_{2.5} Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
Trenton 45-037-0001	March 28, 1980	FRM PM _{2.5} 88101-1 1:3	Urban	Extreme Downwind	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements. No planned changes.
Trenton 45-037-0001	March 28, 1980	Continuous FEM PM _{2.5} 88101-3	Urban	Extreme Downwind	SPM	This monitor fulfills the Appendix D continuous monitoring requirement and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
<i>Augusta 13-245-0091</i>		<i>PM_{2.5} 1:1</i>	<i>Neighborhood</i>	<i>Population Exposure</i>		<i>Georgia monitor</i>
<i>Augusta 13-245-0091</i>		<i>PM_{2.5} 1:3</i>	<i>Neighborhood</i>	<i>Quality Assurance</i>		<i>Georgia monitor</i>
<i>Augusta 13-245-0091</i>		<i>Continuous PM_{2.5}</i>	<i>Neighborhood</i>	<i>Population Exposure</i>		<i>Georgia monitor</i>
Charleston-North Charleston, SC MSA						
North Charleston Fire Station 45-019-0020	November 8, 2021	FRM PM _{2.5} 88101-1	Neighborhood	Highest Concentration; Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
North Charleston Fire Station 45-019-0020	November 8, 2021	PM _{2.5} 88101-2	Neighborhood	Highest Concentration; Population Exposure	QA Collocated SLAMS	This monitor fulfills the Appendix A minimum collocation requirement for the State. No planned changes.

PM_{2.5} Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
North Charleston Fire Station 45-019-0020	November 8, 2021	Continuous PM _{2.5} 88101-3	Neighborhood	Highest Concentration; Population Exposure	SPM	This monitor fulfills the Appendix D continuous monitoring requirement for the MSA and is used for AQI reporting.. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Cape Romain 45-019-0046	July 11, 1983	Continuous PM _{2.5} 88101-3	Regional	General/Background	SPM	This monitor fulfills the Appendix D PM _{2.5} regional background monitoring requirement for the MSA. No planned changes.
Charlotte-Concord-Gastonia, NC-SC						
<i>Garinger 37-119-0041</i>		<i>FRM PM_{2.5} 1:3</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Garinger 37-119-0041</i>		<i>Continuous PM_{2.5}</i>	<i>Neighborhood</i>	<i>NCore</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Remount Rd. 37-119-0045</i>		<i>Continuous PM_{2.5}</i>	<i>Microscale</i>	<i>Source-Oriented</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Remount Rd. 37-119-0045</i>		<i>FRM PM_{2.5} 1:12</i>	<i>Microscale</i>	<i>Source-Oriented</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Friendship Park 37-119-0047</i>		<i>Continuous PM_{2.5}</i>	<i>Neighborhood</i>	<i>General/Background</i>	<i>SPM</i>	<i>North Carolina monitor</i>
Columbia, SC MSA						
Irmo DJJ 45-079-0022	January 20, 2023	FRM PM _{2.5} 88101-1 1:1	Neighborhood	Population Exposure	SLAMS	No planned changes.
Irmo DJJ 45-079-0022	January 20, 2023	Continuous PM _{2.5}	Neighborhood	Population Exposure	SPM	This monitor is used for AQI reporting. It is under a NAAQS Exclusion which runs from

PM_{2.5} Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
		88101-3				09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Parklane 45-079-0007	April 3, 1980	FRM PM _{2.5} 88101-1 1:3	Neighborhood	Population Exposure	NCore SLAMS	This monitor fulfills the Appendix D NCore requirement for the State and minimum monitoring requirement for the MSA. No planned changes.
Parklane 45-079-0007	April 3, 1980	FRM Collocated PM _{2.5} 88101-2 1:3	Neighborhood	Population Exposure	QA Collocated SLAMS	This monitor can be used to fulfill the Appendix A minimum collocation requirement for the State. No planned changes.
Parklane 45-079-0007	April 3, 1980	Continuous PM _{2.5} 88101-3	Neighborhood	Population Exposure	SPM	This monitor fulfills an Appendix D NCore requirement and fulfills the continuous monitoring requirement for the MSA It is also used for AQI reporting. This monitor is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Florence, SC MSA						
Williams Middle School 45-041-0003	August 4, 2008	FRM PM _{2.5} 88101-1 1:3	Neighborhood	Population Exposure/Highest Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.

PM_{2.5} Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Williams Middle School 45-041-0003	August 4, 2008	Continuous PM _{2.5} 88101-3	Neighborhood	Population Exposure/Highest Concentration	SPM	This monitor fulfills the Appendix D continuous monitoring requirement for the MSA and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Greenville-Anderson-Greer, SC MSA						
Greenville Employment Security Commission 45-045-0015	April 11, 2008	FRM PM _{2.5} 88101-1 1:1	Neighborhood	Population Exposure/Welfare Related Impacts	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements for the MSA. No planned changes.
Greenville Employment Security Commission 45-045-0015	April 11, 2008	Continuous PM _{2.5} 88101-3	Neighborhood	Population Exposure/ Welfare Related Impacts	SPM	This monitor fulfills the Appendix D continuous monitoring requirements for the MSA and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Hillcrest Middle School 45-045-0016	February 17, 2009	FRM PM _{2.5} 88101-1 1:3	Urban	Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements for the MSA. No planned changes.
Hillcrest Middle School 45-045-0016	February 17, 2009	Collocated PM _{2.5} 88101-2 1:3	Urban	Population Exposure	QA Collocated SLAMS	This monitor fulfills the Appendix A collocation requirements. No planned changes.

PM_{2.5} Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA						
Coastal Carolina 45-051-0008	July 27, 2016	Continuous PM _{2.5} 88101-3	Urban	Population Exposure	SPM	This monitor is not required, and the Department plans to replace the FEM located here a non-FEM continuous PM _{2.5} monitor for solely AQI purposes.
Spartanburg MSA						
T.K. Gregg Recreation Center 45-083-0011	December 29, 2008	FRM PM _{2.5} 88101-1 1:1	Neighborhood	Highest Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements for this MSA. No planned changes.
T.K. Gregg Recreation Center 45-083-0011	December 29, 2008	Continuous PM _{2.5} 88101-3	Neighborhood	Highest Concentration	SPM	This monitor fulfills the Appendix D continuous monitoring requirements for this MSA and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Remainder of State						
Chesterfield 45-025-0001	January 6, 2000	PM _{2.5} 88101-1 1:3	Regional	Regional Transport	QA Collocated SLAMS	This monitor fulfills Appendix A FRM-FEM T640 collocation requirements for the state. There may be changes to this monitor if Appendix A FRM-FEM T640 collocation is no longer required.
Chesterfield 45-025-0001	January 6, 2000	Continuous PM _{2.5} 88101-3	Regional	Regional Transport	SLAMS	This monitor fulfills the Appendix D PM _{2.5} Regional Transport requirement for the State. There may be changes to this monitor if Appendix A FRM-FEM T640 collocation is no longer required.

Ozone Ambient Air Monitoring Network

Regulations – In April of 1971, the EPA set the first ozone NAAQS at 0.08 ppm with a one-hour averaging time, not to be exceeded more than one hour per year. In February of 1979, the EPA made the decision to raise the NAAQS to 0.12 ppm with a one-hour averaging time. Attainment was defined when the expected number of days per calendar year that had maximum hourly average concentration greater than 0.12 ppm was equal to or less than 1. In 1993, the ozone NAAQS was retained at 0.12 ppm. In July of 1997, the EPA lowered the standard to 0.08 ppm and changed to an 8-hour averaging time. Design values were determined by the annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years. In 2008, the EPA lowered the NAAQS to 0.075 ppm but retained the averaging time and form of calculation. In 2015, the EPA lowered the NAAQS to 0.070 ppm with the averaging time and form of calculation again being retained. In 2020, these standards were retained without revision.

There are two requirements for minimum monitoring found in 40 CFR Part 58, Appendix D, Sections 3(a) and (b) and 40 CFR Part 58, Appendix D, Section 4.1. The requirements are as follows:

1. NCore Requirement – Each state is required to operate at least one NCore site that measures ozone. The Parklane (45-079-0007) Site in the Columbia MSA is the NCore site for South Carolina and supports one ozone monitor. Also, the Garinger (37-119-0041) Site in Charlotte, North Carolina is an NCore site with an ozone monitor.
2. Ozone SLAMS Requirement – This requirement is based on MSA population and design values. Table 32 below is taken from Table D-2 of 40 CFR Part 58, Appendix D and shows the SLAMS ozone minimum monitoring requirements.

Table 32: Table D-2 – SLAMS Minimum Ozone Monitoring Requirements

MSA population^{1,2}	Most recent 3-year design value concentrations $\geq$85% of any O₃ NAAQS³	Most recent 3-year design value concentrations <85% of any O₃ NAAQS^{3,4}
>10 million	4	2
4-10 million	3	1
350,000-<4 million	2	1
50,000-<350,000 ⁵	1	0

¹Minimum monitoring requirements apply to the MSA.
²Population based on latest available census figures.
³The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR Part 50.
⁴These minimum monitoring requirements apply in the absence of a design value.
⁵MSA must contain an urbanized area of 50,000 or more population.

Table 33 indicates the 2023 ozone design values for ozone monitors located within MSAs. The grayed entries denote the highest design values for each MSA.

Table 33: 2023 Population and Ozone Design Values

Site ID	Site Name	MSA	2023 MSA Population	2023 DVs (ppb)
37-109-0004	Crouse	Charlotte-Concord-Gastonia, NC-SC	2,805,115	65
37-119-0041	Garinger	Charlotte-Concord-Gastonia, NC-SC	2,805,115	69
37-119-0046	University Meadows	Charlotte-Concord-Gastonia, NC-SC	2,805,115	68
37-159-0021	Rockwell	Charlotte-Concord-Gastonia, NC-SC	2,805,115	65
37-179-0003	Monroe MS	Charlotte-Concord-Gastonia, NC-SC	2,805,115	67
45-091-0008	York Landfill	Charlotte-Concord-Gastonia, NC-SC	2,805,115	64
45-045-0016	Hillcrest	Greenville-Anderson-Greer	975,480	66
45-007-0006	Garrison	Greenville-Anderson-Greer	975,480	62
45-079-0007	Parklane	Columbia	858,302	62
45-079-0021	Congaree Bluff	Columbia	858,302	57
45-079-1001	Sandhill	Columbia	858,302	65
45-019-0046	Cape Romain	Charleston-North Charleston	849,417	58
45-015-1002	Monck Corner National Guard	Charleston-North Charleston	849,417	60
45-037-0001	Trenton	Augusta-Richmond County, GA-SC	629,429	59
45-003-0003	Jackson Middle School	Augusta-Richmond County, GA-SC	629,429	62
13-245-0091	Augusta	Augusta-Richmond County, GA-SC	629,429	62
45-051-0008	Coastal Carolina	Myrtle Beach-Conway-North Myrtle Beach, SC-NC	397,478	63
45-083-0009	North Spartanburg	Spartanburg	383,327	65
45-031-0003	Pee Dee	Florence	199,630	62

Using the design values and population data from Table 34, the required ozone monitors for each MSA can be calculated. The requirements are as follows:

Table 34: Number of Required Ozone Monitors/MSA

MSA	Required Ozone Monitors/MSA
*Augusta-Richmond County, GA-SC MSA	2
Charleston-North Charleston, MSA	2
*Charlotte-Concord-Gastonia, NC-SC MSA	2
Columbia MSA (NCore)	2
Florence MSA	1
Greenville-Anderson-Greer MSA	2
Hilton Head Island-Bluffton-Port Royal MSA	0
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	2
Spartanburg MSA	2
Sumter MSA	0
*Minimum ambient air monitoring requirements are met cooperatively with the States of Georgia and North Carolina.	

Both the Myrtle Beach-Conway-North Myrtle Beach, SC-NC and Spartanburg, SC MSAs have recently passed the threshold to add an additional ozone monitor. For both MSAs, the Department is working to find a suitable location to house these monitors.

Historical and Current Monitors – South Carolina has operated a total of 59 ozone monitors, with the first monitor being established in 1972. Map 31 shows the locations of historic and active monitors in the state.

Map 31: Active and Historic Ozone Monitors

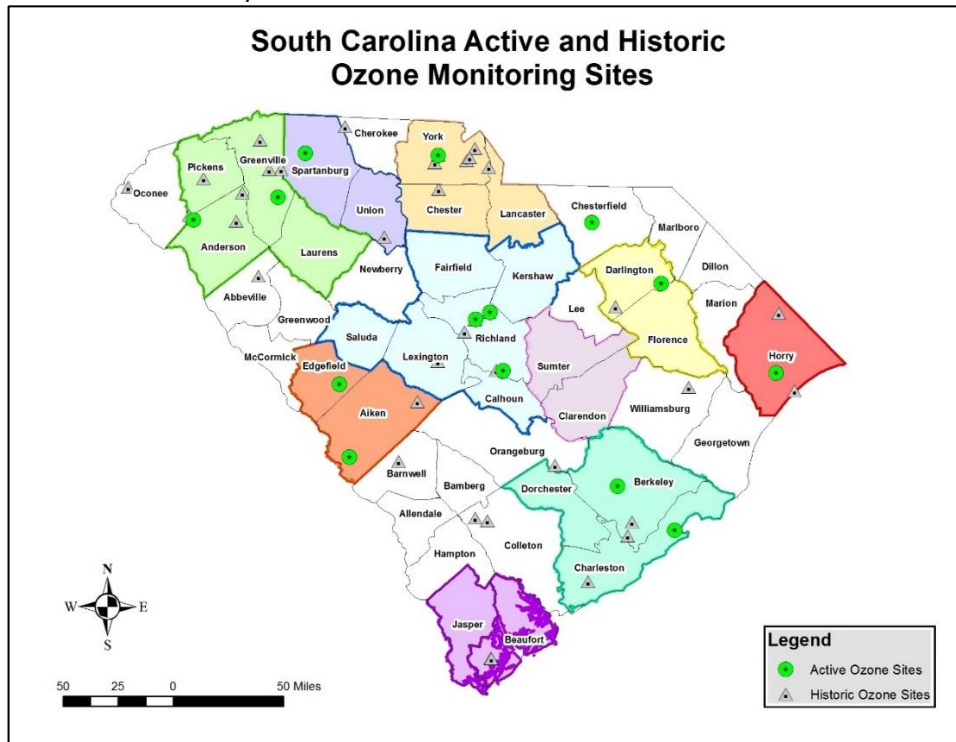


Table 35 enumerates the fourteen ozone monitors operating within South Carolina in 2023.

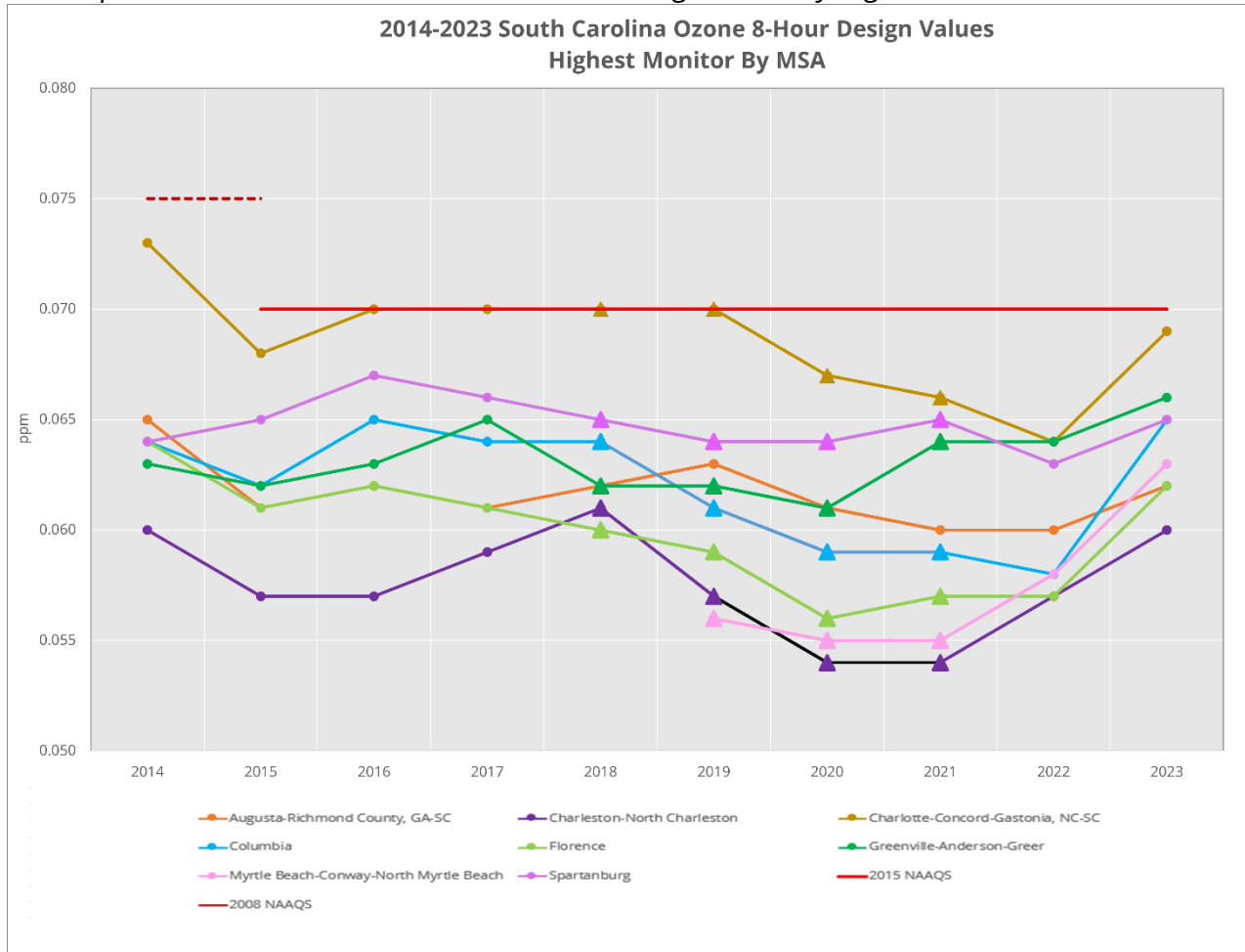
Table 35: South Carolina's Current Ozone Monitors

MSA or County	Site ID	Site Name	Start Date
Augusta-Richmond County	450370001	Trenton	4/3/1980
Augusta-Richmond County	450030003	Jackson Middle School	11/8/1985
Charleston-North Charleston	450190046	Cape Romain	3/5/1987
Charleston-North Charleston	450151002	Moncks Corner National Guard	9/26/2018
Charlotte-Concord-Gastonia	450910008	York Landfill	2/27/2017
Columbia	450790007	Parklane	1/6/1987
Columbia	450790021	Congaree Bluff	1/19/2000
Columbia	450791001	Sandhill	4/18/2002
Florence	450310003	Pee Dee	3/24/1993
Greenville-Anderson-Greer	450450016	Hillcrest	3/4/2009
Greenville-Anderson-Greer	450070006	Garrison Arena	9/26/2018
Myrtle Beach-Conway-North Myrtle Beach	450510008	Coastal Carolina	7/27/2016
Spartanburg	450830009	N. Spartanburg Fire Station #2	4/10/1990
Counties			
Chesterfield County	450250001	Chesterfield	3/7/2002

Ten of these monitors operate only during the South Carolina Ozone Season which is from March 1st to October 31st. Four monitors operated year-round in 2024 and are located at the Parklane (45-079-0007), Cape Romain (45-019-0046), Hillcrest (45-045-0016), and Trenton (45-037-0001) Sites.

Design Value Trends and Comparison to the NAAQS – Graph 11 shows the highest ozone design values is South Carolina MSAs over the last ten years. All ozone data collected from South Carolina ozone monitoring sites between 07/11/2018 and 07/28/2019 was invalidated by EPA because of a failed ozone standard test. Therefore, the South Carolina ozone monitors have no valid design values for the years 2018 through 2021. Triangles on the graph represent incomplete design values.

Graph 11: 2014-2023 South Carolina Ozone Design Values by Highest Monitor in Each MSA



Since 2011, all ozone monitors within South Carolina have been below the NAAQS. The Charlotte-Concord-Gastonia MSA's highest ozone monitor had a design value of 0.070 ppb in 2016, 2017, 2018, and 2019.

Table 36 lists all 2023 ozone design values in the South Carolina MSAs. The highest design value was 69 ppb at the Garinger High School (37-119-0041) monitor in the Charlotte-Concord-Gastonia MSA. Within South Carolina, the highest ozone design value for 2023 was 66 ppb at the Hillcrest (45-045-0006) monitor in the Greenville-Anderson-Greer MSA.

Table 36: South Carolina 2023 Ozone Design Values

MSA	Site Name	Site ID	2023 Design Value (ppb)
Augusta-Richmond County	Augusta	13-245-0091	62
Augusta-Richmond County	Trenton	45-037-0001	59
Augusta-Richmond County	Jackson Middle School	45-003-0003	62
Charleston-North Charleston	Cape Romain	45-019-0046	58

MSA	Site Name	Site ID	2023 Design Value (ppb)
Charleston-North Charleston	Moncks Corner	45-015-1002	60
Charlotte-Concord-Gastonia	Crouse	37-109-0004	65
Charlotte-Concord-Gastonia	Garinger	37-119-0041	69
Charlotte-Concord-Gastonia	University Meadows	37-119-0046	68
Charlotte-Concord-Gastonia	Rockwell	37-159-0021	65
Charlotte-Concord-Gastonia	Monroe	37-179-0003	67
Charlotte-Concord-Gastonia	York Landfill	45-091-0008	64
Columbia	Parklane	45-079-0007	62
Columbia	Congaree Bluff	45-079-0021	57
Columbia	Sandhill	45-079-1001	65
Florence	Pee Dee	45-031-0003	62
Greenville-Anderson-Greer	Hillcrest	45-045-0016	66
Greenville-Anderson-Greer	Garrison	45-007-0006	62
Myrtle Beach-Conway-North Myrtle Beach	Coastal Carolina	45-051-0008	63
Spartanburg	N. Spartanburg F.S. #2	45-083-0009	65
Not in MSA- Chesterfield County	Chesterfield	45-025-0001	60

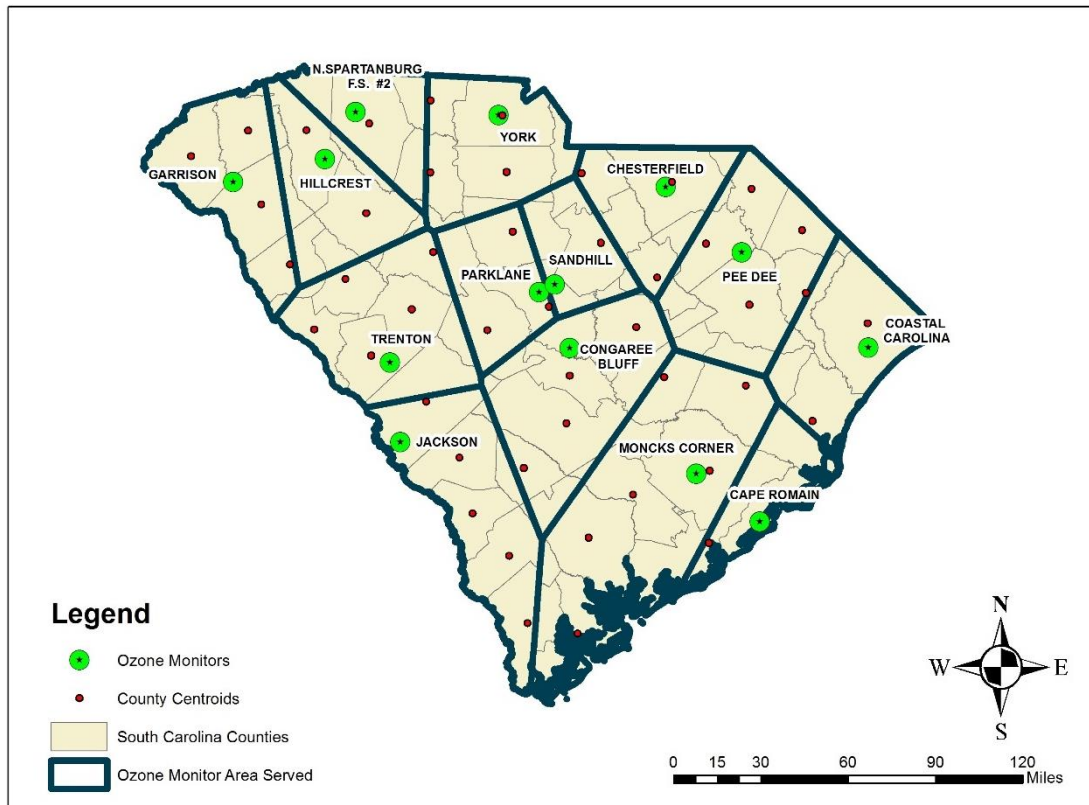
Risk of Future Exceedance – The Risk of Exceedance table (Table 37) contains calculations designed to predict the risk of a future NAAQS exceedance for ozone based on 2019-2023 data. Two monitors, Moncks Corner and Garrison, had not been in operation for 3 years to obtain a valid design value at the beginning of this period. Per EPA request, ozone data collected between 07/11/2018 and 07/28/2019 was invalidated. Therefore, design values for the years 2018 through 2021 are missing. Incomplete design values are used in this test and are marked by an asterisk. The purpose of this test is to see which sites are most likely to exceed the applicable NAAQS in the following three years based on previous data trends. Based on the last five years of monitoring data, the last column indicates there is a 90 percent confidence index all but one of the ozone monitors will exceed 80 percent of the current NAAQS.

Table 37: Ozone 8-Hour Design Value Risk of Future Exceedance

Site ID and Name	2019	2020	2021	2022	2023	Average	Standard Deviation	90% Upper Confidence	Is 90%CI < 80% of NAAQS?
450030003 Jackson	61*	58*	57*	58	62	59.2	2.168	61.267	No
450151002 Moncks Corner		51*	54*	57	60	55.5	3.354	59.447	No
450190046 Cape Romain	57*	54*	54*	57*	58	56	1.673	57.595	No
450250001 Chesterfield	60*	59*	57*	59	60	59	1.095	60.044	No
450510008 Coastal Carolina	56*	55*	55*	58	63	57.4	3.007	60.267	No
450310003 Pee Dee	59*	56*	57*	57	62	58.2	2.135	60.236	No
450370001 Trenton	58*	55*	56*	58	59	57.2	1.470	58.601	No
450450016 Hillcrest	62*	61*	64*	64	66	63.4	1.744	65.062	No
450070006 Garrison		56*	58*	58	62	58.5	2.179	61.065	No
450910008 York Landfill	67*	63*	62*	59	64	63	2.608	65.486	No
450790007 Parklane	61*	59*	59*	58	62	59.8	1.470	61.201	No
450790021 Congaree Bluff	52*	51*	52*	55	57	53.4	2.245	55.540	Yes
450791001 Sandhill	61*	59*	59*	61	65	61	2.191	63.089	No
450830009 NSFS	64*	64*	64*	63	65	64	0.632	64.603	No

Area Served – Map 32 indicates the Thiessen polygons that were used to score each monitor. Each polygon represents one ozone monitor. The centroid of each county determines the polygon with which its data will be associated.

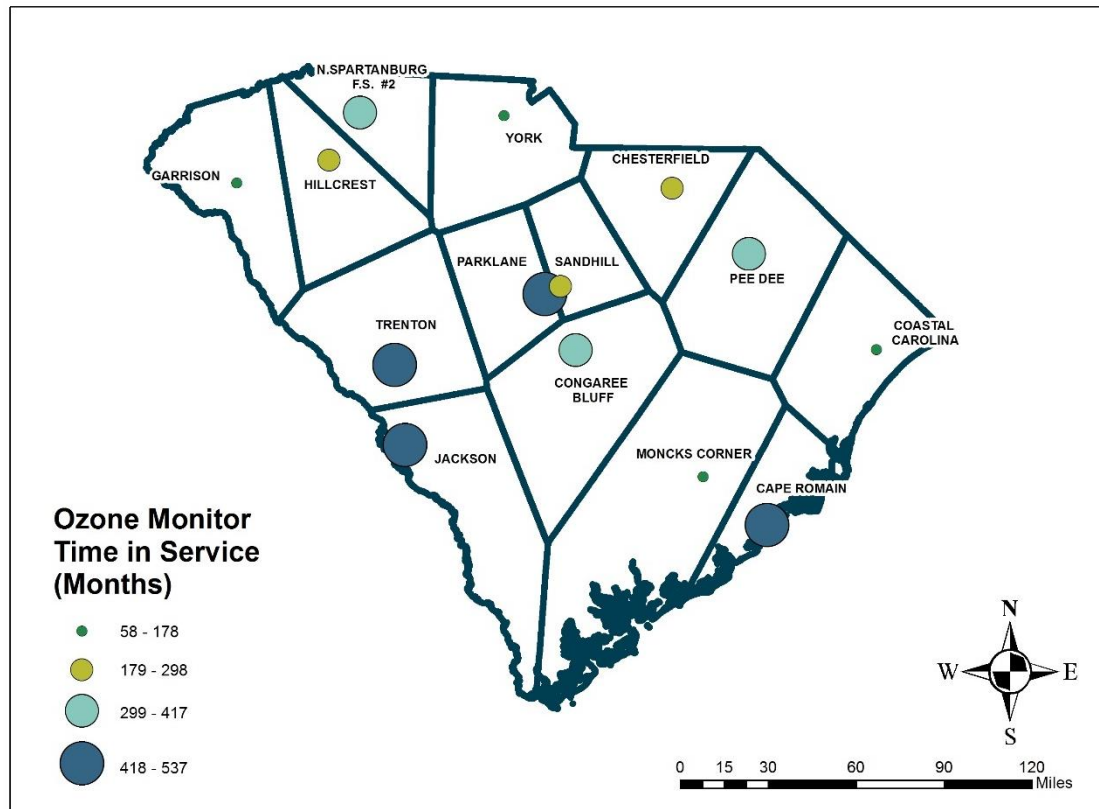
Map 32: Ozone Polygons Representing Area Served



As described in the “Explanation of ArcGIS Methodology for Conducting Additional Statistical Analysis” section of this document, Thiessen polygons are not a perfect representation of the true area served by each monitor. For example, the Congaree Bluff (45-079-0021) ozone monitor is located in the Congaree National Park and is representative of only the conditions found within the park due to its unique airshed, but the Thiessen Polygon associated with it is much larger. Complex factors including meteorology, topography, and monitor placement all affect the true zone of representation each monitor has, but Thiessen polygons are a useful tool to look at the general value of each monitor in a network by assessing a wide variety of parameters that each monitor.

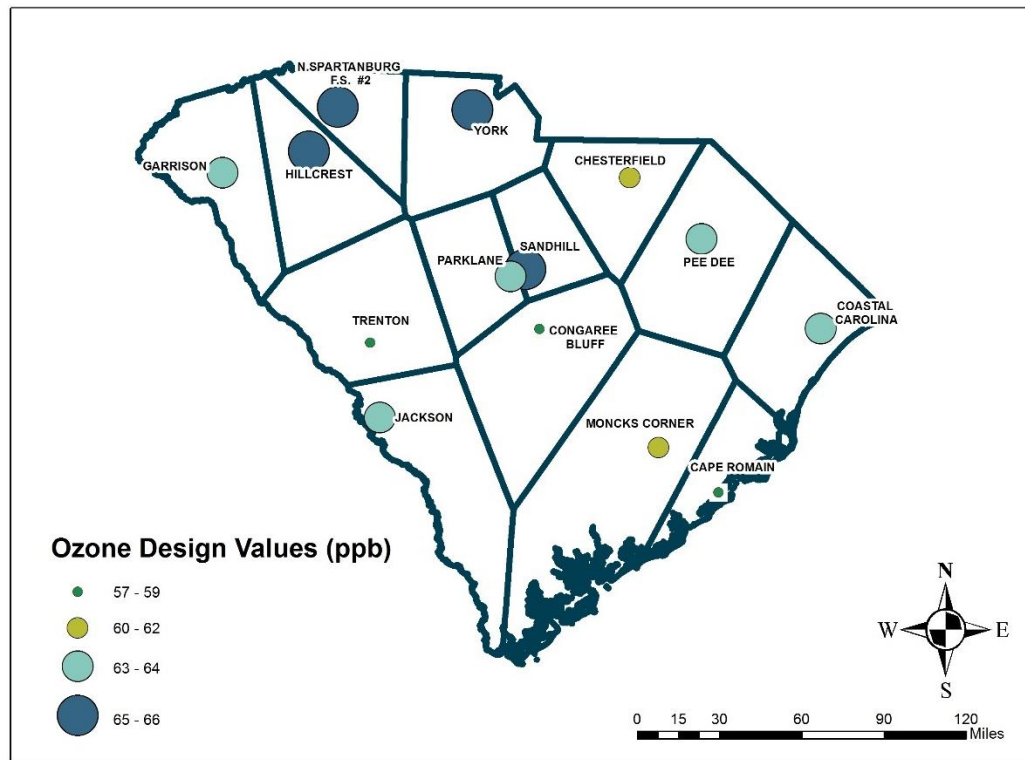
Monitors Time in Service – A monitoring site that has had a monitor in service an extended period of time provides data for long-term trends. Map 33 indicates that the Trenton (45-037-0001) monitor, Jackson (45-003-0003) monitor, Parklane (45-079-0007) monitor, and Cape Romain (45-019-0046) monitor have been in service for the longest amount of time. Established in 1980, the Trenton Monitoring Site has been operating an ozone monitor for the longest period of time: a total of 537 months (as of January 2025), or almost 45 years.

Map 33: Ozone Monitors Time in Service



Measured Concentrations – Individual monitors were ranked based on the concentration of pollutants they measure. Monitors that measure high concentrations or design values are ranked higher than monitors that measure low concentrations. The greater the design value, the higher the site rank. The Department used 2023 design values for the ozone sites to rank the ambient air monitoring sites.

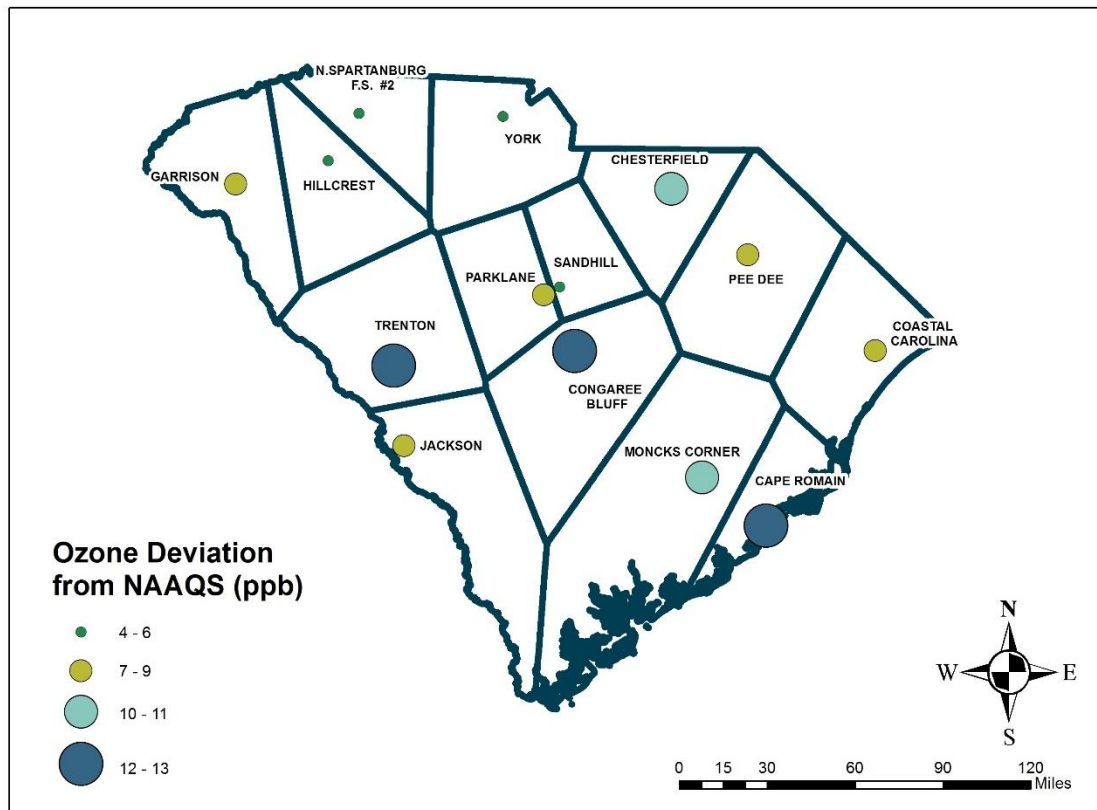
Map 34: 2023 Ozone Design Values



Map 34 indicates that in 2023, the monitors that recorded the highest ozone design values were located at the North Spartanburg Fire Station #2 (45-083-0009) Monitoring Site in the Spartanburg MSA, the Sandhill Experimental Station (45-079-1001) Monitoring Site in the Columbia MSA, the York Landfill (45-091-0008) Monitoring Site in the Charlotte-Concord-Gastonia MSA, and the Hillcrest (45-045-0016) Monitoring Site in the Greenville-Anderson-Mauldin, SC MSA. Of these sites, the highest 2023 ozone design value was 66 ppb at the Hillcrest Monitoring Site.

Deviation from NAAQS – The Deviation from the NAAQS map shows Sites measuring design values that are very close to the NAAQS exceedance threshold ranked as highest in this analysis. In the Map below, smaller circles show design values closer to the NAAQS, and larger circles show design values further from the NAAQS.

Map 35: Deviation from the NAAQS of Ozone Monitors

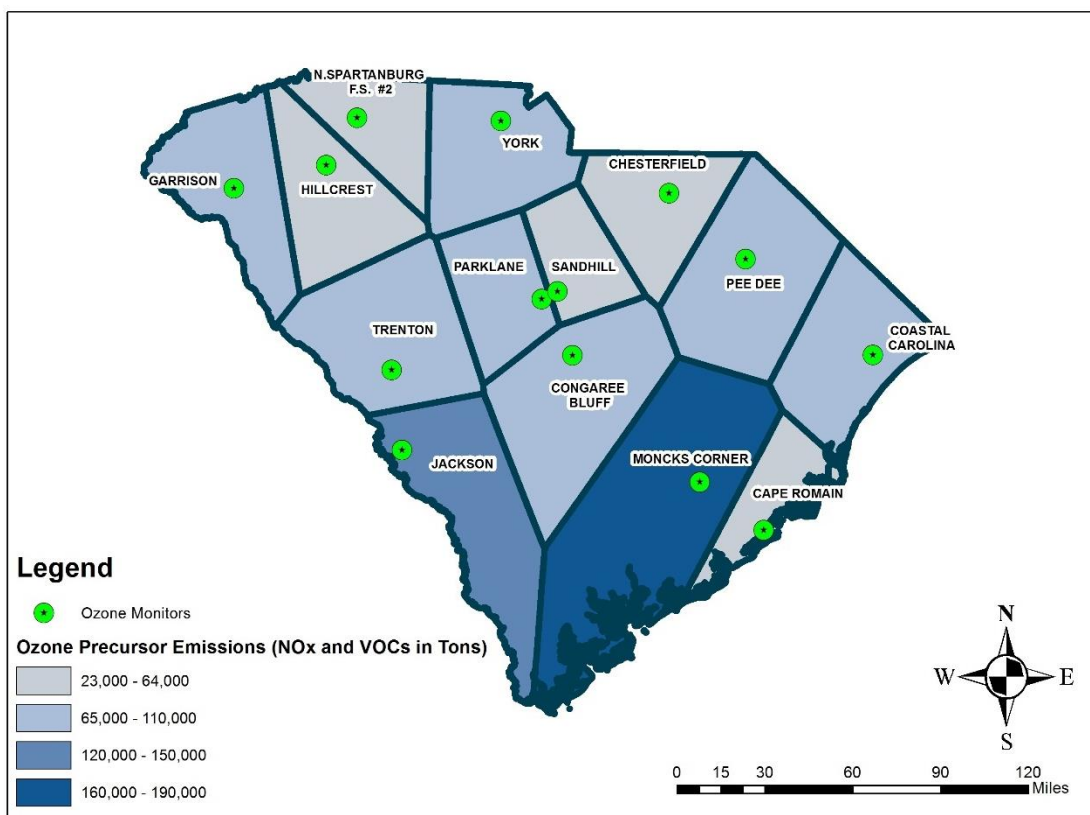


These sites may be considered more valuable for NAAQS compliance evaluation. Sites measuring concentrations well above or below the threshold do not provide as much information in terms of NAAQS compliance. This technique contrasts the difference between the standard and actual measurements or design values. The ozone monitors with the highest deviation from the NAAQS were located at the Trenton (45-037-0001) Monitoring Site in the Augusta-Richmond County, GA-SC MSA, the Congaree Bluff (45-079-0021) Monitoring Site in the Columbia MSA, and the Cape Romain (45-019-0046) Monitoring Site in the Charleston-North Charleston, SC MSA.

Emission Inventory –Emission inventory data were used to find locations where emissions of pollutants of concern are concentrated. This analysis can be scaled to various levels of complexity, depending on available resources. The county-level emissions patterns, such as those in the National Emission Inventory, can be compared with monitor locations. For measuring maximum precursor or primary emissions, monitors should be placed in those counties with maximum emission density. More complex methods use gridded emissions and/or species-weighted emissions, depending on their importance producing secondary pollutants of concern. The monitoring sites were scored based on the total emissions in the counties being represented by each monitoring area (area served polygon).

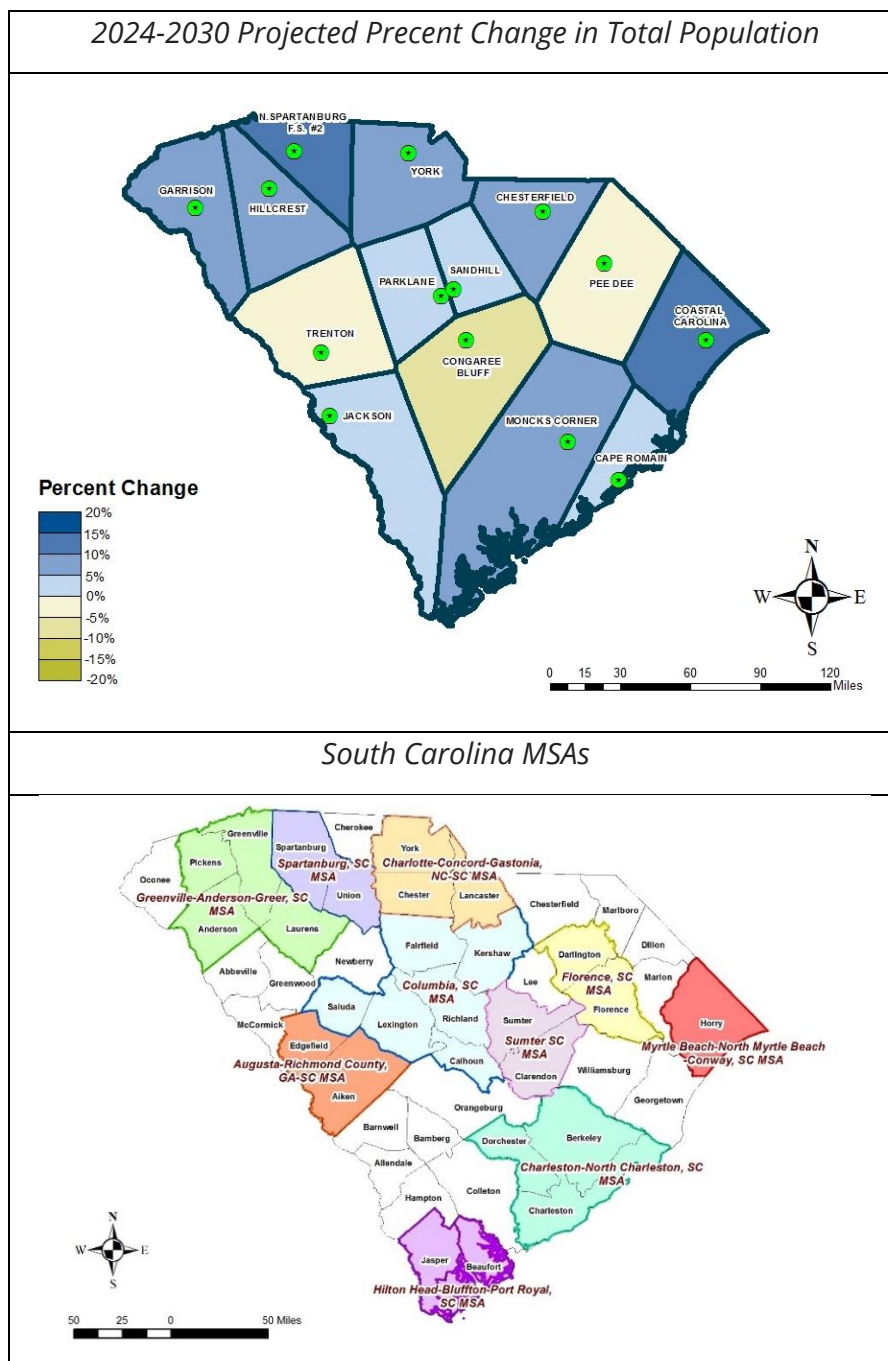
The monitoring site in the polygon area of highest ozone emissions was the Moncks Corner (45-015-1002) Monitoring Site in the Charleston-North Charleston MSA.

Map 36: Ozone Monitors Within the Areas of Ozone Precursor Emissions



Population Change – High rates of population increase are associated with potential increased emissions activity and exposure. Sites were ranked on total population change in the area of representation. Area of representation was estimated using the Thiessen polygons technique. The total population change at the county level whose centroid falls within the area of coverage of an ozone monitor is assigned to that monitor. This technique gives more weight to sites in areas with high rates of population growth and large areas of representation.

Table 38: Projected Population Change

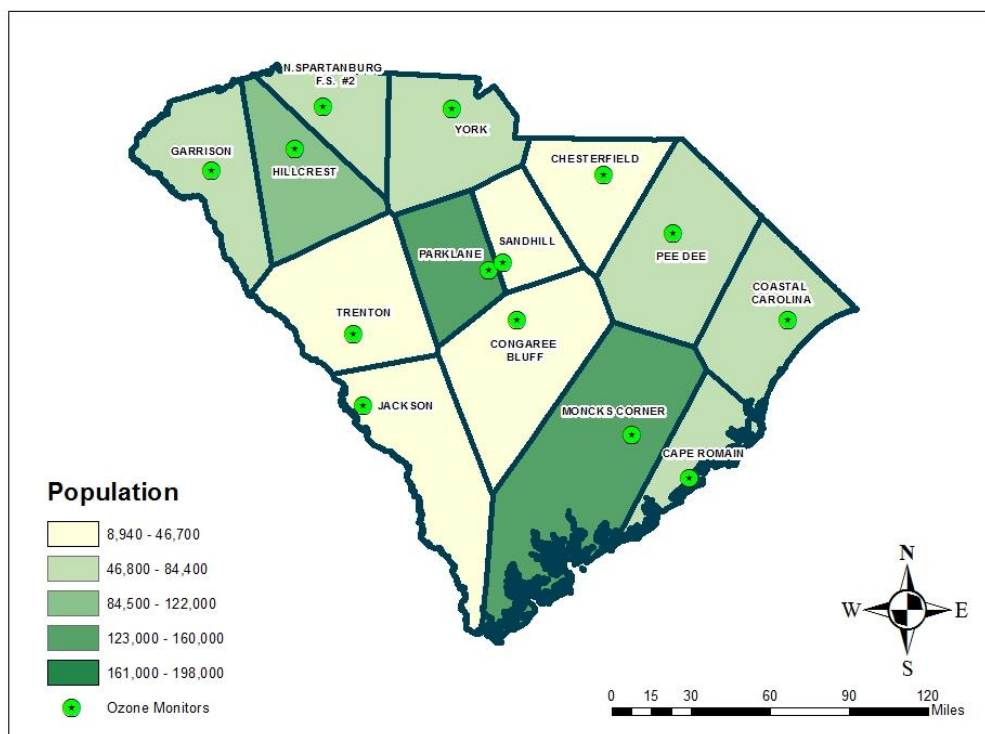


As can be seen in Table 38, when comparing the 2024-2030 Projected Population Change Map to the South Carolina MSAs and Ozone Monitors Map, the Upstate area with the largest projected population changes were located within the Spartanburg MSA. The South Carolina portion of the Charlotte-Gastonia-Concord MSA, the Greenville MSA, and portions of the Columbia MSA are also expected to increase in population. These areas are represented by ozone monitors at the North Spartanburg Fire Station #2 (45-083-0009) Site (Spartanburg MSA), the York Landfill (45-091-0008) Monitoring Site (Charlotte-Concord-Gastonia MSA), the Hillcrest Middle School (45-045-0016) Monitoring Site (Greenville-Anderson-Greer MSA) and Garrison Arena (45-007-0006) Monitoring Site, and the Parklane (45-079-0007) and Sandhill (45-079-1001) Monitoring Sites (Columbia MSA), respectively.

In the coastal areas, all counties are expected to experience growth. These areas are represented by the Myrtle Beach-Conway-North Myrtle Beach MSA and Charleston-North Charleston MSA. The polygon which incorporates the entirety of the Myrtle Beach-North Myrtle Beach-Conway MSA is represented by the ozone monitor located at the Coastal Carolina (45-051-0008) Monitoring Site.

Estimated Population for Children (ages 18 and below) – This test focuses on the estimated current population of younger individuals represented by each ambient air monitoring site. Sites were ranked on the estimated 2023 population below age eighteen in the area of representation. Areas with high populations of youth may be indicative of the effects of pollution on sensitive individuals.

Map 37: 2023 Estimated Population of Children

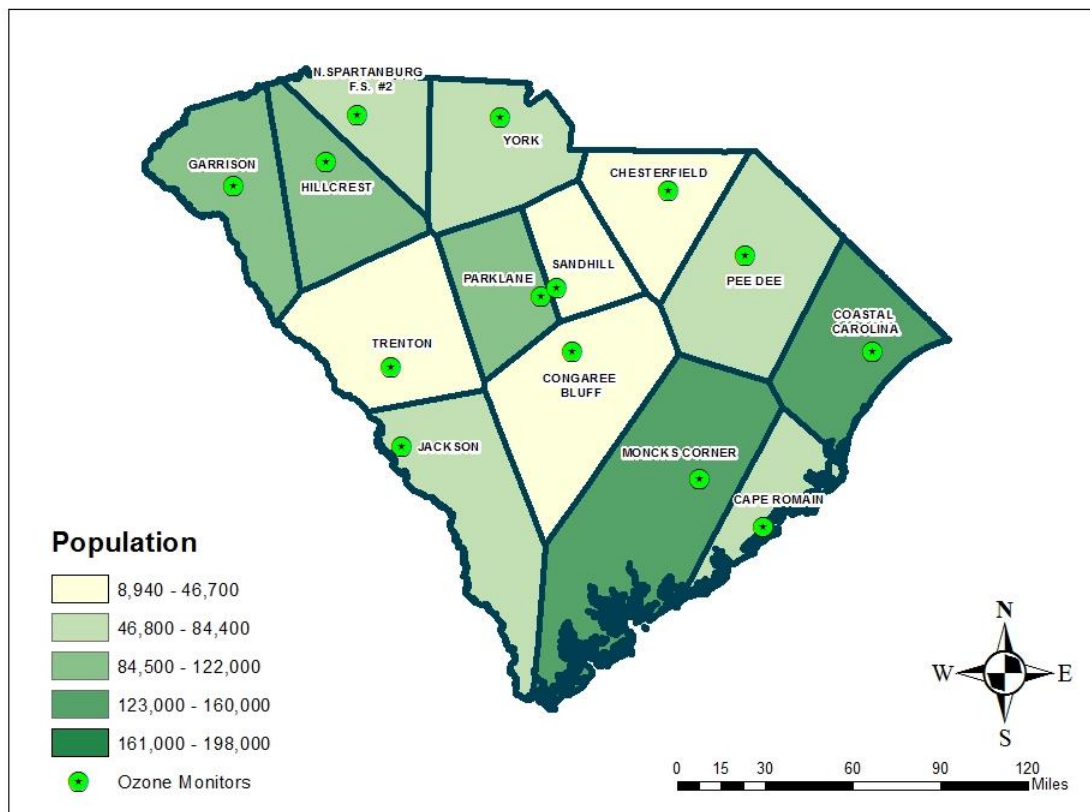


The 2023 Estimated Population for Children Map indicates that the highest population of children were located in the areas represented by the Parklane (45-079-0007) and Moncks Corner (45-015-1002) ozone monitors. These monitors are located in the Columbia and Charleston-North Charleston MSAs, respectively.

Estimated Population for Seniors – The Estimated Population for Seniors test focuses on the total population of older individuals (65 years and above) in the area represented by each ambient air monitoring site. Areas with high populations of older individuals are important to monitor due to the potential effects of pollution on sensitive individuals. Sites were ranked on the population of older individuals in the area of representation. Using the Thiessen polygons technique, the population of a county whose center falls within the area of coverage of a monitor is assigned to that monitor.

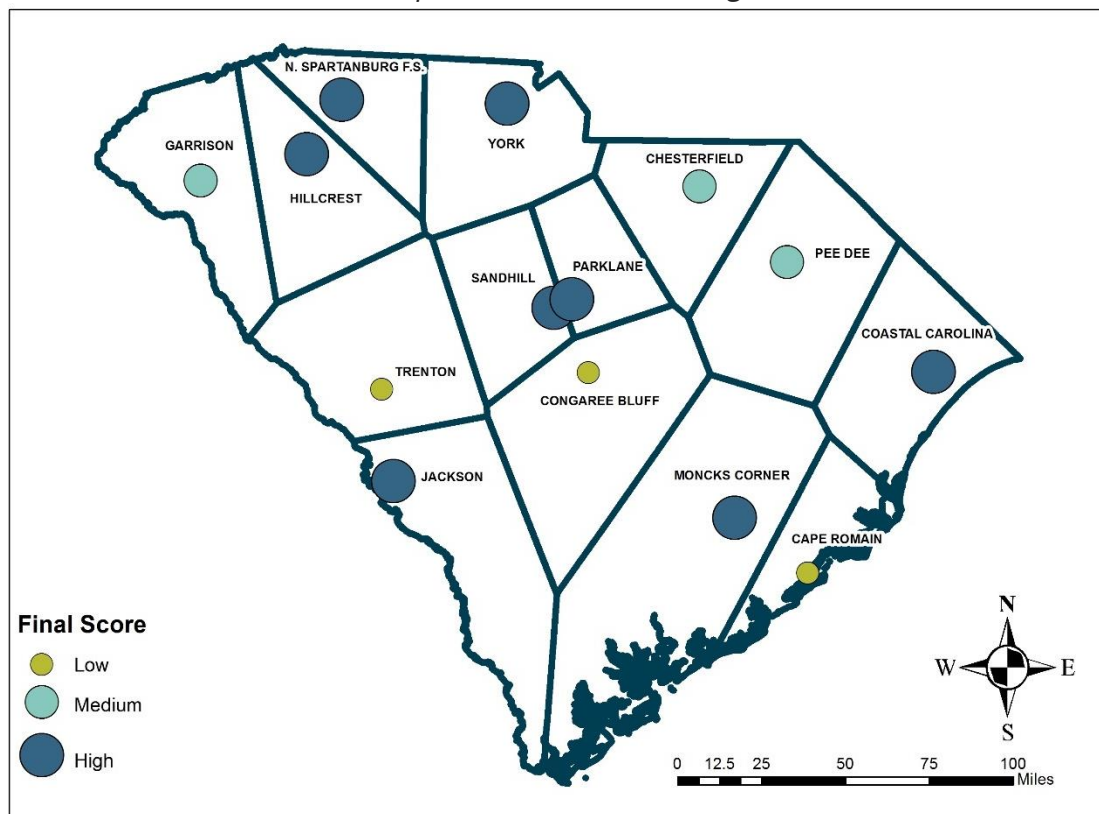
Map 38 indicates the South Carolina coastal region has the 2023 highest population of seniors. These areas contain the Charleston-North Charleston and the Myrtle Beach-Conway-North Myrtle Beach MSAs. These MSAs have ozone monitors at the Moncks Corner National Guard (45-015-1002) and the Coastal Carolina (45-051-0008) Monitoring Sites, respectively.

Map 38: 2023 Estimated Population of Seniors



Results of Scoring of Valuable Ozone Monitors – Based on the above criteria, the GIS analysis produced a final ranking for the ozone monitoring networks of the most and the least valuable sites. Weights given to each criterion and scoring procedures can be found in the “Explanation of ArcGIS Methodology for Conducting Additional Statistical Analysis” section of this document.

Map 40: Final Ozone Scoring



As Map 40 above shows, the scoring results indicated that the most valuable ozone monitors for the Upstate are located at the North Spartanburg Fire Station #2 (45-083-0009) Monitoring Site in the Spartanburg MSA, the Hillcrest (45-045-0016) Monitoring Site in the Greenville-Anderson-Greer MSA, and the York (45-091-0008) Monitoring Site in the Charlotte-Concord-Gastonia, NC-SC MSA. The most valuable ozone monitors for the Midlands are located at the Jackson (45-003-0003) Monitoring Site in the Augusta-Richmond County, GA-SC MSA, the Parklane (45-079-0007) Monitoring Site and the Sandhill (45-079-1001) Monitoring Site in the Columbia MSA. The most valuable ozone monitors for the Low Country are the Moncks Corner National Guard (45-015-1002) Monitoring Site in the Charleston-North Charleston MSA and the Coastal Carolina (45-051-0008) Monitoring Site in the Myrtle Beach-North Myrtle Beach-Conway MSA.

The sites which scored the lowest were the Trenton (45-037-0001), Congaree Bluff (45-079-0021), and Cape Romain (45-019-0046) Monitoring Sites. Despite the low score, the Trenton

ozone monitor is important because it monitors concentrations downwind of Augusta, GA. The Cape Romain ozone monitor is important because it fulfills minimum monitoring requirements, serves as a regional background monitor, and serves as a Visibility Improvement State and Tribal Association of the Southeast (VISTAS) site used to identify sources that significantly impact visibility in Class I areas (such as the National Wildlife Refuge the monitor is located in). The Congaree Bluff ozone monitor was scored as having a low value, but this SPM monitor is a requirement per agreement with the Congaree National Park to monitor for local conditions within the National Park.

Density of Existing Network and Reduction of Number of Sites – There are currently fourteen ozone monitors operating within South Carolina. Only two of these monitors are SPM and are not required by minimum monitoring requirements. The first of these monitors, the Congaree Bluff (45-079-0021) ozone monitor exists to monitor the unique airshed found within Congaree National Park and will continue to operate as agreed upon by SCDDES and the National Park Service. The Chesterfield (45-025-0001) ozone monitor serves an important function as a regional background site and will also continue monitoring. The Department does not have any plans to reduce this number of sites.

Ozone Monitoring Network Current and Future Plans – The current ozone network meets state needs and protects sensitive populations. All MSAs meet the ozone minimum monitoring requirements except the Myrtle Beach-Conway-North Myrtle Beach-Conway, SC MSA and the Spartanburg, SC MSA. On July 21, 2023, OMB added Union County to the Spartanburg MSA, increasing the population of the MSA above 350,000 and triggering the requirement for an additional ozone monitor. In the Myrtle Beach-North Myrtle Beach-Conway MSA, the 2023 design value was 63 ppb, exceeding 85% of the NAAQS and triggering the requirement for an additional ozone monitor. As resources allow, the Department will continue to look for suitable locations to host ozone monitors in both MSAs.

Additionally, the Congaree Bluff Monitoring site has maintained a waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions, originally approved in 2021. The waiver is due to be re-evaluated and renewed July 1, 2025. In order to ensure proper public participation, a waiver renewal request is attached to the South Carolina 2025-2026 Monitoring Network Plan, which was on public notice from April 25, 2025 to May 27, 2025. This waiver request is also attached in Appendix C to this document.

Table 39: Current Ozone Ambient Air Monitoring Network

Ozone Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
Jackson Middle School 45-003-0003	October 24, 1985	Ozone 44201-2	Urban	Upwind Background	SLAMS	This monitor currently fulfills the Appendix D minimum monitoring requirement for SC. No planned changes.
Trenton 45-037-0001	March 28, 1980	Ozone 44201-1	Urban	Extreme Downwind/ Maximum Concentration	SLAMS	No planned changes.
<i>Augusta</i> 13-245-0091	<i>January</i> 1, 1976	<i>Ozone</i> 44201	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>Georgia monitor</i>
Charleston-North Charleston, SC MSA						
Moncks Corner National Guard 45-015-0002	March 2, 2020	Ozone 44201-1	Urban	Max Concentration	SLAMS	This monitor currently fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Cape Romain 45-019-0046	July 11, 1983	Ozone 44201-1	Regional	General/Background	SLAMS	This monitor currently fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Charlotte-Concord-Gastonia, NC-SC						
York Landfill 45-091-0008	February 27, 2017	Ozone 44201-1	Urban	Upwind Background	SLAMS	This monitors ozone for the South Carolina portion of the MSA. No planned changes.
<i>Crouse</i> 37-109-0004		<i>Ozone</i> 44201	<i>Urban</i>	<i>General/Background</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>

Ozone Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
<i>Garinger 37-119-0041</i>		<i>Ozone 44201</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>University Meadows 37-119-0046</i>		<i>Ozone 44201</i>	<i>Urban</i>	<i>Highest Concentration</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Rockwell 37-159-0021</i>		<i>Ozone 44201</i>	<i>Urban</i>	<i>Highest Concentration</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Monroe Middle School 37-179-0003</i>		<i>Ozone 44201</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SPM</i>	<i>North Carolina monitor</i>
Columbia, SC MSA						
Parklane 45-079-0007	April 3, 1980	Ozone 44201-1	Urban	Max Concentration	NCore SLAMS	This monitor fulfills the Appendix D NCore for the State and minimum monitoring requirement for the MSA. No planned changes.
Congaree Bluff 45-079-0021	December 27, 1999	Ozone 44201-1	Neighborhood	General / Background	SPM	This is a required monitor by agreement with the National Forest Service that serves the Congaree National Park. A waiver request for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions has been submitted for this site. No planned changes.
Sandhill Experimental Station 45-079-1001	January 1, 1959	Ozone 44201-1	Urban	Max Ozone Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Florence, SC MSA						

Ozone Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollutant	Scale	Objective	Designation	Recommendations for Optimization
Pee Dee Experimental Station 45-031-0003	February 25, 1993	Ozone 44201-1	Urban	General/ Background/ Max Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Greenville-Anderson-Greer, SC MSA						
Garrison Arena 45-007-0006	March 2, 2020	Ozone 44201-1	Urban	Max Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Hillcrest Middle School 45-045-0016	February 17, 2009	Ozone 44201-1	Urban	Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA						
Coastal Carolina 45-051-0008	June 27, 2016	Ozone 44201-1	Urban	Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
<i>New Myrtle Beach-North Myrtle Beach-Conway Ozone Site</i>	TBD	Ozone 44201-1	TBD	TBD	SLAMS	The Myrtle Beach-North Myrtle Beach-Conway, SC MSA requires an additional ozone monitor. Since there is only one air monitoring site in this MSA, a new site will need to be established. The Department is working to find a suitable

Ozone Ambient Air Monitoring Network						
Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						location for the new ozone monitor.
Spartanburg MSA						
North Spartanburg Fire Station #2 45-083-0009	April 4, 1990	Ozone 44201-1	Urban	Highest Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
<i>New Spartanburg Ozone Monitor</i>	TBD	Ozone 44201-1	TBD	TBD	SLAMS	The Spartanburg, SC MSA requires an additional ozone monitor. The Department is working to find a suitable location for the new ozone monitor.
Remainder of State						
Chesterfield 45-025-0001	January 6, 2000	Ozone 44201-1	Regional	General/Background	SPM	This monitor provides data for rural sites. No planned changes.

Appendix A: Summary of South Carolina Monitoring Network Recommendations by MSA

Table 40: South Carolina Monitoring Network Recommendations by MSA

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
Augusta-Richmond County, GA-SC MSA						
Jackson Middle School 45-003-0003	October 24, 1985	Ozone 44201-2	Urban	Upwind Background	SLAMS	This monitor currently fulfills the Appendix D minimum monitoring requirement for SC. No planned changes.
Trenton 45-037-0001	March 28, 1980	Ozone 44201-1	Urban	Extreme Downwind/ Maximum Concentration	SLAMS	No planned changes.
		FRM PM _{2.5} 88101-1 1:3	Urban	Extreme Downwind	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements. No planned changes.
		Continuo us FEM PM _{2.5} 88101-3	Urban	Extreme Downwind	SPM	This monitor fulfills the Appendix D continuous monitoring requirement. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Augusta 13-245-0091	January 1, 1976	Ozone 44201	Neighborhood	Population Exposure	SLAMS	Georgia monitor
		PM _{2.5} 1:1	Neighborhood	Population Exposure		Georgia monitor
		PM _{2.5}	Neighborhood	Quality Assurance		Georgia monitor

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
		1:3				
		Continuous PM _{2.5}	Neighborhood	Population Exposure		Georgia monitor
		Continuous PM ₁₀	Neighborhood	Population Exposure		Georgia monitor
		SO ₂	Neighborhood	Population Exposure		Georgia monitor.
Charleston-North Charleston, SC MSA						
Moncks Corner National Guard 45-015-0002	March 2, 2020	Ozone 44201-1	Urban	Max Concentration	SLAMS	This monitor currently fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Cape Romain 45-019-0046	July 11, 1983	Ozone 44201-1	Regional	General/Background	SLAMS	This monitor currently fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
		Continuous PM _{2.5} 88101-3	Regional	General/Background	SPM	This monitor fulfills the Appendix D PM _{2.5} regional background monitoring requirement for the MSA. No planned changes.
North Charleston Fire Station 45-019-0020	November 8, 2021	FRM PM _{2.5} 88101-1	Neighborhood	Highest Concentration; Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
		PM _{2.5} 88101-2	Neighborhood	Highest Concentration; Population Exposure	QA Colloca ted SLAMS	This monitor fulfills the Appendix A minimum collocation requirement for the State. No planned changes.
		Continuo us PM _{2.5} 88101-3	Neighborhood	Highest Concentration; Population Exposure	SPM	This monitor fulfills the Appendix D continuous monitoring requirement for the MSA and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
		Continuo us PM ₁₀ 81102-1	Neighborhood	Highest Concentration/ Population Exposure	SLAMS	This monitor replaced the Jenkins Ave. PM ₁₀ monitor in 2023 and currently fulfills the Appendix D PM ₁₀ minimum monitoring requirements for the MSA. No planned changes.
Jenkins Ave. Fire Station 45-019-0003	February 14, 1969	NO ₂ 42602-2	Neighborhood	Highest Concentration/Sourc e Oriented	SPM	This monitor is responsible for source-oriented monitoring in a heavily populated and industrialized area. No planned changes.

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
		SO ₂ 42401-1	Neighborhood	Population Exposure	SLAMS	This monitor fulfills the Appendix D SO ₂ PWEI minimum monitoring requirement for the MSA. No planned changes.
Charlotte-Concord-Gastonia, NC-SC						
York Landfill 45-091-0008	February 27, 2017	Ozone 44201-1	Urban	Upwind Background	SLAMS	This monitors ozone for the South Carolina portion of the MSA. No planned changes.
		SO ₂ 42401-1	Urban	Upwind Background	SPM	This monitor is on a 2-year rotation (2024-2025). In 2026, this monitor will be relocated to the Trenton (45-037-0001) monitoring site in the Augusta- North Augusta, GA-SC MSA.
<i>Crouse 37-109-0004</i>		<i>Ozone 44201</i>	<i>Urban</i>	<i>General/Background</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
<i>Garinger 37-119-0041</i>		<i>Ozone 44201</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
		<i>FRM PM_{2.5} 1:3</i>	<i>Neighborhood</i>	<i>Population Exposure</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
		<i>Continuo us PM_{2.5}</i>	<i>Neighborhood</i>	<i>NCore</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
		<i>Continuo us PM₁₀</i>				<i>North Carolina monitor</i>

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
		NO ₂ 42602	Neighborhood	Population Exposure	SLAMS	North Carolina monitor
		NO _y	Neighborhood	Population Exposure	SLAMS	North Carolina monitor
		SO ₂ 42401-1			SLAMS	North Carolina monitor. This monitor fulfills the Appendix D SO ₂ PWEI minimum monitoring requirement for the MSA.
University Meadows 37-119-0046		Ozone 44201	Urban	Highest Concentration	SLAMS	North Carolina monitor
Rockwell 37-159-0021		Ozone 44201	Urban	Highest Concentration	SLAMS	North Carolina monitor
		NO ₂ 42602	Urban	General/Background	SPM	North Carolina monitor
Monroe Middle School 37-179-0003		Ozone 44201	Neighborhood	Population Exposure	SPM	North Carolina monitor
Remount Rd. 37-119-0045		Continuo us PM _{2.5}	Microscale	Source-Oriented	SLAMS	North Carolina monitor
		FRM PM _{2.5} 1:12	Microscale	Source-Oriented	SLAMS	North Carolina monitor
		NO ₂ 42602	Microscale	Highest Concentration	SLAMS	North Carolina monitor
Friendship Park 37-119-0047		Continuo us PM _{2.5}	Neighborhood	General/Background	SPM	North Carolina monitor

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
<i>Equipment Drive 37-119-0050</i>		<i>NO₂ 42602</i>	<i>Microscale</i>	<i>Highest Concentration</i>	<i>SLAMS</i>	<i>North Carolina monitor</i>
Columbia, SC MSA						
Parklane 45-079-0007	April 3, 1980	Ozone 44201-1	Urban	Max Concentration	NCore SLAMS	This monitor fulfills the Appendix D NCore for the State and minimum monitoring requirement for the MSA. No planned changes.
		FRM PM _{2.5} 88101-1 1:3	Neighborhood	Population Exposure	NCore SLAMS	This monitor fulfills the Appendix D NCore requirement for the State and minimum monitoring requirement for the MSA. No planned changes.
		FRM Collocate d PM _{2.5} 88101-2 1:3	Neighborhood	Population Exposure	QA Colloca ted SLAMS	This monitor can be used to fulfill the Appendix A minimum collocation requirement for the State. No planned changes.
		Continuo us PM _{2.5} 88101-3	Neighborhood	Population Exposure	SPM	This monitor fulfills an Appendix D NCore requirement and fulfills the continuous monitoring requirement for the MSA. It is also used for AQI reporting. This monitor is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						period has been analyzed, the Department will develop a plan moving forward for the monitor.
		Continuo us PM ₁₀ 81102-3	Neighborhood	Population Exposure	SLAMS	This monitor replaced the Cayce City Hall PM ₁₀ monitor in 2023 and currently fulfills the Appendix D PM ₁₀ minimum monitoring requirements for the MSA. No planned changes.
		NO/NO _y	Neighborhood	Population Exposure	NCore SLAMS	This monitor fulfills an Appendix D NCore requirement for the State. No planned changes.
		SO ₂ 42401-1	Neighborhood	Population Exposure/ Other	NCore SLAMS	This monitor fulfills the Appendix D NCore minimum monitoring requirement for the State.
		CO 42101-1	Neighborhood	Population Exposure	NCore SLAMS	This monitor fulfills the Appendix D minimal NCore requirement. No planned changes.
Congaree Bluff 45-079-0021	Decemb er 27, 1999	Ozone 44201-1	Neighborhood	General / Background	SPM	This is a required monitor by agreement with the National Forest Service that serves the Congaree National Park. A waiver request for 40 CFR Part 58 Appendix E Section Siting 2.3

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						Spacing From Obstructions has been submitted for this site. No planned changes.
Sandhill Experimental Station 45-079-1001	January 1, 1959	Ozone 44201-1	Urban	Max Ozone Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
		NO ₂ 42602-1	Urban	General/Background ; Max Precursor Emissions	SPM	This monitor serves as an area-wide monitor for the Columbia area. In the future, this monitor may be moved or rotated. No planned changes.
Irmo DJJ 45-079-0022	January 20, 2023	FRM PM _{2.5} 88101-1 1:1	Neighborhood	Population Exposure	SLAMS	No planned changes.
		Continuo us PM _{2.5} 88101-3	Neighborhood	Population Exposure	SPM	This monitor is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Florence, SC MSA						
Pee Dee Experimental Station 45-031-0003	February 25, 1993	Ozone 44201-1	Urban	General/ Background/ Max Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA.

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						No planned changes.
Williams Middle School 45-041-0003	August 4, 2008	FRM PM _{2.5} 88101-1 1:3	Neighborhood	Population Exposure/Highest Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
		Continuo us PM _{2.5} 88101-3	Neighborhood	Population Exposure/Highest Concentration	SPM	This monitor fulfills the Appendix D continuous monitoring requirement for the MSA. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
Greenville-Anderson-Greer, SC MSA						
Garrison Arena 45-007-0006	March 2, 2020	Ozone 44201-1	Urban	Max Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
Hillcrest Middle School 45-045-0016	February 17, 2009	Ozone 44201-1	Urban	Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
		FRM PM _{2.5} 88101-1 1:3	Urban	Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements for the MSA. No planned changes.
		Collocate d PM _{2.5} 88101-2 1:3	Urban	Population Exposure	QA Colloca ted SLAMS	This monitor fulfills the Appendix A collocation requirements. No planned changes.
Greenville Employment Security Commission 45-045-0015	April 11, 2008	FRM PM _{2.5} 88101-1 1:1	Neighborhood	Population Exposure/Welfare Related Impacts	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements for the MSA. No planned changes.
		Continuo us PM _{2.5} 88101-3	Neighborhood	Population Exposure/ Welfare Related Impacts	SPM	This monitor fulfills the Appendix D continuous monitoring requirements for the MSA and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation period has been analyzed, the Department will develop a plan moving forward for the monitor.
		Continuo us PM ₁₀ 81102-1	Neighborhood	Highest Concentration	SLAMS	This monitor fulfills the Appendix D PM ₁₀ minimum monitoring requirements for the MSA. A waiver request for 40 CFR Part 58 Appendix E

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						Section Siting 2.3 Spacing from Obstructions has been submitted for this site. No planned changes.
		NO ₂ 42602-1	Neighborhood	Population Exposure	SLAMS	This monitor fulfills the Appendix D RA-40 monitoring requirement for the State. A waiver for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions has been requested for this site.
		SO ₂ 42401-1	Neighborhood	Population Exposure	SLAMS	This monitors ambient SO ₂ concentrations in a heavily populated and industrialized area. A waiver request for 40 CFR Part 58 Appendix E Section Siting 2.3 Spacing From Obstructions has been requested for this site. No planned changes.
Myrtle Beach-Conway-North Myrtle Beach, SC MSA						
Coastal Carolina 45-051-0008	June 27, 2016	Ozone 44201-1	Urban	Population Exposure	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
		Continuo us PM _{2.5} 88101-3	Urban	Population Exposure	SPM	No planned changes.

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
<i>New Myrtle Beach- North Myrtle Beach- Conway Ozone Site</i>	TBD	Ozone 44201-1	TBD	TBD	SLAMS	The Myrtle Beach-North Myrtle Beach-Conway, SC MSA requires an additional ozone monitor. Since there is only one air monitoring site in this MSA, a new site will need to be established. The Department is working to find a suitable location for the new ozone monitor.
Sumter, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spartanburg, SC MSA						
North Spartanburg Fire Station #2 45-083-0009	April 4, 1990	Ozone 44201-1	Urban	Highest Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirement for the MSA. No planned changes.
T.K. Gregg Recreation Center 45-083-0011	Decemb er 29, 2008	PM _{2.5} 88101-1 1:1	Neighborhood	Highest Concentration	SLAMS	This monitor fulfills the Appendix D minimum monitoring requirements for this MSA. No planned changes.
		Continuo us PM _{2.5} 88101-3	Neighborhood	Highest Concentration	SPM	This monitor fulfills the Appendix D continuous monitoring requirements for this MSA and is used for AQI reporting. It is under a NAAQS Exclusion which runs from 09/06/2023 until 09/06/2025. Once data from this evaluation

Site Name Site ID	Site Start Date	Pollu- tant	Scale	Objective	Desig- nation	Recommendations for Optimization
						period has been analyzed, the Department will develop a plan moving forward for the monitor.
<i>New Spartanburg Ozone Monitor</i>	TBD	Ozone 44201-1	TBD	TBD	SLAMS	The Spartanburg, SC MSA requires an additional ozone monitor. The Department is working to find a suitable location for the new ozone monitor.
Hilton Head Island-Bluffton-Port Royal, SC MSA						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Remainder of State						
Chesterfield 45-025-0001	January 6, 2000	Ozone 44201-1	Regional	General/Background	SPM	This monitor provides data for rural sites. No planned changes.
		PM _{2.5} 88101-1 1:3	Regional	Regional Transport	QA Colloca ted SLAMS	This monitor fulfills Appendix A collocation requirements for the state. No planned changes.
		Continuo us PM _{2.5} 88101-3	Regional	Regional Transport	SLAMS	This monitor fulfills the Appendix D PM _{2.5} Regional Transport requirement for the State. No planned changes.

Appendix B: Multi-State MOAs

MEMORANDUM OF AGREEMENT
ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR
THE CHARLOTTE-CONCORD-GASTONIA
METROPOLITAN STATISTICAL AREA (MSA)

July 1, 2016

Participating Agencies:

North Carolina
Department of Environmental Quality (NCDEQ)
Division of Air Quality (NCDAQ)

South Carolina
Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

Mecklenburg County, North Carolina
Land Use and Environmental Services Agency
Air Quality (MCAQ)

RECEIVED
JUL 01 2016
BUREAU OF AIR QUALITY

I. PURPOSE/OBJECTIVES/GOALS

The purpose of this Memorandum of Agreement (MOA) is to establish the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement among NCDAQ, SCDHEC, and the MCAQ (collectively referred to as the "affected agencies") to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for criteria pollutants deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will renew the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Charlotte-Concord-Gastonia MSA as required by 40 CFR 58 Appendix D, Section 2(e).

II. BACKGROUND

The Charlotte-Concord-Gastonia MSA consists of

Cabarrus County, NC
Gaston County, NC
Iredell County, NC
Lincoln County, NC
Mecklenburg County, NC
Rowan County, NC
Union County, NC
Chester County, SC
Lancaster County, SC

York County, SC

NCDAQ has jurisdiction over Cabarrus, Gaston, Iredell, Lincoln, Rowan, and Union Counties; SCDHEC has jurisdiction over Chester, Lancaster, and York Counties; MCAQ has jurisdiction over Mecklenburg County.

The NCDAQ, SCDHEC, and MCAQ are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Charlotte-Concord-Gastonia MSA. The EPA has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the MSA.

40 CFR 58 Appendix D, Section 2 (e) states (in part):

“... The EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.”

Currently each air pollution control agency (affected agency) conducts monitoring in its respective jurisdiction and coordinates monitoring with the other air pollution control agencies within the MSA.

III. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- NCDAQ, SCDHEC, and MCAQ (the “affected agencies”) commit to conducting appropriate monitoring in their respective jurisdictions of the MSA; as needed, to collectively meet EPA minimum monitoring requirements for the entire MSA for criteria air pollutant monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all affected agencies. The minimum air quality monitoring requirements for the MSA shall apply to the MSA in its entirety and shall not apply to any sole affected agency within the MSA unless agreed upon by all affected agencies.
- The affected agencies commit to coordinating monitoring responsibilities and requirements to achieve an effective network design regarding criteria air pollutant monitoring conducted in the MSA and commit to communicate unexpected or unplanned changes in monitoring activities within their jurisdictions to the other affected agencies. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected party shall inform the others via telephone or e-mail of any monitoring changes occurring in its jurisdiction of the MSA at its earliest convenience after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to

natural disaster, or similar occurrences that result in extended change (greater than one quarter) or permanent change in the monitoring network. At least once a year in the second quarter or before June 15th, each agency shall make available to the other agency a copy of its proposed monitoring plan for its jurisdiction with the MSA for the next year.

- Each party reserves the right to revoke or terminate this MOA at any time for any reason by giving thirty (30) days written notice prior to the date of termination.

IV. LIMITATIONS

A. All commitments made in this MOA are subject to the availability of funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates NCDAQ, SCDHEC, or MCAQ to expend funds or to enter into any contract, assistance agreement, interagency agreement, or other financial obligation.

B. This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this MOA will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements what will be effected in writing by representatives of the parties.

C. Except as provided in Section III, this MOA does not create any right or benefit, substantive or procedural, enforceable by law or equity against NCDAQ, SCDHEC, or MCAQ, their officers or employees, or any other person. This MOA does not direct or apply to any person outside NCDAQ, SCDHEC, or MCAQ.

V. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY

No proprietary information or intellectual property is anticipated to arise out of this MOA.

VI. POINTS OF CONTACT

The following individuals are designated points of contact for the MOA:

NCDEQ DAQ: Joette Steger
NC DENR Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

joette.steger@ncdenr.gov
Voice/fax: 919-707-8449

SCDHEC: Scott Reynolds
SCDHEC Bureau of Environmental Health Services
2600 Bull Street
Columbia, SC 29201

reynolds@dhec.sc.gov

Voice: 803-896-0902

MCAQ: Jeff Francis
Mecklenburg County Land Use and Environmental Services Agency –
Air Quality
2145 Suttle Avenue
Charlotte, NC 28208-5237

Jeff.Francis@mecklenburgcountync.gov

Phone 704-336-5430

Fax 704-336-4391

In the event that a point of contact needs to be changed, notification may be made via email to the other parties.

VII. MODIFICATION/DURATION/TERMINATION

This MOA will be effective when signed by all parties. This MOA may be amended at any time by the mutual written consent of all parties. The parties will review this MOA at least once every 10 years to determine whether it should be revised, renewed, or cancelled. This MOA may be revoked or terminated by an affected party at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

VIII. REFERENCE

United States Environmental Protection Agency, Title 40 Code of Federal Regulations, Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 2 (e), "General Monitoring Requirements"

IX. APPROVALS

North Carolina Department of Environmental Quality
Division of Air Quality (NCDAQ)

BY: Shirley C. Holman

TITLE: Director, Division of Air Quality

DATE: 6/27/2016

South Carolina Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

BY: Keith B. Dyer

TITLE: Chief, Bureau of Air Quality

DATE: 07/05/2016

Mecklenburg County Land Use and Environmental Services Agency – Air Quality (MCAQ)
Mecklenburg County Air Quality

BY: Kevin H. Pham

TITLE: Director, Air Quality

DATE: 6/29/2014



Catherine E. Heigel, Director

Promoting and protecting the health of the public and the environment

MEMORANDUM

July 5, 2016

Subject: Change of Point of Contact for South Carolina

Memorandum of Agreement on Air Quality Monitoring for Criteria Pollutants for the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA)

From: Rhonda B. Thompson, SC DHEC
Chief, Bureau of Air Quality

As of July 5, 2016, the Point of Contact for South Carolina will be Micheal Mattocks, instead of Scott Reynolds.

Micheal's contact information is below:

Micheal Mattocks
SC DHEC – Bureau of Environmental Health Services
2600 Bull Street
Columbia, SC 29201
(803)896-0856
mattock@dhec.sc.gov



DHEC MOA#: 2017-429

MEMORANDUM OF AGREEMENT

**ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR
THE AUGUSTA - RICHMOND COUNTY
METROPOLITAN STATISTICAL AREA (MSA)**

January 2017

Participating Agencies:

Georgia
Georgia Department of Natural Resources
Environmental Protection Division
Air Protection Branch (GA EPD)

South Carolina
Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

I. PURPOSE/OBJECTIVES/GOALS

The purpose of this Memorandum of Agreement (MOA) is to renew the Augusta - Richmond County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between SCDHEC and GA EPD (collectively referred to as the "affected agencies") to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as any other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Augusta - Richmond County MSA as required by 40 CFR 58 Appendix D, Section 2(e).

II. BACKGROUND

The Augusta - Richmond County MSA consists of the following counties: Burke, Columbia, McDuffie, Lincoln, Richmond, Aiken and Edgefield. GA EPD has jurisdiction over Burke, Columbia, McDuffie, Lincoln, and Richmond Counties in Georgia and SCDHEC has jurisdiction over Aiken and Edgefield Counties, South Carolina. The SCDHEC and GA EPD are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Augusta - Richmond County Metropolitan Statistical Area (MSA). The EPA has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the MSA for PM10, PM2.5, and ozone.

40 CFR 58 Appendix D, Section 2(e) states (in part):

“...The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.”

Currently each air pollution control agency (affected agency) conducts monitoring in its respective jurisdiction and coordinates its monitoring with the other air pollution control agency within the MSA.

III. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- SCDHEC, and GA EPD (the “affected agencies”) commit to conducting appropriate monitoring in their respective jurisdictions of the MSA; as needed, to collectively meet EPA minimum monitoring requirements for the entire MSA for PM10, PM2.5, and ozone, as well as any other criteria air pollutant monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all affected agencies. The minimum air quality monitoring requirements (for PM10, PM2.5, and ozone described in 40 CFR 58) for the MSA shall apply to the MSA in its entirety and shall not apply to any sole affected agency within the MSA unless agreed upon by all affected agencies.
- The affected agencies commit to coordinating monitoring “responsibilities and requirements...to achieve an effective network design” regarding criteria air pollutant monitoring conducted in the MSA and commit to communicate unexpected or unplanned changes in monitoring activities within their jurisdictions to the other affected agency. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other

communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agency via telephone or e-mail of any monitoring changes occurring in its jurisdiction of the MSA at its earliest convenience after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or similar occurrences that result in an extended (greater than 1 quarter) or permanent change in the monitoring network. At least once a year in the second quarter of the year or before June 15th, each affected agency shall make available to the other affected agency, a copy of its proposed monitoring plan for its jurisdiction within the MSA for the next year.

- Each party reserves the right to revoke or terminate this MOA at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

IV. LIMITATIONS

A. All commitments made in this MOA are subject to the availability of appropriated funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates SCDHEC or GA EPD to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.

B. This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this MOA will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of the parties.

C. Except as provided in Section III, this MOA does not create any right or benefit, substantive or procedural, enforceable by law or equity against SCDHEC or GA EPD, their officers or employees, or any other person. This MOA does not direct or apply to any person outside SCDHEC or GA EPD.

V. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY

No proprietary information or intellectual property is anticipated to arise out of this MOA.

VI. POINTS OF CONTACT

The following individuals are designated points of contact for the MOA:

GA EPD: DeAnna Oser
GA EPD Ambient Monitoring Program
4244 International Parkway, Suite 120
Atlanta, GA 30354

DeAnna.Oser@dnr.ga.gov
Voice: (404) 363-7004
FAX: (404) 363-7100

SCDHEC: Micheal Mattocks
SCDHEC Bureau of Environmental Services
8231 Parklane Road
Columbia, SC 29223

mattocm@dhec.sc.gov
Voice: (803) 896-0902
FAX: (803) 896-0980

In the event that a point of contact needs to be changed, notification may be made via email to the other parties.

VII. MODIFICATION/DURATION/TERMINATION

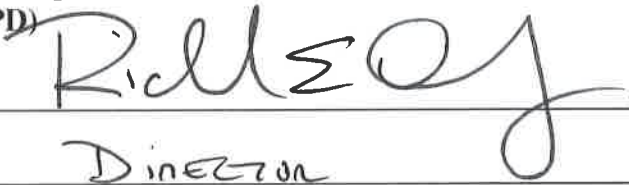
This MOA will be effective when signed by all parties. This MOA may be amended at any time by the mutual written consent of the parties. The parties will review this MOA at least once every 10 years to determine whether it should be revised, renewed, or cancelled. This MOA may be revoked or terminated by an affected agency at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

VIII. REFERENCE

United States Environmental Protection Agency, Title 40 Code of Federal Regulations, Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 2 (e), "General Monitoring Requirements."

IX. APPROVALS

**Georgia Department of Natural Resources, Environmental Protection Division
(GA EPD)**

BY: 
TITLE: Director
DATE: 2/21/17

**South Carolina Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality**

BY: 
TITLE: Bureau Chief
DATE: 03/01/17

THIS AGREEMENT IS NOT OFFICIAL AND BINDING UNTIL SIGNED BY THE
DHEC CONTRACTS MANAGER.


Francine Miller
DHEC Contracts Manager
DATE: 3-6-17

Appendix C: Waivers
Site Waiver for Greenville ESC (45-045-0015) Monitoring Site

Restricted Airflow Due to Obstructions

The S.C. Department of Environmental Services (Department) previously requested approval from EPA for a waiver to be granted for the probe siting criteria for restricted airflow due to obstructions as specified in 40 CFR Part 58 Appendix E Section 2.3 – Spacing from Obstructions for the criteria pollutant monitoring being conducted at the Greenville ESC (45-079-0021) Monitoring Site in Greenville County. Approval to waive the word “continuous” in the 40 CFR Appendix E Section 2.3(b) requirement was granted in EPA’s 2024 Annual Ambient Air Monitoring Network Plan Response Letter dated November 6, 2024.

EPA asked that the Department re-evaluate the need for this waiver in the 2025 Ambient Air Monitoring Network Plan and 2025 5-Year Network Assessment, and again, request the waiver if needed. After additional site evaluations, the conditions requiring a waiver still exist, and additional tree growth has prompted a need for expanded waiver provisions. Basic information on the Site is listed in the Table below. The site record indicates that both requirements in 40 CFR Part 58 Appendix E Section 4.1 for consideration of a waiver have been met.

General Information for the Greenville ESC Monitoring Site	
Item	Description
AQS ID	45-045-0015
Street Address	133 Perry Avenue, Greenville, SC
Geographic Coordinates	+34.84389, -82.41458
MSA Represented	Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Greer MSA
<i>Sulfur Dioxide</i>	
Designation	SLAMS
Analysis Method	Pulsated Fluorescent
Sampling Frequency	Continuous
Monitoring Objective	Population Exposure
Monitoring Scale	Neighborhood
<i>Nitrogen Dioxide</i>	
Designation	SLAMS
Analysis Method	Chemiluminescence
Sampling Frequency	Continuous
Monitoring Objective	Population Exposure
Monitoring Scale	Neighborhood
<i>PM_{2.5} Intermittent</i>	
Designation	SLAMS
Analysis Method	FRM Gravimetric w/ VSCC

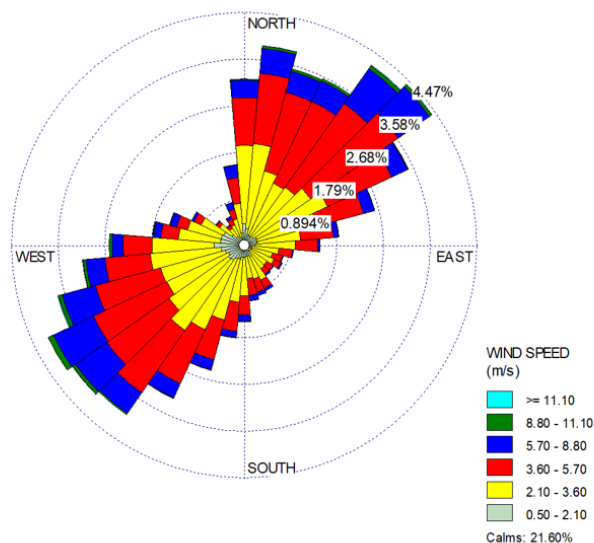
General Information for the Greenville ESC Monitoring Site	
Item	Description
Sampling Frequency	1:1
Monitoring Objective	Population Exposure / Welfare Related Impacts
Monitoring Scale	Neighborhood
PM_{2.5} Continuous	
Designation	SPM
Analysis Method	FEM Broadband Spectroscopy
Sampling Frequency	Continuous
Monitoring Objective	Population Exposure / Welfare Related Impacts
Monitoring Scale	Neighborhood
PM₁₀ Continuous	
Designation	SLAMS
Analysis Method	FEM Broadband Spectroscopy
Sampling Frequency	Continuous
Monitoring Objective	Population Exposure
Monitoring Scale	Neighborhood

Predominant and Secondary Wind Patterns

The wind data from the Greenville-Downtown Airport (GMU) is representative of the wind pattern for the Greenville ESC Site. Using 2017-2021 data, the wind rose in Figure 1 was created. It indicates that the predominant wind directions for this Site are from the southwest and the northeast. Also, secondary dominant winds come from the north-northeast.

Figure 1. Wind Rose for the Greenville ESC Site

Greenville – Downtown Airport (GMU) – WBAN ID: 723119.
2017-2021 Annual Data.



Justification for Request

The Greenville ESC Monitoring Site opened on April 11, 2008. Located in a heavily industrialized area, this monitoring site provides important information on population exposure to SO₂, NO₂, PM_{2.5}, and PM₁₀. In the 2010 NO₂ NAAQS (75 FR 6474), the EPA required the Regional Administrators to identify additional monitors where NO₂ concentrations had the potential to exceed the NAAQS. The NO₂ monitor at the Greenville ESC Monitoring Site was identified as a Regional Administrator required monitor. With 17 years of uninterrupted PM_{2.5} data collection, it has the longest PM_{2.5} data record of any air monitoring site in the upstate region.

The Greenville ESC Monitoring Site has a few tree obstructions to airflow that do not block wind from the prominent wind direction (NE). The Site was granted a waiver for these obstructions when the site was originally established in 2009 and again in 2016. Under advice from EPA, the Department did not renew the waiver when it was due for renewal in 2018 since there was a total of at least 270 degrees of airflow. The *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, promulgated on February 6, 2024, updated 40 CFR Part 58 Appendix E to require that the 270 degrees of necessary airflow be in a continuous arc rather than a total of 270 degrees open airflow from the possible 360 degrees arc.

On March 12, 2024, a site evaluation was conducted which found that there were obstructions to the PM_{2.5} Intermittent probe that reduced the continuous airflow to below 270 degrees. At this time, the Department drafted and submitted the initial waiver request along with the 2024 Annual Ambient Air Monitoring Network Plan. After this evaluation and waiver submittal, the wooden stand at the site was reconstructed to address stability issues (Figure 3). A re-evaluation of the site was conducted on October 17, 2024, to incorporate any changes in probe height or location due to the stand reconstruction. This evaluation revealed that despite the height of the stand raising slightly, new tree growth caused obstructions that reduced airflow at all probes at the site to less than 270 continuous degrees. Approval to waive the word “continuous” in the 40 CFR Appendix E Section 2.3(b) requirement was granted in the EPA’s 2024 Annual Ambient Air Monitoring Network Plan Response Letter dated November 6, 2024.

The most recent site evaluation on April 1, 2025, showed that each probe at the site had less than 270 degrees of both continuous airflow and total airflow. The site now has 200 degrees of continuous airflow, and 257 degrees of total airflow. An aerial picture of the Greenville ESC Monitoring Site and the obstructions, and a view of the Site with the old and new reconstructed stand are shown below (Figures 2 and 3). Four mature trees (trees A, C, D, and E in Figure 3, 4, and 5) have been identified as protruding above all or most probe inlets more than half the distance to the probe, preventing 270 continuous or total degrees of airflow at each probe.

Figure 2. Greenville ESC Site Stand Reconstruction

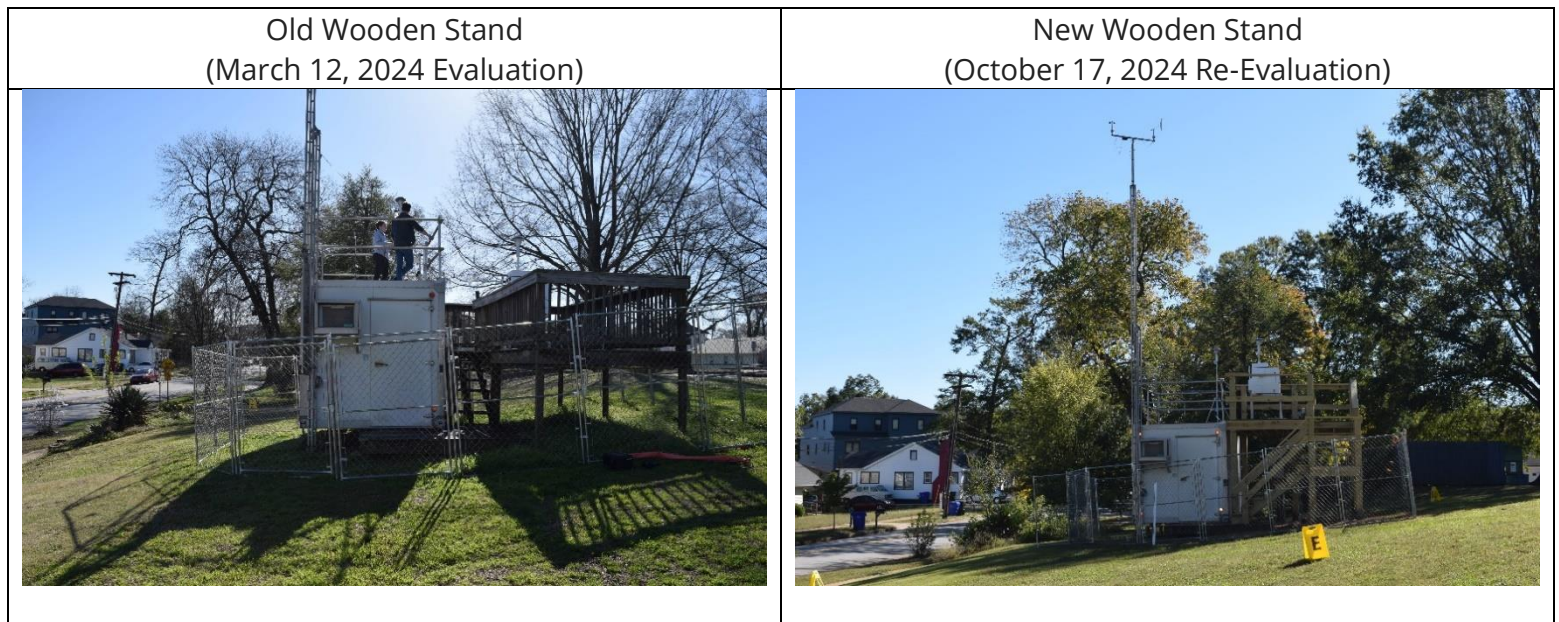
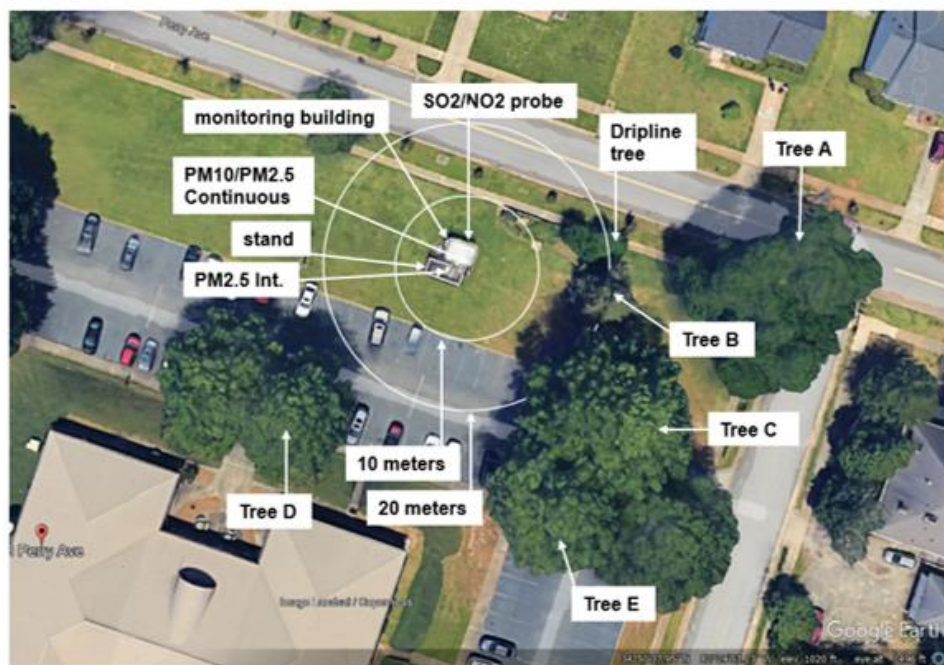


Figure 3. Aerial View of the Greenville ESC Monitoring Site



Tree: **A**-Large tree behind fir tree near road. **B**-Fir Tree east of Site. **C**-Tree at edge of parking lot near dumpster. **D**-Tree in front of Employment Security Building entrance. **E**-Tree south of Tree C.

Panorama Facing Continuous Open Airflow (SW to ENE)

This panoramic view shows the monitoring station from the southwest to the east-northeast. Key features include:

- PM_{2.5} Sampler Probe**: Located on the left side of the frame.
- SO₂/NO₂ Probe**: Located in the center of the frame.
- PM_{2.5} Continuous Probe**: Located on the right side of the frame.
- Dripline Tree**: A tree on the far right with a dripline, indicated by an arrow.

Continuous Airflow: **200°**
 Total Airflow: $200^\circ + 38^\circ + 19^\circ = 257^\circ$
 Obstructed: **103°**

200° open airflow

Tree B, not an obstruction

Dripline tree, not an obstruction

10 meters

Tree D

Tree C

Tree E

Tree A

38° open airflow

57° obstructed

19° open airflow

20° obstructed

GMU Annual 2017-2021

WIND SPEED (MPH)

≤ 11.10
8.82 - 11.10
6.75 - 8.82
3.80 - 6.75
2.10 - 3.80
0.00 - 2.10

Camera: 21.60%

The Greenville ESC Site is constrained by the presence of underground utilities that limits possible placement of the building and the stand. When established, the Site was placed approximately equidistant from the most significant trees. Since then, the trees have grown taller, and the 270 degrees continuous monitoring requirement is no longer met at any probe at the site. Additionally, the most recent site evaluation showed that there is less than 270 degrees of total airflow at the site, which no longer satisfies the waiver terms approved by EPA on November 6, 2024. The site now has 200 degrees of continuous airflow, and 257 degrees of total airflow. Relocation of the sampler on the stand to maximize distance from trees was done in support of previous waiver submissions, but the minor relocations did not have any detectable impact on measured concentration or representativeness of the monitoring for the criteria pollutants. Site topography, land use, and vegetation density is typical of the area being represented. All other Appendix E probe siting criteria are being met at this site. This Site has a long history of SO₂, NO₂, and PM_{2.5} monitoring for population exposure and has been important for determining design values for PM_{2.5} in the quickly growing Greenville-Anderson-Greer MSA.

The Department requests that EPA waive the 40 CFR 58 Appendix E Section 2.3 (b) 270-degree airflow requirement for the Greenville ESC Monitoring Site.

Site Waiver for Congaree Bluff (45-079-0021) Monitoring Site

Introduction

The Department of Environmental Services (Department) requests approval for renewal of a waiver to be granted for the probe siting criteria for restricted airflow due to obstructions as specified in 40 CFR Part 58 Appendix E Section 2.3 – Spacing from Obstructions for the ozone monitoring being conducted at the Congaree Bluff (45-079-0021) Monitoring Site in Richland County. The Department originally received approval for this waiver in the letter which reviewed the Network Plan Addendum to South Carolina's 2015 Annual Ambient Air Monitoring Network Plan (May 26, 2016) and received approval for a renewal of this waiver in the letter which reviewed South Carolina's 2020 Annual Ambient Air Monitoring Network Plan (Addendum) (March 24, 2021).

General Site Information

The Congaree Bluff (45-079-0021) Monitoring Site is located within the boundary of the Congaree National Park (Park), which was established by Congress in 1976. The Site represents general / background concentrations at a neighborhood scale within the Congaree National Park. Most of the Park is designated as Wilderness and also has a Class II Floor Area designation⁷. The National Park Service (NPS) has a Resource Management Plan, which includes an agreement with the Department to operate an air monitoring station within the Park Boundaries⁸. The original Site (Congaree Swamp (45-079-1006)) was located in the flood plain and had to be relocated in 2001 because of operation viability and long-term viability of the monitoring activity within a designated wilderness area⁹. As a result of the Wilderness designation, modifications or improvements are highly restrictive and, in some cases, prohibited. Basic information on the Site is listed in Table 1 below.

⁷ Southeast Support Office. Natural Resources Management. *Relocation of the Ambient Air Quality Monitoring Station at Congaree Swamp National Monument*, by Bobby C. Carson, (Columbia, South Carolina, August 1998).

⁸ National Park Service. U.S. Department of the Interior Natural Resource Stewardship and Science. *Natural Resource Condition Assessment-Congaree National Park Natural Resource Report*. NPS/ECN/NRR-20181665.

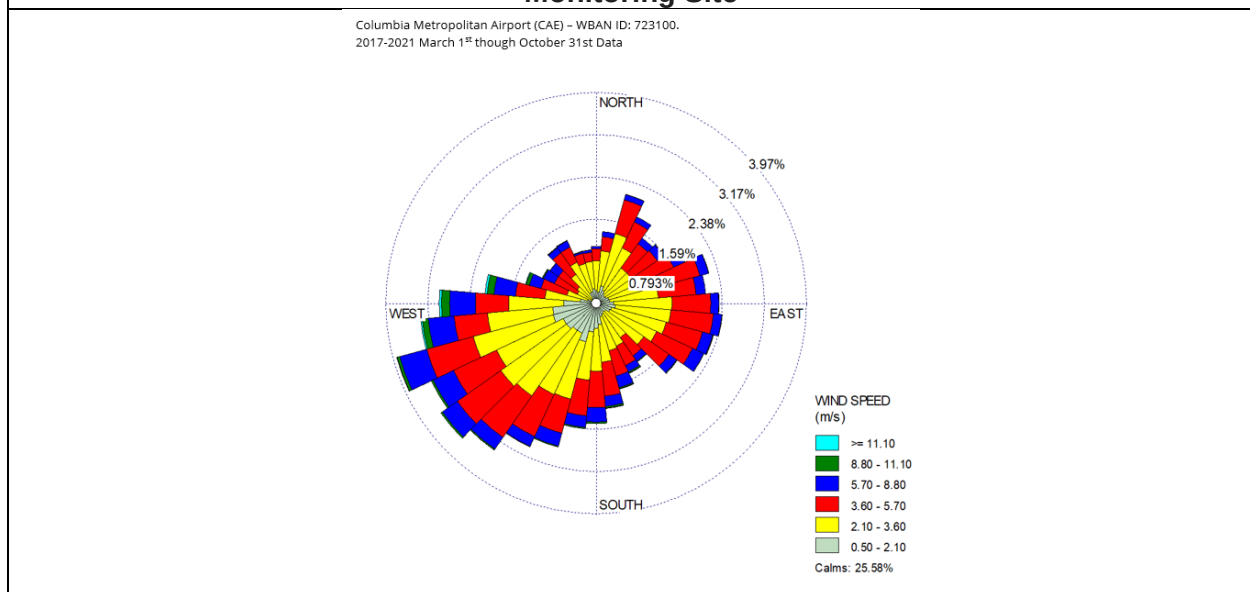
⁹ South Carolina Department of Health and Environmental Control. *General Management Plan/Wilderness Suitability Study and Environmental Assessment Letter*, by Otto Pearson, (Columbia, South Carolina, December 17, 1987).

Table 1: General Information for the Congaree Bluff (45-079-0021) Monitoring Site

ITEM	DESCRIPTION
AQS ID	45-079-0021
Street Address	1850 South Cedar Creek Road Gadsden, SC 29052
Geographic Coordinates	+33.81467, -80.78113
OZONE	
Designation	SPM
Analysis Method	Ultraviolet (047)
Sampling Frequency	Continuous
Monitoring Objective	General / Background
Monitoring Scale	Neighborhood

Predominant and Secondary Wind Patterns

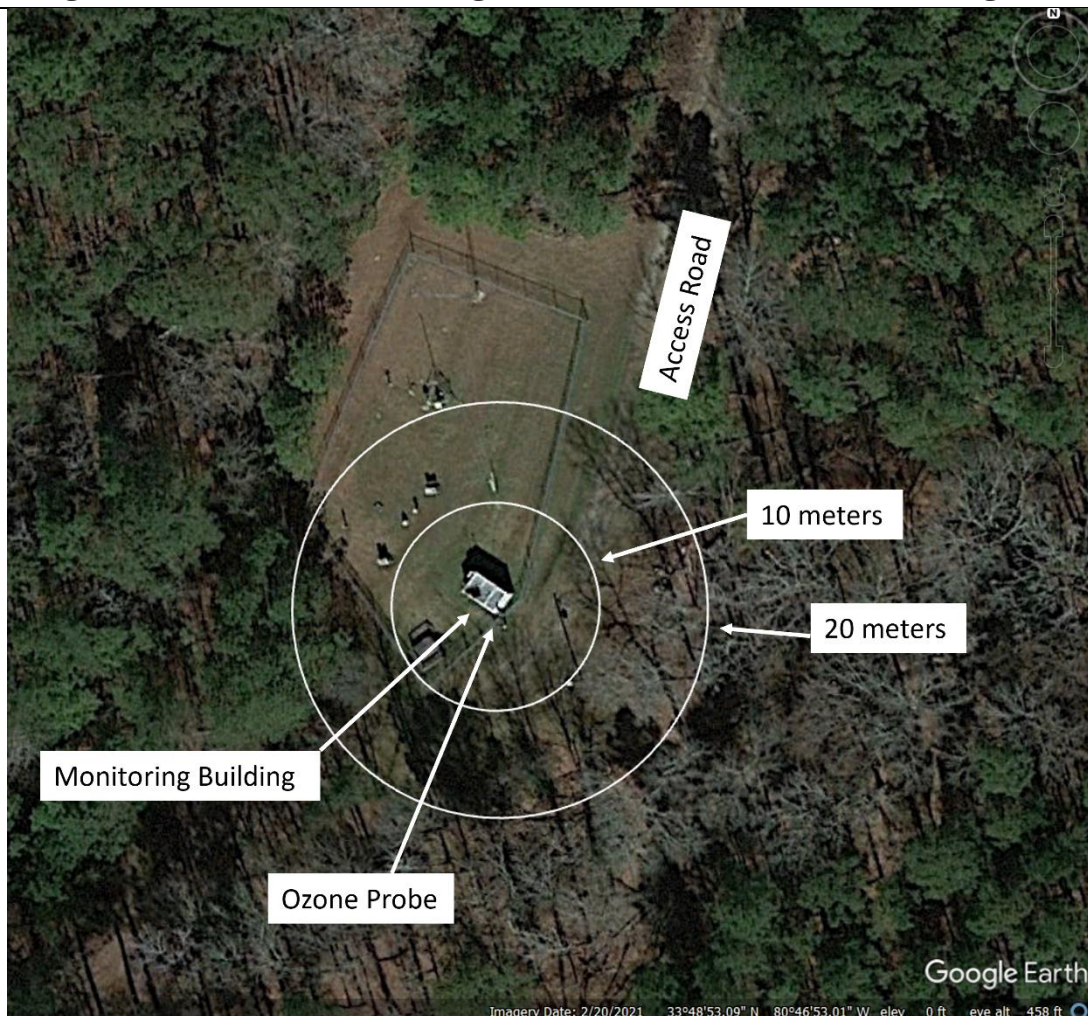
The wind data from the Columbia Metropolitan Airport is representative of the wind pattern for the Congaree Bluff (45-079-0021) Monitoring Site. Using 2017-2021 ozone season data, the wind rose in Figure 1 was created. It indicates that the predominant wind direction for this Site is from the west-southwest. Secondary dominate winds come from the southwest and west.

Figure 1: 2017-2021 Wind Rose for Ozone Season for the Congaree Bluff (45-079-0021) Monitoring Site

Justification for Request

The Congaree Bluff (45-079-0021) Monitoring Site is an essential part of the agreement with the NPS to operate air monitoring within the bounds of the Congaree Swamp National Park. The probes at the Congaree Bluff (45-079-0021) Monitoring Site cannot be reasonably located so as to meet the siting criteria because of physical constraints, nor is there a suitable site to which the station could be moved to, as there are firm restrictions on changes made to the Site. The current location of the Site, shown in Figure 3, is in a clearing within the bounds of the Congaree National Park. The Park is unwilling to allow the removal of the trees violating Section 2.3 of Appendix E as these trees are vital to the delicate ecosystem of the Park and the reestablishment of habitat for the endangered Red-Cockaded Woodpecker.

Figure 3: Aerial Picture of Congaree Bluff (45-079-0021) Monitoring Site



Although compliance with Appendix E siting criteria is not required for SPM monitors, it is the Department's intent that all the samplers meet as many siting and operational

requirements as possible. Currently, the Site does not meet the following siting criteria for tree obstructions: Section 2.3 of Appendix E, which requires that the distance from the obstacle (such as a tree) to the probe must be at least twice the height that obstacle protrudes above the probe and requires that the probe must have at least 270 degrees of continuous unrestricted airflow. Numerous trees, located to the northeast, east, and southeast, were identified as obstructions. This row of trees blocks airflow so that the Site has only 112 degrees of continuous unrestricted airflow. Figure 4, Figure 5, Figure 6, and Figure 7 provide a comprehensive view of the trees.

Figure 4: Congaree Bluff Monitoring Site Facing North



Figure 5: Congaree Bluff Monitoring Site Facing East



Figure 6: Congaree Bluff Monitoring Site Facing South



Figure 7: Congaree Bluff Monitoring Site Facing West



After conferring with EPA-Region 4 and the National Forest Service, a waiver for the tree obstructions was originally applied for on March 16, 2016, and approved by EPA on May 26, 2016. As part of the agreement with EPA-Region 4, the Department changed the purpose of this Site to characterize air quality within the Congaree National Park and changed the scale of the monitor from “Urban” to “Neighborhood” in the 2017 Monitoring Plan. This Plan was submitted to EPA on July 1, 2017, and approved on October 25, 2017. A renewal for this waiver was applied for on February 4th, 2021 and approved March 24, 2021. As a part of South Carolina’s 2025 Annual Network Plan and 2025 Network Assessment, the Department requests renewal for the site waiver of 40 CFR Part 58 appendix E Section 2.3 Siting Criteria for the Congaree Bluff (45-079-0021) Monitoring Site.