D H E C
PROMOTE PROTECT PROSPER
Catherine E. Heigel, Director
Promoting and protecting the health of the public and the environment

July 20, 2015

Ms. Heather McTeer Toney, Regional Administrator
U.S. EPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

RE: Annual Air Network Monitoring Plan for 2016

Dear Ms. McTeer Toney:

In accordance with the requirements of 40 Code of Federal Regulations Part 58, Subpart B, the South Carolina Department of Health and Environmental Control (DHEC) respectfully submits the Annual Air Network Monitoring Plan for calendar year 2016. The DHEC is required by 40 CFR 58.10 to adopt and submit to the Regional Administrator an Annual Monitoring Network Plan which provides for the establishment and maintenance of an air quality surveillance system. This system is a network of State and Local Air Monitoring Stations (SLAMS) including Federal Reference Method (FRM) and Federal Equivalent Method (FEM) monitors that are part of SLAMS, National Core Monitoring Network (NCore) stations, Speciation Trends Network (STN) stations, and Special Purpose Monitor (SPM) monitoring stations. This plan is required to include a statement of purpose for each monitor and evidence that siting and operation of each monitor meets the requirements of 40 CFR 58, Appendices A, C, D and E.

The DHEC received three comments during the public comment period, which was held from May 15, 2015 through June 14, 2015. A complete package, including the Department's response to comments received is being sent to Gregg Worley of your office. Should you have any questions or need additional information regarding this matter, please contact Robert Brown of my staff at (803) 898-4105.

Sincerely,

Myra Reece, Chief
Bureau of Air Quality

cc: Gregg Worley, US EPA Region 4 (w/attachments)
ec: Ryan Brown, US EPA Region 4 (w/attachments)
Carol Kemker, US EPA Region 4 (w/o attachments)
Robert Brown, BAQ (w/o attachments)
Scott Reynolds, BES (w/o attachments)

State of South Carolina Network Description and Ambient Air Network Monitoring Plan

Calendar Year 2016

South Carolina Department of Health and Environmental Control

2600 Bull Street ● South Carolina 29201 ● Phone: 803-898-3432 ● Website: www.scdhec.gov

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Certification

This document contains the planned changes and final description of the sites and monitors of the South Carolina Ambient Air Monitoring Network (Monitoring Network) for criteria pollutants and related parameters for calendar year 2016. The South Carolina Department of Health and Environmental Control (DHEC) certifies that the network described herein meets or exceeds the minimum requirements needed to support the State Implementation Plan, national air quality assessments and policy decisions as required in 40 Code of Federal Regulations (CFR) Part 58, Ambient Air Quality Surveillance, at the time of submittal to the United States Environmental Protection Agency (EPA), Region 4. Due to circumstances that may arise during the implementation of the plan in 2015 and during the 2016 monitoring year, some elements of the network may require modification. A notification of modifications will be posted on the DHEC website and provided to the EPA Region 4 office. Where necessary, a request for approval of deviations from this plan and supporting documentation will be submitted to the EPA Region 4 office.

Scott Reynolds Signature: _____ Date: 7/17/15
Director, Division of Air Quality Analysis, Bureau of Environmental Services
South Carolina Department of Health and Environmental Control

Renee G. Shealy Signature: _____ Date: 7/17/2015
Chief, Bureau of Environmental Services
South Carolina Department of Health and Environmental Control

Robert Brown Signature: _____ Date: 7/17/15
Director, Division of Air Assessment & Regulations, Bureau of Air Quality
South Carolina Department of Health and Environmental Control

Myra C. Reece Signature: _____ Date: 7/20/15
Chief, Bureau of Air Quality
South Carolina Department of Health and Environmental Control

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Myra C. Reece Signature: _____ Date: _____
Chief, Bureau of Air Quality
South Carolina Department of Health and Environmental Control

Acronyms

AQI – Air Quality Index

AQS – Air Quality System

BAQ – Bureau of Air Quality

BC – Black Carbon

CBSA – Core-Based Statistical Area

CFR – Code of Federal Regulation

CO – Carbon Monoxide

CSA – Combined Statistical Area

CSN – Chemical Speciation Network

CMS – Continuous Monitoring Site

DAQA – Division of Air Quality Analysis

DHEC – South Carolina Department of Health and Environmental Control

DNPH – Analysis method using 2,4-dinitrophenylhydrazine

EPA – Environmental Protection Agency

FEM – Federal Equivalent Method

FRM – Federal Reference Method

GC/MS – Gas Chromatography / Mass Spectroscopy

GFAA – Graphite Furnace Atomic Absorption Spectrometry

HPLC – High Performance Liquid Chromatography

IC – Ion Chromatography

IMPROVE – Interagency Monitoring of Protected Visual Environments

ICP/MS – Inductively Coupled Plasma Mass Spectroscopy

MET – Meteorology

MOA – Memorandum of Agreement

MSA – Metropolitan Statistical Area

mSA – Micropolitan Statistical Area

$\mu g/m^3$ – Micrograms per cubic meter

NAAQS – National Ambient Air Quality Standards

NATTS – National Air Toxics Trends Site

NADP-MDN – National Atmospheric Deposition Program Mercury Deposition Network

NCore – National Core Monitoring Network

NO – Nitric oxide

NO_2 – Nitrogen Dioxide

NO_x – Nitrogen Oxides

NO_y – NO_x and other oxidized species

NPAP – National Performance Audit Program

OMB – Office of Management and Budget

PEP – Performance Evaluation Program

$PM_{2.5}$ – Particulate Matter < 2.5 microns

PM_{10} – Particulate Matter < 10 microns

PPB – Parts Per Billion

PPM – Parts Per Million

PSD – Prevention of Significant Deterioration

PTFE – Polytetrafluoroethylene

PUF – Polyurethane Foam

QA – Quality Assurance

QAPP – Quality Assurance Project Plan

QC – Quality Control

SLAMS – State and Local Air Monitoring Station

SO_2 – Sulfur Dioxide

SPM – Special Purpose Monitor

STN – Speciation Trends Network

SVOC – Semi-volatile Organic Compound

TEOM – Tapered Element Oscillating Microbalance

TPY – Tons Per Year

TSP – Total Suspended Particulate

UV – Ultraviolet

VOC – Volatile Organic Compound

WGS84 – World Geodetic System of 1984 revised in 2004

Table of Contents

Introduction

The DHEC or its predecessors have operated an air quality monitoring network in South Carolina since 1959. During that time, the network has continually evolved to meet the requirements and needs of the DHEC's Air Program and to comply with federal requirements. In 2016 the network will be comprised of 104 monitors and samplers at 34 sites.

In October, 2006, the EPA published revisions to the ambient monitoring regulations (71 FR 61236, October 17, 2006) requiring quality assurance (QA), monitor designations, minimum requirements for both number and distribution of monitors among metropolitan statistical areas (MSAs), and probe siting changes. The regulation also included the requirement for an annual monitoring network plan and periodic network assessments.

This plan covers the eighteen month period from July 1, 2015 through December 31, 2016. This period includes a 6 month implementation period during which sites indicated as 'New' will be identified, secured, and prepared for the installation of monitoring equipment. It is expected that any monitoring indicated as 'New' or 'To be established' will be installed, calibrated, and operating in 2016 with the exception of some Ozone monitors which may begin operation at the start of the South Carolina Ozone Monitoring Season (April-October). The annual Network Description and Ambient Air Monitoring Plan, as required and described in 40 CFR Part 58.10, and Periodic Network Assessment, must contain the following information for each monitoring station in the network:

- The Air Quality System (AQS) site identification number (ID) for existing stations
- The location, including street address and geographical coordinates, for each monitoring station
- The sampling and analysis method used for each measured parameter
- The operating schedule for each monitor
- Any proposal to remove or relocate a monitoring station within a period of eighteen months following the plan submittal
- The monitoring objective and spatial scale of representativeness for each monitor
- The identification of any sites that are suitable for comparison against the Particulate Matter < 2.5 microns **(**$PM_{2.5}$) National Ambient Air Quality Standard (NAAQS), and
- The MSA, Core-Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor

This document constitutes the 2016 South Carolina Air Monitoring Network Plan and is organized into two main parts:

- Air Monitoring Station Descriptions: An outline of the designations, parameters, monitoring methods, and the purpose for each monitor at the site and
- Network Summaries: A table which presents the total number of sites and monitors for the State, including a list of all proposed changes to the current network.

The Monitoring Network is reviewed annually. Planned changes are described in this 2016 Monitoring Plan and provided for public review and comment prior to submission to the EPA Region 4 Administrator.

Public Participation Opportunities

In response to public interest and the potential impact of the monitoring regulation changes, the DHEC's Air Program solicits involvement from both internal (to the DHEC) and external workgroups.

Individuals that had expressed interest in the development of the ambient air monitoring network were notified of the availability of the 2016 Monitoring Plan and were invited to provide comments. This group consists of representatives from the business, environmental, and health communities, and concerned citizens.

Other opportunities for public involvement include:

- A webpage maintained for publication and access to current and draft monitoring plan reference documents and announcements[1].
- Availability of the proposed 2016 Monitoring Plan **for public review and comment ran from May 15, 2015 to June 14, 2015.** All recorded participants who registered in the outreach and discussion activities were notified when the 2016 Monitoring Plan became available for review. During this time, the DHEC received three comments, which are addressed in Appendix A.

The DHEC is committed to continuing the opportunities for input and participation in the development of the annual revisions of the Network Description and Ambient Air Network Monitoring Plan and the periodic assessments of the air quality surveillance system.

Network Operation

The primary responsibility for the operation of the Monitoring Network is assigned to the Division of Air Quality Analysis (DAQA) in the Bureau of Environmental Health Services (Division). The Division establishes, maintains, and operates the sites and instruments that make up the network and performs the analysis of samples collected as part of routine monitoring or special projects. Data generated by the network for comparison to the NAAQS is verified to be accurate and reported by the Division to the national AQS database for storage and public access.

Criteria pollutant monitoring for the purpose of comparison to the NAAQS is performed using the EPA designated Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM) to ensure the precision and accuracy of the measurements across the air quality surveillance system.

Regular calibration and audits of the measurement systems are performed to verify that the instruments are operating correctly and data being collected is accurate. The QA activities supporting the Monitoring Network meet or exceed the QA requirements defined in 40 CFR Part 58 Appendix A (Quality Assurance Requirements for SLAMS, SPMs, and Prevention of Significant Deterioration (PSD) Air Monitoring).

Raw data is collected hourly from sites across the state and provided to internal data users (forecasters and data analysts) and to the AIRNow database for presentation to the public. Before the data is submitted to AQS, it is verified to be accurate through review of the instrument Quality Control (QC) and QA performance documentation.

Instrument QA/QC alone is not sufficient to assure monitoring data quality. In addition to periodic site assessments, the DHEC conducts additional visits of monitoring sites to document comparison with applicable siting criteria.

It is the DHEC's intent that all criteria pollutant monitors and samplers be sited and operated in accordance with the requirements of 40 CFR Part 58 and Appendices A (Quality Assurance), C (Methods), D (Network Design), and E (Probe Siting Criteria) and the data collected by these samplers and monitors is suitable for comparison to the NAAQS. The DHEC further intends to assure that the samplers and monitors comply with as many of the recommendations contained within the regulations and applicable guidance documents as is possible.

[1]http://www.scdhec.gov/HomeAndEnvironment/Air/AmbientAir/

An element of the Quality System[2] employed by the Division is periodic assessments of systems and monitor performance. As the primary QA organization for ambient air monitoring activities, the Division operates under the approved Environmental Quality Control Quality Assurance Management Plan, the Ambient Air Quality Monitoring Quality Assurance Project Plan, and approved plans for specific projects. The EPA Region 4 office provides periodic Technical Systems Audits of sampling and analytical methods, network operation, data collection, and reporting and QA activities at their discretion or at the request of the DHEC's Air Program. The EPA Region 4 office may conduct audits of any component of the operation of the network or quality management system. The Division also participates in the National Performance Audit Program (NPAP) and the Performance Evaluation Program (PEP) administered by the EPA to provide independent audits.

Station Description Content

Specific siting information for each site and monitor is stored in the EPA's AQS, the national ambient air database. The AQS Site Description includes the exact location of the site, local, and regional population and description of the site location, monitor types, and monitoring objectives. This site and monitor information is routinely updated whenever there is a change in site characteristics or pollutants monitored.

The AQS is used as the primary repository for all South Carolina ambient air monitoring information, including site descriptions. All ambient air monitoring data is stored in AQS, including non-NAAQS parameters, ambient air toxics, total suspended particulate (TSP), and supporting QA data.

Each network station description contained in this document includes a Site Description and Monitor Details. An explanation of the information in each station description is presented below.

Site Description – The site description includes specific information about each ambient air monitoring site. The site description header includes the following:

1) Site Name – The name given to the site.
2) CSA/MSA – Area where site is located as defined by the United States Census. (February, 2013).[3]
3) AQS Site ID – The unique site ID used in AQS in the form of 45-cc-ssss where:
    a) 45 is the federal identification code for South Carolina
    b) ccc is the county identification code, and
    c) ssss is the site identification code within the county
4) Location – Typically, the street address of the site where available.
5) County – County in which the site is located.
6) Coordinates – Latitude (N), then Longitude (W) listed in decimal degrees using WGS84 projection.
7) Date Established – The date when each existing monitoring station was established is shown in the description. For new stations proposed in this Monitoring Plan, a date is provided when it is expected for the station to be in operation. Individual monitors at a site may have differing start and stop dates.
8) Site Evaluation (most recent date visited) – Each monitoring station in the network is periodically visited to determine whether all required probe exposure criteria for monitors are met. If necessary, corrective action is scheduled to address deficiencies. If a monitoring site has not yet been evaluated, it will be denoted with the word "PENDING". Auditors may visit sites to provide an additional,

[2] The Quality System is the means by which DHEC implements the quality management process through the Quality Assurance Management Plan for SC DHEC, March, 2014.
[3] The US Census Bureau periodically adjusts CBSA names and boundaries. This plan uses the latest available revision.

independent QA check on the site evaluations. When an additional independent check has been conducted, the date of the visit will be noted next to the date of the latest site evaluation and contained within parentheses.

Monitor Details – Each station description has a table that lists the parameter(s) and the descriptive information associated with that particular parameter. An explanation of the information in the tables is presented below.

1) Parameter – Criteria (compounds for which a NAAQS has been established), non criteria, and/or supporting parameters (primarily meteorological measurements) measured at the site are listed.

2) Scale – Each monitor or sampler in the monitoring network is described in terms of the approximate physical dimensions of the air parcel nearest the monitoring station throughout which pollutant concentrations are expected to be reasonably similar. This is most often referred to as the *Scale* of the monitor. Different pollutants monitored at the same location may represent different scales depending on the characteristics of the pollutant. Area dimensions or scales of representativeness used in the network description are:

   a) Microscale – Air volumes associated with area dimensions ranging from several meters up to about 100 meters.

   b) Middle scale – Areas up to several city blocks in size with dimensions ranging from approximately 100 meters to 0.5 kilometers.

   c) Neighborhood scale – Extended areas of a city that have relatively uniform land use with dimensions ranging from 0.5 to 4.0 kilometers.

   d) Urban scale – Citywide or equivalent rural areas with dimensions ranging from 4 to 50 kilometers.

   e) Regional scale – Areas ranging from 50 to hundreds of kilometers in diameter.

   The true representative area may best be described by an irregular shape of the approximate dimensions indicated above to account for local sources, topography and differing land use.

   The representative scale of a monitor is closely associated with the monitoring objective.

3) Objective – The ambient air monitoring network is designed to meet three primary objectives:

   a) Provide air pollution data to the public in a timely manner. Near real-time data is made available on the internet through AIRNow and Air Quality Index (AQI) reporting and forecasting in the major metropolitan areas.

   b) Support compliance with ambient air quality standards and emissions strategy development. Monitors are operated to measure concentrations for comparison to NAAQS and to provide information to aid in the development of strategies to improve air quality.

   c) Support air pollution research studies. Data from the monitoring network support greater understanding of the impacts and effects of ambient air pollution.

   Individual monitors within a monitoring network that support these basic objectives generally serve one or more of the following purposes:

   - Determine highest concentrations of pollutants
   - Determine representative concentrations in areas of high population density
   - Determine impact on air quality of significant sources or source categories
   - Determine general background concentrations

- Determine extent of regional pollutant transport
- Determine welfare-related impacts in more rural and remote areas (ex. visibility impairment and impacts to vegetation)

The design intent in siting stations is to correctly match the area represented by the sample of monitored air with the scale most appropriate to meet the monitoring objective of the monitor. The relationship of appropriate scale to the six basic purposes as follows:

Monitoring Purpose	Siting Scale
Highest concentration	Micro, Middle, Neighborhood
Population exposure	Neighborhood, Urban
Source impact	Micro, Middle, Neighborhood
General/background	Neighborhood, Urban, Regional
Regional transport	Urban, Regional
Welfare-related impacts	Urban, Regional

Monitor and sampler data is regularly reviewed to assure the assigned scale is correct and appropriate for the intended objective.

4) Designation – Monitor designations that may be found in the tables include the State and Local Air Monitoring Station (SLAMS), special purpose monitor (SPM), National Core Monitoring Network (NCore), non-regulatory, QA collocated, and National Atmospheric Deposition Program Mercury Deposition Network (NADP-MDN) monitoring. Definitions of these designations are:

   a) SLAMS – Monitors for which NAAQS have been established. These stations must meet requirements that relate to four major areas: QA, monitoring methodology, sampling interval, and siting of instruments and instrument probes.

   b) SPM – Monitors which support investigations addressing complaints, areas and pollutants of concern, network refinement, modeling verification, and compliance. These monitors are committed to investigation and projects as described in the associated Quality Assurance Project Plan (QAPP). They may be located as separate monitoring stations or be included at existing monitoring locations. The SPM may also monitor for air toxics, particulate, mercury, criteria pollutants, precipitation, and meteorology. Supplemental speciation is a type of SPM monitor that operates according to CSN protocols, but is not contained in the STN Network. This monitoring data will be reported to AQS where possible. Siting and probe exposure will conform to all requirements for SLAMS monitors whenever possible.

   c) NCore – NCore is a national multi-pollutant network that utilizes advanced measurement systems for particles, pollutant gases, and meteorology. It provides data for long-term trends of criteria and non-criteria pollutants and supports air quality model evaluation, scientific studies, and ecosystem assessments. Most NCore monitors are SLAMS.

d) Non-regulatory Monitor – A monitor that measures data on a pollutant that will not be used for regulatory purposes.

e) Collocated QA Sampler – A particulate matter sampler that is paired with but operated independent of a similar sampler. It is used to indicate measurement accuracy.

f) NADP-MDN – Monitors for the NADP-MDN provide data on the geographic distributions and trends of mercury in precipitation. They are run in cooperation with the federal government.

The SLAMS and SPM data may be used in the reporting of an area's AQI. The AQI is a method of reporting that converts concentration levels of pollution to a simple number scale of 0-500. Index reporting is required for all urban areas with a population exceeding 350,000. Intervals on the AQI scale are related to potential health effects of the daily measured concentration of the measured pollutants. All stations in a metropolitan area provide data for daily index reporting. Data collected from continuous Ozone and $PM_{2.5}$ monitors is collected hourly and reported as AQI maps on the EPA's AIRNow website. A daily AQI is provided for the areas in and around Aiken, Charleston, Columbia, Florence/Darlington, Greenville-Spartanburg, and York/Chester/Lancaster.

5) Probe Height – The monitor or sampler probe is the point where ambient air enters the analytical or sample collection system. Ideally, air would be sampled approximately at nose height, but due to operational, exposure and security considerations, air may be sampled further from ground level. Proper probe height is specified in the monitoring regulations (typically between 2 and 15 meters) and is checked as part of the periodic site evaluations.

6) Analysis Methods – All sampling and analytical procedures used for comparison of ambient concentrations of criteria pollutants to the NAAQS will use designated FRM or FEM. Where appropriate for specific monitoring objectives, well characterized non-equivalent methods may be used. Each of the parameters found in the station descriptions along with an explanation of the analysis method are described below.

a) Particulate Matter (<10 microns) (PM_{10}) – PM_{10} samplers operated by the DHEC are designated as either FRM or FEM samplers and are operated according to the requirements set forth in 40 CFR Part 50 and 40 CFR Part 58. Intermittent samplers collect a 24-hour sample no less than every sixth day on a quartz filter. The filter is conditioned and weighed before and after the sample run. The gain in weight in relation to the volume of air sampled is calculated in micrograms per cubic meter ($\mu g/m^3$). The quartz filters are equilibrated before each weighing for a minimum of 24 hours at a 20-23°C mean temperature and a 30-40 percent mean relative humidity.

Continuous PM_{10} samplers provide 24-hour concentration measurements every day. During sampling, ambient air passes through an inlet designed to pass only particles smaller than 10 microns in diameter. After exiting the inlet, the sample stream is sent through a mass transducer to determine instantaneous and total flow. Particulate in the sample stream passes through a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the previous weight gives the total mass of the collected particulate for that period. The mass concentration is computed by dividing the total mass gained by the flow rate. Data is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system. Only 24-hour daily averages are used for comparison to the ambient standards.

b) Particulate Matter < 2.5 microns ($PM_{2.5}$) – All $PM_{2.5}$ samplers operated by the DHEC are designated FRM samplers. Manual samplers are operated per the requirements set forth in 40 CFR Part 50, Appendix L. Samples are collected on 46.2 millimeter Polytetrafluoroethylene (PTFE) filters over a 24-hour sampling period. Air flow through the filter is maintained at 16.7 liters per minute. The flow rate must not vary more than +/-5 percent for five minutes over a 24-hour sample period at actual ambient temperature and pressure. Samples are retrieved within 96 hours of the end of the sample run and are kept cool (4°C or cooler) during transit to meet the thirty-day limit for final weighing.

The PTFE filters are equilibrated and weighed before and after the sample run for a minimum of 24 hours at a controlled atmosphere of 20-23°C mean temperature and 30-40 percent mean relative humidity. Filters are used within thirty days of initial weighing. Samples are typically weighed within two weeks of sampling. Samples must be re-weighed within thirty days of the end of the sample run if kept at 4°C or cooler. The gain in weight in relation to the volume of air sampled is calculated in $\mu g/m^3$.

Unless designated FEM, continuous $PM_{2.5}$ monitors provide hourly measurements for AQI reporting and do not provide concentration data currently suitable for comparison to the NAAQS. During monitoring, ambient air passes through an inlet system designed to pass only particles smaller than 2.5 microns in diameter. After exiting the inlet, the sample stream is sent through a mass transducer to determine instantaneous and total flow. Particulate in the sample stream is captured by a Teflon-coated glass fiber filter. This filter is weighed every two seconds. The difference between the current filter weight and the previous weight gives the total mass of the collected particulate for that period. The mass concentration is computed by dividing the total mass gained by the total flow sampled during the period. Data is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

c) $PM_{2.5}$ Speciation sampling and analysis – In addition to operating $PM_{2.5}$ samplers that allow measurement of only $PM_{2.5}$ mass concentration, the DHEC also operates $PM_{2.5}$ speciation samplers that collect samples that are analyzed to determine the chemical makeup of $PM_{2.5}$. Samples are collected on a set of two cartridges on the Met-One SASS sampler for nitrates and sulfates and a single cartridge on the URG 3000N sampler for carbon. The samples are collected over a 24-hour sampling period. The individual cartridges contain denuders and filters designed to efficiently capture the major components of $PM_{2.5}$.

After collection, the samples are shipped cold to the EPA contract laboratory for analysis. At the laboratory, the samples are analyzed using thermal optical analysis (for carbon), ion chromatography (IC) (for nitrates and sulfates) and x-ray fluorescence (for metals) to determine the presence and concentration of specific compounds. This is referred to as the Chemical Speciation Network (CSN) protocol. Sample results are stored and available from AQS.

d) Sulfur Dioxide (SO_2) – Instruments used to continuously monitor SO_2 concentrations in the atmosphere employ Ultraviolet (UV) Fluorescence Federal Reference Method. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

Calibration of these instruments and audits of their performance are done using the EPA protocol gas mixtures containing a known concentration of SO_2 in nitrogen. This gas is diluted to provide known concentrations of SO_2. These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

e) Carbon Monoxide (CO) – Continuous monitoring for CO is performed by use of the FRM non-dispersive infrared correlation method. Data is stored locally on redundant data acquisition systems and recovered hourly by the Division's automated central data acquisition system.

Calibration of the instrument and audits of its performance are done using the EPA Protocol gas mixtures containing a known concentration of CO in air. The gas is diluted to provide known concentrations of CO. These known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the specific concentrations. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

f) Ozone – Ozone is monitored using the FEM UV photometry method. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by the automated central data acquisition system.

Monitors are routinely calibrated and performance audited using portable Ozone transfer standards. Calibration curves are prepared for each instrument and each measurement is automatically compared to this curve before entry into the data acquisition system.

g) Nitrogen Dioxide (NO_2) – The FRM UV chemiluminescence method is used in the Network for measurement of NO_2 concentration in the ambient air. The continuous data output from the instrument is stored locally on redundant data acquisition systems and recovered hourly by an automated central data acquisition system.

Calibration of the instrument and audits of their performance is done using the EPA protocol gas mixtures containing a known concentration of nitric oxide (NO) and Nitrogen Oxides (NO_x) in nitrogen. The gas is diluted to present several known concentrations of the oxides. A converter is used to convert NO_x to NO for reaction with internally generated Ozone and measurement of the light produced by the reaction. Known concentrations are supplied to the instrument, which is adjusted so that the instrument output corresponds with the supplied concentrations. Calibration curves are prepared for each instrument and the response and calibration are used to report measured concentrations.

h) Lead – Lead concentrations are determined by the analysis of TSP collected using high volume particulate samplers as described in 40 CFR Part 50 Appendix G. Particulate samples are acid extracted from a portion of the filter to dissolve metals from the collected materials. The Lead content is determined using Flameless (Graphite Furnace) Atomic Absorption Spectrometry or may be analyzed using the EPA national contract laboratory using Inductively Coupled Plasma Mass Spectroscopy (ICP/MS).

i) Meteorology – Meteorology consists of wind direction, wind speed, precipitation, temperature and pressure. Collection and/or analysis methods are discussed below.

- Wind Direction and Speed – Wind data is collected using systems that are higher precision 'Air Quality' systems. These use separate or combined wind vanes and anemometers mounted 10 meters above ground. The systems provide needed information about the local meteorology, but data quality is not sufficient for reporting to the national database.

- Precipitation – Precipitation is measured by tipping bucket gauges that provide a signal indicating the occurrence, rate and amount of precipitation. The gauges are not heated, so do not accurately provide the time of frozen precipitation events. The monitors are checked for operation and accuracy using a known volume of water, then compared with actual volumes of collected precipitation in collocated samplers.

- Ambient Temperature and Pressure – Ambient temperature is available from sensors that are part of the sampling systems for the FRM $PM_{2.5}$ samplers. Ambient temperature measurement is necessary for the systems to maintain the required flow rate to reproducibly separate the desired particulate size fractions as conditions change. Although the primary use of the measurement is for sampler flow control, the data is collected every five minutes. Temperature and Pressure sensors are compared to reference systems at least once per month.

j) Volatile Organic Compounds – Volatile Organic Compounds (VOCs) are collected into passivated or silica lined stainless steel canisters. The canisters are cleaned, tested, and evacuated prior to installation at the sampling site, then filled and pressurized with ambient air throughout the sampling period (typically 24 hours). Measured portions of the captured air are concentrated at low temperature and analyzed using Gas Chromatography with a Mass Spectrometer detector (GC/MS) to identify and quantitate the collected compounds. The collection and analysis method is based on the EPA Method TO-15.

k) Semi-volatile Organic Compounds – Semi-volatile Organic Compounds (SVOCs) are collected using polyurethane foam (PUF) and a solid adsorbant to trap the compounds from air pulled through the material by a high volume sampler. The SVOCs are extracted from the collection cartridge using a solvent, and the rinses are concentrated for analysis. Measured portions of the extract are analyzed using GC/MS to identify and quantitate the collected compounds. The collection and analysis method is based on the EPA Method TO-13.

l) Carbonyls – Carbonyls (including aldehydes and ketones) are extracted from ambient air by reaction with a compound that makes them stable enough to capture and hold. The reaction of the compounds with Dinitro phenyl hydrazine (DNPH) removes them from the sampled air and concentrates them in the sample cartridge. Solvent Extraction of the DNPH derivatives from the cartridge is followed by analysis using High Pressure Liquid Chromatograph to identify and quantitate the collected carbonyls. The collection and analysis method is based on the EPA Method TO-11.

m) Metals – Metals in particulate are collected on filters using the TSP or PM_{10} High Volume samplers. Metals are extracted from a portion of the filter using sonication in an acid solution. Detection, identification and quantitation of the target metals use Inductively Coupled Plasma with a Mass Spectrometer (ICP/MS). The collection and analysis method is based on the EPA Method IO-3.

n) Precipitation Chemistry – A portion of the precipitation sample collected each week is analyzed for pH and conductivity. To determine concentrations of dissolved material that contributes to acid rain, the collected material is tested for cations and anions using Ion Chromatography.

o) Sulfate – Sulfate in particulate can be measured in both samples and monitored continuously. The continuous method thermally reduces sulfate in ambient particulate to SO_2 for detection in a dedicated SO_2 monitor. Particulate samples collected on the species specific denuders used in the Speciation Trends and Chemical Speciation Networks (STN/CSN) are analyzed for anions ($SO_4^{=}$ and NO_3^{-}) using Ion Chromatography for separation and quantification of the species.

p) Light Absorbing Carbon (Black Carbon) – Light Absorbing Carbon is measured continuously by the use of an Aethalometer. The transmittance of infrared light through a filter is measured as particulate is captured to determine the amount of black carbon collected.

q) Mercury – Mercury is analyzed in ambient air and in weekly precipitation samples. Ambient concentrations are monitored using the collection of the mercury vapor on an adsorbent

followed by thermal desorption and analysis using Cold Vapor Atomic Fluorescence Spectroscopy.

Mercury in precipitation is sampled and analyzed as part of the National Atmospheric Deposition Program, Mercury Deposition Network (NADP/MDN). Details of the sampling and analysis are available on the NADP website at http://nadp.sws.uiuc.edu/NADP/.

Sampling frequency is the indicator of how often a measurement is made and reported. Sampling typically involves collection of a sample over a period (typically 24 hours, midnight to midnight) and delivery of the sample to the laboratory for preparation and analysis. Samples are collected every day (1:1), every third day (1:3), every sixth day (1:6), every twelfth day (1:12) or weekly, depending on the data quality objectives of the project. Results of the analysis are reported as averages for the sample period. The EPA publishes the 1:3 and 1:6 day sampling schedules used nationwide and by the South Carolina Ambient Air Monitoring Network. [4]

Monitoring typically uses on-site analyzers that continuously sample the air and measure the pollutant of interest. Results of the analysis are reported as hourly averages. Five minute averages are reported for SO_2 concentrations. One minute averages are collected from many of the continuously monitored parameters for use in verification and validation of the reported monitoring data.

Changes for 2016

Any planned changes in parameters monitored, the configuration, or operations at the site planned for 2016 are described herein and summarized in the Summary of 2016 Network Changes. Unless otherwise indicated, changes at a site including the beginning of new monitoring activity will be effective January 1, 2016. Ozone monitoring for 2016 at new or special project sites may start at the beginning of the Ozone monitoring season (April-October).

[4] http://www.epa.gov/ttn/amtic/calendar.html

Network Summary

Network Summary: Calendar Year 2016 Air Monitoring Stations																			
Region	Sites	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	TSP/Lead	Ozone	SO_2	$NO_2/NO/NO_y$	CO	Sulfate	BC	Carbonyls	SVOC	VOC	Mercury	Precip Chem.	Precip.	*MET
Augusta-Richmond County, GA-SC MSA	2	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Charleston-N. Charleston MSA	5	3	2	0	1	0	2	2	2	0	1	1	0	0	0	0	0	0	1
Charlotte-Concord-Gastonia, NC-SC MSA	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Columbia MSA	7	4	2	1	3	1	3	3	3	1	0	1	2	3	0	2	2	2	2
Florence MSA	5	1	1	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Greenville-Anderson-Mauldin MSA	6	3	1	0	1	0	4	1	1	0	0	1	0	0	0	0	0	0	1
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Spartanburg MSA	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Rest of State	6	1	3	1	3	0	5	1	0	0	0	1	1	1	1	0	2	1	1
TOTALS	35	14	11	2	8	5	20	8	6	1	1	4	3	4	1	2	4	3	7

This summary table presents the elements of the 2016 Monitoring Plan after implementation of changes described in this plan.

*MET data includes wind speed and wind direction.

2014 Criteria Pollutant Design Values

This section presents the preliminary, uncertified 2014 design values for the South Carolina criteria pollutant monitoring network.

Site ID	County	Site Name	Ozone (ppm)	$PM_{2.5}$ Annual ($\mu g/m^3$)	$PM_{2.5}$ 24-hour ($\mu g/m^3$)	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 ($\mu g/m^3$) (2013-NOT 3 yrs DV)
001-0001	Abbeville	Due West	0.061									
003-0003	Aiken	Jackson Middle School	0.061									
007-0005	Anderson	Big Creek	0.062									
015-0002	Berkeley	Bushy Park	0.059									
019-0003	Charleston	Jenkins Avenue				*0	14	*36	*6			
019-0046	Charleston	Cape Romain	0.060				*6	*9	*2			
019-0048	Charleston	FAA		8.9	21							
019-0049	Charleston	Charleston Public Works		8.2	20							
021-0002	Cherokee	Cowpens	0.065									
025-0001	Chesterfield	Chesterfield	0.060	8.4	19	*						
029-0002	Colleton	Ashton	0.055									
031-0003	Darlington	Pee Dee	0.064									
037-0001	Edgefield	Trenton	0.055	9.3	20							
041-0003	Florence	Williams		9.6	20							
041-8001	Florence	JCI Railroad										0.04
041-8002	Florence	JCI Entrance										0.04
041-8003	Florence	JCI River										0.04
043-0006	Georgetown	Georgetown CMS										
043-0011	Georgetown	Howard High #3				*0						
045-0015	Greenville	Greenville ESC		10.0	22	*0	5	*45	*9			
045-0016	Greenville	Hillcrest	0.065	9.5	19							
045-1003	Greenville	Famoda	0.061									

Site ID	County	Site Name	Ozone (ppm)	$PM_{2.5}$ Annual ($\mu g/m^3$)	$PM_{2.5}$ 24-hour ($\mu g/m^3$)	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 ($\mu g/m^3$) (2013-NOT 3 yrs DV)
		Farms										
063-0008	Lexington	Irmo		10.3	22		41					
063-0009	Lexington	Cayce CMS										
063-0010	Lexington	Cayce City Hall				*0						
073-0001	Oconee	Long Creek	*0.060	*7.1	*16		*3					
077-0002	Pickens	Clemson	0.063									
077-0003	Pickens	Wolf Creek	*0.059									
079-0007	Richland	Parklane	0.058	9.4	20	*	12			1	1	
079-0019	Richland	Bates House		10.1	22	*0						
079-0021	Richland	Congaree Bluff	0.055				*13					
079-1001	Richland	Sandhill	0.064					*	*			
083-0009	Spartanburg	North Spartanburg	0.066									
083-0011	Spartanburg	T.K. Gregg		9.9	10							
091-0006	York	York CMS	0.060				*4					
* denotes design values that did not meet completeness requirements.												

Required Monitoring

The EPA regulation 40 CFR Part 58 Appendix D requires that each State maintain a minimum number of monitors to properly characterize air quality and to meet any required objectives of the monitoring network[5]. In general, these minimum requirements are based on the MSA population and current ambient air monitoring design values. The following sections discuss the minimum monitoring criteria for each of the criteria pollutants (Ozone, Particulate Matter ($PM_{2.5}$ and PM_{10}), Lead, SO_2, NO_2 and CO), the CBSAs, and the MSA population. The final section shows the current South Carolina minimum monitoring requirements.

Minimum Monitoring for Ozone – The Ozone minimum monitoring criteria has two requirements:

1) Required Ozone SLAMS sites – A minimum number of required Ozone SLAMS sites for each CBSA that is determined by CBSA population and the peak Ozone concentrations.

2) NCore Requirement – Each NCore site must include an Ozone monitor.

Minimum Monitoring for $PM_{2.5}$ – The $PM_{2.5}$ minimum monitoring criteria has six requirements:

1) Required $PM_{2.5}$ SLAMS sites – A minimum number of required $PM_{2.5}$ SLAMS sites for each CBSA.

2) Continuous Requirement – A continuous $PM_{2.5}$ monitoring requirement which is equal to at least one-half (round up) the minimum required $PM_{2.5}$ SLAMS sites. Also, at least one required continuous analyzer in each CBSA must be collocated with one of the required Federal Reference Method (FRM) or Federal Equivalent Method (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.

3) Regional Background and Transport – 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.

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.

5) Near-road $PM_{2.5}$ Monitoring – The EPA requires the collocation of one $PM_{2.5}$ monitor with a near-road NO_2 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 meets the population requirement for a collocated $PM_{2.5}$ monitor. The near-road monitoring requirement for the Charlotte-Concord-Gastonia, NC-SA MSA will be fulfilled by the Mecklenburg County Air Quality Commission.

6) Speciation Monitoring – Chemical speciation monitoring and analyses at sites designated and funded as part of the $PM_{2.5}$ Speciation Trends Network (STN).

Minimum Monitoring for PM_{10} – The PM_{10} minimum monitoring criteria has one requirement that is based on the CBSA population, the number of exceedances of the NAAQS and the percentage of PM_{10} concentrations over or under the NAAQS. Unlike other criteria pollutants, the minimum monitoring requirements for PM_{10} is given as a range of required monitoring sites for a CBSA.

Minimum Monitoring for Lead – The Lead minimum monitoring criteria has two requirements:

1) Facility Requirement – Any facility with annual Lead emissions exceeding 0.5 tpy will be required to have a Lead sampler.

2) NCore Requirement – NCore sites in CBSA with a population of 500,000 (as determined in the latest Census) or greater shall also measure Lead either as Pb-TSP or Pb-PM10.

[5] 40 CFR Part 58.11 paragraph (a)(3)(c) and Appendix D to 40 CFR Part 58.

Based on the state-submitted 2011 National Emissions Inventory, there are no facilities in South Carolina with Lead emissions greater than 0.5 tpy.

On May 7, 2010, the DHEC issued an air synthetic minor construction permit to Johnson Controls Battery Group for the Florence Recycling Center (Permit No. 1040-0129-CA). Under a settlement agreement[6] with several petitioners, the Florence Recycling Center supports source-oriented ambient Lead monitoring being conducted by the DHEC at several sites around the facility. Additional details of the monitoring of this facility can be found in the Florence MSA section of this Monitoring Plan under the site name "Johnson Controls."

Minimum Monitoring for SO_2 – The SO_2 minimum monitoring criteria has three requirements:

1) Requirement for Monitoring by the Population Weighted Emissions Index – The population weighted emissions index (PWEI) is determined using the most current population of each CBSA and the most recent level of SO_2 emissions for each county within the CBSA. The emissions data is available from the National Emissions Inventory. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO_2 monitors are required. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO_2 monitors are required. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required.

   The following table presents each CBSA's 2014 population, 2011 SO_2 emissions, calculated index and minimum monitoring requirements. The process for calculating the index can be found at the bottom of the table.

CBSA	2014 CBSA Population	2011 CBSA SO_2 Emissions (Tons)	PWEI	SO_2 Minimum Monitors Required
*Charlotte-Concord-Gastonia, NC-SC MSA	2,380,314	19735	46975.78	1
Greenville-Anderson-Mauldin MSA	862,463	7199	6209.05	1
Columbia MSA	800,495	17192	13762.39	1
Charleston-North Charleston MSA	727,689	26443	19242.15	1
*Augusta-Richmond County, GA-SC MSA	583,632	9567	5583.71	1
*Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	417,668	8914	3723.24	0
Spartanburg MSA	321,418	708	227.57	0
Florence MSA	207,030	8400	1739.08	0
Hilton Head Island-Bluffton-Beaufort MSA	203,022	586	119.06	0
Sumter MSA	107,919	183	19.73	0

The PWEI is calculated using US Census population data and state emission inventory data at the CBSA level. The population for each CBSA (based on the most recent US Census or Census estimate) is multiplied by the CBSA total SO_2 emissions (reported in tons using the latest National Emissions Inventory data). This product is divided by 1,000,000 to derive the index.

- CBSA with index greater than 1,000,000 will require 3 monitors.
- CBSA with index less than 1,000,000 but greater than 100,000 will require 2 monitors.
- CBSA with index less than 100,000 but greater than 5,000 will require 1 monitor.
- CBSA with index less than 5,000 will require no monitors.

*Monitors may be operated in the non-South Carolina portion of the CBSA.

[6] http://www.scdhec.gov/environment/JCI/docs/JCI-Settlement%20Agreement_07142010.pdf

1) Regional Administrator Required Monitoring – The Regional Administrator may require additional SO_2 monitoring sites above the minimum number of monitors required by the PWEI in areas that have the potential to have high SO_2 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 SO_2 Regional Administrator Required Monitoring

2) NCore Requirement – Each NCore site must include a SO_2 monitor.

Minimum Monitoring for NO_2 – The NO_2 minimum monitoring criteria has four requirements:

1) Near-road NO_2 Monitors – Each state must have one microscale near-road NO_2 monitoring site in each CBSA with a population of 500,000 or more persons. An additional near-road NO_2 monitoring site is required for any CBSA with a population of 2,500,000 or more, or in any CBSA with a population of 500,000 or more that has one or more roadway segments with 250,000 or greater Annual Average Daily Traffic (AADT) counts.

   On March 7, 2013, the EPA established staggered deadlines (phased deployment) for the establishment and operation of the required near-road NO_2 monitors. The phased deployment deadlines are as follows:

   a) One required near-road NO_2 monitor shall be operational in any CBSA with 1,000,000 or more by January 1, 2014 (phase 1).

   b) If a CBSA is required to have two near-road NO_2 monitors, the second monitor shall be operational by January 1, 2015 (phase 2).

   c) All remaining CBSAs having at least 500,000 or more, but less than 1,000,000 shall have their single near - road NO_2 monitor operational by January 1, 2017 (phase 3).

   All areas in South Carolina except the Charlotte-Concord-Gastonia, NC-SC MSA are part of the phase 3 deployment to be operational by 2017. The near-road monitoring requirement for the Charlotte-Concord-Gastonia, NC-SA MSA has been fulfilled by the Mecklenburg County Air Quality Commission.

   Adequate funding is necessary to ensure operation of this network. To date, the EPA has not been able to guarantee that funding will necessarily be available for the third phase of the deployment. The DHEC will review the Technical Assistance Document[7] and monitor progress of the deployment of near-road sites in other areas.

2) Requirements for Area-wide NO_2 Monitoring – Each state must have one monitoring site in each CBSA with a population of 1,000,000 or more persons which will monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales.

3) Regional Administrator Required Monitoring – The Regional Administrators, in collaboration with states, require a minimum of forty additional NO_2 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 site is a Regional Administrator Required Monitoring site.

4) NCore Requirement (NO_y Monitoring) – Each NCore site must include a NO/NO_y monitor that will collect data to be used to produce conservative estimates for NO_2 and further Ozone research.

Minimum Monitoring for CO – The CO minimum monitoring criteria has two requirements:

[7] http://www.epa.gov/ttn/amtic/nearroad.html

1) Near-road CO Monitors – Each state with CBSAs having a population of 1,000,000 or more people must have one CO monitor collocated with one required near-road NO_2 monitor to be operational by January 1, 2017. The Charlotte-Concord-Gastonia, NC-SC MSA is the only CBSA in South Carolina that meets the population requirement for a collocated CO monitor.

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

The CBSAs and the Minimum Monitoring Requirements – The term CBSA is a collective term for the defined MSAs and Micropolitan Statistical Areas (mSA). A MSA area contains a core urban area of 50,000 or more population, and a mSA contains an urban core of at least 10,000 (but less than 50,000) population. Each metropolitan or micropolitan area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core[8].

A MSA or mSA geographic composition, or list of geographic components at a particular point in time, is referred to as its "delineation." The MSA or mSA are delineated by the U.S. Office of Management and Budget (OMB) and are the result of the application of published standards based on Census Bureau data. The standards for delineating the areas are reviewed and revised once every ten years, prior to each decennial census. Generally, the areas are delineated using the most recent set of standards following each decennial census. Between censuses, the delineations are updated annually to reflect the most recent Census Bureau population estimates. Areas based on the 2010 standards and Census Bureau data were delineated in February of 2013.[9]

While the DHEC understands the need for establishing minimum monitoring requirements, the EPA appropriately has mechanisms within the monitoring plan approval and network assessment process to allow states the flexibility to implement a monitoring network that meets the three basic monitoring objectives and addresses National and State needs. The recent changes in the MSA definitions are an example of the reason for the incorporation of flexibility in the regulations and illustrates necessity that the EPA use the discretion available in the monitoring regulations to afford states flexibility and regulatory certainty.

Per 40 CFR Part 58 Appendix D paragraph 2 (e), minimum monitoring requirements in multi-state MSAs can be met through a cooperative agreement. In the absence of an agreement between states, the minimum monitoring requirements must be met independently in each portion of the MSA. South Carolina has established a memorandum of agreement (MOA) with the States of Georgia[10], North Carolina, and Mecklenburg County, North Carolina[11] which specifies the responsibilities of each party to develop a monitoring network that meets the appropriate monitoring objectives for the MSA.

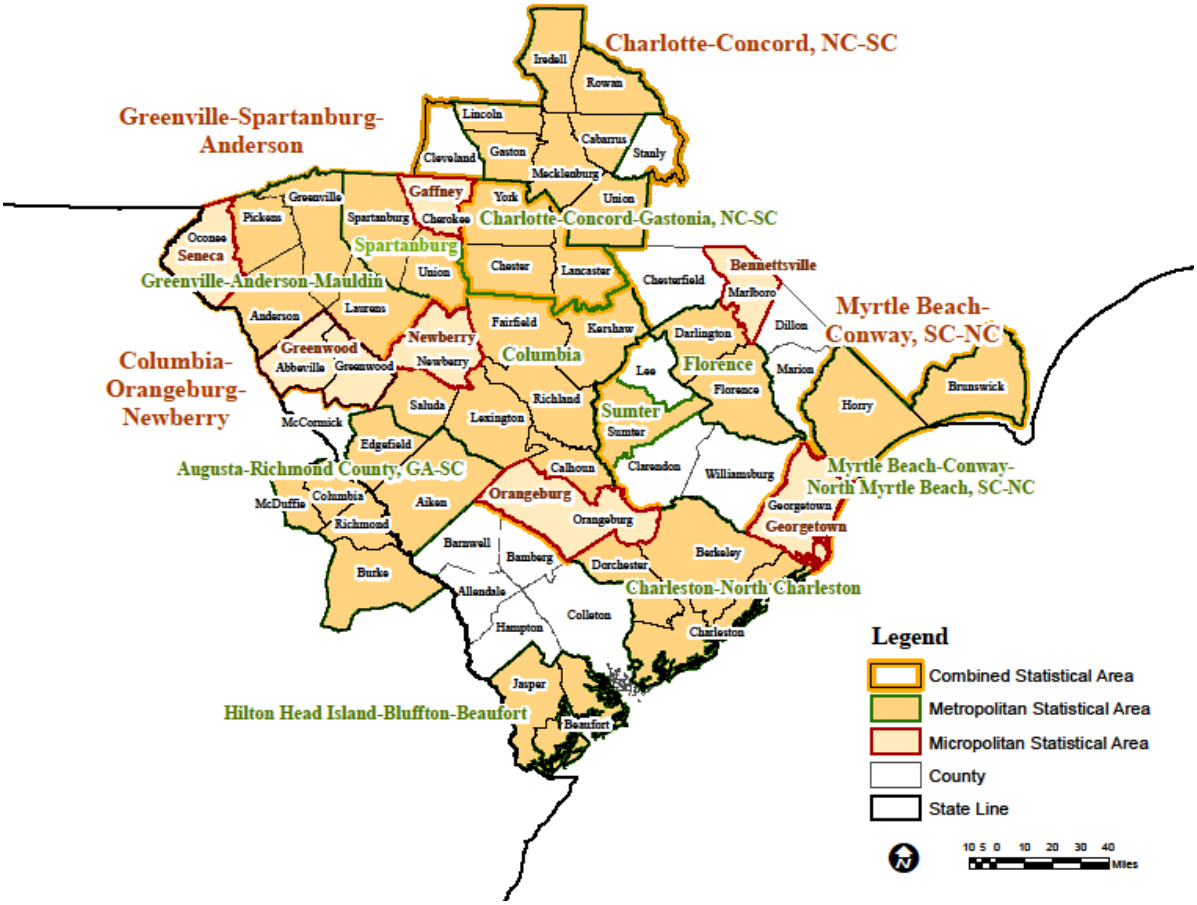
The map below presents South Carolina's CBSAs based on the definitions published in February 2013.

[8] http://www.census.gov/population/metro/

[9] http://www.census.gov/population/metro/data/

[10] The Memorandum of Agreement on Air Quality Monitoring for Criteria Pollutants for the Augusta-Richmond County Metropolitan Statistical Area (MSA) was signed on October 9, 2007 by the South Carolina DHEC Bureau of Air Quality and the Georgia Environmental Protection Division-Air Protection Branch.

[11] The Memorandum of Agreement on Air Quality Monitoring for Criteria Pollutants for the Charlotte-Gastonia-Concord Metropolitan Statistical Area (MSA) was signed on January 12, 2006 by the South Carolina DHEC Bureau of Air Quality, the North Carolina Department of Environmental and Natural Resources-Division of Air Quality and the Mecklenburg County, North Carolina Land Use and Environmental Service Agency-Air Quality.



Population and the Minimum Monitoring Requirements – The minimum monitoring criteria only applies to MSA's. The table below presents the latest (2014)* population estimates for each MSA in South Carolina and the total population of MSAs shared with North Carolina and Georgia.

MSA	Population
Charlotte-Concord-Gastonia, NC-SC MSA	2380314
Greenville-Anderson-Mauldin MSA	862463
Columbia MSA	800495
Charleston-North Charleston MSA	727689
Augusta-Richmond County, GA-SC MSA	583632
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	417668
Spartanburg MSA	321418
Florence MSA	207030
Hilton Head Island-Bluffton-Beaufort MSA	203022
Sumter MSA	107919
*****United States Census Bureau http://www.census.gov/population/metro/data/def.html and CFR 40 Part 58 Table D	

South Carolina Minimum Monitoring Requirements – Based on the *latest available United States Census population estimates and the 2014 ambient air quality design values (page 12), the minimum monitoring requirements for each MSA are:

MSA	Ozone	$PM_{2.5}$	$PM_{2.5}$ Cont.	PM_{10}	Lead	SO_2	NO_2	CO
**Augusta-Richmond County, GA-SC MSA	2	1	1	1-2	0	1	1	0
Charleston-North Charleston, MSA	1	1	1	1-2	0	1	1	0
**Charlotte-Concord-Gastonia, NC-SC MSA	2	2	1	2-4	0	1	2	1
Columbia MSA (NCore)	2	1	1	1-2	1	1	1	1
Florence MSA	1	0	0	0	0	0	0	0
Greenville-Anderson-Mauldin MSA	2	1	1	1-2	0	1	2	0
Hilton Head Island-Bluffton-Beaufort MSA	0	0	0	0	0	0	0	0
Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA	1	0	0	0-1	0	0	0	0
Spartanburg MSA	1	0	0	0-1	0	0	0	0
Sumter MSA	0	0	0	0	0	0	0	0

*****United States Census Bureau http://www.census.gov/population/metro/data/def.html and CFR 40 Part 58 Table D.

****** Minimum ambient air monitoring requirements are met cooperatively with the States of Georgia and North Carolina.

Summary of 2016 Network Changes

Augusta-Richmond County, GA-SC MSA (South Carolina portion includes Aiken and Edgefield Counties)

No changes planned for 2016.

Charleston-North Charleston MSA

No changes planned for 2016.

Charlotte-Concord-Gastonia, NC-SC MSA

No changes planned for 2016.

Columbia MSA

No changes planned for 2016.

Florence MSA

No changes planned for 2016.

Greenville-Anderson-Mauldin MSA

Greenville ESC (45-045-0015) - $PM_{2.5}$ Speciation sampling at this site was terminated due to a loss in federal funding.

Clemson CMS (45-077-0002) – Site will be terminated at the conclusion of the 2015 Ozone season.

Hilton Head Island-Bluffton-Beaufort MSA

No changes planned for 2016.

Myrtle Beach-Conway-North Myrtle Beach SC-NC MSA

Coastal Carolina (45-051-0008) – An ozone monitor will be established and become operational during the summer of 2015.

Spartanburg MSA

No changes planned for 2016.

Sumter MSA

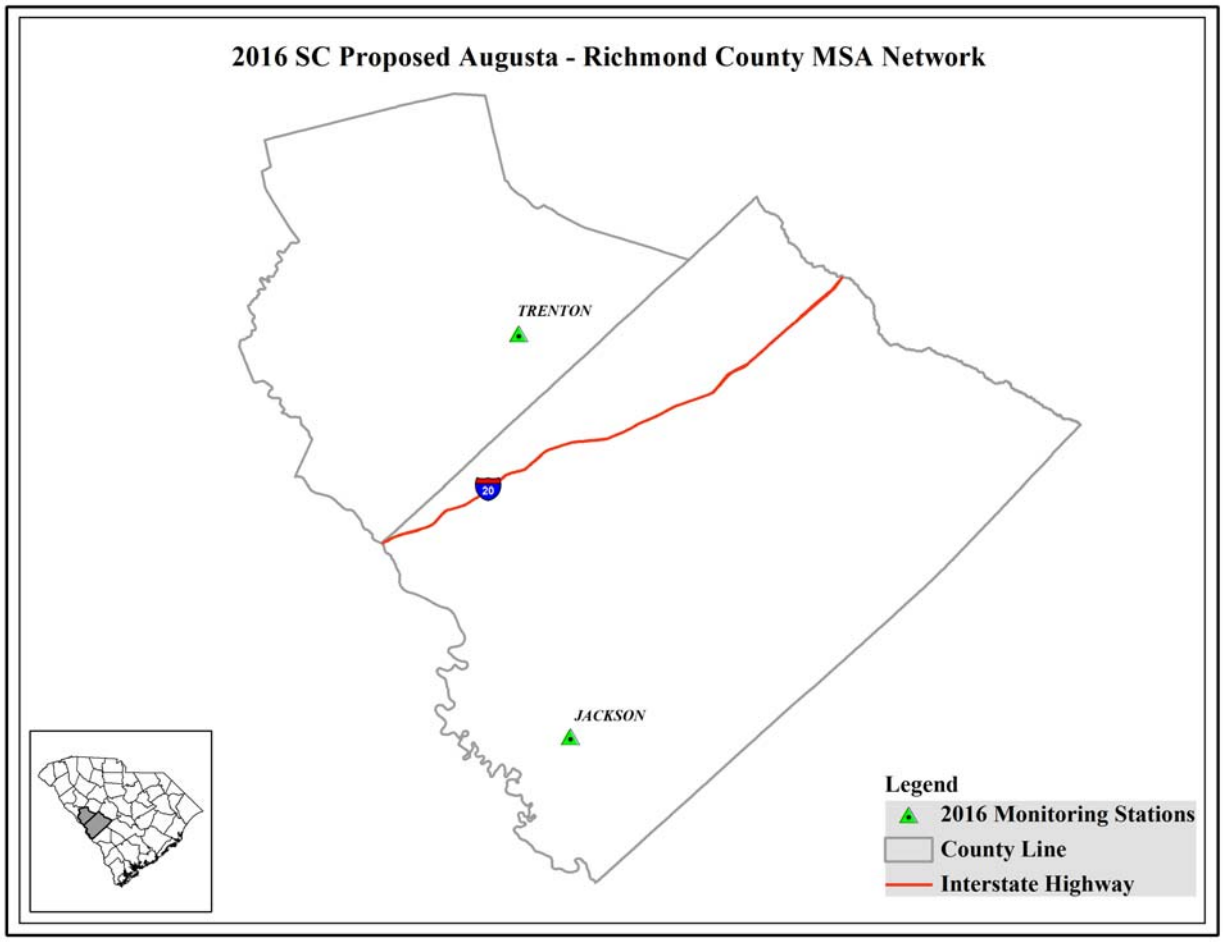
No changes planned for 2016.

Remainder of State

No changes planned for 2016.

Site Descriptions

Augusta-Richmond County, GA-SC MSA (part)



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead / TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-003-0003	Jackson Middle School						●												
45-037-0001	Trenton	○	○				●												
	TOTAL	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate / QA monitors

Jackson Middle School
CSA/MSA: none/Augusta-Richmond County MSA
AQS Site ID: 45-003-0003
Location: 8217 Atomic Road
County: Aiken
Coordinates: +33.34219, -81.78872
Date Established: October 24, 1985
Site Evaluation: The most recent site evaluation was conducted on June 14, 2006 (QA Check: March 29, 2012).

The Jackson Middle School site is located in southwestern Aiken County within the town limits of Jackson at the Jackson Middle School. Jackson is located in a suburban setting to monitor concentrations upwind of the Augusta urbanized area. The Jackson site monitors for Ozone. The sample inlet is 153 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Upwind Background	SLAMS	3.38	FEM Ultraviolet Photometry	Continuous

Trenton
CSA/MSA: none/Augusta-Richmond County MSA
AQS Site ID: 45-037-0001
Location: 660 Woodyard Road (Hwy 121)
County: Edgefield
Coordinates: +33.73993, -81.85362 **Date Established:** March 28, 1980
Site Evaluation: The most recent site evaluation was conducted on March 18, 2003 (QA Check: March 29, 2012).

The Trenton site is located in southeastern Edgefield County. Trenton was originally established to monitor for Ozone crossing into South Carolina from Georgia. The Trenton site has both FRM and continuous monitoring for $PM_{2.5}$. The sample inlets are 39 meters from the nearest road.

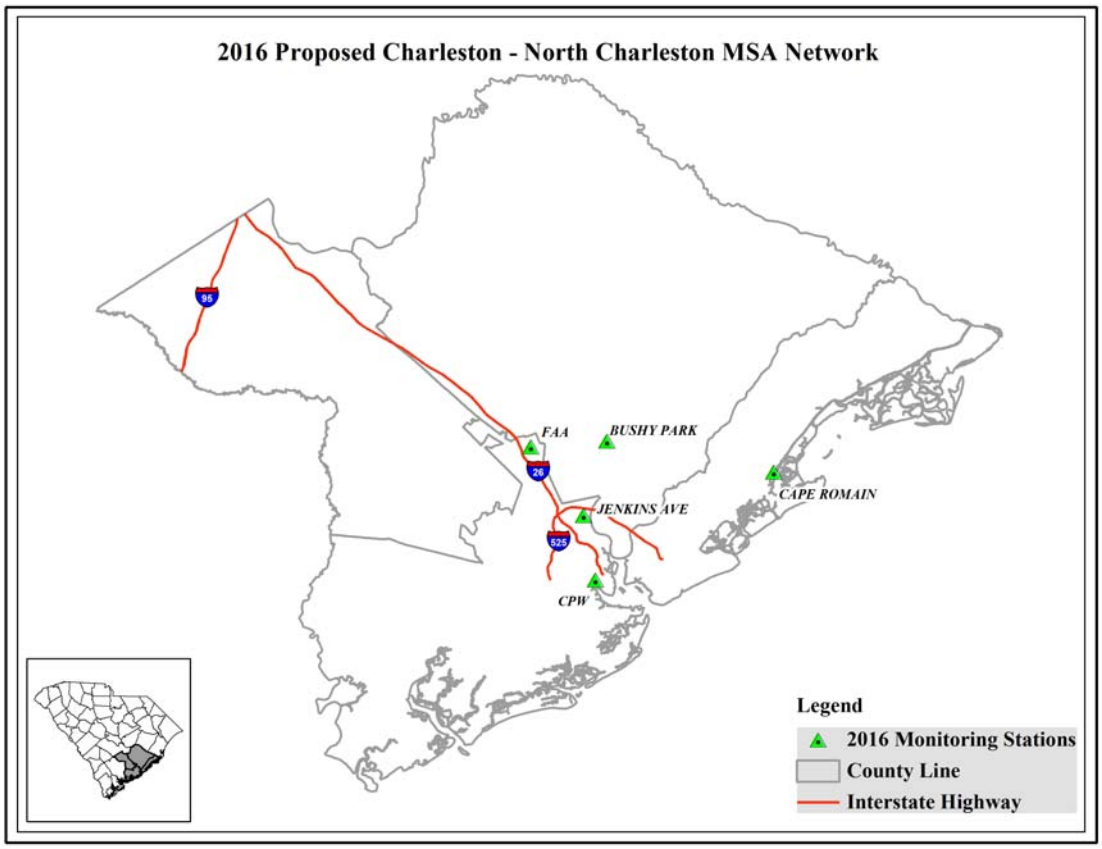
Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Urban	Extreme Downwind	SPM	4.5	FRM Gravimetric	1:3
Continuous $PM_{2.5}$	Urban	Extreme Downwind	SPM	4.5	TEOM 50°C	Continuous
Ozone	Urban	Maximum Ozone Concentration / Extreme Downwind	SLAMS	3.5	FEM Ultraviolet Photometry	Continuous

Charleston-North Charleston MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead / TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-015-0002	Bushy Park Pump Station						●												
45-019-0003	Jenkins Ave. Fire Station				●			●	○										
45-019-0046	Cape Romain		○				●	○	○		○	○							○
45-019-0048	FAA	○○																	
45-019-0049	CPW	●	○																
	TOTAL	3	2	0	1	0	2	2	2	0	1	1	0	0	0	0	0	0	1

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate / QA monitors

Bushy Park Pump Station
CSA/MSA: none/Charleston-North Charleston MSA
AQS Site ID: 45-015-0002
Location: River Oak Drive (Goose Creek)
County: Berkeley
Coordinates: +32.98724, -79.93671 **Date Established:** June 20, 1978
Site Evaluation: The most recent site evaluation was conducted on March 17, 2003 (QA Check: May 19, 2011).

The Bushy Park Pump Station site is located in southeastern Berkeley County downwind from the Charleston urban area. This site monitors for Ozone and the monitoring objective is maximum Ozone concentration. The sample inlets are 11 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016, but encroaching vegetation may require changes to the site or relocation.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	3.12	FEM Ultraviolet Photometry	Continuous

Jenkins Ave. Fire Station
CSA/MSA: none/Charleston-North Charleston MSA
AQS Site ID: 45-019-0003
Location: 4830 Jenkins Ave.
County: Charleston
Coordinates: +32.88228, -79.97755 **Date Established:** February 14, 1969
Site Evaluation: The most recent site evaluation was conducted on March 2, 2005 (QA Check: June 2, 2011).

The Jenkins Ave. Fire Station site is located in the city of North Charleston behind a fire station in an urban and central city setting. The Jenkins Ave. Fire Station site supports monitors for PM_{10}, SO_2, and NO_2. The sample inlets are 9 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM_{10}	Neighbor-hood	Highest Concentration	SLAMS	3.84	FEM TEOM	Continuous
Sulfur Dioxide	Neighbor-hood	Population Exposure	SLAMS	4.18	FEM UV Fluorescence	Continuous
Nitrogen Dioxide	Neighbor-hood	Highest Concentration Source Oriented	SPM	4.18	FRM Chemiluminescence	Continuous

Cape Romain

CSA/MSA: none/Charleston-North Charleston MSA
AQS Site ID: 45-019-0046
Location: 390 Bulls Island Road (Awendaw)
County: Charleston
Coordinates: +32.94101, -79.65719
Date Established: July 11, 1983
Site Evaluation: The most recent site evaluation was conducted on June 3, 2005 (QA Check: April 21, 2011).

The Cape Romain site is located in Charleston County at the Cape Romain National Wildlife Refuge (NWR) near Moore's Landing. The Cape Romain NWR is a Class I area about 20 miles northeast of Charleston. The majority of the Refuge area is offshore extending from Bull Island 20 miles northeast to Cape Romain. The Refuge is bordered on the west by the Intracoastal Waterway. Inland are large tracts of forests with scattered residences. Several miles inland, a primary coastal route, US Highway (Hwy) 17, parallels the coast, with some development along the section of highway that is closest to the Refuge.

The Cape Romain site has continuous monitors for SO_2, NO_2, Ozone, BC, sulfate, $PM_{2.5}$, and meteorological parameters. The sample inlets are 18 meters from the nearest road.

The Cape Roman site is collocated with the Interagency Monitoring of Protected Visual Environments (IMPROVE) sampling site and nearby monitoring performed by other agencies includes precipitation chemistry, $PM_{2.5}$ speciation, and mercury deposition. The site has been used for multiple interagency and regional air monitoring projects.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

(Table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Urban	General Background	SPM	4.70	TEOM 30°C	Continuous
Ozone	Regional	General Background	SLAMS	4.51	FEM Ultraviolet Photometry	Continuous
Sulfur Dioxide	Regional	Source Oriented	SPM	4.51	FEM UV Fluorescence	Continuous
Nitrogen	Regional	General	SPM	4.51	FRM	Continuous

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Dioxide		Background			Chemiluminescence	
Sulfate	Regional	General Background	Non-regulatory	4.00	Catalytic thermal reduction / Pulsed fluorescence	Continuous
Black Carbon	Regional	General Background	Non-regulatory	4.00	Optical absorption	Continuous
Wind Speed / Direction	Neighbor-hood	Local Conditions	Non-regulatory	10.00	Instruments for wind speed and direction, and precipitation	Continuous

FAA
CSA/MSA: none/Charleston-North Charleston MSA
AQS Site ID: 45-019-0048
Location: 2670 Elms Plantation Blvd
County: Charleston
Coordinates: +32.98024, -80.06502
Date Established: April 9, 1999
Site Evaluation: The most recent site evaluation was conducted on May 4, 2006 (QA Check: May 19, 2011).

The Charleston FAA Beacon site is located in Charleston County approximately five miles northwest of the Charleston International Airport near Charleston Southern University. This site has collocated $PM_{2.5}$ samplers. The sample inlets are 50 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure	SPM	2.35	FRM Gravimetric	1:1
Collocated $PM_{2.5}$	Neighbor-hood	Population Exposure	QA Collocated	2.38	FRM Gravimetric	1:6

Charleston Public Works (CPW)

CSA/MSA: none/Charleston-North Charleston MSA
AQS Site ID: 45-019-0049
Location: 360 Fishburne Street
County: Charleston
Coordinates: +32.79097, -79.95871
Date Established: November 20, 1998
Site Evaluation: The most recent site evaluation was conducted on April 24, 2006. (QA Check: June 02, 2011).

The CPW site is located on the western side of the Charleston peninsula near downtown Charleston. The CPW site supports the required $PM_{2.5}$ monitors for the MSA. The sample inlets are 28 meters from the nearest road.

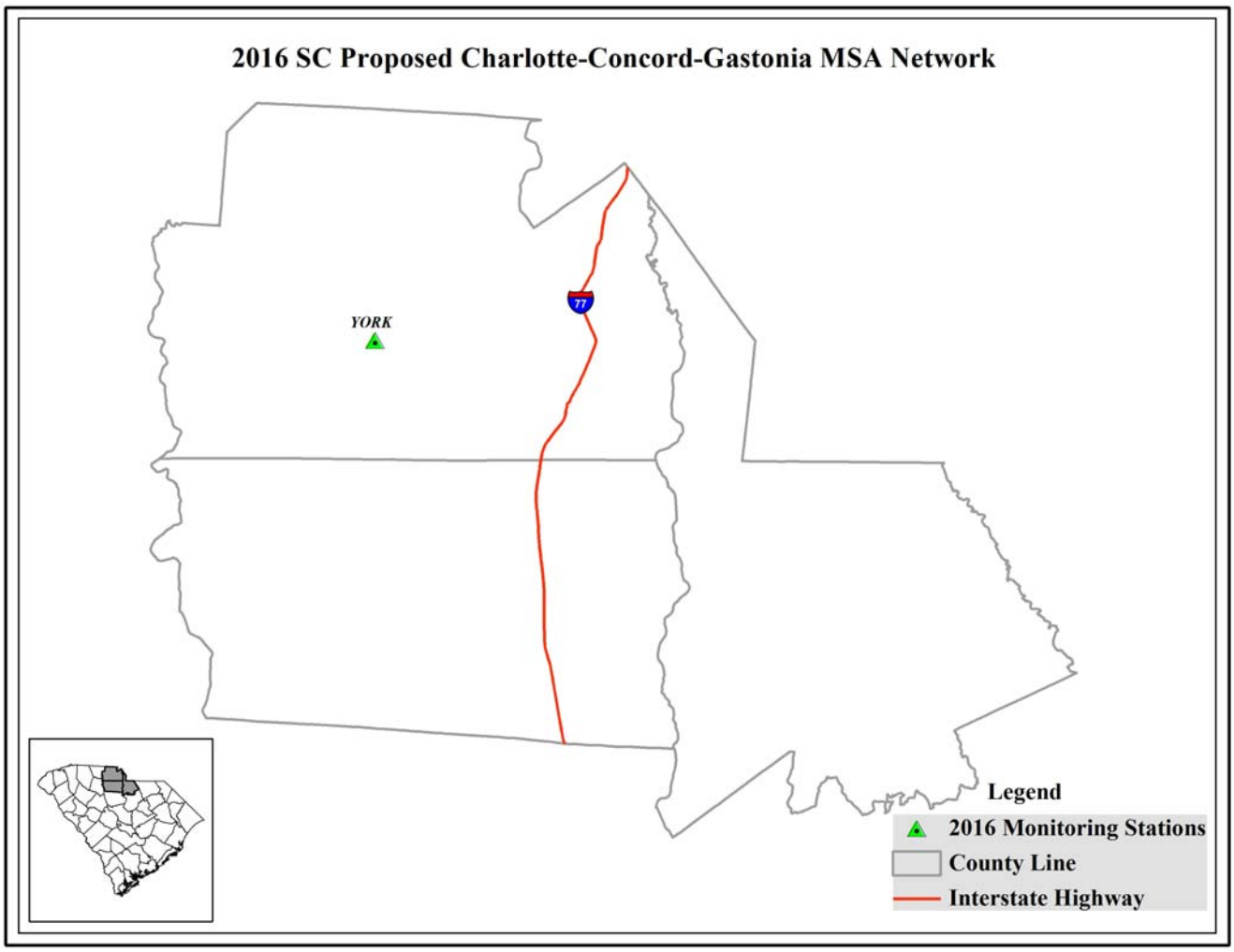
Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure	SLAMS	2.25	FRM Gravimetric	1:1
$PM_{2.5}$	Neighbor-hood	Population Exposure	SPM	2.77	TEOM	Continuous

Charlotte-Concord-Gastonia MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead / TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-091-0006	York CMS						●	○											○
	TOTAL	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
○ SPM / Other ● SLAMS ●●/○○ indicates duplicate / QA monitors																			

York Continuous Monitoring Site (CMS)

CSA/MSA: Charlotte-Concord CSA / Charlotte-Concord-Gastonia MSA
AQS Site ID: 45-091-0006
Location: 2316 Chester Hwy (US 321)
County: York
Coordinates: +34.93581, -81.22838
Date Established: March 30, 1993
Site Evaluation: The most recent site evaluation was conducted on June 13, 2006 (QA Check: May 21, 2013).

The York CMS site is located in south central York County in a rural setting. The site was established to represent background levels near the Charlotte urban area. York CMS has monitors for Ozone and SO_2, as well as a wind tower. The long historical record and location of the site make the data useful to both North and South Carolina Air Programs. The sample inlets are 171 meters from the nearest road.

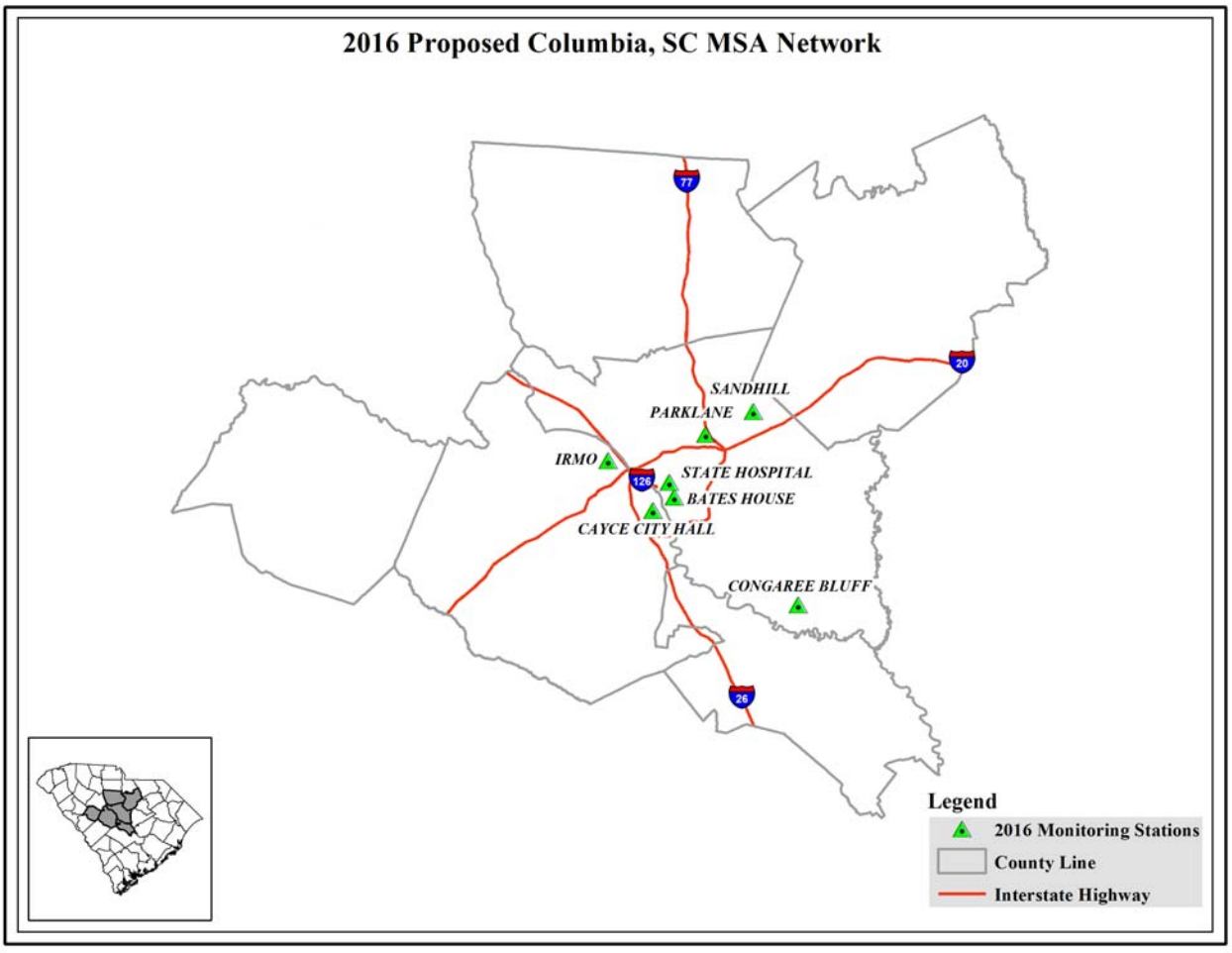
Changes for 2016:

This site is not expected to be available in 2016 and will be replaced by a monitoring station established nearby and representative of the same area.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Upwind Background	SLAMS	4.72	FEM Ultraviolet Photometry	Continuous
Sulfur Dioxide	Urban	Upwind Background	SPM	4.72	FEM UV fluorescence	Continuous
Wind Speed / Direction	Neighbor-hood	Local Conditions	Non-regulatory	10.0	Instruments for wind speed, wind direction	Continuous

Columbia MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead /TSP	Ozone	SO_2	NO_2/NO/NO_y	CO	Sulfate	BC	Carbonyls	SVOC	VOC	Mercury	Precip Chem.	Precip.	MET
45-063-0008	Irmo	●	O					O				O	O	O					
45-063-0010	Cayce City Hall				●														
45-079-0007	Parklane (NCore)	●	O	●	O	●	●	●	●*	●				O			O	O	O
45-079-0019	Bates House (USC)	●●			●														
45-079-0020	State Hospital												O	O					
45-079-0021	Congaree Bluff						O	O								OO	O	O	
45-079-1001	Sandhill						●		O										O
	TOTAL	4	2	1	3	1	3	3	3	1	0	1	2	3	0	2	2	2	2

O SPM / Other

●●/OO indicates duplicate / QA samplers

● SLAMS/NCore *NO and NO_y are being monitored

Irmo
CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-063-0008
Location: 200 Leisure Lane
County: Lexington
Coordinates: +34.051017, -81.15492
Date Established: April 7, 1989
Site Evaluation: The most recent site evaluation was conducted on February 25, 2005 (QA Check: March 06, 2012).

The Irmo site is located in Lexington County near the Town of Irmo. This site has a sampler for $PM_{2.5}$ and continuous monitors for SO_2, BC, and $PM_{2.5}$. Additionally, this site has samplers collecting carbonyl and SVOC samples on a 1:6 schedule. The sample inlets are 43 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016, but changes in the property use by the land owner may require relocation of the monitors on or near the property.

Monitors:

(Table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure	SLAMS	4.95	FRM Gravimetric	1:1
$PM_{2.5}$	Neighbor-hood	Population Exposure	SPM	4.55	TEOM 30°C	Continuous
Sulfur Dioxide	Neighbor-hood	Source-Oriented	SPM	3.23	FEM UV fluorescence	Continuous
Black Carbon	Urban	Population Exposure / General Background	Non-regulatory	4.0	Optical absorption	Continuous
Carbonyls	Neighbor-hood	Population Exposure/ General Background	Non-regulatory	3.9	HPLC Ultraviolet Absorption	1:6
SVOC	Neighbor-	Population	Non-	3.9	PUF/GCMS	1:6

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
	hood	Exposure/ General Background	regulatory			

Cayce City Hall

CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-063-0010
Location: 1830 Morlaine Rd.
County: Lexington
Coordinates: +33.96914, -81.06629
Date Established: December 6, 2007
Site Evaluation: PENDING (QA Check: March 06, 2012).

The Cayce City Hall site is located in the City of Cayce and measures PM_{10}. This site was established to measure PM_{10} concentrations in populated areas and to determine the potential impact of occasional high concentrations on neighborhoods surrounding the industrialized area. The sample inlet is 32 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM_{10}	Neighbor-hood	Population Exposure	SLAMS	2.4	TEOM	Continuous

Parklane (NCore)
CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-079-0007
Location: 8311 Parklane Road
County: Richland
Coordinates: +34.09398, -80.96230
Date Established: April 3, 1980
Site Evaluation: The most recent site evaluation was conducted on March 22, 2007 (QA Check: March 01, 2012).

The Parklane site is located in north central Richland County within the city limits of Columbia. Parklane was originally sited to provide downwind population exposure measurements at the edge of the Columbia urban area population and has been expanded to support the full complement of NCore parameters. The suite of samplers measure $PM_{2.5}$, speciated $PM_{2.5}$, Lead, precipitation chemistry, precipitation, and SVOC. The suite of continuous monitors measure $PM_{2.5}$, Ozone, SO_2, CO, NO, and nitrogen oxides (NO_y). The site also provides support for demonstration, training, and equipment evaluation convenient to the DHEC's Columbia air laboratory. The sample inlets are 57 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

*Bolded parameters are a NCore requirement.

(Table continues on next page)

Parameter ***Required**	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure	NCore	4.82	FRM Gravimetric	1:3
$PM_{2.5}$	Neighbor-hood	Population Exposure	SPM	4.90	TEOM	Continuous
Speciated $PM_{2.5}$	Neighbor-hood	Population Exposure	NCore	2.50	CSN Protocol	1:3
PM_{10}	Neighbor-hood	Population Exposure	NCore	4.4	TEOM	Continuous
$PM_{10-2.5}$	Neighbor hood	Population Exposure	NCore	4.4	Gravimetric FRM Pair	1:3
Lead	Neighbor-hood	Population Exposure	NCore	2.5	GFAA	1:6

Parameter ***Required**	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	NCore	4.13	FEM Ultraviolet Photometry	Continuous
Sulfur Dioxide	Neighbor-hood	Population Exposure	NCore	4.13	Pulsed Florescence	Continuous
Nitric Oxide	Neighbor-hood	Population Exposure	NCore	10	Chemi-luminesence	Continuous
NO_y	Neighbor-hood	Population Exposure	NCore	10	Chemi-luminesence	Continuous
Carbon Monoxide	Neighbor-hood	Population Exposure	NCore	4.13	Gas filter Correlation	Continuous
SVOC	Neighbor-hood	Population Exposure	SPM	2.5	PUF-GC/MS	1:6
Precipitation chemistry	Neighbor-hood	Regional Transport	Non-regulatory	1.4	Not applicable	Weekly-Tues-Tues
Precipitation	Neighbor-hood	General/ Background	Non-regulatory	1.1	Tipping bucket	Continuous and Sample
Wind Speed / Direction	Neighbor-hood	Local Conditions	Non-regulatory	10.0	Instruments for wind speed, wind direction	Continuous

Bates House-University of South Carolina (USC)
CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-079-0019
Location: 323 S. Bull Street
County: Richland
Coordinates: +33.99150, -81.02413
Date Established: November 24, 1998
Site Evaluation: The most recent site evaluation was conducted on March 17, 2003 (QA Check: March 01, 2012).

The Bates House (USC) site is located in Richland County on the University of South Carolina-Columbia campus. The Bates House site has a sampler for $PM_{2.5}$ and collocated precision sampling for $PM_{2.5}$. The site also has collocated wind measurement equipment (3m) operated by the USC Geography Department. The sample inlets are 28 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure	SLAMS	2.41	FRM Gravimetric	1:1
Collocated $PM_{2.5}$	Neighbor-hood	Quality Assurance	QA Collocated	2.40	Gravimetric	1:6
PM_{10}	Neighbor-hood	Population Exposure	SLAMS	2.24	TEOM	Continuous

State Hospital

CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-079-0020
Location: 2100 Bull Street
County: Richland
Coordinates: +34.01549, -81.03418
Date Established: January 7, 1999
Site Evaluation: The most recent site evaluation was conducted on February 9, 2006 (QA Check: March 20, 2012).

The State Hospital site is located in Columbia near the intersection of Elmwood Avenue and Bull Street on the grounds of the South Carolina State Hospital. State Hospital has samplers for carbonyls and SVOC. The sample inlets are 10 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016. Access to this site may be lost due to recent sale and expected redevelopment of the property.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Carbonyls	Middle Scale	Highest Concentration	Non-regulatory	4.23	HPLC Ultraviolet Absorption	1:6
SVOC	Neighbor-hood	General / Background	Non-regulatory	2.87	PUF-GC/MS	1:6

Congaree Bluff

CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-079-0021
Location: 1850 South Cedar Creek Road
County: Richland
Coordinates: +33.81467, -80.78113
Date Established: December 27, 1999
Site Evaluation: The most recent site evaluation was conducted on April 11, 2005 (QA Check: March 20, 2012).

The Congaree Bluff site is located in southern Richland County. The site is located in a rural setting within the boundaries of the Congaree National Park. The Congaree Bluff monitoring continues a data record begun in 1981 with the establishment of the Congaree Swamp site (45-079-1006). The original site was established in cooperation with the Department of the Interior and the support of the General Assembly to provide long term monitoring in this unique area. The Congaree Swamp site was located in the flood plain and had to be relocated to the current Congaree Bluff site in 2001. This site is also part of the National Atmospheric Deposition Program-Mercury Deposition Network (NADP-MDN)

The Congaree Bluff site has monitors for Ozone, SO_2, mercury vapor, and precipitation. Congaree Bluff also has samplers for mercury deposition and precipitation chemistry. The sample inlets are 191 meters from the nearest road. The National Park Service also collects wind data on a collocated 30 meter wind tower.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

(Table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	General / Background	SPM	4.23	FEM Ultraviolet Photometry	Continuous
Sulfur Dioxide	Urban	General / Background	SPM	4.23	FEM UV Fluorescence	Continuous
Mercury (vapor)	Urban	Source Oriented	Non-regulatory	4.23	Cold Vapor Atomic Fluorescence	Continuous
Mercury Deposition	Urban	Source Oriented	NADP-MDN	1.71	MDN protocol	Weekly

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Precipitation chemistry	Regional	Regional Transport	Non-regulatory	1.5	IC	Weekly-Tue-Tue
Precipitation	Neighbor-hood	General/ Background	Non-regulatory	1.73	Tipping Bucket	Continuous and Sample

Sandhill Experimental Station

CSA/MSA: Columbia-Orangeburg-Newberry CSA / Columbia MSA
AQS Site ID: 45-079-1001
Location: 900 Clemson Road
County: Richland
Coordinates: +34.13126, -80.86832
Date Established: January 1, 1959
Site Evaluation: The most recent site evaluation was conducted on July 1, 2002 (QA Check: March 01, 2012).

The Sandhill Experimental Station site is located in northeastern Richland County, downwind from the Columbia metropolitan area. This site is located in a rapidly urbanizing portion of the city of Columbia. The Sandhill site measures NO_2, Ozone, wind direction, and wind speed. The sample inlets are 33 meters from the nearest road.

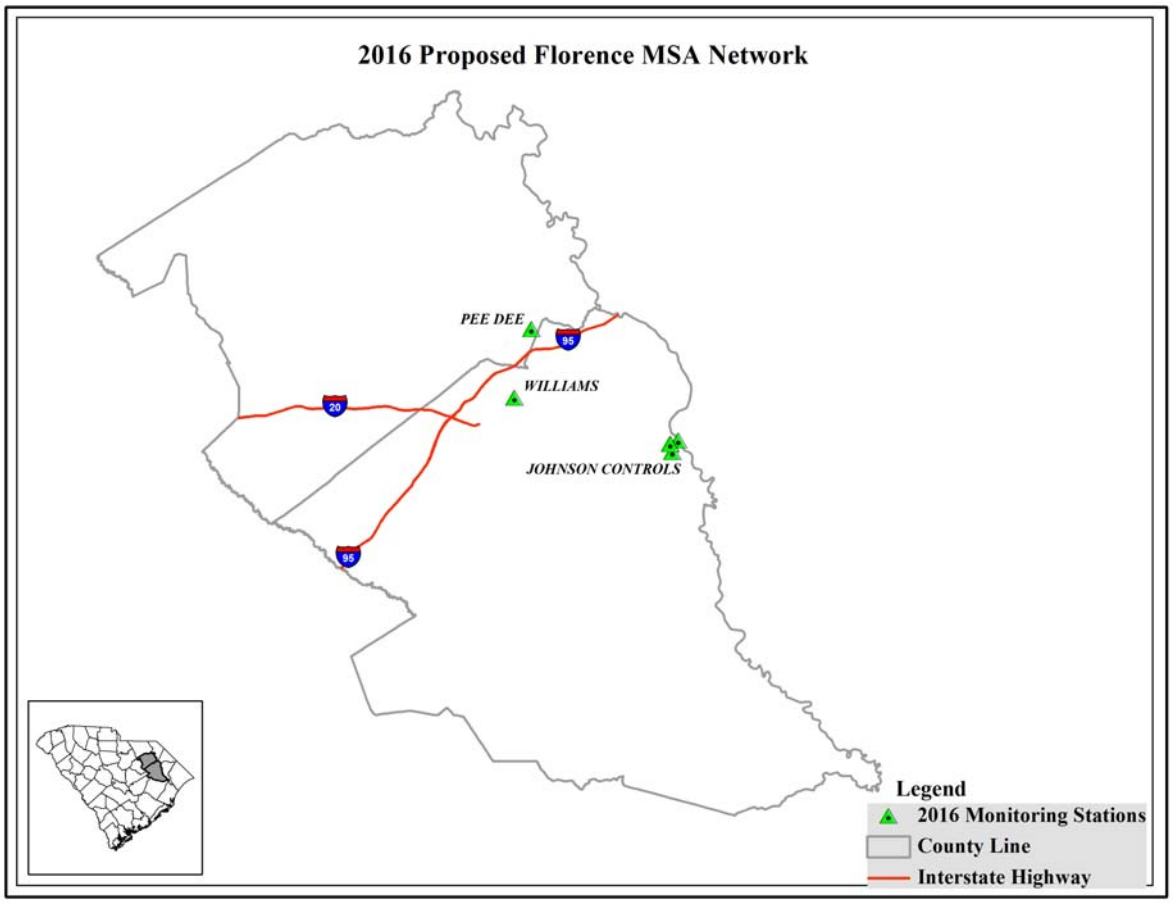
Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	4.15	FEM Ultraviolet Photometry	Continuous
Nitrogen Dioxide	Urban	General / Background Max Precursor Emissions Impact	SPM	4.15	FRM Chemiluminescence	Continuous
Wind Speed / Direction	Neighbor-hood	Local Conditions	Non-regulatory	10.0	Instruments for wind speed and wind direction	Continuous

Florence MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead / TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-031-0003	Pee Dee Exp. Station						●												
45-041-0003	Williams Middle School	●	O																
45-041-8001, 8002, 8003	Johnson Controls					O*													
	TOTAL	1	1	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0

O SPM / Other
● SLAMS
●●/OO indicates duplicate / QA monitors
* See details on page for number of samplers

Pee Dee Experimental Station
CSA/MSA: none/Florence MSA
AQS Site ID: 45-031-0003
Location: 2200 Pocket Road (Darlington)
County: Darlington
Coordinates: +34.28569, -79.74485
Date Established: February 25, 1993
Site Evaluation: The most recent site evaluation was conducted on March 14, 2006 (QA Check: May 5, 2011).

The Pee Dee Experimental Station site is located in northeastern Darlington County. This site serves as the required Ozone monitor in the Florence MSA. The sample inlets are 91 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration/ General Background	SLAMS	3.92	FEM Ultraviolet Photometry	Continuous

Williams Middle School
CSA/MSA: none/Florence MSA
AQS Site ID: 45-041-0003
Location: 1119 N. Irby Street
County: Florence
Coordinates: +34.21427, -79.76735
Date Established: August 4, 2008
Site Evaluation: PENDING (QA Check: May 5, 2011).

The Williams Middle School site is located in Florence County. The DHEC established the Williams site to meet the 40 CFR Part 58 Appendix D requirements for objective and collocated continuous monitoring and reporting.

The Florence MSA has one $PM_{2.5}$ sampler. A collocated continuous monitor is also required to provide timely reporting of concentrations to the public. The sample inlets are 91 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure Highest Concentration	SLAMS	2.70	FRM Gravimetric	1:3
$PM_{2.5}$	Neighbor-hood	Population Exposure Highest Concentration	SPM	3.04	TEOM	Continuous

Johnson Controls (3 Sites-JCI Railroad, JCI Entrance, JCI Woods)
CSA/MSA: none/Florence MSA
AQS Site ID: 45-041-8001, 8002, 8003
Location: Liberty Chapel @ Bethel Rd., Liberty Chapel @ Paper Mill Rd., Liberty Chapel @ Paper Mill Rd.
County: Florence
Coordinates: +34.15567, -79.56981; +34.16413, -79.572330; +34.16747, -79.56266
Site Evaluation: PENDING

Johnson Controls Incorporated (JCI) is located in Florence County. On May 7, 2010, the DHEC issued an air synthetic minor construction permit to Johnson Controls Battery Group for the Florence Recycling Center (Permit No. 1040-0129-CA). Under a settlement agreement[7] with several petitioners, the Florence Recycling Center will conduct source-oriented ambient Lead monitoring at three locations around the facility.

Sampling frequency may be increased if needed for special investigations.

Changes for 2016:

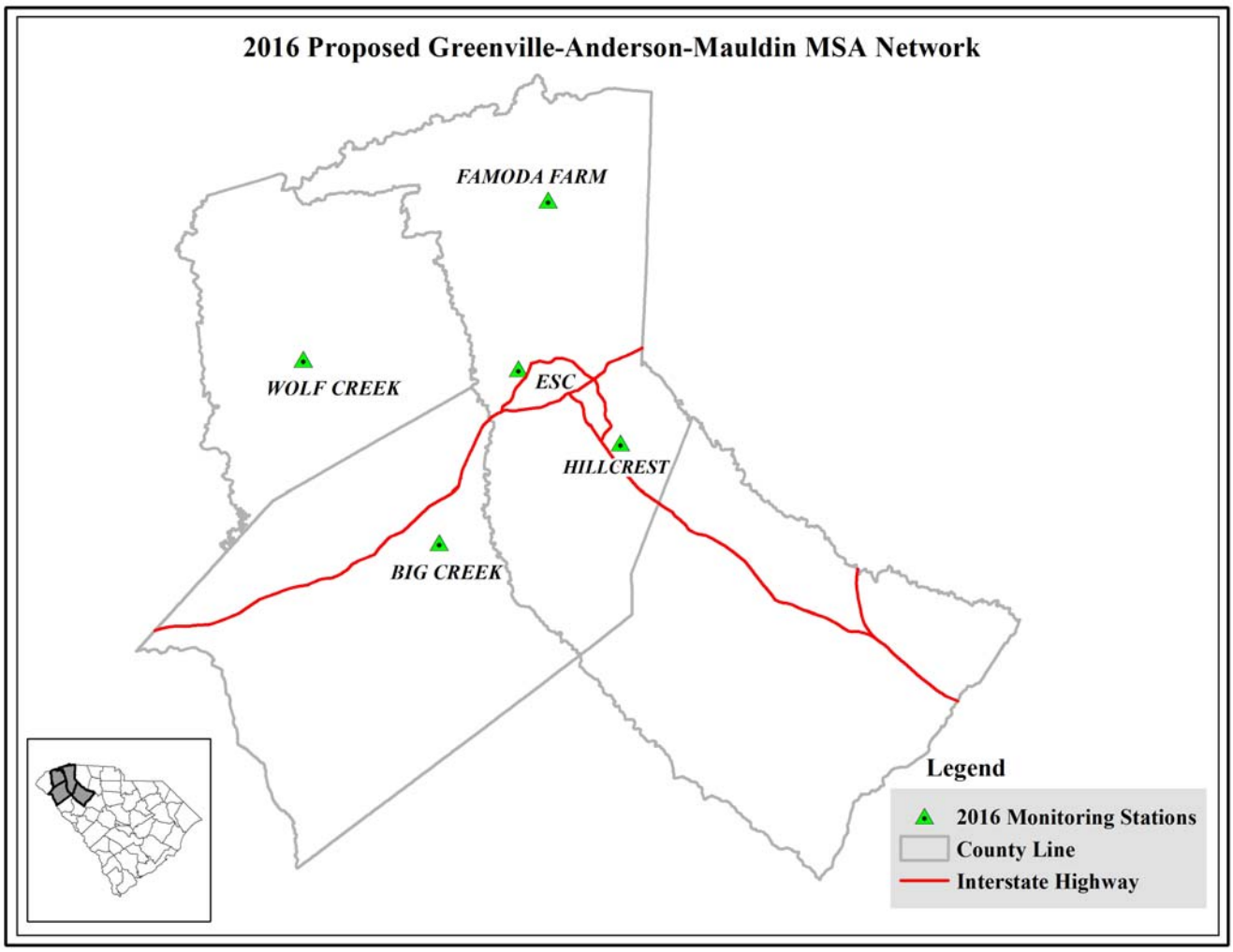
There are no changes planned for 2016.

Monitors:

Site ID	Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency*
041-8001	Lead	Middle	Source oriented	SPM	2.4	GFAA or ICP/MS	1:6
041-8002	Lead	Middle	Source oriented	SPM	2.5	GFAA or ICP/MS	1:6
041-8002	Collocated Lead	Middle	Source oriented	SPM	2.5	GFAA or ICP/MS	1:6
041-8003	Lead	Middle	Source oriented	SPM	2.5	GFAA or ICP/MS	1:6

*Sampling frequency no less than 1:6

Greenville-Anderson-Mauldin MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead /TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-007-0005	Big Creek						●												
45-045-0015	Greenville ESC	●	O		●			●	●			O							O
45-045-0016	Hillcrest	●●					●												
45-045-1003	Famoda Farm						●												
45-077-0003	Wolf Creek						O												
	TOTAL	3	1	0	1	0	4	1	1	0	0	1	0	0	0	0	0	0	1

O SPM / Other
● SLAMS
●●/OO indicates duplicate / QA samplers

Big Creek
CSA/MSA: Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Mauldin MSA
AQS Site ID: 45-007-0005
Location: 215 McAlister Road
County: Anderson
Coordinates: +34.62324, -82.53206
Date Established: June 4, 2008
Site Evaluation: PENDING (QA Check: December 4, 2012).

The Big Creek site is located northeast of the City of Anderson. The site was established to represent maximum Ozone concentrations in the Anderson MSA, downwind of Anderson and upwind background for the Greenville MSA. In February 2013, the MSA definitions were changed and this site is now contained within the Greenville-Anderson-Mauldin MSA. The sample inlet is 49 feet from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration / Upwind Background	SLAMS	4.24	FEM Ultraviolet Photometry	Continuous

Greenville Employment Security Commission (ESC)
CSA/MSA: Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Mauldin MSA
AQS Site ID: 45-045-0015
Location: 133 Perry Avenue
County: Greenville
Coordinates: +34.84389, -82.41458
Date Established: April 11, 2008
Site Evaluation: PENDING (QA Check: April 30, 2013).

The Greenville ESC site is located in the city of Greenville and was established on April 11, 2008. This site supports a FRM $PM_{2.5}$ sampler and a continuous FEM TEOM monitoring for $PM_{2.5}$. It also supports speciated $PM_{2.5}$, PM_{10}, SO_2, NO_2, sulfate, BC, and measurements for wind speed and wind direction. The sample inlets are 15 meters from the nearest road.

The EPA Region 4 has selected this site as one of the locations for a Regional Administrator required NO_2 monitor to help protect susceptible and vulnerable populations as required by 40 CFR, Part 58, Appendix D, Section 4.3.4.

Changes for 2016:

$PM_{2.5}$ Speciation sampling at this site was terminated due to a loss in federal funding.

Monitors:

(Table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Population Exposure / Welfare Related Impacts	SLAMS	3.39	FRM Gravimetric	1:1
$PM_{2.5}$	Neighbor-hood	Population Exposure Required FEM Collocation	SPM	4.40	FEM TEOM	Continuous
PM_{10}	Neighbor-hood	Population Exposure	SLAMS	4.35	FEM TEOM	Continuous
Sulfur Dioxide	Neighbor-hood	Population Exposure	SLAMS	4.51	FEM UV fluorescence	Continuous
Nitrogen	Neighbor-	Population	SLAMS	4.51	FRM	Continuous

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Dioxide	hood	Exposure			Chemilumi-nescence	
Black Carbon	Neighbor-hood	Population Exposure / General Background	Non-regulatory	4.44	Optical absorption	Continuous
Wind Speed / Direction	Neighbor-hood	Local Conditions	Non-regulatory	10.00	Instruments for wind speed and wind direction	Continuous

Hillcrest Middle School
CSA/MSA: Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Mauldin MSA
AQS Site ID: 45-045-0016
Location: 510 Garrison Road
County: Greenville
Coordinates: +34.75185, -82.25670
Date Established: February 17, 2009
Site Evaluation: PENDING (QA Check: April 30, 2013).

The Hillcrest Middle School site represents suburban areas near the interstate corridors in the Greenville MSA. Initiated in 2008, this site was selected as a monitoring location based on results of the Greenville MSA Ozone study. This site supports an Ozone monitor, a FRM $PM_{2.5}$ sampler, and a collocated $PM_{2.5}$ sampler. The sample inlets are 61 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Urban	Population Exposure	SLAMS	3.48	FRM Gravimetric	1:3
Collocated $PM_{2.5}$	Urban	Population Exposure	QA Collocated	3.48	FRM Gravimetric	1:3
Ozone	Urban	Population Exposure	SLAMS	3.81	FEM Ultraviolet Photometry	Continuous

Famoda Farm

CSA/MSA: Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Mauldin MSA
AQS Site ID: 45-045-1003
Location: 7401 Mountain View Road
County: Greenville
Coordinates: +35.05739, -82.37288
Date Established: October 24, 1969
Site Evaluation: PENDING (QA Check: April 30, 2013).

The Famoda Farm site is located in a rural area of northern Greenville County. It was originally established in 1969 and operated until 1982. In 2008, this site was reactivated as part of the Greenville MSA Ozone study, which was designed to investigate Ozone concentration variability across the Upstate by providing information to help refine the monitoring network to better meet monitoring objectives. The site has been retained to represent rural Ozone impacts downwind of the Anderson and Greenville urbanized areas. This site supports an Ozone monitor. The sample inlet is 24 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	3.47	FEM Ultraviolet Photometry	Continuous

Wolf Creek

CSA/MSA: Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Mauldin MSA
AQS Site ID: 45-077-0003
Location: 901 Allgood Bridge Road
County: Pickens
Coordinates: +34.85154, -82.74458
Date Established: August 10, 2010
Site Evaluation: PENDING (QA Check: October 23, 2012).

The Wolf Creek site is located in central Pickens County and was established to gain an understanding of ambient Ozone concentrations in this area.

In 2013, Anderson County was reincorporated into a Greenville-Anderson-Mauldin MSA. The DHEC will continue to evaluate the Greenville-Spartanburg-Anderson CSA network to determine the configuration of Ozone monitors that most appropriately represents Ozone concentrations in the area. The sample inlet is 71 meters from the nearest road.

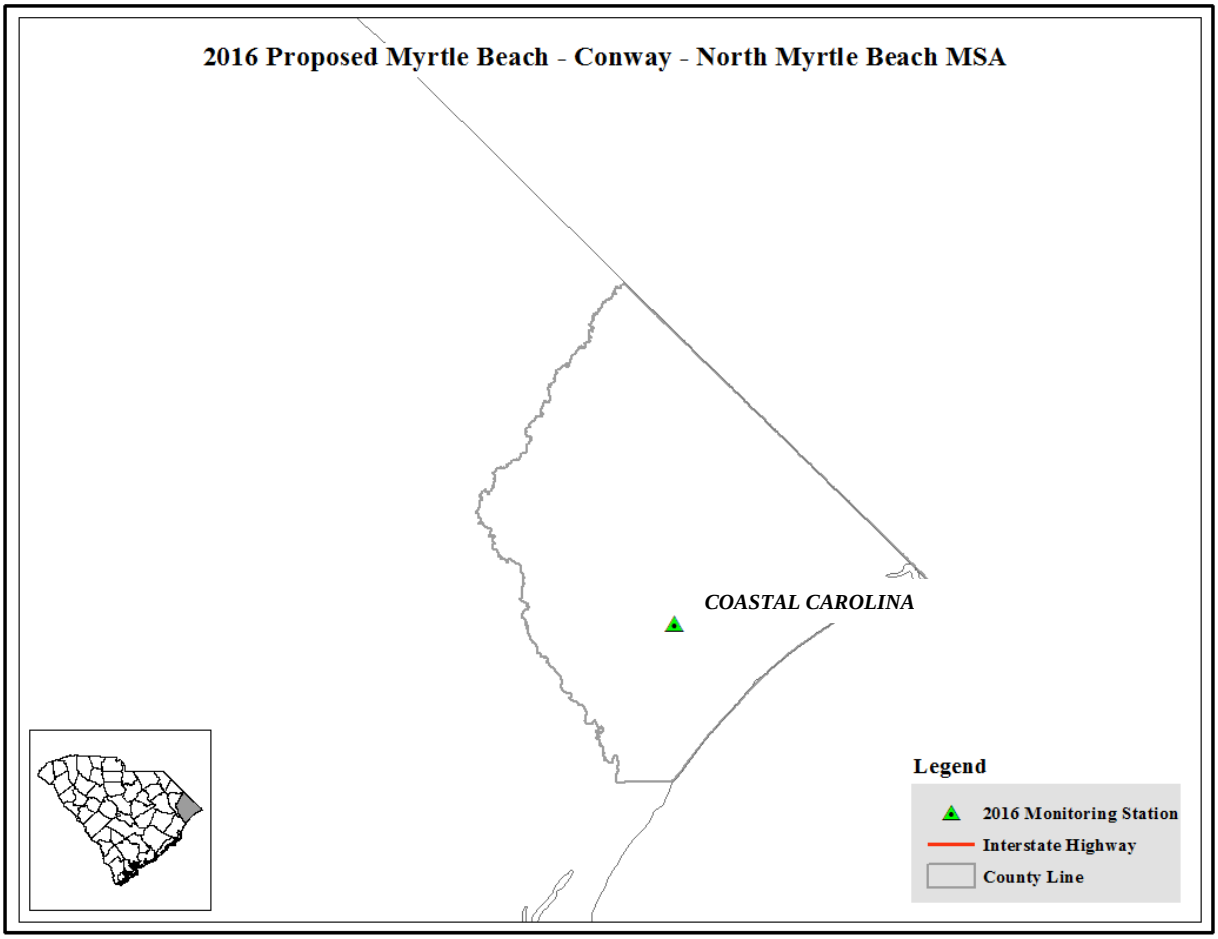
Changes for 2016:

There are no changes planned for 2016. The DHEC continues to evaluate the Greenville MSA Ozone network to determine the configuration of Ozone monitors that most appropriately represent Ozone concentrations across the area.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	General / Background	SPM	2.77	FEM Ultraviolet Photometry	Continuous

Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead / TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-051-0008	Coastal Carolina						●												○
	TOTAL	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate / QA monitors

Coastal Carolina

CSA/MSA: Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA
AQS Site ID: 45-051-0008
Location: Century Circle
County: Horry
Coordinates: +33.80, -78.99
Date Established: 2015
Site Evaluation: PENDING

In February 2013, OMB combined Horry County with Brunswick County, NC to establish the Myrtle Beach-Conway-North Myrtle Beach, SC-NC MSA. In order to meet the minimum monitoring criteria in 40 CFR Part 58 Appendix D, at least one Ozone monitor is required in the MSA. In conjunction with the State of North Carolina, local government and stakeholders, DHEC established the Horry County ozone site in the summer of 2015 to be representative of expected maximum ozone concentrations in northeast South Carolina.

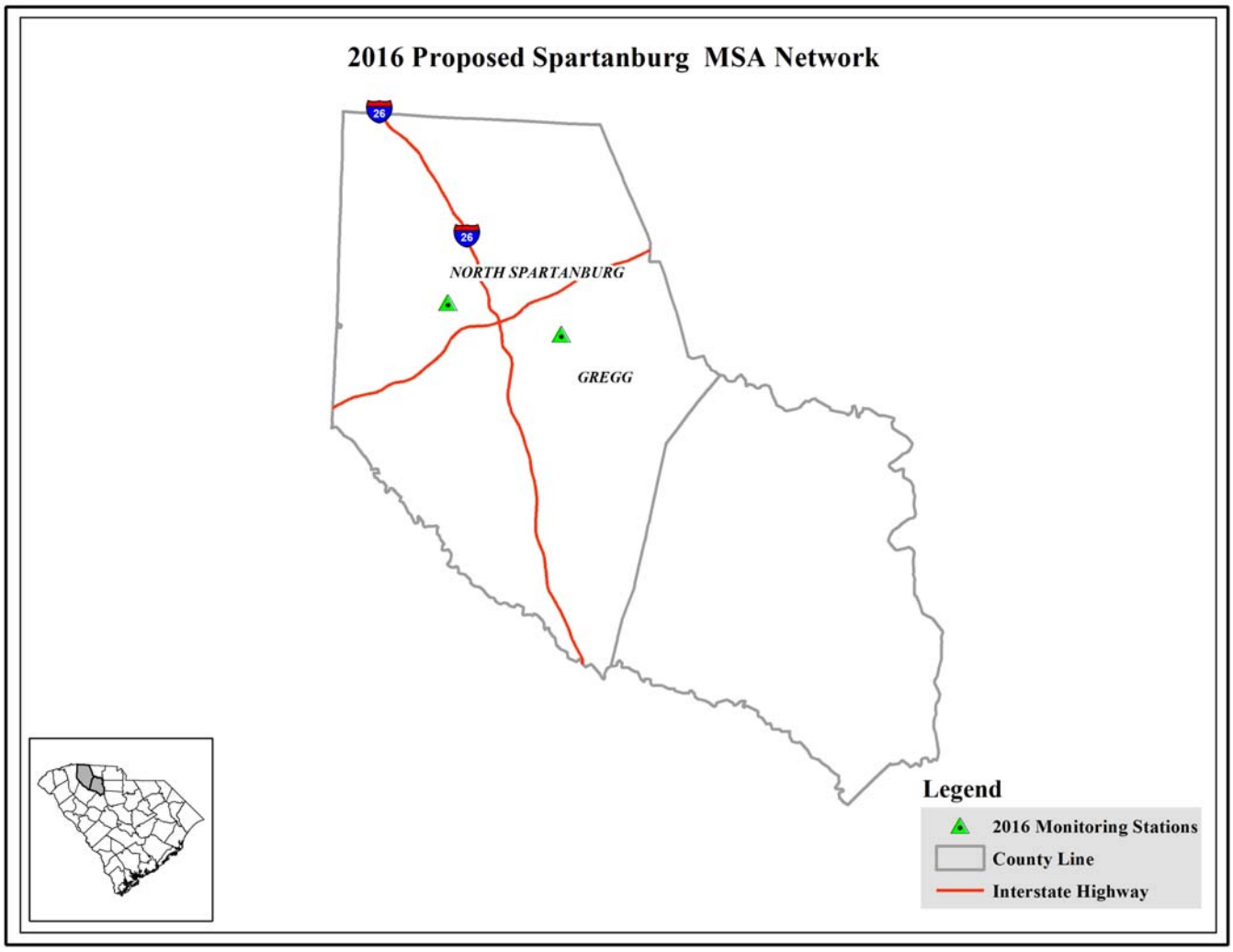
Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Concentration	SLAMS	4.0	FEM Ultraviolet Photometry	Continuous
Wind Speed / Direction	Neighbor-hood	Local Conditions	Non-regulatory	10.0	Instruments for wind speed and wind direction	Continuous

Spartanburg MSA



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead /TSP	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-083-0009	North Spartanburg Fire Station #2						●												
45-083-0011	T.K. Gregg	●	○																
	TOTAL	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate / QA samplers

North Spartanburg Fire Station #2

CSA/MSA: Greenville-Spartanburg-Anderson CSA / Spartanburg MSA
AQS Site ID: 45-083-0009
Location: 1556 John Dodd Road
County: Spartanburg
Coordinates: +34.98874, -82.07573
Date Established: April 4, 1990
Site Evaluation: The most recent site evaluation was conducted on June 8, 2006 (QA Check: May 14, 2013).

The North Spartanburg Fire Station #2 site is located in rural Spartanburg County, northwest of the City of Spartanburg. This site supports an Ozone monitor and was established as a maximum Ozone concentration monitor for the Greenville-Spartanburg-Anderson urban area on April 4, 1990. This monitor is designated SLAMS and fulfills the requirement for a maximum concentration site for the Spartanburg MSA. The sample inlet is 85 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Max Ozone Concentration	SLAMS	3.9	FEM Ultraviolet Photometry	Continuous

T.K. Gregg Recreation Center

CSA/MSA: Greenville-Spartanburg-Anderson CSA / Spartanburg MSA
AQS Site ID: 45-083-0011
Location: 267 Northview Street
County: Spartanburg
Coordinates: +34.95557, -81.92480
Date Established: December 29, 2008
Site Evaluation: PENDING (QA Check: May 14, 2013).

The T. K Gregg Recreation Center site is located in Spartanburg County. With the cooperation of local government and stakeholders, the DHEC established this $PM_{2.5}$ site in the downtown Spartanburg area to meet the 40 CFR Part 58 Appendix D requirements for monitoring objective and collocated continuous monitoring and reporting. This site also supports a collocated $PM_{2.5}$ continuous monitor for the Spartanburg MSA. The sample inlets are 49 meters from the nearest road.

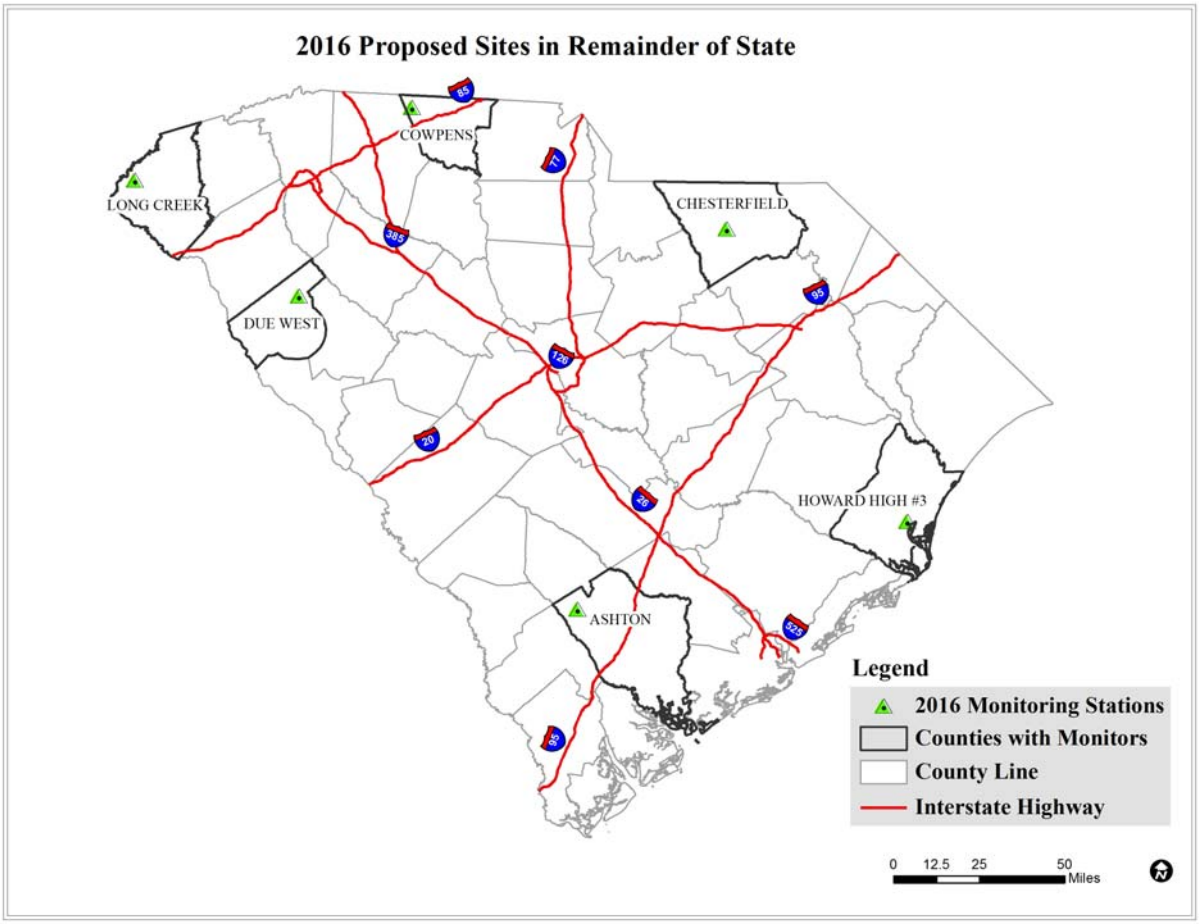
Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Neighbor-hood	Highest Concentration	SLAMS	2.5	FRM Gravimetric	1:1
$PM_{2.5}$	Neighbor-hood	Highest Concentration	SPM	2.5	TEOM	Continuous

Remainder of State



Classification of Monitoring Type by Site

Site ID	Site Name	$PM_{2.5}$	$PM_{2.5}$ Cont.	Speciation	PM_{10}	Lead	Ozone	SO_2	NO_2	CO	Sulfate	BC	Carbonyls	SVOC	VOCs	Mercury	Precip Chem.	Precip.	MET
45-001-0001	Due West						●										○	○	
45-021-0002	Cowpens						○										○		
45-025-0001	Chesterfield	●	○	○	○○		○					○	○	○	○				○
45-029-0002	Ashton		●				○												
45-043-0011	Howard High School #3				○														
45-073-0001	Long Creek		○				○	○											
	TOTAL	1	3	1	3	0	5	1	0	0	0	1	1	1	1	0	2	1	1

○ SPM / Other
● SLAMS
●●/○○ indicates duplicate QA monitors

Due West
CSA/MSA: Greenville-Spartanburg-Anderson CSA/ None
AQS Site ID: 45-001-0001
Location: 59 Jim Scott Lane
County: Abbeville
Coordinates: +34.32527, -82.38653
Date Established: April 2, 1991
Site Evaluation: The most recent site evaluation was conducted on June 27, 2006 (QA Check: May 7, 2013).

The Due West site is located in northeastern Abbeville County. In addition to monitoring for Ozone, Due West has a gauge for precipitation and a sampler for precipitation chemistry. The sample inlets are 76 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	General / Background	SLAMS	4.2	FEM Ultraviolet Photometry	Continuous
Precipitation Chemistry	Regional	Regional Transport	Non-regulatory	1.5	IC	Weekly-Tue-Tue
Precipitation	Neighbor-hood	General/ Background	Non-regulatory	3.0	Tipping bucket	Continuous and Sample

Cowpens

CSA/MSA: Greenville-Spartanburg-Anderson CSA/ None
AQS Site ID: 45-021-0002
Location: McGinnis Road (Old SC Hwy 110)
County: Cherokee
Coordinates: +35.13045, -81.81656
Date Established: March 25, 1988
Site Evaluation: The most recent site evaluation was conducted on June 26, 2006 (QA Check: May 14, 2013).

The Cowpens site is located in northwestern Cherokee County at the Cowpens National Battlefield. Cowpens is sited to represent Ozone concentrations between the Greenville-Spartanburg-Anderson CSA and the Charlotte-Concord CSA. The operation of the Ozone monitor fulfills the ambient monitoring commitment in the Cherokee County Maintenance Plan.[12] In addition to Ozone, the Cowpens site also supports a precipitation chemistry sampler. The sample inlets are 23 meters from the nearest road.

The monitor will be operated through the 2016 Ozone season to fulfill the Cherokee County Maintenance Plan commitments.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	Upwind / Background	SPM	3.05	FEM Ultraviolet Photometry	Continuous
Precipitation Chemistry	Regional	Regional Transport	Non-regulatory	1.50	IC	Weekly-Tue-Tue

[12] 110(a)(1) Maintenance Plan: 8-hour Ozone National Ambient Air Quality Standard, Cherokee County, South Carolina, December, 2007.

Chesterfield (NATTS)
CSA/MSA: none/none
AQS Site ID: 45-025-0001
Location: SC Hwy 145, McBee (Route 2 Box 100)
County: Chesterfield
Coordinates: +34.61538, -80.19878
Date Established: January 6, 2000
Site Evaluation: The most recent site evaluation was conducted on April 21, 2003 (QA Check: June 9, 2011).

The Chesterfield site is located in central Chesterfield County. The Chesterfield site has continuous monitors for BC, $PM_{2.5}$, Ozone, and meteorological parameters. Sampling is done for $PM_{2.5}$ and PM_{10}. This site also serves as the required regional transport site for $PM_{2.5}$. In addition to the CSN protocol $PM_{2.5}$ speciation sampling, this site is a precision site with collocated FRM samplers for $PM_{2.5}$ and PM_{10}. The sample inlets are 45 meters from the nearest road. The Chesterfield site is also a rural National Air Toxics Trends Site (NATTS) which includes carbonyls, VOC, SVOC, and metals sampling.

Changes for 2016:

There are no changes planned for 2016.

Federal funding for speciation sampling at this site was eliminated in 2015. Speciation sampling will continue as long as state resources are available.

Monitors:

(Table continues on next page)

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Regional	Regional Transport	SLAMS	4.83	FRM Gravimetric	1:3
$PM_{2.5}$	Regional	Regional Transport	SPM	3.86	TEOM – 50° C	Continuous
Speciated $PM_{2.5}$	Regional	Regional Transport	Supplemen-tal Speciation	3.96	CSN Protocol	1:6
PM_{10}	Regional	General / Background	SPM	2.43	Gravimetric ICP/MS	1:6
Collocated	Regional	General /	QA	2.43	Gravimetric	1:6

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM_{10}		Background	Collocated			
Ozone	Regional	General / Background	SPM	4.64	FEM Ultraviolet Photometry	Continuous
Black Carbon	Neighborhood	General / Background	Non-regulatory	3.92	Optical absorption	Continuous
Carbonyls	Urban	NATTS	Non-regulatory	3.00	DNPH/IC	1:6
SVOC	Urban	NATTS	SPM	3.00	PUF/GCMS	1:6
Volatile Organic Compounds	Urban	NATTS	Non-regulatory	3.00	Canister/GCMS	1:6
Wind speed / direction	Neighborhood	Local Conditions	Non-regulatory	10.00	Instruments for wind speed and direction	Continuous

Ashton
CSA/MSA: none/none
AQS Site ID: 45-029-0002
Location: Ashton Road (S-13-18) Islandton
County: Colleton
Coordinates: +33.00784 -80.96504
Date Established: March 7, 1990
Site Evaluation: The most recent site evaluation was conducted on April 18, 2005 (QA Check: May 19, 2011).

The Ashton site is located in northwestern Colleton County and was established on March 7, 1990. The site serves as a required regional background for $PM_{2.5}$, representing one of two major and different physiographic regions in South Carolina. It also monitors Ozone concentrations. The sample inlets are 8 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Regional	General / Background	SLAMS	4.40	TEOM 50°C	Continuous
Ozone	Urban	General / Background	SPM	4.70	FEM Ultraviolet Photometry	Continuous

Howard High School #3

CSA/MSA: Myrtle Beach-Conway SC,NC CSA/none
AQS Site ID: 45-043-0011
Location: 594 Gilbert Street
County: Georgetown
Coordinates: +33.36892,-79.29662
Date Established: July, 15 2008
Site Evaluation: PENDING (QA Check: April 21, 2011).

The Howard High #3 site is located in Georgetown County on the grounds of Howard High School and supports a PM_{10} monitor. PM_{10} monitoring in this area of Georgetown has been ongoing since 1970, when the original Howard High site was established. The sample inlet is 55 meters from the nearest road.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
PM_{10}	Neighbor-hood	Population Exposure/ Highest Concentration	SPM	2.23	TEOM	Continuous

Long Creek

CSA/MSA: Greenville-Spartanburg-Anderson CSA/ none
AQS Site ID: 45-073-0001
Location: Round Mt. Tower Rd.
County: Oconee
Coordinates: +34.80524, -83.23779
Date Established: August 1, 1983
Site Evaluation: The most recent site evaluation was conducted on February 18, 2005 (QA Check: December 4, 2012).

The Long Creek site is located on Round Mountain in northwest Oconee County. The Long Creek site was also established as part of the Southern Oxidant Study. It provides a unique vantage for monitoring the impacts of transported pollutants. Long Creek has continuous monitors for Ozone, SO_2, and $PM_{2.5}$. The sample inlets are 11 meters from the nearest road.

Due to the importance of measuring region-wide SO_2, $PM_{2.5,}$ and Ozone concentrations, the unique location, and collocated monitoring activity, the DHEC has determined that current monitoring at this site should be continued.

The DHEC intends to continue to work with the land-owner to improve site exposure due to continued tree growth around the site.

Changes for 2016:

There are no changes planned for 2016.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
$PM_{2.5}$	Urban	General / Background	SPM	4.14	FEM TEOM	Continuous
Ozone	Regional	General / Background	SPM	4.22	FEM Ultraviolet Photometry	Continuous
Sulfur Dioxide	Regional	Regional Transport	SPM	4.22	FEM UV fluorescence	Continuous

Network Development

The Monitoring Network provides data to support an array of decisions ranging from development of emissions strategies to protect and improve air quality to the level of activity appropriate for individuals in sensitive populations. To support these varied data users, the network must provide both stable, long term measures to document trends and rapid reporting of conditions to the public. In response to land use, population, and urban areas growth, the network must be evaluated and adjusted to meet the changing conditions and needs.

The Monitoring Network described in this plan continues to build upon a significant transition from the network that has evolved over the last thirty-five years. It reflects the successes in reducing ambient concentrations of TSP, Lead, CO, NO_2, and SO_2 and the increasing concern about the impact of fine particles and Ozone on public health and the environment.

A series of studies are planned for the major urban areas, as resources permit, to gain better understanding of the air quality and provide information to improve the monitoring network. In addition to the intensive studies that provide a detailed 'snapshot,' it is intended that SPM sites be established and monitored in rotation to provide regular checks and long term tracking of the trends in air quality in all areas of the state including smaller cities, towns, and rural areas. The implementation of this long term strategy is contingent on sufficient federal funding to support the core-required monitoring and will be developed and evaluated as resources become available. Project plans will be developed for the monitoring and data analysis activity to better define the scope of these strategies prior to implementation. These studies are long term needs the DHEC has identified and are important tools for evaluating and improving the representativeness of the ambient air monitoring network and our knowledge of air quality in the State.

Areas where long term strategies are being considered include:

- Near road NO_2 Monitoring Network Implementation – the 2010 Primary National Ambient Air Quality Standards for Nitrogen Dioxide and the 2013 Revision to Ambient Nitrogen Dioxide Monitoring Requirements requires each CBSA having 1,000,000 or more persons to have one near-road NO_2 monitor operational by January 1, 2014 and each CBSA having 500,000 or more persons (but less than 1,000,000), to have one near-road NO_2 monitor operational by January 1, 2017. The DHEC, in conjunction with local stakeholders, will apply the methodology found in The Near Road NO_2 Monitoring Technical Assistance Document, identify an appropriate list of road segments, and propose these sites to the EPA.
- Charleston Port Monitoring – the Charleston Port Expansion project has a projected completion data of 2017-2019. At that time, the DHEC will work with local stakeholders to identify and establish an appropriate $PM_{2.5}$ site.
- Columbia MSA Ozone Study – an addition of supplementary SPM Ozone sites may be added to investigate variability and refine the monitoring network to meet monitoring objectives.

Sites Discontinued

The Table below contains information on the monitoring site the DHEC has scheduled for discontinuance.

Site	ID	Date Established	Notes
Clemson CMS	45-077-0002	07/14/1979	The DHEC has determined that the Ozone monitoring at this site is duplicative and will be discontinued at the conclusion of the 2015 Ozone season.

Clemson CMS

CSA/MSA: Greenville-Spartanburg-Anderson CSA / Greenville-Anderson-Mauldin MSA
AQS Site ID: 45-077-0002
Location: 106 Hope Well Road
County: Pickens
Coordinates: +34.65366, -82.83865
Date Established: July 14, 1979
Site Evaluation: The most recent site evaluation was conducted on March 18, 2003 (QA Check: October 23, 2012).

The Clemson CMS site is located on the grounds of Clemson University near the western border of Pickens County. This monitor measures Ozone concentrations upwind of the Greenville-Spartanburg urbanized area.
This site was part of the Greenville MSA Ozone study, initiated in 2008 and designed to investigate Ozone concentration variability across the Upstate and provide information to help refine the monitoring network to better meet monitoring objectives. The sample inlets are 27 meters from the nearest road.

Changes for 2016:

Ozone concentrations are measured at other nearby locations and monitoring at this site has been determined to be duplicative. Therefore, this site will be terminated at the end of the 2015 Ozone season.

Monitors:

Parameter	Scale	Objective	Designation	Probe Height (m)	Analysis Method	Sampling Frequency
Ozone	Urban	General background	SLAMS	4.59	FEM Ultraviolet Photometry	Continuous

Appendix A: Summary of Public Comments Received

Below is a summary of the comments received and the DHEC's response. A copy of the comments received will be submitted with this Monitoring Plan.

Comments from Lib Cook, Chester, S.C.

Ms. Cook requested an air monitoring station be placed in Richburg, South Carolina (Chester County) so pollutants from local industries would be measured. She is concerned that the ambient air monitors in Charlotte, North Carolina are not representative of the Chester County air shed. Ms. Cook also voiced her opinion against granting a permit to Giti Tire.

DHEC Response: In accordance with Appendix D to 40 CFR 58, ambient air monitors are required to be placed in areas with the highest population, or where the highest pollutant concentrations are predicted. Thus, the nearest ambient air monitoring station to Richburg, South Carolina, is the York CMS monitoring station (page 32), located approximately twenty miles northwest of Richburg. The York CMS monitoring station represents an area that includes all of York and Chester County, as well as parts of Cherokee, Union, Fairfield, and Lancaster Counties in South Carolina. The local, historical, and current ambient monitoring data from the York CMS monitoring station has demonstrated that concentrations of pollutants are well below the health-protective national ambient air quality standards.
Additionally, every five years, South Carolina is required by the EPA to assess and modify its ambient air monitoring network as needed to account for changes such as new facilities, population shifts, and pollutant transport. The next assessment of the statewide network will be published later this summer (2015).

In response to air concerns in the Chester County area, the DHEC's Bureau of Air Quality has established an informal, citizen-led air quality work group. The work group serves as a means to communicate with citizens about air quality issues and concerns and is open to interested members of the community. For further information, please contact Lawra Boyce at (803) 898-4585.

The DHEC is also aware of community interest in the Giti Tire facility. Questions and concerns from the community will be evaluated through the air permitting process.

Comments from Ann Angermeier

Ms. Angermeier stated that she believes the 2016 Monitoring Plan should include a state-wide ban on trash burning.

DHEC Response: Open burning of trash is illegal in South Carolina. South Carolina Regulation 61-62.2[13], Prohibition of Open Burning, prohibits open burning with a few specific exceptions, such as forestry management, residential yard debris, and campfires and recreational fires. However, burning treated lumber, construction debris, motor oil, paint, plastics, rubber, and trash can release harmful toxic chemicals into the air, which can cause health problems and harm the environment. This type of burning should be reported to the local DHEC EQC office[14]. The South Carolina Forestry Commission also has notification and fire management requirements for outdoor burning[15].

[13] http://www.scdhec.gov/HomeAndEnvironment/Air/OpenBurning/
[14] http://www.scdhec.gov/HomeAndEnvironment/DHECLocations/
[15] http://www.state.sc.us/forest/fyard.htm

Many of South Carolina's counties and local governments have enacted more stringent open burning regulations to provide additional air quality benefits. The DHEC encourages stakeholder involvement to promote cleaner alternatives for local waste disposal.

The annual Network Description and Ambient Air Monitoring Plan is produced to fulfill the federal regulations as described in 40 CFR Part 58. These regulations contain requirements for measuring ambient air quality and for reporting ambient air quality data and related information.

The DHEC will follow up with this commenter to address these specific concerns.

Comments from Upstate Forever, non-profit conservation organization, Greenville and Spartanburg, SC

Upstate Forever recognizes and appreciates the ambient air quality monitoring at the Cowpens, Due West, and Long Creek air quality monitoring stations. They believe that the Clemson CMS monitoring station should not be discontinued in 2016 because it will lead to fragmented data and could threaten the Upstate's future attainment to the Ozone standard. Also, Upstate Forever believes that new monitors for Volatile Organic Compounds (VOCs) and Nitrogen Oxides should be added to each MSA in the Upstate.

DHEC Response: The DHEC acknowledges and appreciates the comments about the Cowpens, Due West and Long Creek ambient air monitoring stations. The DHEC's monitoring networks must be designed to best use our limited resources while maximizing appropriate data gathering across the state. We believe this is best accomplished by the shutdown of the Clemson site in consideration of the remaining upstate ozone monitors. The Department is currently replacing a large portion of its existing monitoring equipment due to age and the need to modernize the associated information technology systems, at a significant financial cost to the agency. In addition, as the NAAQS continue to become more stringent, new monitoring sites are needed in other parts of the state that are growing in population, such as in Horry County. Our very limited financial resources must be redirected to other parts of the state to meet federal requirements. Additional monitors in the Upstate are not justified at this time.

The DHEC has provided a full justification for our decision to terminate the Clemson CMS monitoring station as part of the periodic network assessment which has been submitted to the EPA for approval. In general, the DHEC believes that a reallocation of the monitoring resources in the Upstate is appropriate and that adequate monitoring will be left in place to properly characterize air quality for the region.