



GEORGIA

DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

2018 Ambient Air Monitoring Plan

Air Protection Branch

Ambient Monitoring Program

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Acronyms and Glossary

AADT	Annual Average Daily Traffic
Aerosols	A gaseous suspension of fine solid or liquid particles
AM	Annual Mean
Anthropogenic	Resulting from human activity
APB	Air Protection Branch
AQCR	Air Quality Control Region
AQS	Air Quality System
ARITH MEAN	Arithmetic Mean
ARM	Approved Regional Method
BAM	Beta Attenuation Monitor
CAA	Clean Air Act
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CSA	Combined Statistical Area
CV	Coefficient of Variation
DNPH	Dinitrophenylhydrazine
EPA	United States Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method- the official measurement technique for a given pollutant
GA AAMP	Georgia Ambient Air Monitoring Program
GA EPD	Georgia Environmental Protection Division
GEO MEAN	Geometric Mean
HAP	Hazardous Air Pollutant
HPLC	High Performance Liquid Chromatography
LOD	Limit of Detection
$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter
m/s	Meter per second
MSA	Metropolitan Statistical Area, as defined by the US Census Bureau
NAAQS	National Ambient Air Quality Standard
NATTS	National Air Toxics Trends Station
NCore	National Core Multipollutant Monitoring Network
NDV	Normalized Design Value
NMHC	Non-Methane Hydrocarbons
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NO _y	Reactive oxides of Nitrogen
NWS	National Weather Service
O ₃	Ozone
PAH	Polycyclic Aromatic Hydrocarbons
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PM _{2.5}	Particles with an aerodynamic diameter of 2.5 microns or less
PM ₁₀	Particles with an aerodynamic diameter of 10 microns or less
PM _{10-2.5}	Particles with an aerodynamic diameter between 2.5 and 10 microns

ppb	Parts per Billion
ppm	Parts per Million
Precursor	A substance from which another substance is formed
PUF	Polyurethane Foam
QTR	Calendar Quarter
Rawinsonde	A source of meteorological data for the upper atmosphere
SLAMS	State and Local Air Monitoring Stations
SO ₂	Sulfur Dioxide
SPMS	Special Purpose Monitoring Stations
STN	Speciation Trends Network
TBD	To Be Determined
TEOM	Tapered Element Oscillating Microbalance
TNMOC	Total Non-Methane Organic Compounds
TRS	Total Reduced Sulfur
UV	Ultraviolet
VOC	Volatile Organic Compound
W/m ²	Watts per square meter
ZPS	Zero/Precision/Span

Agency Contacts

Access to More Information about the Ambient Air Monitoring Network

While this report includes a great deal of information about the Ambient Air Monitoring Network, much more information is readily available, including summaries of the pollutant data from the monitors around the state.

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1.0 Executive Summary

The Georgia Ambient Air Monitoring Program (GA AAMP) of the Georgia Environmental Protection Division (GA EPD) is submitting this *2018 Ambient Air Monitoring Plan* to the United States Environmental Protection Agency (EPA) Region 4 office as required by federal regulations under 40CFR58.10 (a)(1). The plan provides documentation of the establishment and maintenance of an air quality surveillance system in Georgia that meets all federal requirements found in Appendix A through E of 40CFR58, where applicable. In developing this plan, the GA AAMP assessed monitoring types and objectives, site appropriateness for air quality characterization, representative spatial scale to match objectives at each monitor, and appropriate new technologies. The plan describes the established sites across the State of Georgia, as well as the proposal to maintain or discontinue sites in the state's ambient air quality surveillance system. The plan confirms that the network continues to meet the State and Local Air Monitoring Stations (SLAMS) criteria established by federal regulations, and that the information in the state and federal monitoring records properly classifies each monitoring station. The plan also serves as a directory of existing SLAMS, Photochemical Assessment Monitoring Stations (PAMS), Speciation Trends Network (STN) and Supplemental Speciation sites, National Air Toxics Trends Stations (NATTS), National Core Multipollutant Monitoring Station (NCore), Near-road Monitoring Network, Georgia Air Toxics Network, and the meteorological parameters performed at each location.

Prior to the Clean Air Act of 1970, the state health department conducted air monitoring in Georgia. In the early 1970's, the GA AAMP took over the responsibility of ambient air monitoring to better identify and control air pollutants in Georgia. The GA AAMP currently relies on a sampling network of 39 stations to:

- determine whether air quality standards are being met
- track air quality improvements
- measure the impact of industrial expansion
- provide air pollution information to the public
- assist in enforcement actions

Since the publication of the *2017 Ambient Air Monitoring Plan*, there have been some changes to the state's ambient air monitoring network that should be noted.

New monitors/sites:

The GA AAMP began sampling with three Teledyne T640 continuous PM_{2.5} samplers in the network on October 1, 2017. At the Augusta site (13-245-0091) the Teledyne T640 replaced the TEOM, at the Macon-Forestry site (13-021-0012) the Teledyne T640 replaced the TEOM, and at the Rossville site (13-295-0002) the Teledyne T640 replaced the BAM.

On October 3, 2017, the Teledyne T640 continuous PM_{2.5} sampler replaced the BAM at the Gainesville site (13-139-0003).

The Teledyne T640 continuous PM_{2.5} sampler replaced the BAM at the Gwinnett Tech site (13-135-0002) on October 26, 2017.

At the Warner Robins site (13-153-0001), the BAM continuous PM_{2.5} sampler was replaced with a Teledyne T640 on March 7, 2018.

On November 7, 2017, the TEOM continuous PM_{2.5} sampler was replaced with a Teledyne T640 at the Savannah-L&A site (13-051-1002).

At the South DeKalb site (13-089-0002), the Teledyne T640X replaced the BAM PM_{coarse} system on June 14, 2017.

On October 1, 2017, the TEOM at the Augusta site (13-245-0091) was converted from sampling continuous PM_{2.5} to sample continuous PM₁₀. This sampler is a federal equivalent method, and the PM₁₀ data can be used for attainment purposes compared to the National Ambient Air Quality Standards (NAAQS).

A nephelometer which is a non-regulatory, continuous PM_{2.5} monitor that can provide particle sizing has been installed at the NR-GA Tech site (13-121-0056) on March 1, 2018.

On January 24, 2018, the NATTS PM₁₀ samplers were relocated on the deck at the South DeKalb site (13-089-0002) to make these samplers in compliance with siting criteria.

The Athens site (13-059-0002) shelter was replaced and the PM_{2.5} sampler was installed on the roof deck on January 16, 2018. A Teledyne T640 continuous PM_{2.5} sampler was installed at the site on April 1, 2018.

Starting in January 2019, the GA AAMP may begin to shut down PM_{2.5} FRMs (filter based) monitors where collocated with the continuous PM_{2.5} FEM Teledyne T640 monitors, depending on how well the monitoring data correlates.

The collocated NATTS samplers at the South DeKalb site (13-089-0002) will change from a 1 in 6 day schedule to a once a month schedule as of July 1, 2018.

GA AAMP is planning to replace both the primary and collocated NATTS high-volume PM₁₀ metals samplers with low-volume PM₁₀ metals samplers in the summer of 2018 at the South DeKalb site (13-089-0002).

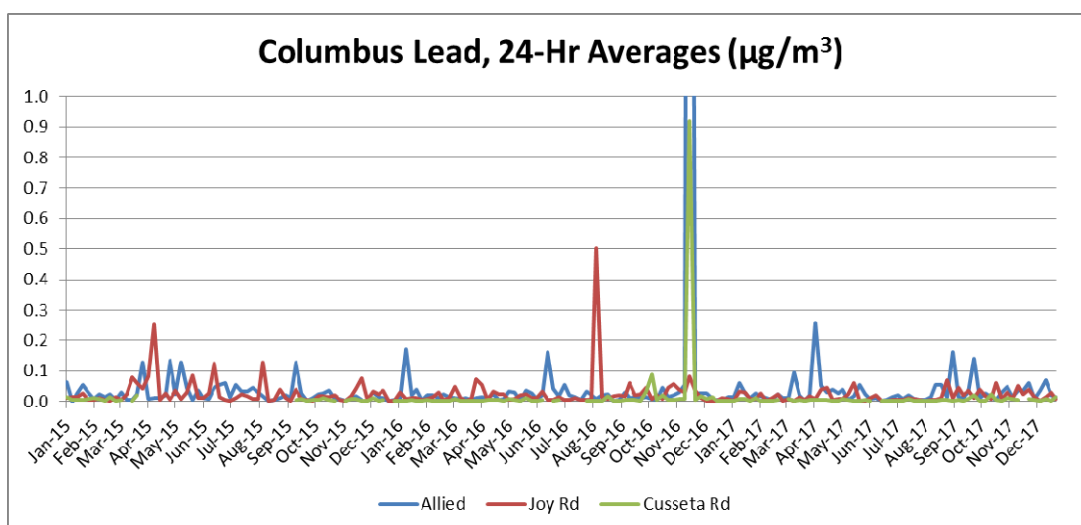
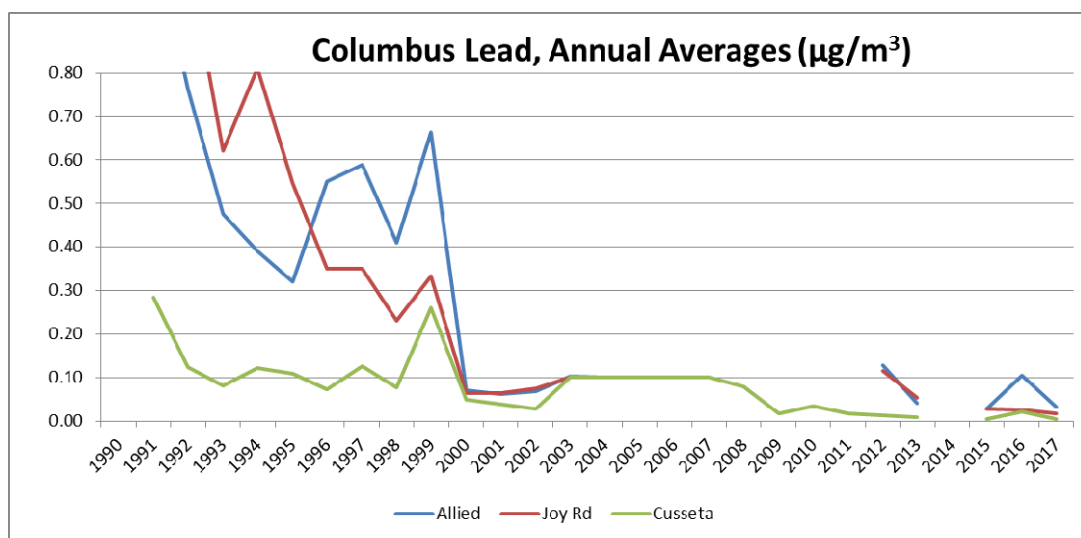
As GA AAMP replaces the Thermo 2025 filter-based PM_{2.5} FRM monitors, the Met One sequential filter-based PM_{2.5} FRM monitors will be used as the replacement.

Discontinued monitors/sites:

Since the GA AAMP began sampling PM₁₀ with the continuous FEM TEOM at the Augusta site (13-245-0091), the integrated filter based PM₁₀ sampler was shut down as of March 31, 2018.

In accordance with 40 CFR 58.14 (c) regarding SLAMS discontinuation requests, the GA AAMP provides the following documentation in support of discontinuing the lead monitor at the Columbus-Joy Road site (13-215-0010). There are currently three lead sites in the Columbus, GA-AL MSA, and according to 40 CFR 58, Appendix D, Section 4.5, the GA AAMP is required

to have one site. The annual averages and 24-hour averages for the three sites collecting lead air monitoring data in Columbus, GA-AL MSA are plotted below. Compared to the other two sites in the MSA, these trends show that the lead monitoring data values collected at the Columbus-Joy Road site (shown in red) are on average with the other two sites, or the second highest values collected. In addition, the lead 3-month rolling averages for 2015 through 2017 are shown for the Columbus-Joy Road site, along with the lead NAAQS, which is $0.15 \mu\text{g}/\text{m}^3$. The Columbus-Joy Road site's 3-month lead monitoring averages have been well below the lead NAAQS standard of $0.15 \mu\text{g}/\text{m}^3$ for the last three years. Following EPA's guidance and recommendation in response to the GA AAMP's request for a siting criteria waiver, the GA AAMP will shut down the Columbus-Joy Road site by June 30, 2018. See the GA AAMP's Public Notice *Site Waiver Requests, March 2018* at <https://airgeorgia.org/networkplans.html> for more details.



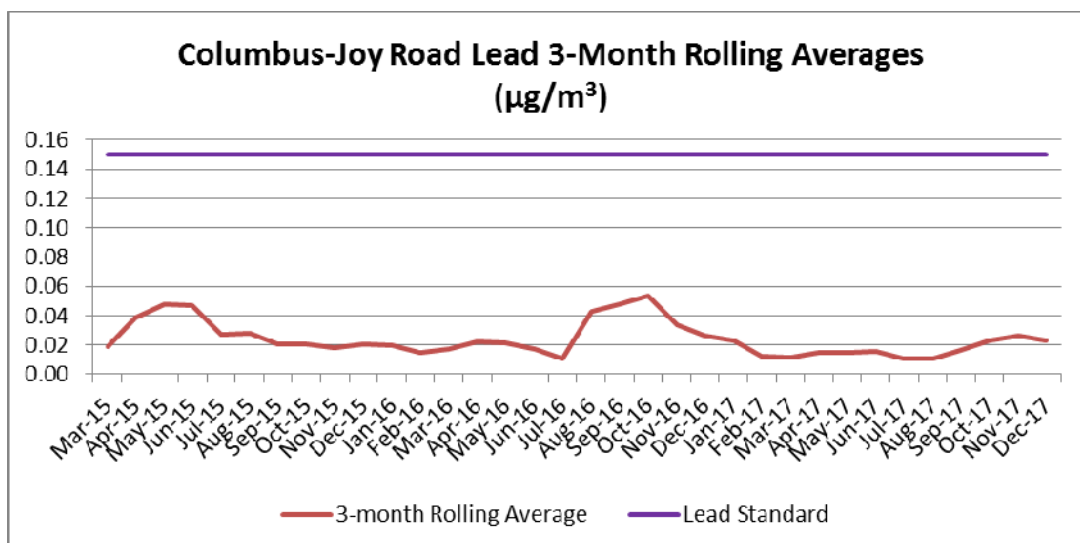


Figure 1: Columbus Lead Data

Relocated monitors/sites:

Due to the property changing ownership, the Newnan site (13- 077-0002) was shut down as of November 15, 2017. The GA AAMP is in the process of finding a suitable location to re-establish sampling air quality in the vicinity of the site.

As of February 1, 2018, the collocated lead monitor in the Columbus GA-AL MSA was changed from the Columbus-Joy Rd (13-215-0010) location to the Columbus-Allied (13-215-0009) location.

1.1 Mandate

This document is produced in response to duties mandated to ambient air monitoring agencies in 40CFR58.10:

40 CFR PARTS 58.10: Annual monitoring network plan and periodic network assessment.

(a)(1) Beginning July 1, 2007, the state, or where applicable local, agency shall submit to the Regional Administrator an annual monitoring network plan which shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations. The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement. The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments.

(2) Any annual monitoring network plan that proposes network modifications (including new or discontinued monitoring sites, new determinations that data are not of sufficient quality to be compared to the NAAQS, and changes in identification of monitors as

suitable or not suitable for comparison against the annual PM_{2.5} NAAQS) to SLAMS networks is subject to the approval of the EPA Regional Administrator, who shall approve or disapprove the plan within 120 days of submission of a complete plan to the EPA.

(3) The plan for establishing required NCore multipollutant stations shall be submitted to the Administrator not later than July 1, 2009. The plan shall provide for all required stations to be operational by January 1, 2011.

(4) A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting 1.0 tpy or greater shall be submitted to the EPA Regional Administrator no later than July 1, 2009, as part of the annual network plan required in paragraph (a)(1) of this section. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting 1.0 tpy or greater to be operational by January 1, 2010. A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy shall be submitted to the EPA Regional Administrator no later than July 1, 2011. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy to be operational by December 27, 2011.

(5)(i) A plan for establishing or identifying an area-wide NO₂ monitor, in accordance with the requirements of Appendix D, section 4.3.3 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2012. The plan shall provide for these required monitors to be operational by January 1, 2013.

(ii) A plan for establishing or identifying any NO₂ monitor intended to characterize vulnerable and susceptible populations, as required in Appendix D, section 4.3.4 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2012. The plan shall provide for these required monitors to be operational by January 1, 2013.

(iii) A plan for establishing a single near-road NO₂ monitor in CBSAs having 1,000,000 or more persons, in accordance with the requirements of Appendix D, section 4.3.2 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2013. The plan shall provide for these required monitors to be operational by January 1, 2014.

(iv) A plan for establishing a second near-road NO₂ monitor in any CBSA with a population of 2,500,000 persons or more, or a second monitor in any CBSA with a population of 1,000,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts, in accordance with the requirements of appendix D, section 4.3.2 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2014. The plan shall provide for these required monitors to be operational by January 1, 2015.

(6) A plan for establishing SO₂ monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator by July 1, 2011 as part of the annual network plan required in paragraph (a) (1). The plan shall provide for all required SO₂ monitoring sites to be operational by January 1, 2013.

(7) A plan for establishing CO monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator. Plans for

required CO monitors shall be submitted at least six months prior to the date such monitors must be established as required by section 58.13.

(8)(i) A plan for establishing near-road PM_{2.5} monitoring sites in CBSAs having 2.5 million or more persons, in accordance with the requirements of appendix D to this part, shall be submitted as part of the annual monitoring network plan to the EPA Regional Administrator by July 1, 2014. The plan shall provide for these required monitoring stations to be operational by January 1, 2015.

(ii) A plan for establishing near-road PM_{2.5} monitoring sites in CBSAs having 1 million or more persons, but less than 2.5 million persons, in accordance with the requirements of appendix D to this part, shall be submitted as part of the annual monitoring network plan to the EPA Regional Administrator by July 1, 2016. The plan shall provide for these required monitoring stations to be operational by January 1, 2017.

(9) The annual monitoring network plan shall provide for the required O₃ sites to be operating on the first day of the applicable required O₃ monitoring season in effect on January 1, 2017 as listed in Table D-3 of appendix D of this part.

(10) A plan for making Photochemical Assessment Monitoring Stations (PAMS) measurements, if applicable, in accordance with the requirements of appendix D paragraph 5(a) of this part shall be submitted to the EPA Regional Administrator no later than July 1, 2018. The plan shall provide for the required PAMS measurements to begin by June 1, 2019.

(11) An Enhanced Monitoring Plan for O₃, if applicable, in accordance with the requirements of appendix D paragraph 5(h) of this part shall be submitted to the EPA Regional Administrator no later than October 1, 2019 or two years following the effective date of a designation to a classification of Moderate or above O₃ nonattainment, whichever is later.

(12) A detailed description of the PAMS network being operated in accordance with the requirements of appendix D to this part shall be submitted as part of the annual monitoring network plan for review by the EPA Administrator. The PAMS Network Description described in section 5 of appendix D may be used to meet this requirement.

(b) The annual monitoring network plan must contain the following information for each existing and proposed site:

(1) The AQS site identification number.

(2) The location, including street address and geographical coordinates.

(3) The sampling and analysis method(s) for each measured parameter.

(4) The operating schedules for each monitor.

(5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.

(6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.

(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM_{2.5} NAAQS as described in §58.30.

(8) The MSA, CBSA, CSA or other area represented by the monitor.

(9) The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.

(10) Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.

(11) Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM₁₀ monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.

(12) The identification of required NO₂ monitors as near-road, area-wide, or vulnerable and susceptible population monitors in accordance with Appendix D, section 4.3 of this part.

(13) The identification of any PM_{2.5} FEMs and/or ARMs used in the monitoring agency's network where the data are not of sufficient quality such that data are not to be compared to the NAAQS. For required SLAMS where the agency identifies that the PM_{2.5} Class III FEM or ARM does not produce data of sufficient quality for comparison to the NAAQS, the monitoring agency must ensure that an operating FRM or filter-based FEM meeting the sample frequency requirements described in §58.12 or other Class III PM_{2.5} FEM or ARM with data of sufficient quality is operating and reporting data to meet the network design criteria described in appendix D to this part.

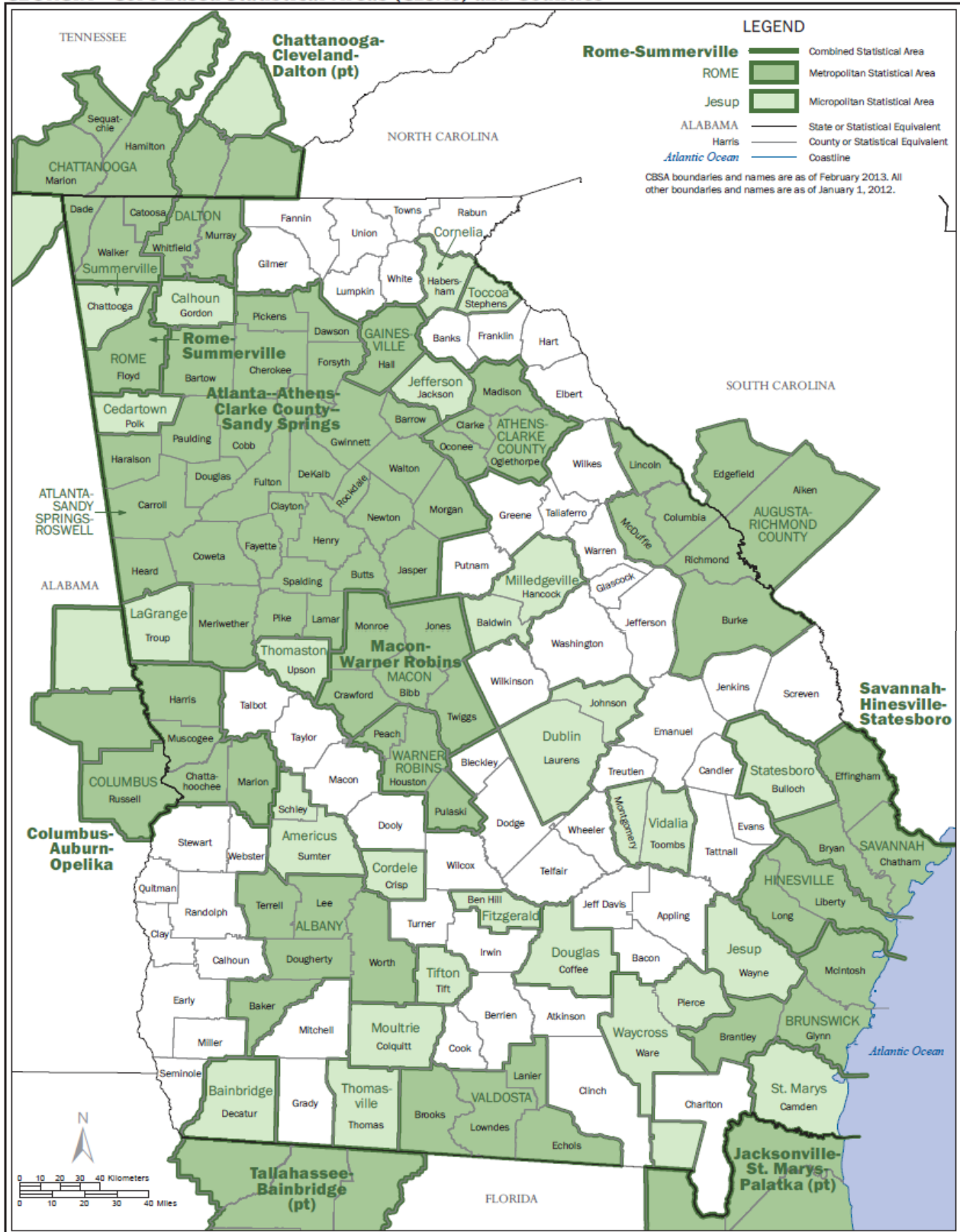
(c) The annual monitoring network plan must document how state and local agencies provide for the review of changes to a PM_{2.5} monitoring network that impact the location of a violating PM_{2.5} monitor. The affected state or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

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

(e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to §58.14.

Within this document, the GA AAMP has included the metropolitan statistical area (MSA) represented by each site, which was derived from the following map (Figure 2), as requested above in paragraph 40CFR58.10(a)(3)(b)(8). The U.S. Census Bureau defines an MSA as a geographic entity containing a core urban area of 50,000 or more population and consists of one or more counties containing the core urban area, as well as adjacent counties that have a high degree of social and economic integration with the urban core (<http://www.census.gov/population/metro/>).

GEORGIA - Core Based Statistical Areas (CBSAs) and Counties



U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. Census Bureau

Figure 2: Map of Statistical Areas in Georgia

1.2 Procedures for Making Changes to the Monitoring Network

In some circumstances, monitors must be shut down or moved. While the Ambient Monitoring Program of GA EPD makes every effort to maintain continued operation of all required monitors, it operates as a guest or leaseholder at all monitoring sites. The GA AAMP does not hold ownership rights to the land at any of its ambient air monitoring sites. If the GA AAMP loses its lease or is otherwise forced to leave a given site, the monitors at that site may be moved to a nearby location [40CFR58.14(c)(6)].

1.3 Memorandum of Agreement

As stated in the Memorandum of Agreement dated December 28, 2017, “The purpose of the Memorandum of Agreement (MOA) is to establish the Chattanooga-Hamilton County-Walker County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between CHCAPCB [Chattanooga-Hamilton County Air Pollution Control Bureau] and GAEPDAPB [Georgia Environmental Protection Division Air Protection Branch] (collectively referred to as the “affected agencies”) to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Chattanooga–Hamilton County-Walker Co, GA MSA as required by 40CFR58 Appendix D, Section 2, (e) (March 28, 2016).” For full MOA documentation, see Appendix E of this document.

The Memorandum of Agreement dated January 2017 states, “The purpose of the Memorandum of Agreement (MOA) is to renew the Augusta-Richmond County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between SCDHEC [South Carolina Department of Health and Environmental Control] and GA EPD (collectively referred to as the “affected agencies”) to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Augusta–Richmond County MSA as required by 40CFR58 Appendix D, Section 2, (e).” For full MOA documentation, see Appendix E of this document.

For the Columbus, GA-AL MSA, both the Alabama Department of Environmental Management and the GA AAMP have agreed to fully cover EPA’s regulations for monitoring their respective state.

1.4 Request for Waiver

The GA AAMP is requesting a waiver to continue monitoring the solar radiation and total ultraviolet radiation at the Conyers site (13-247-0001) for the South DeKalb (13-089-0002)

PAMS site. The South DeKalb monitoring site does not fit the necessary guidelines for measurement of solar radiation, due to the topography of the site location. Solar radiation measurements from the total global solar radiation sensor must be made from a location that is free from any obstruction which may cause a shadowing effect. In addition, the pyranometer must be located away from highly reflective surfaces, which may cause enhanced optical scattering and overestimate the incoming total solar radiation. The required total ultraviolet radiation and solar radiation measurements are collected at the Conyers monitoring site, which meets necessary criteria.

In March 2018, the GA AAMP requested a waiver from EPA regarding the siting criteria at the Columbus-Joy Road (formerly called Columbus-Fort Benning) site (13-215-0010), the siting criteria for South DeKalb site (13-089-0002), and for an alternate PAMS monitoring schedule for the 2018 PAMS season (June-August). See the GA AAMP's Public Notice *Site Waiver Requests, March 2018* at <https://airgeorgia.org/networkplans.html> for more details.

1.5 Air Quality Index (AQI)

The Air Quality Index (AQI) is a method of reporting daily air quality that converts concentration levels of pollution to a simple color-coded number scale of 0-500. Colored categories on the AQI scale are related to potential health effects from exposure to measured concentrations of a major pollutant. Certain monitoring stations in the GA AAMP's SLAMS network provide data used in daily AQI reporting.

Figure 3 shows how the monitored concentrations correspond to the AQI values, descriptors and health advisories. AQI reporting is required for all urban areas with a population exceeding 350,000, which in Georgia include the Atlanta-Sandy Springs-Marietta MSA; the Augusta-Richmond County, GA-SC MSA; the Savannah MSA; and the Chattanooga TN-GA MSA. The GA AAMP provides daily AQI reporting to the general public in Georgia through the Ambient Monitoring Program website (<https://airgeorgia.org/>). The Chattanooga, Tennessee-Georgia MSA AQI reporting is covered by the GA AAMP and the Chattanooga-Hamilton County Air Pollution Control Bureau per the MOA, as discussed above. The Augusta-Richmond County, GA-SC MSA AQI is covered by the GA AAMP and the South Carolina Department of Health and Environmental Control per the MOA. On October 1, 2015, EPA tightened the ozone standard to 70 ppb. At the same time, EPA adjusted the AQI index levels or "breakpoints" to reflect the new standard.

Maximum Pollutant Concentration							AQI Value	Descriptor	EPA Health Advisory
PM _{2.5}	PM ₁₀	SO ₂	O ₃	O ₃	CO	NO ₂			
(24hr) µg/m ³	(24hr) µg/m ³	(1hr)* ppb	(8hr)^ ppm	(1hr) ppm	(8hr) ppm	(1hr) ppb			
0.0–12.0	0– 54	0– 35	0.000–0.054	None	0.0–4.4	0– 53	0 to 50	Good (green)	Air quality is considered satisfactory, and air pollution poses little or no risk.
12.1–35.4	55–154	36–75	0.055–0.070	None	4.5–9.4	54-100	51 to 100	Moderate (yellow)	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to the condition of the air may experience respiratory symptoms.
35.5–55.4	155 – 254	76 – 185	0.071 – 0.085	0.125 – 0.164	9.5–12.4	101-360	101 to 150	Unhealthy for Sensitive Groups	Members of sensitive groups (people with lung or heart disease) are at greater risk from exposure to particle pollution. Those with lung disease are at risk from exposure to ozone. The general public is not likely to be affected in this range.
55.5–150.4	255–354	186–304*	0.086–0.105	0.165–0.204	12.5–15.4	361-649	151 to 200	Unhealthy (red)	Everyone may begin to experience health effects in this range. Members of sensitive groups may experience more serious health effects.
150.5–250.4	355–424	305–604*	0.106–0.200	0.205–0.404	15.5–30.4	650-1249	201 to 300	Very Unhealthy (purple)	AQI values in this range trigger a health alert. Everyone may experience more serious health effects. When the AQI is in this range because of ozone, most people should restrict their outdoor exertion to morning or late evening hours to avoid high ozone exposures.
250.5–350.4	425–504	605–804*	0.201- (^)	0.405 – 0.504	30.5–40.4	1250-1649	301 to 400	Hazardous (maroon)	AQI values over 300 trigger health warnings of emergency conditions. The entire population is more likely to be affected.
350.5–500.4	505–604	805–1004*	None^	0.505–0.604	40.5–50.4	1650-2049	401 to 500		

*Values of 200 or greater are calculated with 24-hr SO₂ concentrations; ^Values of 301 or greater are calculated with 1-hr O₃ concentrations

Figure 3: Detailed AQI Values by Pollutant

1.6 QAPP and QMP

As part of the requirements for EPA (40CFR58 Appendix A), the GA AAMP has submitted the appropriate Quality Assurance Project Plans (QAPP) and Quality Monitoring Plans (QMP). The following table shows the current status of submittals and approvals of these documents.

QAPP ID	QAPP Title	Submittal	Approval
GA-AAMP-QAPP-NR-03-2018	Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for the Near Road Monitoring Network (March 2018 Version)	3-31-2018	To be approved by EPA; initial version submitted 3-21-2014
GA-AAMP-QAPP-CAP&NCORE-2-2018	Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for the Criteria Air Pollutants (Including Data Requirement Rule) and National Core Multi-Pollutant Station (February 2018 Version)	2-22-2018	To be approved by EPA; 12-21-2016 (Conditionally approved by EPA)
GA-AAMP-QAPP-PM25-12-2017	Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for PM _{2.5} (Including Chemical Speciation) (December 2017 Version)	12-28-2017	To be approved by EPA; previous version approved 8-20-2014
GA-AAMP-QAPP-NATTS-4-2018	Quality Assurance Project Plan for the Georgia National Air Toxics Trends Project (April 2018 Version)	4-11-2018	To be approved by EPA; previous version approved 4-22-2014
GA-AAMP-QAPP-PAMS-12-2017	Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for the Photochemical Assessment Monitoring Stations State of Georgia (December 2017 Version)	12-28-2017	To be approved by EPA; previous version approved 7-21-2010

Table 1: List of Georgia EPD's QAPPs

1.7 Public Notice and Comment Procedures

This document and any future changes to the monitoring network are subject to a required public notice and comment process before EPA approval is sought for the changes. Any public comments submitted in response to this document's notice and comment process will be submitted to EPA along with the final document. Persons wishing to comment on the draft *Ambient Air Monitoring Plan* are required to submit their comments, in writing, to the GA AAMP at the following address:

Air Protection Branch
Attn: Annual Air Monitoring Plan Comments
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

In addition, public comments can be submitted in writing to DeAnna Oser, Program Manager of the Ambient Monitoring Program, at DeAnna.Oser@dnr.ga.gov.

The deadline for submitting comments to the GA AAMP is no later than 30 days after the date on which this document is published on <https://airgeorgia.org/>. Should the comment period end on a weekend or holiday, comments will be accepted up until the next working day. The GA AAMP, in soliciting comments for the final draft before submittal to EPA as required by 40CFR58.10(a)(1), will address, as appropriate, any comments received before the deadline.

The GA AAMP's responses to comments and any other relevant information will be made available for public review during normal business hours at the office of the Air Protection Branch, as well as in the final document published on <https://airgeorgia.org/>.

1.8 Inventory of Ambient Monitoring Equipment

As part of the requirements for the *Ambient Air Monitoring Plan*, the GA AAMP has included a list and evaluation of the current ambient monitoring equipment. See attached Appendix B of this document for the inventory listing.

1.9 List of Sites

The following table gives a complete list of the current air monitoring network and the parameters that are sampled at each site.

SITE ID	SITE NAME	COUNTY	O ₃	CO	PM _{2.5}	PM _{2.5}	PM _{2.5}	PM	NO/						PM ₁₀	PAMS			Carb-	Meteo-	Black	
					FRM	Cont.	Spec.	Coarse	NOx	NO ₂	NOy	SO ₂	Pb	PM ₁₀	Cont.	VOC	VOC	SVOC	onyls	rology	Carbon	Metals
Rome MSA																						
131150003	Rome	Floyd				S	X															
131150006	Kraftsman	Floyd										S									NR	
Brunswick MSA																						
131270006	Brunswick	Glynn	S		S																NR	
Valdosta MSA																						
131850003	Valdosta	Lowndes			S	S																
Warner Robins MSA																						
131530001	Warner Robins	Houston			S	S																
Dalton MSA																						
132130003	Fort Mountain	Murray	S																		NR	
Albany MSA																						
130950007	Albany	Dougherty			S	S																
Gainesville MSA																						
131390003	Gainesville	Hall			S	S																
Athens-Clarke County MSA																						
130590002	Athens	Clarke	S		S	S																
Macon MSA																						
130210007	Macon-Allied	Bibb			S		X															
130210012	Macon-Forestry	Bibb	S		S	S						S						NR	NR		NR	NR
Columbus Georgia- Alabama MSA																						
132150001	Columbus-Health Dept.	Muscogee			S																	
132150008	Columbus-Airport	Muscogee	S		S	S																
132150009	Columbus-Allied	Muscogee											S									
132150010	Columbus-Joy Rd	Muscogee											S									
132150011	Columbus-Cusseta	Muscogee			S		X						S									
132151003	Columbus-Crime Lab	Muscogee																			NR	
Savannah MSA																						
130510021	Savannah-E. President	Chatham	S									S						NR	NR	NR	NR	NR
130510091	Savannah-Mercer	Chatham			S																	
130511002	Savannah- L&A	Chatham				S						S									NR	
Augusta-Richmond County, Georgia-South Carolina MSA																						
130730001	Evans	Columbia	S																		NR	
132450091	Augusta	Richmond	S		S	S	X					S			S						NR	

SITE ID	SITE NAME	COUNTY	O ₃	CO	PM _{2.5}	PM _{2.5}	PM _{2.5}	PM Coarse	NO/NO _x	NO ₂	NO _y	SO ₂	Pb	PM ₁₀	PM ₁₀	PAMS	VOC	SVOC	Carbonyls	Meteorology	Black Carbon	Metals
					FRM	Cont.	Spec.								Cont.	VOC						
Atlanta-Sandy Springs-Marietta MSA																						
130630091	Forest Park	Clayton			S																	
130670003	Kennesaw	Cobb	S		S																	
130850001	Dawsonville	Dawson	S																	NR		
130890002	South DeKalb	DeKalb	S/P/C	S/P/C	S/C	S/C	T/C	S	S/P	S/P	S/P/C	C			C	P	N	N	P/N	P/C		N
130890003	NR-285	DeKalb							R	R							R				R	
130970004	Douglasville.	Douglas	S																	NR		
131210039	Fire Station #8	Fulton			S									S								
131210055	Confederate Ave.	Fulton	S			S						S								NR		
131210056	NR-GA Tech	Fulton		R	R	R				R										R	R	
131350002	Gwinnett Tech	Gwinnett	S		S	S																
131510002	McDonough	Henry	S			S																
132319991	EPA CASTNET	Pike	A																			
132470001	Conyers	Rockdale	S																	NR/P		
Chattanooga Tennessee-Georgia MSA																						
132950002	Rossville	Walker			S	S	X															
Not in an MSA																						
130550001	Summerville	Chattooga	S																			
130690002	General Coffee	Coffee			S		X										NR	NR				NR
132611001	Leslie	Sumter	S																			
133030001	Sandersville	Washington			S																	

Monitoring Types: S=SLAMS; P=PAMS; C=NCORE; X=Supplemental Speciation; T=STN; N=NATTS; R=Near-road; NR=Non-Regulatory; G=General Information; A=CASTNET

Table 2: 2018 Georgia Ambient Air Monitoring Network

2.0 Standards

Measuring pollutant concentrations in ambient air and comparing the measured concentrations to corresponding standards determine ambient air quality status for the six criteria pollutants. The six criteria pollutants are sulfur dioxide, particulate matter (PM_{2.5} and PM₁₀), carbon monoxide, ozone, nitrogen dioxide, and lead. The EPA defines the ambient air as that portion of the atmosphere, external to buildings, to which the general public has access.

The National Ambient Air Quality Standards (NAAQS) are divided into primary and secondary standards¹. Primary standards are those established to protect public health. Secondary standards are those established to protect the public welfare from adverse pollution effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, climate, property, transportation, economy, personal comfort and well-being. The scientific criteria upon which the standards are based are reviewed periodically by the EPA, which may reestablish or change the standards according to its findings. Note that there are hundreds of compounds that are generally considered pollutants when found in ambient air but whose health and welfare effects are not well enough understood for ambient standards to be defined.

A pollutant measurement that is greater than the ambient air quality standard for a specific averaging time is called an exceedance. An exceedance does not always imply that a violation of the standard took place. For each pollutant, there are specific rules for a given time period before a pattern of exceedances is considered a violation of the NAAQS. If a violation occurs, it may result in regulatory actions to further clean up the air in the area where the violation occurred. This distinction is made to allow for certain limited exceedances of the standard that may occur, for example, during an unusual weather pattern, reserving regulatory action for cases where the exceedances are too large or too frequent.

3.0 Monitoring Objectives and Spatial Scale

Federal regulations indicate that a minimum of four monitoring objectives should be met in establishing an ambient air monitoring network. The network is to have stations that monitor: (1) the highest pollutant concentrations; (2) the representative concentrations in areas of high population density; (3) the impact of major pollution emissions sources; and (4) the general background concentration levels. The physical siting of the air monitoring station must achieve a spatial scale of representativeness that is consistent with the monitoring objective. The spatial scale results from the physical location of the site with respect to the pollutant sources and categories. It estimates the size of the area surrounding the monitoring site that experiences uniform pollutant concentrations.

The categories of spatial scale are:

Micro Scale: An area of uniform pollutant concentrations ranging from several meters up to 100 meters.

Middle Scale: Uniform pollutant concentrations in an area of about 100 meters to 0.5 kilometer.

Neighborhood Scale: An area with dimensions in the 0.5 to 4.0 kilometer range.

Urban Scale: Citywide pollutant conditions with dimensions ranging from 4 to 50 kilometers.

Regional Scale: An entire rural area of the same general geography (this area ranges from tens to hundreds of kilometers).

¹ For a list of the most current standards, please refer to EPA's website <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

Monitoring objectives and associated spatial scales are taken from Appendix D of 40CFR58, Table D-1, and summarized in Table 3 below.

Table 3: Monitoring Objective and Spatial Scale

Monitoring Objective	Appropriate Spatial Scale
Highest concentration or source impact	Micro, Middle, Neighborhood, or (less frequently) Urban
Population oriented	Neighborhood or Urban
General/background, regional transport, welfare related impacts	Urban or Regional

4.0 Description of Networks

4.1 NCore

The State of Georgia is required to have one National Core (NCore) Multipollutant Monitoring station, and the GA AAMP complies with this requirement at the South DeKalb site (13-089-0002) in DeKalb County. The NCore site monitoring equipment includes: PM_{2.5} FRM, PM_{2.5} continuous, PM_{2.5} speciation, ozone (collecting data year-round), trace level carbon monoxide (CO), trace level sulfur dioxide (SO₂), trace level nitrogen oxide (NO), total reactive nitrogen (NO_y), wind direction, wind speed, temperature, and relative humidity. The site has operated since January 1, 2011, and site establishment and details were included in the GA AAMP's *2011 Ambient Air Monitoring Plan, Appendix C, Ambient Air Monitoring Plan for National Core (NCore) Multipollutant Monitoring Station*. NCore monitoring network sites have the following monitoring objectives:

- timely reporting of data to the public through AIRNow, air quality forecasting, and other public reporting mechanisms
- support development of emission strategies through air quality model evaluation and other observational methods
- accountability of emission strategy progress through tracking long-term trends of criteria and non-criteria pollutants and their precursors
- support long-term health assessments that contribute to ongoing reviews of the National Ambient Air Quality Standards (NAAQS)
- compliance through establishing nonattainment/attainment areas by comparison with the NAAQS
- support multiple disciplines of scientific research, including; public health, atmospheric and ecological

4.2 Sulfur Dioxide

EPA lowered the sulfur dioxide (SO₂) NAAQS standard to a 1-hour primary standard of 75 ppb, and added new SO₂ ambient monitoring requirements in 2010 (Federal Register: Vol. 75, No. 119, 06/22/10). The rule combines air quality modeling and monitoring. The rule requires refined dispersion modeling to determine if areas with sources that have the potential to cause or contribute to a violation of the new SO₂ standard can comply with the standard. The monitoring

regulations require monitors to be placed in Core Based Statistical Areas (CBSAs), based on a population weighted emissions index (PWEI) for the area. The rule requires three monitors in CBSAs with index values of 1,000,000 or more; two monitors in CBSAs with index values less than 1,000,000 but greater than 100,000; and one monitor in CBSAs with index values greater than 5,000. The GA AAMP complies with these requirements by monitoring for SO₂ at the Confederate Avenue (13-121-0055), South DeKalb (13-089-0002), Augusta (13-245-0091), Savannah-L&A (13-051-1002), and Macon-Forestry (13-021-0012) sites. In addition, the GA AAMP chose to continue monitoring for SO₂ with another monitor in the Savannah MSA (Savannah-E. President Street, 13-051-0021).

In accordance with the EPA Data Requirements Rule for sulfur dioxide (Federal Register: Vol. 80, No. 162, 08/21/15), the GA AAMP modeled SO₂ concentrations in 2016 in order to select the most appropriate location for the Rome SO₂ monitor that would capture the maximum SO₂ emissions from the nearby facilities. As of January 1, 2017, the Rome SO₂ monitor was moved from the Coosa location (13-115-0003) to the Kraftsman Road location (13-115-0006) to meet this requirement. For site details, see Appendix A. For more information regarding location selection and modeling, see the GA AAMP's *2016 Ambient Air Monitoring Plan, Appendix D-International Paper-Rome Modeling Report* at <https://airgeorgia.org/networkplans.html>.

As an NCore site, the South DeKalb site (13-089-0002) also began monitoring trace level sulfur dioxide as of October 1, 2010. The GA AAMP collects and reports 5-minute maximum data with all the SO₂ monitors in the state.

4.3 Nitrogen Dioxide

EPA's last revision of the nitrogen dioxide (NO₂) National Ambient Air Quality Standard and monitoring requirements was January 22, 2010. Near-road NO₂ monitors were to be set up in CBSAs with 500,000 or more population (additional monitor with CBSA population above 2,500,000), average traffic counts of 250,000 vehicles or greater, and represent a microscale (no more than 50 meters from the edge of the nearest traffic lane) (Federal Register, Vol. 75, No. 26, 02/09/10). The GA AAMP meets this requirement with two monitors in the Atlanta-Sandy Springs-Marietta MSA. The first near-road NO₂ monitor was set up at the near-road site on the Georgia Institute of Technology campus (NR-GA Tech, 13-121-0056) on June 15, 2014. NO₂/NO/NO_x, CO, PM_{2.5}, black carbon, wind speed and wind direction are monitored at this site. For details regarding the establishment of the first near-road site in the Atlanta-Sandy Springs-Marietta MSA, refer to Appendix E of the *2014 Ambient Air Monitoring Plan* at <https://airgeorgia.org/networkplans.html>. The second near-road monitoring site was set up in the Atlanta-Sandy Springs-Marietta MSA on January 1, 2015 at the established monitoring site near interstate 285 (NR-285, 13-089-0003) (formerly DMRC). At the NR-285 site, NO₂/NO/NO_x, volatile organic compounds, and black carbon are monitored for the near-road network. For details regarding the establishment of the second near-road site, refer to the GA AAMP's Addendum to the *2015 Ambient Air Monitoring Plan* at <https://airgeorgia.org/networkplans.html>.

In addition to the near-road NO₂ requirements, the GA AAMP is required to operate at least one area-wide NO₂ monitor in the Atlanta-Sandy Springs-Marietta MSA. These monitors should be placed in CBSAs with a population of 1,000,000 or more, and are expected to have the highest concentrations representing a neighborhood or larger spatial scale (40CFR58, Appendix D, Section 4.3.3). The South DeKalb site (13-089-0002) is the GA AAMP's PAMS site (discussed

below), and collects area-wide NO₂ data for the Atlanta-Sandy Springs-Marietta MSA. The South DeKalb site has historically collected the highest concentrations, is located within an urban area, represents the urban spatial scale, and operates year round. Therefore, the South DeKalb NO₂ monitor satisfies the area-wide requirement.

4.4 Carbon Monoxide

EPA's last revision to the monitoring requirements for the carbon monoxide (CO) monitoring network was in 2011. EPA requires that a CO monitor be collocated with an NO₂ near-road monitor in urban areas with populations of one million or more. EPA specified that in areas with 2.5 million or more, the CO monitors should be operational by January 1, 2015 (Federal Register: Vol. 76, No. 169, Page 54293, 08/31/11). For this monitoring requirement, the State of Georgia is required to have one CO monitor located in the Atlanta-Sandy Springs-Marietta MSA, collocated with an NO₂ near-road monitor. The GA AAMP meets this monitoring requirement with a CO monitor that began monitoring at the NR-GA Tech site (13-121-0056) on June 15, 2014. In addition, the South DeKalb site (13-089-0002) is the GA AAMP's NCore site and collects CO data as part of that network (discussed above).

4.5 Lead

EPA's last revision to the requirements for measuring lead in the ambient air was in 2010. The emission threshold for placing lead monitors near industrial facilities was lowered from 1.0 tons per year (tpy) to 0.5 tpy (Federal Register: Vol. 75, No. 247, Page 81126, 12/27/10). The GA AAMP meets this requirement with lead monitors located in the Columbus Georgia-Alabama MSA in Muscogee County near a source of lead emissions. One lead monitoring site is required, and at its discretion, the GA AAMP has chosen to have two additional lead monitoring sites in the area. There is one lead monitor located at the Cusseta Elementary School (13-215-0011) site, and one at the Columbus-Joy Road (13-215-0010) site. The Columbus-Allied (13-215-0009) site has two collocated lead monitors. GA AAMP will shut down the Columbus-Joy Road site as of June 30, 2018.

4.6 PM_{2.5} Speciation Trends Network (STN)

EPA expanded PM_{2.5} monitoring to characterize the make-up of the PM_{2.5} sample with Speciation Trends Network (STN) (40CFR58, Appendix D, Section 4.7.4). With this speciation information, air quality modeling can be improved to help implement the NAAQS standards; health studies can be interpreted by knowing the constituents of the PM_{2.5} sample, and the understanding of the constituents in regional haze is also improved. There are 52 Speciation Trends sites across the United States. The GA AAMP meets this requirement with the South DeKalb site (13-089-0002). The South DeKalb Speciation Trends site began monitoring on October 1, 2000, and samples are collected every three days. Additionally, there are six more PM_{2.5} speciation monitors that the GA AAMP has chosen to operate. These sites are located in Rome (started 3/1/02), Macon (started 3/1/02), Columbus (started 5/1/02), Augusta (started 3/2/02), Rossville (started 3/23/05), and Douglas (started 3/1/02). These are in place to provide supplemental speciation data in the overall chemical speciation network, and take samples every 6 days.

4.7 Photochemical Assessment Monitoring Stations (PAMS)

On October 26, 2015, EPA made revisions to the ozone standard, and with those changes, also revised the regulations for the supporting PAMS stations (Federal Register, Vol.80, No. 206, page 65467). EPA is requiring that PAMS measurements be collected at NCore sites only. The GA AAMP meets this requirement with the South DeKalb (13-089-0002) site, which is the GA AAMP's NCore site. Therefore, for the PAMS requirements, the GA AAMP will continue collecting the three 8-hour samples of carbonyls collected every third day during June, July and August; hourly ozone, NO, NO₂, NO_y, temperature, wind direction, wind speed, barometric pressure, relative humidity, precipitation, and sigma theta at the South DeKalb site. As discussed in Section 1.4, solar radiation and ultraviolet radiation are monitored at the Conyers (13-247-0001) site due to siting conditions. However, for the 2018 PAMS season, the GA AAMP has requested an operational waiver for the hourly collection of speciated volatile organic compounds in June, July, and August. Instead, the GA AAMP will collect the VOCs via canister method every six days. See Section 1.4 of this document and the GA AAMP's Public Notice *Site Waiver Requests, March 2018* at <https://airgeorgia.org/networkplans.html> for more details.

The South DeKalb site is located in DeKalb County to provide neighborhood scale measurements in the area that the chemicals that form ozone have the greatest impact. The data measurements generated at the South DeKalb site are used principally for development and evaluation of imminent and future control strategies, corroboration of NO_x and VOC emission inventories, verification of photochemical grid model performance, characterization of ozone and toxics air pollutant exposures, development of pollutant trends (particularly toxic air pollutants and annual ambient speciated VOC trends to compare with trends in annual VOC emission estimates), and determination of attainment with NAAQS for O₃, PM_{2.5}, PM₁₀, CO, SO₂, and NO₂.

4.8 National Air Toxics Trends Station (NATTS)

The National Air Toxics Trends Stations (NATTS) program is a nationwide monitoring project for the assessment of national trends and variations of several selected air toxics pollutants. The NATTS network was established to produce data that is consistent and of standardized quality to be able to perform comparisons of air toxics data nationwide. There are 27 NATTS locations nationwide, with 20 urban sites to address the range of population exposure in urban areas and seven rural sites to characterize population exposure in non-urban areas, establish background concentrations, and better assess environmental impacts of emissions of air toxic pollutants. The GA AAMP meets the requirement with the location of the NATTS station at the South DeKalb site (13-089-0002). As part of the NATTS network, the GA AAMP samples metals with a PM₁₀ sampler, semi-volatile organic compounds, volatile organic compounds, and carbonyls. Samples are collected from midnight to midnight for a 24-hour sample, every 6 days. In addition, an 8-hour carbonyls sample is collected three times a day, every third day through June, July, and August.

4.9 Air Toxics Network

In addition to its required monitoring duties, the GA AAMP has chosen to measure more compounds in ambient air than are required by the Federal Clean Air Act. The GA AAMP's Air Toxics Network consists of three sites: Macon-SE (13-021-0012), Savannah-E.President's St.

(13-051-0021), and General Coffee (13-069-0002). Similar to the NATTS station discussed above, the Air Toxics Network equipment samples for metals, semi-volatile organic compounds, volatile organic compounds. The Savannah site samples carbonyls, along with the South DeKalb NATTS site.

5.0 Site Evaluations

The GA AAMP performs site evaluations throughout the year on an annual basis for each site. The following table details when the most recent site evaluations were performed and a summary of the comments that the evaluator made about each site.

SITE ID	COMMON NAME	COUNTY	SITE EVALUATION DATE	COMMENTS	ACTION TAKEN
Rome MSA					
131150003	Rome	Floyd	5/4/2017	The two tall oaks form an obstruction to the northwest of the samplers. However, over 90% of the monitoring path is not affected by the trees.	No action required
131150006	Kraftsman	Floyd	6/1/2017	Samplers meet siting criteria.	No action required
Brunswick MSA					
131270006	Brunswick	Glynn	12/5/2017	Samplers meet siting criteria. 2025 needs new upper housing seal and hinge lock button.	No action required; will monitor for future response
Valdosta MSA					
131850003	Valdosta	Lowndes	10/06/2017	Samplers meet siting criteria. The BAM door appears to have been previously broken and taped into place. The overall condition appears much the same as recorded on the last survey. Housing seal falling off 2025, taped on.	No action taken; will monitor for future response
Warner Robins MSA					
131530001	Warner Robins	Houston	6/7/2017	Samplers meet siting criteria. BAM door held in place with tape and a concrete block.	BAM and enclosure replaced in March 2018 with T-640 and new enclosure as well
Dalton MSA					
132130003	Fort Mountain	Murray	10/31/2017	Samplers meet siting criteria. Few trees to the south are inside 10x height differential with the MET tower. Ground slopes off severely to the north and east.	No action required; Forest Service property
Albany MSA					
130950007	Albany	Dougherty	2/2/2018	Samplers meet siting criteria. DAS not taking inputs from keypad or keyboard accurately.	Data quality not affected. DAS not in use
Gainesville MSA					
131390003	Gainesville	Hall	3/21/2017	Two trees inside the height-distance differential have been cut down since the last survey. The BAM PM _{2,5} sampler has been replaced by a Teledyne T-640 PM _{2,5} monitor.	Trees have been removed
Athens-Clark County MSA					
130590002	Athens	Clarke	2/17/2017	Water damage around a/c ports. Door rusted at bottom. Drip lines too close.	Shelter has been replaced; tree that was too close to drip line was removed
Macon MSA					
130210007	Macon-Allied	Bibb	7/13/2017	Samplers meet siting criteria. 12.2m to dripline from URG inlet.	No action required
130210012	Macon-Forestry	Bibb	10/18/2017	The metal and PUF samplers need at least 0.3m further elevation to meet inlet siting guidance of 2-7 meters. The floor around the door is rotting out. The floor covering is cracked and has holes. White dust was emitted from the hole when I walked near it when entering the shelter. The condition is worse than the last survey. Repair would extend the life of an otherwise sound shelter. Drip line 10.9m from SO ₂ inlet, 11.4m from O ₃ inlet and closer than last survey.	Samplers raised to meet height guidance; observations do not affect ambient air data quality.

SITE ID	COMMON NAME	COUNTY	SITE EVALUATION DATE	COMMENTS	ACTION TAKEN
Columbus MSA					
132150001	Columbus-Health Dept.	Muscogee	8/16/2017	Samplers meet siting criteria.	Not applicable.
132150008	Columbus-Airport	Muscogee	7/25/2017	Samplers meet siting criteria. Water damage to ceiling and wall around door and a/c. Soft floor.	No action taken.
132150009	Columbus-Allied	Muscogee	1/11/2018	Samplers meet siting criteria. Nearest drip line taller than inlet is 6 m away.	No action taken.
132150010	Columbus-Joy Road	Muscogee	2/15/2018	Drip line too close to samplers.	Moved collocated monitor; shutting down sampler.
132150011	Columbus-Cusseta	Muscogee	2/16/2017	Samplers meet siting criteria.	Not applicable.
132151003	Columbus-Crime Lab	Muscogee	1/11/2018	Samplers meet siting criteria.	Not applicable.
Savannah MSA					
130510021	Savannah-E. President	Chatham	6/16/2017	Samplers meet siting criteria.	Not applicable.
130510091	Savannah-Mercer	Chatham	5/26/2017	Samplers meet siting criteria.	Not applicable.
130511002	Savannah – L&A	Chatham	6/9/2017	Floor soft around doorway. Trees have grown back. SO ₂ drip line <7.5m.	Andersen samplers removed.
Augusta MSA					
130730001	Evans	Columbia	7/10/2017	Samplers meet siting criteria. Shelter exterior and floor rotting, needs paint and replacement wood, flooring. Small hole in floor. Integrity and sample lines are routed on floor of shelter, along ground outside, and then up tower to inlet. Recommend lines are replaced and routed up and out at top of wall of shelter to avoid contamination, improve response and standardize with other sites.	Shelter has been reorganized and unneeded equipment and supplies removed
132450091	Augusta	Richmond	8/17/2017	Samplers meet siting criteria.	Not applicable.
Atlanta-Sandy Springs-Marietta MSA					
130630091	Forest Park	Clayton	8/24/2017	Samplers meet siting criteria. There are not any site deficiencies that need to be addressed.	Not applicable.
130670003	Kennesaw	Cobb	2/1/2018	Samplers meet siting criteria. There were not any deficiencies observed at this site.	Not applicable.
130850001	Dawsonville	Dawson	1026/2017	Samplers meet siting criteria. A large swath of trees has been cut down to the south and west of the trailer. Met tower is inside 10x height differential with a few trees to the north and east. A few trees to the southeast and northeast exceed the distance height differential.	No action taken; Forest Service property
130890002	South DeKalb	DeKalb	12/11/2017	A new trailer for the VOCs and carbonyls is being set up. Some trees to the south, west, and north of the samplers have been cut back since the last survey, increasing the drip line distances. The BAM samplers have been replaced by a Teledyne T640x mass monitor. The tallest trees to the north are 23-25 meters high. To the west, 20 meters tall, to the east, 17-19 meters tall, to the south, 18 meters tall. Trees to the north and east are inside twice the required height-distance differential (with some exceptions).	Relocated deck equipment; applying for waiver.

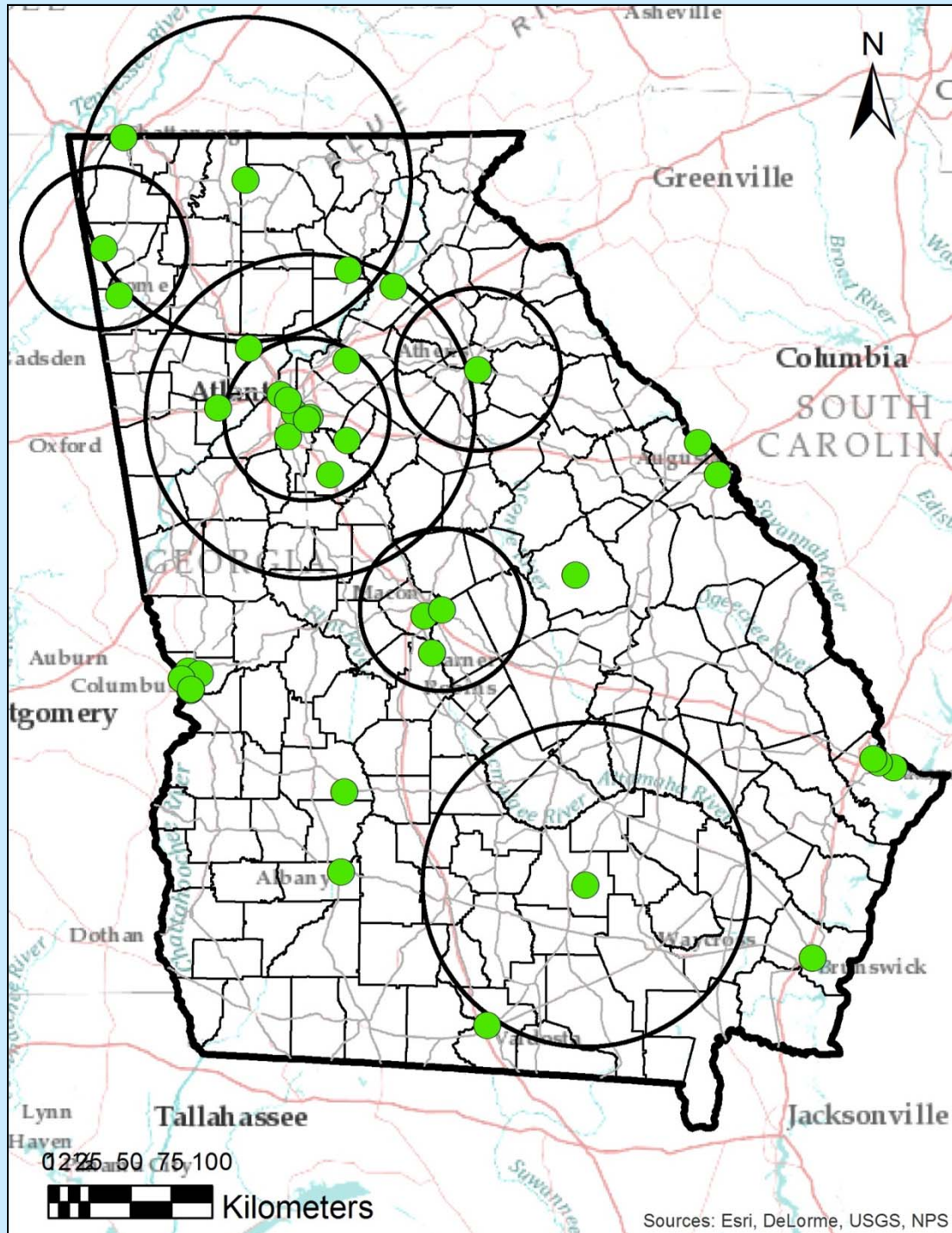
SITE ID	COMMON NAME	COUNTY	SITE EVALUATION DATE	COMMENTS	ACTION TAKEN
130890003	NR-285	DeKalb	4/27/2017	Samplers meet siting criteria. The DOT is presently working on the shoulder adjacent to NR-285 in order to add an exit lane to Flat Shoals Rd. A sound barrier wall will eventually be built between the road and the sampler. No deficiencies were noted at the site at this time.	Not applicable. Sound barrier does not interfere with sampling path.
130970004	Douglasville	Douglas	1/30/2018	Samplers meet siting criteria. The inside trailer siding near the floor and the countertop has become slightly warped due to past water infiltration. The water appears to have gained access through the vent hole on the side of the shelter during heavy rains. There is no outside damage to the shelter that would allow water in.	No action taken.
131210039	Fire Station #8	Fulton	8/01/2017	Samplers meet siting criteria. There are not any deficiencies compromising sampling quality.	Not applicable.
131210055	Confederate Ave.	Fulton	2/13/2017	Samplers meet siting criteria.	Not applicable.
131210056	NR-GA Tech	Fulton	2/8/18	Samplers meet siting criteria. There were no deficiencies observed at the site.	Not applicable.
131350002	Gwinnett Tech	Gwinnett	4/18/2017	Samplers meet siting criteria. The trailer floor has a few rips in it near the door. The trailer floor is bucking up slightly because of water infiltration on plywood support. A small wooden board is broken on the Partisol platform. No deficiencies noted that would affect sampling performance.	Partisol platform repaired. Shelter replaced.
131510002	McDonough	Henry	9/29/2017	Samplers meet siting criteria. Water damage to shelter interior. Rooftop taller than inlets ~8m from TEOM, ~9.6m from O ₃ . Dripline 23.4m across road. Exact measurement difficult due to shipping containers, clutter around shelter. Cars idle near shelter while dropping off goods to thrift store.	No action taken.
132470001	Conyers	Rockdale	8/29/2017	Samplers meet siting criteria. The closest tall tree to the southeast is slightly inside of twice the height differential to the inlet, but only intrudes on 10% of the monitoring path. More than 90% of the monitoring path at the site is obstruction free (all trees are an adequate distance away from the inlets based their height and the inlets' height).	Data quality not affected. No action taken.
Chattanooga Tennessee-Georgia MSA					
132950002	Rossville	Walker	12/07/2017	Samplers meet siting criteria. No deficiencies to be addressed.	Not applicable.
Not in an MSA					
130550001	Summerville	Chattooga	4/26/2017	Samplers meet siting criteria.	Not applicable.
130690002	General Coffee	Coffee	10/26/2017	Samplers meet siting criteria. Logbooks stored offsite. Drip line 13.7m from 2025. Drip line 11.7m from SASS. 2025 inlet shield bent. 2025 inlet 1.5m from PUF. AVOCs inlet on post.	2025 inlet replaced; 2m from PUF.
132611001	Leslie	Sumter	3/1/2017	Shelter floor rotten. Water damage to ceiling, around door jamb, and along base of walls. The drip-line is 6.3 m East of inlet.	Shelter replaced and relocated in 2018.
133030001	Sandersville	Washington	5/8/2017	Samplers meet siting criteria. Dripline 10m from PM _{2.5} inlet.	Not applicable.

Table 4: Site Evaluations

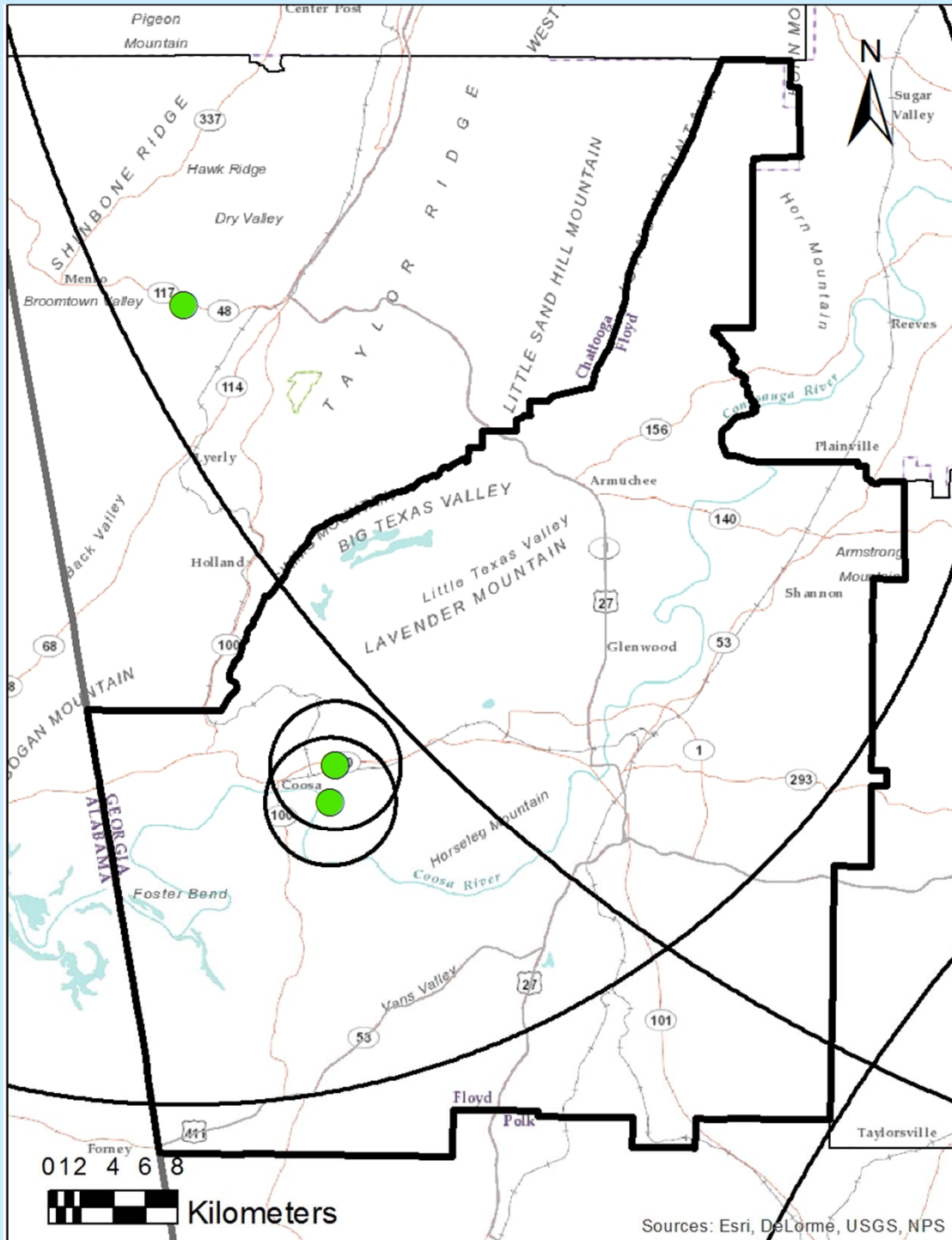
**Appendix A:
Individual Site Information
Grouped by Metropolitan Statistical Area
(Smallest to Largest)**

**Georgia Department of Natural Resources
Environmental Protection Division**

Spatial Scales of GA AAMP's Ambient Air Monitors



Rome MSA



Radius of Circles on Map

Micro Scale: up to 100m

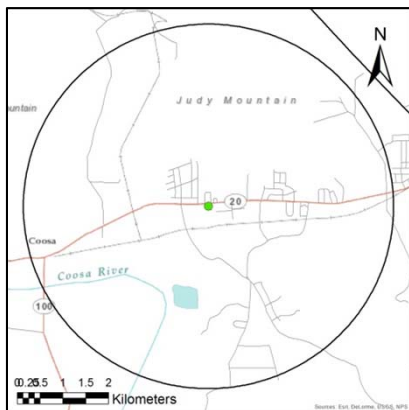
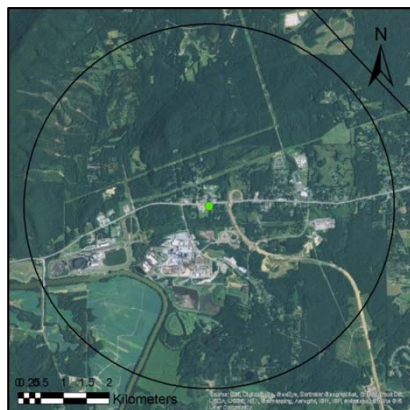
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Rome



AQS ID: 131150003

Address: 5041 Alabama Hwy, Rome, Floyd County, Georgia 30165

Site Established: 1/1/74

Latitude/Longitude: N34.2605/W-85.3232

Elevation: 186 meters

Area Represented: Rome MSA

Site History: Established as SO₂ site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5} Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/1/02
PM _{2.5} Continuous	Population Exposure	Continuous	3.5 m	Neighborhood	1/1/08*

*Sampler inactive from 1/1/15 until reopened 2/15/17

GA AAMP's plans for this site : Continue monitoring

Kraftsman



AQS ID: 131150006

Address: 238 Mays Bridge Rd. SW, Rome, Floyd County, Georgia 30165

Site Established: 1/1/17

Latitude/Longitude: N34.2434/W-85.3259

Elevation: 191 meters

Area Represented: Rome MSA

Site History: Established as SO₂ site

North

South

East

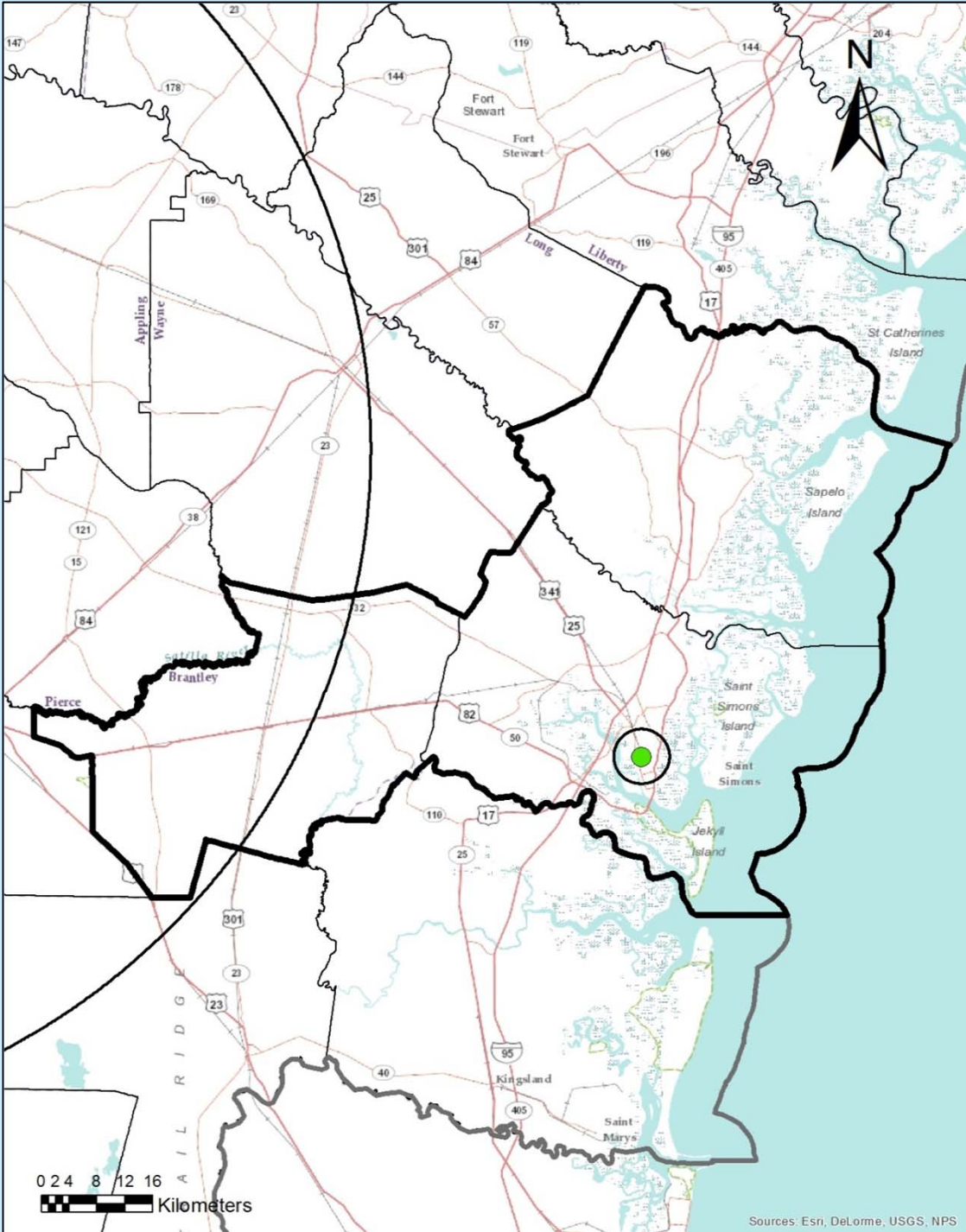
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
SO ₂	Population Exposure	Continuous	3.8 m	Neighborhood	1/1/2017
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	3.8 m	Neighborhood	1/1/2017
Wind Speed	Population Exposure	Continuous	10 m	Neighborhood	1/1/2017
Wind Direction	Population Exposure	Continuous	10 m	Neighborhood	1/1/2017

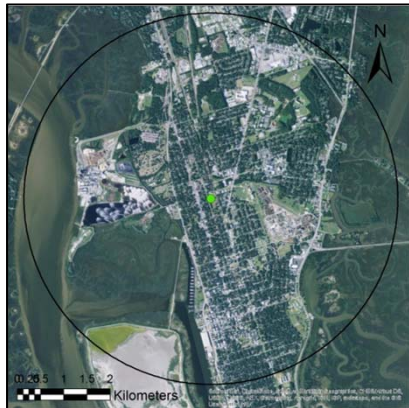
GA AAMP's plans for this site: Continue monitoring

Brunswick MSA



- Radius of Circles on Map
- Micro Scale: up to 100m
- Middle Scale: up to 0.5km
- Neighborhood Scale: up to 4.0km
- Urban Scale: up to 50km
- Regional Scale: up to 100s of km (100km shown)

Brunswick



AQS ID: 131270006

Address: Risley Early College Academy, 2900 Albany Street, Brunswick, Glynn County, Georgia 31520

Site Established: 1/1/87

Latitude/Longitude: N31.1696/W-81.4952

Elevation: 19.4 meters

Area Represented: Brunswick MSA

Site History: Established as SO₂ site

North

South

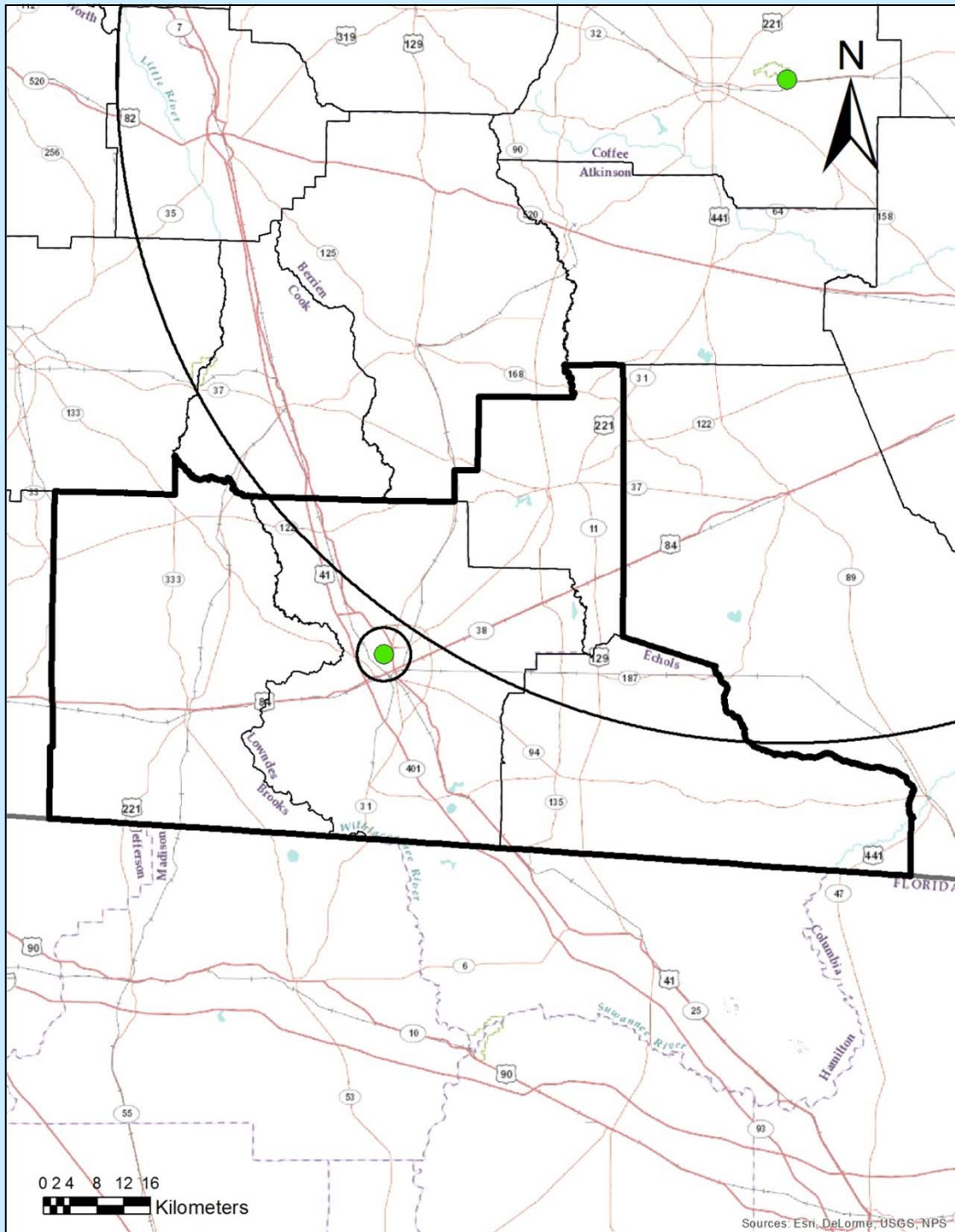
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	2.6 m	Neighborhood	8/31/95
O ₃	Population Exposure	Continuous (Mar-Oct)	4.3 m	Neighborhood	3/1/95
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/1/04
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/1/04

GA AAMP's plans for this site: Continue monitoring

Valdosta MSA



Radius of Circles on Map

Micro Scale: up to 100m

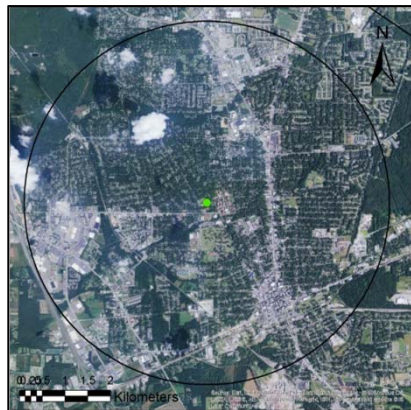
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Valdosta



AQS ID: 131850003

Address: 1605 Azalea Drive, Valdosta, Lowndes County, Georgia 31602

Site Established: 12/17/99

Latitude/Longitude: N30.8486/W-83.2933

Elevation: 62.7 meters

Area Represented: Valdosta MSA

Site History: Established as PM_{2.5} site

North

South

East

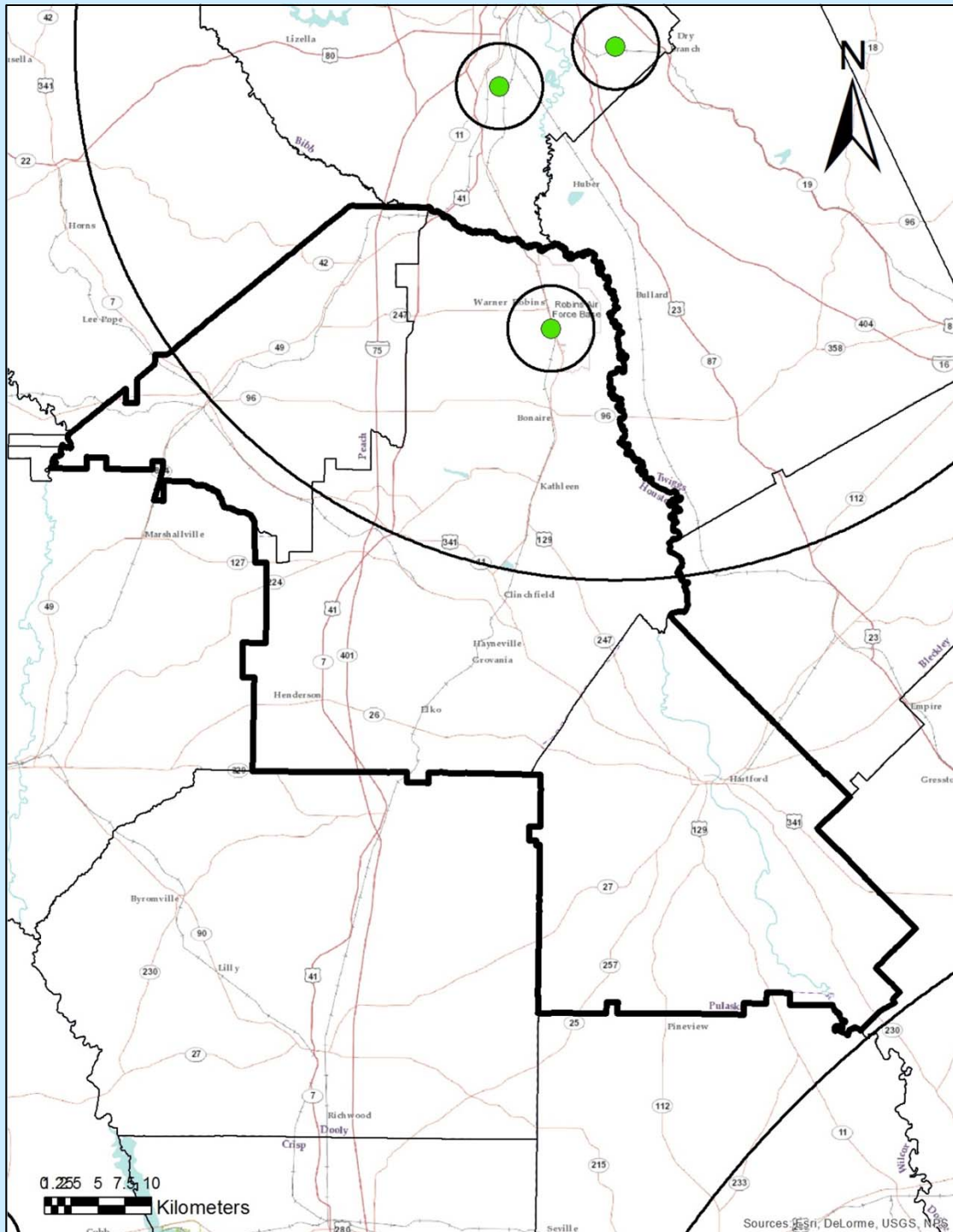
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	3 m	Neighborhood	1/1/00
PM _{2.5}	Population Exposure	Continuous	3 m	Neighborhood	1/1/08

GA AAMP's plans for this site: Continue monitoring; GA AAMP plans to replace the BAM Continuous PM_{2.5} sampler with an FEM Teledyne T640 Continuous PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

Warner Robins MSA



Radius of Circles on Map

Micro Scale: up to 100m

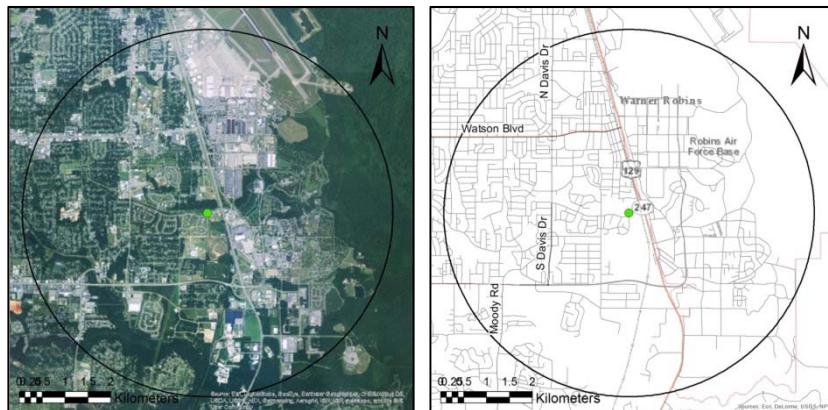
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Warner Robins



AQS ID: 131530001

Address: Warner Robins Air Force Base, Memorial Park, 800 South 1st Street, Warner Robins, Houston County, Georgia 31088

Site Established: 6/15/00

Latitude/Longitude: N32.6056/W-83.5978

Elevation: 86.25 meters

Area Represented: Warner Robins MSA

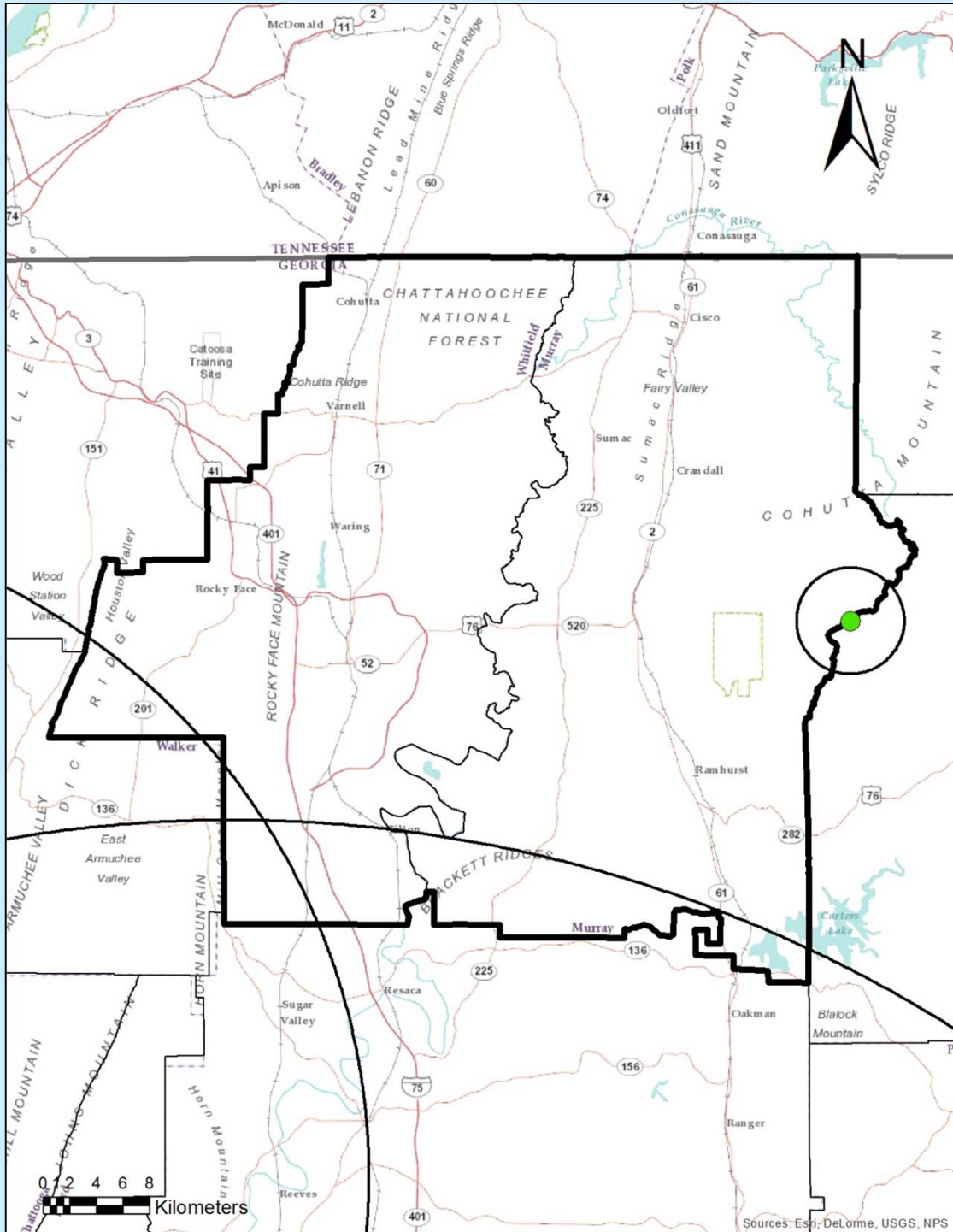
Site History: Established as PM_{2.5} site



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	3 m	Neighborhood	7/5/00
PM _{2.5}	Population Exposure	Continuous	3 m	Neighborhood	1/1/08

GA AAMP's plans for this site: Continue monitoring; On March 7, 2018 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the BAM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

Dalton MSA



Radius of Circles on Map

Micro Scale: up to 100m

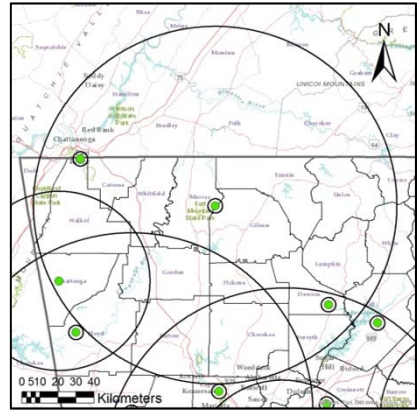
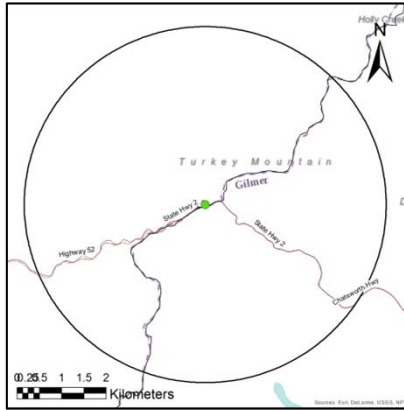
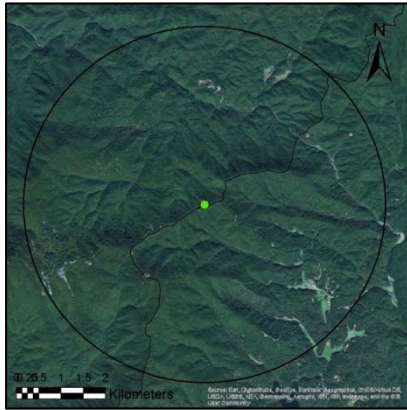
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Fort Mountain



AQS ID: 132130003

Address: Fort Mountain, State Highway 52, Cohutta Overlook, Chatsworth, Murray County, Georgia 30705

Site Established: 3/23/99

Latitude/Longitude: N34.7851/W-84.6265

Elevation: 794 meters

Area Represented: Dalton MSA

Site History: Established as O₃ site

North

South

East

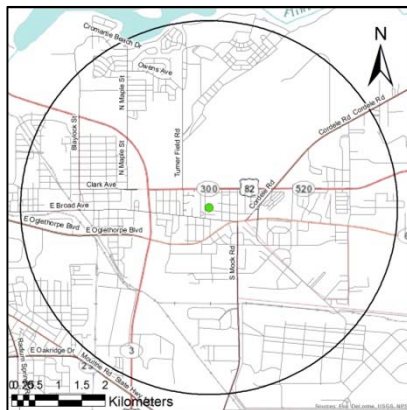
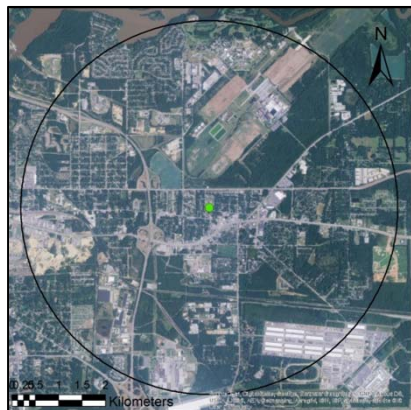
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	5 m	Regional	3/1/00
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	2/7/02
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	2/7/02
Temperature	General/ Background	Continuous	3 m	Neighborhood	2/7/02
Relative Humidity	General/ Background	Continuous	3 m	Neighborhood	2/7/02

GA AAMP's plans for this site: Continue monitoring

Albany



AQS ID: 130950007

Address: Turner Elementary School, 2001 Leonard Avenue, Albany, Dougherty County, Georgia 31705

Site Established: 7/31/91

Latitude/Longitude: N31.5776/W-84.0998

Elevation: 67 meters

Area Represented: Albany MSA

Site History: Established as TSP site

North

South

East

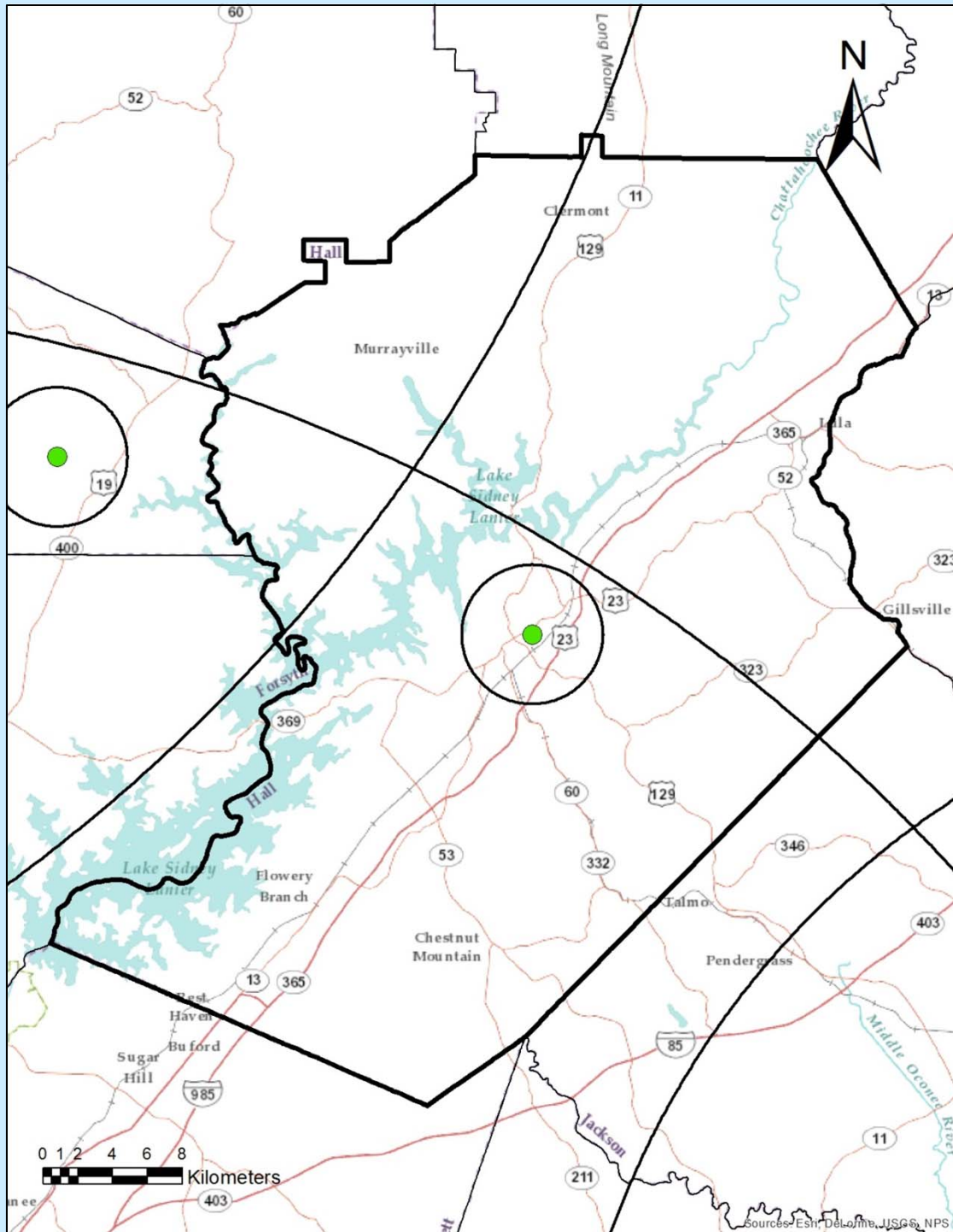
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	2.1 m	Neighborhood	2/2/99
PM _{2.5}	Quality Assurance	Every 12 days	2.1 m	Neighborhood	1/10/13
PM _{2.5}	Population Exposure	Continuous	2.1 m	Neighborhood	5/11/08

GA AAMP's plans for this site: Continue monitoring; Running continuous monitor as FEM as of 1/10/13; Schedule of PM_{2.5} FRM sampler based on EPA requirements, however actual operation is daily; GA AAMP plans to replace the FEM BAM Continuous PM_{2.5} sampler with an FEM Teledyne T640 Continuous PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM T640 monitor, samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

Gainesville MSA



Radius of Circles on Map

Micro Scale: up to 100m

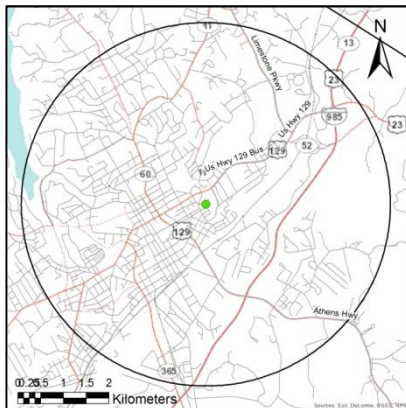
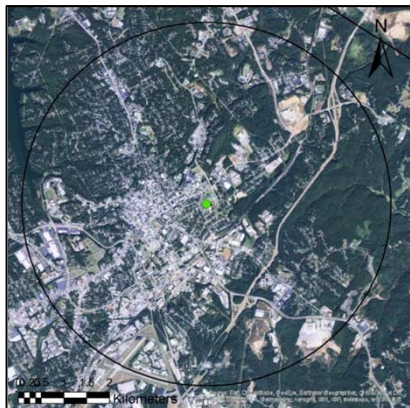
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Gainesville



AQS ID: 131390003

Address: Fair Street School, 695 Fair Street, Gainesville, GA 30501

Site Established: 1/1/97

Latitude/Longitude: N34.2993/W-83.8134

Elevation: 353 meters

Area Represented: Gainesville MSA

Site History: Established as PM_{2.5} site

North

South

East

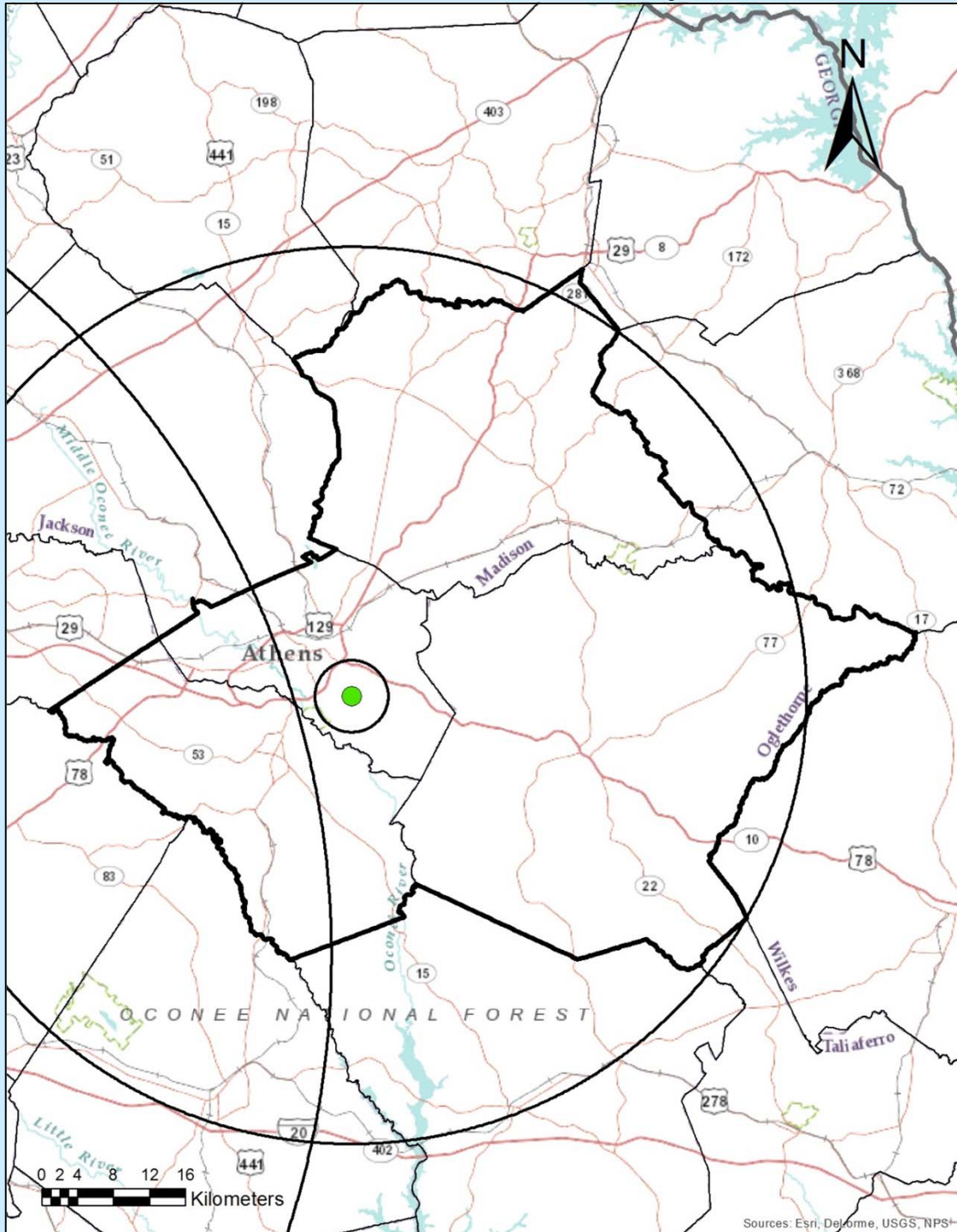
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	2.3 m	Neighborhood	2/14/99
PM _{2.5}	Population Exposure	Continuous	2.9 m	Neighborhood	1/1/08

GA AAMP's plans for this site: Continue monitoring; On October 3, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the BAM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

Athens-Clarke County MSA



Radius of Circles on Map

Micro Scale: up to 100m

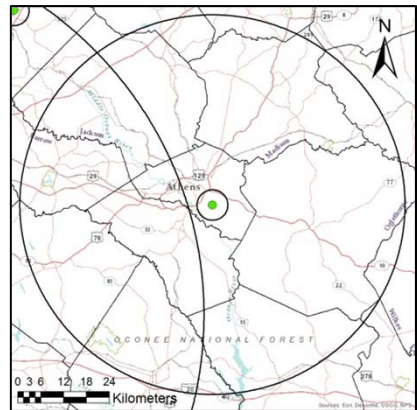
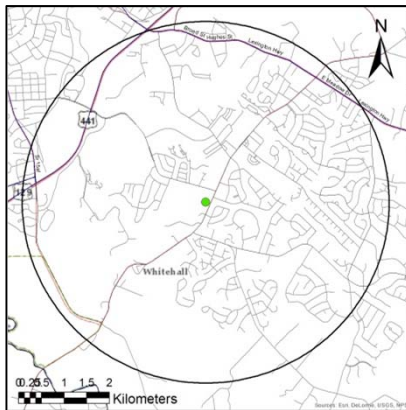
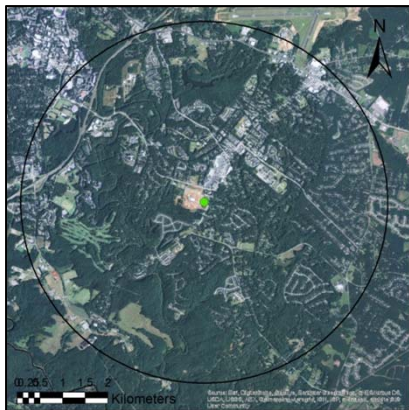
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Athens



AQS ID: 130590002

Address: 2350 Barnett Shoals Road, Athens, Clarke County, Georgia 30605

Site Established: 3/1/02

Latitude/Longitude: N33.9180/W-83.3445

Elevation: 220 meters

Area Represented: Athens-Clarke County MSA

Site History: Established as O₃ and PM site

North

South

East

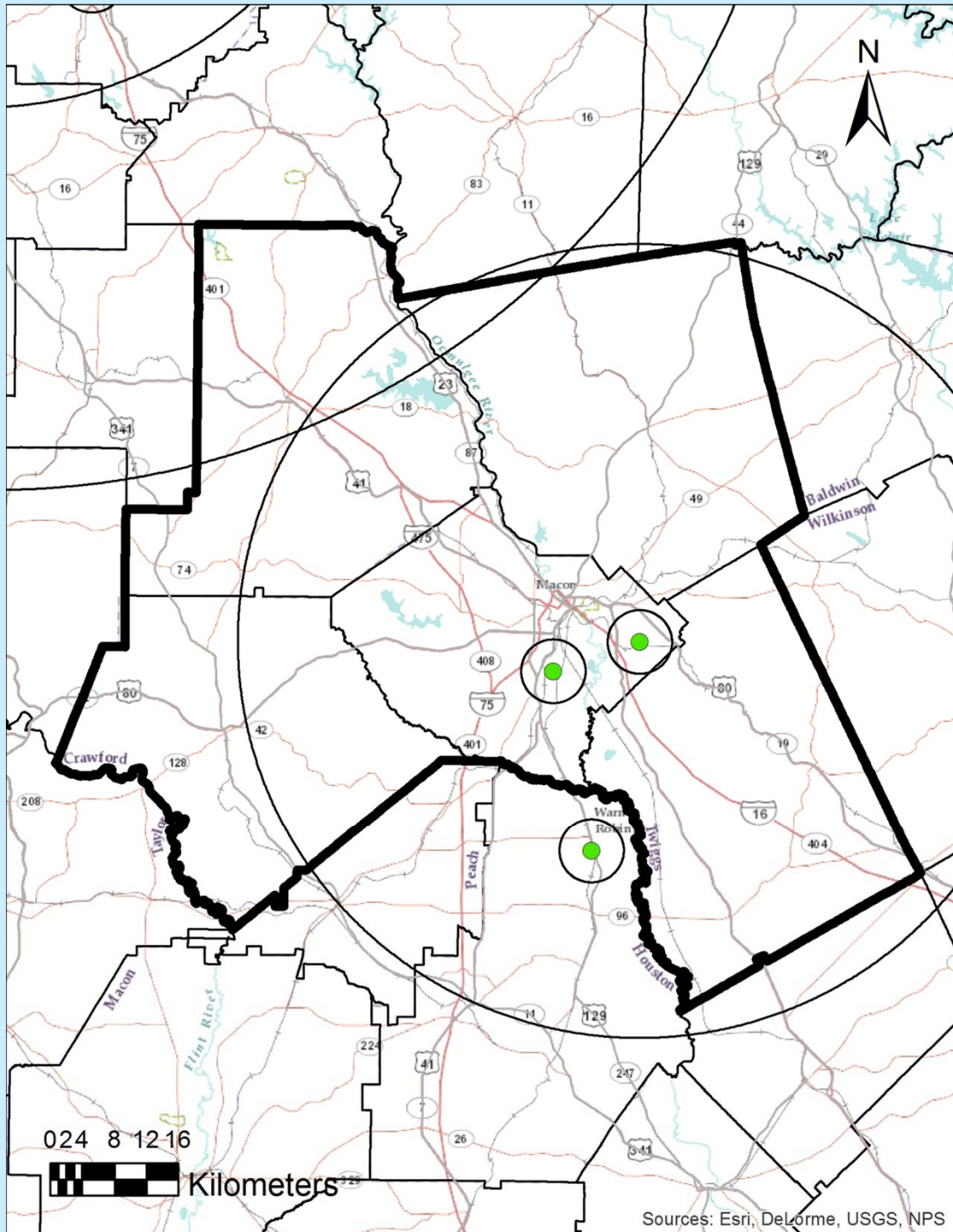
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	3.4 m	Urban	5/1/02
PM _{2.5}	Population Exposure	Every 3 days	4.7 m	Neighborhood	2/12/05
PM _{2.5}	Population Exposure	Continuous	4.4 m	Neighborhood	8/1/04

GA AAMP's plans for this site: Continue monitoring; Replaced the shelter and relocated all monitors to the new roof deck; On April 1, 2018 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the BAM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM Teledyne T640 monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers; GA AAMP plans to add a second FEM Teledyne T640 Continuous PM_{2.5} sampler to satisfy collocation requirements.

Macon MSA



Radius of Circles on Map
Micro Scale: up to 100m
Middle Scale: up to 0.5km
Neighborhood Scale: up to 4.0km
Urban Scale: up to 50km
Regional Scale: up to 100s of km (100km shown)

Macon-Allied



AQS ID: 130210007

Address: 300 Allied Industrial Blvd., Macon, Bibb County, Georgia 31206

Site Established: 1/1/74

Latitude/Longitude: N32.7773/W-83.6411

Elevation: 106 meters

Area Represented: Macon MSA

Site History: Established as TSP site

North

South

East

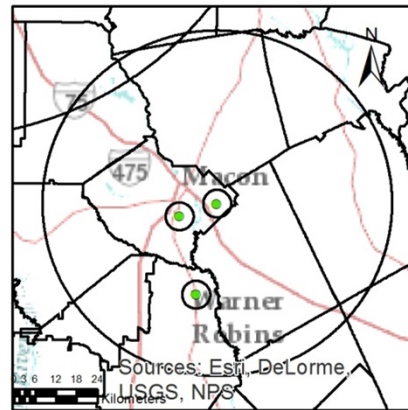
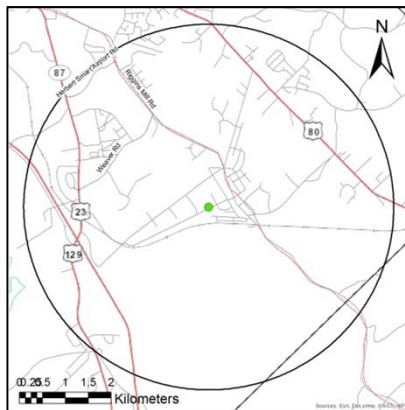
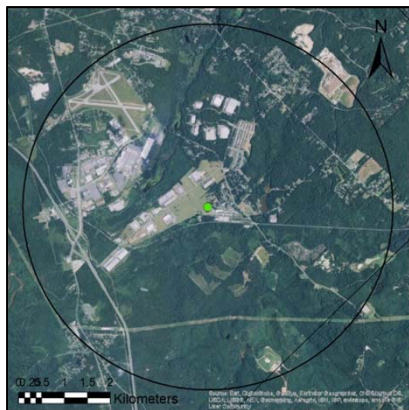
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5} Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/1/02
PM _{2.5}	Population Exposure	Every 3 days	2.5 m	Neighborhood	2/2/99
PM _{2.5}	Quality Assurance	Every 12 days	2.5 m	Neighborhood	2/2/99

GA AAMP's plans for this site: Continue monitoring

Macon-Forestry



AQS ID: 130210012

Address: Georgia Forestry Commission, 5645 Riggins Mill Road, Dry Branch, Bibb County, Georgia 31020

Site Established: 5/7/97

Latitude/Longitude: N32.8051/W-83.5436

Elevation: 120 meters

Area Represented: Macon MSA

Site History: Established as O₃ and SO₂ site

North

South

East

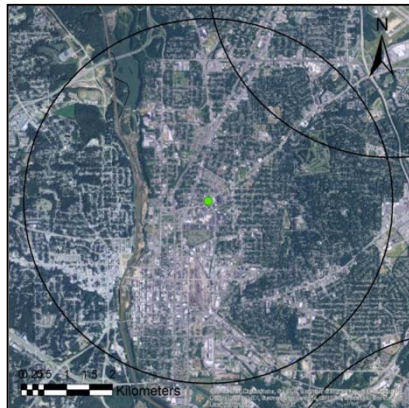
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	3 m	Neighborhood	2/1/99
PM _{2.5}	Population Exposure	Continuous	3.5 m	Neighborhood	5/5/03
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/1/04
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/1/04
O ₃	Population Exposure	Continuous (Mar-Oct)	3.5 m	Neighborhood	5/7/97
SO ₂	Population Exposure	Continuous	3.5 m	Urban	5/7/97
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	3.5 m	Neighborhood	8/1/10
Toxics	Population Exposure	Every 12 days	2.2 m	Neighborhood	1/1/99

GA AAMP's plans for this site: Continue monitoring; On October 1, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the TEOM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

Columbus-Health Department



AQS ID: 132150001

Address: Muscogee City Health Department, 2100 Comer Ave., Columbus, Muscogee County, Georgia 31901

Site Established: 1/1/57

Latitude/Longitude: N32.4842/W-84.9789

Elevation: 111 meters

Area Represented: Columbus Georgia-Alabama MSA

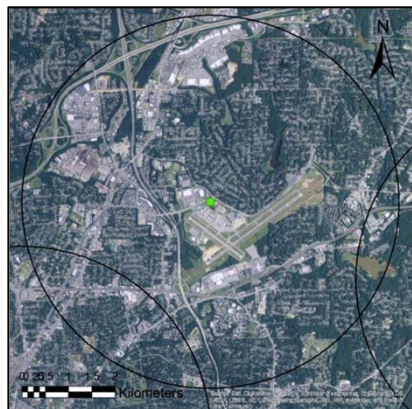
Site History: Established as TSP site



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	1.8 m	Neighborhood	3/4/99

GA AAMP's plans for this site: Continue monitoring

Columbus-Airport



AQS ID: 132150008

Address: Columbus Airport, 3100 Airport Thruway Drive, Columbus, Muscogee County, Georgia 31909

Site Established: 7/1/82

Latitude/Longitude: N32.5211/W-84.9447

Elevation: 445 meters

Area Represented: Columbus Georgia-Alabama MSA

Site History: Established as O₃ site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	3 m	Neighborhood	7/1/82
PM _{2.5}	Population Exposure	Every 3 days	4.8 m	Neighborhood	6/2/03
PM _{2.5}	Population Exposure	Continuous	3 m	Neighborhood	6/1/03

GA AAMP's plans for this site: Continue monitoring

Columbus-Allied



AQS ID: 132150009

Address: 4365 Allied Drive, Columbus, Muscogee County, Georgia 31906

Site Established: 9/1/90

Latitude/Longitude: N32.4344/W-84.9293

Elevation: 85 meters

Area Represented: Columbus Georgia-Alabama MSA

Site History: Established as lead site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Lead	Source Oriented	Every 6 days	2.3 m	Micro	9/1/90*
Lead	Quality Assurance /Source Oriented	Every 12 days	2.3 m	Micro	2/1/18

* Sampler inactive from 3/31/04 until reopened on 2/3/12

GA AAMP's plans for this site: Continue monitoring; the collocated lead monitor at the Columbus-Joy Rd location was moved to the Columbus-Allied location as of 2/1/18.

Columbus-Joy Road



AQS ID: 132150010

Address: 847 Joy Road, Columbus, Muscogee County, Georgia 31906

Site Established: 3/1/91

Latitude/Longitude: N32.4362/W-84.9341

Elevation: 81.9 meters

Area Represented: Columbus Georgia-Alabama MSA

Site History: Established as lead site

North

South

East

West

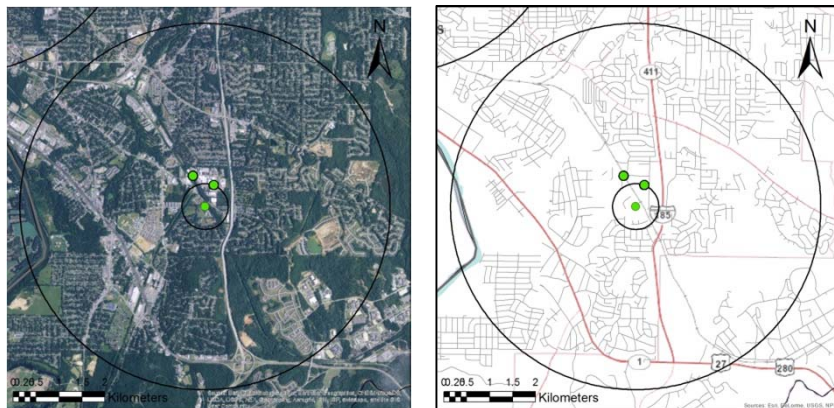


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Lead	Source Oriented	Every 6 days	2 m	Micro	3/1/91*

* Sampler inactive from 3/31/04 until reopened on 12/27/11

GA AAMP's plans for this site: Following EPA's guidance and recommendation in response to the GA AAMP's request for a siting criteria waiver, the GA AAMP will shut down this site by June 30, 2018 (See Section 1.0 of this document and GA AAMP's Public Notice *Site Waiver Requests, March 2018* for more details).

Columbus-Cusseta



AQS ID: 132150011

Address: Cusseta Road Elementary School, 4150 Cusseta Road, Columbus, Muscogee County, Georgia 31903

Site Established: 9/4/91

Latitude/Longitude: N32.4297/W-84.9316

Elevation: 87.1 meters

Area Represented: Columbus Georgia-Alabama MSA

Site History: Established as lead site

North

South

East

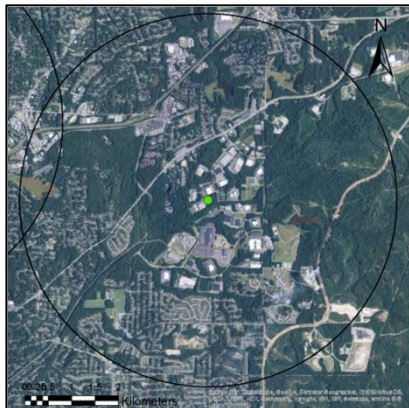
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Lead	Population Exposure/Source Oriented	Every 6 days	1.8 m	Middle	9/4/91
PM _{2.5}	Population Exposure	Every 3 days	1.8 m	Neighborhood	1/21/99
PM _{2.5} Speciation	Population Exposure	Every 6 days	1.8 m	Neighborhood	5/1/02

GA AAMP's plans for this site: Continue monitoring

Columbus-Crime Lab



AQS ID: 132151003

Address: Columbus Crime Lab, 8395 Beaver Run Road, Midland, Muscogee County, Georgia 31820

Site Established: 6/30/80

Latitude/Longitude: N32.5394/W-84.8448

Elevation: 122 meters

Area Represented: Columbus Georgia-Alabama MSA

Site History: Established as O₃ site

North



South



East



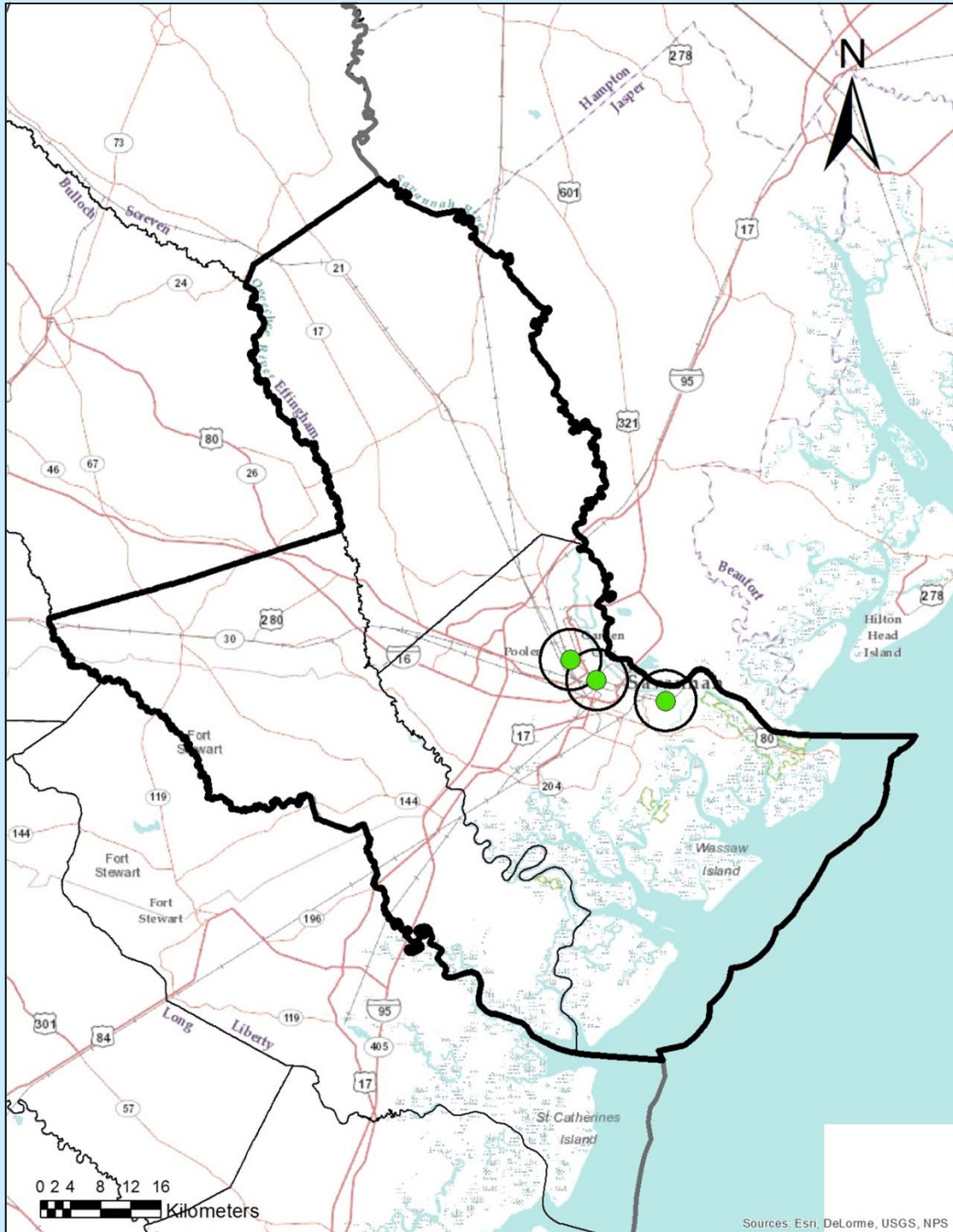
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/5/06
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/5/06
Temperature	General/ Background	Continuous	2.2 m	Neighborhood	1/5/06
Relative Humidity	General/ Background	Continuous	2.2 m	Neighborhood	1/5/06
Precipitation	General/ Background	Continuous	2.6 m	Neighborhood	1/5/06
Barometric Pressure	General/ Background	Continuous	1.8 m	Neighborhood	1/5/06

GA AAMP's plans for this site: Continue monitoring

Savannah MSA



Radius of Circles on Map

Micro Scale: up to 100m

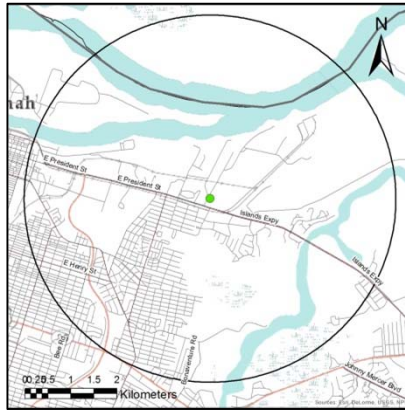
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Savannah- E. President



AQS ID: 130510021

Address: American Red Cross, 2500 E. President Street, Bd-A, Savannah, Chatham County, Georgia 31404

Site Established: 2/1/95

Latitude/Longitude: N32.0683/W-81.0496

Elevation: 10.4 meters

Area Represented: Savannah MSA

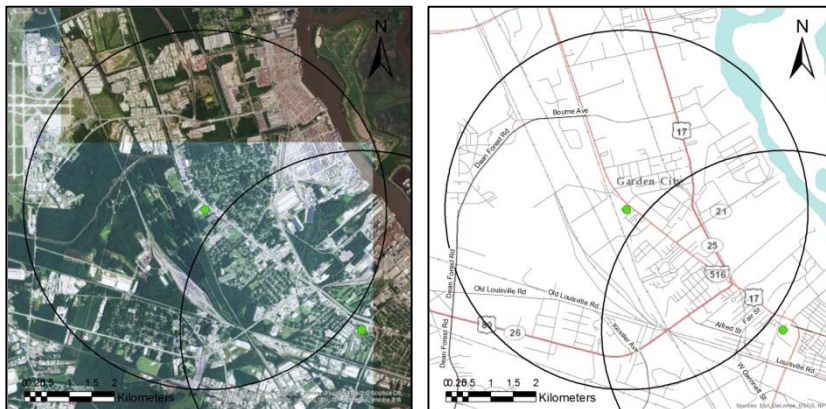
Site History: Established as SO₂ and H₂S site



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	3.8 m	Neighborhood	4/19/95
SO ₂	Source Oriented	Continuous	3.8 m	Neighborhood	3/29/95
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	3.8 m	Neighborhood	8/1/10
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/1/04
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/1/04
Toxics	Population Exposure	Every 12 days	1.8 m	Neighborhood	9/18/96
Carbonyls	Population Exposure	Every 12 days	4.1 m	Neighborhood	1/1/99

GA AAMP's plans for this site: Continue monitoring

Savannah-Mercer



AQS ID: 130510091

Address: Mercer Middle School, 201 Rommel Avenue, Savannah, Chatham County, Georgia 31408

Site Established: 7/7/76

Latitude/Longitude: N32.1105/W-81.1620

Elevation: 9.8 meters

Area Represented: Savannah MSA

Site History: Established as TSP site

North

South

East

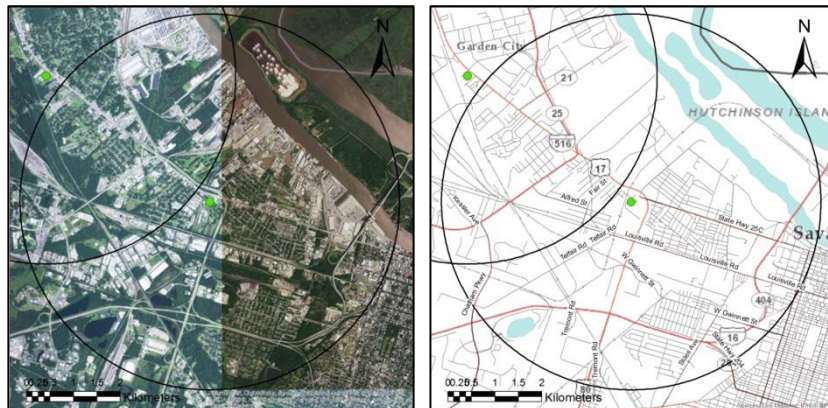
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	2.2 m	Neighborhood	1/1/99

GA AAMP's plans for this site: Continue monitoring; GA AAMP may discontinue this monitor once confidence is gained in the FEM Teledyne T640 Continuous PM_{2.5} sampler established at the Savannah-L&A site.

Savannah- L&A



AQS ID: 130511002

Address: Pumping Station at Intersection of West Lathrop and Augusta Avenue, Savannah, Chatham County, Georgia 31415

Site Established: 1/1/72

Latitude/Longitude: N32.0906/W-81.1304

Elevation: 6.11 meters

Area Represented: Savannah MSA

Site History: Established as TSP site

North

South

East

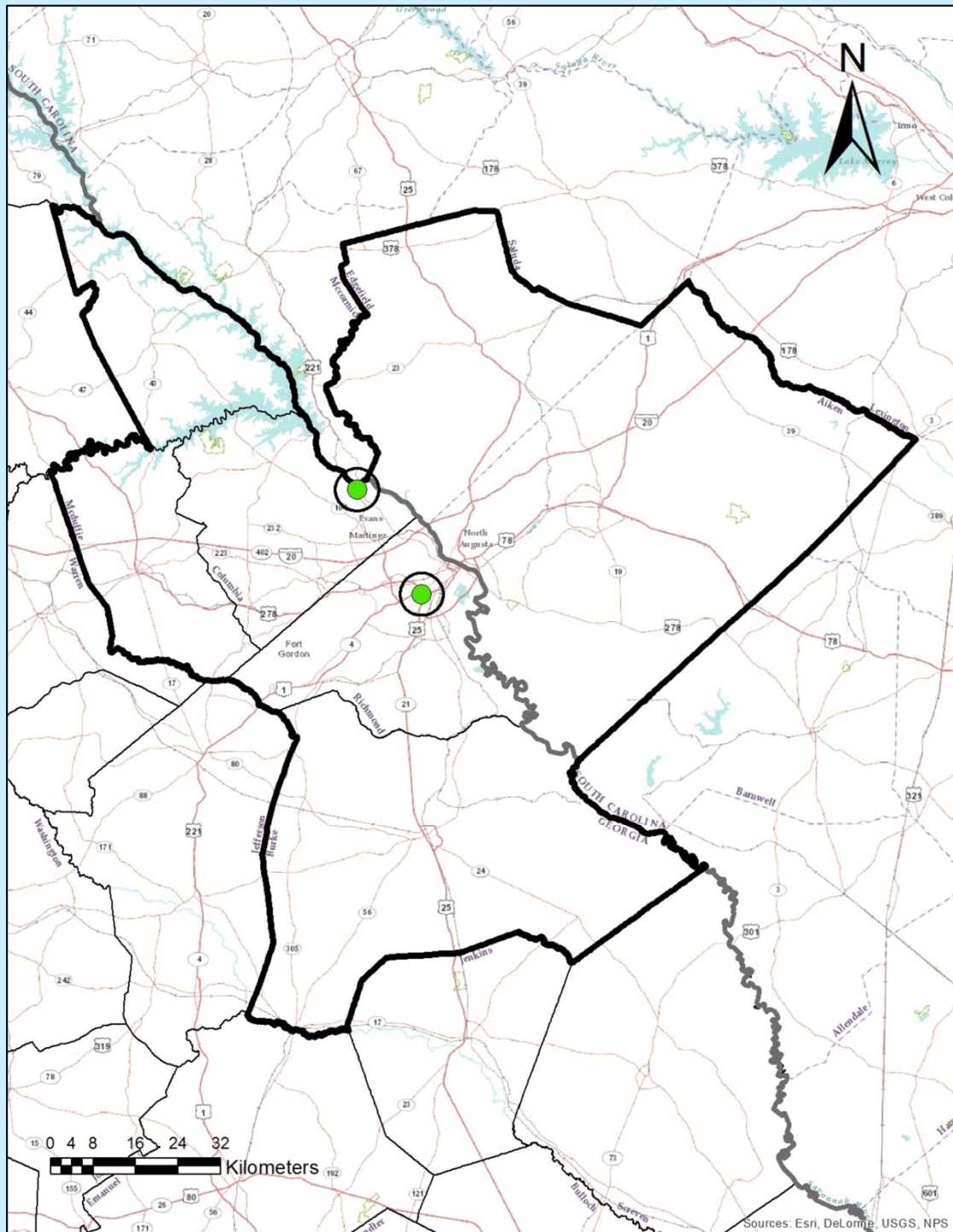
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
SO ₂	Population Exposure	Continuous	4.1 m	Neighborhood	1/1/98
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	4.1 m	Neighborhood	8/1/10
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/1/79
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/1/79
PM _{2.5}	Population Exposure	Continuous	4.5 m	Neighborhood	10/1/03

GA AAMP's plans for this site: Continue monitoring; propose to add an ozone monitor when initiated by EPA. On November 7, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the TEOM PM_{2.5} sampler.

Augusta-Richmond County, Georgia- South Carolina MSA



Radius of Circles on Map

Micro Scale: up to 100m

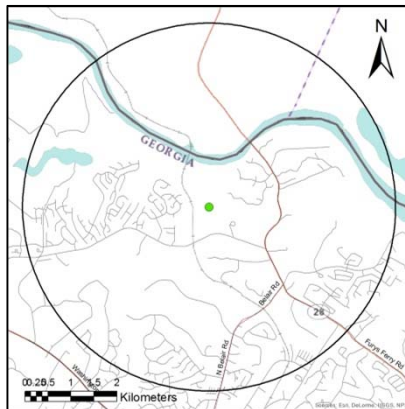
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Evans



AQS ID: 130730001

Address: Riverside Park, 4431 Hardy McManus Road, Evans, Columbia County, Georgia 30809

Site Established: 2/17/05

Latitude/Longitude: N33.5819/W-82.1314

Elevation: 74 meters

Area Represented: Augusta-Richmond County, Georgia-South Carolina MSA

Site History: Established as O₃ and NO_y site

North

South

East

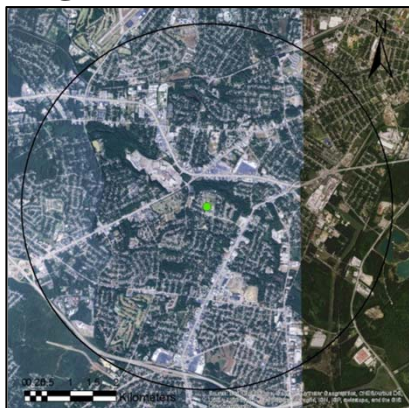
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	5 m	Neighborhood	3/1/05
Wind Speed	General/Background	Continuous	10 m	Neighborhood	2/17/05
Wind Direction	General/Background	Continuous	10 m	Neighborhood	2/17/05
Temperature	General/Background	Continuous	2 m	Neighborhood	2/17/05
Relative Humidity	General/Background	Continuous	2 m	Neighborhood	2/17/05

GA AAMP's plans for this site: Continue monitoring

Augusta



AQS ID: 132450091

Address: Bungalow Road Elementary School, 2216 Bungalow Rd, Augusta, Richmond County, Georgia 30906

Site Established: 1/1/76

Latitude/Longitude: N33.4339/W-82.0224

Elevation: 48.77 meters

Area Represented: Augusta-Richmond County, Georgia-South Carolina MSA

Site History: Established as TSP site

North

South

East

West



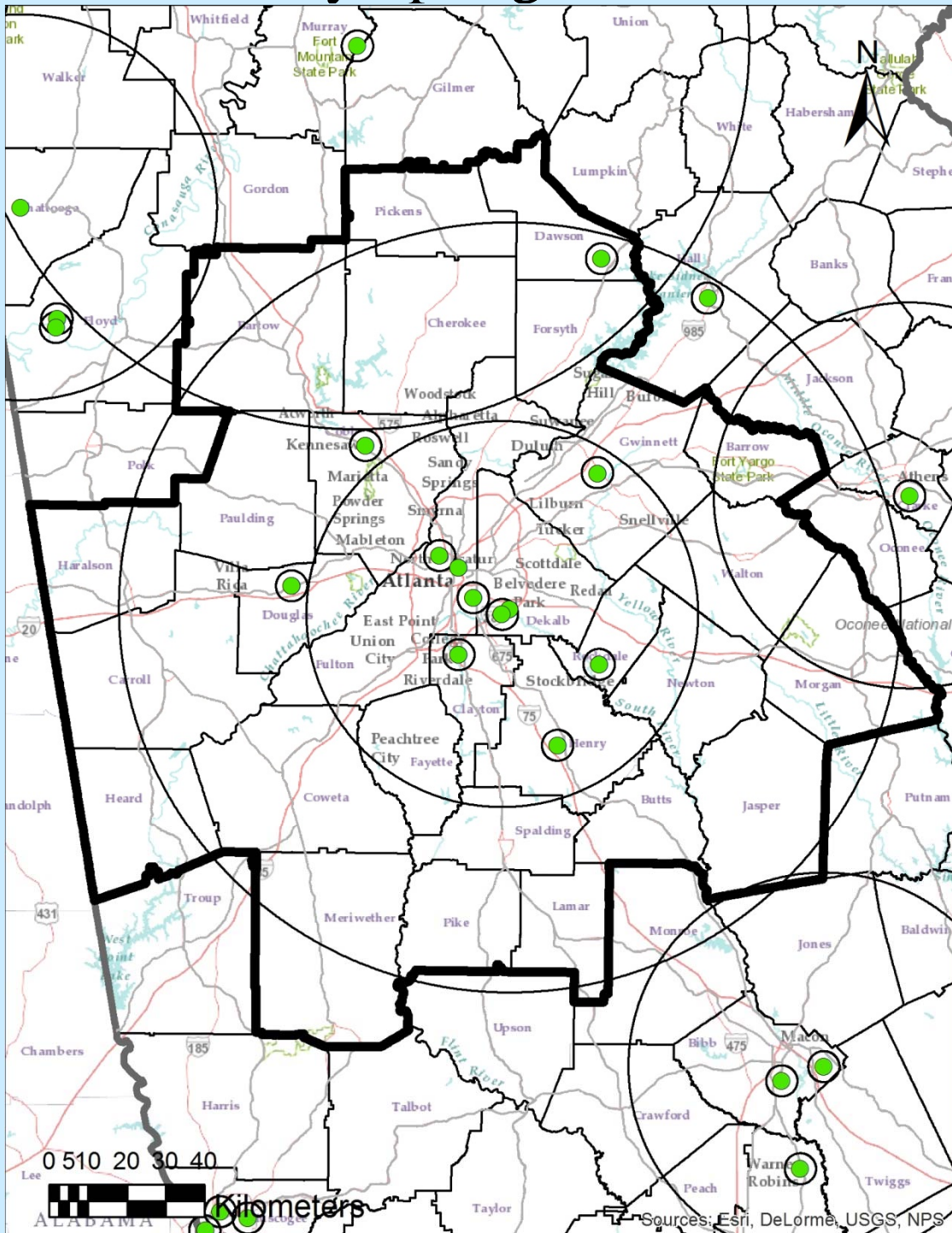
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	4.5 m	Neighborhood	4/27/89
PM ₁₀	Population Exposure	Continuous	3.5 m	Neighborhood	4/9/96
PM _{2.5} Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/2/02
PM _{2.5}	Population Exposure	Every 3 days	2.5 m	Neighborhood	2/8/99
PM _{2.5}	Population Exposure	Continuous	4.5 m	Neighborhood	10/1/03
SO ₂	Population Exposure	Continuous	4.5 m	Neighborhood	1/14/13
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	4.5 m	Neighborhood	1/14/13

Augusta (continued)

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	10/2/03
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	10/2/03
Temperature	General/ Background	Continuous	2 m	Neighborhood	10/2/03
Relative Humidity	General/ Background	Continuous	2 m	Neighborhood	10/2/03
Precipitation	General/ Background	Continuous	4 m	Neighborhood	10/2/03
Barometric Pressure	General/ Background	Continuous	2 m	Neighborhood	10/2/03

GA AAMP's plans for this site: Continue monitoring; On October 1, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the TEOM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers. The continuous TEOM PM_{2.5} sampler was changed to a continuous FEM to monitor PM₁₀ at the site on October 1, 2017. The integrated PM₁₀ sampler was discontinued as of March 31, 2018.

Atlanta-Sandy Springs-Marietta MSA



Radius of Circles on Map

Micro Scale: up to 100m

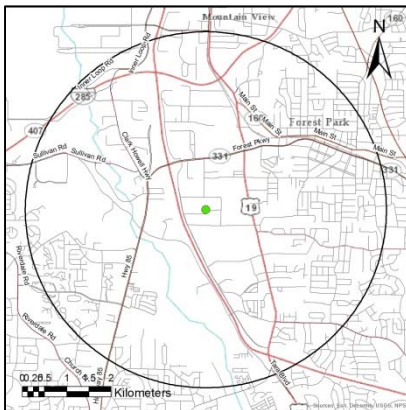
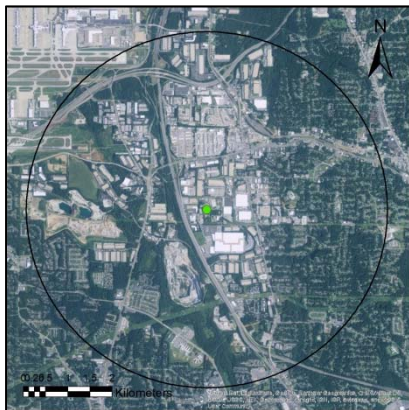
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Forest Park



AQS ID: 130630091

Address: 25 Kennedy Drive, Forest Park, Clayton County, Georgia 30297

Site Established: 1/1/78

Latitude/Longitude: N33.6107/W-84.3908

Elevation: 288 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as TSP site

North

South

East

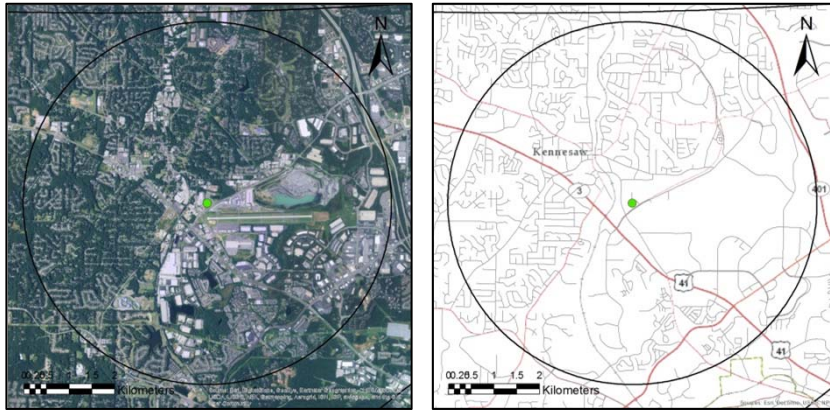
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	2.2 m	Neighborhood	1/9/99

GA AAMP's plans for this site: Continue monitoring

Kennesaw



AQS ID: 130670003

Address: Georgia National Guard, 1901 McCollum Parkway, Kennesaw, Cobb County, Georgia, 30144

Site Established: 2/7/99

Latitude/Longitude: N34.0153/W-84.6075

Elevation: 317 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as PM_{2.5} site

North

South

East

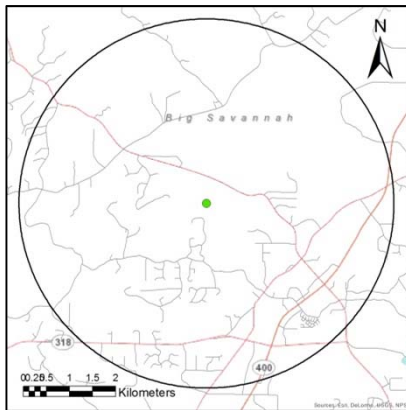
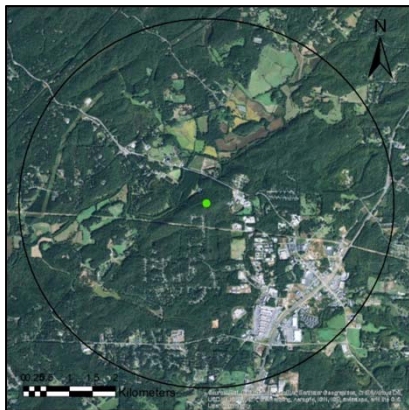
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	4.2 m	Neighborhood	9/1/99
PM _{2.5}	Population Exposure	Every 3 Days	4.8 m	Neighborhood	2/7/99

GA AAMP's plans for this site: Continue monitoring

Dawsonville



AQS ID: 130850001

Address: Georgia Forestry Commission, 4500 Georgia Highway 53 East, Dawsonville, Dawson County, Georgia 30534

Site Established: 1/1/85

Latitude/Longitude: N34.3761/W-84.0596

Elevation: 372 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ site

North

South

East

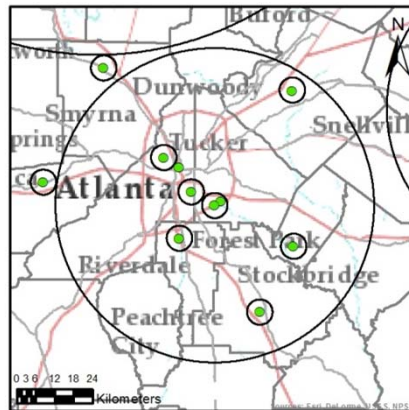
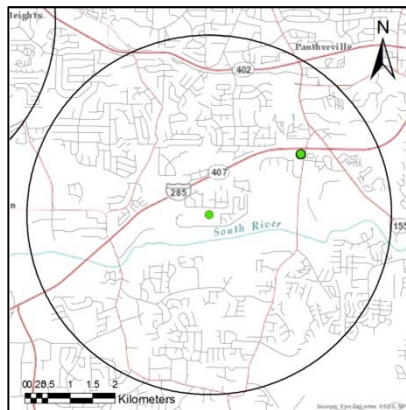
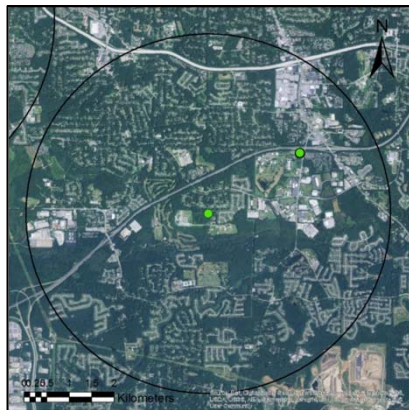
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	4 m	Neighborhood	1/1/85
Wind Speed	General/Background	Continuous	10 m	Regional	1/1/05
Wind Direction	General/Background	Continuous	10 m	Regional	1/1/05

GA EPD's plans for this site: Continue monitoring

South DeKalb



AQS ID: 130890002

Address: 2390-B Wildcat Road, Decatur, DeKalb County, Georgia 30034

Site Established: 1/1/74

Latitude/Longitude: N33.6877/W-84.2905

Elevation: 308 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	2.4 m	Neighborhood	1/22/99
PM _{2.5}	Quality Assurance	Every 12 days	2.4 m	Neighborhood	12/20/08
PM _{2.5}	Population Exposure	Continuous	4 m	Neighborhood	5/1/03
PM _{2.5} Speciation	Population Exposure	Every 3 days	2.2 m	Neighborhood	10/1/00
SO ₂	Population Exposure	Continuous	3.8 m	Neighborhood	10/1/10
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	3.8 m	Neighborhood	10/1/10
O ₃	Highest Concentration	Continuous	4 m	Neighborhood/ Urban	1/1/74
CO	Population Exposure	Continuous	4 m	Neighborhood	5/19/03

South DeKalb (continued)

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
NO _y	Population Exposure	Continuous	10 m	Neighborhood/ Urban	1/1/98
NO	Population Exposure	Continuous	4 m	Neighborhood/ Urban	4/1/94
NO _x	Population Exposure	Continuous	4 m	Neighborhood/ Urban	4/1/94
NO ₂	Population Exposure	Continuous	4 m	Neighborhood/ Urban	7/21/78
Carbonyls (PAMS)	Max Precursor Emissions	Three 8-hour samples every third day in summer	3.8 m	Neighborhood	6/1/93
Carbonyls (NATTS)	Population Exposure	Every 6 days	3.8 m	Neighborhood	6/1/93
Carbonyls (NATTS)	Quality Assurance	1/month	3.8 m	Neighborhood	1/1/06
PM ₁₀ Select Metals (NATTS)	Population Exposure	Every 6 days	2 m	Neighborhood	1/1/00
PM ₁₀ Select Metals (NATTS)	Quality Assurance	1/month	2 m	Neighborhood	1/1/05
PM ₁₀ Continuous	Population Exposure	Continuous	4 m	Neighborhood	1/1/11
PM _{coarse} Continuous	Population Exposure	Continuous	4 m	Neighborhood	1/1/11
VOCs (PAMS)	Max Precursor Emissions	Continuous in Summer (June-August)*	3.8 m	Neighborhood	6/1/93
VOCs (NATTS/PAMS)	Population Exposure	Every 6 days	3.8 m	Neighborhood	6/1/93
VOCs (NATTS)	Quality Assurance	1/month**	3.8 m	Neighborhood	1/1/05
Semi-VOCs (NATTS)	Population Exposure	Every 6 days	2.5 m	Neighborhood	4/30/07
Semi-VOCs (NATTS)	Quality Assurance	1/month	2.5 m	Neighborhood	4/30/07
Outdoor Temperature	General/ Background	Continuous	2 m	Neighborhood	6/1/93
Rain/Melt Precipitation	General/ Background	Continuous	3.2 m	Neighborhood	1/1/97
Barometric Pressure	General/ Background	Continuous	2 m	Neighborhood	6/1/93
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	6/1/93

Decatur- South DeKalb (continued)

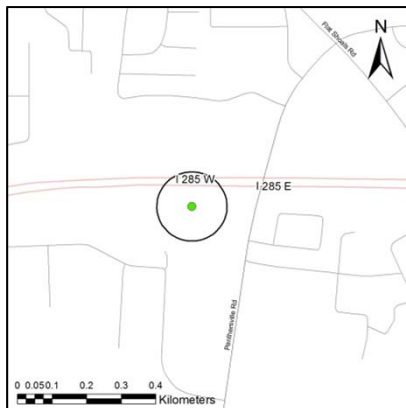
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	6/1/93
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	6/1/93
Sigma Theta	General/ Background	Continuous	10 m	Neighborhood	1/1/02
Relative Humidity	General/ Background	Continuous	2 m	Neighborhood	6/1/93

GA AAMP's plans for this site: Continue monitoring. NCore site (refer to GA AAMP's 2011 *Ambient Air Monitoring Plan, Appendix C, Ambient Air Monitoring Plan for National Core (NCore) Multipollutant Monitoring Station* for full description and approval). Schedule of PM_{2.5} FRM sampler based on EPA requirements, however actual operation is daily. Solar radiation and Ultraviolet radiation for South DeKalb PAMS are currently monitored at the Conyers site due to equipment specifications (see Section 1.4 for waiver request). On June 14, 2017 GA AAMP replaced the FEM BAM with an FEM Teledyne T640X Continuous PM_{2.5}, PM₁₀, and PM_{coarse} sampler, and until GA AAMP gains confidence in the FEM Teledyne monitor, samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers. The NATTS PM₁₀ metals samplers were relocated on the deck on January 24, 2018 to make these samplers in compliance with siting criteria. GA AAMP is planning to replace both the primary and collocated NATTS high-volume PM₁₀ metals samplers with low-volume PM₁₀ metals samplers in the summer of 2018.

*GA AAMP applied for an alternate sampling schedule waiver for the PAMS VOCs for 2018 PAMS season. See GA AAMP's *Public Notice Site Waiver Requests, March 2018* for more details.

**Scheduled every 6 days through August, then the schedule will switch to 1/month.

NR-285



AQS ID: 130890003

Address: 3073 Panthersville Road, Decatur, DeKalb County, Georgia 30034

Site Established: 7/1/86

Latitude/Longitude: N33.6985/W-84.2727

Elevation: 238 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as lead site

North

South

East

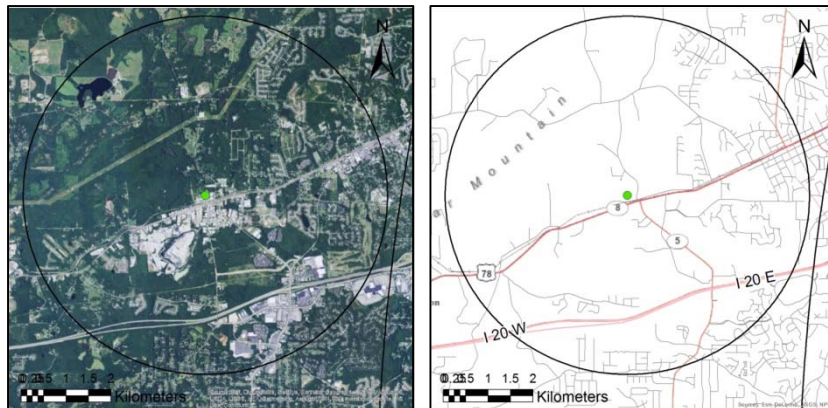
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
NO ₂	Population Exposure	Continuous	3.3 m	Micro	1/1/15
NO	Population Exposure	Continuous	3.3 m	Micro	1/1/15
NO _x	Population Exposure	Continuous	3.3 m	Micro	1/1/15
VOCs	Population Exposure	Every 6 days	3.3 m	Micro	3/31/15
Black Carbon	Population Exposure	Continuous	3.3 m	Micro	9/1/15

GA AAMP's plans for this site: Continue monitoring; Near-road site as of 1/1/15 (see Addendum to 2015 Ambient Monitoring Plan for full description).

Douglasville



AQS ID: 130970004

Address: Douglas County Water Authority, 7725 W. Strickland St., Douglasville, Douglas County, Georgia 30134

Site Established: 8/15/97

Latitude/Longitude: N33.7411/W-84.7765

Elevation: 373 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ site

North

South

East

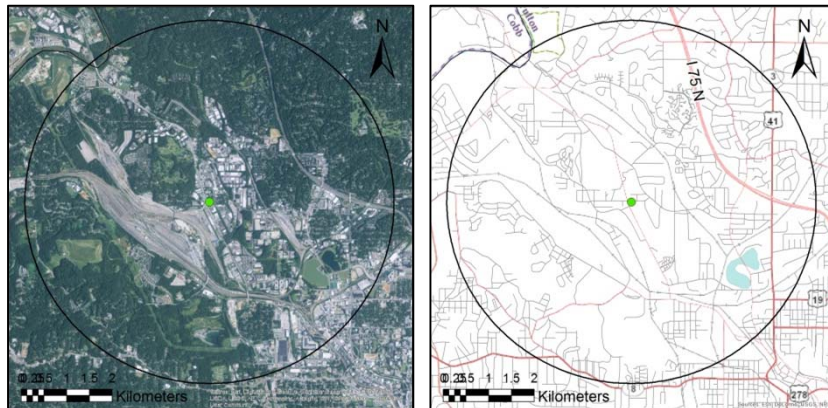
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	4 m	Neighborhood	8/15/97
Wind Direction	General/Background	Continuous	10 m	Neighborhood	8/15/97
Wind Speed	General/Background	Continuous	10 m	Neighborhood	8/15/97

GA AAMP's plans for this site: Continue monitoring

Fire Station #8



AQS ID: 131210039

Address: Fire Station #8, 1711 Marietta Blvd., Atlanta, Fulton County, Georgia 30318

Site Established: 1/1/73

Latitude/Longitude: N33.8021/W-84.4357

Elevation: 265 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

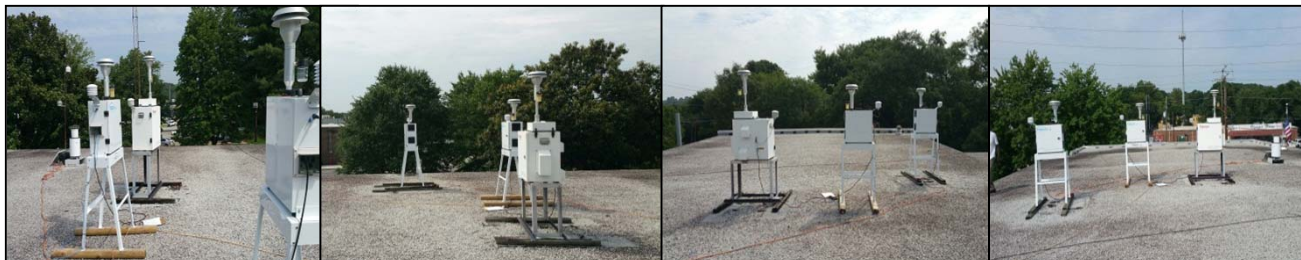
Site History: Established as TSP site

North

South

East

West

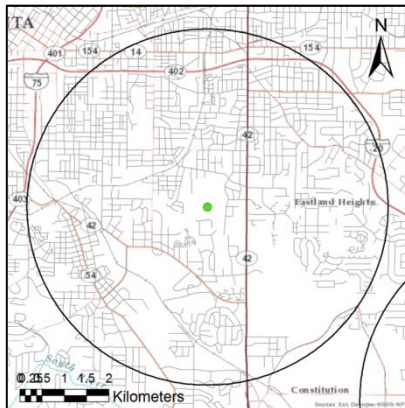
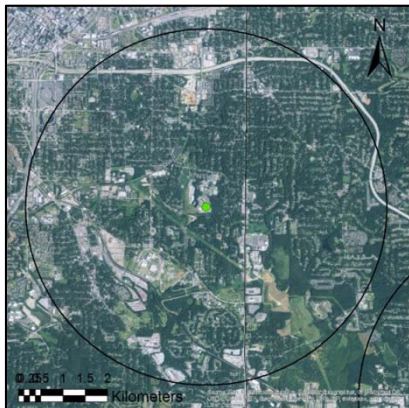


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	10 m	Neighborhood	1/21/99*
PM ₁₀	Population Exposure	Every 6 days	10 m	Neighborhood	1/1/86**
PM ₁₀	Population Exposure/Quality Assurance	Every 12 days	10 m	Neighborhood	2/1/86***

* Sampler inactive from 9/30/06 to 12/1/08, **Sampler inactive from 9/26/06 to 1/3/13, ***Sampler inactive from 10/12/87 to 1/1/06 and from 9/26/06 to 6/1/17

GA AAMP's plans for this site: Continue monitoring

Confederate Avenue



AQS ID: 131210055

Address: 945 East Confederate Avenue, Atlanta, Fulton County, Georgia 30316

Site Established: 10/1/91

Latitude/Longitude: N33.7206/W-84.3574

Elevation: 288 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ and SO₂ site

North

South

East

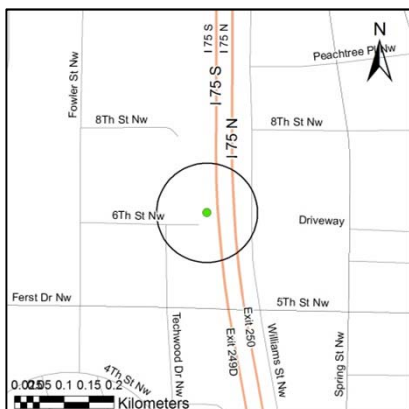
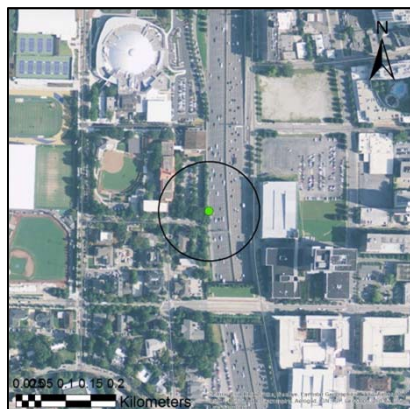
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
SO ₂	Population Exposure	Continuous	4 m	Neighborhood	10/1/91
SO ₂ 5-Minute Maximum	Population Exposure	Continuous	4 m	Neighborhood	8/1/10
O ₃	Population Exposure	Continuous (Mar-Oct)	4 m	Neighborhood	10/1/91
PM _{2.5}	Population Exposure	Continuous	4.8 m	Neighborhood	7/1/05
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/1/04
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/1/04

GA AAMP's plans for this site: Continue monitoring

NR-GA Tech



AQS ID: 131210056

Address: Georgia Institute of Technology, 6th Street and I-75, Atlanta, Fulton County, Georgia, 30313

Site Established: 6/15/14

Latitude/Longitude: N33.7784/W-84.3914

Elevation: 286 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as near-road site

North

South

East

West



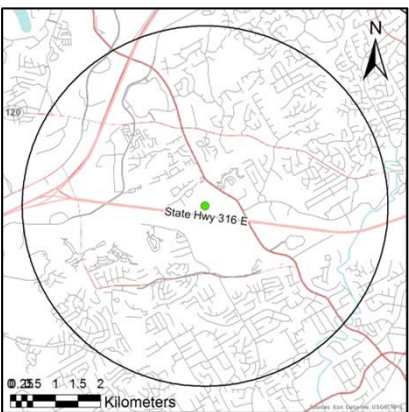
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
NO ₂	Source Oriented	Continuous	3.5 m	Micro	6/15/14
NO	Source Oriented	Continuous	3.5 m	Micro	6/15/14
NO _x	Source Oriented	Continuous	3.5 m	Micro	6/15/14
CO	Source Oriented	Continuous	3.5 m	Micro	6/15/14
PM _{2.5}	Source Oriented	Every 3 days	4.8 m	Micro	1/1/15
Black Carbon	Source Oriented	Continuous	4.4 m	Micro	7/9/15
Wind Speed	Source Oriented	Continuous	5.5 m	Micro	8/20/14

NR-Georgia Tech (continued)

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Wind Direction	Source Oriented	Continuous	5.5 m	Micro	8/20/14
PM _{2.5}	Source Oriented	Continuous	3.5 m	Micro	3/1/18

GA AAMP's plans for this site: Continue monitoring; See Appendix E of *2014 Ambient Air Monitoring Plan* for near-road site establishment and details. On March 1, 2018 GA AAMP installed a nephelometer at this site (see Section 1g of Appendix C for more details).

Gwinnett



AQS ID: 131350002

Address: Gwinnett Tech, 5150 Sugarloaf Parkway, Lawrenceville, Gwinnett County, Georgia 30043

Site Established: 3/17/95

Latitude/Longitude: N33.9632/W-84.0691

Elevation: 294 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ site

North

South

East

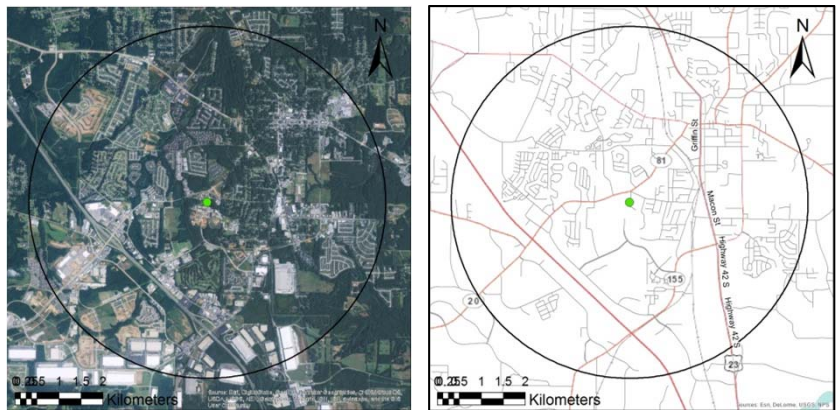
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Highest Concentration	Continuous (Mar-Oct)	3.4 m	Neighborhood	5/17/95
PM _{2.5}	Population Exposure	Every 3 days	4.7 m	Neighborhood	1/1/00
PM _{2.5}	Population Exposure	Continuous	4.4 m	Neighborhood	9/1/03

GA AAMP's plans for this site: Continue monitoring; On October 26, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the BAM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

McDonough



AQS ID: 131510002

Address: Blessings Thrift Store, 86 Work Camp Rd, McDonough, Henry County, Georgia 30253

Site Established: 6/7/99

Latitude/Longitude: N33.4338/W-84.1619

Elevation: 261.35 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ site

North

South

East

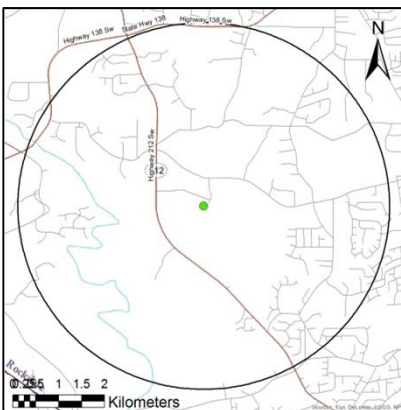
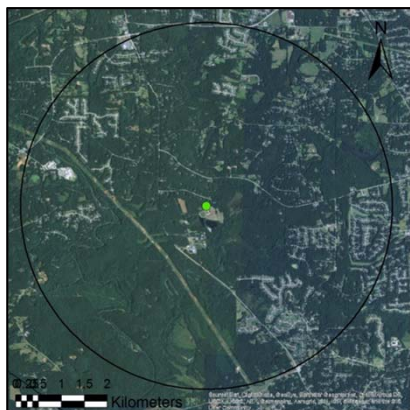
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Population Exposure	Continuous (Mar-Oct)	4 m	Neighborhood	6/7/99
PM _{2.5}	Population Exposure	Continuous	4.2 m	Neighborhood	9/1/03

GA AAMP's plans for this site: Continue monitoring

Conyers



AQS ID: 132470001

Address: 2625 Georgia Highway 212, Conyers, Rockdale County, Georgia 30094

Site Established: 7/26/78

Latitude/Longitude: N33.5884/W-84.0697

Elevation: 219 meters

Area Represented: Atlanta-Sandy Springs-Marietta MSA

Site History: Established as O₃ site

North



South



East



West



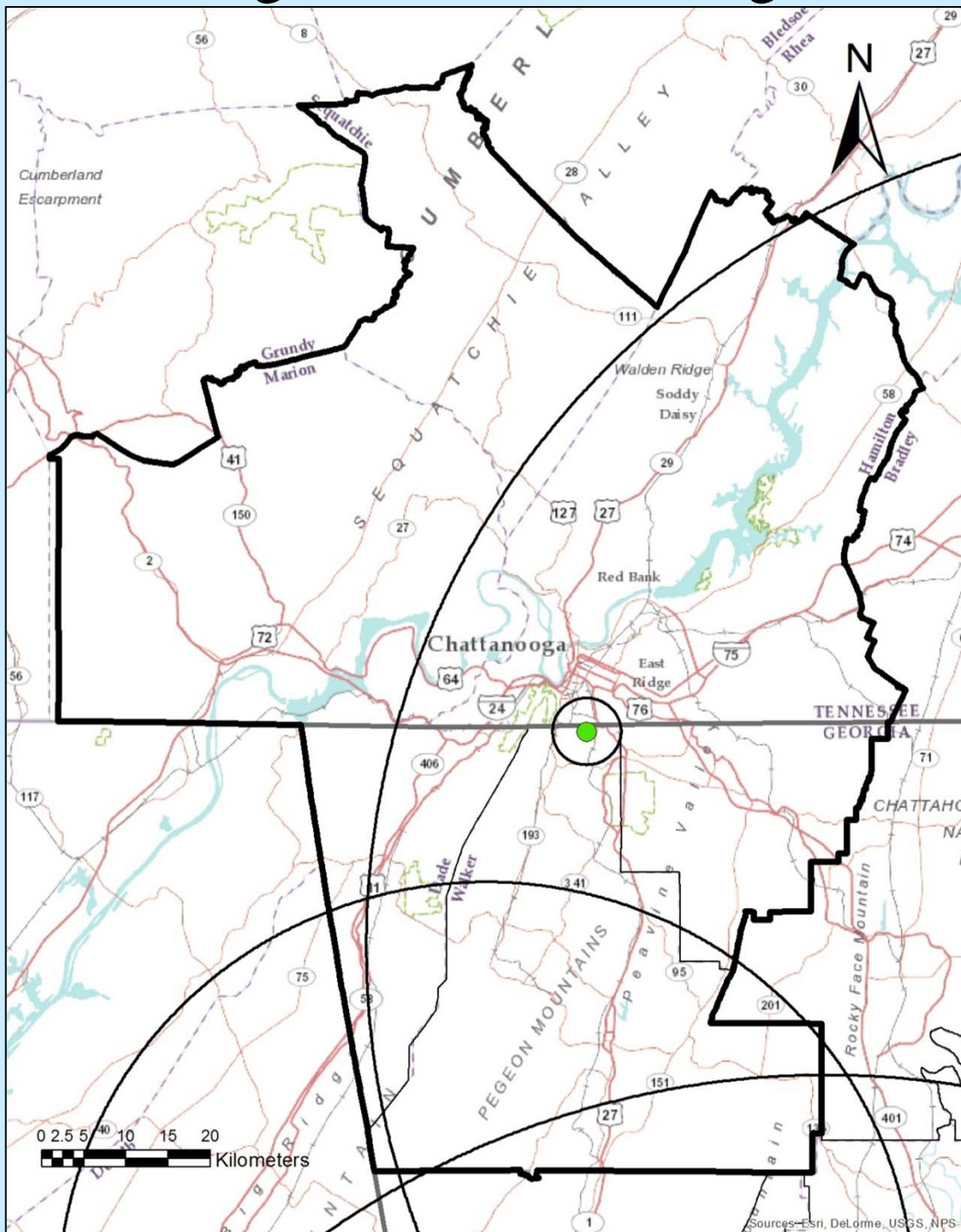
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Maximum Concentration	Continuous (Mar-Oct)	4.4 m	Neighborhood	7/26/78
Relative Humidity	General/ Background	Continuous	2.9 m	Neighborhood	6/1/94
Barometric Pressure	General/ Background	Continuous	2.9 m	Neighborhood	6/1/94
Ultraviolet Radiation	General/ Background	Continuous	2.2 m	Neighborhood	1/1/97
Outdoor Temperature	General/ Background	Continuous	2.9 m	Neighborhood	6/1/94
Solar Radiation	General/ Background	Continuous	2.2 m	Neighborhood	6/1/94

Conyers (continued)

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	6/1/94
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	6/1/94
Rain/Melt Precipitation	General/ Background	Continuous	3.8 m	Neighborhood	7/1/03

GA AAMP's plans for this site: Continue monitoring; Ultraviolet radiation and solar radiation monitored at Conyers are also used to fulfill meteorological requirements for South DeKalb PAMS (see Section 1.4 for waiver request).

Chattanooga Tennessee-Georgia MSA



Radius of Circles on Map

Micro Scale: up to 100m

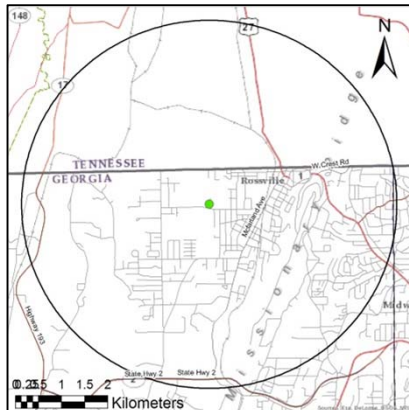
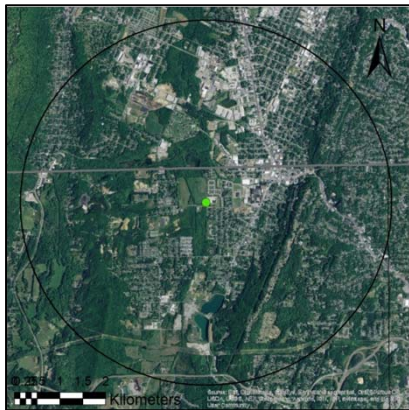
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

Regional Scale: up to 100s of km (100km shown)

Rossville



AQS ID: 132950002

Address: 601 Maple Street, Lot #6, Rossville, Walker County, Georgia, 30741

Site Established: 1/1/67

Latitude/Longitude: N34.9788/W-85.3009

Elevation: 200 meters

Area Represented: Chattanooga Tennessee-Georgia MSA

Site History: Established as TSP and SO₂/NO₂ site

North

South

East

West



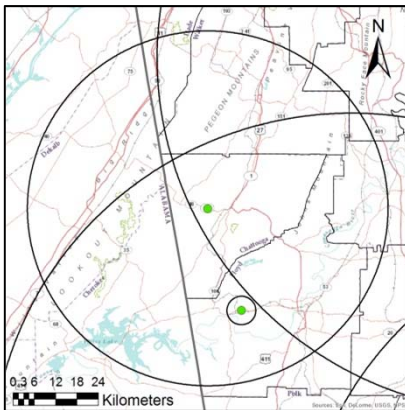
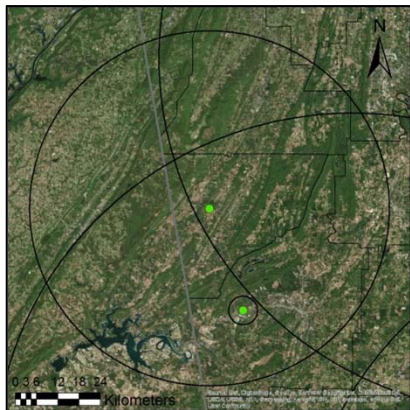
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Continuous	2.9 m	Neighborhood	1/24/07
PM _{2.5}	Population Exposure/ Regional Transport	Every 3 days	2.2 m	Neighborhood	1/1/00
PM _{2.5} Speciation	Population Exposure	Every 6 days	2.2 m	Neighborhood	3/23/05

GA AAMP's plans for this site: Continue monitoring; On October 1, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM_{2.5} sampler to replace the BAM PM_{2.5} sampler, and until GA AAMP gains confidence in the FEM monitor, 3-day samples will be collected with the PM_{2.5} FRM monitor to assess how well data correlates between these two samplers.

Sites Not in an MSA

(Listed in AQS ID Order)

Summerville



AQS ID: 130550001

Address: DNR Fish Hatchery, 231 Fish Hatchery Road, Summerville, Chattooga County, Georgia 30747

Site Established: 1985

Latitude/Longitude: N34.4744/W-85.4089

Elevation: 276 meters

Area Represented: Not in an MSA, Summerville Micropolitan Statistical Area

Site History: Established as Acid Rain site

North

South

East

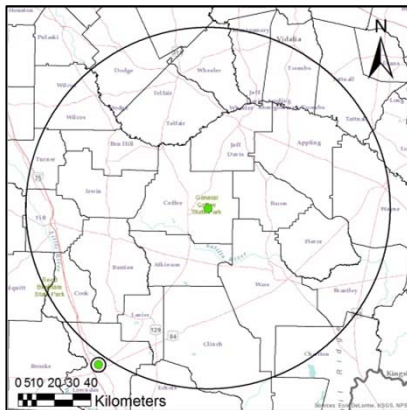
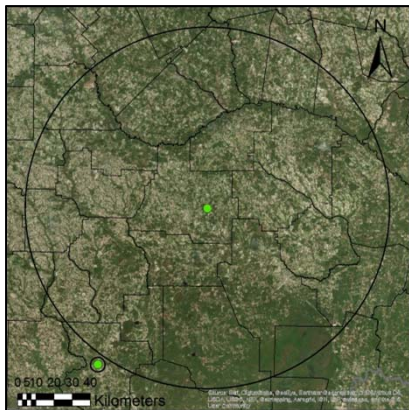
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	Regional Transport	Continuous (Mar-Oct)	4 m	Urban	3/1/04

GA AAMP's plans for this site: Continue monitoring

General Coffee



AQS ID: 130690002

Address: 46 John Coffee Road, Nicholls, Coffee County, Georgia 31554

Site Established: 1/1/99

Latitude/Longitude: N31.5129/W-82.7501

Elevation: 49 meters

Area Represented: Not in an MSA, Douglas Micropolitan Statistical Area

Site History: Established as Air Toxics site

North

South

East

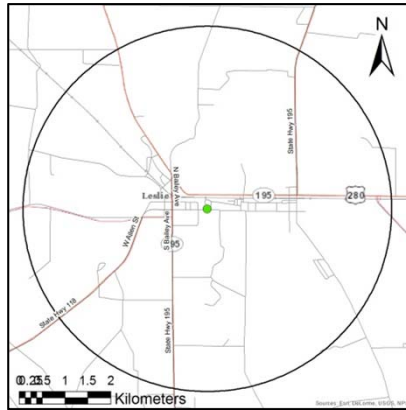
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5} Speciation	General Background	Every 6 days	3.5 m	Regional	3/1/02
Toxics	General Background	Every 12 days	2.5 m	Regional	1/1/99
PM _{2.5}	General Background	Every 3 days	3 m	Regional	2/1/17

GA AAMP's plans for this site: Continue monitoring

Leslie



AQS ID: 132611001

Address: Leslie Community Center, N Bass St/E Allen St, Leslie, Sumter County, Georgia 31764

Site Established: 1/1/81

Latitude/Longitude: N31.9541/W-84.0811

Elevation: 108 meters

Area Represented: Not in an MSA, Americus Micropolitan Statistical Area

Site History: Established as O₃ site

Northwest



Southeast



East



West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O ₃	General/ Background	Continuous (Mar-Oct)	3 m	Neighborhood	1/1/81

GA AAMP's plans for this site: Continue monitoring

Sandersville



AQS ID: 133030001

Address: Oconee Center, 824 School Street, Sandersville, Washington County, Georgia 31082

Site Established: 1/1/74

Latitude/Longitude: N32.9672/W-82.8070

Elevation: 140 meters

Area Represented: Not in an MSA, Washington County

Site History: Established as TSP site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM _{2.5}	Population Exposure	Every 3 days	3 m	Neighborhood	1/30/99

GA AAMP's plans for this site: Continue monitoring

Appendix B: Inventory of Ambient Monitoring Equipment

**Georgia Department of Natural Resources
Environmental Protection Division**

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Rome MSA			
Rome	ESC DAS	Datalogger 8832	good/ >5
	Met-One SASS	Speciated PM2.5 Sampler	good/ >4
	TEOM	Continuous PM2.5 Sampler	good/ >4
Kraftsman	ESC DAS	Datalogger 8832	good/ >4
	Thermo SO2 Analyzer	43i	good/ >4
	Thermo SO2 Calibrator	146i	good/ >4
	EnviroNics Zero Air Supply	7000	good/ >3
Brunswick MSA			
Brunswick	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49C-PS	good/ >7
	Thermo 2025	PM2.5 Sampler	good/ >7
	Sonic Anemometer	81000	good/ >4
	EnviroNics Zero Air Supply	7000	good/ >4
Valdosta MSA			
Valdosta	Thermo 2025	PM2.5 Sampler	good/ >4
	Met-One BAM Monitor	1020 Continuous PM2.5 Sampler	good/ >5
	ESC DAS	Datalogger 8832	good/ >4
Warner Robins MSA			
Warner Robins	Thermo 2025	PM2.5 Sampler	good/ >3
	Teledyne T640	Continuous PM2.5 Sampler	good/ >1
Dalton MSA			
Fort Mountain	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49C-PS	good/ >7
	RM Young Wind Instrument	05305vm	good/ >10
	RM Young Temp/Relative Humidity	41375VC	good/ >4
	EnviroNics Zero Air Supply	7000	good/ >3
Gainesville MSA			
Gainesville	Thermo 2025	PM2.5 Sampler	good/ >3
	Teledyne	T640 Continuous PM2.5 Sampler	good/ <1
	ESC DAS	Datalogger 8832	good/ >5
Albany MSA			
Albany	Thermo 2025	PM2.5 Sampler	good/ >3
	Thermo 2025	PM2.5 Sampler Co-locate	good/ >3
	Met-One BAM Monitor	Continuous PM2.5 Sampler	good/ >4
	ESC DAS	Datalogger 8832	good/ >5
Athens-Clarke County MSA			
Athens	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49i-PS	good/ >7
	Thermo 2025	PM2.5 Sampler	good/ >3
	Teledyne	T640 Continuous PM2.5 Sampler	good/ <1
	ESC DAS	Datalogger 8832	good/ >5
	EnviroNics Zero Air Supply	7000	good/ >3
Macon MSA			
Macon-Allied	Thermo 2025	PM2.5 Sampler	good/ >3
	Thermo 2025	PM2.5 Sampler Co-locate	good/ >3
	Met-One SASS	Speciated PM2.5 Sampler	good/ >10
	URG Sequential Sampler	Speciation Particulate 3000N MOD C	good/ >10
Macon Forestry	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >10
	Thermo O3 Calibrator	49iPS	good/ >10
	Thermo SO2 Analyzer	43i	good/ >7
	Thermo SO2 Calibrator	146i	good/ >10

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Macon Forestry (cont'd)	Enviroics Zero Air Supply	7000	good/ >3
	Thermo 2025	PM2.5 Sampler	good/ >3
	Teledyne	T640 Continuous PM2.5 Sampler	good/ <1
	Graseby PUF Sampler	GPS1-11	good/ >10
	Graseby HIVOL Sampler (metals)	2000H	good/ >10
	AVOCS	VOC Sampler	good/ >10
	RM Young Wind Instrument	05305vm	good/ >10
Columbus Georgia-Alabama MSA			
Columbus - Health Department	Thermo 2025	PM2.5 Sampler	good/ >3
Columbus - Airport	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >10
	Thermo O3 Calibrator	49C	good/ >5
	Thermo 2025	PM2.5 Sampler	good/ >3
	R&P PM2.5 Sampler	TEOM 1400 AB	good/ >7
	R&P	Sample Equil System	good/ >10
	Enviroics Zero Air Supply	7000	good/ >3
Columbus - Allied	General Metal Hi-Volume	HIVOL Sampler (lead) 2000H	good/ >10
	General Metal Hi-Volume	HIVOL Sampler (lead) 2000H	good/ >10
Columbus - Joy Road	General Metal Hi-Volume	HIVOL Sampler (lead) 2000H	good/ >10
Columbus - Cusseta	Thermo 2025	PM2.5 Sampler	good/ >3
	Met-One SASS	Speciation Control Box	good/ >5
	URG Sequential Sampler	Speciation Particulate 3000N MOD C	good/ >3
	General Metal Hi-Volume	HIVOL Sampler (lead) 2000H	good/ >10
Columbus - Crime Lab	Sonic Anemometer	81000	good/ >5
	RM Young BP Sensor	Barometric Pressure	good/ >4
	Nova Lynx	Tipping Bucket	good/ >4
	RM Young Temp/Relative Humidity	41375VC	good/ >4
	ESC DAS	Datalogger 8832	good/ >5
Savannah MSA			
Savannah - East President	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49C	good/ >7
	Thermo O3 Calibrator	49C	good/ >7
	Thermo SO2 Analyzer	43i	good/ >7
	Thermo SO2 Calibrator	146i	good/ >7
	GRASEBY/GMW PUF Sampler	GSP1	good/ >7
	Andersen HIVOL Sampler	GBM2000HBL Metals Sampler	good/ >7
	ATEC Carbonyl Sampler	100	good/ >7
	XONTECK VOC Sampler	VOC Sampler	good/ >7
	Enviroics Zero Air Supply	7000	good/ >3
Sonic Anemometer	81000	good/ >5	
Savannah - Mercer School	Thermo 2025	PM2.5 Sampler	good/ >3
Savannah - L&A	ESC DAS	Datalogger 8832	good/ >5
	Thermo SO2 Analyzer	43i	good/ >7
	Thermo SO2 Calibrator	146i	good/ >7
	Teledyne	T640 Continuous PM2.5 Sampler	good/ <1
	Sonic Anemometer	81000	good/ >3
	Enviroics Zero Air Supply	7000	good/ >3
Augusta-Richmond County, Georgia-South Carolina MSA			
Evans	Thermo O3 Analyzer	Thermo 49C	good/ >6
	Thermo O3 Calibrator	Thermo 49C-PS	good/ >5
	RM Young Wind Instrument	05305vm	good/ >10
	Tower	Fold Over	good/ >5
	ESC DAS	Datalogger 8832	good/ >5
	RM Young Temp/Relative Humidity	41382VC	good/ >3

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Augusta	EnviroNics Zero Air Supply	7000	good/ >3
	Thermo O3 Analyzer	49C	good/ >7
	Thermo O3 Calibrator	49C-PS	good/ >7
	Thermo SO2 Analyzer	43i	good/ >7
	EnviroNics Zero Air Supply	7000	good/ >3
	Thermo SO2 Calibrator	146i	good/ >7
	R&P PM10 Sampler	TEOM 1400 AB Series Continuous	good/ >7
	Thermo 2025	PM2.5 Sampler	good/ >3
	Teledyne T640	Continuous PM2.5 Sampler	good/>1
	Met-One SASS	Speciated PM2.5 Sampler	good/ >4
	URG 3000N	Speciated PM2.5 Sampler	good/ >4
	Sonic Anemometer	81000	good/ >4
	ESC DAS	Datalogger 8832	good/ >5
	Nova Lynx	Tipping Bucket	good/ >4
	RM Young Temp/Relative Humidity	41375VC	good/ >4
RM Young BP Sensor	Barometric Pressure	good/ >4	
EnviroNics Zero Air Supply	7000	good/ >3	
Atlanta-Sandy Springs-Marietta MSA			
Forest Park	Thermo 2025	PM2.5 Sampler	good/ >3
Kennesaw	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49C-PS	good/ >7
	EnviroNics Zero Air System	7000	good/ >4
	Thermo 2025	PM2.5 Sampler	good/ >3
	EnviroNics Zero Air Supply	7000	good/ >3
South DeKalb	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >2
	Thermo O3 Calibrator	49iPS	good/ >3
	EnviroNics Dynamic Gas Calibrator	6103	good/ >3
	EnviroNics Gas Calibrator	9100 Gas Dilution Calibrator	good/ >3
	Thermo NOy Analyzer	42iY	good/ >7
	Thermo NOx Analyzer	42i	good/ >7
	Thermo CO Analyzer	48i-TLE	good/ >3
	Thermo SO2 Analyzer	43i-TLE	good/ >3
	Thermo 2025	PM2.5 Sampler	good/ >3
	Thermo 2025	PM2.5 Sampler Co-locate	good/ >3
	Teledyne T640X	PM2.5, PM10, PMcoarse	good/>1
	Met-One SASS	Speciated PM2.5 Sampler	good/ >3
	URG 3000N	Speciated PM2.5 Sampler	good/ >7
	EnviroNics Zero Air Supply	7000 H	good/ >3
	ATEC Carbonyl Sampler	Model 8000	good/ >3
	ATEC Carbonyl Sampler	Model 8000	good/ >3
	Shawnee Instruments	PM10 Sampler	good/ >7
	Shawnee Instruments	PM10 Sampler Co-locate	good/ >7
	PUF	Semi-VOCs Sampler	good/ >6
PUF	Semi-VOCs Sampler Co-locate	good/ >6	
ATEC 2200	VOCs Sampler	good/ >7	
ATEC 2200	VOCs Sampler Co-locate	good/ >7	
South DeKalb cont'd	RM Young Wind Instrument	05305vm	good/ >4
	RM Young Temp/Relative Humidity	41375VC	good/ >4
	Nova Lynx	Tipping Bucket	good/ >4
	RM Young BP Sensor	Barometric Pressure	good/ >4
NR-285	TAPI T200UP	NOx	good/ >3
	Xonteck 911	VOC Sampler	good/ >7

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
NR-285 cont'd	Envionics Calibrator	6103	good/ >3
	Thermo MAAP 5012 BC	Black Carbon	good/ >2
Douglasville	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49i-PS	good/ >7
	RM Young Wind Instrument	05305VM	good/ >3
	Envionics Zero Air Supply	7000	good/ >3
	ESC DAS	Datalogger 8832	good/ >4
Fire Station #8	Met-One	PM2.5 Sampler	good/ >3
	Tisch PM10 Sampler	PM10 Sampler	good/>1
	Tisch PM10 Sampler	PM10 Sampler Co-locate	good/>1
Confederate Avenue	ESC DAS	Datalogger 8832	good/ >2
	Thermo O3 Analyzer	49i	good/ >5
	Thermo O3 Calibrator	49i-PS	good/ >4
	Thermo SO2 Analyzer	43i	good/ >4
	Thermo SO2 Calibrator	146i	good/ >2
	R&P PM2.5 Sampler	TEOM 1400 AB Series Continuous	good/ >7
	Envionics Zero Air Supply	7000	good/ >3
NR-GA Tech	RM Young Wind Instrument	05305vm	good/ >4
	ESC DAS	Datalogger 8832	good/ >4
	Thermo NO2 Analyzer	42i	good/ >3
	Thermo CO Analyzer	48i	good/ >7
	Thermo 2025	PM2.5 Sampler	good/ >3
	Nephelometer	PM2.5 Sampler	good/>1
	Envionics Zero Air Supply	7000	good/ >3
Gwinnett Tech.	Envionics Calibrator	6103	good/ >3
	ESC DAS	Datalogger 8832	good/ >4
	Thermo O3 Analyzer	49C	good/ >7
	Thermo O3 Calibrator	49C-PS	good/ >7
	Envionics Zero Air Supply	7000	good/ >3
	Thermo 2025	PM2.5 Sampler	good/ >7
McDonough	Teledyne T640	Continuous PM2.5 Sampler	good/>1
	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49i-PS	good/ >7
	Envionics Zero Air Supply	7000	good/ >3
Conyers	R&P PM2.5 Sampler	TEOM 1400 A Series Continuous	good/ >7
	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49iPS	good/ >7
	Envionics Zero Air Supply	7000	good/ >3
	RM Young Wind Instrument	05305vm	good/ >3
Conyers	PSP	Solar Radiation Instrument	good/ >7
	TUVR	Ultraviolet Radiation Instrument	good/ >7
	Nova Lynx	Tipping Bucket	good/ >4
	RM Young Temp/Relative Humidity	41375VC	good/ >4
RM Young BP Sensor	Barometric Pressure	good/ >4	
Chattanooga Tennessee-Georgia MSA			
Rossville	ESC DAS	Datalogger 8832	good/ >5
Rossville cont'd	Thermo 2025	PM2.5 Sampler	good/ >4
	Met-One SASS	Speciated PM2.5 Sampler	good/ >4
	URG 3000N	Speciated PM2.5 Sampler	good/ >4
	Teledyne	T640 Continuous PM2.5 Sampler	good/ <1
Sites Not in an MSA			
Summerville	ESC DAS	Datalogger 8832	good/ >5

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Summerville cont'd	Thermo O3 Analyzer	49i	good/ >7
	Thermo O3 Calibrator	49i-PS	good/ >7
	EnviroNics Zero Air Supply	7000	good/ >3
General Coffee	Met-One SASS	Speciated PM2.5 Sampler	good/ >3
	URG 3000N	Speciated PM2.5 Sampler	good/ >7
	Thermo 2025	PM2.5 Sampler	good/ >10
	Graseby HIVOL Sampler (metals)	2000H	good/ >10
	AVOCS	VOC Sampler	good/ >6
Leslie	ESC DAS	Datalogger 8832	good/ >5
	Thermo O3 Analyzer	49i	good/ >10
	Thermo O3 Calibrator	49i-PS	good/ >10
	EnviroNics Zero Air Supply	7000	good/ >3
Sandersville	Thermo 2025	PM2.5 Sampler	good/ >7
Georgia AAMP			
Quality Assurance Unit	TriCal (1)	Flow Standard	good/ >5
	General Metal Works	Hi-Volume Orifice	good/ >5
	Graseby GMW	PUF Orifice	good/ >5
	DC-Lite DCL-H	Flow Standard	good/ >5
	DC-Lite DCL-L	Flow Standard	good/ >5
	DC-2	DryCal Flow Standard Base	good/ >5
	DC-HC-1	DryCal High Flow Cell	good/ >5
	DC-LC-1	DryCal Low Flow Cell	good/ >5
	DC-MC-1	DryCal Medium Flow Cell	good/ >5
	DeltaCal (3)	Flow Standard	good/ >5
	Gilibrator Flow Cell (6)	Flow Standard	good/ >5
	VRC	Variable HiVol orifice	good/ >5
	Thermo 146I (2)	Multi-gas Calibrator	good/ >5
	Thermo 49PS (2)	Ozone Standard	good/ >5
Meteorology Unit Workshop	Sonic Anemometer (16)	81000	Varies
	Sonic Anemometer (7)	85000	Varies
	PSP (9)	Solar Radiation Instrument	Varies
	TUVR (13)	Ultraviolet Radiation Instrument	Varies
	RM Young Wind Instrument (2)	05305VM	good/ >7
	Nova Lynx	Tipping Bucket	good/ >7
	RM Young Temp/Relative Humidity	41375VC	good/ >3
	RM Young BP Sensor	Barometric Pressure	good/ >7
Warehouse/Storage	AGILAIRE (16)	8832 Data System Controller Data	Varies
	ESC (1)	8816 Data Logger	good/ >10
	THERMO (13)	49i O3 Analzer	Varies
	THERMO (7)	49i Calibrator	Varies
	THERMO (5)	49c O3 Analyzer	Varies
	THERMO (5)	49c O3 Calibrator	Varies
	THERMO (5)	48c CO Analyzer	Varies
	THERMO (5)	43i SO2 Analyzer	Varies
	THERMO (5)	146c Gas Calibrator	Varies
	THERMO (6)	42i NO, NO2, NOX Analyzer	Varies
	THERMO (8)	43c SO2 Analyzer	Varies
	THERMO (9)	146i Gas Calibrator	Varies
	THERMO (1)	42iy NO Diff NOY	good/ >7
	THERMO (8)	42c NO, NO2, Nox Anlayzer	Varies
	THERMO (5)	48i CO Analyzer	good/ >10
	ENVIRONICS (6)	Zero Air Generator Model 7000	good/ >3
	ENVIRONICS (2)	Series 9100 Cal System	good/ >3
	TELEDYNE (2)	Zero Air Generator Model 701	Varies

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Warehouse/Storage (cont'd)	MET ONE (2)	SASS Sampler Tripod	good/ >7
	MET ONE (7)	SASS Sampler	good/ >6
	ENVIRONICS (4)	6103 Calibrator	good/ >3
	MET ONE (10)	BAM 1020	Varies
	THERMO, TEOM (2)	Control Unit	Varies
	SABIO (2)	Model 1001 Zero Air System	good/ >4
	THERMO (7)	2025 2.5 Sampler	Varies
	THERMO (6)	2025i 2.5 Sampler	good/ >4
	MET ONE (4)	URG	good/ >4
	R&P PM2.5 Sampler	TEOM 1400 AB Series Continuous	good/ >7
	Graseby PUF Sampler	BMPS1-11	good/ >12
	General Metal Hi-Volume (3)	HIVOL Sampler 2000H	good/ >12
	ATEC VOCs Sampler	2200 - 1PX	good/ >7
	ATEC Carbonyl Sampler	100	good/ >7

**Appendix C:
Pollutant Description, Analysis Method, and Quality
Assurance Schedule**

**Georgia Department of Natural Resources
Environmental Protection Division**

Pollutant Description, Analysis Method, and Quality Assurance Schedule

All monitors have known precision, accuracy, interferences, and operational parameters. The monitors as well as all measurement devices are carefully calibrated at predetermined frequencies, varying from daily to quarterly. Calibration standards are traceable to National Institute of Standards and Technology (NIST) master standards.

Monitoring and analysis are performed according to a set of standard operating procedures (SOP). Field personnel visit sampling sites, replace sample media, and check the operation and calibration of monitors per the SOP.

Specialized data-collection and storage equipment is used at most sites to collect the data. A computerized telemetry system aids in assembly of the data for submission to the U.S. EPA. This enhances data validity, minimizes travel costs, and allows data to be available by computer at GA AAMP's main office immediately. Numerous manual and automated checks are performed to ensure that only valid data are reported to EPA.

Quality assurance activities are carried out to determine the quality of the collected ambient data, improve the quality of the data, and evaluate how well the entire monitoring system operates. The goal of quality assurance activities is to produce high quality monitoring data.

1.0 Particulate Matter

Particulate matter is defined as any airborne material, except uncombined water (liquid, mist, steam, etc.) that exists in a finely divided form as liquid or solid at standard temperature (25°C) and pressure (760mmHg) and has an aerodynamic diameter of less than 100 micrometers. Three sizes of particulate matter are monitored: PM₁₀, PM_{2.5}, and PM_{coarse} (10-2.5). PM₁₀ is particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (µm). PM_{2.5} are solid particles and liquid droplets found in the air that are less than 2.5 micrometers (µm) or microns in diameter. Individually, these particles and droplets are invisible to the naked eye. Collectively, however, they can appear as clouds or a fog-like haze. PM_{2.5} is also referred to as "fine" particles. PM_{10-2.5} is called PM_{coarse}. The PM_{coarse} fraction has a diameter between 2.5 and 10 micrometers (µm) or microns. In comparison, a human hair is 70-100 µm in diameter.

Particulates are emitted by many human activities, such as fuel combustion, motor vehicle operation, industrial processes, grass mowing, agricultural tilling, and open burning. Natural sources include windblown dust, forest fires, volcanic eruptions, and pollen. Particulates emitted directly from a source may be either fine (less than 2.5 µm) or larger (2.5-60 µm), but particles formed in the atmosphere will usually be fine. Typically, fine particles are formed by condensation of materials produced during combustion or atmospheric reactions in which gaseous pollutants are chemically converted to particles.

Particulate matter can cause health problems affecting the breathing system, including aggravation of existing lung and heart disease, limitation of lung clearance, changes in form and structure of organs, and development of cancer. Individuals most sensitive to the effects of

particulate matter include those with chronic obstructive lung or heart disease, those suffering from the flu, asthmatics, the elderly, children, and mouth breathers.

Health effects from inhaled particles are influenced by the depth of penetration of the particles into the respiratory system, the amount of particles deposited in the respiratory system, and the chemical composition of the deposited particles. The risks of adverse health effects are greater when particles enter the tracheobronchial and alveolar portions of the respiratory system. Healthy respiratory systems can trap particles larger than 10 μm more efficiently before they move deeply into the system, and can more effectively remove the particles that are not trapped before they can lodge deeply in lung tissue.

Particulate matter also can interfere with plant photosynthesis by forming a film on leaves that reduces exposure to sunlight. Particles also can cause soiling and degradation of property, which can be costly to clean and maintain. Suspended particles can absorb and scatter light, causing reduction of visibility. This is a national concern, especially in areas such as national parks, historic sites, and scenic attractions.

a. Particulate Matter (PM₁₀) Integrated

GA AAMP conducts PM₁₀ monitoring on an integrated basis at one site in Georgia. GA AAMP uses an EPA-approved method. The Tisch – TE Wilbur Filter Based PM₁₀ Air Sampler functions to collect airborne particulate matter $\leq 10\mu\text{m}$ (PM₁₀) on a pre-weighted 47mm diameter filter over a 24 hour period, midnight to midnight. The sampler normally samples every 6 days and exposed filter are subsequently collected and sent to the GA EPD Laboratory for gravimetric analysis and measurement of PM₁₀ concentration. The system monitors and records all system sensors such as flow, temperatures and barometric pressure, as well as the system pressure, filter temperature variation, and flow total which provides the operator or laboratory technician additional information on the sample if warnings or alarms occurred during the sample run. These monitors are used to determine attainment of the PM₁₀ standard. These analyzers are subjected to quarterly checks and are audited by GA AAMP's Quality Assurance Unit on a semi-annual basis, within a five to seven month window.

b. Particulate Matter (PM₁₀) Continuous

GA AAMP conducts PM₁₀ monitoring on a continuous basis at two sites in Georgia. GA AAMP uses EPA-approved equivalent methods. The Thermo Scientific tapered element oscillating microbalance (TEOM) is one of these methods (EQPM-1090-079), and the data is used to determine attainment of the PM₁₀ NAAQS. The monitor consists of three basic components: the central unit, the sampling pump, and the sampling inlet hardware. The sampling inlet is designed to cut out particles larger than 10 microns in size. The TEOM sampler draws air through a filter at a constant mass flow controller flow rate. During sampling, ambient air passes through the PM₁₀ inlet first, then, if sampling for PM_{2.5} through a sharp cut cyclone. Only particles equal to or less than 10 microns, or 2.5 microns in diameter, respectively are allowed to pass on into two separate flows: the 3 LPM sample stream, which is sent to the mass transducer and the 13.7 LPM exhaust stream. The 3 LPM sample stream is collected onto the Teflon™ coated filter which is weighed every 2 seconds. The difference between the filter's current weight and the initial weight gives the total mass of the collected particles in $\mu\text{g}/\text{m}^3$.

The other method used for sampling PM_{10} is the Teledyne T640/640x, which is a real-time, continuous PM mass monitor that uses scattered light spectrometry for measurement. The T640 measures $PM_{2.5}$, and the T640x Option measures $PM_{2.5}$, PM_{10} , and $PM_{10-2.5}$. The sampling head draws in the ambient air with different size particles, which are dried with the Aerosol Sample Conditioner (ASC) and moved into the optical particle sensor where scattered light intensity is measured to determine particle size diameter. The inlet used for the T640x option samples at 16.67 liters per minute (LPM) to mechanically size-cut the aerosol intake for sampling particles at 10 microns and under. The particles move separately into the T-aperture through an optically differentiated measurement volume that is homogeneously illuminated with polychromatic light. This Model T640 with 640x option PM_{10} monitor is configurable as a PM_{10} FEM (EQPM-0516-239), and the data is used to determine attainment of the PM_{10} NAAQS. This analyzer is subjected to monthly flow checks and is audited by GA AAMP's Quality Assurance Unit on a semi-annual basis.

c. Fine Particulate Matter ($PM_{2.5}$) Integrated

At sites where GA AAMP collects $PM_{2.5}$ samples on an integrated basis, the samples are measured using very similar techniques utilized for measuring PM_{10} . The official federal reference method (FRM) requires that samples are collected on Teflon™ filters with a $PM_{2.5}$ sampler for 24 hours. A specialized particle size sorting device is used to filter the air, collecting only particles 2.5 microns in size and smaller. The filters are weighed in a laboratory before and after the sampling period. The change in the filter weight corresponds to the mass weight of $PM_{2.5}$ particles collected. That mass weight, divided by the total volume of air sampled, corresponds to the mass concentration of the particles in the air for that 24-hour period. This data is collected using the FRM, and the data is appropriate to use for making attainment determinations relative to the $PM_{2.5}$ NAAQS. Currently, GA AAMP uses the Thermo Scientific Partisol 2025 (RFPS-0498-118 or EQPM-0202-145), and as GA AAMP replaces these Thermo 2025 filter-based $PM_{2.5}$ FRM monitors, the Met One sequential filter-based $PM_{2.5}$ FRM monitors (RFPS-0717-245) will be used as the replacement. The sampling frequency for integrated $PM_{2.5}$ sampling varies by site, based on EPA rules, and is listed with each individual site's information in Appendix A of this document and in Table 1 below. On a semi-annual basis, GA AAMP's Quality Assurance Unit audits these $PM_{2.5}$ samplers.

d. Fine Particulate Matter ($PM_{2.5}$) Continuous

GA AAMP monitors for $PM_{2.5}$ on a continuous basis with three different methods. One method is the beta attenuation method (BAM-1020). The MetOne BAM-1020 is adapted from PM_{10} service to $PM_{2.5}$ service by use of an inline BGI "Sharp Cut Cyclone". The inlet is designed to cut out particles that are larger than 2.5 microns in size. The beta rays are attenuated as they collide with particles collected on filter tape. The decrease in signal detected by the scintillation counter is inversely proportional to the mass loading on the filter tape. The pump turns on at the beginning of the hour and runs for 50 minutes. During the last 10 minutes of the hour, the pump is turned off while the tape transport operates, and the final mass reading is collected and self-tests are performed. The sampling method for the BAM type of continuous $PM_{2.5}$ monitor was approved as Federal Equivalent Method (FEM) in Notices of the Federal Register/Vol.73; No.49 dated March 12, 2008 when used with a "Very Sharp Cut Cyclone" (VSCC). GA AAMP operates the continuous BAM as an FEM with a VSCC at the Albany-Turner Elementary site

(13-095-0007) as of January 1, 2013, and the PM_{2.5} data collected with this sampler is used for making attainment decisions relative to the NAAQS. This PM_{2.5} sampler is used as a collocated quality assurance monitor at this site. For the remaining BAM PM_{2.5} samplers, GA AAMP has not configured the monitors as FEMs, and the samplers are used for the Air Quality Index (AQI) and informational purposes.

Another PM_{2.5} continuous collection method utilized by GA AAMP is the Teledyne T640, which is an optical aerosol spectrometer that converts optical measurements to mass measurements by determining sampled particle size via scattered light using 90° white-light scattering with polychromatic LED. The inlet used for the T640 samples at 5.0 liters per minute (LPM). The Aerosol Sample Conditioner (ASC) removes the volatile components (mainly water) of the aerosol to avoid false particle size. The internal vacuum pump is controlled by a pulse-width modulation (PWM) feedback control for consistently accurate flow to the sensor. The external vacuum pump is controlled by an ambient and pressure compensated mass flow controller in combination with a pneumatic valve for consistently accurate flow. The Teledyne T640 is officially designated as an US EPA Federal Equivalent Method (FEM) (EQPM-0516-236 and EQPM-0516-238) (81 FR 45285), and used for making attainment decisions relative to the PM_{2.5} NAAQS. Starting in January 2019, GA AAMP may begin to shut down PM_{2.5} FRMs (filter based) monitors where collocated with the continuous PM_{2.5} FEM Teledyne T640 monitors, depending on how well the monitoring data correlates.

The other locations where GA AAMP samples PM_{2.5} on a continuous basis, the Thermo Scientific tapered element oscillating microbalance (TEOM) Series 1400/1400a monitors is used. These monitors use an inline PM_{2.5} cyclone for particle size selection and an inline Sample Equilibration System (SES), which uses a diffusion drying technique to minimize water vapor interference with the particle mass measurement. The instrument oscillates the sample filter on a microbalance continuously while particles are collected from ambient air. By measuring the change in the oscillation frequency, the change in filter mass can be determined. The sampling method for the TEOM type of continuous PM_{2.5} monitor was approved as Federal Equivalent Method (FEM) in Notices of the Federal Register/Vol.74; page 28696 dated June 17, 2009 when used with a “Filter Dynamics Measurement System (FDMS)”. The FDMS component estimates and adjusts for the volatile component of the mass. Currently, the TEOMs in the ambient air monitoring network are not configured to sample as FEMs. Therefore, data collected from the TEOM samplers cannot be used for making attainment decisions relative to the NAAQS.

All three types of continuous PM_{2.5} samplers are used to support development of air quality models and forecasts, including the AQI, and to provide the public with information about pollutant concentrations in real time. All three types of analyzers are subject to monthly flow checks and are audited by GA AAMP’s Quality Assurance Unit on a semi-annual basis.

e. Fine Particulate Matter (PM_{2.5}) Speciation

Particle speciation measurements require the use of a wide variety of analytical techniques, but all generally use filter media to collect the particles to be analyzed. Laboratory techniques currently in use are gravimetric (micro weighing); X-ray fluorescence and particle-induced X-ray emission for trace elements; ion chromatography for anions and selected cations; controlled combustion for carbon; and gas chromatography/mass spectroscopy (GC/MS) for semi-volatile

organic particles. Samples are collected for 24 hours and shipped to an EPA-appointed laboratory for analysis. The sampling frequency varies by site and is detailed in Table 1. GA AAMP's Quality Assurance Unit subjects these samplers to audits on a semi-annual basis.

f. Coarse Particulate Matter (PM_{10-2.5})

As part of the NCore requirements (discussed in Section 4.1), the South DeKalb site (13-089-0002) began PM_{10-2.5} sampling as of January 1, 2011. The Teledyne T640x replaced the BAM PM_{10-2.5} system on June 14, 2017. The Teledyne T640/640x is a real-time, continuous PM mass monitor that uses scattered light spectrometry for measurement. The T640x Option measures PM_{2.5}, PM₁₀, and PM_{10-2.5}. The sampling head draws in the ambient air with different size particles, which are dried with the Aerosol Sample Conditioner (ASC) and moved into the optical particle sensor where scattered light intensity is measured to determine particle size diameter. The particles move separately into the T-aperture through an optically differentiated measurement volume that is homogeneously illuminated with polychromatic light. GA AAMP uses the 16.7 LPM Model T640 with 640x option PM_{10-2.5} monitor: EQPM-0516-240. This analyzer is subjected to monthly flow checks and is audited by GA AAMP's Quality Assurance Unit on a semi-annual basis.

g. Nephelometer

The Ambilabs Nephelometer measures ambient air for the presence of particulate matter on a continuous, real-time basis. The nephelometer determines PM concentrations by measuring the shutter count which allows the light source to stabilize, and wavelengths which shows the average diameter of the measured particle size. Measurements are updated every second. The unit includes an LCD display to provide information about the parameters and flow rate. An active heating system, which is controlled based on relative humidity (RH) levels, warms the sample air and sample cell to keep the RH below a set point to avoid particle growth with humidity. The nephelometer is equipped with an internal data logger that enables data to be stored and downloaded through the R232 port. The nephelometer is subjected to weekly zero, precision, and span (ZPS) checks, quarterly multipoint calibrations, and is audited by GA AAMP's Quality Assurance Unit on a semi-annual basis.

The sampling frequency of the integrated (FRM), continuous (BAM, TEOM, and Teledyne), and speciated PM_{2.5} samplers is detailed in Table 1, and the attached Appendix A. The PM_{2.5} samplers highlighted in yellow are the PM_{2.5} samplers that are used for comparison to the NAAQS for attainment purposes.

Site ID	Common Name	City	County	Integrated	Continuous	Speciation
Rome MSA						
131150003	Rome	Rome	Floyd		PM _{2.5}	6 Day
Brunswick MSA						
131270006	Brunswick	Brunswick	Glynn	PM _{2.5} (3 Day)		
Valdosta MSA						
131850003	Valdosta	Valdosta	Lowndes	PM _{2.5} (3 Day)	PM _{2.5}	
Warner Robins MSA						

131530001	Warner Robins	Warner Robins	Houston	PM _{2.5} (3 Day)	FEM PM _{2.5}	
Albany MSA						
130950007	Albany	Albany	Dougherty	2 PM _{2.5} (3 Day, 12 Day)	FEM PM _{2.5}	
Gainesville MSA						
131390003	Gainesville	Gainesville	Hall	PM _{2.5} (3 Day)	FEM PM _{2.5}	
Athens-Clarke County MSA						
130590002	Athens	Athens	Clarke	PM _{2.5} (3 Day)	FEM PM _{2.5}	
Macon MSA						
130210007	Macon-Allied	Macon	Bibb	2 PM _{2.5} (3 Day, 12 Day)		6 Day
130210012	Macon-Forestry	Macon	Bibb	PM _{2.5} (3 Day)	FEM PM _{2.5}	
Columbus, Georgia- Alabama MSA						
132150001	Columbus-Health Dept.	Columbus	Muscogee	PM _{2.5} (3 Day)		
132150008	Columbus-Airport	Columbus	Muscogee	PM _{2.5} (3 Day)	PM _{2.5}	
132150011	Columbus-Cusseta	Columbus	Muscogee	PM _{2.5} (3 Day)		6 Day
Savannah MSA						
130510091	Savannah-Mercer	Savannah	Chatham	PM _{2.5} (3 Day)		
130511002	Savannah-L&A	Savannah	Chatham		FEM PM _{2.5}	
Augusta, Georgia-South Carolina MSA						
132450091	Bungalow Road	Augusta	Richmond	PM _{2.5} (3 Day)	FEM PM _{2.5}	6 Day
Atlanta-Sandy Springs-Marietta MSA						
130630091	Forest Park	Forest Park	Clayton	PM _{2.5} (3 Day)		
130670003	Kennesaw	Kennesaw	Cobb	PM _{2.5} (3 Day)		
130890002	South DeKalb	Decatur	DeKalb	2 PM _{2.5} (3 Day, 12 Day)	FEM PM _{2.5}	3 Day
131210039	Fire Station #8	Atlanta	Fulton	PM _{2.5} (3 Day)		
131210055	Confederate Ave.	Atlanta	Fulton		PM _{2.5}	
131210056	NR-Georgia Tech	Atlanta	Fulton	PM _{2.5} (3 Day)		
131350002	Gwinnett Tech	Lawrenceville	Gwinnett	PM _{2.5} (3 Day)	FEM PM _{2.5}	
131510002	McDonough	McDonough	Henry		PM _{2.5}	
Chattanooga, Tennessee-Georgia MSA						
132950002	Rossville	Rossville	Walker	PM _{2.5} (3 Day)	FEM PM _{2.5}	6 Day
Not in an MSA						
130690002	General Coffee	Douglas	Coffee	PM _{2.5} (3 Day)		6 Day
133030001	Sandersville	Sandersville	Washington	PM _{2.5} (3 Day)		

Highlighted samplers used for comparison to NAAQS

Table 1: PM_{2.5} Sampling Frequency

2.0 Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless and poisonous gas produced by incomplete burning of fossil fuels used in vehicles, space heating, and industrial processes. Boilers and other fuel burning heating systems are also significant sources.

Breathing elevated levels of carbon monoxide affects the oxygen-carrying capacity of the blood. Hemoglobin in the blood binds with CO more readily than with oxygen, starving the body of

vital oxygen. Individuals with lung and heart diseases or anemia are particularly sensitive to CO health effects. Low concentrations affect mental function, vision, and alertness. High concentrations can cause fatigue, reduced work capacity and may adversely affect fetal development. Chronic exposure to CO at concentrations as low as 70 parts per million (ppm) (80 mg/m³) can cause cardiac damage. Other health effects associated with exposure to CO include central nervous system effects and pulmonary function difficulties. Ambient CO apparently does not adversely affect vegetation or materials.

Carbon monoxide (CO) is monitored using EPA-approved reference or equivalent methods. These analyzers are self-contained and capable of measuring ambient CO on a continuous, real-time basis using the non-dispersive infrared analysis and gas filter correlation techniques. CO is monitored using specialized analyzers based on the principle that CO absorbs infrared radiation. The sample is drawn through the sample bulkhead and the optical bench. Radiation from an infrared source is chopped and then passed through a gas filter alternating between CO and nitrogen (N₂). The radiation then passes through a narrow bandpass interference filter and enters the optical bench where absorption by the sample gas occurs. The infrared radiation then exits the optical bench and falls on an infrared detector. The N₂ side of the filter wheel produces a measure beam which can be absorbed by the CO in the cell. The chopped detector signal is modulated by the alternation between the two gas filters with amplitude related to the concentration of CO in the sample cell. Thus, the gas filter correlation system responds specifically to CO. The sampler is equipped with a microprocessor that enables digital measurement of CO, automatic compensation for changes in temperature and pressure, and internal diagnostics. These analyzers are subjected to weekly zero, precision, and span (ZPS) checks, quarterly multipoint calibrations, and are audited by GA AAMP's Quality Assurance Unit on a semi-annual basis.

3.0 Ozone (O₃)

Ozone (O₃) is a clear gas that forms in the troposphere (lower atmosphere) by chemical reactions involving hydrocarbons (also called volatile organic compounds) and oxides of nitrogen in the presence of sunlight. Even low concentrations of tropospheric ozone, also called ground level ozone are harmful to people, animals, vegetation and materials.

Ozone is the major component of a complex mixture of compounds known as photochemical oxidants. Ozone is not usually emitted directly into the atmosphere, but is formed by a series of complex reactions involving hydrocarbons, nitrogen oxides, and strong sunlight. Ozone concentrations are generally higher during the daytime, when temperatures are moderate or hot, and during seasons when conditions are dry and the sunlight is more intense.

Ozone is a pulmonary irritant, affecting the respiratory mucous membranes, as well as other lung tissues and respiratory functions. Ozone has been shown to impair normal function of the lung causing shallow, rapid breathing and a decrease in pulmonary function. Other symptoms of exposure include chest tightness, coughing and wheezing. People with asthma, bronchitis, or emphysema may experience breathing difficulty when exposed to short-term concentrations at higher levels of ozone. Continued or repeated long-term exposure may result in permanent lung structure damage.

Ozone damages vegetation by injuring leaves. Ozone also accelerates material aging, cracking rubber, fading dyes and eroding paint.

Georgia's ozone analyzers continuously measure the concentration of ozone in ambient air using the ultraviolet (UV) photometric method and are EPA-approved for regulatory air monitoring programs. The degree to which the UV light is absorbed is directly related to the ozone concentration. The ambient air is drawn into the sample bulkhead and is split into two gas streams. One gas stream flows through an ozone scrubber to become the reference gas. The reference gas then flows to the reference solenoid valve. The sample gas flows directly to the sample solenoid valve. The solenoid valves alternate the reference and sample gas streams between the two cells every 10 seconds. When cell A contains reference gas, cell B contains sample gas and vice versa. The UV light intensities of each cell are measured by detectors A and B. When the solenoid valves switch the reference and sample gas streams to opposite cells, the light intensities are ignored for several seconds to allow the cells to be flushed. The sampler calculates the ozone concentration for each cell and outputs the average concentration to both the front panel display and the analog or digital output. Data gained from the monitors is used to determine compliance with the NAAQS for ozone.

As required by Table D-3 of 40 CFR Part 58, Appendix D (4.1)(c)(3)(i), GA AAMP operates ozone monitors each year from March 1st through October 31st, with the exception of the NCore (National Core Monitoring Network) ozone monitor. The NCore ozone monitor, located at the South DeKalb site (13-089-0002), samples year round, as required by 40 CFR Part 58. During the monitoring season, analyzers are subjected to weekly ZPS checks and quarterly multipoint calibrations. GA AAMP's Quality Assurance Unit audits these samplers on an annual basis.

EPA established a Clean Air Status and Trends Network (CASTNET) monitoring site in Georgia in 1988. The CASTNET site is part of a national air quality monitoring network put in place to assess long-term trends in atmospheric deposition and ecological effects of air pollutants. The CASTNET site is one of 85 regional sites across rural areas of the United States and Canada measuring nitrogen, sulfur, and ozone concentrations, and deposition of sulfur and nitrogen. Like the South DeKalb ozone monitor, the CASTNET ozone monitor also collects data year-round. Since 2011, the CASTNET ozone monitor has met requirements for quality assurance and completeness criteria and can be used for comparison to the NAAQS [40 CFR 58, (1.1)(b)].

4.0 Sulfur Dioxide (SO₂)

Sulfur dioxide (SO₂) is a colorless, corrosive, harmful gas with a pungent odor. Sulfur oxides contribute to the formation of acid rain and the formation of particles that reduce visibility. The main sources of SO₂ are combustion of fossil fuels containing sulfur compounds and the manufacture of sulfuric acid. Other sources include refining of petroleum and smelting of ores that contain sulfur.

The most obvious health effect of sulfur dioxide is irritation and inflammation of body tissues brought in contact with the gas. Sulfur dioxide can increase the severity of existing respiratory diseases such as asthma, bronchitis, and emphysema. Sulfuric acid and fine particulate sulfates, which are formed from sulfur dioxide, also may cause significant health problems. Sulfur dioxide causes injury to many plants. A bleached appearance between the veins and margins on

leaves indicates damage from SO₂ exposure. Commercially important plants sensitive to SO₂ include cotton, cucumber, alfalfa, sweet potatoes, tulips, apple trees, and several species of pine trees.

Sulfur dioxide is measured in the ambient air using EPA-approved reference method instruments as defined in 40 CFR Part 53. Georgia's sulfur dioxide network consists of continuous instruments using a pulsed ultraviolet (UV) fluorescence technique. This monitoring technique is based on measuring the emitted fluorescence of SO₂ produced by its absorption of UV radiation. Pulsating UV light is focused through a narrow bandpass filter allowing only light wavelengths of 1,900 to 2,300 angstrom units (\AA) to pass into the fluorescence chamber. SO₂ absorbs light in this region without any quenching by air or most other molecules found in polluted air. The SO₂ molecules are excited by UV light and emit a characteristic decay radiation. A second filter allows only this decay radiation to reach a photomultiplier tube. Electronic signal processing transforms the light energy impinging on the photomultiplier tube into a voltage which is directly proportional to the concentration of SO₂ in the sample stream being analyzed. The sampler outputs the SO₂ concentration to the front panel display and analog or digital output. These analyzers are subjected to weekly ZPS checks, quarterly multipoint calibrations, and are audited by GA AAMP's Quality Assurance Unit on an annual basis.

5.0 Nitrogen Oxides (NO_x)

Several gaseous oxides of nitrogen (NO_x) are normally found in the atmosphere, including nitrous oxide (N₂O), nitric oxide (NO) and nitrogen dioxide (NO₂). Nitrous oxide is a stable gas with anesthetic characteristics and typical ambient concentrations well below the threshold concentration for a biological effect. Nitric oxide is a colorless gas with ambient concentrations generally low enough to have no significant biological effect. Nitrogen dioxide is reddish-brown but is not usually visible at typical ambient concentrations.

The most significant nitrogen oxide emissions result from the burning of fossil fuels such as coal, oil, and gasoline, due to the oxidation of atmospheric nitrogen and nitrogen compounds in the fuel. The primary combustion product is NO, which immediately reacts with oxygen in the atmosphere to form NO₂.

At high concentrations, nitrogen dioxide has significant health effects as a pulmonary irritant, especially upon asthmatics and children. At concentrations more typical in Georgia, though, NO₂ is primarily of concern because of its role in the formation of ground-level ozone. In warm, sunny conditions, it reacts with hydrocarbons in the atmosphere to form ozone. Ironically, the same reaction can run in reverse in the absence of sunlight, though, meaning that urban areas with higher NO₂ emissions and daytime ozone problems will often have virtually zero ozone present at night. Yet the next morning, the store of unreacted NO₂ that builds up in these areas overnight can cause rapid ozone formation once the sun rises. Therefore, urban areas often have summertime ozone concentrations with dramatic afternoon peaks contrasting against periods overnight where no ozone is present. Areas without significant local NO₂ sources, like rural areas and national parks, tend to have ozone present around the clock, but in moderate concentrations that are steadier throughout a twenty-four hour period.

Some types of vegetation are very sensitive to NO_2 , including oats, alfalfa, tobacco, peas, and carrots. Chronic exposure causes chlorosis (yellowing) and acute exposure usually causes irregularly shaped lesions on the leaves.

Nitric oxide and nitrogen dioxide do not directly damage materials. However, NO_2 can react with moisture in the air to produce nitric acid, which corrodes metal surfaces and contributes to acid rain. High concentrations of NO_2 may reduce visibility.

Oxides of nitrogen, particularly NO_2 , are monitored using specialized analyzers that continuously measure the concentration of oxides of nitrogen in ambient air using the ozone-phase chemiluminescent method. Nitric oxide (NO) and ozone (O_3) react to produce a characteristic luminescence with intensity linearly proportional to the NO concentration. Infrared light emission results when electronically excited NO_2 molecules decay to lower energy states. NO_2 must first be converted to NO before it can be measured using the chemiluminescent reaction. NO_2 is converted to NO by a molybdenum NO_2 -to- NO converter heated to about 325°C . The ambient air sample is drawn into the sample bulkhead. The sample flows through a particulate filter, a capillary, then to the mode solenoid valve. The solenoid valve routes the sample either straight to the reaction chamber (NO mode) or through the NO_2 -to- NO converter and then to the reaction chamber (NO_x mode). Dry air enters the dry air bulkhead through a flow sensor, and then through a silent discharge ozonator. The ozonator generates the necessary ozone concentration needed for the chemiluminescent reaction. The ozone reacts with the NO in the ambient air to produce electronically excited NO_2 molecules. A photomultiplier tube housed in a thermoelectric cooler detects the NO_2 luminescence. The NO and NO_2 concentrations calculated in the NO and NO_x modes are stored in memory, and the difference between the concentrations are used to calculate the NO_2 concentration. The sampler outputs NO , NO_2 , and NO_x concentrations on the front panel display and the analog or digital outputs. There are two major instrument designs. While they are closely related, they do not monitor the same species. NO_x analyzers measure NO , NO_2 , and NO_x . NO_y analyzers measure NO and NO_y , but cannot measure NO_2 . The NO_y analyzers are also specialized for measuring trace-level concentrations; as such, they cannot measure higher concentrations. Because of these tradeoffs, it is necessary to operate a network of both instrument types to get a complete picture of local conditions. Of the oxides of nitrogen, only NO_2 is regulated under the NAAQS. Therefore, only the NO_x type analyzers produce data directly relevant to the standard. These analyzers are subjected to weekly ZPS checks, quarterly multipoint calibrations, and are audited by GA AAMP's Quality Assurance Unit on an annual basis.

GA AAMP also operates a Teledyne API Model T200UP direct NO_2 analyzer. Measurements are made with a high efficiency photolytic converter with specific conversion of NO_2 . A Teflon™ cell with reflective properties combined with a Blue Light Converter increases the overall conversion efficiency of the chemiluminescent reaction. These direct NO_2 type analyzers produce data relevant to the standard, with Federal Equivalent Method EQNA-0512-200.

6.0 Lead (Pb)

Lead (Pb) is a toxic heavy metal element occurring in the atmosphere as a constituent of small particles. The major source of atmospheric lead used to be the combustion of gasoline containing the additive tetraethyl lead as an antiknock agent. The use as a gasoline additive has been banned

in all applications except aviation gasoline. This ban has dramatically decreased concentrations of lead in the ambient air. Significant remaining sources include coal combustion and sandblasting of highway structures and water tanks. Lead is also used in some batteries, paints, insecticides, and newspaper inks.

Lead persists and accumulates in the environment and the human body. It may be inhaled, ingested, and eventually absorbed into the bloodstream and distributed to all body tissues. Exposure to low concentrations interferes with blood production and specific enzyme systems. It is believed to cause kidney and nerve cell damage, and severe lead poisoning is known to cause brain damage in children.

Since lead is a particulate, the measurement for ambient air lead concentrations is performed using a manual method, unlike measurements for the gaseous pollutants discussed earlier (ozone, SO₂, NO₂ and CO). Samples are collected on 8" x 10" pre-weighed fiberglass filters with a high-volume total suspended (TSP) sampler for 24 hours, collecting particles with diameters of 100 microns or less. High volumes of ambient air in the flow range of 40-60 cubic feet per minute are sampled at a constant rate during the sampling period. This produces a uniform distribution of particles deposited on the sample filter downstream of the sampler inlet. Samples collected with the TSP high-volume sampler can be used to determine the average ambient TSP concentration over a sampling period followed by subsequent analysis to determine the identity and quantity of inorganic metals present in the TSP. The filter sample is shipped to a laboratory for analysis using inductively coupled plasma mass spectroscopy (commonly known as ICP-MS). Data gained from the criteria lead samplers is used to determine compliance with the National Ambient Air Quality Standards for lead. On a semi-annual basis, GA AAMP's Quality Assurance Unit audits these samplers.

In addition to the criteria lead network sites, lead is monitored as a trace metal in the Georgia Air Toxics Monitoring Network, the National Air Toxics Trends Station (NATTS), and with the PM_{2.5} speciation samplers. With the Air Toxics Network, samples are obtained with a high-volume sampler collecting total suspended particles in the ambient air. The NATTS lead is sampled using a PM₁₀ sampler, and particles are sampled up to 10 microns in size. With the PM_{2.5} speciation sampler, samples are collected that include particles up to 2.5 microns in size. All three of these additional sampling techniques also collect 24-hour samples on pre-weighed filters, have samples sent to a laboratory for analysis, and are analyzed with ICP-MS. GA AAMP's Quality Assurance Unit audits these lead samplers on an annual basis.

7.0 Metals

A sub-group of the Air Toxics Network includes the metals group, which encompass compounds such as cadmium, mercury, chromium and lead. The Air Toxics pollutants, also known as Hazardous Air Pollutants (HAPs), are those pollutants that are known or suspected to cause cancer or other serious health effects, such as damage to the immune system, reproductive effects or birth defects, developmental or neurological problems, or adverse environmental effects. These effects can vary depending on how often one is exposed, how long one is exposed, the person's health that is exposed, and the toxicity of the compound. Some of the substances tend to have only one critical effect, while others may have several. The lifetime, transportation, and make-up of these pollutants are affected by weather (rain and wind) and landscape (mountains

and valleys). They can be transported far away from the original source, or be caught in rain and brought down to waterways or land.

In addition to exposure from breathing air toxics, some toxic air pollutants such as mercury can deposit onto soils or surface waters, where plants take them up, are ingested by animals, and are eventually magnified up through the food chain. Through this process, known as bioaccumulation, larger animals build up concentrations of these pollutants in their tissues that may be thousands of times higher than that found in the most polluted water or soil. Like humans, animals may experience health problems if exposed to sufficient quantities of air toxics over time. Humans who eat animals that have accumulated large concentrations of these pollutants are at the very top of this bioaccumulative food chain and as such are at particular risk for experiencing health effects.

The high-volume sampler used for sampling metals as part of the Air Toxics Network is a timed sampler. The sampler is calibrated to collect 1000 to 2000 liters (L) of air per minute. Particulate material is trapped on an 8.5" x 11" quartz fiber filter. The particulates include dust, pollen, diesel fuel by-products, particulate metal, etc. The filters are pre-weighed at a remote laboratory prior to use and weighed again after sampling. The filters are subjected to a chemical digestion process and are analyzed on an inductively coupled plasma mass spectrometer (ICP/MS). The samplers run once every twelve days following a pre-established schedule that corresponds to a nationwide sampling schedule. On the twelfth day the sampler runs midnight to midnight and takes a 24-hour composite sample.

The PM₁₀ sampler used for sampling toxic metal particles less than or equal to 10 microns in diameter as part of the NATTS network is a timed sampler. Collecting 1020 to 1240 liters (L) of air per minute, the sampler uses an 8.5" x 11" quartz glass fiber filter to trap particulate matter. The sample is analyzed using inductively coupled plasma mass spectrometry (ICP/MS). With ICP/MS, an argon gas is used to atomize and ionize the elements in a sample. The resulting ions are used to identify the isotopes of the elements and a mass spectrum is used to identify the element proportional to a specific peak formed from an isotope. In the summer of 2018, GA AAMP plans to replace both the primary and collocated NATTS high-volume PM₁₀ metals samplers with low-volume PM₁₀ metals samplers. GA AAMP will use the Met One single channel sampler set up for PM₁₀, collecting samples on 47 mm diameter Teflon™ filters, with a volumetric flow rate of 6.7 liters per minute. The NATTS PM₁₀ metals samplers are subjected to quarterly checks and audited by GA AAMP's Quality Assurance Unit on a semi-annual basis.

8.0 Volatile Organic Compounds (VOCs)

All Volatile Organic Compounds (VOCs) contain carbon, the basic chemical element found in living beings. Carbon-containing chemicals are called organic. Volatile chemicals escape into the air easily and react with NO₂ in sunlight to form ground level ozone. Some VOCs are also hazardous air pollutants, which can cause serious health effects. VOCs are released from burning fuel (gasoline, oil, coal, natural gas, etc.), solvents, paints, glues, and other products used at work or at home. Cars are a significant source of VOCs. VOCs include chemicals such as benzene, toluene, methylene chloride and methyl chloroform. Some VOCs are naturally occurring. VOCs such as pinenes and terpenes emitted from pine trees are a significant source of VOCs in the southeastern United States.

VOCs are collected and analyzed with two different methods. One method is with the Air Toxics Network in which the VOCs are collected with a canister. A SUMMA® polished canister is evacuated to a near-perfect vacuum and attached to a sampler with a pump controlled by a timer. The canister is filled to greater than 10 psig. The samples are collected for a 24-hour period, every 6 or 12 days depending on the site. The Air Toxics VOCs canister is analyzed using a gas chromatograph with mass spectroscopy detection (GC/MS), using method TO14/15, at the GA EPD laboratory. The second method of VOCs collection and analysis is with the PAMS network in which VOCs are collected and analyzed on-site with a gas chromatograph/flame ionization detector (GC/FID). During June, July, and August, the PAMS VOCs samples are collected continuously on an hourly basis. Also throughout the year with the PAMS network, a 24-hour VOCs sample is collected every 6 days and analyzed with the GC/FID method at the GA EPD laboratory. The VOC samplers in the PAMS network are subjected to quarterly checks and audited every six months. The Air Toxics VOCs samplers are subjected to quarterly checks and are audited by GA AAMP's Quality Assurance Unit on an annual basis.

9.0 Carbonyls

Carbonyl compounds are a subset of VOCs, and define a large group of substances, which include acetaldehyde and formaldehyde. These compounds can act as precursors to ozone formation. They can be formed from the breakdown of certain organic pollutants in outdoor air, from forest fires and wildfires, as well as from vehicle exhaust.

The carbonyls are sampled with two types of methods. One type is an absorbent cartridge filled with dinitrophenylhydrazine (DNPH)-coated silica that is attached to a pump to allow approximately 180 liters of air to be sampled. The cartridge is then analyzed using high performance liquid chromatography (HPLC). For the PAMS site, during June, July, and August, three 8-hour samples are taken every third day. A 24-hour integrated carbonyls sample is also taken every 6 days throughout the year at the South DeKalb NATTS site. The other method used for collecting carbonyls is the canister sampler that is used for sampling volatile organic compounds. Acrolein is a carbonyl compound that is collected using this canister method, described above, and analyzed with the GC/MS method. The PAMS and NATTS carbonyls samplers are subjected to quarterly checks and audited by GA AAMP's Quality Assurance Unit every six months. Also at select Air Toxics sites, carbonyls samples are collected on a DNPH cartridge for a 24-hour period, every 12 days. The Air Toxic carbonyls samplers are subjected to quarterly checks and audited by GA AAMP's Quality Assurance Unit annually.

10.0 Semi-Volatile Organic Compounds

Polycyclic aromatic hydrocarbons (PAHs), also called semi-volatile organic compounds are chemical compounds that consist of fused, six-carbon aromatic rings. They are formed by incomplete combustion of carbon-containing fuels such as wood, coal, diesel fuels, fat or tobacco. PAHs can occur in air attached to dust particles, and some can evaporate into the air from soil or surface waters. PAHs can stick tightly to particles and seep through soil to contaminate groundwater. They do not dissolve easily in water and can stick to solid particles and settle to the bottoms of lakes and rivers. Many PAHs are known or suspected carcinogens. The PUF (polyurethane foam) sampler used for sampling semi-volatile organic compounds is a timed sampler. The sampler is calibrated to collect 198 to 242 liters (L) of air per minute. A

multi-layer cartridge is prepared which collects both the particulate fraction and the volatile fraction of this group of compounds. The plug, filter and absorbent are extracted at the GA EPD laboratory and analyzed using gas chromatography with an electron capture detector (ECD). The semi-VOCs samplers are subjected to quarterly checks and audited by GA AAMP's Quality Assurance Unit annually.

11.0 Black Carbon

Black carbon is a particulate aerosol formed from the incomplete combustion of fossil fuels, biomass, and biofuels. Diesel engines are a large contributor of black carbon. Sampling for black carbon provides an estimate of the anthropogenic portion of carbon sources in ambient air pollution. For continuous sampling of black carbon, GA AAMP currently uses a Multiangle Absorption Photometer (MAAP) at the NR-285 (13-089-0003) and NR-Georgia Tech (13-121-0056) sites. Operating at 60 Watts/110V AC, these instruments use quartz tape to perform an optical analysis to determine the concentration of carbon particles passing through an air stream. The analysis is conducted using spectrophotometry, measuring the wavelength of the light energy absorbed and plotting the results on the site computer. These parameters are subjected to quarterly checks and audited by GA AAMP's Quality Assurance Unit every six months.

12.0 Meteorological Parameters

GA AAMP has fifteen meteorological stations across the state. Surface meteorological measurements, including wind speed and wind direction, are measured at each location. In addition, as part of the Photochemical Assessment Monitoring Site (PAMS) in the metropolitan Atlanta area, a complete suite of meteorological instrumentation is used to characterize meteorological conditions. The PAMS station measures hourly-averaged vector wind speed and vector-averaged wind direction at the 10-meter level, and hourly-averaged surface temperature, relative humidity and barometric pressure at the 2-meter level. Several sites include instruments to record total hourly precipitation, global solar radiation, and total ultraviolet radiation. In addition, the standard deviation of the wind direction is computed at the NCore site (South DeKalb). These parameters are audited by the GA AAMP's Quality Assurance Unit on an annual basis. For upper air measurement, GA AAMP uses a Vaisala BL-VIEW Ceilometer in conjunction with balloon rawinsonde data collected from NWS at Peachtree City. This upper air system is useful for monitoring the mixing height and low-level winds during smoke transport events.

**Appendix D:
List of Closed Ambient Monitors
(in order of shut down date)**

**Georgia Department of Natural Resources
Environmental Protection Division**

Site ID	Site Name	Sampler	Date Shut Down	Last Published in Annual Plan
131210039	Fire Station#8	PM ₁₀	9/26/06	N/A
130893001	Tucker	Ozone	10/31/06	N/A
130090001	Milledgeville-Airport	SO ₂	12/31/06	2009
130893001	Tucker	PAMS VOCs, NO/NO _x /NO _y /NO ₂	1/7/07	N/A
131110091	McCaysville	SO ₂	10/2/07	2007
131210001	Fulton Co Health Dept	PM ₁₀	9/1/08	2008
130970003	Douglasville-Beulah Pump Station	PM ₁₀	9/1/08	2008
132550002	Griffin-Spalding County	PM ₁₀	9/1/08	2008
132151003	Columbus-Crime Lab	Ozone	10/31/08	2008
130090001	Milledgeville-Airport	Air Toxics	10/31/08	2011
131150004	Rome-Co. Health Dept	Air Toxics	10/31/08	2011
131210020	Utoy Creek	Air Toxics	10/31/08	2011
131273001	Brunswick-Brunswick Coll	Air Toxics/Carbonyls	10/31/08	2011
131390003	Gainesville	Air Toxics	10/31/08	2011
131530001	Warner Robins	Air Toxics	10/31/08	2011
131850003	Valdosta	Air Toxics	10/31/08	2011
132155000	Columbus-Columbus State	Air Toxics	10/31/08	2011
132450092	Augusta-Clara Jenkins	Air Toxics	10/31/08	2011
130550001	Summerville-Fish Hatchery	Acid Rain	10/31/08	2011
130850001	Dawsonville	Acid Rain	10/31/08	2011
131890001	McDuffie-Fish Hatchery	Acid Rain	10/31/08	2011
132410002	Hiawassee-Lake Burton	Acid Rain	10/31/08	2011
132970001	Social Circle-Fish Hatchery	Continuous PM _{2.5}	10/31/08	2011
131130001	Fayetteville-GA DOT	Ozone, Wind Speed, Wind Direction	10/31/08	2013
131270006	Brunswick	Total Reduced Sulfur	10/31/08	2013
131210048	Georgia Tech	PM _{2.5}	12/1/08	2008
131150005	Rome	PM _{2.5} , PM ₁₀ , PM _{2.5} speciation	Consolidated with 131150003 3/09	2008
131210048	Georgia Tech	SO ₂ , NO, NO ₂ , NO _x	4/30/09	2011
130150003	Cartersville	Wind Speed, Wind Dir	12/31/11	2011
130730001	Evans	NO _y	7/28/2008	2012
130210013	Macon-Lake Tobesofkee	NO _y , O ₃	10/31/2008	2012
131270006	Brunswick	SO ₂	12/31/12	2012
132150008	Columbus -Airport	SO ₂	12/31/12	2012
130510017	Savannah-Market St.	PM _{2.5}	12/31/12	2012
132450005	Augusta-Medical College	PM _{2.5}	12/31/12	2012
131210032	Atlanta-E. Rivers School	PM _{2.5} , PM ₁₀	12/31/12	2012
130892001	Doraville Health Center	PM _{2.5}	12/31/12	2012
130670004	Powder Springs-Macland Aquatic Ctr.	PM _{2.5}	12/31/12	2012
130210007	Allied	PM ₁₀	12/31/12	2012
130510014	Savannah-Shuman Middle	PM ₁₀	12/31/12	2012
130550001	Summerville-Fish Hatchery	PM ₁₀	12/31/12	2012
130892001	Doraville Health Center	PM ₁₀	12/31/12	2012
130950007	Albany	PM ₁₀	12/31/12	2012
131150003	Rome	PM ₁₀	12/31/12	2012
131210048	Georgia Tech	PM ₁₀	12/31/12	2012
131270004	Brunswick-Arco Pump	PM ₁₀	12/31/12	2012

	Station			
132150011	Columbus-Cusseta Road	PM ₁₀	12/31/12	2012
133030001	Sandersville	PM ₁₀	12/31/12	2012
130893001	Tucker-Idlewood Road	Wind Speed, Wind Direction, Temp, RH, Solar Radiation, UV Radiation, BP, Precip	5/31/13	2013
130890002	South DeKalb	Hexavalent chromium	7/15/13	2013
132470001	Conyers	Continuous Gas Chromatograph	8/31/13	2013
130150003	Cartersville	Lead	2/22/14	2013
131210099	Roswell Road	CO	3/5/14	2013
130590002	Athens	PM _{2.5} Speciation	1/24/15	2014
132230003	Yorkville	Continuous Gas Chromatograph	8/31/15	2015
132230003	Yorkville	6-Day PAMs, NO/NO ₂ /NO _x , CO	12/31/15	2015
130850001	Dawsonville	Air Toxics/Carbonyls	12/31/15	2015
132470001	Conyers	6-Day PAMs, NO/NO ₂ /NO _x	12/31/15	2015
130890003	NR-285	Lead	6/30/16	2016
130890002	South DeKalb	Black carbon	12/31/16	2016
133190001	Gordon	PM _{2.5}	12/31/16	2016
132230003	Yorkville	O ₃	12/31/16	2016
132230003	Yorkville	PM _{2.5} , Continuous PM _{2.5} , VOCs, Semi-VOCs, Carbonyls, Metals, Wind Speed, Wind Direction, Temp, RH, Solar Radiation, UV Radiation, BP, Precip	1/31/17	2016
131150003	Rome-Coosa	SO ₂	12/31/16	2017
132450091	Augusta	Integrated PM ₁₀	3/31/18	2017

Appendix E: Memorandum of Agreement

**Georgia Department of Natural Resources
Environmental Protection Division**

MEMORANDUM OF AGREEMENT
ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR
THE CHATTANOOGA-WALKER COUNTY
METROPOLITAN STATISTICAL AREA MSA
December 28, 2017

Participating Agencies:

Georgia
Georgia Department of Natural Resources (GA DNR)
Environmental Protection Division GA EPD APB

Tennessee
Chattanooga-Hamilton County Air Pollution Control Bureau (CHCAPCB)

I. PURPOSE/OBJECTIVES/GOALS

The purpose of the Memorandum of Agreement (MOA) is to establish the Chattanooga-Hamilton County-Walker County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between CHCAPCB and GAEPDAPB (collectively referred to as the “affected agencies”) to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Chattanooga-Hamilton County-Walker Co, GA MSA as required by 40 CFR 58 Appendix D, Section 2, (e) (March 28, 2016)¹.

II. BACKGROUND

The Chattanooga-Hamilton Co-Walker Co, GA MSA consists of the following counties: Dade, Walker, Catoosa, Hamilton, Marion, and Sequatchie. GA EPD APB has jurisdiction over Dade, Walker, and Catoosa Counties in Georgia and CHCAPCB has jurisdiction over Hamilton County, Tennessee. The State of Tennessee has jurisdiction over Marion and Sequatchie Counties in Tennessee, but does not have any permanent air monitoring sites in those counties. The CHCAPCB and GA EPD APB are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Chattanooga-Hamilton County-Walker Co, GA Metropolitan Statistical Area (MSA). The United States Environmental Protection Agency (EPA) has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the

MSA for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone.

40 CFR 58 Appendix D, Section 2, (e)¹ states (in part):

“...The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.”¹

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

I. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- CHCAPCB and GA EPD APB (the “affected agencies”) commit to conducting appropriate monitoring in their respective jurisdictions of the MSA; as needed, to collectively meet EPA minimum monitoring requirements for the entire MSA for PM10, PM2.5, and ozone, as well as other criteria air pollutant monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all affected agencies. The minimum air quality monitoring requirement (for PM10, PM2.5, and ozone described in 40 CFR 58) for the MSA shall apply to the MSA in its entirety and shall not apply to any sole affected agency within the MSA unless agreed upon by all affected agencies.
- The affected agencies commit to coordinating monitoring “...responsibilities and requirements...to achieve an effective network design...”¹ regarding criteria air pollutant monitoring conducted in the MSA and commit to communicate unexpected or unplanned changes in monitoring activities within their jurisdictions to the other affected agencies of this MOA. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or e-mail of any monitoring changes occurring in its jurisdiction of the MSA at its earliest convenience after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or similar occurrences that result in a loss of more than 25% data in a quarter or a permanent change in the monitoring network. At least once a year in the second quarter of the year or before June 15th, each agency shall make available to the other agencies who are a party to this agreement, a copy of its proposed monitoring plan for the MSA for the next

year. The CHCAPCB will submit the network review that is submitted to the State of Tennessee for inclusion in the State's monitoring plan.

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

III. LIMITATIONS

- A. All commitments made in this MOA are subject to the availability of appropriated funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates CHCAPCB or GA EPD APB to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- B. This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimburse or contribution of funds between parties to this MOA will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of the parties.
- C. Except as provided in Section III, this MOA does not create any right or benefit, substantive or procedural, enforceable by law or equity against CHCAPCB or GA EPD APB, their officers or employees, or any other person. This MOA does not direct or apply to any person outside CHAPCD or GAEPD APB.

V. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY

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

VI. POINTS OF CONTACT

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

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VII. MODIFICATION/DURATION/TERMINATION

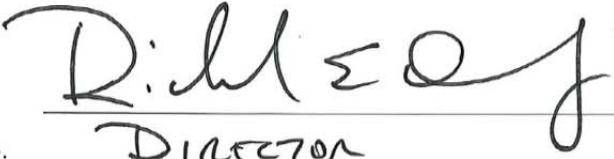
This MOA will be effective when signed by all parties. This MOA may be amended at any time by the mutual written consent of the parties. The parties will review this MOA at least once every 10 years to determine whether it should be revised, renewed, or cancelled. This MOA may be revoked or terminated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

VIII. REFERENCE


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

IX. APPROVALS

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

BY: 
TITLE: DIRECTOR
DATE: 1/24/18

Chattanooga-Hamilton County Air Pollution Bureau (CHCAPCB)

BY: 
TITLE: Director
DATE: January 3, 2018



DHEC MOA#: 2017-429

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

January 2017

Participating Agencies:

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

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

I. PURPOSE/OBJECTIVES/GOALS

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

II. BACKGROUND

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

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

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

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

III. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

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

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

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

IV. LIMITATIONS

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

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

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

V. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY

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

VI. POINTS OF CONTACT

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

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

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

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

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

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

VII. MODIFICATION/DURATION/TERMINATION

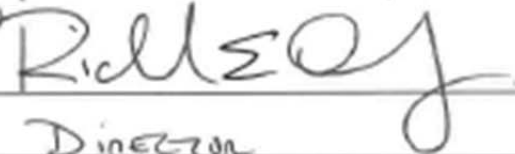
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IX. APPROVALS

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

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

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

BY: 
TITLE: Bureau Chief
DATE: 03/02/17

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


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