

**May 4, 2021**

**NOTICE OF THE OPPORTUNITY FOR PUBLIC COMMENT  
GEORGIA DEPARTMENT OF NATURAL RESOURCES  
ENVIRONMENTAL PROTECTION DIVISION  
AIR PROTECTION BRANCH**

STATE OF GEORGIA

NOTICE OF DRAFT 2021 AMBIENT AIR MONITORING PLAN – May 2021

To All Interested Parties:

The Georgia Environmental Protection Division (GA EPD) announces its intent to issue the *2021 Ambient Air Monitoring Plan* to the U.S. Environmental Protection Agency in July 2021. The GA EPD is required to produce this annual plan as part of EPA's amended ambient air monitoring regulations established October 17, 2006.

Georgia EPD's *2021 Ambient Air Monitoring Plan* will show how the state agency plans to meet EPA regulations for monitoring air quality in the state by assessing monitoring objectives, site appropriateness for air quality characterization, spatial scale represented by each monitor and appropriate new technologies.

GA EPD's air monitoring network consists of a number of stations located throughout the state. GA EPD uses the air monitoring data to track if air quality standards are being met, to assist in enforcement actions, to determine the improvement or decline of air quality, to trace the extent of allowable industrial expansion and to provide air pollution information to the public.

The draft *2021 Ambient Air Monitoring Plan* will be available for review on the GA EPD Air Protection Branch internet site: <https://epd.georgia.gov/air-protection-branch-public-announcements> and the Ambient Air Monitoring Program website: <https://airgeorgia.org/>.

Persons wishing to comment on the draft *Ambient Air Monitoring Plan* are required to submit their comments, in writing, to GA EPD 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](mailto:DeAnna.Oser@dnr.ga.gov) or to [EPD.comments@dnr.ga.gov](mailto:EPD.comments@dnr.ga.gov).

Comments must be received by GA EPD no later than June 4, 2021. Should the comment period end on a weekend or holiday, comments will be accepted up until the next working day. GA EPD, in soliciting comments for the final draft before submittal to EPA as required by 40CFR58, will consider all comments received on or prior to that date.

After the comment period has expired, GA EPD will consider all comments received. GA EPD's responses to comments and any other relevant information will be included in the final document published on <https://airgeorgia.org/>.

For additional information, contact the manager of the Ambient Air Monitoring Program, DeAnna Oser at the Atlanta address, or by phone at 404-363-7000. Please refer to this notice when requesting information.



# GEORGIA

DEPARTMENT OF NATURAL RESOURCES

---

ENVIRONMENTAL PROTECTION DIVISION

## **2021 Ambient Air Monitoring Plan**

Air Protection Branch

Ambient Monitoring Program





## Table of Contents

Table of Contents .....	i
Agency Contacts .....	iv
1.0 Executive Summary .....	1
1.1 Mandate.....	3
1.2 Procedures for Making Changes to the Monitoring Network.....	8
1.3 Memorandum of Agreement.....	8
1.4 Request for Waiver/Discontinuance .....	9
1.5 Air Quality Index (AQI) .....	9
1.6 QAPP and QMP .....	11
1.7 Public Notice and Comment Procedures .....	11
1.8 Use of Data .....	12
1.9 New Technologies .....	12
1.10 Georgia AAMP Budget.....	13
1.11 Inventory of Ambient Monitoring Equipment.....	13
1.12 List of Sites .....	13
2.0 Standards.....	16
3.0 Monitoring Objectives and Spatial Scale.....	16
4.0 Description of Networks .....	17
4.1 NCore.....	17
4.2 Sulfur Dioxide.....	17
4.3 Nitrogen Dioxide .....	18
4.4 Carbon Monoxide .....	19
4.5 PM <sub>2.5</sub> Speciation Trends Network (STN).....	19
4.6 Photochemical Assessment Monitoring Stations (PAMS) .....	19
4.7 National Air Toxics Trends Station (NATTS).....	20
4.8 Ozone .....	20
4.9 Particulate Matter.....	21
5.0 Site Evaluations .....	21
Appendix A: Individual Site Information Grouped by Metropolitan Statistical Area (Smallest to Largest) .....	25
Appendix B: Inventory of Monitoring Equipment .....	81
Appendix C: Pollutant Description, Analysis Method, and QA Schedule .....	90
Appendix D: List of Closed Monitors .....	104
Appendix E: Memorandum of Agreement .....	107
Appendix F: Comments .....	118

## List of Figures and Tables

Figure 1: Map of Statistical Areas in Georgia .....	7
Figure 2: Detailed AQI Values by Pollutant.....	10
Table 1: List of Georgia AAMP's QAPPs.....	11
Table 2: 2021 Georgia Ambient Air Monitoring Network.....	14
Table 3: Monitoring Objective and Spatial Scale .....	17
Table 4: Site Evaluations .....	22

## 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
µg/m <sup>3</sup>	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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
NO <sub>y</sub>	Reactive oxides of Nitrogen
NWS	National Weather Service
O <sub>3</sub>	Ozone
PAH	Polycyclic Aromatic Hydrocarbons
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PM <sub>2.5</sub>	Particles with an aerodynamic diameter of 2.5 microns or less
PM <sub>10</sub>	Particles with an aerodynamic diameter of 10 microns or less
PM <sub>10-2.5</sub>	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 <sub>2</sub>	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 <sup>2</sup>	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.

### Agency Contacts for Georgia Environmental Protection Division

#### Regarding this report and questions relating to the collected ambient air quality data:

DeAnna Oser, Ambient Monitoring Program Manager

[DeAnna.Oser@dnr.ga.gov](mailto:DeAnna.Oser@dnr.ga.gov)

470-524-0541

Janet Aldredge-Byars, Data Analysis Unit Manager

[Janet.Aldredge@dnr.ga.gov](mailto:Janet.Aldredge@dnr.ga.gov)

470-938-3390

#### Regarding the collection of the ambient data:

Jaime Gore, Manager, Operations 1 Unit Manager

[Jaime.Gore@dnr.ga.gov](mailto:Jaime.Gore@dnr.ga.gov)

470-524-0495

Ken Buckley, Manager, Operations 2 Unit Manager

[Ken.Buckley@dnr.ga.gov](mailto:Ken.Buckley@dnr.ga.gov)

470-524-0673

Lynsey Scarbrough, Manager, Operations Support Unit Manager

[Lynsey.Scarbrough@dnr.ga.gov](mailto:Lynsey.Scarbrough@dnr.ga.gov)

404-783-1466

#### Regarding quality oversight of the monitoring program:

Farhana Yasmin, Quality Assurance Unit Manager

[Farhana.Yasmin@dnr.ga.gov](mailto:Farhana.Yasmin@dnr.ga.gov)

470-524-0653

#### Regarding the meteorology monitoring program:

Bill Murphey, Meteorology Unit Manager

[Bill.Murphey@dnr.ga.gov](mailto:Bill.Murphey@dnr.ga.gov)

404-363-7079

## 1.0 Executive Summary

The Georgia Ambient Air Monitoring Program (GA AAMP) of the Georgia Environmental Protection Division (GA EPD) is submitting this *2021 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, 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 35 stations to:

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

Since the publication of the *2020 Ambient Air Monitoring Plan*, there have been some changes to the state's ambient air monitoring network that should be noted.

### Changes to Monitoring:

When all the analytical quality assurance requirements can be met, the GA AAMP plans to replace both the primary and collocated NATTS high-volume PM<sub>10</sub> metals samplers with low-volume PM<sub>10</sub> metals samplers at the South DeKalb site (13-089-0002).

GA AAMP has monitors in place to characterize ethylene oxide in the ambient air. Please refer to the GA AAMP Quality Assurance Project Plan on the GA EPD website (<https://epd.georgia.gov/ethylene-oxide-information>) for more details.

GA AAMP has moved the PM<sub>2.5</sub> sampler sampling station to ground level at the Sandersville site (13-303-0001). Construction is planned for the location on the ground; therefore, GA AAMP moved the sampling station across the street from that location on March 13, 2020.

Due to the roof being replaced at the monitoring location on the S.L. Mason School at the Valdosta site (13-185-0003), the GA AAMP moved the samplers to a platform on ground level. The air monitoring equipment was shut down on March 11, 2020 at the S.L. Mason School at the 1605 Azalea Drive location, and moved to the ground at 821 Gordon Street, also at the S.L. Mason School on March 18, 2020. The S.L. Mason School, where the old site was located, moved, and the GA AAMP moved from the school's old location to the school's new location. Refer to *Addendum to 2020 Ambient Air Monitoring Plan* for more details.

At the Valdosta site (13-185-0003), GA AAMP replaced the non-FEM BAM Continuous PM<sub>2.5</sub> sampler with an FEM Teledyne T640 Continuous PM<sub>2.5</sub> sampler on October 22, 2020.

GA AAMP shut down the two lead monitors in the Columbus, GA-AL MSA at the Columbus-Allied (13-215-0009) and Columbus-Cusseta (13-215-0011) sites as of December 31, 2020. Refer to *Addendum to 2020 Ambient Air Monitoring Plan* for more details.

GA AAMP shut down the Columbus-Health Department site (13-215-0001) as of December 31, 2020. There was an FRM PM<sub>2.5</sub> monitor at this site. Refer to *Addendum to 2020 Ambient Air Monitoring Plan* for more details.

As of December 31, 2020, GA AAMP shut down the Rome-Kraftsman site (13-115-0006). SO<sub>2</sub>, wind direction, and wind speed were monitored at this site. Refer to *Addendum to 2020 Ambient Air Monitoring Plan* for more details. The wind direction and wind speed equipment will be relocated to the Rome-Coosa (13-115-0003) site this year.

Due to construction at the location, the Columbus-Cusseta site (13-215-0011) was shut down at the end of July 2020. As of March 1, 2021, GA AAMP has moved to a new location, Columbus-Baker (13-215-0012), and the data at these two locations will be linked in AQS for continuity and historical purposes.

The Rossville-Maple St. site (13-295-0002) was shut down as of July 2020 due to construction at the location. GA AAMP has moved the site to a new location, Rossville-Williams St. (13-295-0004), and once the site is fully functional on May 1, 2021, the data will be linked in AQS for continuity and historical purposes.

As of March 17, 2021, the Augusta (13-245-0091) PM<sub>2.5</sub> speciation monitor has been temporarily suspended due to lack of available personnel. GA AAMP is actively working to fill the vacancy.

At the Augusta site (13-245-0091), GA AAMP is replacing the continuous PM<sub>10</sub> TEOM and continuous PM<sub>2.5</sub> T640 with continuous T640X, which reads PM<sub>2.5</sub>, PM<sub>10</sub>, and PMcoarse during fiscal year 2022 (budget year July 1, 2021 through June 30, 2022).

The GA AAMP will begin sampling with an FEM continuous PM<sub>2.5</sub> T640 sampler at the Brunswick site (13-127-0006) during the fiscal year 2022.

The GA AAMP will replace the continuous non-FEM PM<sub>2.5</sub> TEOM at the Columbus-Airport site (13-215-0008) with continuous FEM PM<sub>2.5</sub> T640 during fiscal year 2022.

GA AAMP is renewing the waiver for the PAMS meteorology sensors at the Conyers site (13-247-0001) that was addressed in previous *Ambient Air Monitoring Plans*.

## 1.1 Mandate

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

***40 CFR PART 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<sub>2.5</sub> 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 NO<sub>2</sub> 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 NO<sub>2</sub> 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 NO<sub>2</sub> 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 NO<sub>2</sub> 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 SO<sub>2</sub> 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 SO<sub>2</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> 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 O<sub>3</sub> sites to be operating on the first day of the applicable required O<sub>3</sub> 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 (On January 8, 2020 (85 FR 834, page 834) EPA delayed the start of the revised PAMS monitoring network to June 1, 2021.)
- (11) An Enhanced Monitoring Plan for O<sub>3</sub>, 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 O<sub>3</sub> 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<sub>2.5</sub> 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-PM<sub>10</sub> 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 NO<sub>2</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> monitoring network that impact the location of a violating PM<sub>2.5</sub> 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.*

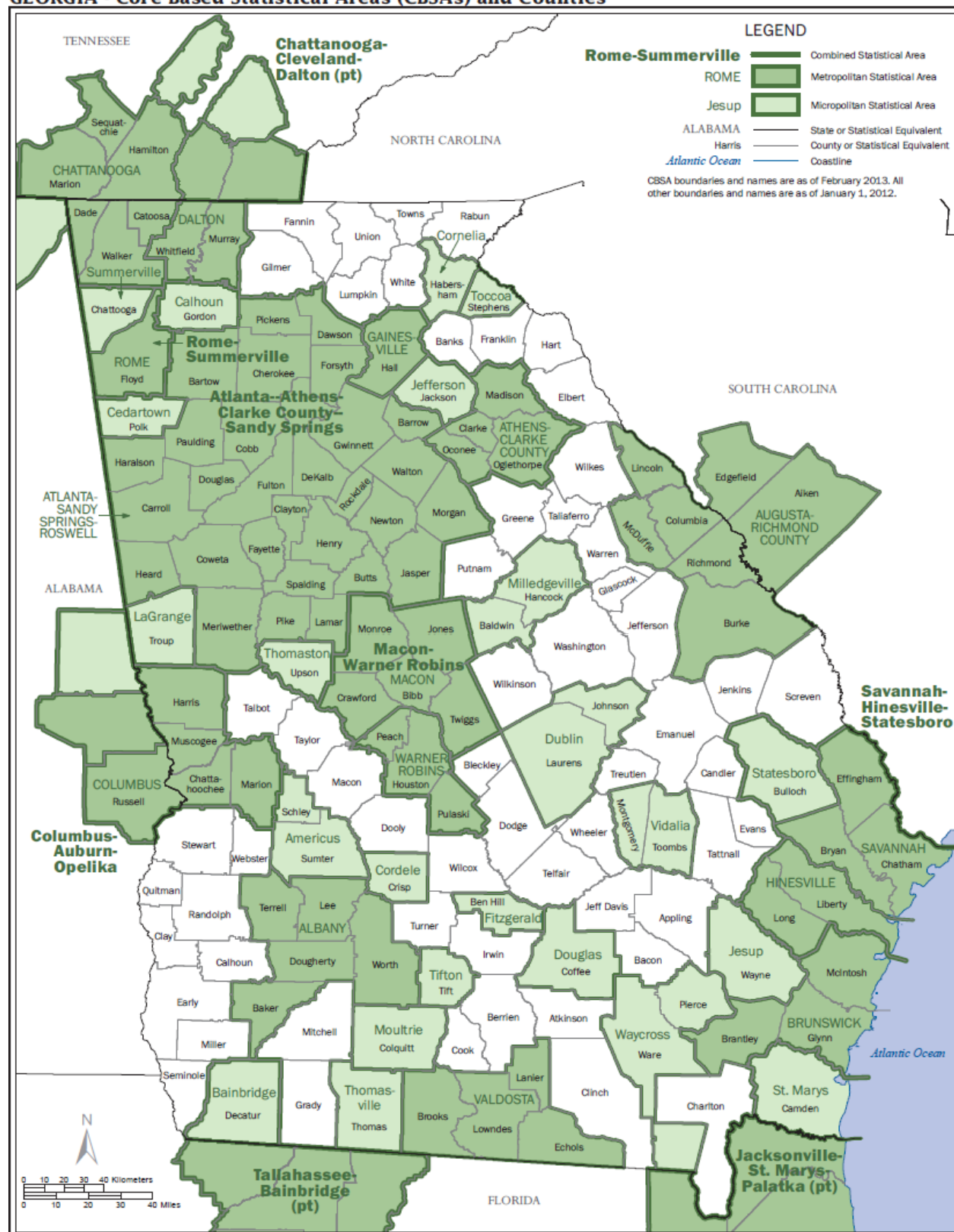
*(d) The state, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in*

*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 1), 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>).

### GEORGIA - Core Based Statistical Areas (CBSAs) and Counties



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

### Figure 1: 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 AAMP 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

The GA AAMP has memorandum of agreements with the Chattanooga-Hamilton County Air Pollution Control Bureau and the South Carolina Department of Health and Environmental Control for air monitoring activities in MSAs that cross state lines.

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 (PM<sub>10</sub>), particles of an aerodynamic diameter of 2.5 micrometers and less (PM<sub>2.5</sub>), 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 (PM<sub>10</sub>), particles of an aerodynamic diameter of 2.5 micrometers and less (PM<sub>2.5</sub>), 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

### **Renewal of Solar and TUV Radiation at Conyers Site:**

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.

GA AAMP will continue preparing to implement the PAMS program as funding and personnel resources allow with the goal of full implementation on or before June 1, 2021.

## 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 2 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.

Maximum Pollutant Concentration							AQI Value	Descriptor	EPA Health Advisory
PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	O <sub>3</sub>	O <sub>3</sub>	CO	NO <sub>2</sub>			
(24hr) µg/m <sup>3</sup>	(24hr) µg/m <sup>3</sup>	(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	<b>Good (green)</b>	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	<b>Moderate (yellow)</b>	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	<b>Unhealthy for Sensitive Groups</b>	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	<b>Unhealthy (red)</b>	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	<b>Very Unhealthy (purple)</b>	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	<b>Hazardous (maroon)</b>	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 SO<sub>2</sub> concentrations; ^Values of 301 or greater are calculated with 1-hr O<sub>3</sub> concentrations

**Figure 2: 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 Title	Submittal	Approval
Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for PM <sub>2.5</sub>	8/27/2020	11/9/2020
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	12/18/2020	3/17/2021
Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for the Photochemical Assessment Monitoring Stations State of Georgia	4/29/2020	7/1/2020
Quality Assurance Project Plan of the Georgia Ambient Air Quality Monitoring Project for the Near Road Monitoring Network	12/16/2020	3/17/2021
Quality Assurance Project Plan for the Georgia National Air Toxics Trends Project	11/20/2020	12/21/2020
Quality Assurance Project Plan for the Georgia Ambient Monitoring Program Ethylene Oxide*	9/24/2019	4/20/2020
Quality Assurance Project Plan for the Georgia Ambient Monitoring Program to Evaluate New and Emerging Technologies for Ethylene Oxide	12/9/2020	4/29/2021
Quality Management Plan for the Air Protection Branch	9/1/2020	

\*no longer effective

**Table 1: List of Georgia AAMP's QAPPs**

## 1.7 Public Notice and Comment Procedures

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 proposed changes and documentation 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](mailto:DeAnna.Oser@dnr.ga.gov) or to [EPD.comments@dnr.ga.gov](mailto:EPD.comments@dnr.ga.gov).

The deadline for submitting comments to the GA AAMP is no later than 30 days after the date on which the 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 included in the final document published on <https://airgeorgia.org/>.

## **1.8 Use of Data**

GA AAMP collects ambient air monitoring data covering both criteria and non-criteria pollutants. This data is used by several different groups and has many uses from public health studies to making regulatory decisions. The data is used to provide air pollution information to the public, including the Air Quality Index (discussed above in Section 1.4 and in Section 13.0), the GA Ambient Air Monitoring Program website (<https://airgeorgia.org/>) with hourly readings of continuous data, and finally producing a forecast of the air quality which is reported in AirNow and various news reports to the public. The data is used to assist in enforcement actions with permitting and compliance, and to determine the extent of allowable industrial expansion. State modelers as well as private consultants use the air monitoring data to help make these determinations. The ambient air monitoring data has been used by non-governmental planning groups, such as the Georgia Commute Options, and intergovernmental groups, such as Atlanta Regional Commission, to make recommended improvements for cities across the state. The ambient air monitoring data is used to determine whether National Ambient Air Quality Standards as defined by EPA are being met, and if the state of Georgia has areas of nonattainment according to these standards.

GA AAMP routinely has requests of the ambient air monitoring data from other states, various universities, research institutes, and federal agencies such as Centers for Disease Control. The data is used to determine the improvement or declination of air quality, and how the air quality is related to human and environmental health. In addition, the data has been used in international studies to compare with major cities around the world.

Annually, the GA AAMP provides an Ambient Air Surveillance report that summarizes and analyzes the previous year's ambient air data, including a risk assessment, for the general public. In addition, GA AAMP produces an Ambient Air Monitoring Plan on an annual basis. The Ambient Air Monitoring Plan details the location and site specific data for each monitor in GA AAMP's ambient monitoring network, as well as GA AAMP's plans for changes to the network. This document is made available for public review and comment regarding placement of ambient air monitors and collection of ambient air data. Both the Ambient Air Surveillance Report and Ambient Air Monitoring Plan are also found on the website listed above.

## **1.9 New Technologies**

At a few sites across the state, GA AAMP is planning to add new monitoring equipment in which new technologies will be put to use. The GA AAMP plans to begin using the Thermo 49iQPS Ozone Calibrators later this year. The GA AAMP also plans to begin using a direct NO<sub>2</sub> analyzer that uses Cavity Attenuated Phase Shift (CAPS) Spectroscopy to measure True NO<sub>2</sub>, NO<sub>x</sub>, and NO gases. In addition, the Ambilabs Nephelometer, which measures ambient air for the presence of particulate matter on a continuous, real-time basis is now operational at the NR-



GA Tech site. The GA AAMP will begin using Met One, Instruments black carbon samplers at the NR-GA Tech and NR-285 sites. For the ethylene oxide study, GA AAMP is using the Entech passive samplers with evacuated stainless steel containers to take measurements. In addition, GA AAMP is using a Picarro sampler which uses cavity ring-down spectroscopy for continuous ethylene oxide measurements. GA AAMP is also planning to incorporate new data logger technologies throughout the network in the coming year. For more information about technology used in the GA AAMP network, refer to Appendix C.

### **1.10 Georgia AAMP Budget**

GA AAMP's budget is made up of a combination of three sources: state funds, federal funds, and fee funds. In recent years, GA AAMP has had budget constraints, and since the last *Ambient Air Monitoring Plan* there has been some fluctuation in the number of ambient air monitoring samplers across the state. A complete list of the monitors that have been shut down since the last publication of the *Ambient Air Monitoring Plan* can be found in Appendix D of this document.

### **1.11 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.

### **1.12 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 <sub>3</sub>	CO	PM <sub>2.5</sub> FRM	PM <sub>2.5</sub> Cont.	PM <sub>2.5</sub> Spec.	PM Coarse	NO/ NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>y</sub>	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>10</sub> Cont.	PAMS VOC	VOC	SVOC	Carb- onys	Meteo- rology	Black Carbon	Metals
<b>Rome MSA</b>																					
131150003	Rome	Floyd				S	X												*		
<b>Brunswick MSA</b>																					
131270006	Brunswick	Glynn	S		S	*													NR		
<b>Valdosta MSA</b>																					
131850003	Valdosta	Lowndes			S	S															
<b>Warner Robins MSA</b>																					
131530001	Warner Robins	Houston			S	S															
<b>Dalton MSA</b>																					
132130003	Fort Mountain	Murray	S																NR		
<b>Albany MSA</b>																					
130950007	Albany	Dougherty			S	S															
<b>Gainesville MSA</b>																					
131390003	Gainesville	Hall				S															
<b>Athens-Clarke County MSA</b>																					
130590002	Athens	Clarke	S			S															
<b>Macon MSA</b>																					
130210007	Macon-Allied	Bibb			S		X														
130210012	Macon-Forestry	Bibb	S		S	S						S							NR		
<b>Columbus Georgia- Alabama MSA</b>																					
132150008	Columbus-Airport	Muscogee	S		S	S															
132150012	Columbus-Baker	Muscogee			S		X														
132151003	Columbus-Crime Lab	Muscogee																	NR		
<b>Savannah MSA</b>																					
130510021	Savannah-E. President	Chatham	S									S							NR		
130511002	Savannah- L&A	Chatham				S						S							NR		
<b>Augusta-Richmond County, Georgia-South Carolina MSA</b>																					
130730001	Evans	Columbia	S																NR		
132450091	Augusta	Richmond	S			S	X					S		S					NR		

Table 2: 2021 Georgia Ambient Air Monitoring Network

SITE ID	SITE NAME	COUNTY	O <sub>3</sub>	CO	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM Coarse	NO/ NO <sub>x</sub>	NO <sub>2</sub>	NO <sub>y</sub>	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>10</sub>	PAMS	VOC	SVOC	Carb- onyls	Meteo- rology	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	United Ave.	Fulton	S			S						S							NR		
131210056	NR-GA Tech	Fulton		R	R	R				R									R	R	
131350002	Gwinnett Tech	Gwinnett	S			S															
131510002	McDonough	Henry	S			S															
132319991	EPA CASTNET	Pike	A																		
132470001	Conyers	Rockdale	S																NR/P		
Chattanooga Tennessee-Georgia MSA																					
132950004	Rossville-Williams St.	Walker			S	S	X														
Not in an MSA																					
130550001	Summerville	Chattooga	S																		
130690002	General Coffee	Coffee			S		X														
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

\*=Forthcoming

**Table 2: 2021 Georgia Ambient Air Monitoring Network (continued)**

## 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<sub>2.5</sub> and PM<sub>10</sub>), 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 standards<sup>1</sup>. 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).

---

<sup>1</sup> 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.

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

**Table 3: Monitoring Objective and Spatial Scale**

## 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<sub>2.5</sub> FRM, PM<sub>2.5</sub> continuous, PM<sub>2.5</sub> speciation, ozone (collecting data year-round), trace level carbon monoxide (CO), trace level sulfur dioxide (SO<sub>2</sub>), trace level nitrogen oxide (NO), total reactive nitrogen (NO<sub>y</sub>), 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 (SO<sub>2</sub>) NAAQS standard to a 1-hour primary standard of 75 ppb, and added new SO<sub>2</sub> ambient monitoring requirements in 2010 (75FR119, 06/22/10) and retained in 2019 (84FR9866, 3/18/19). 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 SO<sub>2</sub> 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. Based on these requirements, the GA AAMP is required to have one monitor in the Atlanta-Sandy Springs-Marietta MSA. Currently, GA AAMP monitors SO<sub>2</sub> at the United Avenue (13-121-0055) and South DeKalb (13-089-0002) sites in the Atlanta-Sandy Springs-Marietta MSA, the Augusta (13-245-0091) site in the Augusta-Richmond County, GA-SC MSA, the Savannah-L&A (13-051-1002) and Savannah-E. President Street (13-051-0021) sites in the Savannah MSA, and the Macon-Forestry (13-021-0012) site in the Macon MSA.

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 SO<sub>2</sub> monitors in the state.

### 4.3 Nitrogen Dioxide

On May 18, 2018, EPA retained the 2010 nitrogen dioxide (NO<sub>2</sub>) National Ambient Air Quality Standard (NAAQS) (Federal Register, Vol. 83, No. 75, 04/18/18). EPA's last revision of the NAAQS was January 22, 2010. Near-road NO<sub>2</sub> 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 NO<sub>2</sub> 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. NO<sub>2</sub>/NO/NO<sub>x</sub>, CO, PM<sub>2.5</sub>, 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, NO<sub>2</sub>/NO/NO<sub>x</sub>, 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 NO<sub>2</sub> requirements, the GA AAMP is required to operate at least one area-wide NO<sub>2</sub> 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 NO<sub>2</sub> 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 NO<sub>2</sub> 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 NO<sub>2</sub> 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 NO<sub>2</sub> 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 PM<sub>2.5</sub> Speciation Trends Network (STN)

The Speciation Trends Network (STN) (40CFR58, Appendix D, Section 4.7.4) characterizes the make-up of the PM<sub>2.5</sub> samples collected. 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<sub>2.5</sub> 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<sub>2.5</sub> 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.

#### 4.6 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 hourly collection of speciated volatile organic compounds in June, July, and August; three 8-hour samples of carbonyls collected every third day during June, July and August; hourly ozone, NO, NO<sub>2</sub>, NO<sub>x</sub>, 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.

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<sub>x</sub> and VOCs 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 VOCs trends to compare with trends in annual VOC emission estimates), and determination of attainment with NAAQS for O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, CO, SO<sub>2</sub>, and NO<sub>2</sub>. On January 8, 2020 (85 FR 834, page 834) EPA delayed the start of the revised PAMS monitoring network to June 1, 2021. GA AAMP will continue preparing to implement the program as funding and personnel resources allow with the goal of full implementation on or before June 1, 2021.

#### **4.7 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 both urban sites to address the range of population exposure in urban areas, and 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 PM<sub>10</sub> 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. Also at the South DeKalb site, GA AAMP began sampling ethylene oxide as of January 2020.

#### **4.8 Ozone**

Ozone monitoring has been in place in the Atlanta area since the 1970's. Currently the Atlanta-Sandy Springs-Roswell MSA ozone network includes nine monitors located in nine counties. Across Georgia, there are 19 ozone monitors in the network, which exceeds the EPA requirement (40CR58, Appendix D, Section 4.1). The standard is an 8-hour averaging time, fourth maximum value, averaged over three years. On October 1, 2015, EPA lowered the ozone standard to 0.070 ppm. For this 2015 standard, and with the 2014-2016 data, the Atlanta area was redesignated to include only a 7-county area for the non-attainment area (Federal Register, Vol. 83, No. 107, page 25776).

As part of the Clean Air Status and Trends Network (CASTNET), EPA established a monitoring site in Pike County, 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 95 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. <https://www.epa.gov/castnet>. With the exception of the South DeKalb and CASTNET sites, ozone in Georgia, unlike other pollutants previously discussed, is monitored March through October, complying with federal monitoring regulations (in 40CFR Part 58).



## 4.9 Particulate Matter

Particulate pollution may be categorized by size since there are different health impacts associated with the different sizes of particulate matter. GA AAMP currently monitors for three sizes of particles: PM<sub>10</sub> (up to 10 microns in diameter), PM<sub>2.5</sub> (up to 2.5 microns in diameter) and PMcoarse (PM<sub>10</sub> minus PM<sub>2.5</sub>). To give size relation, approximately ten PM<sub>10</sub> particles can fit on a cross section of a human hair, and approximately thirty PM<sub>2.5</sub> particles would fit on a cross section of a hair. These particles and droplets are invisible to the naked eye, and composition and sources can vary greatly by region. There are three monitoring stations with PM<sub>10</sub> monitors, one station with a PMcoarse monitor, and 24 stations with continuous and/or integrated PM<sub>2.5</sub> monitors, which exceeds the number of samplers required according to 40CFR58, Appendix D, Section 4.7.

For an area to be in attainment of the annual ambient air PM<sub>2.5</sub> standard, the three-year average of the annual average concentrations has to be less than or equal to 12.0 µg/m<sup>3</sup>. In addition, the 24-hour primary and secondary standard requires that the three-year average of the 98th percentile of the 24-hour concentrations be less than or equal to 35 µg/m<sup>3</sup>. Currently all areas of Georgia are designated unclassifiable/attainment for the 2012 annual PM<sub>2.5</sub> standard because the national standards are being met. For PM<sub>10</sub>, the 24-hour data is compared to 150 µg/m<sup>3</sup>. The standard allows one exceedance per year, averaged over a 3-year period, and all three samplers collected data well below the standard. Currently, there is no standard for PMcoarse.

## 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.

**Table 4: Site Evaluations**

SITE ID	COMMON NAME	COUNTY	SITE EVALUATION DATE	COMMENTS	ACTION TAKEN
Rome MSA					
131150003	Rome	Floyd	6/18/2020	The site is neighborhood spatial scale. The small tree next to the trailer needs to be cut down. The tree dripline is 4m from the TEOM inlet but the tree height still slightly lower than the inlet. Samplers meet siting criteria.	No action required
Brunswick MSA					
131270006	Brunswick	Glynn	11/3/2020	2025 needs new hinge lock buttons. 2025 inlet 5m above ground, O3 inlet 1.5m over shelter, 2025 inlet to wall 4.1m, 2025 2m inlet to platform. O3 inlet 18.8m to dripline, 2025 20m inlet to dripline. Samplers meet siting criteria.	No action required
Valdosta MSA					
131850003	Valdosta	Lowndes	12/15/2020	Samplers meet siting criteria. T640 touch screen not responsive at extreme lower left, suggest repair or replace. T640 ambient temperature sensor 1.4m from inlet down beside sampler, sheltered from wind, suggest Ta sensor moved closer to inlet, and more effectively exposed to equivalent ambient conditions as sampled air, as is consistent with other samplers. T640 11.8m, 2025 12.8m to nearest dripline, samplers installed near young trees which will grow and encroach on inlets soon. 14.4m to near edge Lamar Street, 17.8m from T640 inlet to middle Lamar Street inlet heights T640 3.1m, 2.8m. 1.9m between inlets.	No action required
Warner Robins MSA					
131530001	Warner Robins	Houston	1/27/2021	T640 to dripline 28.4m, T640 inlet to ground 2.2m, 2025 inlet to ground 2.1m, 2025 to dripline 38.8m, T640 inlet to 2025 inlet 3.6m. 2025 leaning listing northward. Samplers meet siting criteria.	No action required.
Dalton MSA					
132130003	Fort Mountain	Murray	10/27/2020	Closest tree dripline is 25m south from inlet. Nearest trees to the south are 11-12m higher than the inlet, but the trunks are >than 24m away. Samplers meet siting criteria.	No action required
Albany MSA					
130950007	Albany	Dougherty	2/8/2021	Samplers meet siting criteria. Air handler exhaust 3.1m from T640. Inlet heights: T640 2.3m, Primary 2025 2.1, collocated 2025 2.1m. Inlet separation: T640 to Primary 2025 3m, T640 to Collocated 2025 2.4m, 2025 to 2025 2.5. Samplers on rooftop 4.4m above ground. Nearest dripline 71.4m from T640 inlet.	No action required.
Gainesville MSA					
131390003	Gainesville	Hall	3/11/2021	The Partisol FRM PM2.5 sampler is still at the site but is not being used. It last sampled 10/29/18. The Teledyne T640 now serves as the particulate monitor. The large oaks SSW of the sampler have been cut down. Samplers meet siting criteria.	No action required.
Athens-Clark County MSA					
130590002	Athens	Clarke	5/13/2020	O3 inlet 4.5m, T640 4.6m, T640 4.5m. 3.1m O3 to dripline, 6.2m T640 P, T640 C 6.8m. 1.3m between T640 inlets, 2m from O3 to nearest T640 inlet. T640 102m to nearest lane traffic, 20m to parking lot. Deficiencies noted.	Trees that were too close to dripline were pruned 8/31/2020. Samplers now meet siting criteria.
Macon MSA					
130210007	Macon-Allied	Bibb	7/13/2020	Nearest dripline 28.4m to SASS 28.2m to Primary 2025. 1.4m SASS to URG, 2.7m SASS to Primary 2025, 2.6m P 2025 to C 2025, 2.2m URG to P 2025, 3m C 2025 to URG. Inlet heights: P2025 2.1m, C2025 2.1m, URG 2.1m, SASS 1.8m. Samplers meet siting criteria.	No action required
130210012	Macon-Forestry	Bibb	10/5/2020	Ozone solenoid and lines not labeled. Ozone solenoid is tangled up in lines behind analyzer. Recommend more stable arrangement and labels for integrity line and position on solenoid. The floor around the door is rotting out. The floor covering is cracked and has holes. There is water damage to the west wall of the shelter, where an antenna was installed. Drip lines were found to be too close. Deficiencies noted.	Trees that were too close to the sample inlets were cut back 12/11/2020. Samplers now meet siting criteria.

SITE ID	COMMON NAME	COUNTY	SITE EVALUATION DATE	COMMENTS	ACTION TAKEN
Columbus MSA					
132150008	Columbus-Airport	Muscogee	8/17/2020	Water damage to ceiling and wall around door and a/c. Soft floor. Samplers meet siting criteria.	No action taken. Shelter is safe and usable, but it is noted for replacement in near future (1 year or more).
132150012	Columbus-Baker	Muscogee	3/10/2021	Samplers meet siting criteria. Adjacent lots are school, post office, fire station and recreational areas. Distances to traffic lanes: 2025 117m to Benning Dr, SASS 2.6m to edge Roper Ave, 5.4m to center Roper Ave; Inlet heights: 2025 2.7m, SASS 2.5m, URG 2.7m; Inlet separation: SASS to URG 2.2m, SASS to 2025 2.7m, URG to 2025 3m; Nearest dripline 52m to URG.	No action required.
132151003	Columbus-Crime Lab	Muscogee	1/26/2021	Trees at fence to north higher than instruments other than anemometer: 7.4m to tipping bucket, 2.2m to tower. Heights above ground: Anemometer 9m, Hygrometer 2.9, Thermometer 2.9m, Barometer 1.7m, Precipitation gauge 3.5m. Samplers meet siting criteria.	Not applicable.
Savannah MSA					
130510021	Savannah-E. President	Chatham	4/12/2021	Water damage to interior walls. Nearest drip line to inlets is now more than 28m distant. Barometer inlet height 1.6m, RH inlet 2.3m, tower 9.5m. SO <sub>2</sub> 3.9m, O <sub>3</sub> 3.9m. O <sub>3</sub> to SO <sub>2</sub> inlet 0.7m. Samplers meet siting criteria.	Not applicable.
130511002	Savannah – L&A	Chatham	6/10/2020	Floor around doorway rotten. Water damage to walls. Driplines too close. SO <sub>2</sub> nearest dripline 4.9m, height 4m, 1.6m to rooftop. T640 nearest dripline 6.3m, to ground 4.1m, to rooftop 1.8m. Deficiencies noted.	All but two trees on the far side of the fence away from the shelter were cut by 10/25/20 and remaining two were taken out by 11/10/20. Samplers now meet siting criteria.
Augusta MSA					
130730001	Evans	Columbia	9/10/2020	Shelter exterior and floor rotting. Integrity and sample lines are routed down onto floor of shelter, along ground outside, and then looped up the tower to inlet. Recommend lines are replaced and routed up and out at top of wall of shelter as short as possible to avoid contamination, improve response and standardize with other sites. Nearest dripline >30m. Samplers meet siting criteria.	Not applicable.
132450091	Augusta	Richmond	9/8/2020	107m from met tower to roadway. Samplers meet siting criteria.	Not applicable.
Atlanta-Sandy Springs-Marietta MSA					
130630091	Forest Park	Clayton	9/14/2020	The site was moved April 2016, from the DOT building roof to a nearby location on the ground, 115 meters to the NE. There are not any site deficiencies that need to be addressed. Samplers meet siting criteria.	Not applicable.
130670003	Kennesaw	Cobb	2/7/2021	Samplers meet siting criteria. There were not any deficiencies observed at the site. A parking lot is 18 meters north of inlets. A small parking lot is also adjacent to the sampler trailer, south. McCollum Pkwy is 82 meters south of the sampling trailer. The airport is across the street, south of the parkway.	Not applicable.
130850001	Dawsonville	Dawson	10/14/2020	Samplers meet siting criteria. Met tower is inside 10x height differential with the trees to the north, east and south. Three trees to the SE of the ozone inlet and two to the north are inside the height-distance criteria. 270 degrees of the ozone probe monitoring path has unrestricted air flow.	Not applicable.

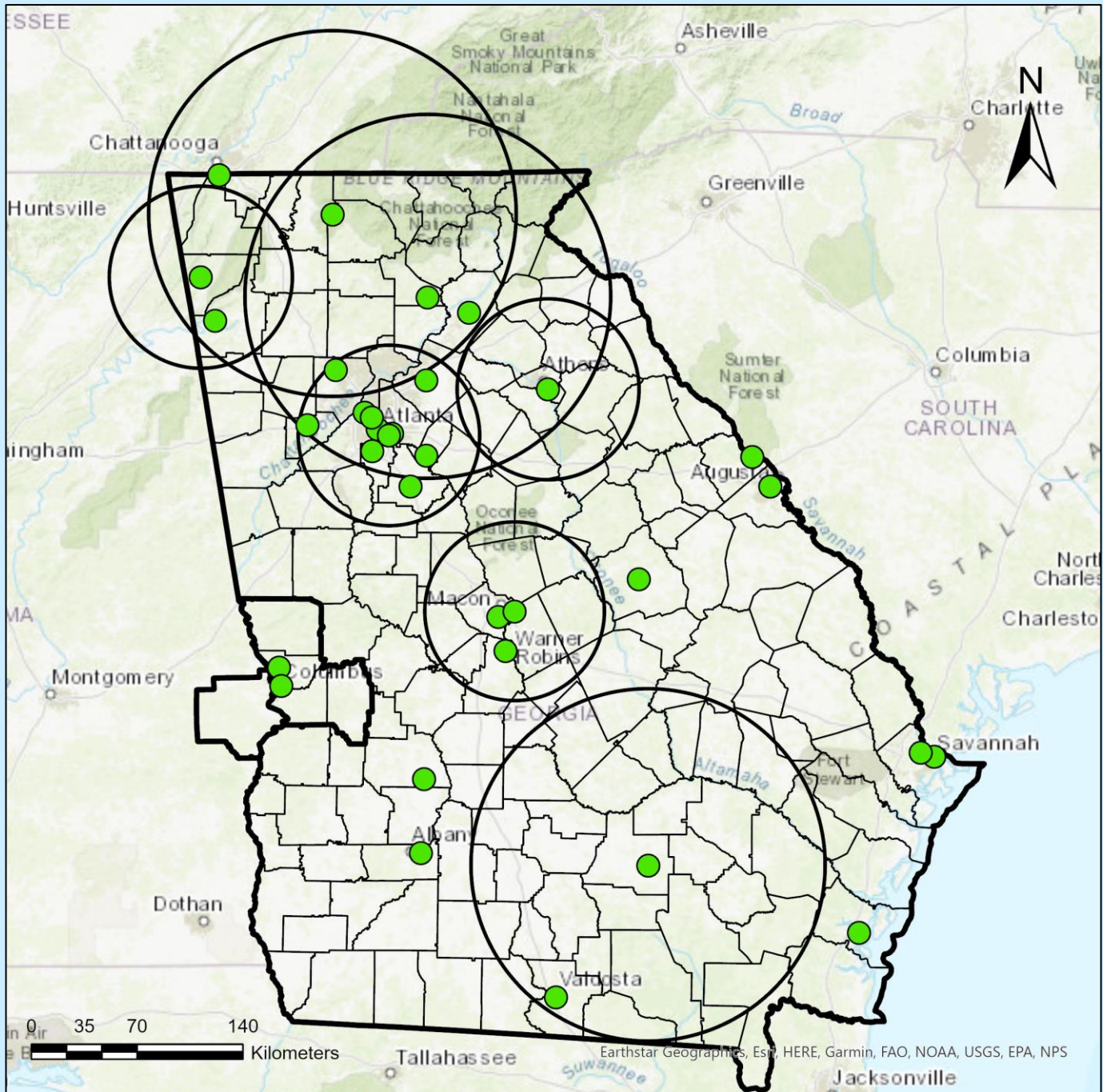
	COMMON NAME	COUNTY	SITE EVALUATION DATE	COMMENTS	ACTION TAKEN
130890002	South DeKalb	DeKalb	12/27/2020	Samplers meet siting criteria. A large swath of trees to the north, east and west was cut down in Oct.2018 to extend obstacle distances to sampling inlets. All drip lines to sampler inlets exceed 20 meters. Although a few trees are still inside height-distance differential, at least 270 degrees of the monitoring path for all of the samplers is now unobstructed. A new deck was built Nov. 2019 for the exterior samplers.	Not applicable.
130890003	NR-285	DeKalb	6/15/2020	Samplers meet siting criteria. The Near Road site began sampling Jan. 2015. A new exit lane to Flat Shoals Rd. adjacent to the site has been completed since the last survey. An ATEC 2200 VOCS sampler is being stored inside the trailer. No deficiencies were noted at the site at this time.	Not applicable.
130970004	Douglasville	Douglas	2/25/2021	The trailer is located at the Douglasville Water and Sewer Authority Maintenance site. The area is a parking lot for WSA service vehicles and storage for water works equipment and pipes. The parking lot for WSA vehicles is to the north, east, and south of the trailer. The WSA building is 32 meters to the southeast. 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. The trailer floor has a tear in it. The small tree to the west of the trailer at the fence has a drip line inside of 10 meters. Dripline of the tree to the west is too close, samplers do not meet siting criteria.	Tree was cut on 3/26/2021. Samplers now meets siting criteria.
131210039	Fire Station #8	Fulton	7/30/2020	Samplers meet siting criteria. Solar panels are present on the roof. There are not any deficiencies compromising sampling quality.	Not applicable.
131210055	United Ave.	Fulton	3/08/2021	The site is located at the Georgia Highway Patrol and the Georgia Army National Guard complex. A storage trailer is now adjacent to the sampling trailer to the east but does not affect sampling since the inlets are higher than the trailer. Samplers meet siting criteria.	Not applicable.
131210056	NR-GA Tech	Fulton	6/15/2020	Samplers meet siting criteria. This site is designated as a NO <sub>2</sub> Near Road Site and sampling began June 16, 2014. There were no deficiencies observed at the site.	Not applicable.
131350002	Gwinnett Tech	Gwinnett	6/15/2020	Samplers meet siting criteria. The sampling trailer is surrounded on west (25 meters away) and northeast (22 meters away) by the college parking lot. The trailer floor has a few rips in it near the door. The trailer floor is buckling up slightly because of water infiltration on plywood support. No deficiencies noted that would affect sampling performance.	New shelter installed February 2021.
131510002	McDonough	Henry	8/26/2020	Ants. Damage to walls. TEOM 4.4m height, 25.4m to dripline, 1.9m to shelter, 7.2m to adj rooftop. O <sub>3</sub> 3.9m height, 29.4m to dripline, 1.5m to shelter, 9.5m to rooftop, 2.2m to TEOM. Samplers meet siting criteria.	No action taken.
132470001	Conyers	Rockdale	8/20/2020	Only one tree, the sweet gum to the SE, is inside the distance-height criteria. The predominate wind direction is not out of the SE. The rest of the air flow is unobstructed. Samplers meeting siting criteria.	Not applicable.
Chattanooga Tennessee-Georgia MSA					
132950004	Rossville-Williams St.	Walker	4/27/21	Samplers meet siting criteria. The site has been relocated from Maple St. The new platform is 600 meters East of the old site. 120 meters to nearest tree.	Not applicable.
Not in an MSA					
130550001	Summerville	Chattooga	3/29/2021	Samplers meet siting criteria. The site is Urban spatial scale. No deficiencies detected.	Not applicable.
130690002	General Coffee	Coffee	12/4/2020	Samplers meet siting criteria. Drip line 13.1m from 2025. Drip line 11.3m from SASS, Drip line 12.8m from URG. 2025 inlet 1.5m from Xonteck, Deck 0.86m to ground. 2025 inlet 2.1m to deck, SASS 1.8m to deck, URG 2m to deck. URG to SASS inlet 2.5m, 2025 to SASS inlet 4.5m, 2025 to URG 5.1m.	Not applicable.
132611001	Leslie	Sumter	3/4/2021	Water damage to walls and floor. Nearest dripline 26.8m West. 25m to Allen Street, 113m to Bass Street. Trees that had been too close to dripline were cut 10/22/2020. Samplers meet siting criteria.	Not applicable.
133030001	Sandersville	Washington	4/22/2020	Samplers meet siting criteria. T640 inlet 3.1m above ground. Ta sensor mounted on post separate from T640 1.8m above ground, recommend Ta sensor relocate closer to inlet. 20.8m to center of nearest road, 17.4m to edge of nearest road, 43.6m to nearest dripline.	Not applicable.

**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



## Radius of Circles on Map

Micro Scale: up to 100m

Middle Scale: up to 0.5km

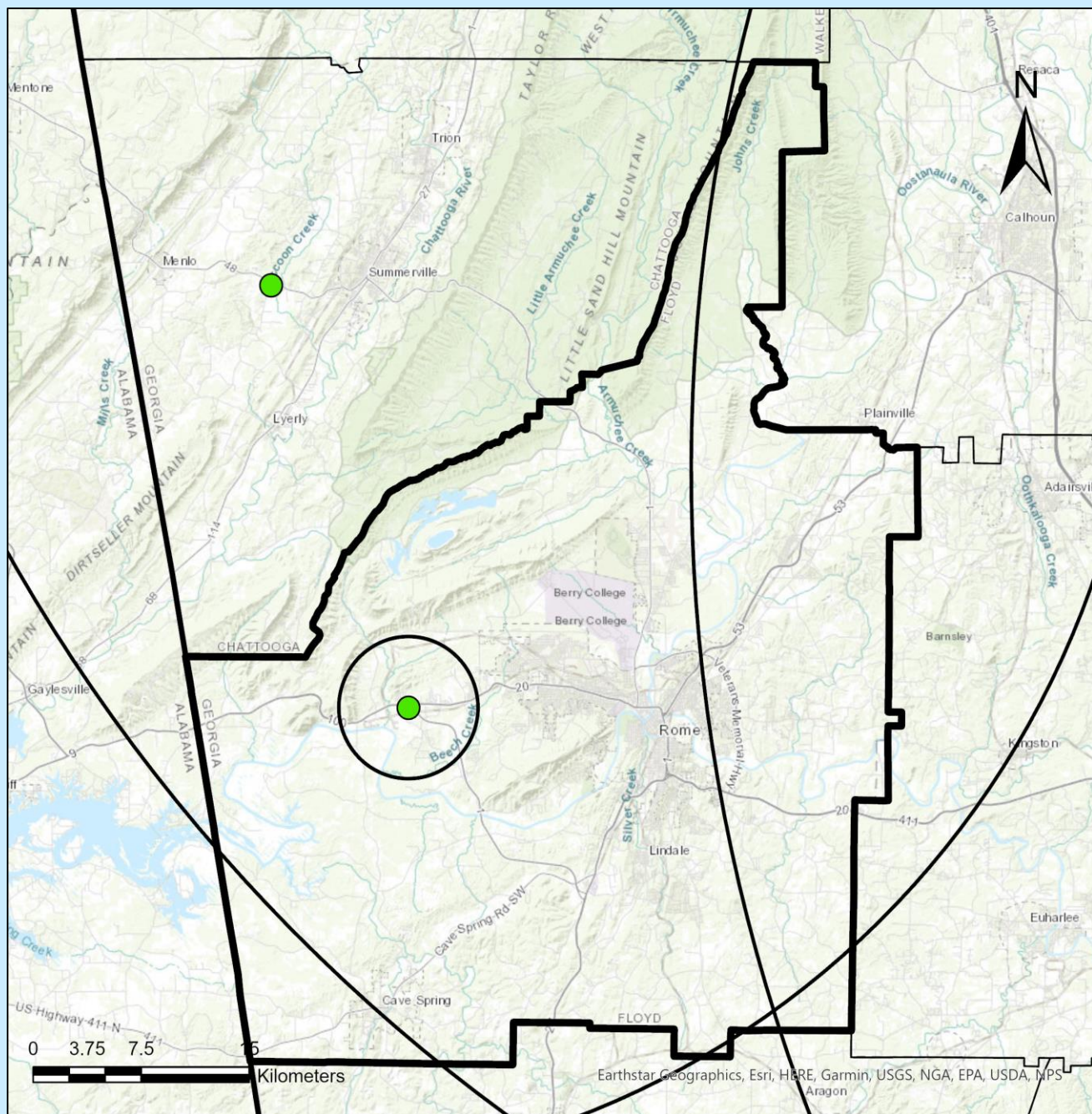
Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

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



# Rome MSA



## Radius of Circles on Map

Micro Scale: up to 100m

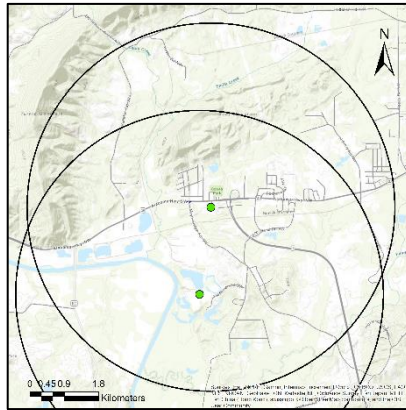
Middle Scale: up to 0.5km

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 SO<sub>2</sub> site

North

South

East

West



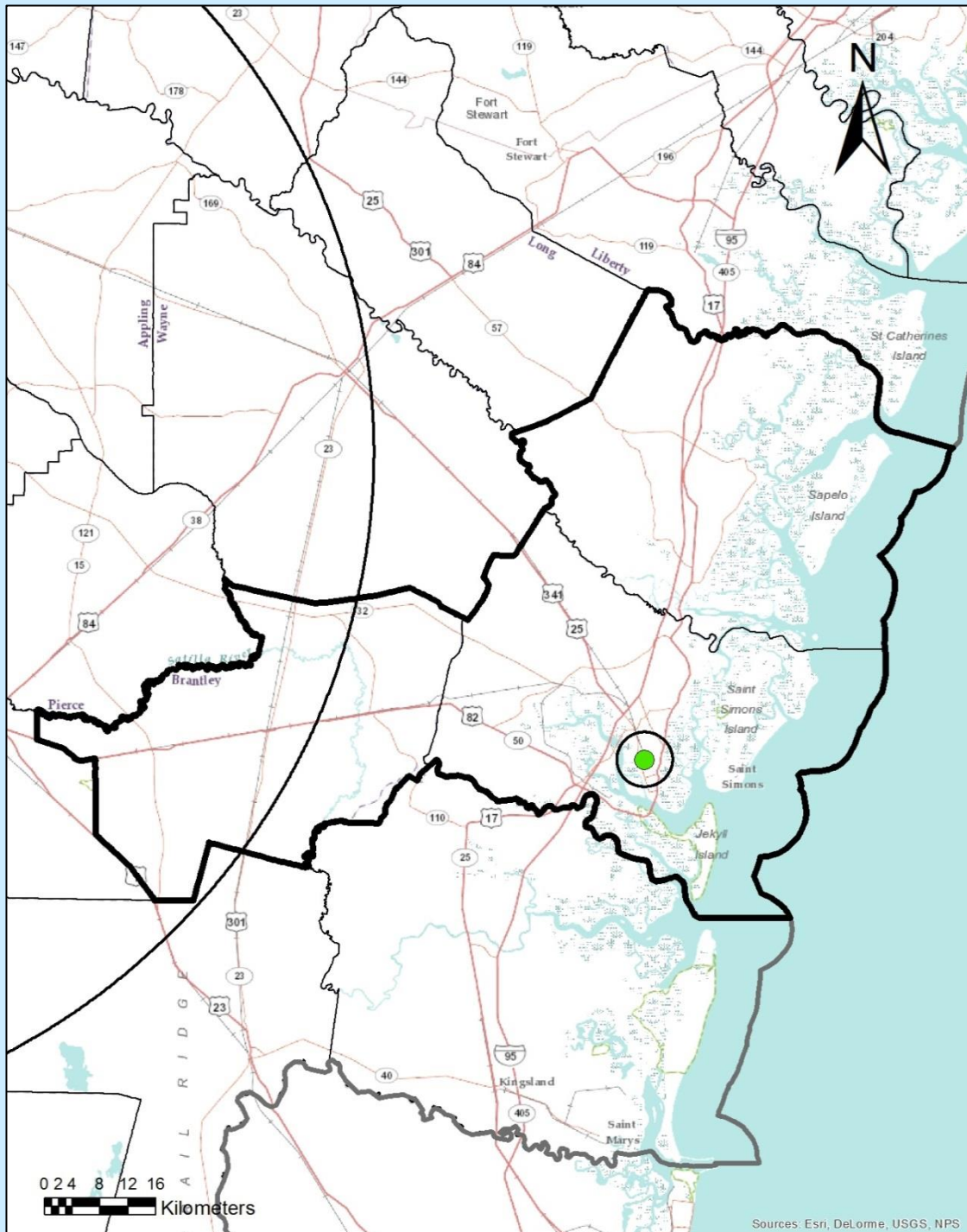
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub> Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/1/02
PM <sub>2.5</sub> Continuous	Population Exposure	Continuous	3.5 m	Neighborhood	1/1/08*

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

GA AAMP's plans for this site: Continue monitoring; wind direction and wind speed monitors will be added to this site within the next year



# Brunswick MSA



## Radius of Circles on Map

Micro Scale: up to 100m

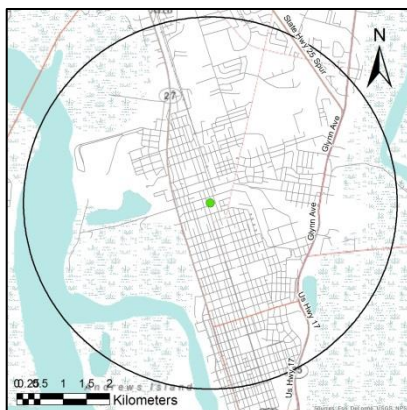
Middle Scale: up to 0.5km

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 SO<sub>2</sub> site

North

South

West

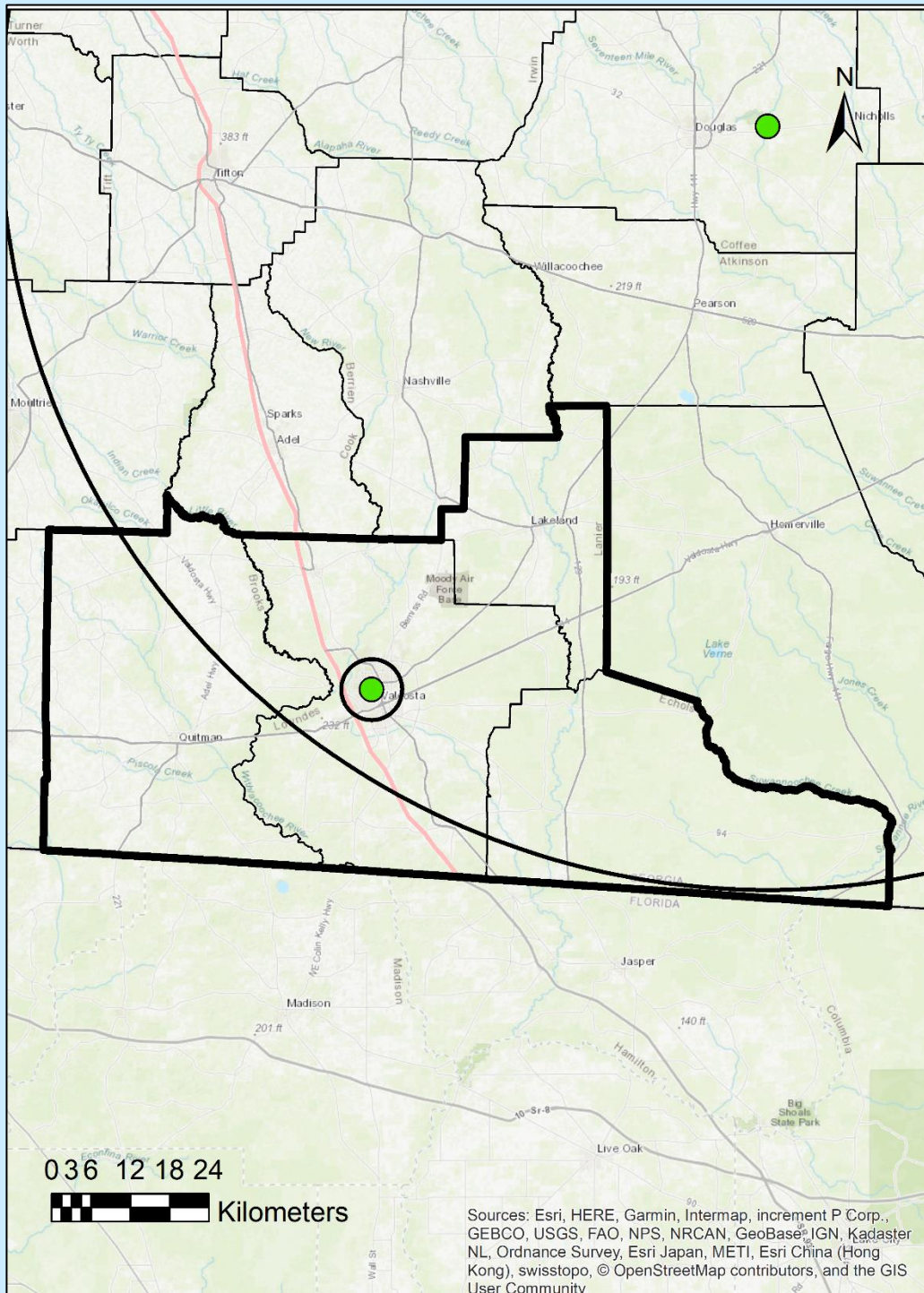


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	2.6 m	Neighborhood	8/31/95
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	4.3 m	Neighborhood	3/1/95
Wind Speed	General/ Background	Continuous	10 m	Neighborhood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

GA AAMP's plans for this site: Continue monitoring; GA AAMP plans to install an FEM T640 Continuous PM<sub>2.5</sub> sampler within the fiscal year 2022.



# Valdosta MSA



## Radius of Circles on Map

Micro Scale: up to 100m

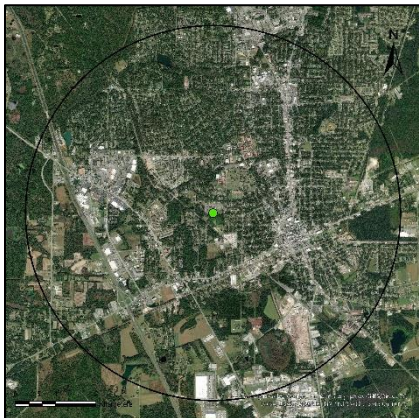
Middle Scale: up to 0.5km

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: 821 W Gordon Street, Lowndes County, Georgia 31602

Site Established: 12/17/99

Latitude/Longitude: N30.836577/W-83.294719

Elevation: 55.0 meters

Area Represented: Valdosta MSA

Site History: Established as PM<sub>2.5</sub> site

North

South

East

West

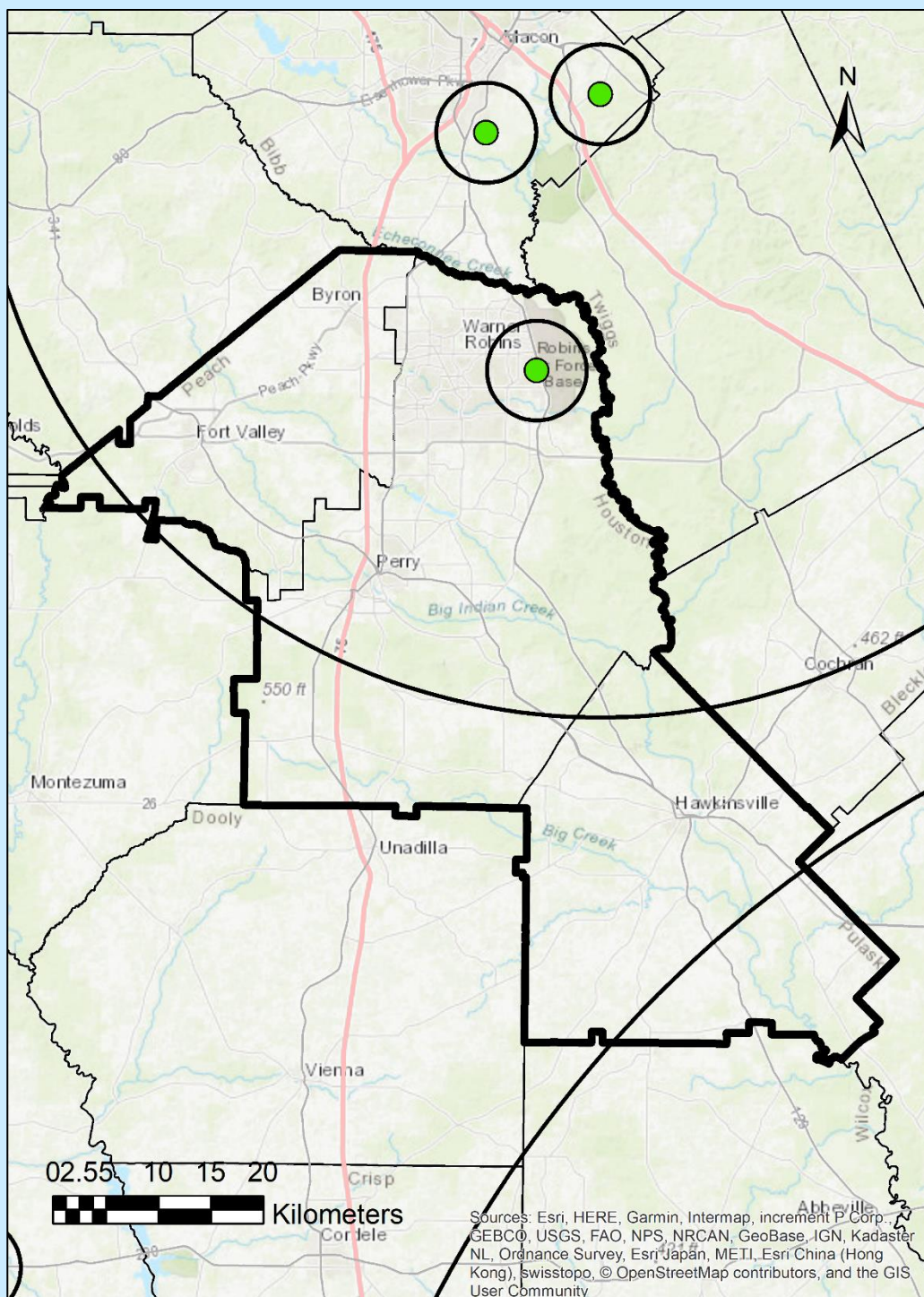


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	2.8 m	Neighborhood	1/1/00
PM <sub>2.5</sub>	Population Exposure	Continuous	3.1 m	Neighborhood	1/1/08

GA AAMP's plans for this site: Continue monitoring; GA AAMP moved the monitoring station to the ground due to construction being done on the roof where the monitor was previously located (new site location meets siting criteria); GA AAMP shut down the non-FEM BAM Continuous PM<sub>2.5</sub> sampler on 3/11/20, and replaced it with an FEM Teledyne T640 Continuous PM<sub>2.5</sub> sampler on October 22, 2020.



# Warner Robins MSA



## Radius of Circles on Map

Micro Scale: up to 100m

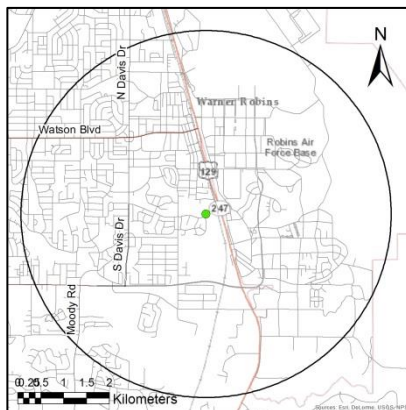
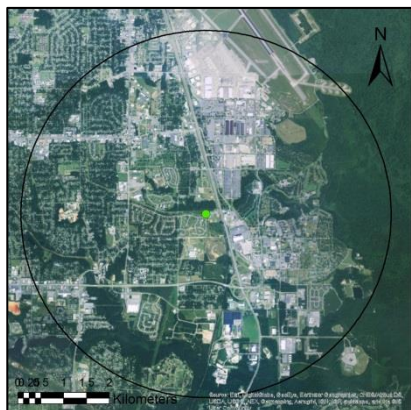
Middle Scale: up to 0.5km

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 1<sup>st</sup> 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<sub>2.5</sub> site

North

South

East

West

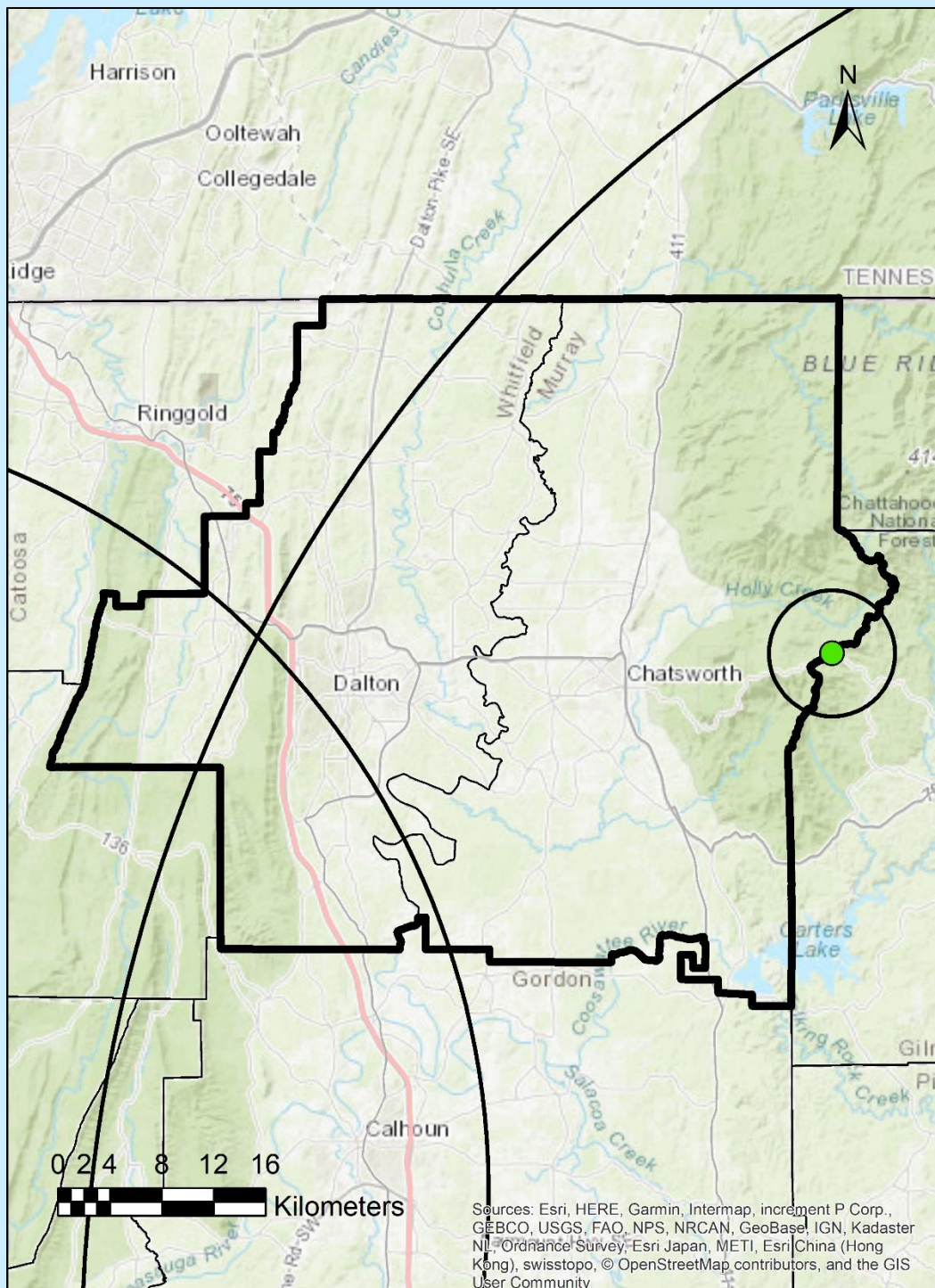


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	3 m	Neighborhood	7/5/00
PM <sub>2.5</sub>	Population Exposure	Continuous	3 m	Neighborhood	1/1/08

GA AAMP's plans for this site: Continue monitoring; Running continuous monitor as FEM as of 3/7/2018



# Dalton MSA



## Radius of Circles on Map

Micro Scale: up to 100m

Middle Scale: up to 0.5km

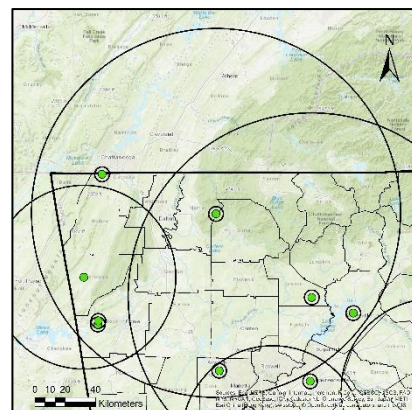
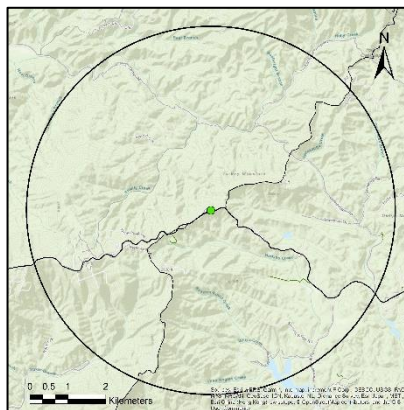
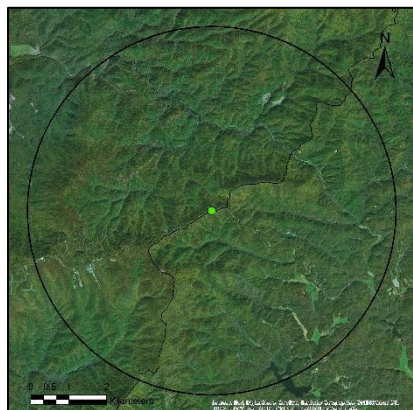
Neighborhood Scale: up to 4.0km

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

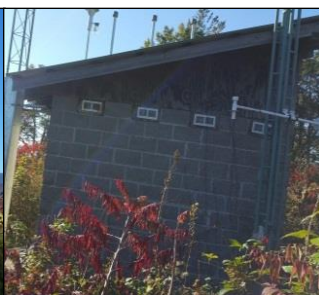
Site History: Established as O<sub>3</sub> site

North

South

East

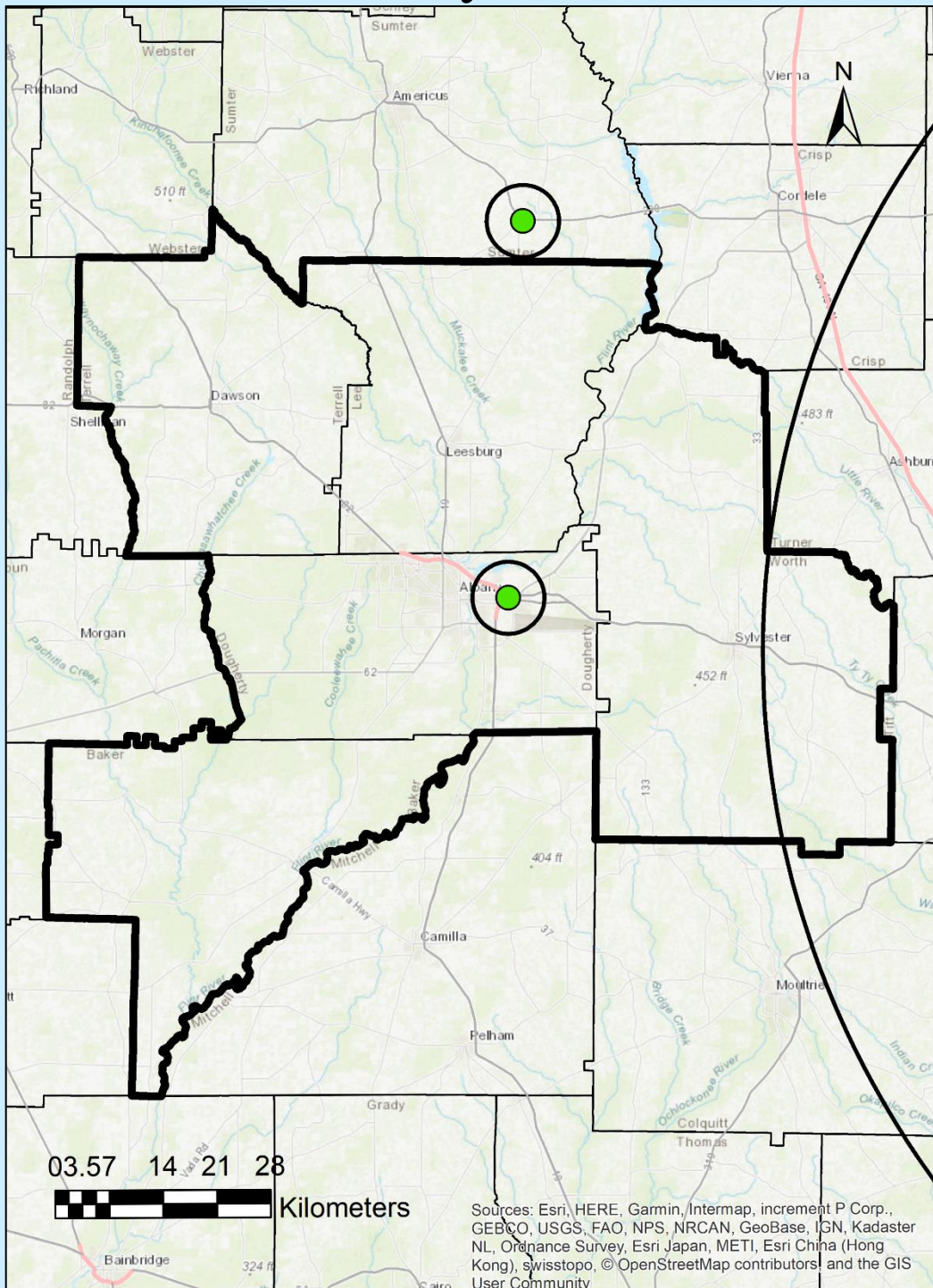
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	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
Outdoor 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 MSA



## Radius of Circles on Map

Micro Scale: up to 100m

Middle Scale: up to 0.5km

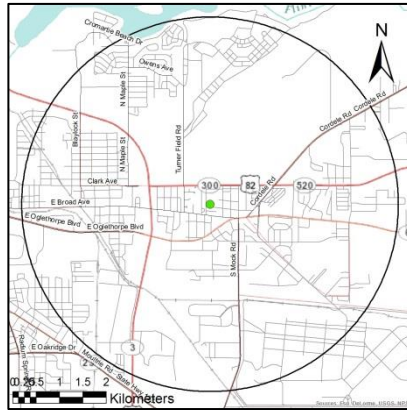
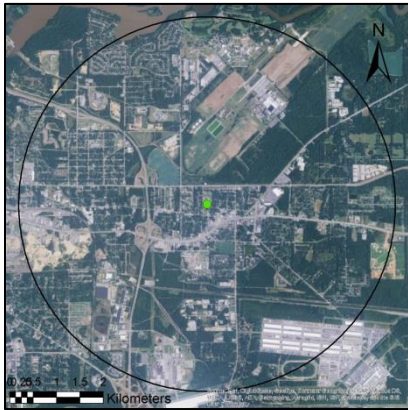
Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

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



## 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

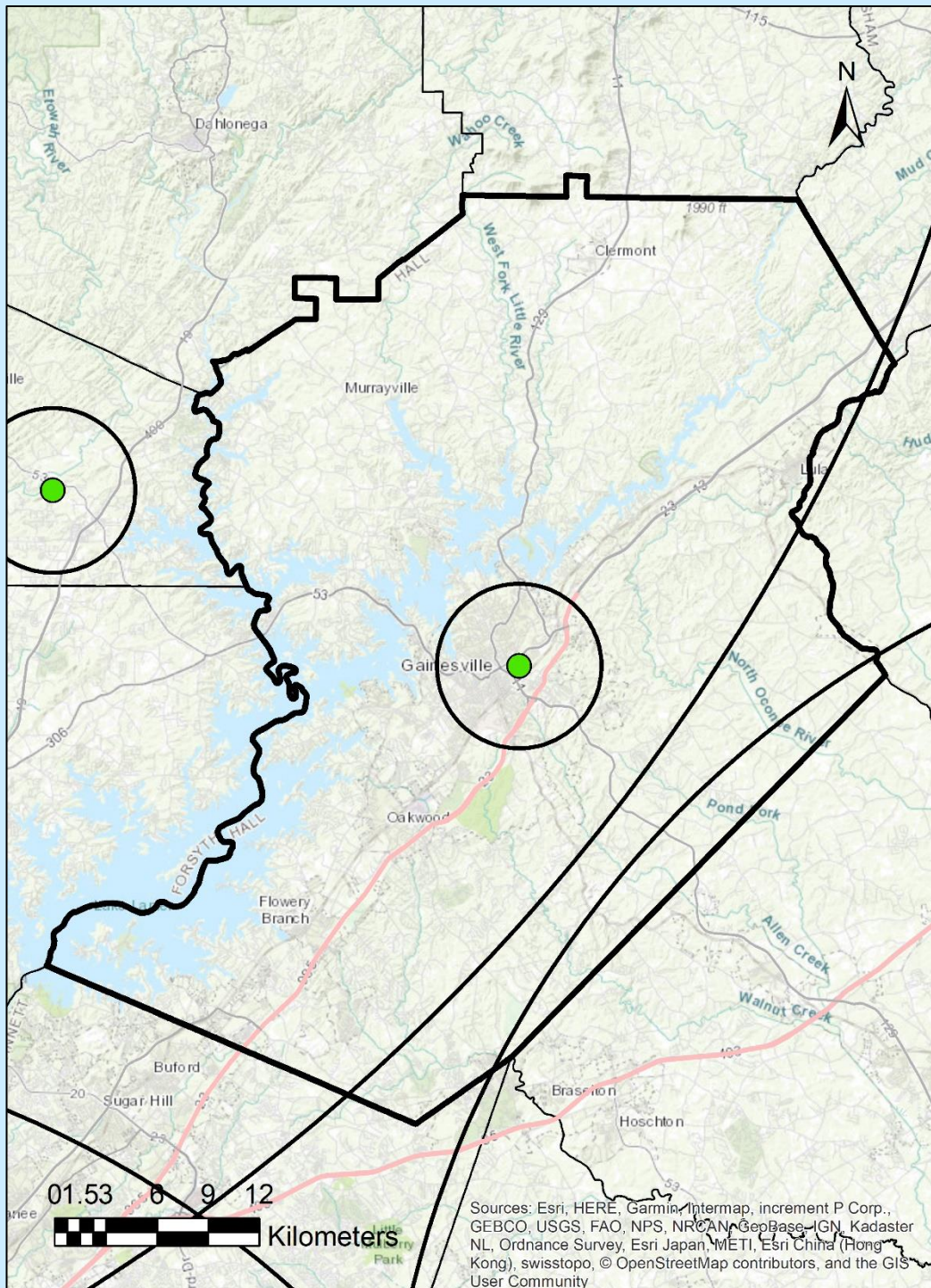
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	2.1 m	Neighborhood	2/2/99
PM <sub>2.5</sub>	Quality Assurance	Every 12 days	2.1 m	Neighborhood	1/10/13
PM <sub>2.5</sub>	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; GA AAMP replaced the FEM BAM Continuous PM<sub>2.5</sub> sampler with an FEM Teledyne T640 Continuous PM<sub>2.5</sub> sampler on 3/1/19. GA AAMP is planning to relocate this sampling station to ground level once the appropriate infrastructure is in place.

# Gainesville MSA



## Radius of Circles on Map

Micro Scale: up to 100m

Middle Scale: up to 0.5km

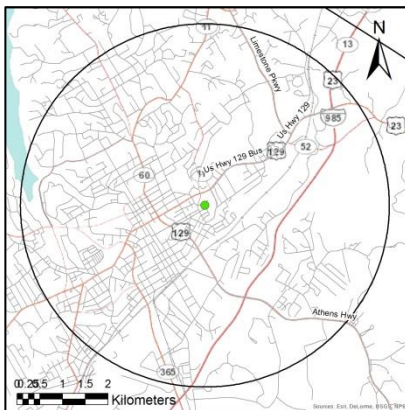
Neighborhood Scale: up to 4.0km

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<sub>2.5</sub> site

North

South

East

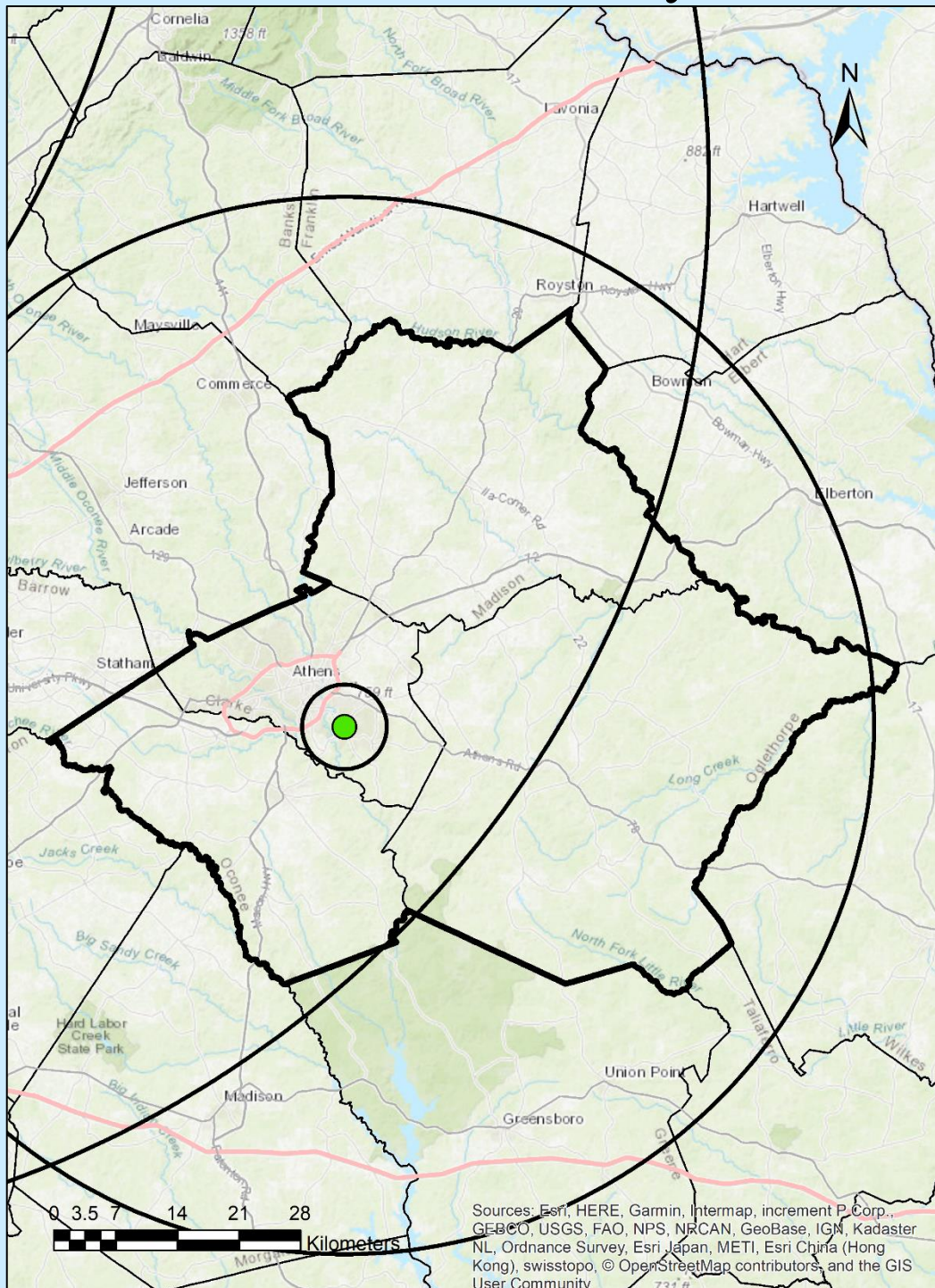
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Continuous	2.9 m	Neighborhood	1/1/08

GA AAMP's plans for this site: Continue monitoring; Running continuous monitor as FEM as of 10/3/2017.

# Athens-Clarke County MSA



## Radius of Circles on Map

Micro Scale: up to 100m

Middle Scale: up to 0.5km

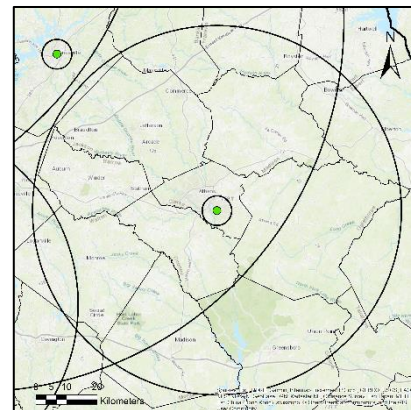
Neighborhood Scale: up to 4.0km

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 O<sub>3</sub> and PM site

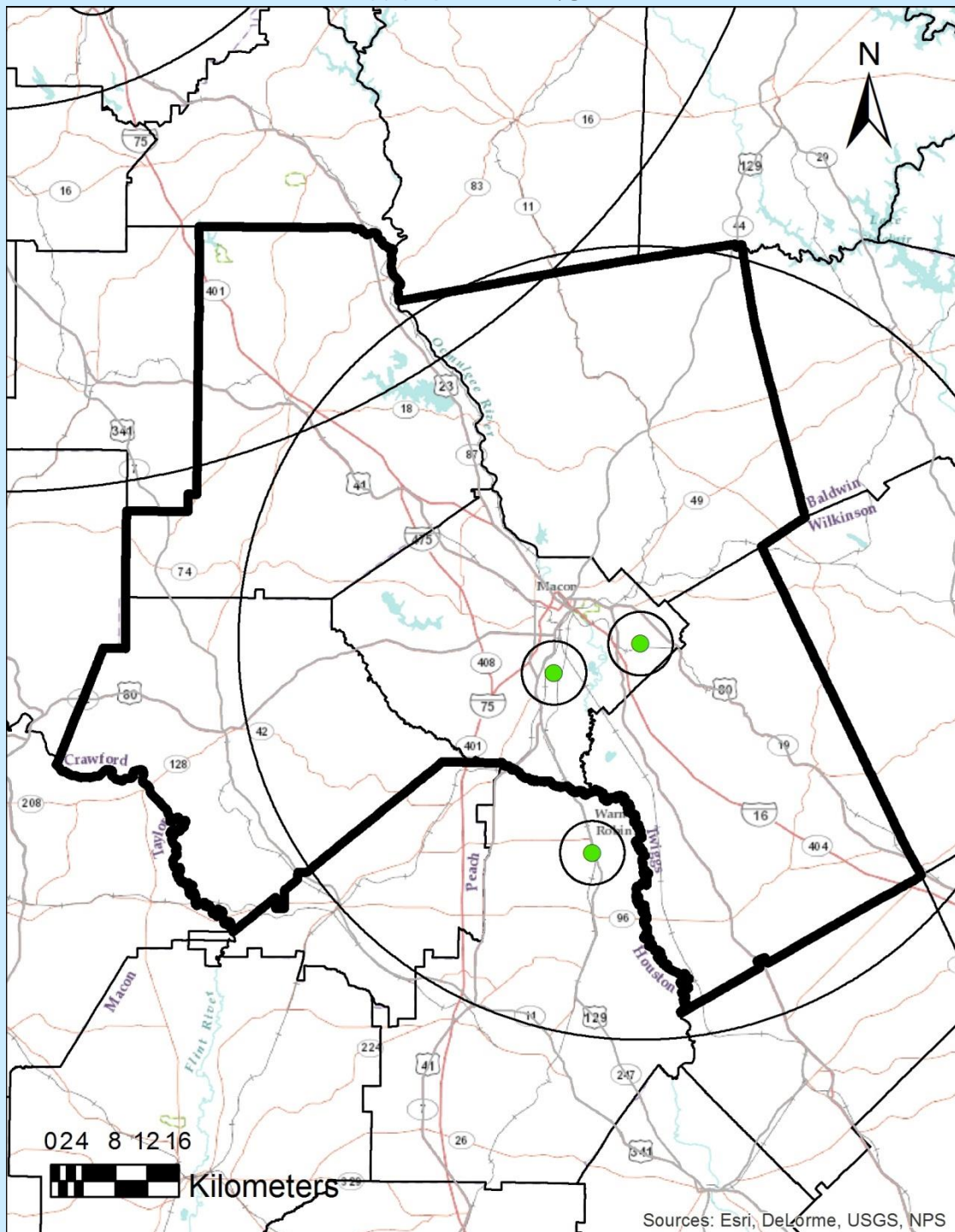


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	3.4 m	Urban	5/1/02
PM <sub>2.5</sub>	Population Exposure	Continuous	4.4 m	Neighborhood	8/1/04
PM <sub>2.5</sub>	Quality Assurance	Continuous	4.4 m	Neighborhood	2/15/19

GA AAMP's plans for this site: Continue monitoring; Running continuous PM<sub>2.5</sub> monitor as FEM as of 4/1/2018; On February 15, 2019, GA AAMP added a second FEM Teledyne T640 Continuous PM<sub>2.5</sub> sampler to satisfy collocation requirements.



# Macon MSA



Radius of Circles on Map

Micro Scale: up to 100m

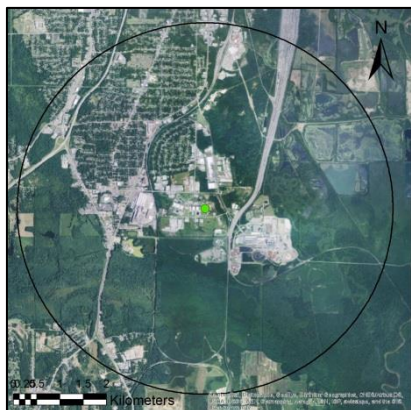
Middle Scale: up to 0.5km

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

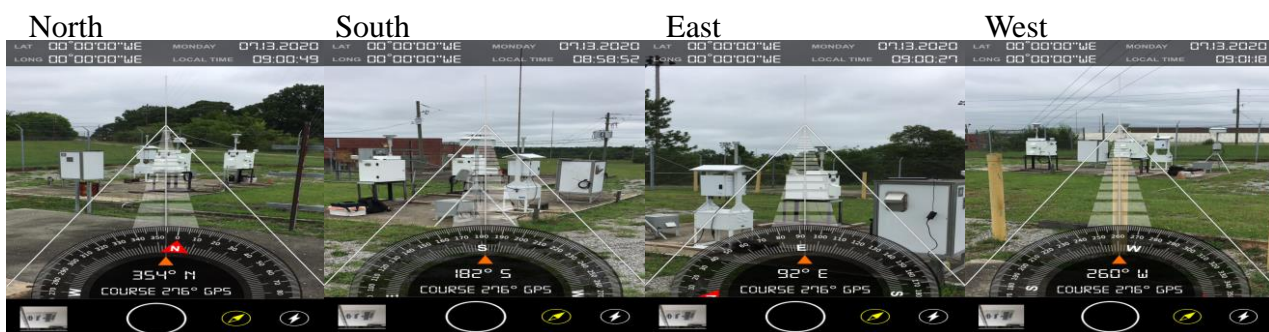
Site Established: 1/1/74

Latitude/Longitude: N32.7773/W-83.6411

Elevation: 106 meters

Area Represented: Macon MSA

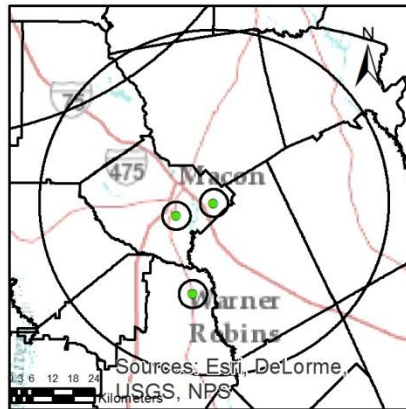
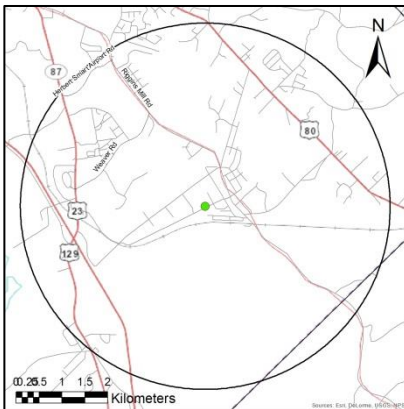
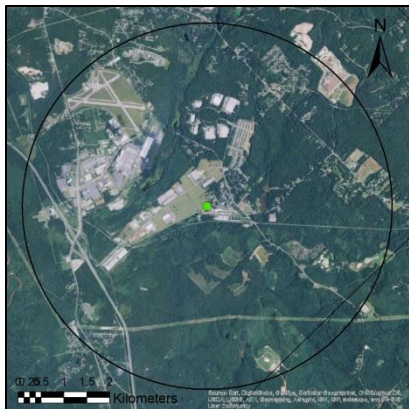
Site History: Established as TSP site



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub> Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/1/02
PM <sub>2.5</sub>	Population Exposure	Every 3 days	2.5 m	Neighborhood	2/2/99
PM <sub>2.5</sub>	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 O<sub>3</sub> and SO<sub>2</sub> site

North

South

East

West

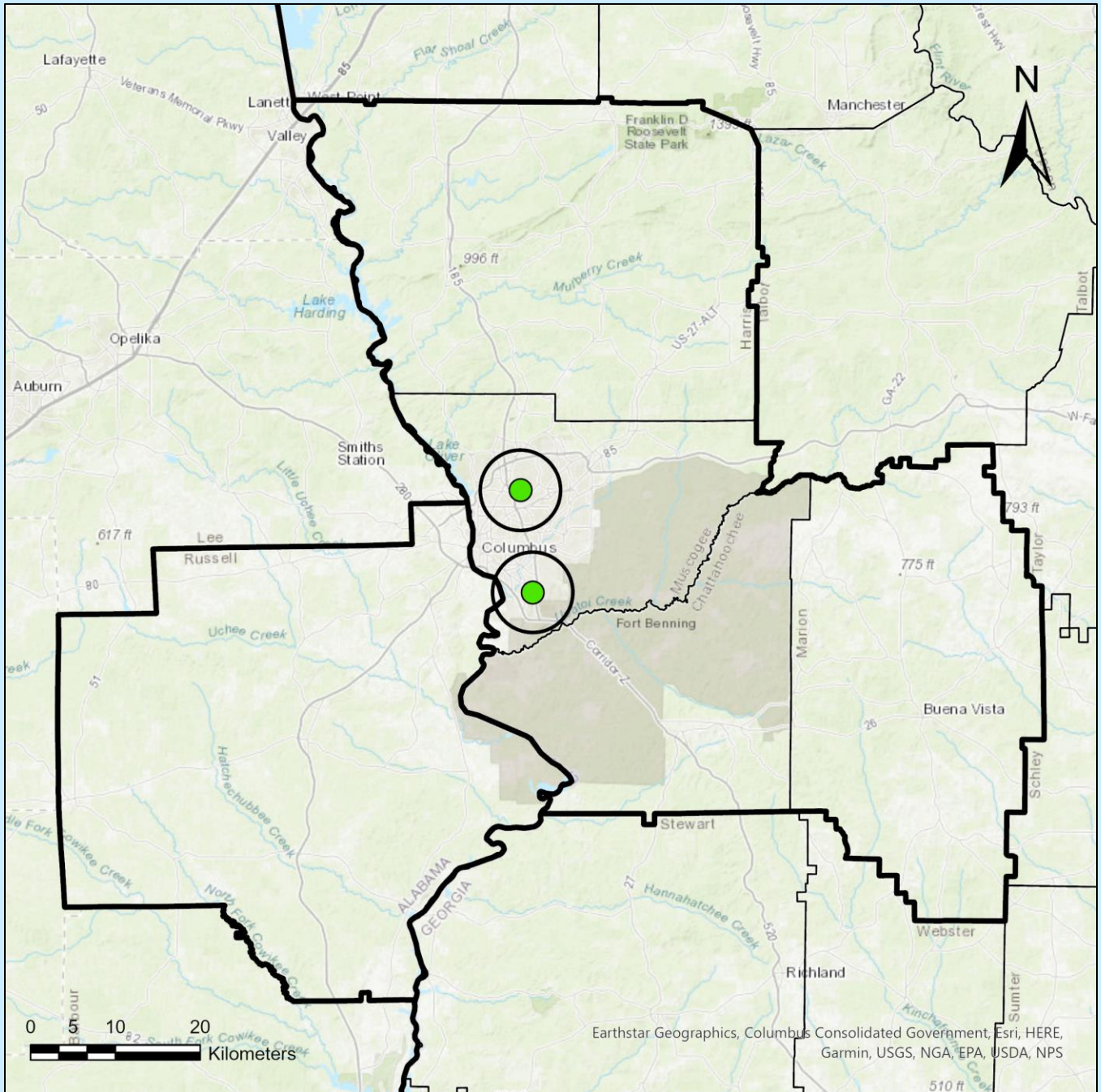


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	3 m	Neighborhood	2/1/99
PM <sub>2.5</sub>	Population Exposure	Continuous	3.5 m	Neighborhood	5/5/03
Wind Direction	General/ Background	Continuous	10 m	Neighborhood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

GA AAMP's plans for this site: Continue monitoring; Running continuous PM<sub>2.5</sub> monitor as FEM as of 10/1/2017.



# Columbus Georgia-Alabama MSA



## Radius of Circles on Map

Micro Scale: up to 100m

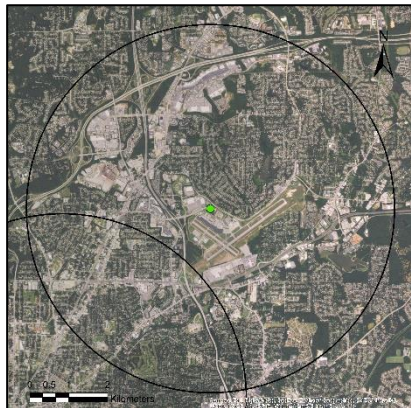
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

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

## 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 O<sub>3</sub> site

North

South

East

West

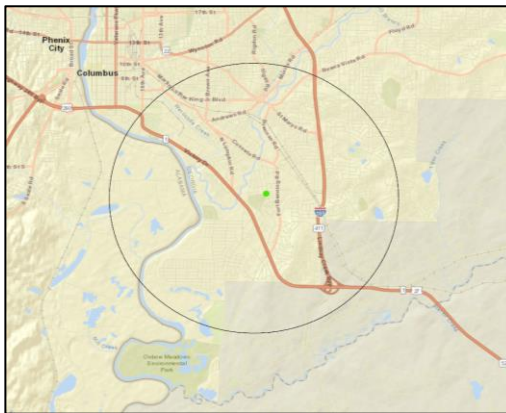


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	3 m	Neighborhood	7/1/82
PM <sub>2.5</sub>	Population Exposure	Every 3 days	4.8 m	Neighborhood	6/2/03
PM <sub>2.5</sub>	Population Exposure	Continuous	3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

GA AAMP's plans for this site: Continue monitoring



## Columbus-Baker



AQS ID: 132150012

Address: Baker Middle School, 1215 Benning Dr, Columbus, Muscogee County, Georgia 31903

Site Established: 3/1/21

Latitude/Longitude: N32.4274/W-84.9457

Elevation: 85 meters

Area Represented: Columbus Georgia-Alabama MSA

Site History: Established as PM<sub>2.5</sub> site

North

South

East

West

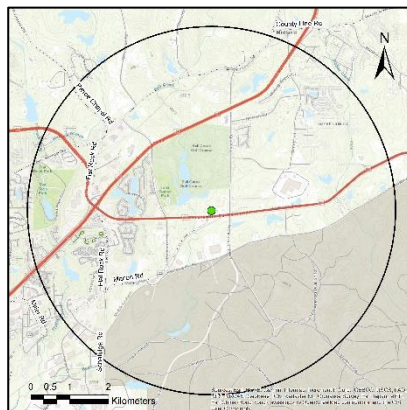
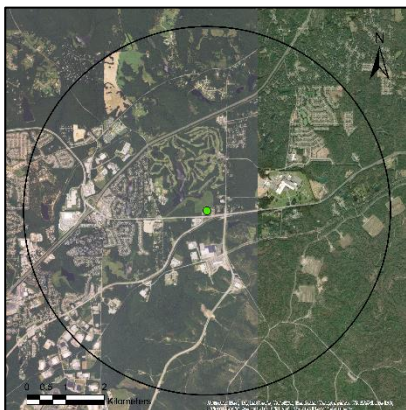


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	2.7 m	Neighborhood	3/1/21
PM <sub>2.5</sub> Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/1/21

GA AAMP's plans for this site: Continue monitoring; site moved from Columbus-Cusseta location and historical data can be found with AQS ID 13-215-0011.



## 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 O<sub>3</sub> site

North

South

East

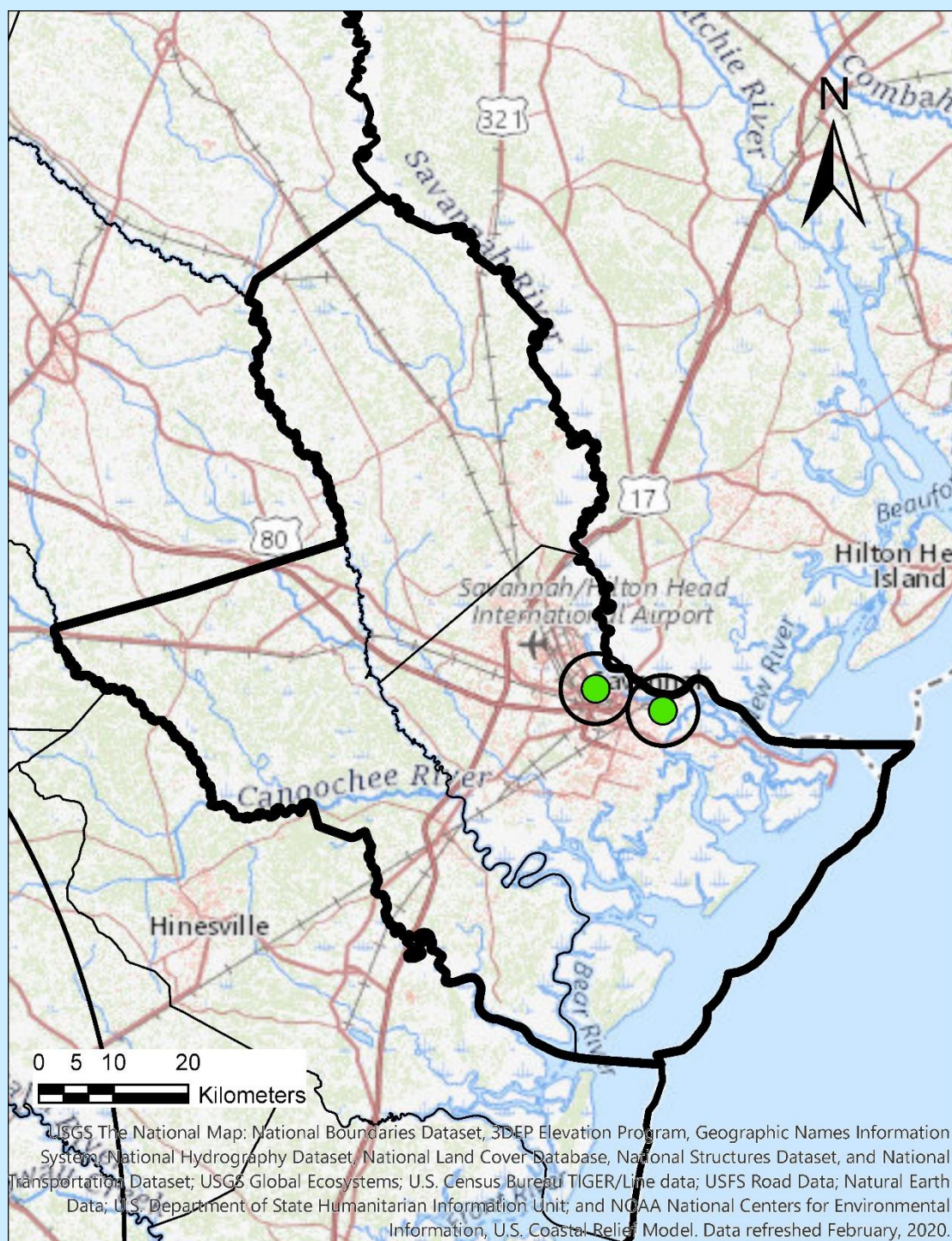
West



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
Outdoor Temperature	General/ Background	Continuous	2.2 m	Neighborhood	1/5/06
Relative Humidity	General/ Background	Continuous	2.2 m	Neighborhood	1/5/06
Rain/Melt 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

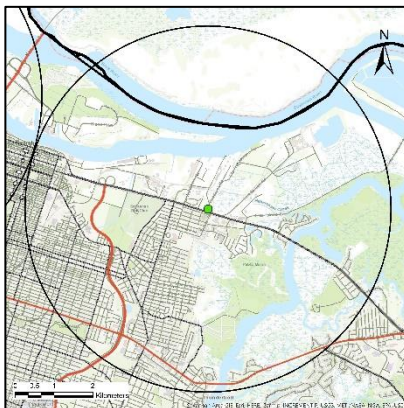
Neighborhood Scale: up to 4.0km

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 SO<sub>2</sub> and H<sub>2</sub>S site

North

South

East

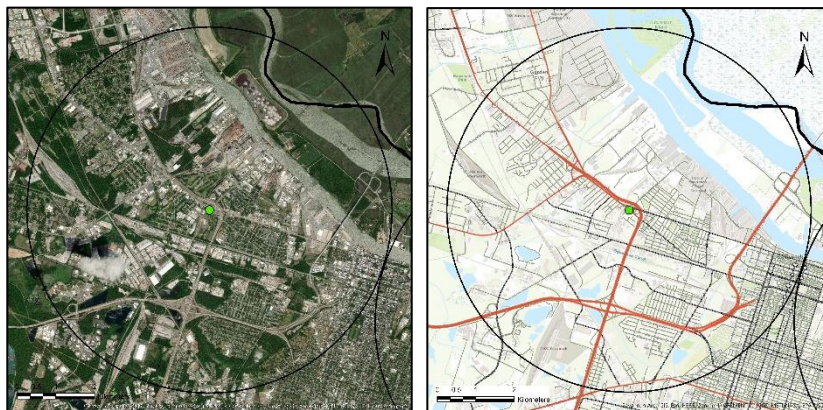
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	3.8 m	Neighborhood	4/19/95
SO <sub>2</sub>	Source Oriented	Continuous	3.8 m	Neighborhood	3/29/95
SO <sub>2</sub> 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

GA AAMP's plans for this site: Continue monitoring

## 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

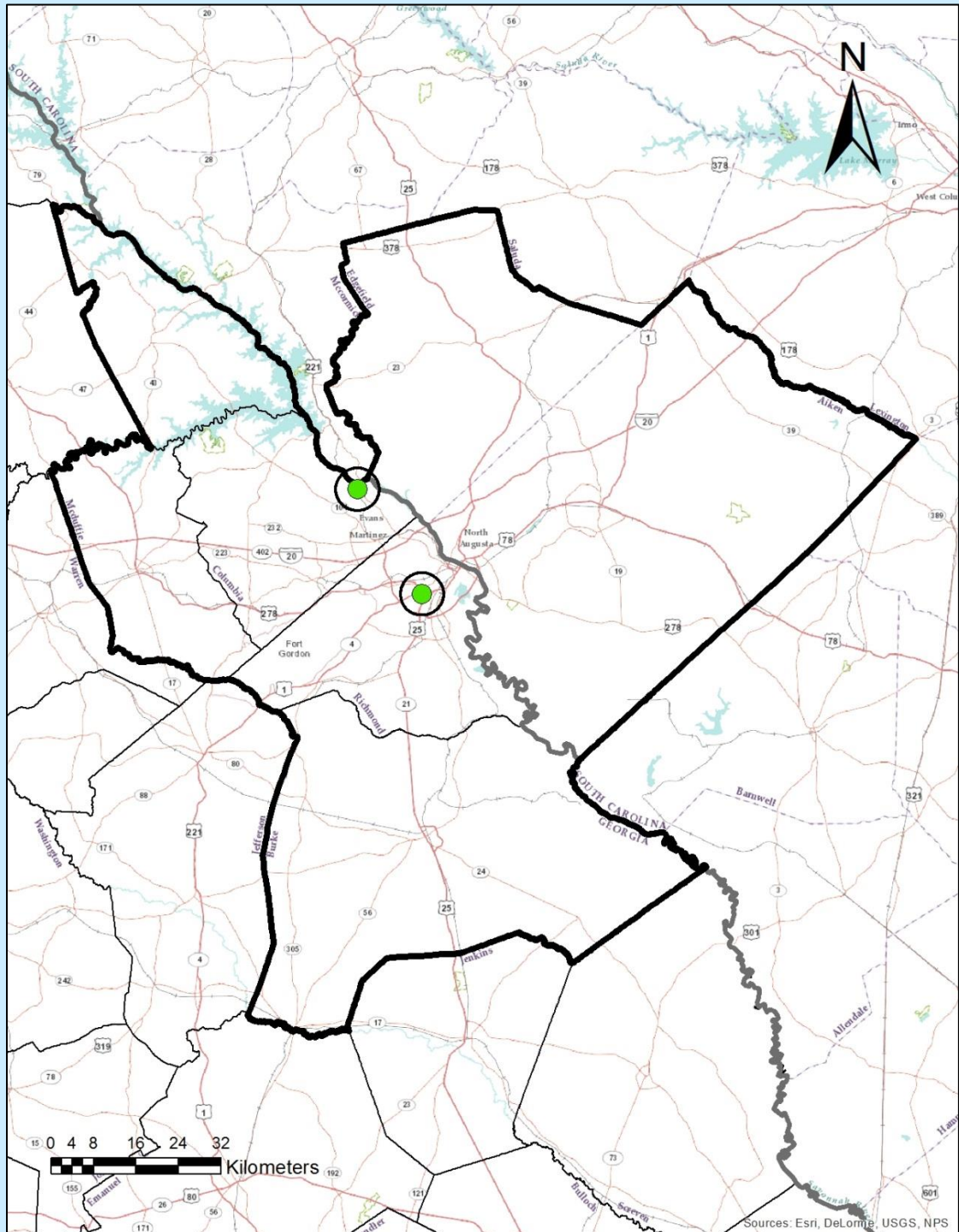


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
SO <sub>2</sub>	Population Exposure	Continuous	4.1 m	Neighborhood	1/1/98
SO <sub>2</sub> 5-Minute Maximum	Population Exposure	Continuous	4.1 m	Neighborhood	8/1/10
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	1/1/79
Wind Speed	General/ Background	Continuous	10 m	Neighborhood	1/1/79
PM <sub>2.5</sub>	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; Running continuous PM<sub>2.5</sub> sampler as FEM as of 11/7/2017.



# Augusta-Richmond County, Georgia-South Carolina MSA



## Radius of Circles on Map

Micro Scale: up to 100m

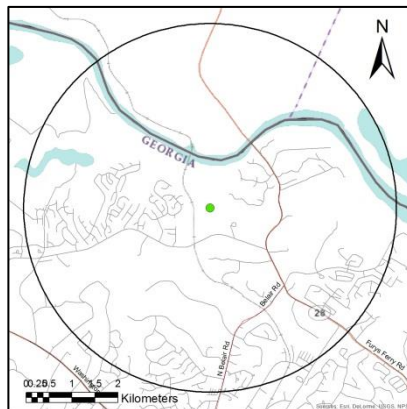
Middle Scale: up to 0.5km

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 O<sub>3</sub> and NO<sub>y</sub> site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	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
Outside 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



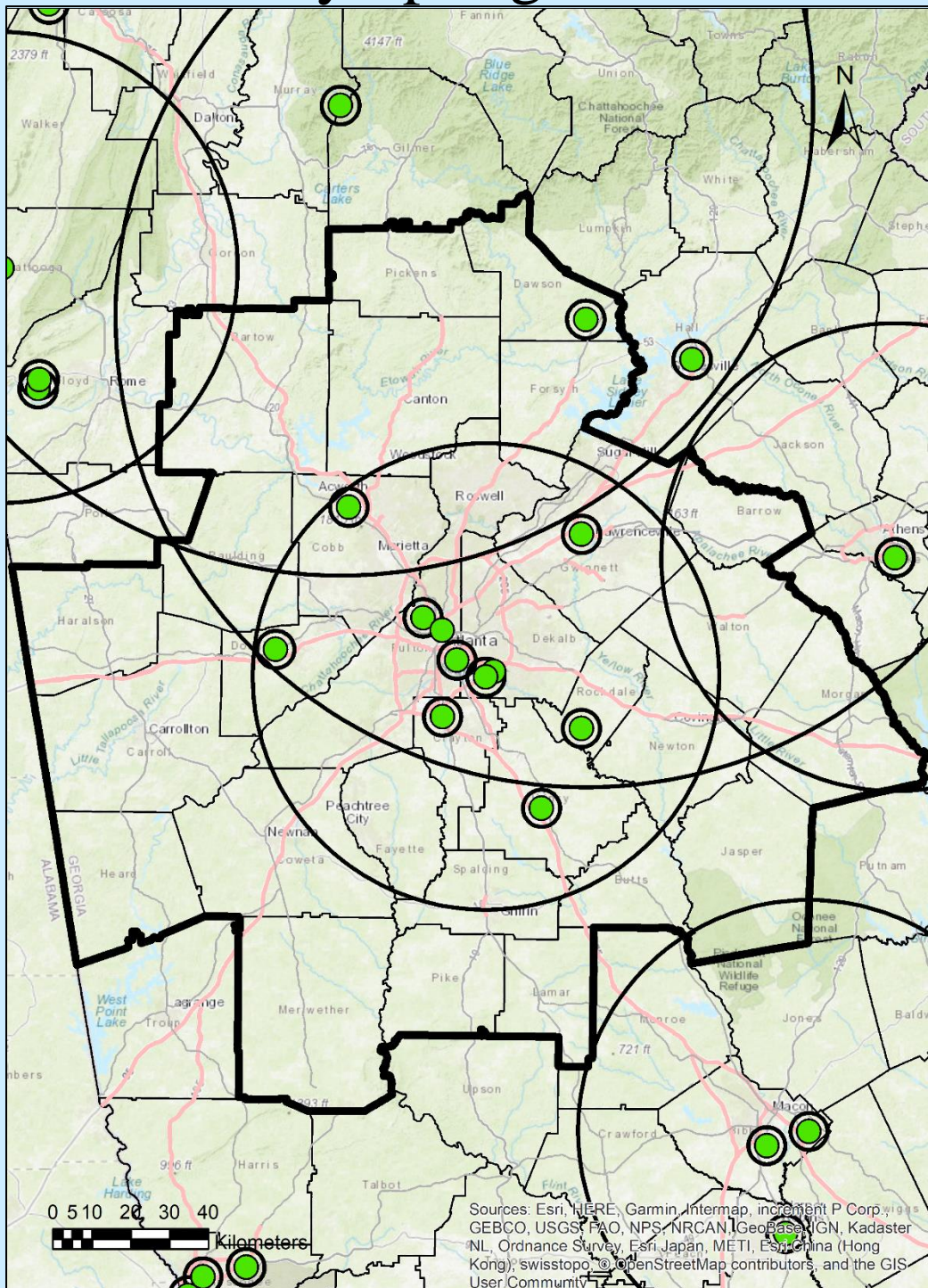
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	4.5 m	Neighborhood	4/27/89
PM <sub>10</sub>	Population Exposure	Continuous	3.5 m	Neighborhood	4/9/96
PM <sub>2.5</sub> Speciation	Population Exposure	Every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

**Augusta (continued)**

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
Wind Direction	General/ Background	Continuous	10 m	Neighborhood	10/2/03
Outside Temperature	General/ Background	Continuous	2 m	Neighborhood	10/2/03
Relative Humidity	General/ Background	Continuous	2 m	Neighborhood	10/2/03
Rain/Melt 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; Running continuous PM<sub>2.5</sub> monitor as FEM as of 10/1/2017; In January 2017, the PM<sub>10</sub> integrated sampler collected an unexplainably high value. Therefore, GA AAMP replaced the integrated sampler, which collected data every 6 days, with a continuous hourly PM<sub>10</sub> sampler as a proactive solution to collect data more frequently. If high values occur in the future that are at levels approaching or above the National Ambient Air Quality Standard, the number of PM<sub>10</sub> monitors in the Augusta-Richmond County, GA-SC MSA may need to be reconsidered. GA AAMP is replacing the continuous PM<sub>10</sub> TEOM and continuous PM<sub>2.5</sub> T640 with continuous T640X, which reads PM<sub>2.5</sub>, PM<sub>10</sub>, and PMcoarse within the fiscal year 2022. The PM<sub>2.5</sub> speciation sampling was suspended as of March 2021, and will restart as soon as personnel is available.

# Atlanta-Sandy Springs-Marietta MSA



## Radius of Circles on Map

Micro Scale: up to 100m

Middle Scale: up to 0.5km

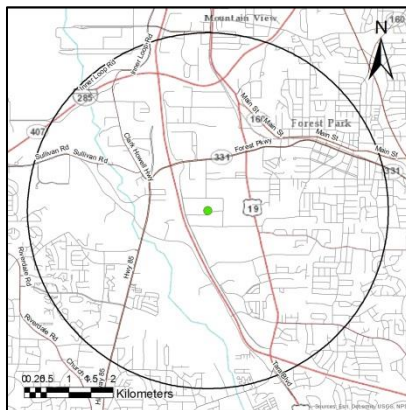
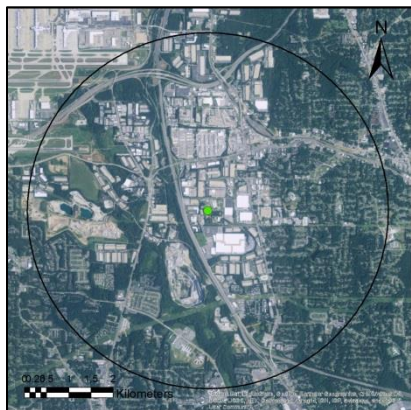
Neighborhood Scale: up to 4.0km

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

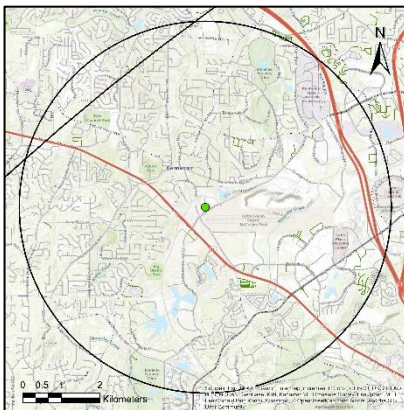
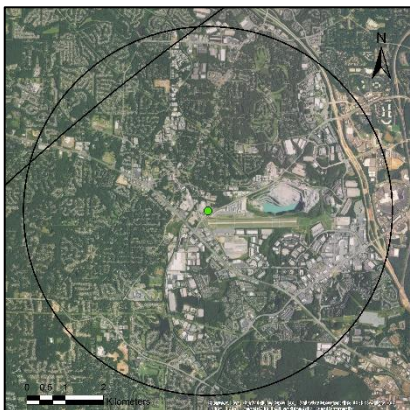


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	2.2 m	Neighborhood	1/9/99

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<sub>2.5</sub> site

North

South

East

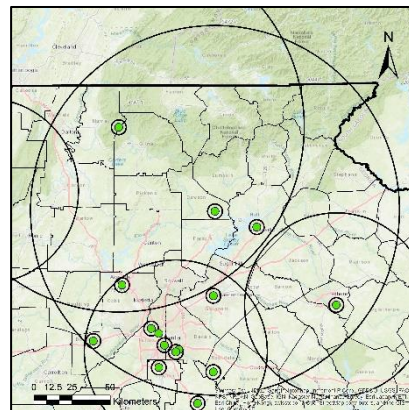
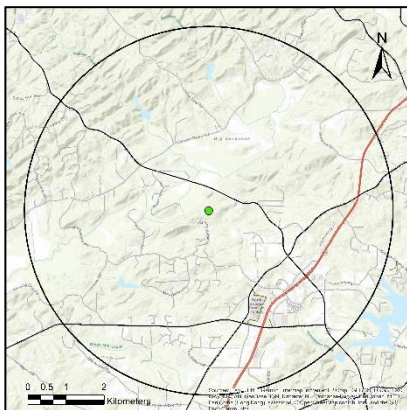
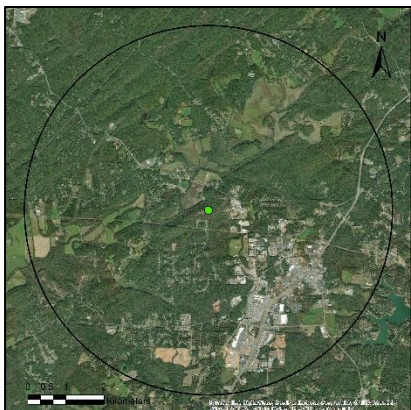
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	4.2 m	Neighborhood	9/1/99
PM <sub>2.5</sub>	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 O<sub>3</sub> site

North

South

East

West

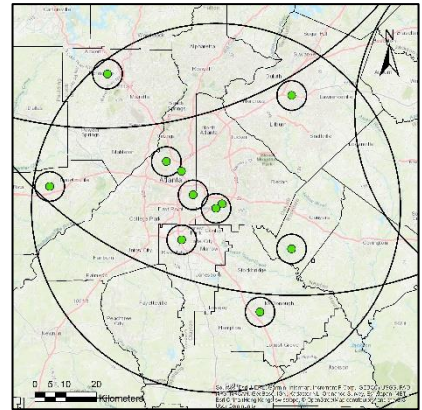
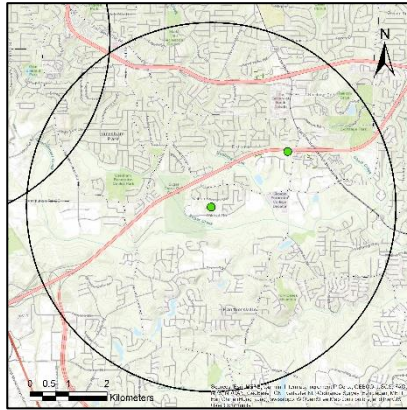
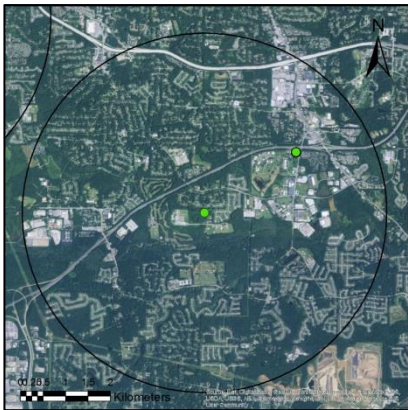


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	4 m	Neighborhood	1/1/85
Wind Speed	General/ Background	Continuous	10 m	Regional	1/1/05
Wind Direction	General/ Background	Continuous	10 m	Regional	1/1/05

GA AAMP'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 O<sub>3</sub> site

North

South

East

West



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



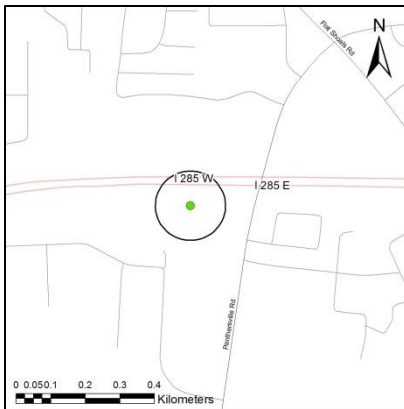
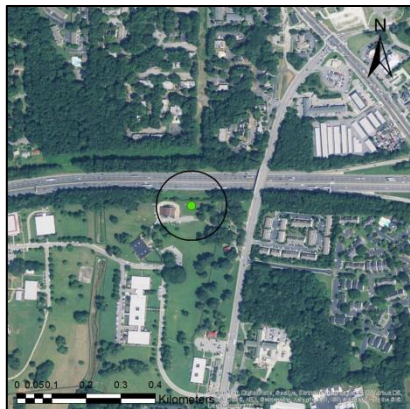
**South DeKalb (continued)**

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
NO <sub>y</sub>	Population Exposure	Continuous	10 m	Neighborhood/ Urban	1/1/98
NO	Population Exposure	Continuous	4 m	Neighborhood/ Urban	4/1/94
NO <sub>x</sub>	Population Exposure	Continuous	4 m	Neighborhood/ Urban	4/1/94
NO <sub>2</sub>	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 <sub>10</sub> Select Metals (NATTS)	Population Exposure	Every 6 days	2 m	Neighborhood	1/1/00
PM <sub>10</sub> Select Metals (NATTS)	Quality Assurance	1/month	2 m	Neighborhood	1/1/05
PM <sub>10</sub> Continuous	Population Exposure	Continuous	4 m	Neighborhood	1/1/11
PM <sub>coarse</sub> 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)	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

**South DeKalb (continued)**

Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
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). 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). GA AAMP is planning to replace both the primary and collocated NATTS high-volume PM<sub>10</sub> metals samplers with low-volume PM<sub>10</sub> metals samplers when the collection and analysis method are fully operational. GA AAMP installed an Agilent 7890B Gas Chromatograph to fulfill the PAMS requirement for measuring hourly VOCs that will become operational when functioning properly. GA AAMP is planning to install a direct NO<sub>2</sub> monitor in summer of 2021 to fulfill PAMS requirements. This site is also being used as part of GA AAMP's ethylene oxide monitoring study. GA AAMP has installed a continuous ethylene oxide monitor as part of Community Scale Air Toxics Monitoring Grant.

**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

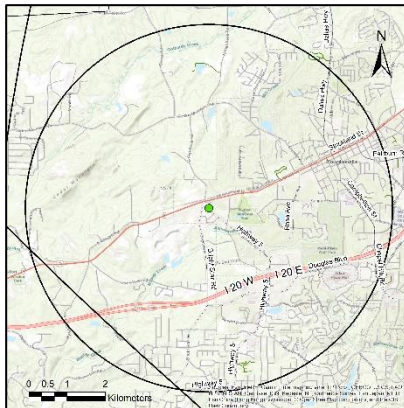
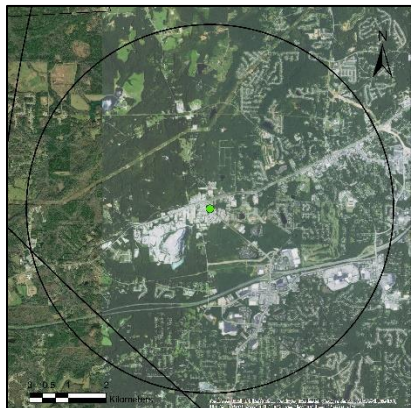


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
NO <sub>2</sub>	Source Oriented	Continuous	3.3 m	Micro	1/1/15
NO	Source Oriented	Continuous	3.3 m	Micro	1/1/15
NO <sub>x</sub>	Source Oriented	Continuous	3.3 m	Micro	1/1/15
VOCs	Population Exposure	Every 12 days	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); this site is also being used as part of GA AAMP's ethylene oxide monitoring study.



## 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 O<sub>3</sub> site

North

South

East

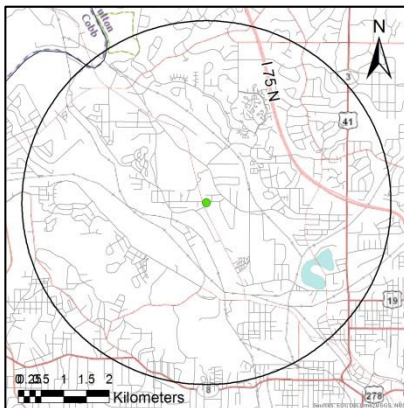
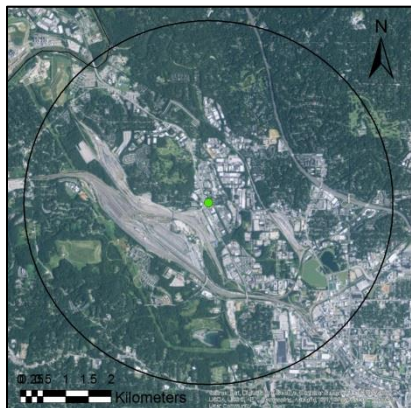
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	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

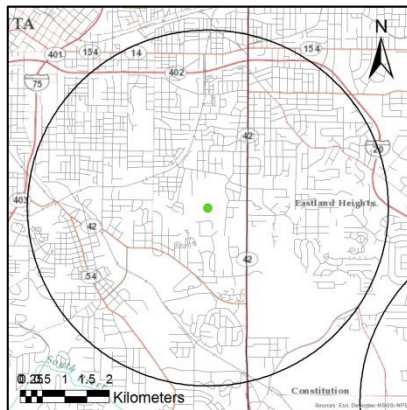
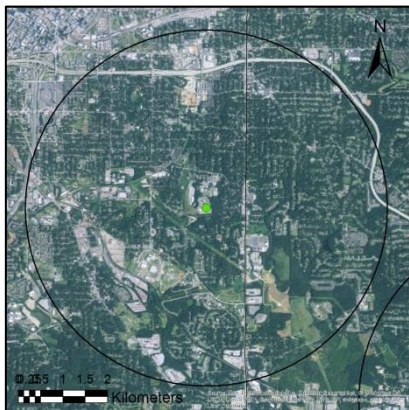


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Every 3 days	10 m	Neighborhood	1/21/99*
PM <sub>10</sub>	Population Exposure	Every 6 days	10 m	Neighborhood	1/1/86**
PM <sub>10</sub>	Population Exposure/Quality Assurance	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

## United Avenue



AQS ID: 131210055

Address: 945 United 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 O<sub>3</sub> and SO<sub>2</sub> site

North

South

East

West

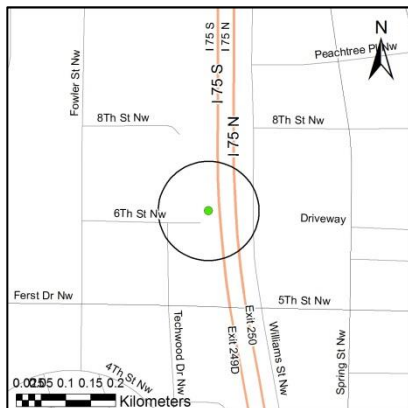
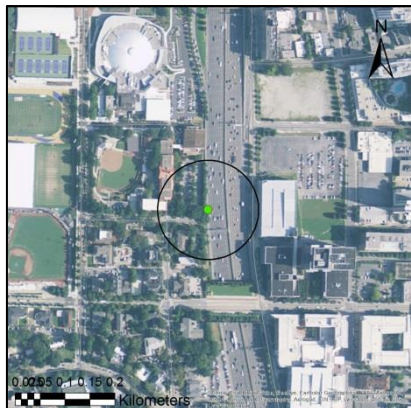


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
SO <sub>2</sub>	Population Exposure	Continuous	4 m	Neighborhood	10/1/91
SO <sub>2</sub> 5-Minute Maximum	Population Exposure	Continuous	4 m	Neighborhood	8/1/10
O <sub>3</sub>	Maximum Concentration	Continuous (Mar-Oct)	4 m	Neighborhood	10/1/91
PM <sub>2.5</sub>	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



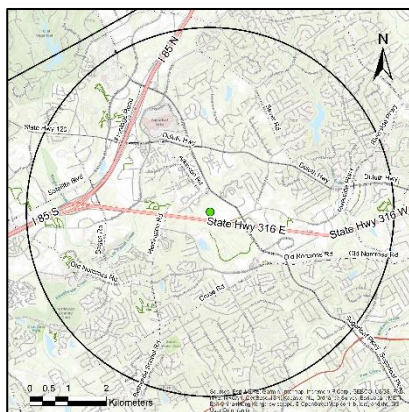
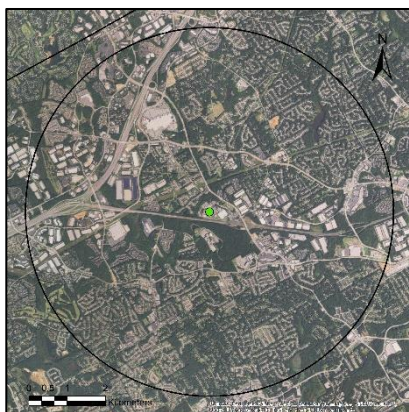
Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
NO <sub>2</sub>	Source Oriented	Continuous	3.5 m	Micro	6/15/14
NO	Source Oriented	Continuous	3.5 m	Micro	6/15/14
NO <sub>x</sub>	Source Oriented	Continuous	3.5 m	Micro	6/15/14
CO	Source Oriented	Continuous	3.5 m	Micro	6/15/14
PM <sub>2.5</sub>	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-GA 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 <sub>2.5</sub>	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 1.0 of Appendix C for more details).

## Gwinnett Tech



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 O<sub>3</sub> site

North

South

East

West

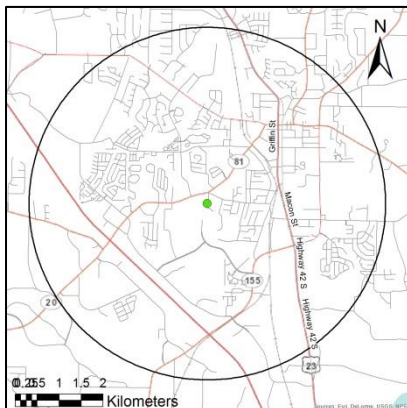
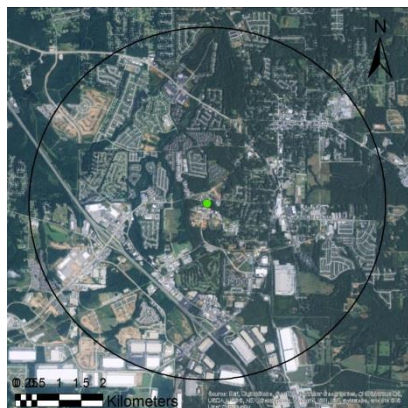


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Population Exposure	Continuous (Mar-Oct)	3.4 m	Neighborhood	5/17/95
PM <sub>2.5</sub>	Population Exposure	Continuous	4.4 m	Neighborhood	9/1/03

GA AAMP's plans for this site: Continue monitoring; On October 26, 2017 GA AAMP installed an FEM Teledyne T640 Continuous PM<sub>2.5</sub> sampler to replace the BAM PM<sub>2.5</sub> sampler.



## 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

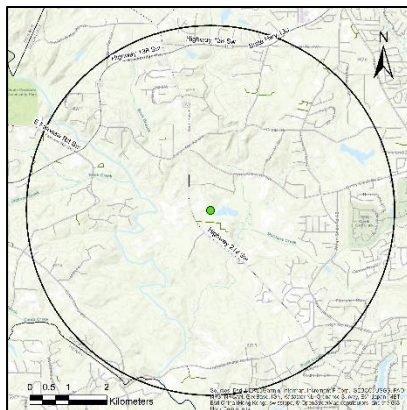
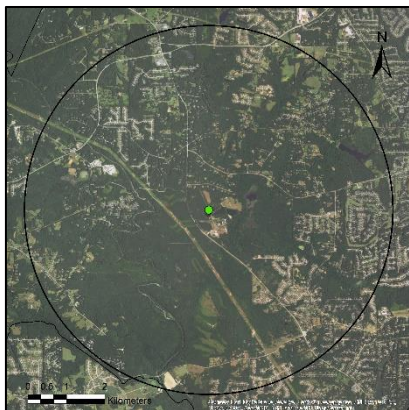
Site History: Established as O<sub>3</sub> site



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	Maximum Concentration	Continuous (Mar-Oct)	4 m	Neighborhood	6/7/99
PM <sub>2.5</sub>	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 O<sub>3</sub> site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	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

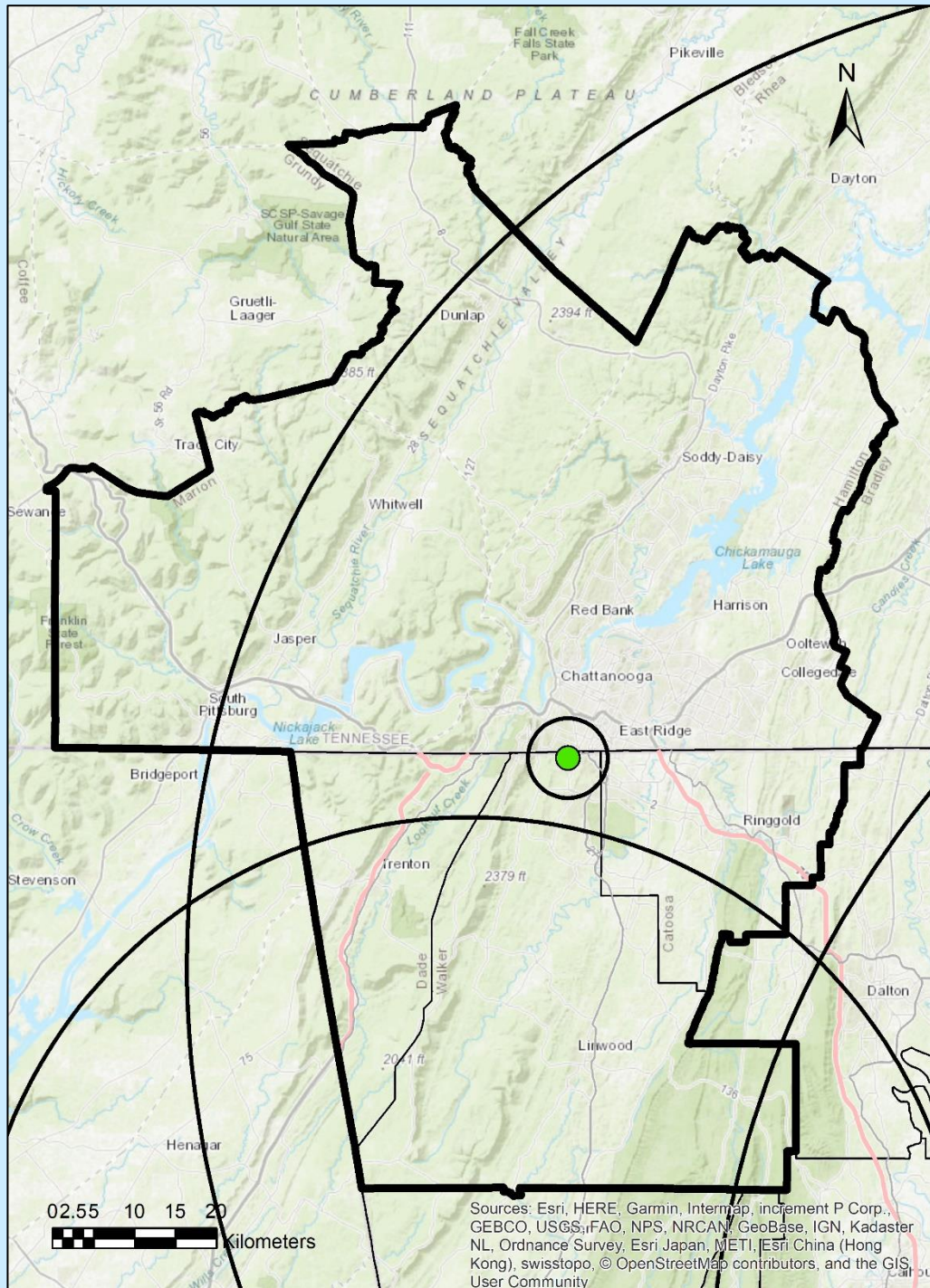
**Conyers (continued)**

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

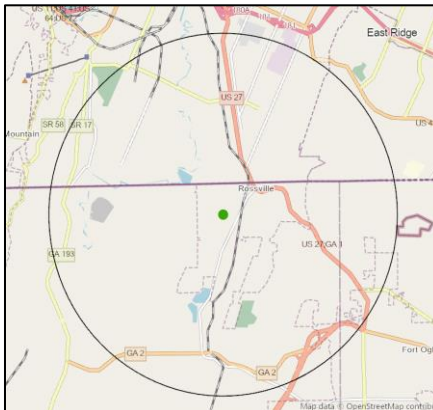
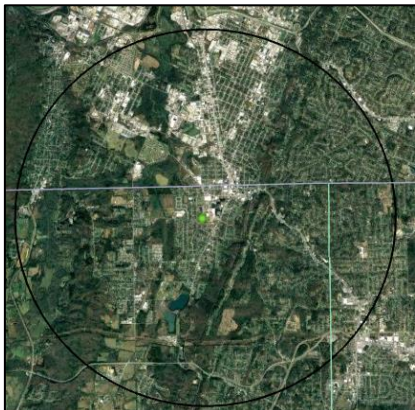
Middle Scale: up to 0.5km

Neighborhood Scale: up to 4.0km

Urban Scale: up to 50km

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

## Rossville-Williams St.



AQS ID: 132950004

Address: 301 Williams St., Rossville, Walker County, Georgia, 30741

Site Established: 3/1/21

Latitude/Longitude: N34.9784/W-85.2943

Elevation: 200 meters

Area Represented: Chattanooga Tennessee-Georgia MSA

Site History: Established as PM<sub>2.5</sub> site

North

South

East

West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub>	Population Exposure	Continuous	2.5 m	Neighborhood	3/1/21
PM <sub>2.5</sub>	Population Exposure/ Regional Transport	Every 3 days	2.7 m	Neighborhood	3/1/21
PM <sub>2.5</sub> Speciation	Population Exposure	Every 6 days	2.5 m	Neighborhood	3/1/21

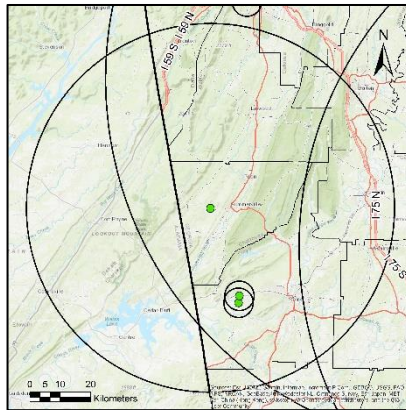
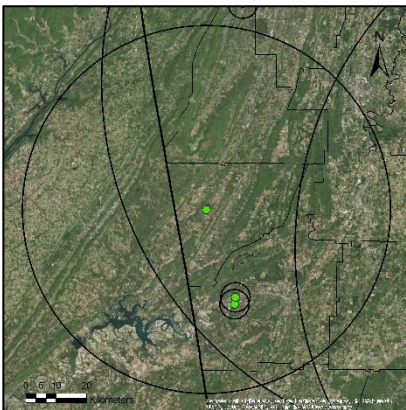
GA AAMP's plans for this site: Continue monitoring; site moved from Maple St. location and historical data can be found with AQS ID 13-295-0002.

# 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

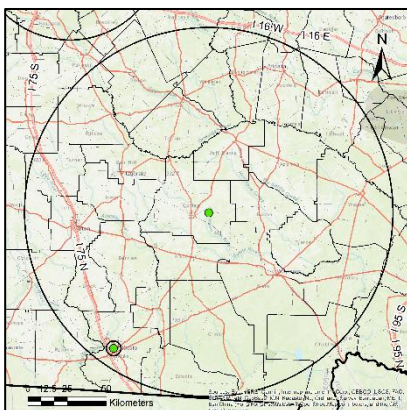
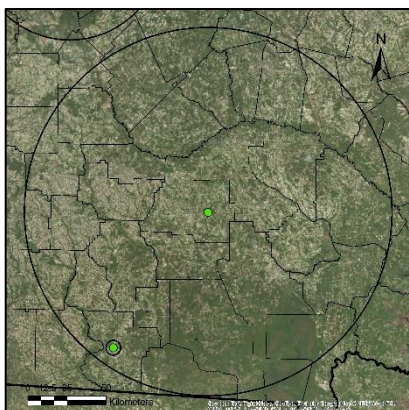
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	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

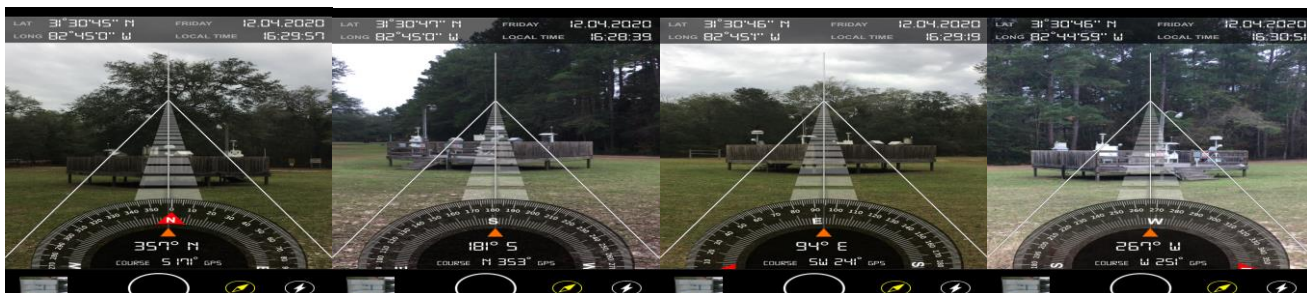
Site History: Established as Air Toxics site

North

South

East

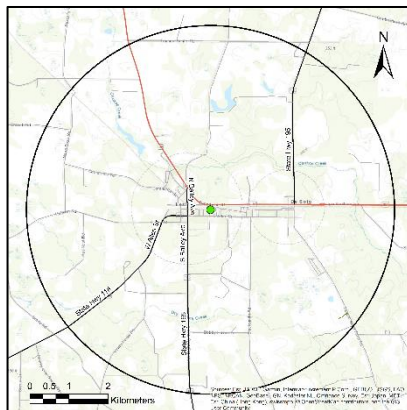
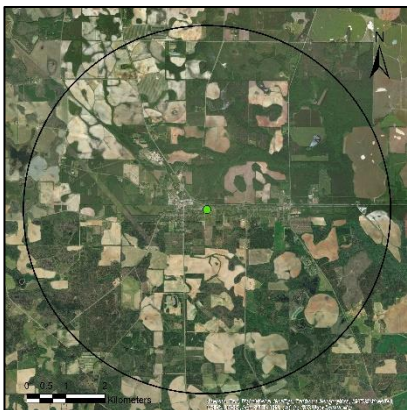
West



Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
PM <sub>2.5</sub> Speciation	General Background	Every 6 days	3.5 m	Regional	3/1/02
PM <sub>2.5</sub>	General Background	Every 3 days	3 m	Regional	2/1/17
Ethylene Oxide	General Background	As needed	3 m	Regional	9/19/19

GA AAMP's plans for this site: Continue monitoring; this site is also being used as part of GA AAMP's ethylene oxide monitoring study.

## 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 O<sub>3</sub> site

North

South

East

West

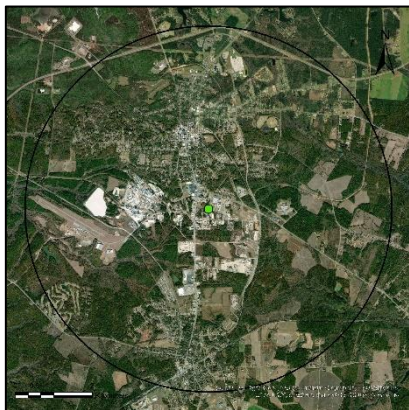


Parameter	Monitoring Objective	Sampling Schedule	Probe Inlet Height	Spatial Scale	Begin Date
O <sub>3</sub>	General/ Background	Continuous (Mar-Oct)	3 m	Neighborhood	1/1/81

GA AAMP's plans for this site: Continue monitoring



## Sandersville



AQS ID: 133030001

Address: 420 Riddleville Road, Sandersville, Washington County, Georgia 31082

Site Established: 1/1/74

Latitude/Longitude: N32.968060/W-82.805903

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 <sub>2.5</sub>	Population Exposure	Continuous	3.1 m	Neighborhood	1/30/99

GA AAMP's plans for this site: Continue monitoring; On August 14, 2019 GA AAMP replaced the FRM with an FEM Teledyne T640 Continuous PM<sub>2.5</sub> sampler. GA AAMP has moved sampling station to ground level due to roof of building replaced (new site location meets siting criteria).

## **Appendix B:**

### **Inventory of Ambient Monitoring Equipment**

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

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
<b>Rome MSA</b>			
Rome	ESC DAS 8832	Datalogger 8832	good/ >7
	Met One SASS	PM2.5 Speciation Sampler	good/ >6
	URG 3000N	PM2.5 Speciation Sampler	good/ >10
	TEOM 1400AB	Continuous PM2.5/PM10 Sampler	good/ >6
<b>Brunswick MSA</b>			
Brunswick	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >6
	Aluma T-135	Meteorological Crank Tower	good/ >10
	EnviroNics 7000	Zero Air Supply	good/ >6
<b>Valdosta MSA</b>			
Valdosta	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >6
	Teledyne T640	Continuous PM2.5 Sampler	new
	ESC DAS 8832	Datalogger	good/<5
<b>Warner Robins MSA</b>			
Warner Robins	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Teledyne T640	Continuous PM Sampler	good/>3
<b>Dalton MSA</b>			
Fort Mountain	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >10
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >6
	Aluma FOT-10	Meteorological Fold Over Tower	good/ >10
<b>Gainesville MSA</b>			
Gainesville	Teledyne T640	Continuous PM Sampler	good/ >3
	ESC DAS 8832	Datalogger	good/ >7
<b>Albany MSA</b>			
Albany	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Thermo Partisol-Plus 2025	Collocated Integrated PM2.5 Sampler	good/ >5
	ESC DAS 8832	Datalogger	good/ >7
	Teledyne T640	Continuous PM Sampler	good/ >1
<b>Athens-Clarke County MSA</b>			
Athens	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	Teledyne T640	Continuous PM Sampler	good/ >2
	Teledyne T640	Collocated Continuous PM Sampler	good/ >1
	ESC DAS 8832	Datalogger	good/ >7
	EnviroNics 7000	Zero Air Supply	good/ >5
<b>Macon MSA</b>			
Macon-Allied	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Thermo Partisol-Plus 2025	Collocated Integrated PM2.5 Sampler	good/ >5
	Met One SASS	PM2.5 Speciation Sampler	good/ >10
	URG 3000N	PM2.5 Speciation Sampler	good/ >10
Macon Forestry	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >10
	Thermo 49 series	O3 Calibrator	good/ >10
	Thermo 43i	SO2 Analyzer	good/ >9
	Thermo 146i	Multi-Gas Calibrator	good/ >10
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Teledyne T640	Continuous PM Sampler	good/ >2



SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Macon-Forestry cont'd	Sulfur Dioxide Cylinder	Gas Cylinder	good/ >9
	Graseby PUF Sampler GPS1-11*	Semi-VOCs (PAH) Sampler	good/ >10
	Graseby High Volume 2000H*	Metals Sampler	good/ >10
	AVOCS*	VOC Sampler	good/ >10
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >10
	Aluma T-135	Meteorological Crank Tower	good/ >10
Columbus Georgia-Alabama MSA			
Columbus - Airport	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >10
	Thermo 49 series	O3 Calibrator	good/ >7
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	TEOM 1400AB	Continuous PM2.5 Sampler	good/ >9
	EnviroNics 7000	Zero Air Supply	good/ >5
Columbus - Baker	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Met One SASS	PM2.5 Speciation Sampler	good/ >7
	URG 3000N	PM2.5 Speciation Sampler	good/ >5
Columbus - Crime Lab	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >7
	Aluma T-135	Meteorological Crank Tower	good/ >10
	RM Young Barometric Pressure Sensor 61302V	Barometric Pressure Sensor	good/ >6
	Novalynx 260-2501 Tipping Bucket	Precipitation Sensor	good/ >6
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >6
	ESC DAS 8832	Datalogger	good/ >7
Savannah MSA			
Savannah - E President	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	Thermo 43i	SO2 Analyzer	good/ >9
	Thermo 146i	Multi-Gas Calibrator	good/ >9
	EnviroNics 7000	Zero Air Supply	good/ >5
	Graseby PUF Sampler GSP1*	Semi-VOCs (PAH) Sampler	good/ >9
	Andersen Hi-VL 2000 HBL*	Metals Sampler	good/ >9
	ATEC 1000*	Carbonyls Sampler	good/ >9
	Sulfur Dioxide Cylinder	Gas Cylinder	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >7
	Aluma T-135	Meteorological Crank Tower	good/ >10
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >6
	RM Young Barometric Pressure Sensor 61302	Barometric Pressure Sensor	good/ >6

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Savannah - L&A	ESC DAS 8832	Datalogger	good/ >7
	Thermo 43i	SO2 Analyzer	good/ >9
	Thermo 146i	Multi-Gas Calibrator	good/ >9
	Teledyne T640	Continuous PM Sampler	good/ >2
	Sulfur Dioxide Cylinder	Gas Cylinder	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >5
	Aluma T-135	Meteorological Crank Tower	good/ >10
	Envionics 7000	Zero Air Supply	good/ >5
Augusta-Richmond County, Georgia-South Carolina MSA			
Evans	Thermo 49 series	O3 Analyzer	good/ >8
	Thermo 49 series	O3 Calibrator	good/ >7
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >10
	Aluma FOT-10	Meteorological Fold Over Tower	good/ >7
	ESC DAS 8832	Datalogger	good/ >7
	Sabio 1001	Zero Air Supply	good/ >5
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >5
Augusta	Sabio 1001	Zero Air Supply	good/ >5
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	Thermo 43i-TLE	SO2 Analyzer	good/ >9
	Thermo 146i	Multi-Gas Calibrator	good/ >9
	TEOM 1400AB	Continuous PM10 Sampler	good/ >9
	Teledyne T640	Continuous PM2.5 Sampler	good/ >3
	Met One SASS	PM2.5 Speciation Sampler	good/ >6
	URG 3000N	PM2.5 Speciation Sampler	good/ >6
	Sulfur Dioxide Cylinder	Gas Cylinder	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >6
	Aluma T-135	Meteorological Crank Tower	good/ >10
	ESC DAS 8832	Datalogger	good/ >7
	Novalynx 260-2501 Tipping Bucket	Precipitation Sensor	good/ >6
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >6
	PM Young Barometric Pressure Sensor 61302	Barometric Pressure Sensor	good/ >6
Atlanta-Sandy Springs-Marietta MSA			
Forest Park	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
Kennesaw	ESC DAS 8832	Datalogger	good/ >6
	Thermo 49 series	O3 Analyzer	good/ >8
	Thermo 49 series	O3 Calibrator	good/ >8
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >4
Dawsonville	Thermo 49 series	O3 Analyzer	good/ >7
	Thermo 49 series	O3 Calibrator	good/ >7
	ESC DAS 8832	Datalogger	good/ >7
	Envionics 7000	Zero Air Supply	good/ >7
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >7
	Aluma FOT-10	Meteorological Fold Over Tower	good/ >10
South DeKalb	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >4
	Thermo 49 series	O3 Calibrator	good/ >5
	Envionics 6103	Multi-Gas Calibrator	good/ >5
	Envionics 6103	Multi-Gas Calibrator	good/ >4
	Themo 42iY	NOy Analyser	good/ >9

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
South DeKalb cont'd	Thermo 42i	NOx Analyzer	good/ >9
	Thermo 48i-TLE	CO Analyzer	good/ >5
	Thermo 43i-TLE	SO2 Analyzer	good/ >5
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Thermo Partisol-Plus 2025	Collocated Integrated PM2.5 Sampler	good/ >5
	Teledyne T640X	Continuous PM Sampler	good/ >3
	Met One SASS	PM2.5 Speciation Sampler	good/ >5
	URG 3000N	PM2.5 Speciation Sampler	good/ >9
	Sabio 1001	Zero Air Supply	good/ >4
	Sabio 1001	Zero Air Supply	good/ >4
	ATEC 8000	Carbonyls Sampler	good/ >5
	ATEC 8000	Collocated Carbonyls Sampler	good/ >5
	Tisch Environmental PUF	Semi-VOCs (PAH) Sampler	good/ >8
	Tisch Environmental PUF	Collocated Semi-VOCs (PAH) Sampler	good/ >8
	ATEC 2200	VOCs Sampler	good/ >9
	ATEC 2200	Collocated VOCs Sampler	good/ >9
	Picarro G2920	Continuous Ethylene Oxide Sampler	new
	Agilent 7890-B GC	Gas Chromatograph	good/ >1
	AirGas Hydrogen Cylinder (4)	Gas Cylinder	good/ >1
	AirGas Helium Cylinder (3)	Gas Cylinder	good/ >1
	NexAir Helium Cylinder	Gas Cylinder	good/ >1
	AirGas Compressed Air (9)	Gas Cylinder	good/ >1
	AirGas Nitrogen Cylinder (2)	Gas Cylinder	good/ >1
	Carbon Monoxide Cylinder	Gas Cylinder	good/ <9
	Nitrogen Oxide Cylinder	Gas Cylinder	good/ <9
	Sulfur Dioxide Cylinder	Gas Cylinder	good/ <9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >6
	Aluma T-135	Meteorological Crank Tower	good/ >10
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >6
	Novalynx 260-2501 Tipping Bucket	Precipitation Sensor	good/ >6
	RM Young Barometric Pressure Sensor 61302	Barometric Pressure Sensor	good/ >6
NR-285	Thermo 42i	NOx Analyzer	good/ >5
	Xonteck 910	VOC Sampler	good/ >5
	EnviroNics 6103	Multi-gas Calibrator	good/ >5
	Nitrogen Oxide Cylinder	Gas Cylinder	good/ >9
	MAAP 5012	Black Carbon Sampler	good/ >4
Douglasville	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >5
	Aluma T-135	Meteorological Crank Tower	good/ >10
	Sabio 1001	Zero Air Supply	good/ >5
	ESC DAS 8832	Datalogger	good/ >6
Fire Station #8	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Tisch TE-Wilbur Filter Based	Integrated PM10 Sampler	good/ >3
	Tisch TE-Wilbur Filter Based	Collocated Integrated PM10 Sampler	good/ >3
United Avenue	ESC DAS 8832	Datalogger	good/ >4
	Thermo 49 series	O3 Analyzer	good/ >7
	Thermo 49 series	O3 Calibrator	good/ >6
	Thermo 43i	SO2 Analyzer	good/ >6
	Thermo 146i	Multi-gas Calibrator	good/ >4



SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
United Avenue cont'd	TEOM 1400AB	Continuous PM2.5 Sampler	good/ >9
	Sulfur Dioxide Cylinder	Gas Cylinder	good/ >9
	Sabio 1001	Zero Air Supply	good/ >5
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >10
	Aluma T-135	Meteorological Crank Tower	good/ >10
NR-GA Tech	ESC DAS 8832	Datalogger	good/ >6
	Thermo 42i	NO2 Analyzer	good/ >5
	Thermo 48i-TLE	CO Analyzer	good/ >9
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	Ambilabs Dual Wavelength Nephelometer	Continuous PM2.5 Sampler	good/ >3
	Carbon Monoxide Cylinder	Gas Cylinder	good/ >9
	Nitrogen Oxide Cylinder	Gas Cylinder	good/ >9
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >6
	Aluma T-135	Meteorological Crank Tower	good/ >6
	EnviroNics 7000	Zero Air Supply	good/ >5
	EnviroNics 6103	Multi-gas Calibrator	good/ >5
	Multi Angle Absorption Photometer (MAAP) 5012	Black Carbon Sampler	good/ >4
Gwinnett Tech	ESC DAS 8832	Datalogger	good/ >6
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	EnviroNics 7000	Zero Air Supply	good/ >4
	Teledyne T640	Continuous PM Sampler	good/ >3
McDonough	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	EnviroNics 7000	Zero Air Supply	good/ >5
	TEOM 1400AB	Continuous PM2.5 Sampler	good/ >9
Conyers	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
	Teledyne 701	Zero Air Supply	good/ >5
	RM Young Ultrasonic Anemometer 81000	Wind Speed and Wind Direction	good/ >6
	Aluma T-135	Meteorological Crank Tower	good/ >10
	Eppley Lab Standard Precision Pyronometer 38380F3	Solar Radiation Instrument	good/ >9
	Eppley Lab TUVB 38020	Ultraviolet Radiometer	good/ >9
	Novalynx 260-2501 Tipping Bucket	Precipitation Sensor	good/ >6
	RM Young Temp/RH Probe 41382VC	Ambient Temperature & Relative Humidity	good/ >6
	RM Young Barometric Pressure Sensor 61302	Barometric Pressure Sensor	good/ >6
Chattanooga Tennessee-Georgia MSA			
Rossville-Williams St.	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >6
	Met One SASS	PM2.5 Speciation Sampler	good/ >6
	URG 3000N	PM2.5 Speciation Sampler	good/ >6
	ESC DAS 8832	Datalogger	good/ >7
	Teledyne T640	Continuous PM2.5 Sampler	good/ >2
Sites Not in an MSA			
Summerville	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >9
	Thermo 49 series	O3 Calibrator	good/ >9
General Coffee	Met One SASS	PM2.5 Speciation Sampler	good/ >5
	URG 3000N	PM2.5 Speciation Sampler	good/ >9

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
General Coffee cont'd	Graseby High Volume 2000H*	Metals Sampler	good/ >10
	Xonteck 911^	VOC Sampler	good/ >8
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >10
Leslie	ESC DAS 8832	Datalogger	good/ >7
	Thermo 49 series	O3 Analyzer	good/ >10
	Thermo 49 series	O3 Calibrator	good/ >10
	EnviroNics 7000	Zero Air Supply	good/ >5
Sandersville	Teledyne T640	Continuous PM Sampler	good/ >3
Georgia AAMP			
Quality Assurance Unit	Alicat Scientific FP-25 (2)	Flow, Temperature & Pressure Standard	good/ >6
	Andersen General Metals Works	High Volume PM10 Orifice	good/ >6
	BGI/MesaLabs DeltaCal (4)	Flow, Temperature & Pressure Standard	good/ >6
	BGI/MesaLabs TetraCal (3)	Flow, Temperature & Pressure Standard	good/ >6
	BGI VRC	Variable High Volume Orifice	good/ >6
	BIOS DC-Lite DCL-H	Flow Standard	good/ >6
	BIOS DC-Lite DCL-L	Flow Standard	good/ >6
	BIOS Definer 220 High Flow	High flow volumetric standardized gas	good/ >6
	BIOS Definer 220 Low Flow	Low flow volumetric standardized gas	good/ >6
	Chinook Engineering Streamline Pro (3)	Flow Transfer Standard	good/ >6
	Dwyer 475-1 FM	Digital Manometer	good/ >6
	Dwyer 475-2-FM	Digital Manometer	good/ >6
	Fisher Scientific 14-648-4 (5)	Stop Watch	good/ >6
	Graseby Graseby GMW	PUF Orifice	good/ >6
	Linde Spectra PAMS Gas Standard	PAMS - Gas Standard	good/ >6
	Mesa Labs Flexcal High Flow	High Flow	good/ >6
	Mesa Labs Flexcal Low Flow	Low Flow	good/ >6
	Scott-Marrin EPA UltraPure Gas Standard	PAMS - EPA UltraPure Gas Standard	good/ >6
	Sensidyne Gilibrator Flow Cell (6)	Flow Standard	good/ >6
	Sensidyne Gilibrator Flow Cell Base (2)	Flow Standard	good/ >6
	Tisch Environmental TE-5028A	High Volume PM10 Orifice	good/ >6
	Tisch Environmental TE-5040A	PUF Orifice	good/ >6
	Vaisala HM40/HM46	Temperature & Relative Humidity Probe	good/ >6
	Vaisala HMI41/HMP46	Temperature & Relative Humidity Probe	good/ >6
	Dwyer 477-1-FM (2)	Digital Manometer	good/ >6
	Dwyer 475-0-FM (3)	Digital Manometer	good/ >6
	Thermo 49i-PS (2)	O3 Standard	good/ >9
	Thermo 49-PS (2)	O3 Standard	good/ >10
	Thermo 146i (2)	Multi-Gas Calibrator	good/ >10
	Praxair/Nexair EPA Protocol Gas Standard (2)	EPA Protocol NO/CO/SO2 Gas Standard	good/ >6
	Airgas EPA Protocol Gas Standard (5)	EPA Protocol NO/NOx/CO/SO2 Gas Standard	good/ >6
	Bosch GLM 80 (2)	Laser Distance/Angle Measurer	good/ >6
	Scott-Marrin EPA Protocol Gas Standard (3)	EPA Protocol NO/CO/SO2 Gas Standard	good/ >6

SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Quality Assurance Unit cont'd	Scott-Marrin EPA Protocol Gas Standard	EPA Protocol NO/NOx/CO/SO2 Gas Standard	good/ >6
Meteorology Unit Workshop	RM Young Ultrasonic Anemometer 810000 (13)	Wind Speed and Wind Direction	Varies
	RM Young Meteorological Translator 26800	Datalogger	good/ >1
	Eppley Lab Standard Precision Pyronometer 38380F3 (5)	Solar Radiation Instrument	Varies
	Eppley Lab TUVB (6)	Ultraviolet Radiometer	Varies
	RM Young Wind Monitor 05305VM (2)	Wind Speed and Wind Direction	good/ >9
	Novalynx 260-2501 Tipping Bucket (8)	Precipitation Sensor	good/ >9
	RM Young Temp/RH Probe 41382VC/ 41382VC (13)	Ambient Temperature & Relative Humidity	good/ >5
	RM Young Barometric Pressure Sensor 61302 (14)	Barometric Pressure	good/ >9
	Aluma T-135 (5)	Meteorological Crank Tower	Varies
Workshop	Met One SASS (7)	PM2.5 Speciation Sampler	good/ >8
	URG 3000N (4)	PM2.5 Speciation Sampler	good/ >5
	Thermo 43i-TLE (3)	SO2 Analyzer	Various
	Thermo 146i (10)	Multi-Gas Calibrator	Various
	Thermo 42i (5)	NO, NO2, NOx Analyzer	Various
	EnviroNics 6103 (3)	Multi-Gas Calibrator	good/ >4
	Thermo 48i-TLE (6)	CO Analyzer	Various
	Thermo 42iY	NOy Analyzer	good/ >8
	Thermo 43i (4)	SO2 Analyzer	Various
	Sabio 1001 (2)	Zero Air Supply	good/ >5
	Teledyne T701H (2)	Zero Air Supply	Various
	EnviroNics 7000 (6)	Zero Air Supply	good/ >4
	Teledyne T640 (3)	Continuous PM Sampler	good/ >3
	Teledyne T640X	Continuous PM Sampler	good/ >3
	Met One E-SEQ-FRM (5)	Integrated PM Sampler	Various
	Thermo 42C (2)	NO/NO2/NOx Analyzer	Various
	Thermo 49i-PS (5)	O3 Calibrator	Various
	Thermo 49i (2)	O3 Analyzer	Various
	Thermo 49C-PS (5)	O3 Calibrator	Various
	Thermo 49C (2)	O3 Analyzer	Various
	Thermo Partisol-Plus 2025 (13)	Integrated PM2.5 Sampler	Various
	TEOM 1400AB (3)	Continuous PM2.5 Sampler	good/ >8
	Agilaire 8872 (2)	Datalogger	Various
	ATEC 2200-iP (6)	VOCs Sampler	good/ >8
	ATEC 2200-iC (3)	VOCs Sampler	good/ >8
	ATEC 8000 (5)	Carbonyls Sampler	Various
	Agilaire 8832 (7)	Datalogger	Various
	Thermo 49i QPS (7)	Primary O3 Standard	good/ >3
	Thermo 49i-PS, Thermo 49i	O3 Bench Calibrator and Sampler	good/ >8
	Thermo 146iQ	Multi-Gas Calibrator	good/ >2
	Xonteck 911 (2)	Canister Sampler	good/ >5
	Tisch Wilbur	PM10 Sampler	good/ >3
	Alicat Scientific FP-25 (6)	Flow, Temperature & Pressure Standard	Various
	Alicat Whisper	Flow, Temperature & Pressure Standard	Various
	BGI/MesaLabs TetraCal (17)	Flow, Temperature & Pressure Standard	Various



SITE NAME	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	COND./ AGE
Workshop cont'd	BGI/MesaLabs DeltaCal (22)	Flow, Temperature & Pressure Standard	Various
	Tisch Environmental TE-5028A VRC (10)	Variable High Volume Orifice	Various
	Tisch Environmental TE-5040A (11)	PUF Orifice	Various
	Sensidyne Gilibrator Flow Cell Base (17)	Flow Standard	Various
	Sensidyne Gilibrator Flow Cell (51)	Flow Standard	Various
	AirGas Hydrogen Cylinder (2)	Gas Cylinder	good/ >1
	Carbon Monoxide Cylinder(2)	Gas Cylinder	good/ >9
	Nitrogen Oxide Cylinder	Gas Cylinder	good/ >9
	Sulfur Dioxide Cylinder (3)	Gas Cylinder	good/ >9
	ESC DAS 8832	Datalogger	good/ >6
	Thermo 43i	SO2 Analyzer	good/ >6
	Thermo 146i	Multi-Gas Calibrator	good/ >6
	Sulfur Dioxide Cylinder	Gas Cylinder	good/ <9
	RM Young Ultrasonic Anemometer 810000	Wind Speed and Wind Direction	good/ >3
	Aluma T-135	Meteorological Crank Tower	good/ >3
	EnviroNics 7000	Zero Air Supply	good/ >5
	TSP High Volume 2000H	Metals-Pb (lead) Sampler	good/ >10
	TSP High Volume 2000H	Collocated Metals-Pb (lead) Sampler	good/ >10
	Thermo Partisol-Plus 2025	Integrated PM2.5 Sampler	good/ >5
	TSP High Volume 2000H	TSP-Pb (lead) Sampler	good/ >10
	Compressed Air Mix	Gas Cylinder	good/ >9

**NOTE:****COND = Condition****\* = Not currently in use****Age = age in years****^ = Used for Data Study**

## **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: PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>coarse</sub> (10-2.5). PM<sub>10</sub> is particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (µm). PM<sub>2.5</sub> 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<sub>2.5</sub> is also referred to as "fine" particles. PM<sub>10-2.5</sub> is called PM<sub>coarse</sub>. The PM<sub>coarse</sub> 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  $\mu\text{m}$  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 (PM<sub>10</sub>) Integrated**

GA AAMP conducts PM<sub>10</sub> monitoring on an integrated basis at one site in Georgia. GA AAMP uses an EPA-approved method. The Tisch – TE Wilbur Filter Based PM<sub>10</sub> Air Sampler functions to collect airborne particulate matter  $\leq 10\mu\text{m}$  (PM<sub>10</sub>) 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 InterMountain Laboratory (a division of Pace Analytical Services LLC) for gravimetric analysis and measurement of PM<sub>10</sub> 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 PM<sub>10</sub> 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 (PM<sub>10</sub>) Continuous**

GA AAMP conducts PM<sub>10</sub> 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 PM<sub>10</sub> 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 PM<sub>10</sub> inlet first, then, if sampling for PM<sub>2.5</sub> 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<sub>10</sub> 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<sub>2.5</sub>, and the T640x Option measures PM<sub>2.5</sub>, PM<sub>10</sub>, and PM<sub>10-2.5</sub>. 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<sub>10</sub> monitor is configurable as a PM<sub>10</sub> FEM (EQPM-0516-239), and the data is used to determine attainment of the PM<sub>10</sub> 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<sub>2.5</sub>) Integrated**

At sites where GA AAMP collects PM<sub>2.5</sub> samples on an integrated basis, the samples are measured using very similar techniques utilized for measuring PM<sub>10</sub>. The official federal reference method (FRM) requires that samples are collected on Teflon™ filters with a PM<sub>2.5</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> FRM monitors, the Met One sequential filter-based PM<sub>2.5</sub> FRM monitors (RFPS-0717-245) will be used as the replacement. The sampling frequency for integrated PM<sub>2.5</sub> 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<sub>2.5</sub> samplers.

### **d. Fine Particulate Matter (PM<sub>2.5</sub>) Continuous**

GA AAMP monitors for PM<sub>2.5</sub> on a continuous basis with three different methods. One method 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<sub>2.5</sub> NAAQS. As of November 2018, GA AAMP began to shut down PM<sub>2.5</sub> FRMs (filter based) monitors where collocated with the continuous PM<sub>2.5</sub> FEM Teledyne T640 monitors, depending federal siting requirements.

Another PM<sub>2.5</sub> continuous collection method utilized by GA AAMP is the Thermo Scientific tapered element oscillating microbalance (TEOM) Series 1400/1400a monitors is used. These monitors use an inline PM<sub>2.5</sub> 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<sub>2.5</sub> 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.

The other type of continuous PM<sub>2.5</sub> monitor that GA AAMP uses is the Ambilabs Nephelometer, which 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.

All three types of continuous PM<sub>2.5</sub> 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<sub>2.5</sub>) 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<sub>10-2.5</sub>)**

As part of the NCore requirements (discussed in Section 4.1), the South DeKalb site (13-089-0002) began PM<sub>10-2.5</sub> sampling as of January 1, 2011. The Teledyne T640x PM<sub>10-2.5</sub> is the current system

used to measure coarse particulate matter. The Teledyne T640/640x is a real-time, continuous PM mass monitor that uses scattered light spectrometry for measurement. The T640x Option measures PM<sub>2.5</sub>, PM<sub>10</sub>, and PM<sub>10-2.5</sub>. 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<sub>10-2.5</sub> 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.

The sampling frequency of the integrated (FRM), continuous (Teledyne, TEOM, Nephelometer), and speciated PM<sub>2.5</sub> samplers is detailed in Table 1, and the attached Appendix A. The PM<sub>2.5</sub> samplers highlighted in yellow are the PM<sub>2.5</sub> samplers that are used for comparison to the NAAQS for attainment purposes.

Site ID	Common Name	City	County	Integrated	Continuous	Speciation
<b>Rome MSA</b>						
131150003	Rome	Rome	Floyd		PM <sub>2.5</sub>	6 Day
<b>Brunswick MSA</b>						
131270006	Brunswick	Brunswick	Glynn	PM <sub>2.5</sub> (3 Day)		
<b>Valdosta MSA</b>						
131850003	Valdosta	Valdosta	Lowndes	PM <sub>2.5</sub> (3 Day)	FEM PM <sub>2.5</sub>	
<b>Warner Robins MSA</b>						
131530001	Warner Robins	Warner Robins	Houston	PM <sub>2.5</sub> (3 Day)	FEM PM <sub>2.5</sub>	
<b>Albany MSA</b>						
130950007	Albany	Albany	Dougherty	2 PM <sub>2.5</sub> (3 Day, 12 Day)	FEM PM <sub>2.5</sub>	
<b>Gainesville MSA</b>						
131390003	Gainesville	Gainesville	Hall		FEM PM <sub>2.5</sub>	
<b>Athens-Clarke County MSA</b>						
130590002	Athens	Athens	Clarke		2 FEM PM <sub>2.5</sub>	
<b>Macon MSA</b>						
130210007	Macon-Allied	Macon	Bibb	2 PM <sub>2.5</sub> (3 Day, 12 Day)		6 Day
130210012	Macon-Forestry	Macon	Bibb	PM <sub>2.5</sub> (3 Day)	FEM PM <sub>2.5</sub>	
<b>Columbus, Georgia- Alabama MSA</b>						
132150008	Columbus-Airport	Columbus	Muscogee	PM <sub>2.5</sub> (3 Day)	PM <sub>2.5</sub>	
132150012	Columbus-Baker	Columbus	Muscogee	PM <sub>2.5</sub> (3 Day)		6 Day
<b>Savannah MSA</b>						
130511002	Savannah-L&A	Savannah	Chatham		FEM PM <sub>2.5</sub>	
<b>Augusta, Georgia-South Carolina MSA</b>						
132450091	Bungalow Road	Augusta	Richmond		FEM PM <sub>2.5</sub>	6 Day
<b>Atlanta-Sandy Springs-Marietta MSA</b>						
130630091	Forest Park	Forest Park	Clayton	PM <sub>2.5</sub> (3 Day)		
130670003	Kennesaw	Kennesaw	Cobb	PM <sub>2.5</sub> (3 Day)		

130890002	South DeKalb	Decatur	DeKalb	2 PM <sub>2.5</sub> (3 Day, 3 Day)	FEM PM <sub>2.5</sub>	3 Day
131210039	Fire Station #8	Atlanta	Fulton	PM <sub>2.5</sub> (3 Day)		
131210055	United Ave.	Atlanta	Fulton		PM <sub>2.5</sub>	
131210056	NR-Georgia Tech	Atlanta	Fulton	PM <sub>2.5</sub> (3 Day)	PM <sub>2.5</sub>	
131350002	Gwinnett Tech	Lawrenceville	Gwinnett		FEM PM <sub>2.5</sub>	
131510002	McDonough	McDonough	Henry		PM <sub>2.5</sub>	
<b>Chattanooga, Tennessee-Georgia MSA</b>						
132950004	Rossville-Williams St.	Rossville	Walker	PM <sub>2.5</sub> (3 Day)	FEM PM <sub>2.5</sub>	6 Day
<b>Not in an MSA</b>						
130690002	General Coffee	Douglas	Coffee	PM <sub>2.5</sub> (3 Day)		6 Day
133030001	Sandersville	Sandersville	Washington		FEM PM <sub>2.5</sub>	

Highlighted samplers used for comparison to NAAQS

**Table 1: PM<sub>2.5</sub> 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/m<sup>3</sup>) 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 (N<sub>2</sub>). 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 N<sub>2</sub> 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 (O<sub>3</sub>)

Ozone (O<sub>3</sub>) 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 1<sup>st</sup> through October 31<sup>st</sup>, 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 (SO<sub>2</sub>)**

Sulfur dioxide (SO<sub>2</sub>) 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 SO<sub>2</sub> 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 SO<sub>2</sub> exposure. Commercially important plants sensitive to SO<sub>2</sub> 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 SO<sub>2</sub> 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 (Å) to pass into the fluorescence chamber. SO<sub>2</sub> absorbs light in this region without any quenching by air or most other molecules found in polluted air. The SO<sub>2</sub> 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 SO<sub>2</sub> in the sample stream being analyzed. The sampler outputs the SO<sub>2</sub> 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<sub>x</sub>)**

Several gaseous oxides of nitrogen (NO<sub>x</sub>) are normally found in the atmosphere, including nitrous oxide (N<sub>2</sub>O), nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). 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 NO<sub>2</sub>.

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, NO<sub>2</sub> 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 NO<sub>2</sub> emissions and daytime ozone problems will often have virtually zero ozone present at night. Yet the next morning, the store of unreacted NO<sub>2</sub> 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 NO<sub>2</sub> 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<sub>2</sub>, 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<sub>2</sub> can react with moisture in the air to produce nitric acid, which corrodes metal surfaces and contributes to acid rain. High concentrations of NO<sub>2</sub> may reduce visibility.

Oxides of nitrogen, particularly NO<sub>2</sub>, are monitored using specialized analyzers that continuously measure the concentration of oxides of nitrogen in ambient air using the ozone-phase chemiluminescent method. GA AAMP operates a Thermo Environmental Model 42i Chemiluminescence NO-NO<sub>2</sub>-NO<sub>x</sub> Analyzer (EPA Automated Equivalent Method RFNA-1289-074). Nitric oxide (NO) and ozone (O<sub>3</sub>) react to produce a characteristic luminescence with intensity linearly proportional to the NO concentration. Infrared light emission results when electronically excited NO<sub>2</sub> molecules decay to lower energy states. NO<sub>2</sub> must first be converted to NO before it can be measured using the chemiluminescent reaction. NO<sub>2</sub> is converted to NO by a molybdenum NO<sub>2</sub>-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<sub>2</sub>-to-NO converter and then to the reaction chamber (NO<sub>x</sub> 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<sub>2</sub> molecules. A photomultiplier tube housed in a thermoelectric cooler detects the NO<sub>2</sub> luminescence. The NO and NO<sub>2</sub> concentrations calculated in the NO and NO<sub>x</sub> modes are stored in memory, and the difference between the concentrations are used to calculate the NO<sub>2</sub>

concentration. The sampler outputs NO, NO<sub>2</sub>, and NO<sub>x</sub> 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<sub>x</sub> analyzers measure NO, NO<sub>2</sub>, and NO<sub>x</sub>. NO<sub>y</sub> analyzers measure NO and NO<sub>y</sub>, but cannot measure NO<sub>2</sub>. The NO<sub>y</sub> 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<sub>2</sub> is regulated under the NAAQS. Therefore, only the NO<sub>x</sub> 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.

## **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, SO<sub>2</sub>, NO<sub>2</sub> and CO). Lead is monitored as a trace metal in the National Air Toxics Trends Station (NATTS), and with the PM<sub>2.5</sub> speciation samplers. The NATTS lead is sampled using a PM<sub>10</sub> sampler, and particles are sampled up to 10 microns in size. With the PM<sub>2.5</sub> speciation sampler, samples are collected that include particles up to 2.5 microns in size. These sampling techniques collect 24-hour samples on pre-weighed filters, have samples sent to a laboratory for analysis, and are analyzed using inductively coupled plasma mass spectroscopy (commonly known as ICP-MS). On a semi-annual basis, GA AAMP's Quality Assurance Unit audits these samplers.

## **7.0 Metals**

A sub-group of the National Air Toxics Trends data includes the metals group, which encompass compounds such as cadmium, mercury, chromium and lead. These 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 PM<sub>10</sub> 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 samplers run once every six days following a pre-established schedule that corresponds to a nationwide sampling schedule. On the sixth day the sampler runs midnight to midnight and takes a 24-hour composite sample. 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. GA AAMP plans to replace both the primary and collocated NATTS high-volume PM<sub>10</sub> metals samplers with low-volume PM<sub>10</sub> metals samplers when the GA EPD Laboratory is able to process these samples. GA AAMP will use the Met One single channel sampler set up for PM<sub>10</sub>, collecting samples on 47 mm diameter Teflon™ filters, with a volumetric flow rate of 16.7 liters per minute. The NATTS PM<sub>10</sub> 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 NO<sub>2</sub> 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 five different types of samplers. Three types of collection method use a passivated inert stainless steel canister: ATEC 2200, Xonteck 910/911, and Entech. For the ATEC and Xonteck, the 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 5 psig. For the ethylene oxide study, Entech passive subambient samplers are used. The canister is evacuated to a near-perfect vacuum and attached to the sampler controlled by a timer. The solenoid is opened

on the passive sampler via the timer and fills the canister with ambient air until about 2 to 4 inches of vacuum are left. All three of these samplers collect a sample for a representative 24-hour period, and the samples are analyzed using a gas chromatograph with mass spectroscopy detection (GC/MS), using EPA compendium method TO15, by the GA EPD laboratory or the Eastern Research Group (ERG), as applicable. The South DeKalb site uses the ATEC 2200 to collect VOCs as part of the National Air Toxics Trends Station. These VOCs samplers are subjected to quarterly checks and are audited by GA AAMP's Quality Assurance Unit twice per year.

The fourth VOCs sampler is a Picarro G2920 sampler, which uses cavity ring-down spectroscopy (CRDS) for continuous hourly ethylene oxide measurements. This sampler was installed at the South DeKalb site as part of the Community Scale Air Toxics Monitoring Grant. The Picarro G2920 is capable of measuring levels less than 100 parts per trillion. The Picarro G2920 will be checked by verifying the linearity of the ethylene oxide response in the sampler.

The fifth type of sampler used for VOCs collection and analysis is with the Photochemical Assessment Monitoring Station (PAMS) network in which VOCs are collected and analyzed on-site with a gas chromatograph/flame ionization detector (GC/FID). The South DeKalb site is the GA AAMP's PAMS site. During June, July, and August, the PAMS VOCs samples are collected continuously on an hourly basis. The VOCs sampler in the PAMS network is subjected to checks and audited during the PAMS season (June, July and August).

## 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.

## 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, as part of the NATTS network, 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 <sub>10</sub>	9/26/06	N/A
130893001	Tucker	Ozone	10/31/06	N/A
130090001	Milledgeville-Airport	SO <sub>2</sub>	12/31/06	2009
130893001	Tucker	PAMS VOCs, NO/NO <sub>x</sub> /NO <sub>y</sub> /NO <sub>2</sub>	1/7/07	N/A
131110091	McCaysville	SO <sub>2</sub>	10/2/07	2007
131210001	Fulton Co Health Dept	PM <sub>10</sub>	9/1/08	2008
130970003	Douglasville-Beulah Pump Station	PM <sub>10</sub>	9/1/08	2008
132550002	Griffin-Spalding County	PM <sub>10</sub>	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 <sub>2.5</sub>	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 <sub>2.5</sub>	12/1/08	2008
131150005	Rome	PM <sub>2.5</sub> FRM, PM <sub>10</sub> , PM <sub>2.5</sub> speciation	Consolidated with 131150003 3/09	2008
131210048	Georgia Tech	SO <sub>2</sub> , NO, NO <sub>2</sub> , NO <sub>x</sub>	4/30/09	2011
130150003	Cartersville	Wind Speed, Wind Dir	12/31/11	2011
130730001	Evans	NO <sub>y</sub>	7/28/2008	2012
130210013	Macon-Lake Tobesofkee	NO <sub>y</sub> , O <sub>3</sub>	10/31/2008	2012
131270006	Brunswick	SO <sub>2</sub>	12/31/12	2012
132150008	Columbus -Airport	SO <sub>2</sub>	12/31/12	2012
130510017	Savannah-Market St.	PM <sub>2.5</sub> FRM	12/31/12	2012
132450005	Augusta-Medical College	PM <sub>2.5</sub> FRM	12/31/12	2012
131210032	Atlanta-E. Rivers School	PM <sub>2.5</sub> FRM, PM <sub>10</sub>	12/31/12	2012
130892001	Doraville Health Center	PM <sub>2.5</sub> FRM	12/31/12	2012
130670004	Powder Springs-Maclang Aquatic Ctr.	PM <sub>2.5</sub> FRM	12/31/12	2012
130210007	Allied	PM <sub>10</sub>	12/31/12	2012
130510014	Savannah-Shuman Middle	PM <sub>10</sub>	12/31/12	2012
130550001	Summerville-Fish Hatchery	PM <sub>10</sub>	12/31/12	2012
130892001	Doraville Health Center	PM <sub>10</sub>	12/31/12	2012
130950007	Albany	PM <sub>10</sub>	12/31/12	2012
131150003	Rome	PM <sub>10</sub>	12/31/12	2012
131210048	Georgia Tech	PM <sub>10</sub>	12/31/12	2012
131270004	Brunswick-Arco Pump	PM <sub>10</sub>	12/31/12	2012

	Station			
132150011	Columbus-Cusseta Road	PM <sub>10</sub>	12/31/12	2012
133030001	Sandersville	PM <sub>10</sub>	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 <sub>2.5</sub> Speciation	1/24/15	2014
132230003	Yorkville	Continuous Gas Chromatograph	8/31/15	2015
132230003	Yorkville	6-Day PAMs, NO/NO <sub>2</sub> /NO <sub>x</sub> , CO	12/31/15	2015
130850001	Dawsonville	Air Toxics/Carbonyls	12/31/15	2015
132470001	Conyers	6-Day PAMs, NO/NO <sub>2</sub> /NO <sub>x</sub>	12/31/15	2015
130890003	NR-285	Lead	6/30/16	2016
130890002	South DeKalb	Black carbon	12/31/16	2016
133190001	Gordon	PM <sub>2.5</sub> FRM	12/31/16	2016
132230003	Yorkville	O <sub>3</sub>	12/31/16	2016
132230003	Yorkville	PM <sub>2.5</sub> FRM, Continuous PM <sub>2.5</sub> , 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 <sub>2</sub>	12/31/16	2017
132450091	Augusta	Integrated PM <sub>10</sub>	3/31/18	2017
130770002	Newnan	O <sub>3</sub> , PM <sub>2.5</sub> , Wind Direction, Wind Speed	11/15/17	2018
132150010	Columbus-Joy Rd	Lead	6/30/18	2018
132450091	Augusta	PM <sub>2.5</sub> FRM	10/31/18	2018
131390003	Gainesville	PM <sub>2.5</sub> FRM	10/31/18	2018
131350002	Gwinnett Tech	PM <sub>2.5</sub> FRM	10/31/18	2018
130210012	Macon-Forestry	Air Toxics	12/31/18	2018
130510021	Savannah-E. President's Street	Air Toxics	12/31/18	2018
130690002	General Coffee	Air Toxics	12/31/18	2018
130590002	Athens	PM <sub>2.5</sub> FRM	3/31/19	2018
130510091	Savannah-Mercer	PM <sub>2.5</sub> FRM	6/30/19	2019
133030001	Sandersville	PM <sub>2.5</sub> FRM	8/15/19	2019
131150006	Rome-Kraftsman	SO <sub>2</sub> , Wind Speed, Wind Direction	12/31/2020	2020
132150009	Columbus-Allied	Lead	12/31/2020	2020
132150011	Columbus-Cusseta	PM <sub>2.5</sub> FRM, Lead	7/30/2020	2020
132150001	Columbus-Health Department	PM <sub>2.5</sub> FRM	12/31/2020	2020
132950002	Rossville-Maple St.	PM <sub>2.5</sub> FRM, PM <sub>2.5</sub> Continuous, PM <sub>2.5</sub> Speciation	7/30/2020	2020

## **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 (PM<sub>10</sub>), particles of an aerodynamic diameter of 2.5 micrometers and less (PM<sub>2.5</sub>), 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)<sup>1</sup>.

**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)<sup>1</sup> 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.”<sup>1</sup>

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...”<sup>1</sup> 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 15<sup>th</sup>, 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:

GA EPD APB     DeAnna G. Oser  
GAEPD APB Ambient Monitoring Program  
4244 International Parkway, Suite 120  
Atlanta, GA 30354

[DeAnna.Oser@dnr.ga.gov](mailto:DeAnna.Oser@dnr.ga.gov)

Voice: (404) 363-7004

FAX: (404) 363-7100

CHCAPCB     Robert Colby  
CHCAPCB  
6125 Preservation Dr  
Chattanooga, Tn 37416

[bcolby@chattanooga.gov](mailto:bcolby@chattanooga.gov)

Voice: (423) 643-5999

FAX: (423) 643-5972

## 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: \_\_\_\_\_

DATE: \_\_\_\_\_

*R. H. E. J.*  
*DIRECTOR*  
*1/24/18*

**Chattanooga-Hamilton County Air Pollution Bureau (CHCAPCB)**

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

*Robert H. E. J.*  
*Director*  
*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 PM<sub>10</sub>, PM<sub>2.5</sub>, 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 PM<sub>10</sub>, PM<sub>2.5</sub>, 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 PM<sub>10</sub>, PM<sub>2.5</sub>, 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

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

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

## **VII. MODIFICATION/DURATION/TERMINATION**

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

## **VIII. REFERENCE**

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



**IX. APPROVALS**

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

BY: TITLE: DirectorDATE: 2/21/17

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

BY: TITLE: Bureau ChiefDATE: 03/01/17

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

  
Francine Miller  
DHEC Contracts Manager

DATE: 3-6-17

## **Appendix F: Comments**

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

