

**State of Alabama
Ambient Air Monitoring
2020 Network Plan**

May 26, 2020



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Definitions and Acronyms

AAQM	Ambient Air Quality Monitoring
AAQMP	Ambient Air Quality Monitoring Plan
ADEM	Alabama Department of Environmental Management
ARM	Approved Regional Method
AQS	Air Quality System
avg	average
CBSA	Core Based Statistical Area
CFR	<i>Code of Federal Regulations</i>
CO	Carbon Monoxide
CSA	Combined Statistical Area
CSN	Chemical Speciation Network
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
HDNREM	Huntsville Division of Natural Resources and Environmental Management
hr	hour
hi-vol	high-volume sampler
JCDH	Jefferson County Department of Health
low-vol	low-volume particulate sampler
m ³	cubic meter
min	minute
ml	milliliter
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NCore	National Core multipollutant monitoring station
O ₃	ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	lead
PM	particulate matter
PM _{2.5}	particulate matter ≤ 2.5 micrometers diameter
PM ₁₀	particulate matter ≤ 10 micrometers diameter
PQAO	primary quality assurance organization
PSD	Prevention of Significant Deterioration
PWEI	Population Weighted Emissions Index
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SLAMS	State or Local Air Monitoring Station
SO ₂	Sulfur Dioxide
SPM	Special Purpose Monitor
STN (PM _{2.5})	Speciation Trends Network
tpy	tons per year
TSP	Total Suspended Particulate
URG	URG-3000N PM _{2.5} Speciation monitoring carbon-specific sampler
° C	degree Celsius
µg/m ³	micrograms (of pollutant) per cubic meter (of air sampled)
µSA	Micropolitan Statistical Area
≥	greater than or equal to
>	greater than
≤	less than or equal to
<	less than

Introduction

In October 2006, the United States Environmental Protection Agency (EPA) issued final Federal Regulations (40 CFR Part 58) concerning state and local agency ambient air monitoring networks. These regulations require states to submit an annual monitoring network review to EPA. This document provides the framework for establishment and maintenance of Alabama's air quality surveillance system, lists changes that occurred during 2019/2020, and changes proposed to take place to the current ambient air monitoring network during 2020/2021.

Public Review and Comment

The annual monitoring network review must be made available for public inspection for thirty (30) days prior to submission to EPA. For 2020, this document was placed on ADEM's website on 05/28/2020 to begin a 30-day public review period. This document can be accessed at the following link:

<http://www.adem.state.al.us/newsEvents/publicNotices.cnt>

Or by contacting:

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Overview of Alabama's Air Monitoring Network

Ambient air monitors in the state of Alabama are operated for a variety of monitoring objectives. These objectives include determining whether areas of the state meet the National Ambient Air Quality Standards (NAAQS), to provide public information such as participation in EPA's AirNow program, Air Quality Index (AQI) reporting for larger Metropolitan Statistical Areas (MSAs), for use in Air Quality models, and to provide data to Air Quality Researchers. Entities in Alabama monitor all six (6) criteria pollutants which have NAAQS identified for them: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO₂), Ozone (O₃), particulate matter (PM₁₀, PM_{2.5}), and Sulfur Dioxide (SO₂). PM_{2.5} speciated compounds, a non-criteria pollutant, is also monitored for special purposes. In addition, meteorological data may also be collected to support air monitoring and aid in analysis of the ambient air monitoring data.

In Alabama, the air quality surveillance system is operated by three separate entities: the Alabama Department of Environmental Management (ADEM), and two local agencies, the Jefferson County Department of Health (JCDH), and the Huntsville Department of Natural Resources and Environmental Management (HDNREM). Each agency is responsible for its own annual network plan. This document reflects only the ADEM air quality surveillance system. An overview of the 2020 ADEM Monitoring Network can be found in Table 1.

The JCDH plan will be available for review on their website by following this link. <https://jcdh.org/SitePages/Misc/AirProgReports.aspx>

The HDNREM plan will be available for review on their website by following this link. <https://www.huntsvilleal.gov/environment/air-quality/>

Currently, the Air Quality Index (AQI) is reported for Huntsville, Birmingham, Mobile, Montgomery and Phenix City on the Internet at the sites listed below.

ADEM	http://www.adem.state.al.us/programs/air/airquality/ozone/historical.cnt
JCDH	https://jcdh.org/SitePages/Programs-Services/EnvironmentalHealth/Air-RadiationProtectionDivision/AirQualForecast.aspx
HDNREM	https://www.huntsvilleal.gov/environment/air-quality/air-pollution-control-program/air-quality-daily-index-reports/

Summary of adjustments and proposals for the ADEM AAQMP

Summary of changes in 2019/2020

- **Decatur, AQS ID 01-103-0011**, an API T-640 was to replace the existing BAM-1020 for continuous PM_{2.5} monitoring in March 2020, upon installation of the new air monitoring shelter. The shelter manufacturer is located in Ohio. Shelter construction and delivery has been delayed due to Ohio's COVID-19 shelter in place order. Installation of the shelter and change of equipment is anticipated by the end of June 2020.
- **Dothan (Civic Center), AQS ID 01-069-0003**, As approved in the previous network plan, PM_{2.5} monitoring was discontinued at this site on December 31, 2019.
- **Dothan, AQS ID 01-069-0004**, As approved in the previous network plan, O₃ monitoring was discontinued at this site at the end of the season on October 31, 2019.
- **Muscle Shoals, AQS ID 01-033-1002**, As approved in the previous network plan, all monitoring was discontinued and the site was shut-down. Ozone monitoring was discontinued at the end of the season on October 31, 2019. PM_{2.5} monitoring was discontinued early with EPA approval on August 4, 2019, due to damage from electrical storms.
- **Troy Lead, AQS ID 01-109-0003**, analysis method of the Hi-Vol TSP Pb samples changed from flameless atomic absorption, method code 044 to ICP-MS, method code 813, on June 27, 2019.
- All continuous gas analyzer inlets in ADEM's Ambient Air Quality Monitoring Program were replaced with CAS inlets.

Summary of proposed changes for 2020/2021

- **Phenix City – South Girard School, AQS ID 01-113-0003**, PM_{2.5} monitoring is currently performed by two local FRM samplers, primary and collocated, that both collect on a 1 in 3 day schedule and a continuous BAM-1022 monitor. On January 1, 2021, the continuous PM_{2.5} BAM-1022 SPM will be designated as the primary PM_{2.5} SLAMS monitor. To meet collocation requirements for the method, the current collocated local FRM sampler will continue to operate but reduce its collection frequency from 1 in 3 day to a 1 in 6 day schedule. The current primary local FRM sampler will be discontinued on 12/31/2020 and removed from the site.
- **VA, Tuscaloosa, AQS ID 01-125-0004**, PM_{2.5} monitoring is currently performed by one local FRM sampler at this site. On January 1, 2021, to meet collocation requirements of FRM sampling, a second local FRM collocated sampler will begin operations on a 1 in 6 day schedule.
- **Ward, Sumter Co., AQS ID 01-119-0003**, On January 1, 2021, the BAM-1022 will replace the BAM-1020 for continuous PM_{2.5} monitoring. As this monitor will be the second continuous FEM monitor in the network, no collocation of a FRM is required at this site.
- **Duncanville, Tuscaloosa, AQS ID 01-125-0010**, This ozone site is scheduled to receive a new shelter in 2021. No changes to air monitoring at the site are requested.

Table 1 2020 ADEM Ambient Air Monitoring Network

ADEM Site Common Name	AQS ID	Ozone	PM2.5 Local	PM 2.5 Local Collocated	PM2.5 Speciation	PM2.5 Continuous	PM10 Lo-Vol	PM10 Lo-Vol Collocated	Lead TSP	Lead TSP Collocated	SO2
Fairhope	01-003-0010	X	X								
Ashland	01-027-0001		X								
Crossville	01-049-1003		X								
Wetumpka Westside Technology	01-051-0004	X									
Gadsden C College	01-055-0010		X								
Southside	01-055-0011	X									
Chickasaw	01-097-0003	X	X			X					X
Bay Road	01-097-2005	X									
MOMS, ADEM	01-101-1002	X	X	X		X	X	X			
Decatur	01-103-0011	X	X			X					
Troy Lead	01-109-0003								X	X	
Phenix City - South Girard School	01-113-0003	X	X	X ¹	X	X ²					
Helena	01-117-0004	X									
Lhoist, Montevallo Plant (DRR)	01-117-9001										X
Ward, Sumter Co.	01-119-0003	X				X ⁴					X
VA, Tuscaloosa	01-125-0004		X	X ³							
Duncanville, Tuscaloosa	01-125-0010	X									
1. PCG25 - Proposed to be discontinued 12/31/2020											
2. PCG BAM 1022 – Proposed to be primary monitor 1/1/2021											
3. TSV25C0 – Proposed to begin 1/1/2021											
4. WRD BAM1022 – Proposed to be FEM beginning 1/1/2021											

Network Plan Description

As per 40 CFR Part 58.10, an annual monitoring network plan which provides for the establishment and maintenance of an air quality surveillance system consisting of the air quality monitors in the state is required to be submitted by all states to EPA.

Specifically §58.10 (a) requires for each existing and proposed monitoring site:

1. A statement of purpose for each monitor.
2. Evidence that siting and operation of each monitor meets the requirements of Appendices A, C, D, and E of 40 CFR Part 58, where applicable.
3. §58.10 (b) requires the plan contain the following information for each existing and proposed site:
 - a. The Air Quality System (AQS) site identification number.
 - b. The location, including street address and geographical coordinates.
 - c. The sampling and analysis method(s) for each measured parameter.
 - d. The operating schedules for each monitor.
 - e. Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
 - f. The monitoring objective and spatial scale of representativeness for each monitor.
 - g. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM_{2.5} NAAQS as described in §58.30.
 - h. The Metropolitan Statistical Area (MSA), Core Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.
 - i. The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.
 - j. Any source-oriented monitors for which a waiver has been requested or granted by the U.S. EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.
 - k. Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the U.S. EPA Regional Administrator for the use of Pb-PM10 monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.
 - l. The identification of required NO₂ monitors as near-road, area-wide, or vulnerable and susceptible population monitors in accordance with Appendix D, section 4.3 of this part.
 - m. The identification of any PM 2.5 FEMs and/or ARMs used in the monitoring agency's network where the data are not of sufficient quality such that data are not to be compared to the NAAQS. For required SLAMS where the agency identifies that the PM 2.5 Class III FEM or ARM does not produce data of sufficient quality for comparison to the NAAQS, the monitoring agency must ensure that an operating FRM or filter-based FEM meeting the sample frequency requirements described in § 58.12 or other Class III PM_{2.5} FEM or ARM with data of sufficient quality is operating and reporting data to meet the network design criteria described in Appendix D to this part.

Monitoring Requirements

Appendix A of 40 CFR Part 58 outlines the Quality Assurance Requirements for SLAMS, SPMs, and PSD Air Monitoring. It details calibration and auditing procedures used to collect valid air quality data, the minimum number of collocated monitoring sites, calculations used for data quality assessments, and reporting requirements. All sites operated by ADEM follow the requirements set forth in Appendix A.

Appendix C of 40 CFR Part 58 specifies the criteria pollutant monitoring methods which must be used in SLAMS and NCore stations. All criteria pollutant monitoring operated by ADEM follow the methods specified in Appendix C.

Appendix D of 40 CFR Part 58 specifies network design criteria for ambient air quality monitoring. The overall design criteria, the minimum number of sites for each parameter, the type of sites, the spatial scale of the sites, and the monitoring objectives of the sites are detailed. In designing the air monitoring network for ADEM, the requirements of Appendix D were followed. The specifics for each pollutant network are in their individual chapters.

Appendix E of 40 CFR Part 58 specifies probe material, placement of the monitoring probe and spacing from obstructions. All monitors operated by ADEM were evaluated against Appendix E criteria.

Population and CBSA

Alabama has a 2019 population estimate of 4,903,185. Alabama's Metropolitan and Micropolitan Core Based Statistical Areas with corresponding classifications as Metropolitan or Micropolitan, county names included in that area, and the 2019 estimated population totals are listed in Table 2.

Minimum monitoring requirements vary for each pollutant and can be based on a combination of factors such as population, the level of monitored pollutants, and Core Based Statistical Area boundaries as defined in the latest U.S. Census information. The term "Core Based Statistical Area" (CBSA) is a collective term for both Metropolitan Statistical Areas (MSA) and Micropolitan Statistical Areas (μ SA).

Table 2 Alabama CBSAs

Alabama Core Based Statistical Area	Counties in CBSA	2019 Population Estimate	Metropolitan or Micropolitan Statistical Areas
Anniston-Oxford	Calhoun	113,605	Metropolitan
Auburn-Opelika	Lee	164,542	Metropolitan
Birmingham-Hoover	Bibb, Blount, Chilton, Jefferson, Shelby, St. Clair, Walker	1,090,435	Metropolitan
Columbus, GA-AL	Russell County in Alabama and Chattahoochee, Harris, Marion, Muscogee Counties in Georgia	321,048	Metropolitan
Daphne-Fairhope-Foley	Baldwin	223,234	Metropolitan
Decatur	Lawrence, Morgan	152,603	Metropolitan
Dothan	Geneva, Henry, Houston	149,358	Metropolitan
Florence-Muscle Shoals	Colbert, Lauderdale	147,970	Metropolitan
Gadsden	Etowah	102,268	Metropolitan
Huntsville	Limestone, Madison	471,824	Metropolitan
Mobile	Mobile	429,536	Metropolitan
Montgomery	Autauga, Elmore, Lowndes, Montgomery	373,290	Metropolitan
Tuscaloosa	Hale, Pickens, Tuscaloosa	252,047	Metropolitan
Albertville	Marshall	96,774	Micropolitan
Alexander City	Tallapoosa	51,030	Micropolitan
Atmore	Escambia	36,633	Micropolitan
Cullman	Cullman	83,768	Micropolitan
Enterprise	Coffee	52,342	Micropolitan
Eufaula, AL-GA Micro Area	Eufaula, AL-GA Micro Area	26,985	Micropolitan
Fort Payne	DeKalb	71,513	Micropolitan
Jasper, AL Micro Area	Jasper, AL Micro Area	63,521	Micropolitan
LaGrange, GA-AL Micro Area	LaGrange, GA-AL Micro Area	103,176	Micropolitan
Ozark	Dale	49,172	Micropolitan
Scottsboro	Jackson	51,626	Micropolitan
Selma	Dallas	37,196	Micropolitan
Talladega-Sylacauga	Coosa, Talladega	79,978	Micropolitan
Troy	Pike	33,114	Micropolitan

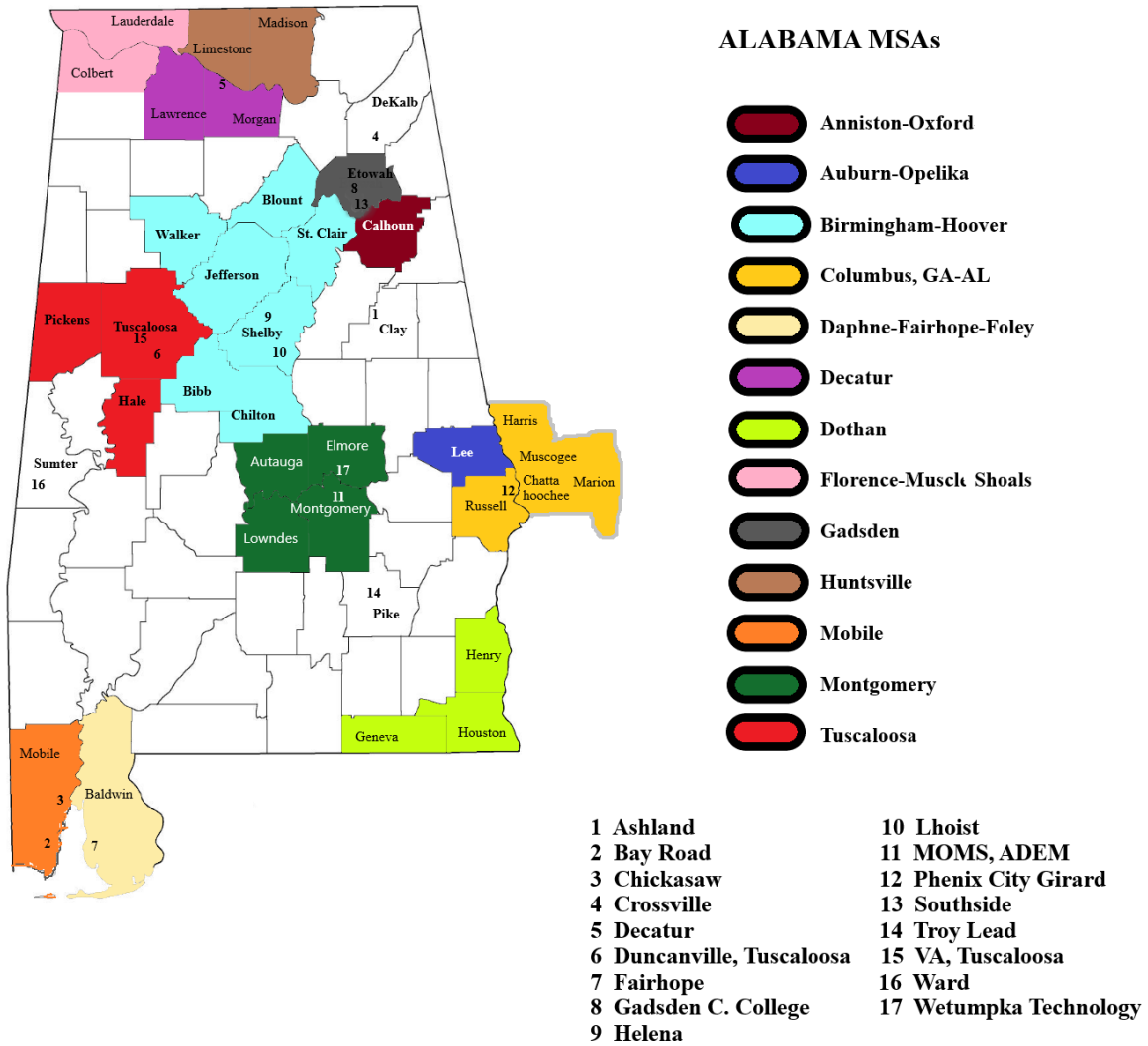


Figure 1 Alabama MSAs and ADEM Monitoring Sites

Types of Monitoring Stations

CASTNET – *Clean Air Status and Trends Network*: is a national air quality monitoring network designed to provide data to assess trends in air quality, atmospheric deposition, and ecological effects due to changes in air pollutant emissions. CASTNET provides long-term monitoring of air quality in rural areas to determine trends in regional atmospheric nitrogen, sulfur, and ozone concentrations and deposition fluxes of sulfur and nitrogen pollutants in order to evaluate the effectiveness of national and regional air pollution control programs. EPA-sponsored CASTNET ozone monitors are Part 58 compliant, therefore the data can be used for regulatory purposes. CASTNET Ozone data is now reported to AQS. There is one CASNET site in Alabama, **Sand Mountain, AQS ID 01-049-9991**, in DeKalb County, operated by an EPA contractor.

NCore – *National Core multi-pollutant monitoring station*: Sites that measure multiple pollutants at trace levels in order to provide support to integrated air quality management data needs. Each state is required to operate at least one NCore site. There is one NCore site in Alabama, **North Birmingham, AQS ID 01-073-0023**, located in Jefferson County and operated by JCDH. Refer to the JCDH Ambient Air Network Plan for details.

PAMS – *Photochemical Assessment Monitoring Station*: PAMS are established to obtain more comprehensive data in areas with high levels of ozone pollution by also monitoring oxides of Nitrogen (NO_x) and volatile organic compounds (VOCs). PAMS monitoring requirements were revised in the 2016 ozone NAAQS rule and a PAMS site will be required in Jefferson County. Refer to the JCDH Ambient Air Network Plan for details.

SLAMS - *State or Local Ambient Monitoring Station*: SLAMS make up ambient air quality monitoring sites that are primarily needed for NAAQS comparisons. With exception to two monitors, an API T640 that is starting a 24-month evaluation period located at Decatur, AQS ID 01-103-0011, and a SASS URG used for supplemental speciation, located at Phenix City, AQS ID 01-113-0003, all of the ADEM ambient air monitors are designated SLAMS. Monitors are described in detail in the section labeled ADEM's Pollutant Network Tables.

SPM – *Special Purpose Monitor*: **Phenix City, AQS ID 01-113-0003**, began monitoring PM_{2.5} continuously with a BAM-1022 on 09/18/2017. This BAM is labeled as SPM while undergoing a 24-month evaluation period and until it is designated as the primary monitor at the site.

SO2 DRR - *SO2 Data Requirements Rule*: DRR became effective September 21, 2015. Per 40 CFR Part 51, states are required to report all sources that generate >2,000 tpy SO₂, not dependent upon population density. Each source in this category must characterize air quality through air quality modeling or ambient air monitoring. Each source that chooses monitoring must operate their site equivalent with the SLAMS requirements of 40 CFR Part 58. Source-oriented monitoring for SO₂ is required beginning January 1, 2017, and continues to operate in its second 3-yr cycle. Alabama has one DRR SO₂ monitoring site, **Lhoist, Montevallo Plant, AQS ID 01-117-9001**, operated by a Lhoist contractor within the ADEM PQAO.

STN – *PM_{2.5} Speciation Trends Network*: A PM_{2.5} speciation station designated to be part of the speciation trends network. This network provides chemical species data of fine particulates. There is one STN site in Alabama, **North Birmingham, AQS ID 01-073-0023**, located in Jefferson County and operated by JCDH. Refer to the JCDH Ambient Air Network Plan for details.

Supplemental Speciation – A monitoring site that is not dedicated as an STN site in the Chemical Speciation Network, but has monitors used to gain supplemental data for that network. ADEM provides supplemental speciation data from **Phenix City-South Girard School, AQS ID 01-113-0003**.

ADEM's Monitoring Networks by Pollutant

Carbon Monoxide (CO) Network

On August 12, 2011, EPA issued a final rule that retained the existing NAAQS for Carbon Monoxide (CO) and made changes to the ambient air monitoring requirements. EPA revised the minimum requirements for CO monitoring by requiring CO monitors to be collocated with one required near-road NO₂ monitor in CBSAs having a population of 1,000,000 or more persons. ADEM does not operate a near-road monitoring site or CO monitor. For more information regarding CO monitoring in Alabama refer to the JCDH Ambient Air Network Plan for details.

Lead (Pb) Network

In 2008, EPA revised the NAAQS for lead (Pb). The Pb standard was lowered from 1.5 ug/m³ for a quarterly average to 0.15 ug/m³ based on the highest rolling 3-month average over a 3-year period. EPA set minimum monitoring requirements for source and population oriented monitoring. Source oriented monitoring is required near sources that have Pb emissions ≥1 ton per year. Population oriented monitoring is required for CBSAs >500,000. In December 2010, EPA revised the Pb rule to require source-oriented monitors for sources greater than ½ ton per year and stated that population oriented monitors would be located at NCore sites. In March 2016, EPA removed the requirement for Pb monitoring at NCore sites that were not located near a Pb emissions source.

Based on current emissions data or modeling, ADEM has identified one source, Sanders Lead Company, Inc., located in Troy, Pike County, a micropolitan statistical area, which emits greater than 1/2 ton of Pb per year. **Troy Lead, AQS ID 01-109-0003**, operated by ADEM, has been monitoring for Pb near that source since 1979. To meet QA requirements, collocated lead monitoring is also occurring at this site. No additional changes are proposed for this network.

Nitrogen Dioxide (NO₂) Network

On January 22, 2010, the US EPA finalized the monitoring rules for Nitrogen Dioxide (NO₂). The rules require the placement of NO₂ monitors near a major road in each CBSA with a population ≥500,000 people and a second monitor is required near another major road in areas with either a CBSA population ≥2.5 million people, or one or more road segments with an annual average daily traffic (AADT) count ≥250,000 vehicles. For near road NO₂ monitoring, Birmingham-Hoover is the only MSA in Alabama with a population greater than 500,000. However, the population is less than 2.5 million and there are no road segments with AADT greater than 250,000 vehicles. The rules also require an NO₂ monitor to be placed in any urban area with a population greater than or equal to 1 million people to assess community-wide concentrations. Birmingham-Hoover is the only MSA in Alabama with a population greater than 1 million. Refer to the JCDH Ambient Air Network Plan for details. ADEM does not operate an NO₂ monitor.

Ozone (O₃) Network

Effective December 28, 2015, the level of the NAAQS for ozone was changed from 0.075 to 0.070 ppm. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.070 ppm.

Minimum monitoring requirements for ozone are based on population and whether the design value is <85% of the NAAQS, or ≥85% of the NAAQS (See Table 3). Since the NAAQS for ozone is 0.070 parts per million of ozone, then 85% of the NAAQS truncated is 0.059 ppm. ADEM's Ozone Monitoring Sites and Design Values are described in Table 4.

Table 3 SLAMS Minimum Ozone Monitoring Site Requirements

SLAMS MINIMUM OZONE MONITORING REQUIREMENTS		
MSA population ^{1,2}	Most recent 3-year design value concentrations ≥85% of any O ₃ NAAQS ³	Most recent 3-year design value concentrations <85% of any O ₃ NAAQS ^{3,4}
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000 ⁵	1	0

1 Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 Population based on latest available census figures.

3 The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 These minimum monitoring requirements apply in the absence of a design value.

5 Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table 4 ADEM Ozone Monitoring Sites and Design Values

Site Name	AQS ID	2017-2019 Design Values	MSA	MSA MAX DV ²	2019 population estimate
Helena ¹	01-117-0004	0.066	Birmingham-Hoover	0.067	1,090,435
Phenix City - South Girard School ^{1,4}	01-113-0003	0.061			
Columbus-Airport GA	13-215-0008	0.060	Columbus, GA-AL	0.061	321,048
Fairhope	01-003-0010	0.063	Daphne-Fairhope-Foley	0.063	223,234
Decatur	01-103-0011	0.063	Decatur	0.063	152,603
Southside	01-055-0011	0.062	Gadsden	0.062	102,268
Chickasaw	01-097-0003	0.063			
Bay Road	01-097-2005	0.061	Mobile	0.063	429,536
Wetumpka Westside Technology ⁵	01-051-0004	0.059			
MOMS, ADEM	01-101-1002	0.059	Montgomery	0.059	373,290
Duncanville, Tuscaloosa	01-125-0010	0.060	Tuscaloosa	0.060	252,047
Ward, Sumter Co.	01-119-0003	0.057	not in MSA	N/A	NA
Sand Mountain ³	01-049-9991	0.061	not in MSA	N/A	NA

DV ≥ 85% of the NAAQS

¹ Only site within MSA operated by ADEM

² MSA MAX DV may be obtained from monitors not operated by ADEM

³ CASTNET site operated by EPA contractor

⁴ Current DV only reflects 2018 and 2019 data. 2017 DV .059 collected approximately 5 miles NW of the current site at AQS ID 01-113-0002. Continuation of the data set for DV purposes has been requested.

⁵ Current DV only reflects 2018 and 2019 data. 2017 DV .055 collected approximately 1.3 miles E of the current site at AQS ID 01-051-0003. Continuation of the data set for DV purposes has been requested.

Ozone Monitoring Requirements for Alabama MSAs

Birmingham-Hoover MSA

Using the Birmingham-Hoover MSA 2019 population estimate and the design value from Table 4, two Ozone monitors are required in this MSA. ADEM operates **Helena, AQS ID 01-117-0004**, because it is located in Shelby County. Other ozone sites in this MSA are located within the jurisdiction of the JCDH. For more information regarding ozone monitoring in Jefferson County refer to the JCDH ambient air network plan. No changes are planned for the ADEM site.

Columbus, GA-AL MSA

Using the Columbus GA-AL MSA 2019 population estimate and the design value from Table 4, one Ozone monitor is required for this MSA. ADEM operates **Phenix City-South Girard School, AQS ID 01-113-0003**, in Russell County, Alabama. For more information regarding ozone monitoring in this MSA, refer to the State of Georgia's ambient air network plan. No changes are planned for ozone monitoring at the ADEM site.

Daphne-Fairhope-Foley MSA

Using the Daphne-Fairhope-Foley MSA 2019 population estimate and the design value from Table 4, one Ozone monitor is required for this MSA. There is currently one Ozone site, **Fairhope, AQS ID 01-003-0010**. No changes are planned.

Decatur MSA

Using the Decatur MSA 2019 population estimate and the design value from Table 4, one Ozone monitor is required for this MSA. There is currently one Ozone site, **Decatur, AQS ID 01-103-0011**. No changes are planned for ozone monitoring at this site.

Gadsden MSA

Using the Gadsden MSA 2019 population estimate and the design value from Table 4, one Ozone monitor is required for this MSA. There is currently one Ozone site, **Southside, AQS ID 01-055-0011**. No changes are planned.

Huntsville MSA

ADEM does not operate any ozone monitors in this MSA. For information regarding ozone monitoring in Huntsville refer to the HDNREM ambient air network plan.

Mobile MSA

Using the Mobile MSA 2019 population estimate and the design value from Table 4, two Ozone monitors are required for this MSA. There are currently two Ozone sites, **Chickasaw, AQS ID 01-097-0003**, and **Bay Road, 01-097-2005**. No changes are planned.

Montgomery MSA

Using the Montgomery MSA 2019 population estimate and the design value from Table 4, two Ozone monitors are required for this MSA. There are currently two Ozone sites, **MOMS, ADEM, AQS ID 01-101-1002** and **Wetumpka Westside Technology Park, AQS ID 01-051-0004**. No changes are planned.

Tuscaloosa MSA

Using the Tuscaloosa MSA 2019 population estimate and design value from Table 4, one Ozone monitor is required for this MSA. There is currently one Ozone site, **Duncanville, Tuscaloosa, AQS ID 01-125-0010**. If funding can be secured, this site will receive a new shelter in 2021.

Anniston-Oxford and Auburn-Opelika MSAs

The MSAs of Auburn-Opelika and Anniston-Oxford were evaluated by ADEM. It was determined that due to the close proximity of ozone monitors in the neighboring MSAs, additional ozone monitors would not be needed. Since these areas do not have design values, no ozone monitors are required by Appendix D of 40 CFR Part 58.

Sites not located in an MSA

Ward, Sumter Co., AQS ID 01-119-0003, represents rural, background ozone values for the state. The historical design values for this monitor have been less than 85% of the NAAQS. No changes are planned for ozone monitoring at this site.

Sand Mountain, AQS ID 01-049-9991, is a CASTNET site operated by an EPA contractor.

PM_{2.5} Network

Minimum monitoring requirements for PM_{2.5} are based on population and the design value <85% of the NAAQS or ≥85% of the NAAQS (See Table 5). Additionally, a regional background site and a regional transport site are required.

Section 4.7.2 of Appendix D of 40 CFR Part 58 also requires a collocated continuous PM_{2.5} monitor in each MSA that is required to have a FRM monitor. The number of collocated continuous monitors required for an MSA will be equal to at least half of the required FRM monitors for that MSA. This is not required if the continuous monitor is a FEM that is labeled as the primary and comparable to the NAAQS. The state is also required to operate PM_{2.5} speciation monitors to characterize the constituents of PM_{2.5}. The number of speciation monitors is determined in consultation with EPA Region IV.

PM_{2.5} design values in Table 6 are based on 2017-2019 data. A design value of **29.75** ug/m³ is the lowest value which is ≥85% of the 24-hour standard of 35 ug/m³. A design value of **10.2** ug/m³ is the lowest value that is ≥85% of the annual standard of 12 ug/m³ (effective March 18, 2013).

Table 5 PM_{2.5} Minimum Monitoring Site Requirements

PM _{2.5} MINIMUM MONITORING REQUIREMENTS		
MSA population ^{1,2}	Most recent 3-year design value ≥85% of any PM _{2.5} NAAQS ³	Most recent 3-year design value <85% of any PM _{2.5} NAAQS ^{3,4}
>1,000,000	3	2
500,000–1,000,000	2	1
50,000–<500,000 ⁵	1	0

1 Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 Population based on latest available census figures.

3 The PM_{2.5} National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 These minimum monitoring requirements apply in the absence of a design value.

5 Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

The current PM_{2.5} monitoring rule requires CBSAs with populations greater than one million but less than four million operate a PM_{2.5} monitor at its NO₂ near road site by January 1, 2017. ADEM does not operate an NO₂ monitor or a near road site. More information regarding this requirement in Alabama can be found in the JCDH ambient air network plan.

ADEM's PM_{2.5} Network is described in Table 6.

Table 6 ADEM PM_{2.5} Monitoring Sites and Design Values

Site Name	AQS Site ID	PM_{2.5} 24 hr DV 2017- 2019	PM_{2.5} Annual DV 2017- 2019	MSA	24hr MSA MAX DV²	Annual MSA MAX DV²	2019 Pop Est
Phenix City - South Girard School ¹	01-113-0001	21	9.4	Columbus GA-AL	27	9.4	321,048
Fairhope	01-003-0010	17	7.3	Daphne-Fairhope-Foley	17	7.3	223,234
Decatur	01-103-0011	15	7.5	Decatur	15	7.5	152,603
Gadsden C College	01-055-0010	16	8.3	Gadsden	16	8.3	102,268
Chickasaw	01-097-0003	17	8.1	Mobile	17	8.1	429,536
MOMS, ADEM	01-101-1002	19	8.8	Montgomery	19	8.8	373,290
VA, Tuscaloosa	01-125-0004	17	8.0	Tuscaloosa	17	8.0	252,047
Ashland (Background/Regional Transport)	01-027-0001	16	7.4	Not in MSA	16	7.4	NA
Crossville (Background)	01-049-1003	16	7.5	Not in MSA	16	7.5	NA
DV ≥ 85% of the NAAQS							
¹ Only site within MSA operated by ADEM							
² MSA MAX DV may be obtained from monitors not operated by ADEM							

PM_{2.5} Monitoring Requirements for Alabama MSAs

Birmingham-Hoover MSA

ADEM does not operate PM_{2.5} monitors in the Birmingham-Hoover MSA. For more information regarding PM_{2.5} monitoring in this MSA refer to the JCDH ambient air network plan.

Columbus, GA-AL MSA

Using the Columbus, GA-AL MSA 2019 population estimate and the design value from Table 6, one FRM monitor is required. ADEM operates one FRM monitor, one collocated FRM monitor, one speciation monitor, and one FEM continuous monitor at **Phenix City – South Girard School, AQS ID 01-113-0003**. The FEM continuous monitor has completed the NAAQS evaluation period and will become the primary. The current primary FRM monitor will be discontinued and the current collocated FRM monitor will operate on a 1 in 6 day frequency for quality assurance. For more information regarding other PM_{2.5} monitoring in this MSA refer to the State of Georgia's ambient air network plan.

Daphne-Fairhope-Foley MSA

Using the Daphne-Fairhope-Foley MSA 2019 population estimate and the design value from Table 6, zero FRM monitors are required. There is currently one FRM monitor located at **Fairhope, AQS ID 01-003-0010**. No changes are planned.

Decatur MSA

Using the Decatur MSA 2019 population estimate and the design value from Table 6, zero FRM monitors are required. There is currently one FRM monitor and one non-FEM continuous monitor located at **Decatur, AQS ID 01-103-0011**. The non-FEM BAM-1020 will be replaced with an API T-640 as soon as the new shelter is installed. The API T-640 will be operated as a FEM continuous monitor which will be capable of producing NAAQS comparable data after its evaluation period.

Gadsden MSA

Using the Gadsden MSA 2019 population estimate and the design value from Table 6, zero FRM monitors are required. There is currently one FRM monitor at **Gadsden Community College, AQS ID 01-055-0010**. No changes are planned.

Huntsville MSA

ADEM does not operate PM_{2.5} monitors in the Huntsville MSA. For information regarding PM_{2.5} monitoring in this MSA refer to the HDNREM ambient air network plan.

Mobile MSA

Using the Mobile MSA 2019 population estimate and the design value from Table 6, zero FRM monitors are required. There is currently one FRM monitor and one non-FEM continuous monitor located at **Chickasaw, AQS ID 01-097-0003**. No changes are planned.

Montgomery MSA

Using the Montgomery MSA 2019 population estimate and the design value from Table 6, zero FRM monitors are required. There is currently one FRM monitor, one collocated FRM monitor, and one non-FEM continuous monitor located at **MOMS, ADEM, AQS ID 01-101-1002**. No changes are planned.

Tuscaloosa MSA

Using the Tuscaloosa MSA 2019 population estimate and the design value from Table 6, zero FRM monitors are required. There is currently one FRM monitor located at **VA, Tuscaloosa, AQS ID 01-125-0004**. ADEM will begin operating a collocated monitor operating on a 1 in 6 days frequency at this site to meet quality assurance requirements on January 1, 2021.

Anniston-Oxford and Auburn-Opelika MSAs

The MSAs of Anniston-Oxford and Auburn-Opelika were evaluated to determine the need for monitors. It was determined that due to the close proximity of PM_{2.5} monitors in neighboring MSAs, additional monitors would not be needed. PM_{2.5} monitoring in the adjacent MSAs continue to provide adequate coverage. Since these areas do not have design values, no FRM monitors are required by Appendix D of 40 CFR Part 58.

PM_{2.5} Monitors not located in MSAs

Ashland, AQS ID 01-027-0001, serves as a regional transport site in between the large MSAs of Birmingham-Hoover, Alabama and Atlanta-Sandy Springs-Roswell, Georgia using one FRM monitor. No changes are planned.

Crossville, AQS ID 01-049-1003, represents rural, background PM_{2.5} values for the northeast part of the state using one FRM monitor. No changes are planned.

Ward, Sumter Co., AQS ID 01-119-0003, represents rural, background PM_{2.5} values for the west part of the state using one non-FEM BAM-1020. The non-FEM BAM-1020 will be replaced with an FEM BAM-1022 on January 1, 2021.

PM₁₀ Network

PM₁₀ has been a criteria pollutant since 1987. Since that time there has been widespread monitoring of the PM₁₀ levels in Alabama. In 2006, the U.S. EPA modified the NAAQS for PM₁₀ to revoke the annual standard. Currently, there is a daily standard of 150 ug/m³ based on 3 years of data.

The Montgomery MSA has a population between 250,000 and 500,000 and PM₁₀ concentrations are less than 80% of the NAAQS daily standard. According to Table D-4 of Appendix D to Part 58, 0 to 1 PM₁₀ monitors are required. In the Montgomery MSA, ADEM operates two low-volume PM₁₀ monitors on a 1 in 6 day schedule at **MOMS, ADEM, AQS ID 01-101-1002**, one being the collocated quality assurance monitor. No changes are planned.

Sulfur Dioxide (SO₂) Network

Effective August 23, 2010, EPA strengthened the primary NAAQS for SO₂. EPA established a new 1-hour standard at 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. According to EPA, for a short-term 1-hour SO₂ standard, it is more technically appropriate, efficient, and effective to use modeling as the principal means of assessing compliance for medium to larger sources, and to rely more on monitoring for groups of smaller sources and sources not as conducive to modeling. Such an approach is consistent with EPA's historical approach and longstanding guidance for SO₂. EPA is setting specific minimum requirements that inform states on where they are required to place SO₂ monitors. The final 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 final rule requires:

- 3 monitors in CBSAs with PWEI values $\geq 1,000,000$ or more;
- 2 monitors in CBSAs with PWEI values $< 1,000,000$ but $> 100,000$; and
- 1 monitor in CBSAs with PWEI values $> 5,000$.

According to the latest PWEI calculations listed in

Table 7 only the Birmingham-Hoover MSA requires SO₂ monitoring. ADEM operates two SO₂ monitors: **Chickasaw, AQS ID 01-097-0003**, for the Mobile MSA and **Ward, Sumter Co., AQS ID 01-119-0003**, not located in an MSA, for background purposes. For more information regarding SO₂ monitoring in the Birmingham-Hoover MSA refer to the JCDH ambient air monitoring network plan.

Effective September 21, 2015, the SO₂ Data Requirements Rule (DRR) per 40 CFR Part 51, requires states to report all sources that generate $> 2,000$ tpy SO₂, not dependent upon population density. Each source in this category must characterize air quality through air quality modeling or ambient air monitoring. Each source that chooses monitoring must operate their site equivalent with the SLAMS requirements of 40 CFR Part 58. Lhoist North America of Alabama, LLC – Montevallo Plant, located within the Birmingham-Hoover MSA, has monitored SO₂ in accordance with the DRR since January 1, 2017. The site is **Lhoist, Montevallo Plant, AQS ID 01-117-9001**, and operates within ADEM's PQAQ.

Table 7 SO₂ Monitors Required

SO ₂ Population Weighted Emissions Index (PWEI) Calculations using 2019 Census Estimates and 2017 National Emissions Inventory (NEI) v2				
CBSA Name	2017 NEI v2 SO₂ (tpy)	Population (2019)	PWEI in Million persons-tpy	Required Monitors
Birmingham-Hoover	19,971	1,090,435	21,777	2
Mobile	7,948	429,536	3,414	0
Florence-Muscle Shoals	160	147,970	24	0
Albertville	33	96,774	3	0
Anniston-Oxford-Jacksonville	141	113,605	16	0
Auburn-Opelika	155	164,542	26	0
Columbus, GA-AL	3,571	321,048	1,146	0
Cullman	62	83,768	5	0
Daphne-Fairhope-Foley	167	223,234	37	0
Decatur	1,834	152,603	280	0
Dothan	201	149,358	30	0
Enterprise	87	52,342	5	0
Gadsden	39	102,268	4	0
Huntsville	173	471,824	82	0
Montgomery	2,415	373,290	901	0
Ozark	125	63,521	8	0
Scottsboro	721	51,626	37	0
Selma	125	37,196	5	0
Talladega-Sylacauga	226	79,978	18	0
Troy	8,141	33,114	270	0
Tuscaloosa	474	252,047	119	0
Valley	88	no data	0	0

Quality Assurance

ADEM has an EPA-approved Quality Assurance Program Plan that details the activities used to control and document the quality of the data collected. ADEM is an independent Primary Quality Assurance Organization (PQAO) as defined by 40 CFR Part 58. Part of the EPA-required quality control program for particulate monitoring is the use of collocated particulate monitors. 40 CFR Part 58, Appendix A requires a percentage of manual particulate monitors to be collocated with FRM monitors so that quality statistics can be calculated. ADEM includes monitors for this purpose.

ADEM AAQMP Pollutant Network Tables

A description of ADEM's ambient air monitoring network, followed by detailed site evaluations, will be presented in this section.

Included will be:

- Site Common Name
- County/CBSA
- AQS ID
- Address
- Latitude and Longitude
- Monitoring Objective/Scale
- Beginning and Ending Sampling Date
- Method, Method Code and Operating Schedule
- Comparability to the NAAQS

Lead

Site Common Name	County/CBSA	AQS ID	Address	Latitude	Longitude	Monitoring Objective / Scale	Date Began	Date Ended	Method, Method Code and Schedule	NAAQS
Troy Lead	Pike/Troy μ SA	01-109-0003	Henderson Road, Troy	31.790479	-85.978974	Highest Concentration / Neighborhood	1/1/1979 1/1/1979	active active	Hi-Vol 813, 6 Hi-Vol 813, 6	Y Y

Hi-Vol = Hi-Volume Total Suspended Particulate G = Lead Analysis by Graphite Furnace 6 = 24 hours every 6th day

Ozone

Site Common Name	County/CBSA	AQS ID	Address	Latitude	Longitude	Monitoring Objective / Scale	Date Began	Date Ended	Method, Method Code and Schedule	NAAQS
Fairhope	Baldwin/Daphne-Fairhope-Foley MSA	01-003-0010	Fairhope High School, Fairhope	30.497478	-87.880258	Population Exposure/ Neighborhood	3/1/2000	active	U, 087, C	Y
Wetumpka Westside Technology Park	Elmore/Montgomery MSA	01-051-0004	3148 Elmore Road, Wetumpka	32.53568	-86.255193	Highest Concentration/ Urban	3/1/2018	active	U, 087, C	Y
Southside	Etowah/Gadsden MSA	01-055-0011	1450 Parker Anderson Lane, Southside	33.904039	-86.053867	Highest Concentration/ Neighborhood	4/26/2002	active	U, 087, C	Y
Chickasaw	Mobile/Mobile MSA	01-097-0003	Iroquois and Azalea Chickasaw	30.770181	-88.087761	Population Exposure/ Neighborhood	3/2/1982	active	U, 087, C	Y
Bay Road	Mobile/Mobile MSA	01-097-2005	Bay Road, Mobile	30.474305	-88.141022	Population Exposure and Highest Concentration/	3/1/1999	active	U, 087, C	Y
MOMS, ADEM	Montgomery/Montgomery MSA	01-101-1002	1350 Coliseum Blvd, Montgomery	32.412811	-86.263394	Population Exposure/ Neighborhood	6/2/1993	active	U, 087, C	Y
Decatur	Morgan/Decatur MSA	01-103-0011	Wallace Development Center, Decatur	34.530717	-86.967536	Population Exposure/ Urban	4/1/2000	active	U, 087, C	Y
Phenix City - South Girard	Russell/Columbus GA-AL MSA	01-113-0003	510 6th Place South, Phenix City	32.437028	-84.999653	Highest Concentration/ Urban	3/1/2018	active	U, 087, C	Y
Helena	Shelby/Birmingham-Hoover MSA	01-117-0004	Bearden Farm, Helena	33.317142	-86.825754	Population Exposure/ Urban	1/1/1983	active	U, 087, C	Y
Ward, Sumter Co.	Sumter/no MSA	01-119-0003	NNE of Ward Post Office	32.362606	-88.277992	General/Background/ Regional	3/1/2013	active	U, 087, C	Y
Duncanville, Tuscaloosa	Tuscaloosa/Tuscaloosa MSA	01-125-0010	11690 Southfork Drive, Duncanville	33.089772	-87.459733	Population Exposure/ Urban	2/1/2001	active	U, 087, C	Y

U = UV Photometric Ozone Analyzer C = Continuous

PM2.5

Site Common Name	County/CBSA	AQS ID	Address	Latitude	Longitude	Monitoring Objective/Scale	Date Began	Date Ended	Method, Method Code and Schedule	NAAQS
Fairhope	Baldwin/ Daphne-Fairhope-Foley MSA	01-003-0010	Fairhope High School, Fairhope	30.497478	-87.880258	Population Exposure/ Neighborhood	1/1/2000	active	L, 145, 3	Y
Ashland	Clay/no MSA	01-027-0001	Ashland Airport, Ashland	33.284928	-85.803608	Regional Transport/ Regional	1/1/1999	active	L, 145, 3	Y
Crossville	DeKalb/no MSA	01-049-1003	13112 Hwy 68, Crossville	34.288567	-85.969858	General/Background/ Neighborhood	1/1/1999	active	L, 145, 3	Y
Gadsden C College	Etowah/Gadsden MSA	01-055-0010	1001 Wallace Drive, Gadsden	33.991494	-85.992647	Population Exposure/ Urban	1/1/2000	active	L, 145, 3	Y
Chickasaw	Mobile/Mobile MSA	01-097-0003	Iroquois and Azalea, Chickasaw	30.770181	-88.087761	Population Exposure/ Regional	7/19/2002	active	L, 145, 3	Y
							1/1/2011	active	B, 731, C	N
							1/16/2009	active	L, 145, 3	Y
MOMS, ADEM	Montgomery/ Montgomery MSA	01-101-0002	1350 Coliseum Blvd, Montgomery	32.412811	-86.263394	Population Exposure/ Neighborhood	1/16/2009	active	L, 145, 6	Y
							4/1/2009	active	B, 731, C	N
							8/7/2001	active	L, 145, 3	Y
Decatur	Morgan/Decatur MSA	01-103-0011	Wallace Ctr.Hwy 31, Decatur	34.530717	-86.967536	Population Exposure/ Middle	1/1/2011	active	B, 731, C	N
							1/18/2017	active	L, 145, 3	Y
Phenix City - S. Girard School ^{1,2}	Russell/Columbus GA-AL MSA	01-113-0003	510 6th Place South, Phenix City	32.437028	-84.999653	Highest Concentration/ Urban	1/18/2017	active	L, 145, 3	Y
							9/18/2017	active	B, 209, C	N
Ward, Sumter Co. ⁴	Sumter/no MSA	01-119-0003	NNE of Ward Post Office, Ward	32.362606	-88.277992	General/Background/ Regional	7/1/2013	active	B, 731, C	N
VA, Tuscaloosa ³	Tuscaloosa/Tuscaloosa MSA	01-125-0004	3701 Loop Road East, Tuscaloosa	33.189931	-87.484189	Population Exposure/ Neighborhood	10/1/2002	active	L, 145, 3	Y

B = Beta Attenuation Monitor L = Low Volume Sequential Sampler 3 = 24 hours every 3rd day 6 = 24 hours every 6th day C = Continuous

1. PCG 25 - Proposed to be discontinued 12/31/2020
2. PCG BAM 1022 – Proposed to be primary monitor 1
3. TSV25C0 – Proposed to begin 1/1/2021
4. WRD BAM1022 – Proposed to be FEM beginning

PM10

Site Common Name	County / CBSA	AQS ID	Address	Latitude	Longitude	Monitoring Objective / Scale	Date Began	Date Ended	Method, Method Code and Schedule	NAAQS
MOMS, ADEM	Montgomery / Montgomery MSA	01-101-1002	1350 Coliseum Blvd, Montgomery	32.412811	-86.263394	Population Exposure/ Neighborhood	9/16/1993	active	L, 127, 6	Y
						Quality Assurance/ Neighborhood	1/1/2013	active	L, 127, 6	Y

L = Low Volume Sequential Sampler 6 = 24 hours every 6th day

SO₂

Site Common Name	County / CBSA	AQS ID	Address	Latitude	Longitude	Monitoring Objective / Scale	Date Began	Date Ended	Method, Method Code and Schedule	NAAQS
Chickasaw	Mobile / Mobile MSA	01-097-0003	Iroquois And Azalea, Chickasaw	30.76972	-88.0875	Population Exposure / Neighborhood	1/1/2013	active	P, 100, C	Y
Lhoist	Shelby / Birmingham-Hoover MSA	01-117-9001	7444 St. Hwy 25, Calera	33.0928	-86.8072	High Concentration – SO2 DRR / Middle	1/1/2017	active	P, 100, C	Y
Ward	Sumter / no MSA	01-119-0003	NNE of Ward Post Office, Ward	32.362606	-88.277992	General/Background / Regional	1/1/2018	active	P, 100, C	Y

P = Pulsed Fluorescent C = Continuous

Site Assessments

All of ADEM's sites meet the requirements of 40 CFR 58, Appendices A, C, D and E, as appropriate. A monitor's suitability for comparison with the NAAQS is documented in the ADEM Pollutant Network Tables and Site Assessments. Due to Alabama's Shelter in Place order immediately followed by the Safer at Home order in response to the COVID-19 pandemic, site evaluations will be completed by August 1, 2020, to ensure continued compliance with regulations.