State of Alabama
Ambient Air Monitoring
2016 Consolidated Network Review

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Definitions and Acronyms

AAQM	Ambient Air Quality Monitoring
AAQMP	Ambient Air Quality Monitoring Plan
ADEM	Alabama Department of Environmental Management
Appendix D	Volume 40, Code of Federal Regulations, part 58, Appendix D
AQS	Air Quality System
Avg	average
B'ham	Birmingham
CBSA	Core Based Statistical Area
CFR	*Code of Federal Regulations*
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 PM_{10} 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 stations
O_3	ozone
PAMS	Photochemical Assessment Monitoring Stations
Pb	lead
PM	particulate matter
$PM_{2.5}$	particulate matter ≤2.5 micrometers diameter
PM_{10}	particulate matter ≤10 micrometer diameter
$PM_{10-2.5}$	particulate matter ≤10 microns but > 2.5 microns
PSD	Prevention of Significant Deterioration
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
TEOM	Tapered Element Oscillating Microbalance (Rupprecht and Patashnick Co.)
tpy	tons per year
TSP	Total Suspended Particulate
URG	URG-3000N $PM_{2.5}$ Speciation monitoring carbon-specific sampler
USEPA	United States Environmental Protection Agency
° C	degree Celsius
$\mu g/m^3$	micrograms (of pollutant) per cubic meter (of air sampled)
≥	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 2015, and changes proposed to take place to the current ambient air monitoring network during 2016/2017.

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 2016, this document was placed on ADEM's website on May 17, 2016 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
then choose this document.

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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. Alabama monitors the six (6) criteria pollutants which have NAAQS identified for them; Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO_2), Ozone (O_3), particulate matter (PM_{10}, $PM_{2.5}$, and $PM_{10-2.5}$), and Sulfur Dioxide (SO_2). There are other non-criteria pollutants, such as $PM_{2.5}$ speciated compounds, that are also monitored for special purposes. In addition, meteorological data is also collected to support the monitoring and aid in analysis of the ambient air monitoring data.

In Alabama, the air quality surveillance system is operated by the state environmental agency, 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 has performed the required annual review of their portion of the current ambient air quality network and developed a proposed network plan to be implemented during 2016. This document is a compilation of reports from each agency.

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	http://www.jcdh.org/EH/AnR/AnR03.aspx
HDNREM	http://www.hsvcity.com/NatRes/Pollen/polindex.htm#DAQ

An overview of the 2016 Alabama Monitoring Network can be seen in Table 1.

Summary of findings of the 2016 Network Review

ADEM

Summary of changes in ADEM in 2015

- MOMS (AQS ID 01-101-1002) discontinued monitoring for the Chemical Speciation Network (CSN) due to a low Primary Objectives Score. More information concerning the CSN may be found at https://www3.epa.gov/ttnamti1/speciepg.html.
- The Phenix City $PM_{2.5}$ monitoring site (AQS ID 01-113-0001) had to be moved due to loss of access to the site. With consultation with US EPA, the site was moved to 1319 9th Avenue, Phenix City within 1/3 mile of the previous location. The public review period was closed on March 10, 2016 with no comments received. ADEM is awaiting a response from EPA.

Proposed changes for ADEM in 2016

- ADEM received written notification in April, 2016, that they must relocated the DBT (AQS ID: 01-051-0001) Ozone monitor shelter from the current location. ADEM is in the process of reviewing potential locations, including a new site only 160 meters away. When a new site is selected ADEM will follow EPA guidance for network modification.
- Planned SO2 DRR monitoring at North America of Alabama, LLC – Montevallo Plant, located in Calera, Birmingham-Hoover MSA

HDNREM

Summary of changes in HDNREM in 2015

- Old Airport Road site (AQS ID 01-101-1002) discontinued monitoring for the Chemical Speciation Network (CSN) due to a low Primary Objectives Score. More information concerning the CSN may be found at https://www3.epa.gov/ttnamti1/speciepg.html

Proposed changes for HDNREM in 2016

- No changes are planned for the Huntsville Air Monitoring Network.

JCDH

Summary of changes for JCDH in 2015

- Replacement of shelters at Wylam and Tarrant
- Discontinued monitoring of $PM_{2.5}$ and CO at Shuttlesworth
- Discontinued monitoring for Low Vol PM10 at Tarrant, Fairfield, Sloss Shuttlesworth and McAdory.

Summary of changes for JCDH in 2016

- Planned SO2 DRR Monitoring at Shuttlesworth for One Year
- Replacement of shelters at Shuttlesworth North Birmingham
- Addition of $PM_{2.5}$ continuous monitor at Shuttlesworth
- Discontinuation of Pb monitoring at the North Birmingham NCore site

Network Modification Plan

The 2016 revision to 40 CFR 58 included the following section concerning the 5-year network assessment.

> **§58.14 System modification.**
>
> (a) The state, or where appropriate local, agency shall develop a network modification plan and schedule to modify the ambient air quality monitoring network that addresses the findings of the network assessment required every 5 years by §58.10(d). The network modification plan shall be submitted as part of the Annual Monitoring Network Plan that is due no later than the year after submittal of the network assessment.

Alabama completed the required network assessment in July of 2015.

EPA has created a website for publishing plans and assessments.

https://www3.epa.gov/ttnamti1/5yrnetassess.html

Findings from the Five Year Ambient Air Monitoring Network Assessment for the State of Alabama

While the 2015 Ambient Air Quality Monitoring Plan shows several of the current monitors are no longer required by Appendix D due to a reduction in ambient concentrations in recent years, the site matrix analysis shows that most of the monitors are still important in the network. The current network provides broad coverage across Alabama and also provides more intensive monitoring in areas of higher population and emissions.

Ozone

Due to expected changes to the level of the NAAQS for ozone, no changes are planned to the network at this time. If resources allow for an additional site, the Auburn area would be a likely candidate. No additional funding has been identified to operate a new site.

PM 10

Due to the very low concentrations recorded and the aging equipment and infrastructure at the Mobile sites ADEM closed a continuous PM_{10} monitor in Chickasaw and a manual PM10 monitor at WKRG and JCDH closed 3 manual PM_{10} monitors. There are no additional modifications planned at this time.

SO2

ADEM currently operates one monitor which meets Appendix D requirements. With the promulgation of the Data Requirements Rule (DRR), all identified large source industries had to declare if they were modeling or monitoring to show compliance. ADEM is working on monitor siting placement with those large-source industries which chose to monitor.

PM 2.5, NO2, CO, and Pb

Since the current network meets or exceeds Appendix D requirements, no modifications to the network are foreseen at this time.

Table 1 - 2016 Alabama Monitoring Network

Site Common Name	AQS ID	Ozone	PM2.5	PM 2.5 collocated	PM2.5 Spec.	BAM (Cont. PM2.5)	TEOM (Cont. PM2.5)	PM 10 LoVol	PM10 LoVol Collocated	PM10	PM10 collocated	PM 10 Continuos	Lead	Lead Collocated	Lead-PM10	SO2	NO2	NOy	CO
JCDH Sites																			
North Birmingham (NCore)	01-073-0023	x	x	x	x	x		x	x			x	x	x	x	x	x	x	x
Fairfield	01-073-1003	x														x			x
McAdory School	01-073-1005	x	x	x			x												
Leeds Elem. School	01-073-1010	x	x	x			x	x											
Wylam	01-073-2003		x	x	x		x	x	x			x							
Hoover	01-073-2006	x					x												
Corner High School	01-073-5003	x					x												
Tarrant Elem. School	01-073-6002	x						x				x							
Sloss Shuttlesworth	01-073-6004						x					x							
Arkadelphia (Near Road)	01-073-2059		x														x		x
ADEM Sites																			
Fairhope	01-003-0010	x	x																
Ashland	01-027-0001		x																
Muscle Shoals	01-033-1002	x	x																
Crossville	01-049-1003		x																
DBT	01-051-0001	x																	
Gadsden - CC	01-055-0010		x			x													
Southside	01-055-0011	x																	
Dothan -CC	01-069-0003		x																
Dothan	01-069-0004	x																	
Mobile - Chickasaw	01-097-0003	x	x			x										x			
Mobile - Bay Road	01-097-2005	x																	
Montgomery - MOMS	01-101-1002	x	x	x						x	x								
Decatur	01-103-0011	x	x			x													
Troy	01-109-0003												x	x					
Phenix City - Downtown	01-113-0001		x	x	x	x													
Phenix City - Ladonia	01-113-0002	x																	
Helena	01-117-0004	x																	
Ward, Sumter Co.	01-119-0003	x				x													
Childersburg	01-121-0002		x																
Tuscaloosa - VA Hospital	01-125-0004		x			x													
Duncanville, Tuscaloosa	01-125-0010	x														x			

HDNR Sites																			
Pulaski Pike (Fire station #10)	01-089-0002									x									
Downtown Garage (Madison S	01-089-0003									x									
South Parkway (Fire Station #7	01-089-0004									x									
Huntsville Old Airport Road	01-089-0014	x	x	x			x			x	x								
Capshaw	01-089-0022	x																	

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. Proposals for any State and Local Air Monitoring Station (SLAMS) network modifications.

§58.10 (b) requires the plan contain the following information for each existing and proposed site:

1. The Air Quality System (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.
7. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in §58.30.
8. The Metropolitan Statistical Area (MSA), Core Based Statistical Area (CBSA), Combined Statistical Area (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 U.S. 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 U.S.EPA Regional Administrator for the use of Pb-PM_{10} monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.

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 in Alabama operate following the requirements set forth 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 in Alabama 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 Alabama, the requirements of Appendix D were followed. The specifics for each pollutant network are in the their individual chapters.

Appendix E of 40 CFR Part 58 specifies the placement of the monitoring probe, it's spacing from obstructions and probe material. All monitors operated in Alabama meet Appendix E criteria.

Population and CBSA

Alabama has a 2015 population estimate of 4,858,979 of which 3,960,423 is located in the 13 MSAs listed in Table 2.

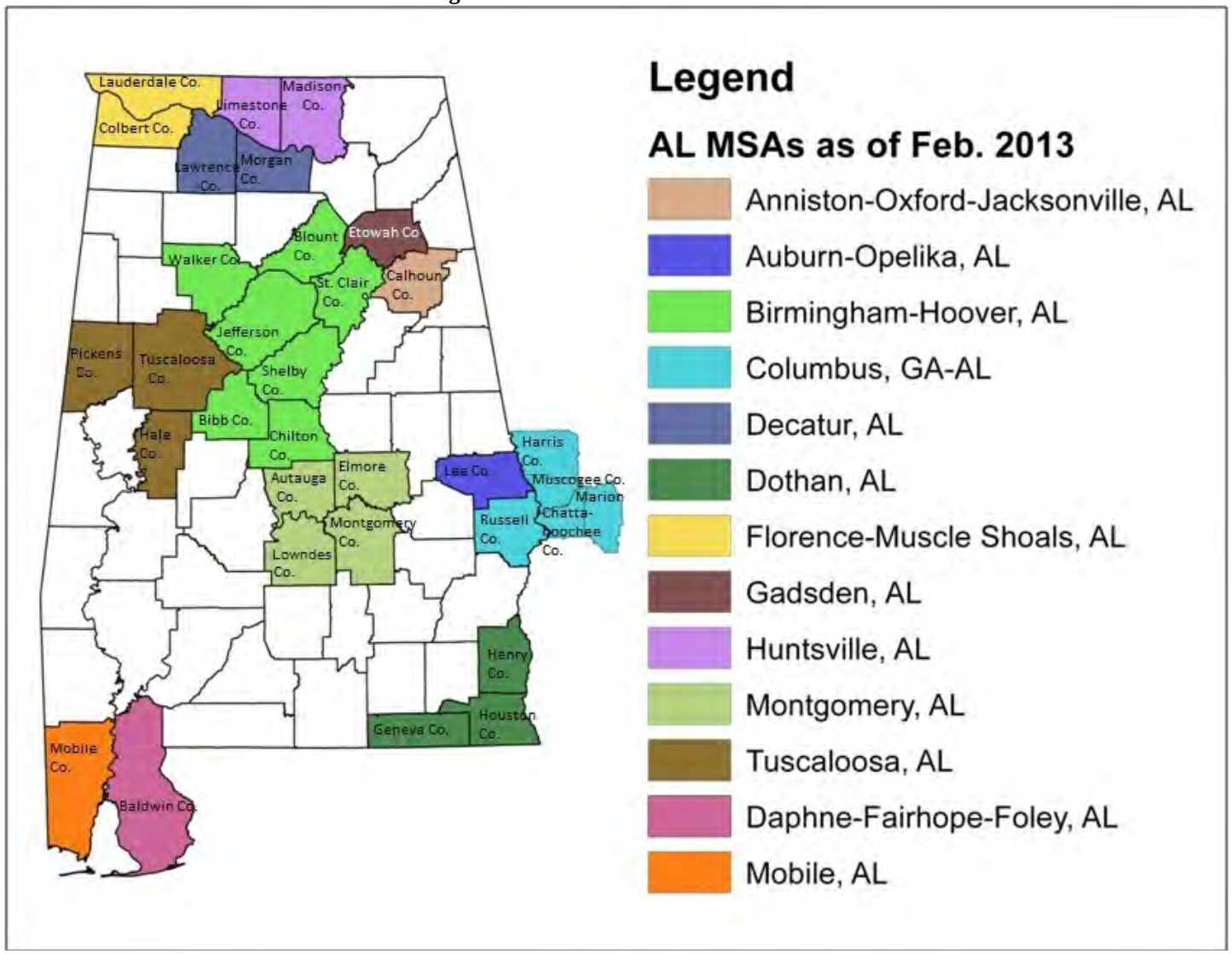
Minimum monitoring requirements vary for each pollutant and can be based on a combination of factors such as population, the level of monitored pollutants, and Core Based Statistical Area boundaries as defined in the latest US Census information. The term "Core Based Statistical Area" (CBSA) is a collective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

Table 2 lists the CBSAs in Alabama along with county names included in that area, and the 2015 estimated population. The Metropolitan Statistical Areas followed by the Micropolitan Statistical Areas are listed from highest to lowest population.

Table 2 - Alabama CBSAs

Core Based Statistical Area (CBSA) Title	Counties	2015 population est.	Metropolitan/Micropolitan Statistical Area
Birmingham-Hoover, AL	Jefferson, Shelby, Bibb, Blount, Chilton, St. Clair, and Walker	1,145,647	Metropolitan Statistical Area
Huntsville, AL	Madison and Limestone	444,752	Metropolitan Statistical Area
Mobile, AL	Mobile County	415,395	Metropolitan Statistical Area
Montgomery, AL	Montgomery, Autauga, Elmore, and Lowndes	373,792	Metropolitan Statistical Area
Columbus, GA-AL	Russell County, AL and Chattahoochee County, GA, Harris County, GA, Marion County, GA, Muscogee County, GA	313,749	Metropolitan Statistical Area
Tuscaloosa, AL	Tuscaloosa, Pickens, and Hale	239,908	Metropolitan Statistical Area
Daphne-Fairhope-Foley, AL	Baldwin	203,709	Metropolitan Statistical Area
Auburn-Opelika, AL	Lee	156,993	Metropolitan Statistical Area
Decatur, AL	Lawrence and Morgan	152,680	Metropolitan Statistical Area
Dothan, AL	Henry, Geneva, and Houston	148,171	Metropolitan Statistical Area
Florence-Muscle Shoals, AL	Colbert and Lauderdale	146,950	Metropolitan Statistical Area
Anniston-Oxford-Jacksonville, AL	Calhoun	115,620	Metropolitan Statistical Area
Gadsden, AL	Etowah	103,057	Metropolitan Statistical Area
Albertville, AL	Marshall	94,725	Micropolitan Statistical Area
Talladega-Sylacauga, AL	Coosa and Talladega	91,586	Micropolitan Statistical Area
Cullman, AL	Cullman	82,005	Micropolitan Statistical Area
Scottsboro, AL	Jackson	52,419	Micropolitan Statistical Area
Enterprise, AL	Coffee	51,211	Micropolitan Statistical Area
Ozark, AL	Dale	49,565	Micropolitan Statistical Area
Selma, AL	Dallas	41,131	Micropolitan Statistical Area
Valley, AL	Chambers	34,123	Micropolitan Statistical Area
Troy, AL	Pike	33,046	Micropolitan Statistical Area

Figure 1-Alabama with MSAs as of 2013



Types of Monitoring Stations

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 (NOx) and volatile organic compounds (VOCs). **PAMS monitoring requirements were revised in the 2016 ozone NAAQS rule and a PAMS site will be required in the state of Alabama in Jefferson County.** This site will need to be operational by 2019.

SLAMS - *State or Local Ambient Monitoring Station*: The SLAMS make up ambient air quality monitoring sites that are primarily needed for NAAQS comparisons. **Alabama SLAMS are described in detail by pollutant and monitoring agency in the section labeled Alabama's SLAMS by Pollutant.**

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 currently one STN site located in Alabama at the North Birmingham NCore site (01-073-0023) operated by JCDH.**

Supplemental Speciation - Any $PM_{2.5}$ speciation station that is used to gain supplemental data and is not dedicated as part of the speciation trends network. **Two $PM_{2.5}$ supplemental speciation sites are located in Alabama**: Phenix City-Downtown (AQS ID 01-113-0001) operated by ADEM and Wylam (AQS ID 01-073-2003) operated by JCDH.

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 one NCore site. **The NCore site for Alabama is at the North Birmingham site (AQS ID 01-073-0023), Birmingham MSA, operated by JCDH. Additional information concerning this site can be found in the JCDH Air Monitoring Network Description.**

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 in DeKalb County (AQS ID 01-049-9991), operated by an EPA contractor.

Alabama's SLAMS by Pollutant

Lead Network

In 2008, EPA revised the NAAQS for lead (Pb). The Pb standard was lowered from 1.5 ug/m^3 for a quarterly average to 0.15 ug/m^3 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 Co., located in Troy, Pike County (not within a CBSA), which emits greater than 1/2 ton of Pb per year. Troy (AQS ID 01-109-0003), operated by ADEM, has been monitoring for Pb near that source since 2009. To meet QA requirements, collocated lead monitoring is also occurring at this site.

Based on current emissions data, JCDH and the HDNREM have no sources that would require Pb monitoring.

Based on population requirements, North Birmingham NCore site, Birmingham-Hoover MSA (AQS ID 01-073-0023),operated by JDCH, and has been collecting Pb monitoring data since 12-29-2011. JCDH will discontinue Pb monitoring at the North Birmingham NCore site at the end of calendar year 2016.

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 monitors to be sited near roads in certain urban areas.

40 CFR Part 58 Appendix D, 4.2 details the requirements for CO monitoring.

> 4.2.1 General Requirements. (a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO2 monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of 1,000,000 or more persons. If a CBSA has more than one required near-road NO2 monitor, only one CO monitor is required to be collocated with a near-road NO2 monitor within that CBSA. (b) If a state provides quantitative evidence demonstrating that peak ambient CO concentrations would occur in a near-road location which meets microscale siting criteria in Appendix E of this part but is not a near-road NO2 monitoring site, then the EPA Regional Administrator may approve a request by a state to use such an alternate near-road location for a CO monitor in place of collocating a monitor at near-road NO2 monitoring site.

Those monitors required in CBSAs having 1 million or more persons are required to be operational by January 1, 2017.

Based on this, the CO monitor required to be collocated with the near road NO_2 monitor in the Birmingham-Hoover CBSA and operational by January 1, 2017 is satisfied at the Near Road Site (AQS ID 01 073 2059), operated by JCDH.

Currently CO is monitored at the following 4 sites :

Table 3 - JCDH CO Monitoring sites

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham, SR	33.553031	-86.814853	3/1/2000	High Pop. Exposure	Neighborhood	Continuously Year-round
01-073-1003	Jefferson	Fairfield, PFD	33.485556	-86.915062	12/11/74	High Pop. Exposure	Neighborhood	Continuously Year-round
01-073-2059	Jefferson	Near Road Site	33.521427	-86.815000	1/1/2014	High Pop. Exposure	Micro	Continuously Year-round

Nitrogen Dioxide (NO_2) Network

On January 22, 2010 the US EPA finalized the monitoring rules for Nitrogen Dioxide (NO_2). The new rules include new requirements for the placement of new NO_2 monitors in urban areas.

These include:

Near Road Monitoring

At least one monitor must be located near a major road in each CBSA with a population ≥500,000 people. 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 segment with an annual average daily traffic (AADT) count ≥250,000 vehicles.

These NO_2 monitors must be placed near those road segments ranked with the highest traffic levels by AADT, with consideration given to fleet mix, congestion patterns, terrain, geographic location, and meteorology in identifying locations where the peak concentrations of NO_2 are expected to occur. Monitors must be placed no more than 50 meters (about 164 feet) away from the edge of the nearest traffic lane.

For near road NO_2 monitoring, Birmingham-Hoover is the only CBSA 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. Therefore, only one near road NO_2 monitor is located in the Birmingham-Hoover CBSA. JCDH has established a site at Arkadelphia Road known as Near Road Site (AQS ID 01-073-2059), that monitors for NO_2, CO and $PM_{2.5}$. The establishment of a permanent near-road NO_2 monitoring site, meeting design and siting criteria as specified in 40 CFR Part 58 was operational by January 1, 2014.

Community Wide Monitoring

A minimum of one monitor must be placed in any urban area with a population greater than or equal to 1 million people to assess community-wide concentrations.

For community wide monitoring, Birmingham-Hoover is the only CBSA in Alabama with a population greater than 1 million, thereby requiring one NO_2 monitor. North Birmingham NCore (AQS ID 01-073-0023), operated by JCDH, monitors for NO_y and NO_2 based on community wide requirements.

Sulfur Dioxide (SO_2) Network

Effective August 23, 2010, EPA strengthened the primary National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO_2). EPA established a new 1-hour standard at a level of 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 SO_2 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 SO_2. EPA is setting specific minimum requirements that inform states on where they are required to place SO_2 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 of 1,000,000 or more;

2 monitors in CBSAs with PWEI values less than 1,000,000 but greater than 100,000; and

1 monitor in CBSAs with PWEI values greater than 5,000.

According to the latest PWEI calculations listed in Table 4, only the Birmingham-Hoover and Mobile CBSAs require SO_2 monitoring.

The Birmingham-Hoover CBSA requires two SO_2 monitors. North Birmingham NCore (AQS ID 01-073-0023) and Fairfield (AQS ID 01-073-1003), operated by JCDH, monitor for SO_2 to fulfill the requirement.

The Mobile CBSA requires one SO_2 monitor. Chickasaw (AQS ID 01-097-0003), operated by ADEM since 01/01/2013, monitors for SO_2 to fulfill the requirement.

Effective September 21, 2015, per 40 CFR Part 51, states are required to report all sources that generate >2,000 tpy SO_2, not dependent upon population density. For each source in this category, air quality must be determined through air quality modeling or ambient air monitoring. For sources that are characterized by monitoring operation of the site must be equivalent with the SLAMS requirements of 40 CFR Part 58. Source-oriented monitoring for SO_2 is required to commence on January 1, 2017. This option is only available in areas that are currently in attainment.

ADEM has identified one source that will be characterized by monitoring, Lhoist North America of Alabama, LLC – Montevallo Plant, located in Calera, Birmingham-Hoover MSA. Modeling was done to identify the ideal monitor placement and is currently under evaluation by the department. Further details about this site and the selection process can be found in APPENDIX D. When ADEM receives concurrence of the site selection from EPA, the site will be set up and become operational by January 1, 2017.

Table 4 - CBSA's PWEI and number of monitors required
Population Weighted Emissions Index (PWEI) Calculations
April 2016 - Using 2015 Census Estimates & 2011 NEI

CBSA Name	2011 NEI SO_2 (tpy)	Population (2015)	PWEI in Million persons-tpy	Required Monitors
Birmingham-Hoover, AL	115,337	1,145,647	132,135	2
Mobile, AL	18,726	415,395	7,779	1
Florence-Muscle Shoals, AL	18,642	146,950	2,739	0
Montgomery, AL	3,982	373,792	1,488	0
Columbus, GA-AL	3,696	313,749	1,160	0
Decatur, AL	4,881	152,680	745	0
Talladega-Sylacauga, AL	5,274	91,586	483	0
Gadsden, AL	3,949	103,057	407	0
Scottsboro, AL	6,497	52,419	341	0
Cullman, AL	3,487	82,005	286	0
Troy, AL	8,066	33,046	267	0
Tuscaloosa, AL	1,045	239,908	251	0
Huntsville, AL	284	444,752	126	0
Daphne-Fairhope-Foley, AL	213	203,709	43	0
Dothan, AL	221	148,171	33	0
Selma, AL	773	41,131	32	0
Auburn-Opelika, AL	189	156,993	30	0
Anniston-Oxford, AL	216	115,620	25	0
Albertville, AL	81	94,725	8	0
Ozark	106	49,565	5	0
Valley, AL	138	34,123	5	0
Enterprise-Ozark, AL	87	51,211	4	0

PM_{10} Network

PM_{10} has been a criteria pollutant since 1987. Since that time there has been widespread monitoring of the PM_{10} levels in Alabama. In 2006, the US EPA modified the NAAQS for PM_{10} to revoke the annual standard. Currently, there is still a daily standard of 150 ug/m^3 based on 3 years of data. All monitors in the state have recorded PM_{10} levels that meet the NAAQS. Table 6 shows the minimum monitoring requirements.

Table 5 - Appendix D to part 58 PM_{10} Minimum Monitoring Requirements

TABLE D–4 OF APPENDIX D TO PART 58

PM_{10} MINIMUM MONITORING REQUIREMENTS
(NUMBER OF STATIONS PER MSA)[1]

Population category	High concentration[2]	Medium concentration[3]	Low concentration[4,5]
>1,000,000	6–10	4–8	2–4
500,000–1,000,000	4–8	2–4	1–2
250,000–500,000	3–4	1–2	0–1
100,000–250,000	1–2	0–1	0

1 Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.
2 High concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM_{10} NAAQS by 20 percent or more.
3 Medium concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM_{10} NAAQS.
4 Low concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM10 NAAQS.
5 These minimum monitoring requirements apply in the absence of a design value.

The Birmingham-Hoover MSA has a population >1,000,000 and PM_{10} concentrations ≥ 80 percent of the PM_{10} National Ambient Air Quality Standards (NAAQS). According to table 6 above, the Birmingham-Hoover MSA is in the medium concentration range and is required to operate between 4 and 8 PM_{10} monitoring sites. Due to historically low PM_{10} concentrations and lower population in Walker, Shelby, and Chilton Counties, these required sites are located in Jefferson County and operated by JCDH where the population and emissions are primarily concentrated. Currently, JCDH operates PM10 monitors at five sites which are acceptable for comparison to the NAAQS.

At the North Birmingham NCore site (AQS ID 01 073 0023) JCDH operates three PM10 monitors, the primary monitor on a 1 in 3 day schedule, a collocated monitor on a 1 in 6 day schedule and one continuous monitor. The collocated pair of PM_{10} monitors (PQ200s) at the North Birmingham NCore site will continue to be operated at local conditions for lead monitoring. Leeds Elem. School (AQS ID 01-073-1010) has one PM_{10} monitor on a 1 in 6 day schedule. Wylam (AQS ID 01 073 2003) has three PM_{10} monitors: a primary and collocated low volume monitor on a 1 in 6 day schedule and a continuous monitor. Tarrant Elementary School (AQS ID 01 073 6002) has two PM_{10} monitors: one low volume monitor on a 1 in 3 day schedule and one continuous monitor. Sloss Shuttlesworth (AQS ID 01-073-6004) has one continuous PM_{10} monitor.

All other monitors in Alabama have indicated the PM_{10} levels to be in the low concentration range. According to Table 5, Columbus, GA-AL, Huntsville, Mobile and Montgomery MSAs, with populations between 250,000 and 500,000, are required to have 0 to 1 monitors.

The Huntsville MSA has three hi-volume PM_{10} monitors which are comparable to the NAAQS. These are located at Pulaski Pike-Fire St. #10 (AQS ID 01-089-0002), South Parkway-Fire St. #7 (AQS ID 01-089-0004) and Huntsville Old Airport (AQS ID 01-089-0014). Huntsville also operates a continuous hi-volume PM_{10} monitor at the Old Airport Road site. Additionally, HDNREM operates a special purpose hi-volume PM_{10} monitor at the Downtown Garage Site (AQS ID 01-089-0003) for daily reporting to the public only, not for NAAQS comparison.

The Montgomery MSA has one site at MOMS (AQS ID 01-101-1002) with two PM_{10} monitors, one of them being the quality assurance monitor, operated by ADEM.

Ozone 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 6). Since the NAAQS for ozone is 0.070 parts per million of ozone then 85% of the NAAQS truncated is **0.059** ppm

Table 6 - Appendix D to Part 58. SLAMS Minimum O3 Monitoring Requirements

TABLE **D–2** OF APPENDIX D TO PART 58
SLAMS MINIMUM **O3** MONITORING REQUIREMENTS

MSA population[1, 2]	Most recent 3-year design value concentrations ≥85% of any **O3** NAAQS[3]	Most recent 3-year design value concentrations <85% of any **O3** NAAQS[3,4]
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000[5]	1	0

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 7 lists Alabama's Ozone sites, AQS ID, 2013-2015 Ozone Design Values, MSA name, maximum design value of the MSA, number of Ozone monitors required by the CFR, and the current number of Ozone monitors.

Table 7- Alabama MSAs with Ozone Monitoring Sites and current Design Value

Site Name	AQS ID	2013-2015 Design Values	MSA	MSA Max DV	# of sites required per CFR	Current # of sites
North Birmingham NCore	01-073-0023	0.064	Birmingham-Hoover	0.067	2	8
Fairfield	01-073-1003	0.065				
McAdory School	01-073-1005	0.064				
Leeds Elem. School	01-073-1010	0.063				
Hoover	01-073-2006	0.065				
Corner High School	01-073-5003	0.063				
Tarrant Elem. School	01-073-6002	0.067				
Helena	01-117-0004	0.065				
Ladonia, Phenix City	01-113-0002	0.061	Columbus, GA-Phenix City, AL	0.061	1	2*
Columbus, GA, Airport	13-215-0008	0.061				
Decatur	01-103-0011	0.061	Decatur	0.061	1	1
Dothan	01-069-0004	0.060	Dothan	0.06	1	1
Fairhope	01-003-0010	0.065	Daphne-Fairhope	0.065	1	1
Muscle Shoals	01-033-1002	0.058	Florence-Muscle Shoals	0.058	1	1
Southside	01-055-0011	0.059	Gadsden	0.059	0	1
Huntsville Old Airport	01-089-0014	0.063	Huntsville	0.063	2	2
Huntsville Capshaw Rd	01-089-0022	0.061				
Mobile - Chickasaw	01-097-0003	0.062	Mobile	0.065	2	2
Mobile - Bay Road	01-097-2005	0.065				
DBT	01-051-0001	0.060	Montgomery	0.062	2	2
Montgomery - MOMS	01-101-1002	0.062				
Duncanville, Tuscaloosa	01-125-0010	0.059	Tuscaloosa	0.059	0	1
Ward, Sumter Co Background)	01-119-0003	0.057	not in MSA	NA		1
Sand Mtn. **	01-049-9991	0.065	not in MSA	NA		
No monitor			Anniston-Oxford	NA	0	
No monitor			Auburn-Opelika	NA	0	

*1 in AL and 1 in GA

** CASTNET site operated by EPA contractor.

DV ≥ 85% of the NAAQS

Ozone Monitoring requirements for Alabama MSAs

Birmingham-Hoover MSA

Using the 2015 Birmingham-Hoover MSA population estimate (Table 2) and the design value from Table 7, two Ozone monitors are required in this MSA. There are currently eight Ozone sites in this MSA. One site, Helena (AQS ID 01-117-0004), operated by ADEM, is located in Shelby County. Seven sites, North Birmingham NCore (AQS ID 01-073-0023), Fairfield (AQS ID 01-073-1003), McAdory School (AQS ID 01-073-1005), Leeds Elementary School (AQS ID 01-073-1010), Hoover (AQS ID 01-073-2006), Corner High School (AQS ID 01-073-5003) and Tarrant Elementary School (AQS ID 01-073-6002), operated by JCDH, are located in Jefferson County. Additional information about these monitors is found in the JCDH Network description. No changes are planned for this MSA.

Columbus, GA/AL MSA

Using the Columbus GA/AL MSA population estimate in 2015 (Table 2) and the design value from Table 7, one Ozone monitor is required for this MSA. There are currently two Ozone sites in this MSA. One site, Ladonia (01-113-0002), operated by ADEM, is west of Phenix City in Russell County, and the other site, Columbus, GA, Airport (AQS ID 13-215-0008), operated by Georgia Environmental Protection Division, is located in Georgia. No changes are planned for this MSA.

Decatur MSA

Using the Decatur MSA population estimate in 2015 (Table 2) and the design value from Table 7, one Ozone monitor is required for this MSA. There is currently one Ozone site, Decatur (01-103-0011), operated by ADEM. No changes are planned for this MSA.

Dothan MSA

Using the Dothan MSA population estimate in 2015 (Table 2) and the design value from Table 7, one Ozone monitor is required for this MSA. There is currently one Ozone site, Dothan (01-069-0004), operated by ADEM. No changes are planned for this MSA.

Daphne-Fairhope-Foley MSA

Using the Daphne-Fairhope-Foley MSA population estimate in 2015 (Table 2) and the design value from Table 7, one Ozone monitor is required for this MSA. There is currently one Ozone site, Fairhope (01-003-0010), operated by ADEM. No changes are planned for this MSA.

Florence-Muscle Shoals MSA

Using the Florence-Muscle Shoals MSA population estimate in 2015 (Table 2) and the design value from Table 7, no Ozone monitors are required for this MSA. There is currently one Ozone site, Muscle Shoals (01-033-1002), operated by ADEM. No changes are planned for this MSA.

Gadsden MSA

Using the Gadsden MSA population estimate in 2015 (Table 2) and the design value from Table 7, one Ozone monitor is required for this MSA. There is currently one Ozone site, Southside (01-055-0011), operated by ADEM. No changes are planned for this MSA.

Huntsville MSA

Using the Huntsville MSA population estimate in 2015 (Table 2) and the design value from Table 7, two Ozone monitors are required for this MSA. There are currently two Ozone sites, Huntsville Old Airport (01-089-0014) and Huntsville Capshaw Rd (01-089-0022), operated by HDNREM. No changes are planned for this MSA.

Mobile MSA

Using the Mobile MSA population estimate in 2015 (Table 2) and the design value from Table 7, two Ozone monitors are required for this MSA. There are currently two Ozone sites, Chickasaw (01-097-0003) and Bay Road (01-097-2005), operated by ADEM. No changes are planned for this MSA.

Montgomery MSA

Using the Montgomery MSA population estimate in 2015 (Table 2) and the design value from Table 7, two Ozone monitors are required for this MSA. There are currently two Ozone sites, MOMS (01-101-1002) and DBT, Wetumpka (01-051-0001), operated by ADEM. ADEM received written notification on April, 2016, that they must relocate the site DBT (AQS ID: 01-051-0001) from the current location. Per our lease agreement, ADEM has 90 days to relocate the site, either to an adjacent property or a new site in Elmore County. Any changes will be sent out for public comment prior to EPA submission.

Tuscaloosa MSA

Using the Tuscaloosa MSA population estimate in 2015 (Table 2) and the design value from Table 7, one Ozone monitor is required for this MSA. There is currently one Ozone site, Duncanville (01-125-0010), operated by ADEM. No changes are planned for this MSA.

Auburn-Opelika and Anniston-Oxford MSAs

The MSAs of Auburn-Opelika and Anniston-Oxford were evaluated by ADEM. Both MSAs have populations less than 160,000. 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 58.

Sites not located in an MSA

Sumter County represents rural, background ozone values for the state. The historical design values for this monitor have been less than 85% of the NAAQS. One Ozone site, Ward (01-119-0003), operated by ADEM, is located in Sumter County. No changes are planned for this site.

There is an Ozone monitor, located at the CASTNET site near Crossville in DeKalb County, Sand Mountain (01-149-9991), operated by EPA.

$PM_{2.5}$ Network

Minimum monitoring requirements for $PM_{2.5}$ are based on population and whether the design value is less than 85% of the NAAQS, or greater than or equal to 85% of the NAAQS (See Table 8). In addition to the FRM monitors required by Table 8, the state is required to operate a regional background and a regional transport site. 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 requirement goes away 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 9 are based on 2013 – 2015 data. A design value of **29.75** ug/m^3 is the lowest value which is ≥85% of the 24-hour standard of 35 ug/m^3. A design value of **10.2** ug/m^3 is the lowest value that is ≥85% of the annual standard of 12 ug/m^3(effective March 18, 2013).

Table 8 - Appendix D to Part 58, PM2.5 Minimum Monitoring Requirements

TABLE **D–5** OF APPENDIX D TO PART 58. **PM2.5** MINIMUM MONITORING REQUIREMENTS		
MSA population [1,2]	Most recent 3-year design value ≥85% of any PM2.5 NAAQS[3]	Most recent 3-year design value<85% of any PM2.5 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 PM2.5 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 New $PM_{2.5}$ Rule requires CBSAs with populations greater than a million but less than 4 million operate a $PM_{2.5}$ monitor at its NO_2 near road site by January 1, 2017. The only CBSA in Alabama that requires a NO_2 near road monitoring site is the Birmingham-Hoover MSA. The requirement is satisfied by Near Road Site (AQS ID 01-073-2059), operated by JCDH.

In order to meet the continuous monitoring requirements of Appendix D, ADEM currently operates 7 MetOne BAM monitors (AQS method code 731) which do not have FEM designation. These monitors are also used for AQI submittals and for submittal to the AirNow system. Comparison with the NAAQS will be based on the FRMs at each site which are designated as the primary monitor and operate on the required frequency.

Table 9 lists Alabama's $PM_{2.5}$ sites, AQS ID, the 2013-2015 $PM_{2.5}$ 24-hour and Annual and Design Values for each site, MSA name, the 2015 estimated population of the MSAs, the Annual and 24-hour Design Value for each MSA, , the number of monitors required by the CFR and the current number of $PM_{2.5}$ monitors.

Table 9- MSAs with $PM_{2.5}$ Monitoring Sites and current Design Value

Site Name	AQS Site ID	PM2.5 24 hr DV 2013-2015	PM2.5 Annual DV 2013-2015	MSA	Annual MSA DV	24hr MSA DV	# of sites required per CFR	Current # of sites
North Birmingham NCore	01-073-0023	23	11.0	Birmingham-Hoover	11.0	23	3	7
McAdory School	01-073-1005	NA**	NA**					
Leeds Elem. School	01-073-1010	20	10.1					
Wylam	01-073-2003	20	10.5					
Sloss Shuttlesworth	01-073-6004	NA**	NA**					
Arkadelphia (Near Road)	01-073-2059	NA**	NA**					
Pelham***	01-117-0006	19	9.2					
Muscogee DH GA	13-215-0001	21	9.6	Columbus, GA/AL	10.0	22.0	0	4*
Columbus Airport GA	13-215-0008	21	9.6					
Cussetta Rd GA	13-215-0011	22	9.6					
Phenix City - Downtown	01-113-0001	20	10.0					
Decatur	01-103-0011	18	8.9	Decatur	8.9	18.0	0	1
Dothan CC	01-069-0003	18	8.1	Dothan	8.1	18.0	0	1
Fairhope	01-003-0010	17	8.6	Daphne-Fairhope-Foley	8.6	17.0	0	1
Muscle Shoals	01-033-1002	18	8.9	Florence-Muscle Shoals	8.9	18.0	0	1
Gadsden - CC	01-055-0010	19	9.3	Gadsden	9.3	19.0	0	1
Huntsville Old Airport	01-089-0014	18	8.6	Huntsville	8.6	18.0	0	1
Mobile - Chickasaw	01-097-0003	18	8.6	Mobile	8.6	18.0	0	1
Montgomery – MOMS	01-101-1002	19	9.3	Montgomery	9.3	19.0	0	1
Tuscaloosa - VA Hospital	01-125-0004	19	9.0	Tuscaloosa	9.0	19.0	0	1
Ashland	01-027-0001	20	8.4	Not in MSA	8.4	20.0	1	1
Crossville	01-049-1003	19	9.2	Not in MSA	9.2	19.0	1	1
Childersburg	01-121-0002	19	9.5	Not in MSA	9.5	19.0	0	1
Ward, Sumter Co. Background (continuous)	01-119-0003			Not in MSA			1	1
No Monitor				Anniston-Oxford	NA	NA	0	0
No Monitor				Auburn-Opelika	NA	NA	0	0

*1 in AL and 3 in GA

DV ≥ 85% of the NAAQS

*** Closed 06/2015

NA ** incomplete data set

$PM_{2.5}$ Monitoring requirements for Alabama MSAs

Birmingham-Hoover MSA

Using the Birmingham-Hoover MSA population estimate in 2015 (Table 2) and the design value from Table 9, three FRM and two continuous monitors are required for this MSA. The Pelham FRM monitor (AQS ID 01-117-0006), operated by ADEM, was closed 06/2015. JCDH operates 5 FRM monitors are located in Jefferson County, 4 collocated FRM monitors, 5 continuous monitors, 1 IMPROVE network speciation monitor, 1 STN speciation monitor, and 1 supplemental speciation monitor.

North Birmingham NCore (AQS ID 01-073-0023), has four $PM_{2.5}$ monitors: one FRM monitor on a 1 in 3 day schedule with a collocated FRM on a 1 in 6 day schedule, a continuous monitor, an IMPROVE Speciation monitor on a 1 in 3 day schedule and an STN Speciation monitor on a 1 in 3 day schedule. McAdory School (AQS ID 01-073-1005) operates three $PM_{2.5}$ monitors : one FRM on a 1 in 3 day schedule with a collocated FRM on a 1 in 6 day schedule and a continuous monitor. Leeds (AQS ID 01-073-1010) operates three $PM_{2.5}$ monitors : one FRM on a 1 in 6 day schedule with a collocated FRM on a 1 in 6 day schedule and a continuous monitor. Hoover (AQS ID 01-073-2006) operates a continuous $PM_{2.5}$ monitor. Arkadelphia Near Road Site (AQS ID 01-073-2059) operates an FRM $PM_{2.5}$ monitor on a 1 in 6 day schedule. Wylam (AQS ID 01-073-2003) operates an FRM on a 1 in 3 day schedule with a collocated FRM on a 1 in 6 day schedule, a continuous $PM_{2.5}$ monitor and a $PM_{2.5}$ STN Speciation monitor. Further details of the JCDH $PM_{2.5}$ network can be found in the Network Description section of this document.

Columbus, GA/AL MSA

Using the Columbus, GA/AL MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There are currently four FRM monitors, one collocated FRM monitor, two non-FRM/FEM/ARM continuous monitors, and two speciation monitors in this MSA. ADEM operates one FRM monitor, one collocated FRM monitor, one speciation monitor, and one FEM continuous monitor at the Phenix City, AL site (AQS ID 01-113-0001). The continuous FEM monitor was installed in March of 2016 and is not currently comparable to the NAAQS while it is in the 2-year evaluation period. The State of Georgia operates three FRM monitors, one speciation monitor and one continuous monitor in Columbus. No changes are planned for this MSA.

Daphne-Fairhope-Foley MSA

Using the Daphne-Fairhope-Foley MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor located at the Fairhope site (AQS ID 01-003-0010). No changes are planned for this MSA.

Decatur MSA

Using the Decatur MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor and one non-FEM continuous monitor located at the Decatur site (AQS ID 01-103-0011). No changes are planned for this MSA.

Dothan MSA

Using the Dothan MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor located at the Dothan Civic Center site (AQS ID 01-069-0003). No changes are planned for this MSA.

Florence-Muscle Shoals MSA

Using the Florence-Muscle Shoals MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor located at the Muscle Shoals site (AQS ID 01-003-1002). No changes are planned for this MSA.

Gadsden MSA

Using the Gadsden MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor and one non-FEM continuous monitor at the Gadsden C College site (AQS ID 01-055-0010). No changes are planned for this MSA.

Huntsville MSA

Using the Huntsville MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. Currently, there is one FRM, one collocated FRM monitor and one non-FRM/FEM/ARM continuous monitor, operated by HDNREM, located in this MSA. No changes are planned for this MSA.

Mobile MSA

Using the Mobile MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor and one non-FEM continuous monitor located at the Chickasaw site (AQS ID 01-097-0003). No changes are planned for this MSA.

Montgomery MSA

Using the Montgomery MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor, one collocated FRM monitor, and one non-FEM continuous monitor located at the MOMS, ADEM site (AQS ID 01-101-1002). No changes are planned for this MSA.

Tuscaloosa MSA

Using the Tuscaloosa MSA population estimate in 2015 (Table 2) and the design value from Table 9, no FRM monitor is required. There is currently one FRM monitor and one non-FEM continuous monitor located at the VA, Tuscaloosa site (AQS ID 01-125-0004). No changes are planned for this MSA.

Auburn-Opelika and Anniston-Oxford MSAs

The MSAs of Auburn-Opelika and Anniston-Oxford were evaluated to determine the need for monitors. Both MSAs have populations less than 160,000. 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

Sumter County represents rural, background $PM_{2.5}$ values for the west part of the state. A non-FEM continuous monitor is currently being operated in Ward, Sumter County. ADEM intends to maintain this site.

The Micropolitan Statistical Area of Talladega-Sylacauga is adjacent to the Anniston-Oxford and the Birmingham-Hoover MSAs. The $PM_{2.5}$ annual design value, 9.5, and the $PM_{2.5}$ 24-hour standard design value, 19.0, is less than 85% of the NAAQS. There is currently one FRM monitor located in Childersburg, Talladega County (AQS ID 01-121-0002). ADEM intends to maintain this site.

An FRM monitor located near Ashland, Clay County (AQS ID 01-027-0001), serves as a regional transport site in between the large MSAs of Birmingham-Hoover and Atlanta. The $PM_{2.5}$ annual design value, 8.4, and 24-hour standard design value, 20.0, are less than 85% of the NAAQS for this monitor. ADEM intends to maintain this site.

An FRM monitor in Crossville, DeKalb County (AQS ID 01-049-1003), represents rural, background $PM_{2.5}$ values for the northeast part of the state. The $PM_{2.5}$ annual design value, 9.2, and 24-hour standard design value, 19.0, is less than 85% of the NAAQS. ADEM intends to maintain this site.

Quality Assurance

Each of the three monitoring agencies have US EPA approved Quality Assurance Program Plans that detail the activities used to control and document the quality of the data collected. Each agency operates as an independent Primary Quality Assurance Organization (PQAO) as defined by 40 CFR Part 58. Part of the EPA required quality control program for particulate monitors 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. Each agency network includes monitors for this purpose.

Monitoring Equipment Evaluation

An evaluation of the condition of ambient monitors and auxiliary equipment was performed by each of the three monitoring agencies. The equipment was categorized as “good” or “poor”. As resources allow, equipment in “poor” condition will be replaced. A report of each Agency’s equipment evaluation will be submitted to the US EPA by July 1 each year.

NETWORK DESCRIPTIONS

A description of the ambient air monitoring networks for each air pollution agency, followed by detailed site evaluations, will be presented in this section.

Included will be:

- AQS ID
- Address
- Latitude and Longitude
- Scale
- Type
- Monitoring Objective
- Beginning Sampling Date and Ending Sampling Date
- Method
- Operating Schedule
- Is it comparable to the NAAQS?

ADEM AIR MONITORING NETWORK DESCRIPTION

Abbreviations	
Scale	
N	Neighborhood (0.5 – 4 Kilometers)
U	Urban (overall citywide conditions, 4 -50 kilometers
R	Regional (usually rural, with homogenous geography, tens to hundreds of kilometers)
M	Middle Scale
Type	
CAS	CASNET operated by EPA
S	SLAMS
QA	QA Collocated Monitor
SPM	Special Purpose Monitor
Operating Schedule	
C	Continuous monitor
D	Daily 24-hour samples
3	1 24-hour sample every 3 days (on national schedule)
6	1 24-hour sample every 6 days (on national schedule)
Methods	
H	Hi-volume SSI sampler
L	Low Volume SSI
T	TEOM continuous monitor
B	BAM continuous monitor
U	UV photometric ozone analyzer
P	Pulsed Fluorescent
S	Hi-Volume Total Suspended Particulate monitor
G	Lead Analysis by Graphite furnace
NAAQS[1]	
Y,N	Data suitable for comparison to NAAQS

[1] Collocated monitors must be operated in the same manner as the federal reference method but one monitor at the site is designated as the main monitor for comparison to the NAAQS.

PM_{10}

Site common name	County	AQS Site ID	Address	Latitude	Longitude	SCALE	TYPE	Monitoring objective / CBSA	Date Began	Date Ended	METHOD	SCHEDULE	NAAQS	Comment
Montgomery - MOMS	Montgomery	01-101-1002	1350 Coliseum Blvd, Montgomery, AL	32.412811	-86.263394	N	S	Population Exposure/ Montgomery, AL	6/1/1993	active	S	6	Y	
Montgomery - MOMS	Montgomery	01-101-1002	1350 Coliseum Blvd, Montgomery, AL	32.412811	-86.263394	N	QA	Population Exposure/ Montgomery, AL	1/1/2013	active	S	6	Y	Collocated

Lead

Site common name	County	AQS Site ID	Address	Latitude	Longitude	SCALE	TYPE	Monitoring objective / CBSA	Date Began	Date Ended	METHOD	SCHEDULE	NAAQS	Comment
Troy	Pike	01-109-0003	Henderson Road, Troy, AL	31.790560	-85.979170	N	S	Highest Concentration / Troy,AL uSA	1/1/2009	active	S, G	6	Y	Source oriented
Troy	Pike	01-109-0003	Henderson Road, Troy, AL	31.790560	-85.979170	N	QA	Highest Concentration / Troy,AL uSA	1/1/2009	active	S, G	6	Y	Collocated

PM 2.5

Site common name	County	AQS Site ID	Address	Latitude	Longitude	SCALE	TYPE	Monitoring objective / CBSA	Date Began	Date Ended	METHOD	SCHEDULE	NAAQS	Comment
Fairhope	Baldwin	01-003-0010	Fairhope High School, Fairhope, AL	30.497478	-87.880258	M	S	Population exposure/ Daphne-Fairhope µSA	1/1/2000	active	L	3	Y	FRM
Ashland	Clay	01-027-0001	Ashland Airport	33.284928	-85.803608	R	S	Highest Concentration/ not in CBSA	1/1/1999	active	L	3	Y	FRM Regional Transport
Muscle Shoals	Colbert	01-033-1002	2nd Street and Wilson Dam Road	34.762619	-87.638097	N	S	Highest Concentration/ Florence MSA	1/1/1999	active	L	3	Y	FRM
Crossville	DeKalb	01-049-1003	13112 Hwy 68, Crossville AL	34.288567	-85.969858	N	SPM	General/background/ Fort Payne µSA	1/1/1999	active	L	3	Y	FRM
Gadsden C College	Etowah	01-055-0010	1001 Wallace Dr Gadsden, AL	33.991494	-85.992647	U	S	Population Exposure/ Gadsden MSA	1/1/2000	active	L	3	Y	FRM
Gadsden C College	Etowah	01-055-0010	1001 Wallace Dr Gadsden, AL	33.991494	-85.992647	U	S	Population Exposure/ Gadsden MSA	1/1/2014	active	B	C	N	Collocated Non-FEM Continuous
Dothan Civic Center	Houston	01-069-0003	126 North St Andrews St. Civic Center	31.224783	-85.390789	N	S	Population Exposure/ Dothan MSA	1/7/2005	active	L	3	Y	FRM
Chickasaw	Mobile	01-097-0003	Iroquois and Azalea, Chickasaw	30.770181	-88.087761	N	S	Population Exposure/ Mobile MSA	7/19/2002	active	L	3	Y	FRM
Chickasaw	Mobile	01-097-0003	Iroquois and Azalea, Chickasaw	30.770181	-88.087761	N	S	Population Exposure/ Mobile MSA	3/1/2011	active	B	C	N	Collocated Non-FEM Continuous

PM 2.5 continued

Site common name	County	AQS Site ID	Address	Latitude	Longitude	SCALE	TYPE	Monitoring objective / CBSA	Date Began	Date Ended	METHOD	SCHEDULE	NAAQS	Comment
MOMS, ADEM	Montgomery	01-101-0002	1350 Coliseum Blvd, Montgomery, AL	32.412811	-86.263394	N	S	Population Exposure/ Montgomery MSA	1/16/2009	active	L	3	Y	FRM
MOMS, ADEM	Montgomery	01-101-0002	1350 Coliseum Blvd, Montgomery, AL	32.412811	-86.263394	N	QA	Population Exposure/ Montgomery MSA	1/16/2009	active	L	6	Y	Collocated FRM
MOMS, ADEM	Montgomery	01-101-0002	1350 Coliseum Blvd, Montgomery, AL	32.412811	-86.263394	N	SPM	Population Exposure/ Montgomery MSA	4/1/2009	active	B	C	N	Collocated Non-FEM Continuous
Decatur	Morgan	01-103-0011	Wallace Ctr.Hwy 31, Decatur	34.530717	-86.967536	M	S	Population Exposure/ Decatur MSA	8/7/2001	active	L	3	Y	FRM
Decatur	Morgan	01-103-0011	Wallace Ctr.Hwy 31, Decatur	34.530717	-86.967536	M	SPM	Population Exposure/ Decatur MSA	4/1/2009	active	B	C	N	Collocated Non-FEM Continuous
Phenix City	Russell	01-113-0001	St. Patrick's Church, Phenix City	32.472316	-85.005028	N	S	Highest Concentration/ Columbus, GA-AL MSA	1/1/1999	active	L	3	Y	FRM
Phenix City	Russell	01-113-0001	St. Patrick's Church, Phenix City	32.472316	-85.005028	N	QA	Highest Concentration/ Columbus, GA-AL MSA	5/17/2004	active	L	3	Y	Collocated FRM
Phenix City	Russell	01-113-0001	St. Patrick's Church, Phenix City	32.472316	-85.005028	N	SPM	Highest Concentration/ Columbus, GA-AL MSA	1/25/2010	active	T	C	N	Collocated Non-FEM Continuous
Pelham	Shelby	01-117-0006	Pelham High School	33.31278	-86.82111	U	S	Highest Concentration/ Birmingham MSA	1/1/1999	6/1/2015	L	3	Y	
Ward, Sumter County	Sumter	01-119-0003	NNE of Ward Post office, Sumter Co., Alabama	32.362606	-88.277992	R	SPM	Background/General/ not in MSA	3/1/2013	active	B	C	N	Continuous For Background
Childersburg	Talladega	01-121-0002	300 1st Street Southeast, Childersburg, AL	33.27947	-86.349438	N	S	Highest Concentration/ Talladega µSA	1/1/1999	active	L	3	Y	FRM
VA, Tuscaloosa	Tuscaloosa	01-125-0004	3701 Loop Road East	33.189931	-87.484189	N	S	Population Exposure/ Tuscaloosa MSA	10/1/2002	active	L	3	Y	FRM
VA, Tuscaloosa	Tuscaloosa	01-125-0004	3701 Loop Road East	33.189931	-87.484189	N	SPM	Population Exposure/ Tuscaloosa MSA	1/1/2014	active	B	3	N	Collocated Non-FEM Continuous

OZONE

Site common name	County	AQS Site ID	Address	Latitude	Longitude	SCALE	TYPE	Monitoring objective / CBSA	Date Began	Date Ended	METHOD	SCHEDULE	NAAQS	Comment
Fairhope	Baldwin	01-003-0010	Fairhope High School, Fairhope, AL	30.497478	-87.880258	N	SPM	Population Exposure/ Mobile MSA	3/1/2000	active	U	C	Y	
Muscle Shoals	Colbert	01-033-1002	Wilson Dam Rd And 2nd St.	34.762619	-87.638097	N	SPM	Population Exposure/ Decatur MSA	3/1/2003	active	U	C	Y	
DBT	Elmore	01-051-0001	Dewberry Trail, Wetumpka	32.492533	-86.134986	U	S	Highest Concentration/ Montgomery MSA	3/1/1990	active	U	C	Y	
Southside	Etowah	01-055-0011	1450 Parker Anderson Lane, Southside, Al	33.9039	-86.0539	N	S	Max Concentration/ Gadsden MSA	4/26/2002	active	U	C	Y	
Dothan	Houston	01-069-0004	161 Buford Lane	31.188933	-85.423094	N	S	Population Exposure/ Dothan MSA	3/14/2005	active	U	C	Y	
Chickasaw	Mobile	01-097-0003	Iroquois And Azalea Chickasaw	30.770181	-88.087761	N	S	Population Exposure/ Mobile MSA	3/2/1982	active	U	C	Y	
Bay Road	Mobile	01-097-2005	Bay Rd. ,Mobile AL	30.4747	-88.1411	U	S	Population Exposure/ Mobile MSA	3/1/1999	active	U	C	Y	
MOMS, ADEM	Montgomery	01-101-1002	1350 Coliseum Blvd, Montgomery, AL	32.412811	-86.263394	N	S	Population Exposure/ Montgomery MSA	6/2/1993	active	U	C	Y	
Decatur	Morgan	01-103-0011	Wallace Development Center	34.530717	-86.967536	U	S	General/Background/ Decatur MSA	4/1/2000	active	U	C	Y	
Ladonia, Phenix City	Russell	01-113-0002	9 Woodland Drive (School) , Ladonia, Al	32.46735	-85.083447	U	SPM	Population Exposure/ Columbus, GA-AL MSA	3/1/2003	active	U	C	Y	
Helena	Shelby	01-117-0004	Helena, Bearden Farm	33.3169	-86.825	U	S	Population Exposure/ Birmingham MSA	1/1/1983	active	U	C	Y	
Ward, Sumter Co.	Sumter	01-119-0003	NNE of Ward Post Office, Sumter Co., Alabama	32.362606	-88.277992	R	SPM	General/Background/ not in MSA	3/1/2013	active	U	C	Y	
Duncanville, Tuscaloosa	Tuscaloosa	01-125-0010	11690 Southfork Dr. Duncanville, Al	33.089772	-87.459733	U	S	Population Exposure/ Tuscaloosa MSA	2/1/2001	active	U	C	Y	
Sand Mountain	Dekalb	01-049-9991	Sand Mountain Agricultural Exper. Station Crossville, AL	34.2888	-85.9698	R	CAS	Highest Concentration/ Fort Payne µSA	1/1/2011	active	U	C	N	operated by EPA

SO_2

Site common name	County	AQS Site ID	Address	Latitude	Longitude	SCALE	TYPE	Monitoring objective / CBSA	Date Began	Date Ended	METHOD	SCHEDULE	NAAQS	Comment
Chickasaw	Mobile	01-097-0003	Iroquois And Azalea Chickasaw	30.76972	-88.0875	N	S	Population Exposure/ Mobile MSA	1/1/2013	active	P	C	Y	
Duncanville, Tuscaloosa	Tuscaloosa	01-125-0010	11690 Southfork Dr. Duncanville, Al	33.08953	-87.45972	U	S	Population Exposure/ Tuscaloosa MSA	1/1/2013	active	P	C	Y	

Fairhope
Fairhope High School
1 Pirate Drive
Fairhope, Alabama 36532
Baldwin County

AQS Site ID: 01-003-0010
Latitude: 30.497478
Longitude: -87.880258

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Population Exposure / Daphne-Fairhope, AL	L	3	Y	1/1/2000	active	
Ozone	N	SPM	Population Exposure / Mobile MSA	U	C	Y	3/1/2000	active	

Facing North

Facing South

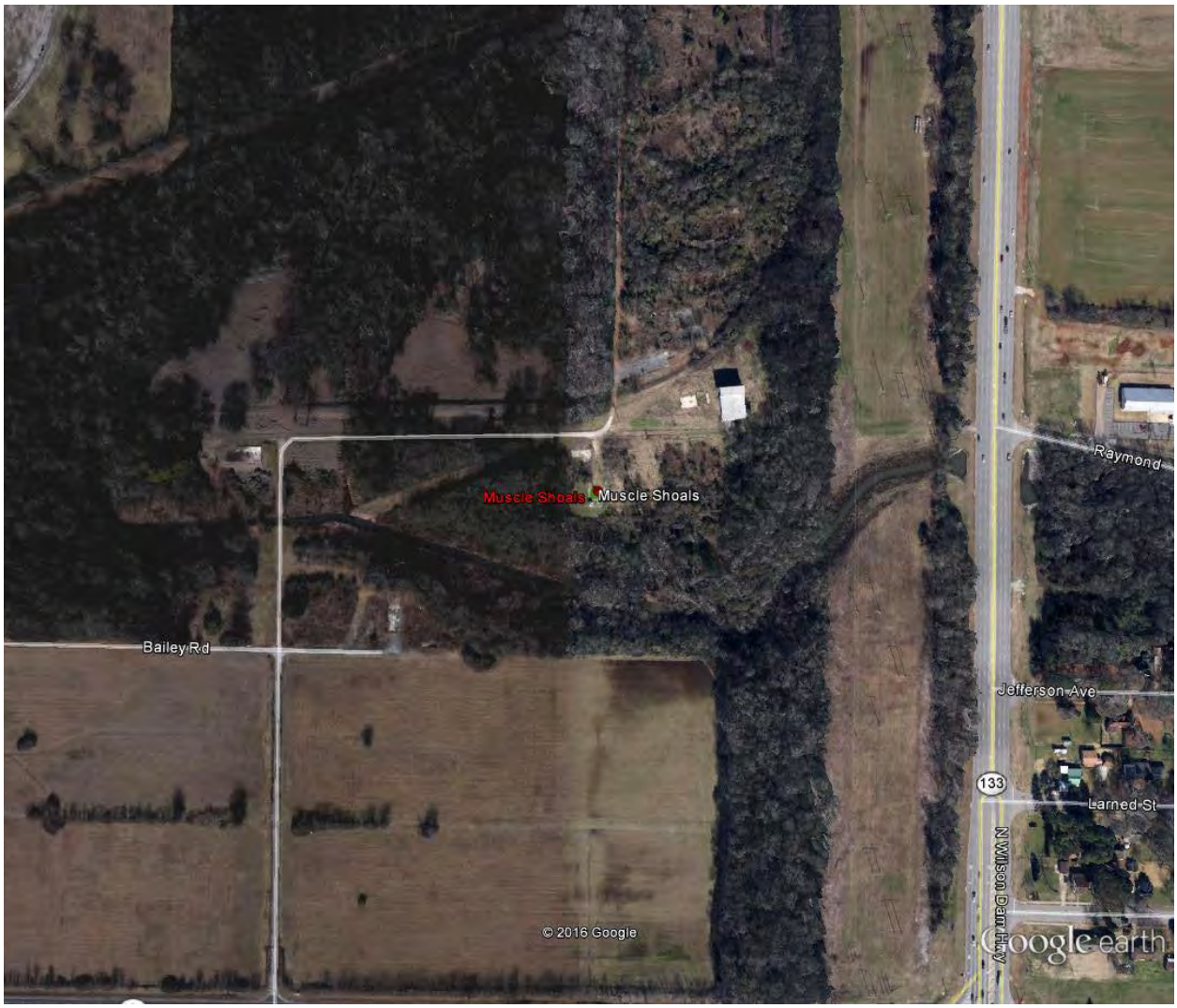
Facing East

Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
R&P 2.5	2.1m	N/A	19.2m	17.4m	68m to Gail Rowe Ln	Grass	N/A	N/A
UV Ozone	4.3m	1.1m	14.6m	12.8m	68m to Gail Rowe Ln	Grass	Teflon	Stainless steel

Muscle Shoals
2nd Street and Wilson Dam Road
Muscle Shoals, Alabama 35661
Colbert County

AQS Site ID: 01-003-1002
Latitude: 34.762619
Longitude: -87.638097



AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Highest Concentration / Florence MSA	L	3	Y	1/1/1999	active	
Ozone	N	SPM	Population Exposure / Decatur MSA	U	C	Y	3/1/2003	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	3.7m	1.1m	8m	7.6m	>400m	Grass	Teflon	Stainless steel
R&P 2.5	2.1m	N/A	8m	7.6m	>400m	Grass	N/A	N/A

Ashland
Ashland Airport
Ashland, Alabama 36251
Clay County

AQS Site ID: 01-027-0001
Latitude: 33.284928
Longitude: -85.803608

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	R	S	Highest Concentration / not in CBSA	L	3	Y	1/1/1999	active	


Facing North


Facing South


Facing East


Facing West

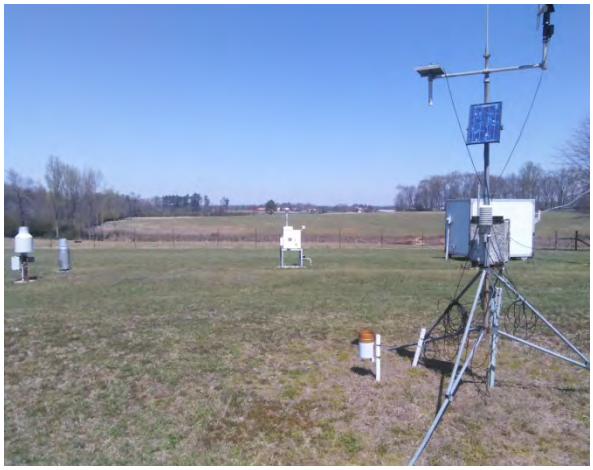
Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway (nearest pavement)	Type of ground cover around site	Probe material
R&P 2.5	N/A	2.1m	45m	37m	>200m	Grass	N/A

Crossville
13112 Highway 68
Crossville, Alabama 35962
DeKalb County

AQS Site ID: 01-049-1003
Latitude: 34.288567
Longitude: -85.969858

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	R	S	General / background	L	3	Y	1/1/1999	active	



Facing North

Facing South

Facing East

Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material
R&P 2.5	N/A	2.1m	28m	26m	>100m	Grass	N/A

DBT, Wetumpka
Dewberry Trail
Wetumpka, Alabama 36093
Elmore County

AQS Site ID: 01-051-0001
Latitude: 32.492533
Longitude: -86.134986

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	U	S	Highest Concentration / Montgomery MSA	U	C	Y	3/1/1990	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet above supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4m	1.2m	12.8m	11.9m	28m	Grass	Teflon	Stainless Steel

Comment: ADEM has been asked to move this monitor. ADEM will be looking for a new site in the summer of 2016.

Gadsden C College
1001 Wallace Drive
Gadsden, Alabama 35902
Etowah County

AQS Site ID: 01-055-0010
Latitude: 33.991494
Longitude: -85.992647

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	U	S	Population Exposure / Gadsden MSA	L	3	Y	1/1/2000	active	
PM 2.5	U	S	Population Exposure / Gadsden MSA	B	C	N	3/1/2014	active	Collocated Non-FEM Continuous

Facing North

Facing South

Facing East

Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material
BAM 2.5	2.1m	2.2m	18m	17m	80m	Grass	N/A
R&P 2.5	2.1m	2.1m	20m	19m	78m	Grass	N/A

Southside
1450 Parker Anderson Lane
Southside, Alabama 35907
Etowah County

AQS Site ID: 01-055-0011
Latitude: 33.9039
Longitude: -86.0539

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	N	S	Highest Concentration / Gadsden MSA	U	C	Y	4/26/2002	active	

Facing North

Facing South

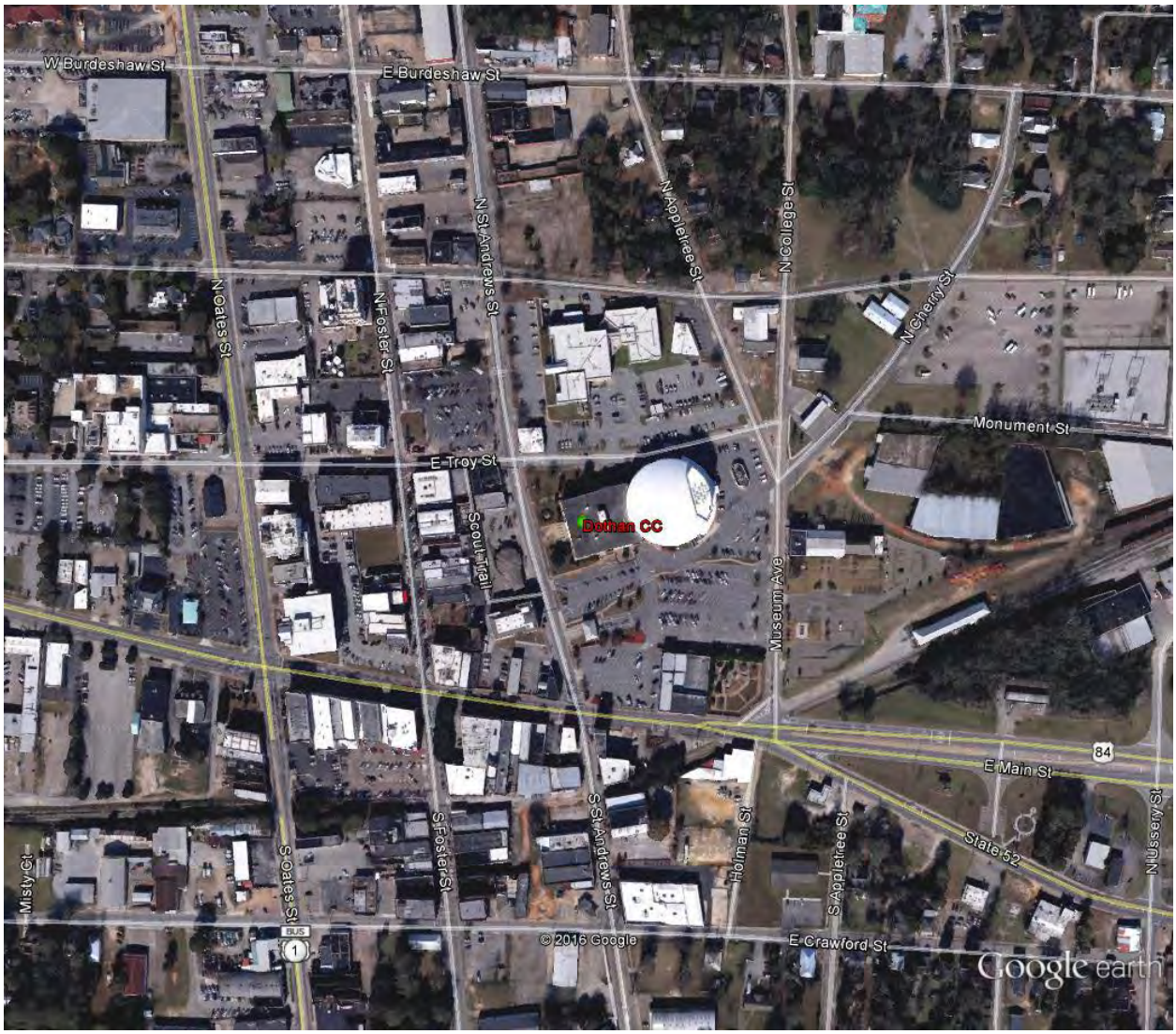
Facing East

Facing West

Monitor	Height of inlet	Distance of inlet above supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4.4m	1.8m	18m	16m	81m	Grass and gravel	Teflon	Stainless Steel

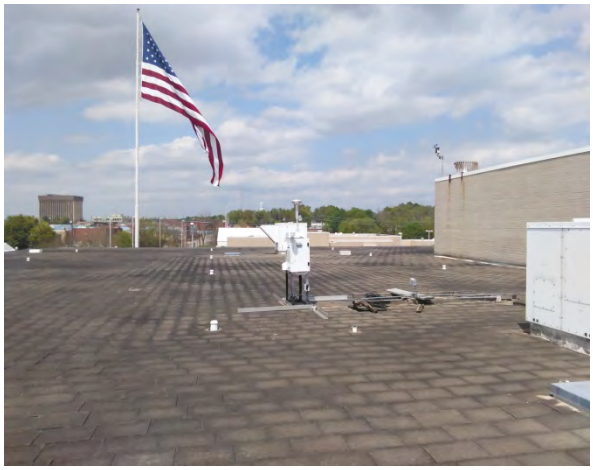
Dothan Civic Center
126 North St. Andrews Street
Dothan, Alabama 36303
Houston County

AQS Site ID: 01-069-0003
Latitude: 31.224783
Longitude: -85.390789



AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Population Exposure / Dothan MSA	L	3	Y	1/7/2005	active	



Facing North

Facing South

Facing East

Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material
R&P 2.5	N/A	13m	>40m	>40m	45m	Cement tile roof	N/A

Dothan
161 Buford Lane
Dothan, Alabama 36301
Houston County

AQS Site ID: 01-069-0004
Latitude: 31.188933
Longitude: -85.423094

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	N	S	Population Exposure / Dothan MSA	U	C	Y	3/14/2005	active	

Facing North

Facing South

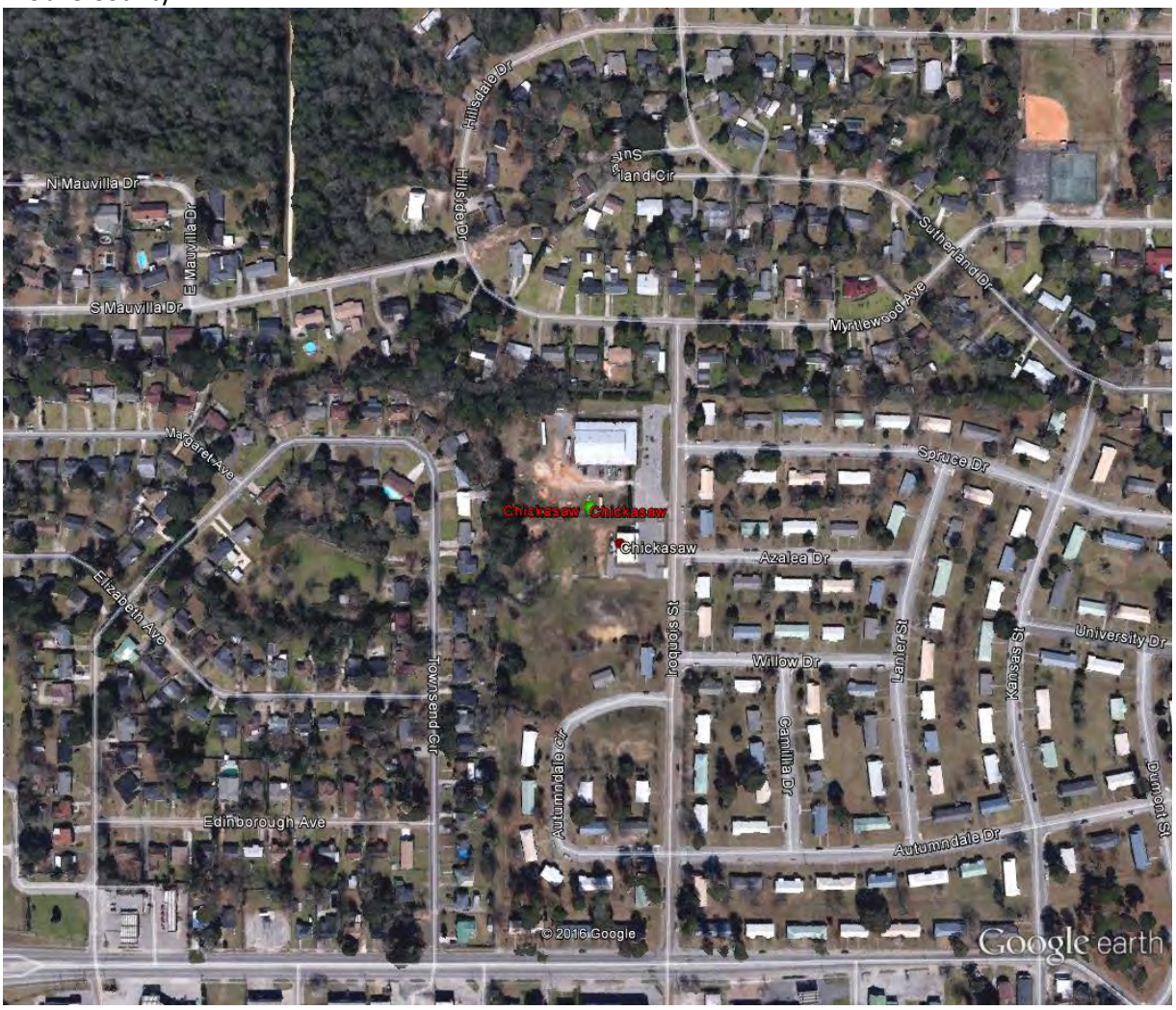
Facing East

Facing West

Monitor	Height of inlet	Distance of inlet above supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4.3m	1.7m	41m	35m	100m to S Park Ave	Grass and pavement	Teflon	Stainless Steel

Chickasaw
Iroquois and Azalea
Chickasaw, Alabama 36611
Mobile County

AQS Site ID: 01-097-0003
Latitude: 30.770181
Longitude: -88.087761

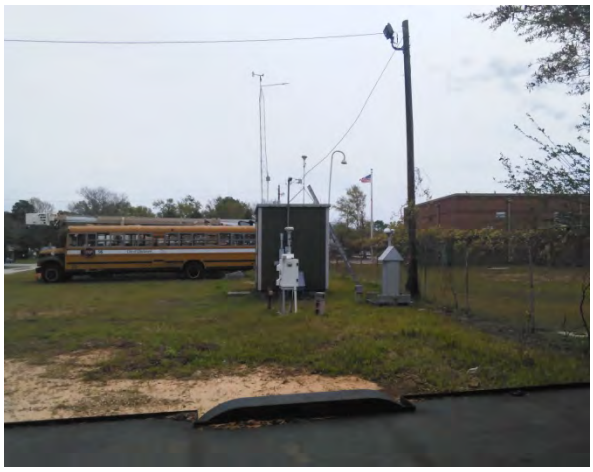


AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Population Exposure / Mobile MSA	L	3	Y	7/19/2002	active	
PM 2.5	N	S	Population Exposure / Mobile MSA	B	C	N	3/1/2011	active	Collocated Non-FEM Continuous
Ozone	N	S	Population Exposure / Mobile MSA	U	C	Y	3/2/1982	active	
SO_2	N	S	Population Exposure / Mobile MSA	P	C	Y	1/1/2013	active	

Facing North

Facing South



Facing East

Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
BAM 2.5	5.2m	2.1m	20m	16.5m	58m	Grass and pavement	N/A	N/A
R&P 2.5	2.1m	N/A	11m	7.3m	58m	Grass and pavement	N/A	N/A
UV Ozone	4.57m	1.65m	16.5m	12.8m	58m	Grass and pavement	Teflon	Stainless steel
SO2	4m	1m	18.2m	14.6m	58m	Grass and pavement	Teflon	Teflon

Bay Road
Bay Road
Mobile, Alabama 36582
Mobile County

AQS Site ID: 01-097-2005
Latitude: 30.4747
Longitude: -88.1411

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	U	S	Population Exposure / Mobile MSA	U	C	Y	3/1/1999	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet above supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4.3m	1.1m	44m	38m	30m to unnamed road and 207m to Bay Rd	Grass and gravel	Teflon	Stainless Steel

MOMS, ADEM
1350 Coliseum Boulevard
Montgomery, Alabama 36610
Montgomery County

AQS Site ID: 01-101-1002
Latitude: 32.412811
Longitude: -86.263394

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 10	N	S	Population Exposure / Montgomery MSA	H	6	Y	6/1/1993	active	
PM 10	N	QA	Population Exposure / Montgomery MSA	H	6	Y	1/1/2013	active	Collocated
PM 2.5	N	S	Population Exposure / Montgomery MSA	L	3	Y	1/16/2009	active	
PM 2.5	N	QA	Population Exposure / Montgomery MSA	L	3	Y	1/16/2009	active	Collocated
PM 2.5	N	S	Population Exposure / Montgomery, AL	B	C	N	4/1/2009	active	Collocated Non-FEM Continuous
Ozone	N	S	Population Exposure / Montgomery MSA	U	C	Y	6/2/1993	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
Hi-Vol SSI PM 10	2.3m	N/A	15m	15m	>100m	Grass, gravel and pavement	N/A	N/A
Hi-Vol SSI PM 10	2.3m	N/A	17.3m	17.3m	>100m	Grass, gravel and pavement	N/A	N/A
R&P 2.5	3.26m	N/A	14m	14m	>100m	Grass, gravel and pavement	N/A	N/A
R&P 2.5	3.26m	N/A	14m	14m	>100m	Grass, gravel and pavement	N/A	N/A
BAM 2.5	4.86m	2m	10.7m	10.7m	>100m	Grass, gravel and pavement	N/A	N/A
UV Ozone	3.75m	1.1m	8m	8m	>100m	Grass, gravel and pavement	Teflon	Stainless steel

Decatur
Wallace Development Center, Highway 31
Decatur, Alabama 35603
Morgan County

AQS Site ID: 01-103-0011
Latitude: 34.530717
Longitude: -86.967536

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	M	S	Population Exposure / Decatur MSA	L	3	Y	8/7/2001	active	
PM 2.5	M	S	Population Exposure / Decatur MSA	B	C	N	4/1/2009	active	Collocated Non-FEM Continuous
Ozone	U	S	General / Background / Decatur MSA	U	C	Y	4/1/2000	active	


Facing North


Facing South


Facing East


Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	3.9m	1.2m	>20m	>20m	>400m	Grass	Teflon	Stainless steel
BAM 2.5	4.9m	2.4m	>20m	>20m	>400m	Grass	N/A	N/A
R&P 2.5	2.1m	N/A	>20m	>20m	>400m	Grass	N/A	N/A

Troy
Henderson Road
Troy, Alabama
Pike County

AQS Site ID: 01-109-0003
Latitude: 31.790560
Longitude: -85.979170

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Lead	N	S	Highest Concentration / Troy, AL	S, G	6	Y	1/1/2009	active	
Lead	N	QA	Highest Concentration / Troy, AL	S, G	6	Y	1/1/2009	active	collocated


Facing North


Facing South

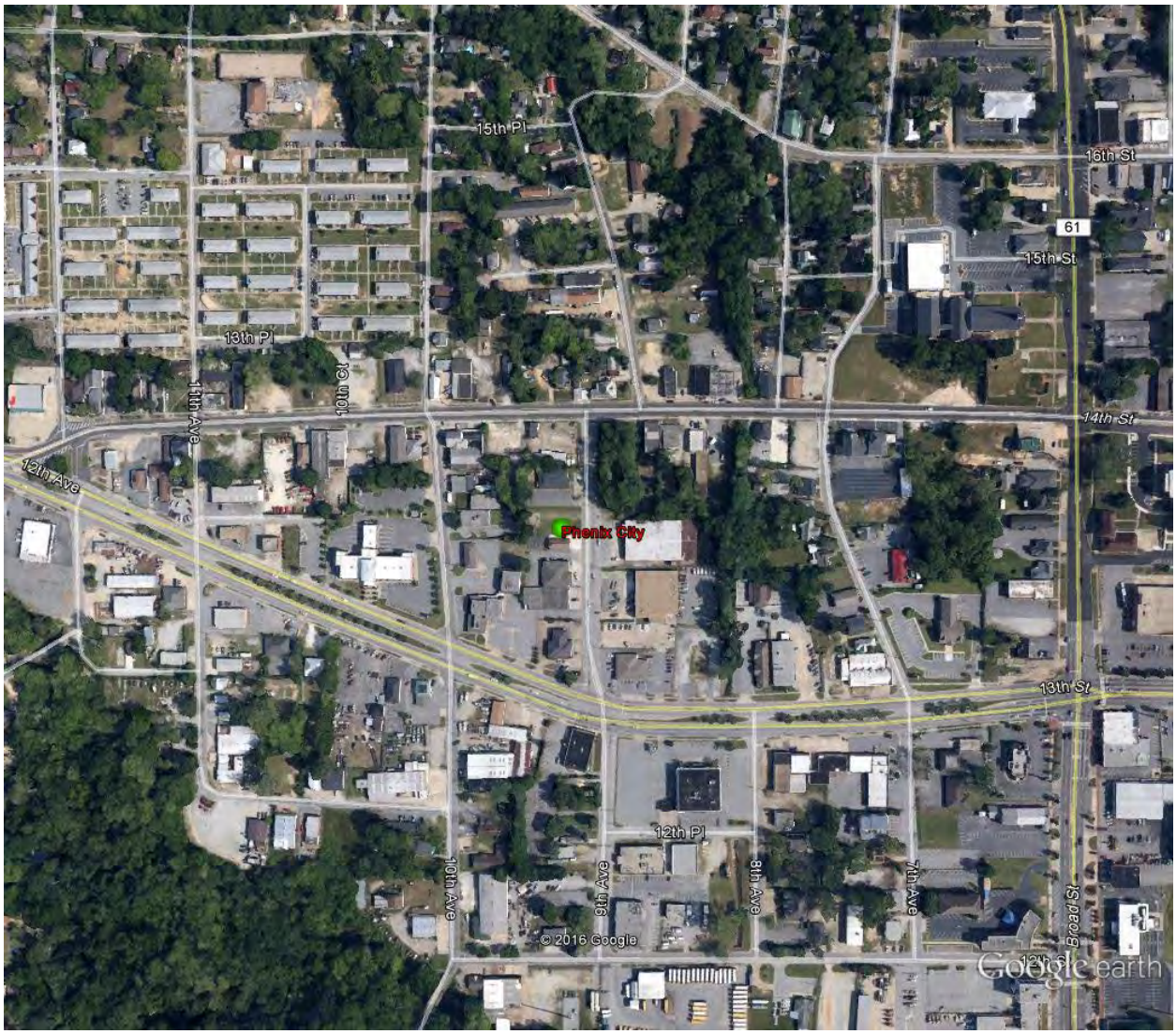

Facing East


Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway (nearest pavement)	Type of ground cover around site	Probe material
TSP – HV	2.1m	2m	12.8m	11.9m	13.7m	Grass	N/A
TSP - HV	2.1m	2.1m	9.1m	10m	15.5m	Grass	N/A

Phenix City
1319 9th Avenue
Phenix City, Alabama 36867
Russell County

AQS Site ID: 01-113-0001
Latitude: 32.472136
Longitude: -85.005028



AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Highest Conc./ Columbus, GA-AL MSA	L	3	Y	1/1/1999	active	
PM 2.5	N	QA	Highest Conc./ Columbus, GA-AL MSA	L	3	Y	5/17/2004	active	Collocated
PM 2.5	N	S	Highest Conc./ Columbus, GA-AL MSA	B	C	N	3/28/2016	active	FEM Continuous (in 2-year eval.)
CSN Supplemental			Highest Conc./ Columbus, GA-AL MSA	L			4/4/2005		

Facing North

Facing South

Facing East

Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material
R&P 2.5	1m	3.81m	14.6m	11m	18.3m	Grass and pavement	N/A
R&P 2.5	1m	3.81m	15.5m	12m	17.3m	Grass and pavement	N/A
BAM 1022	1 m	3.7m	13.7m	9m	17.3m	Grass and pavement	N/A
SASS	1.8m	3.7m	13.7m	9m	17.3m	Grass and pavement	N/A
URG	1.8m	3.7m	15.5m	12m	15.5m	Grass and pavement	N/A

Ladonia , Phenix City
9 Woodland Drive
Ladonia, Alabama 36869
Russell County

AQS Site ID: 01-113-0002
Latitude: 32.46735
Longitude: -85.083447

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	U	SPM	Population Exposure/ Columbus, GA-AL MSA	U	C	Y	03/1/2003	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet above supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4.3m	1.6m	>20m	>20m	100m to Woodland Drive	Grass and pavement	Teflon	Stainless Steel

Helena
Bearden Farm
Helena, Alabama
Shelby County

AQS Site ID: 01-117-0004
Latitude: 33.3169
Longitude: -86.825

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	U	S	Population Exposure / Birmingham MSA	U	C	Y	1/1/1983	active	


Facing North


Facing South


Facing East


Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4.5m	1.8m	12.5m	8.5m	>90m	Grass	Teflon	Stainless steel

Ward, Sumter County
NNE of Ward Post Office
Ward, Alabama 36907
Sumter County

AQS Site ID: 01-119-0003
Latitude: 32.362606
Longitude: -88.277992

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	R	S	Background / General / Not in MSA	B	C	N	3/1/2013	active	Non-FEM Continuous For Background
Ozone	R	SPM	Background / General / Not in MSA	U	C	Y	3/1/2013	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet from supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
BAM 2.5	4.7m	1.3m	22m	16.5m	43m	Grass	N/A	N/A
UV Ozone	4.7m	1.3m	21m	15.5m	43m	Grass	Teflon	Stainless steel

Childersburg
300 1st Street Southeast
Childersburg, Alabama 35044
Talladega County

AQS Site ID: 01-121-0002
Latitude: 33.27947
Longitude: -86.349438

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Highest Concentration / Talladega µSA	L	3	Y	1/1/1999	active	

Facing North

Facing South

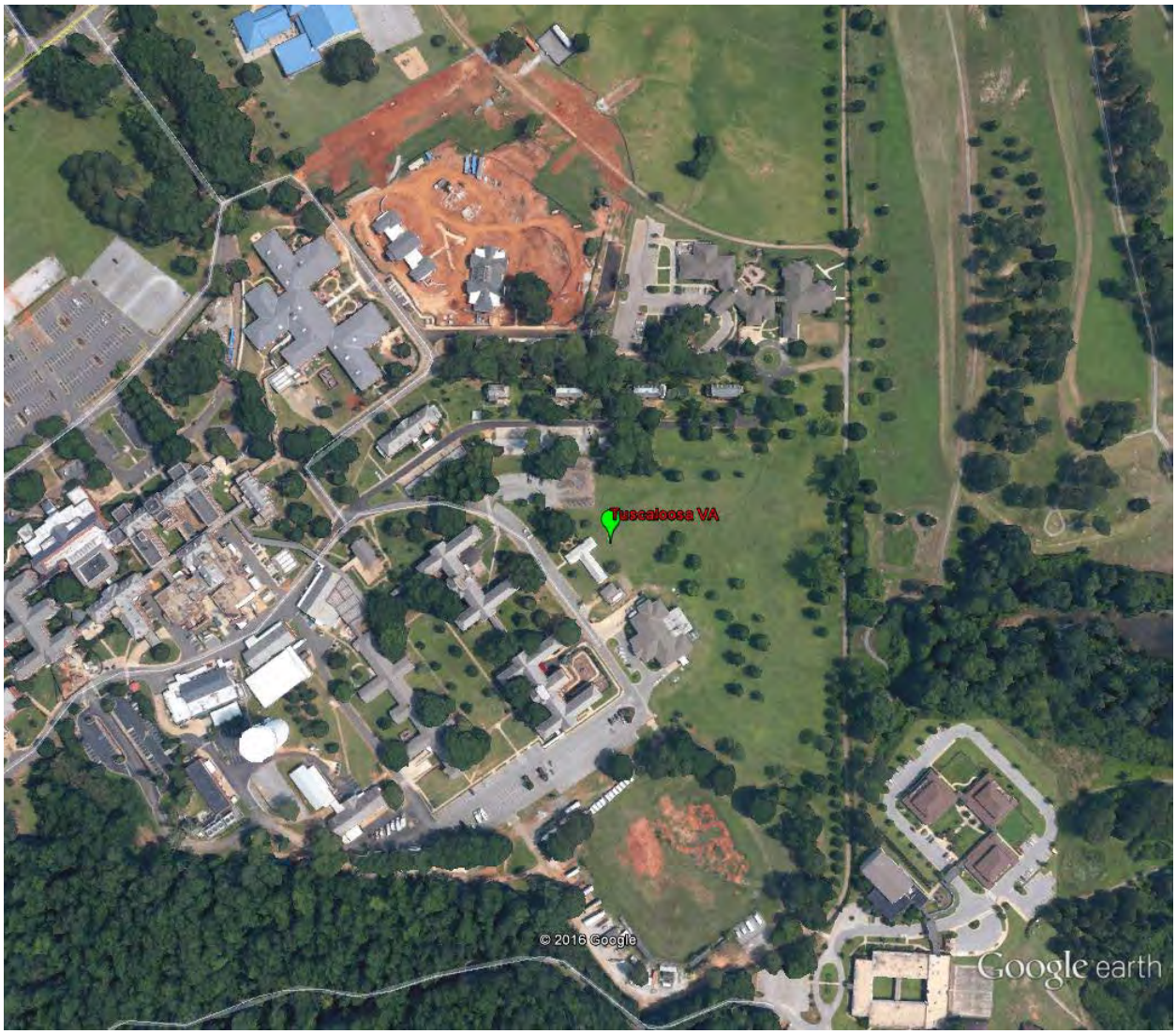
Facing East

Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material
R&P 2.5	N/A	2.8m	27m	17m	17m from 3rd Ave SE 64m from DeSoto Caverns Parkway	Grass	N/A

VA, Tuscaloosa
3701 Loop Road East
Tuscaloosa, Alabama 35404
Tuscaloosa County

AQS Site ID: 01-125-0004
Latitude: 33.189931
Longitude: -87.484189



AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM 2.5	N	S	Population Exposure / Tuscaloosa MSA	L	3	Y	10/1/2002	active	
PM 2.5	N	S	Population Exposure / Tuscaloosa MSA	B	3	N	3/1/2014	active	Collocated Non-FEM Continuous

Facing North

Facing South

Facing East

Facing West

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material
BAM 2.5	1.8m	2.26m	17m	15.5m	>40m	Grass	N/A
R&P 2.5	1.8m	2.1m	19m	17.4m	>40m	Grass	N/A

Duncanville, Tuscaloosa
11690 Southfork Drive
Duncanville, Alabama 35456
Tuscaloosa County

AQS Site ID: 01-125-0010
Latitude: 33.089772
Longitude: -87.459733

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	U	S	Population Exposure / Tuscaloosa MSA	U	C	Y	2/1/2001	active	

Facing North

Facing South

Facing East

Facing West

Monitor	Height of inlet	Distance of inlet above supporting structure	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway	Type of ground cover around site	Probe material	Bell Housing Material
UV Ozone	4m	1.1m	>20m	>20m	>40m	Grass	Teflon	Stainless Steel

APPENDIX A

Jefferson County Department Of Health (JCDH)

Jefferson County Department Of Health (JCDH)

Annual Air Monitoring Network Plan

May 2016

Regulations codified at 40 CFR Part 58, Appendices D (Network Design Criteria for Ambient Air Quality Monitoring) and E (Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring) were reviewed to determine if modifications to the existing air monitoring network are required.

Summary of JCDH Network Review

Lead (Pb) monitoring is required in major urbanized areas where Pb levels have been shown or are expected to be of concern due to the proximity of Pb point source emissions. According to the new lead regulations, sources emitting a half ton or more of lead per year would be candidates for lead ambient air monitoring. There are no longer any significant point sources of lead emissions greater than the half ton threshold in Jefferson County. Therefore, based on past monitoring and 2015 emissions inventory data, a lead source monitoring site is not required.

The EPA revised the NAAQS for Nitrogen Dioxide and it was promulgated in February 2010. In this rule, EPA required changes to the monitoring network that will focus monitoring resources to capture short-term NO_2 concentrations near heavily trafficked roads, to assess area-wide (or community-wide) NO_2 concentrations, and to assess NO_2 concentrations for vulnerable and susceptible populations. Jefferson County has installed the requisite monitoring site in October 2013 which became operational on January 1, 2014. NO_y monitoring began at the NCore site January 1, 2011.

To determine localized concentrations of PM2.5 in the North Birmingham area, the Department conducted PM2.5 monitoring at the Shuttlesworth site for one year [from July 1, 2013 to September 30, 2014]. This was operated as a special purpose, non-SLAMS monitor. Concentrations and concentration variations were very similar to those at next closest, proximate site, the North Birmingham monitoring site. JCDH will continue to monitor for PM2.5 at this site using a continuous monitoring method where the results will be publically accessible through the AirNow website located in the JCDH webpage.

Continuous $PM_{2.5}$ SPM (Special Purpose Monitors)

Continuous $PM_{2.5}$ monitoring is required in relation to the minimum SLAMS monitoring requirement stated above; i.e., equal to at least one-half (round up) the minimum monitoring requirement. Jefferson County is required to operate two continuous $PM_{2.5}$ monitors. However, six continuous $PM_{2.5}$ monitors are actually operated in Jefferson County for the purpose of AirNow mapping and to support our EMPACT website. Continuous $PM_{2.5}$ monitors are collocated with manual $PM_{2.5}$ monitors at North Birmingham, Wylam, McAdory and Leeds for quality assurance purposes.

Network Review Findings

The existing network as summarized in the attached Air Monitoring Network Description complies with 40 CFR Part 58 requirements. The described network should adequately characterize typical population exposure concentrations and compliance status with the NAAQS for pollutants of concern.

The monitoring site location map can be found in APPENDIX C.

JCDH AIR MONITORING NETWORK DESCRIPTION

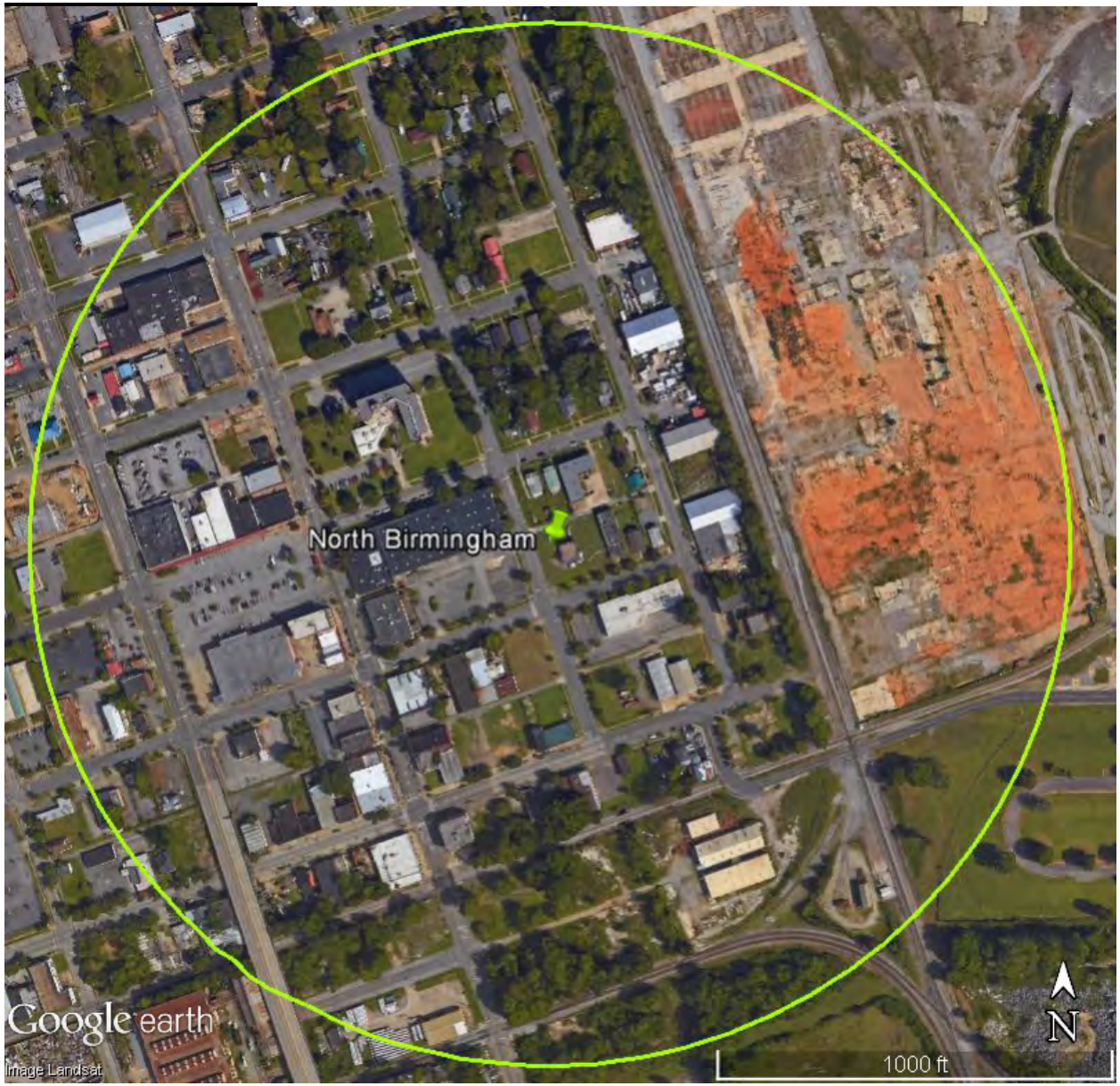
(As of 2016)

Abbreviations	
Scale	
N	Neighborhood (0.5 – 4 Kilometers)
U	Urban (overall citywide conditions, 4 -50 kilometers
R	Regional (usually rural, with homogenous geography, tens to hundreds of kilometers)
MC	Microscale
Type	
CS	Core SLAMS
NCS	NCore SLAMS
S	SLAMS
SPM	Special Purpose Monitor
Operating Schedule	
C	Continuous monitor
D	Daily 24-hour samples
3	1 24-hour sample every 3 days (on national schedule)
6	1 24-hour sample every 6 days (on national schedule)
Methods	
H	Hi-volume SSI sampler
L	Low Volume SSI
T	TEOM continuous monitor
U	UV photometric ozone analyzer
S	Hi-Volume Total Suspended Particulate monitor
G	Lead Analysis by Graphite furnace
P	Pulsed Fluorescent
I	Non Dispersive Infrared
F	Gas Filter Correlation
B	Beta Attenuation
UP	Chemiluminescence- photolytic
NAAQS[2]	
Y,N	Data suitable for comparison to NAAQS

North Birmingham/NCore

[2] Collocated monitors must be operated in the same manner as the Federal Reference Method; one monitor at the site is designated as the main monitor for comparison to the NAAQS.

0.25 mile radius



Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-0023	3009 28th St. North	33.553.056 -86.815000	N	NCS	Neighborhood	03/01/00	Active	U	C	Y	*Year Round*
SO2				N	NCS	High Population Exposure	01/01/11	Active	P	C	Y	
CO				N	NCS	Neighborhood	03/01/00	Active	F	C	Y	

NOy				N	NCS	High Population Exposure	01/01/11	Active	UP	C	Y	
NO_2				N	NCS	High Population Exposure	01/01/14	Active	UP	C	Y	*Began 01/2014*
Low Vol PM10				N	NCS	High Concentration	01/01/03	Active	L	3	Y	*LC/Lead//STP*
Low Vol PM10				N	NCS	Collocated Sampler	01/01/03	Active	L	6	Y	*LC/Lead//STP*
Cont PM10				N	SPM	High Concentration	02/01/13	Active	B	C	N	*Began 02/2013*
Lead				N	NCS	Neighborhood	01/01/11	Active	L	3	Y	*XRF Analysis*
Lead				N	NCS	Collocated Sampler	01/01/11	Active	L	6	Y	*XRF Analysis*
PM2.5				N	NCS	High Concentration	01/01/99	Active	L	3	Y	
PM2.5				N	NCS	Collocated Sampler	01/01/99	Active	L	6	Y	
Cont PM2.5				N	SPM	High Concentration	02/01/13	Active	B	C	N	*Began 02/2013*
PM10 IMPROVE				N	NCS	High Concentration	04/21/04	Active		3	N	
PM2.5 IMPROVE SPECIATION				N	NCS	High Concentration	04/21/04	Active		3	N	
PM2.5 STN SPECIATION				N	NCS	High Concentration	01/01/01	Active		3	N	*1 in 3 Alternate Schedule*
RadNet				N	NCS	High Concentration	04/19/07	Active		C	N	

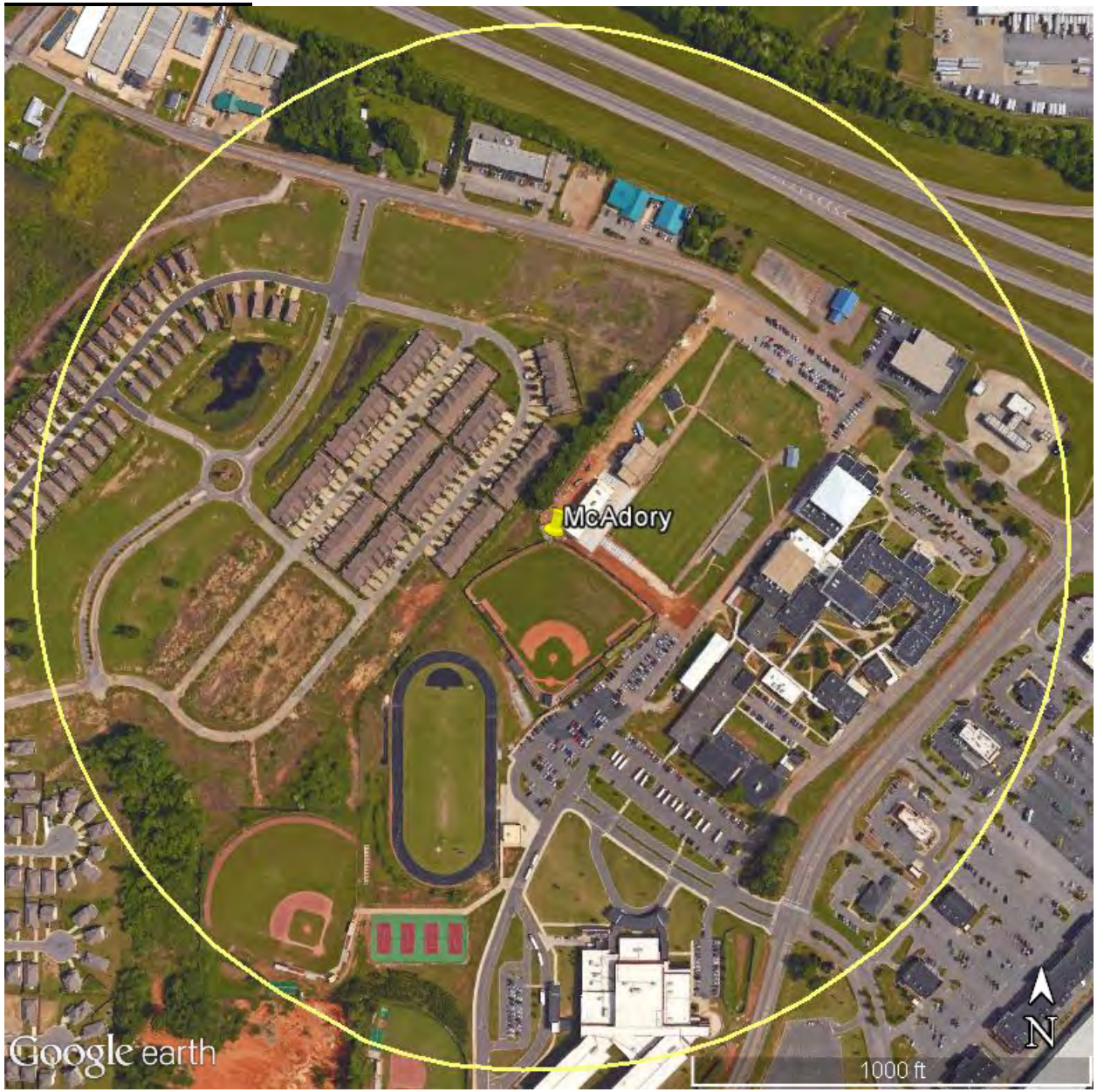
Fairfield

0.25 mile radius

Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-1003	5229 Court B	33.485556 -86.915000	N	S	High Population Exposure	04/26/74	Active	U	C	Y	*March - October*
SO2				N	S	High Population Exposure	12/11/74	Active	P	C	Y	
CO				N	S	High Concentration	06/17/87	Active	I	C	Y	

McAdory

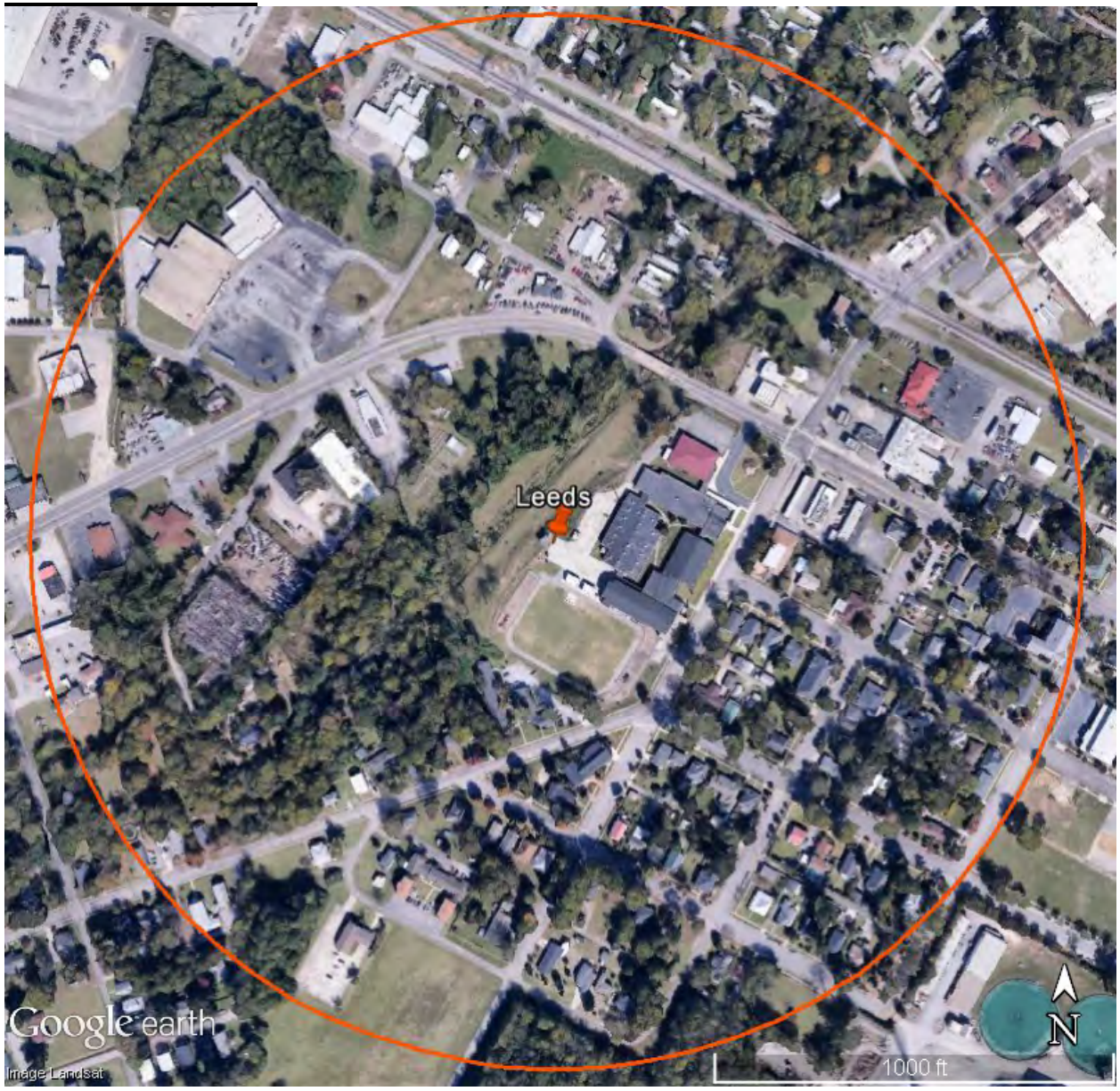
0.25 mile radius



Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-1005	4800 McAdory School Rd.	33.331111 -87.003611	U	S	High Concentration	06/17/87	Active	U	C	Y	*March - October*
PM2.5				N	SPM	Typical Population	01/01/99	Active	L	3	Y	
PM2.5				N	SPM	Collocated Sampler	01/01/99	Active	L	6	Y	
Cont PM2.5				N	SPM	Typical Population	01/01/99	Active	T	C	N	

Leeds

0.25 mile radius



Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-1010	201 Ashville Rd.	33.545278 -86.549167	N	S	High Population Exposure	03/01/01	Active	U	C	Y	*March - October*
Low Vol PM10				N	S	Typical Population	01/01/04	Active	L	6	Y	*LC converted to STP*
PM2.5				N	SPM	Typical Population	01/01/04	Active	L	6	Y	

PM2.5				N	SPM	Collocated Sampler	01/01/04	Active	L	6	Y	
Cont PM2.5				N	SPM	Typical Population	01/01/04	Active	T	C	N	

Hoover

0.25 mile radius

Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-2006	3425 Tamassee Lane	33.386389 -86.816667	N	S	High Population Exposure	09/01/88	Active	U	C	Y	*March - October*
Cont PM2.5				N	SPM	High Population Exposure	07/25/01	Active	T	C	N	

Corner

0.25 mile radius

Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-5003	1005 Corner School Rd.	33.801667 -86.942500	U	S	Typical Population	03/01/00	Active	U	C	Y	*March - October*
Cont PM2.5				U	SPM	Typical Population	07/22/01	Active	T	C	N	

Tarrant
0.25 mile radius

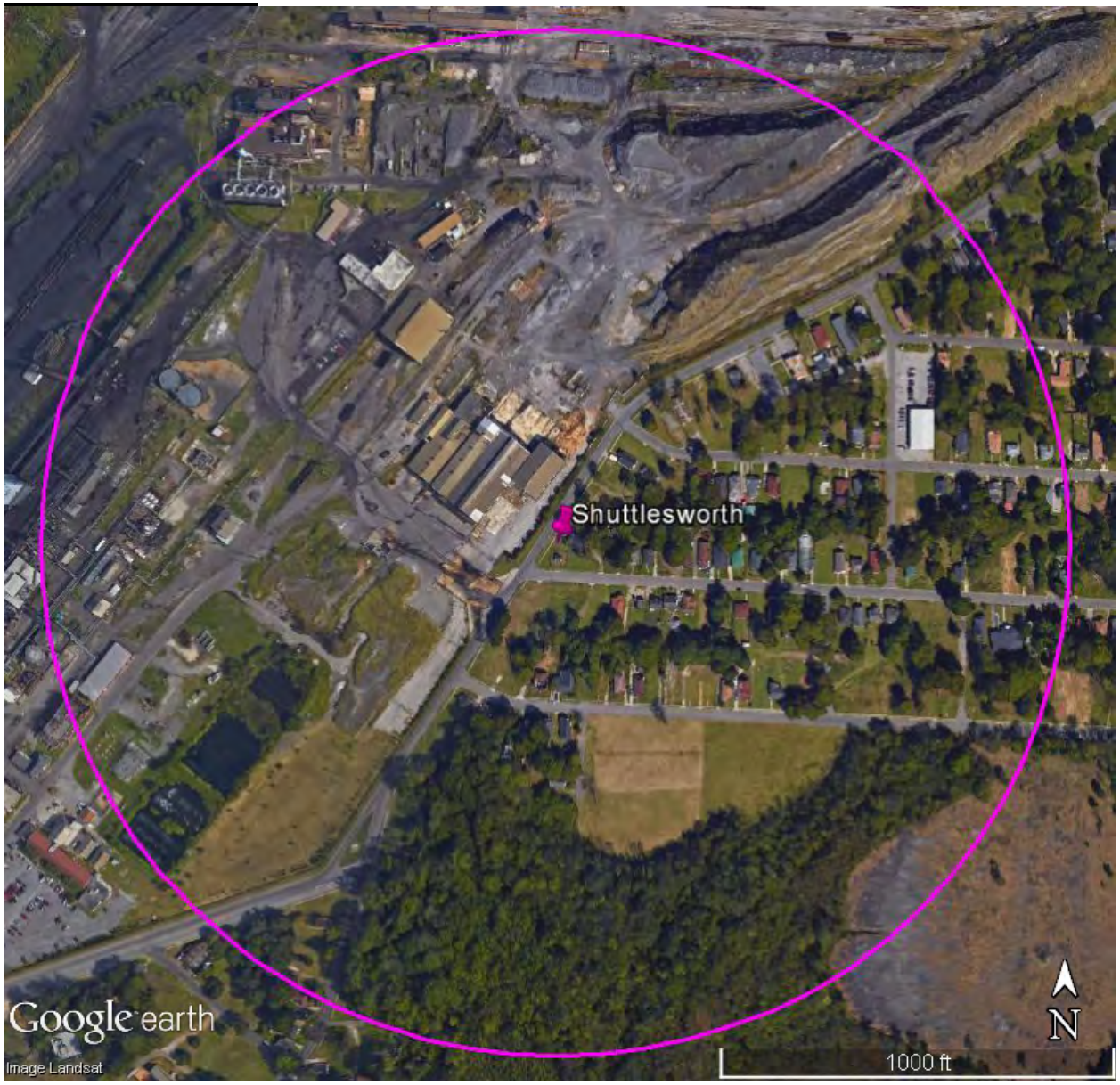
Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Ozone	01-073-6002	1269 Portland St.	33.578333 -86.773889	N	S	High Population Exposure	03/24/80	Active	U	C	Y	*March - October*
Low Vol PM10				N	S	High Population Exposure	01/01/13	Active	L	6	Y	*LC converted to STP*
Cont PM10				N	S	High Population Exposure	03/24/80	Active	T	C	Y	

Arkadelphia
0.25 mile radius

Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
CO	01-073-2059	1110 5th Street West	33.521427 -86.844112	N	NS	Neighborhood	01/01/14	Active	F	C	Y	
NO2				N	S	Neighborhood	01/01/14	Active	UP	C	Y	*Began 01/2014*
PM2.5				N	S	Neighborhood	01/01/14	Active	L	6	Y	*Began 01/2014*

Shuttlesworth

0.25 mile radius



Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Cont PM10	01-073-6004	4113 Shuttlesworth Drive	33.565278 -86.796389	N	S	High Population Exposure	01/25/1996	Active	T	C	Y	
Cont PM2.5				N	S	Neighborhood	02/01/2016	Active	T	C	N	
SO_2				N	S	Neighborhood				C	N	*Will not be installed until 4th Quarter 2016*

Wylam

0.25 mile radius

Pollutant	AQS Site ID	Address	Latitude Longitude	SCALE	Type	Monitoring objective	Began Sampling	Ended Sampling	METHOD	SCHEDULE	NAAQS	Comment
Low Vol PM10	01-073-2003	1242 Jersey Street	33.499722 -86.924167	N	S	High Population Exposure	01/01/03	Active	L	6	Y	*LC converted to STP*
Low Vol PM10				N	S	Collocated Sampler	01/01/03	Active	L	6	Y	*LC converted to STP*
Cont PM10				N	SPM	High Population Exposure	07/13/01	Active	T	C	Y	
PM2.5				N	S	High Population Exposure	01/01/99	Active	L	3	Y	
PM2.5				N	S	Collocated Sampler	01/01/99	Active	L	6	Y	

Cont PM2.5				N	S P M	High Population Exposure	07/13/01	Active	T	C	N	
PM2.5 SPECIATION				N	S	High Concentration	10/01/01	Active		6	N	*1 in 3 Alternate Schedule*

APPENDIX B

Huntsville Department of Natural Resources and Environmental Management (HDNREM)

Annual Air Monitoring Network Plan

ANNUAL AIR MONITORING NETWORK PLAN

April 28, 2016

Regulations codified at 40 CFR Part 58, Appendices A (Quality Assurance Requirements for SLAMS, SPMs and PSD Air Monitoring), C (Ambient Air Quality Monitoring Methodology), D (Network Design Criteria for Ambient Air Quality Monitoring) and E (Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring) were reviewed to determine if modifications to the existing air monitoring network are required.

NCore Ambient Air Monitoring Stations

Each State is required to operate one NCore site (multipollutant). Huntsville was not selected for the NCore site.

PAMS (Photochemical Assessment Monitoring Stations)

PAMS monitoring is required in areas classified as serious, severe, or extreme for the 8-hour ozone standard. Huntsville is presently classified as an ozone attainment area. Consequently, PAMS monitoring is not required.

SLAMS (State and Local Air Monitoring Stations)

The minimum ozone monitoring requirements are based on MSA (Metropolitan Statistical Area) populations and 3-year design value concentrations. The Huntsville MSA population is 417,593 based on the 2010 decennial census population. Huntsville's 3-year design value concentration for 2013-2015 is .064 ppm. MSA's with populations of 50,000 to less than 350,000 having a design value $\geq$85% of the O3 NAAQS are required to operate one ozone site. MSA's with populations of 350,000 to less than 4,000,000 are required to operate two ozone sites. Huntsville operates two ozone monitoring sites, as required.

There is a two-tier minimum nitrogen dioxide (NO_2) monitoring requirement. Near-road microscale monitoring is required in each CBSA (Core-based statistical area) with a population of 500,000 or more. Area-wide high concentration monitoring is required in each CBSA with a population of 1,000,000 or more. The Huntsville CBSA population is 417,593. Huntsville is not required to operate a SLAMS NO_2 monitor.

The minimum monitoring requirements for carbon monoxide (CO) require one monitor be collocated with a near-road NO_2 monitor in each CBSA with a population of 1,000,000 or more. Huntsville is not required to operate a SLAMS CO monitor.

The minimum sulfur dioxide (SO_2) monitoring requirements are based on a Population Weighted Emissions Index (PWEI), which is calculated by multiplying the population of the CBSA and the total SO_2 emissions {using the most recent published version of the National Emissions Inventory (NEI)} within the CBSA area. The resulting product is then divided by one million, representing million persons-tons per year. Areas having a PWEI greater than 1,000,000 are required to operate 3 monitors; areas having a PWEI equal to or greater than 100,000 but less than 1,000,000 are required to operate 2 monitors; areas having a PWEI greater than 5,000 but less than 100,000 are required to operate 1 monitor. The Huntsville PWEI is 135 (based on 2010 decennial census population and 2011 NEI, total SO_2 emissions data for the Huntsville CBSA). The 2011 NEI data was still used in this calculation since 2014 NEI data is not yet available. Huntsville is not required to operate a SLAMS SO_2 monitor.

Lead monitoring (Pb) is required in areas where Pb levels have been shown or are expected to be of concern due to the proximity of Pb point source emissions. Generally, industrial sources emitting 0.5 ton or more of lead per year and airports emitting 1.0 ton or more per year would be candidates for lead ambient air monitoring. There are no significant point sources of lead emissions in Huntsville. Based on past monitoring and emissions inventory data, a SLAMS lead site is not required.

Huntsville's PM_{10} concentrations are less than 80 percent of the PM_{10} NAAQS (National Ambient Air Quality Standards). Based on Huntsville's MSA population being between 250,000-500,000 and low concentrations, Huntsville is required to operate 1 site. Huntsville operates 3 PM_{10} sites located in south, central, and north Huntsville. These monitors can be operated at very low cost and provide good spatial coverage within the city. Experience has shown that members of the public want ambient air monitoring to be performed in their part of the city, and the PM_{10} monitoring sites provide a monitoring presence at relatively low cost. Furthermore, the PM_{10} data provide an indirect indication of $PM_{2.5}$ spatial variability at a tiny fraction of the cost of operating multiple $PM_{2.5}$ sites.

The minimum $PM_{2.5}$ monitoring requirements are based on MSA populations and 3-year design value concentrations. Huntsville's 3-year design value concentration for 2013-2015 is 18 $\mu g/m^3$ for the 24-hour standard and 8.6 $\mu g/m^3$ for the annual standard. MSA's with populations of 50,000 to less than 500,000 having a design value $\geq$ 85% of the $PM_{2.5}$ NAAQS are required to operate one $PM_{2.5}$ site on a 1 in 3 day sampling frequency. Huntsville operates one $PM_{2.5}$ site on a 1 in 3 day schedule to meet this requirement. Note: Operating frequency increases to daily sampling when the 24-hour design value is within ± 5 percent of the 24-hour $PM_{2.5}$ NAAQS (34, 35, and 36 $\mu g/m^3$).

SLAMS sites were also evaluated to determine consistency of spatial scales with stated monitoring objectives. Reference the attached monitoring network description. In addition to the information listed below, the description also indicates site locations, monitoring methodologies, and operational schedules.

Site #	Site Name	Pollutant	Monitoring Objective	Current Spatial Scale based on ADT* for nearest streets	Scale Meets Objective
0002	Pulaski	PM_{10}	Population	Neighborhood	Yes
0004	South Parkway	PM_{10}	High Conc.	Middle	Yes
0014	Airport Road	PM_{10}	Population	Urban	Yes
0014	Airport Road	$PM_{2.5}$	Population	Urban	Yes
0014	Airport Road	O_3	Population	Neighborhood	Yes
0022	Capshaw	O_3	High Conc.	Urban	Yes

Notes:

Site 0002	Monitor 30.5 m from Pulaski Pike	ADT 13,800 Probe Ht. 4.3 m
Site 0004	Monitor 30.5 m from Mem. Pkwy.	ADT 37,800 Probe Ht. 4.3 m
Site 0014	Monitors 91 m from Airport Road	ADT 17,800 Probe Ht of PM monitors – 4.3 m
	Monitors 548 m from Mem. Pkwy.	ADT 84,750** Probe Ht of continuous monitor(s) 4.5 m
Site 0022	Monitor 30 m from Capshaw Road	ADT 10,500 Probe Ht. 4.0 m

ADT = Average Daily Traffic
*****Traffic count data as provided by the Traffic Engineering Department represents 2014 data.
**ADT counts on Memorial Parkway immediately north and south of Airport Road averaged.

SPM (Special Purpose Monitors)

The special purpose PM_{10} monitor is operated Monday – Friday from 3:00 – 3:00 p.m. This data is used in reporting the daily Air Quality Index to the local print and television media.

Continuous $PM_{2.5}$ monitoring is required in relation to the minimum SLAMS monitoring requirement stated above; i.e., equal to at least one-half (round up) the minimum monitoring requirement. Huntsville is therefore required to operate one continuous $PM_{2.5}$ monitor. This monitor is a non-FRM/FEM/ARM. This data is used to support public reporting and forecasting of the Air Quality Index.

Site #	Site Name	Pollutant	Monitoring Objective	Current Spatial Scale based on ADT* for nearest streets	Scale Meets Objective
0003	Downtown Garage (AQI Reporting Site)	PM_{10}	Population	Neighborhood	Yes
0014	Airport Road	$PM_{2.5}$	Population	Urban	Yes

ADT = Average Daily Traffic

*****Traffic count data as provided by the Traffic Engineering Department represents 2014 data.

Fire Station #10 Site
5006 Pulaski Pike
Huntsville, Alabama 35810
Madison County

AQS Site ID: 01-089-0002
Latitude: 34.788333
Longitude: -86.616111

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM-10	N	S	Population	H	6	Y	1/1/1991	Active	

NORTH

SOUTH

EAST

WEST

Pollutant	Distance between collocated inlets	Height Of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor from roadway (nearest pavement)	Type of ground cover around site	Probe material
PM-10	N/A	4.3m	24.4m	18.3m	30.5m	Asphalt Grass	N/A

Fire Station #7 Site
11545 S. Memorial Parkway
Huntsville, Alabama 35803
Madison County

AQS Site ID: 01-089-0004
Latitude: 34.620278
Longitude: -86.566389

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM-10	M	S	High Concentration	H	6	Y	6/28/1990	Active	

NORTH

SOUTH

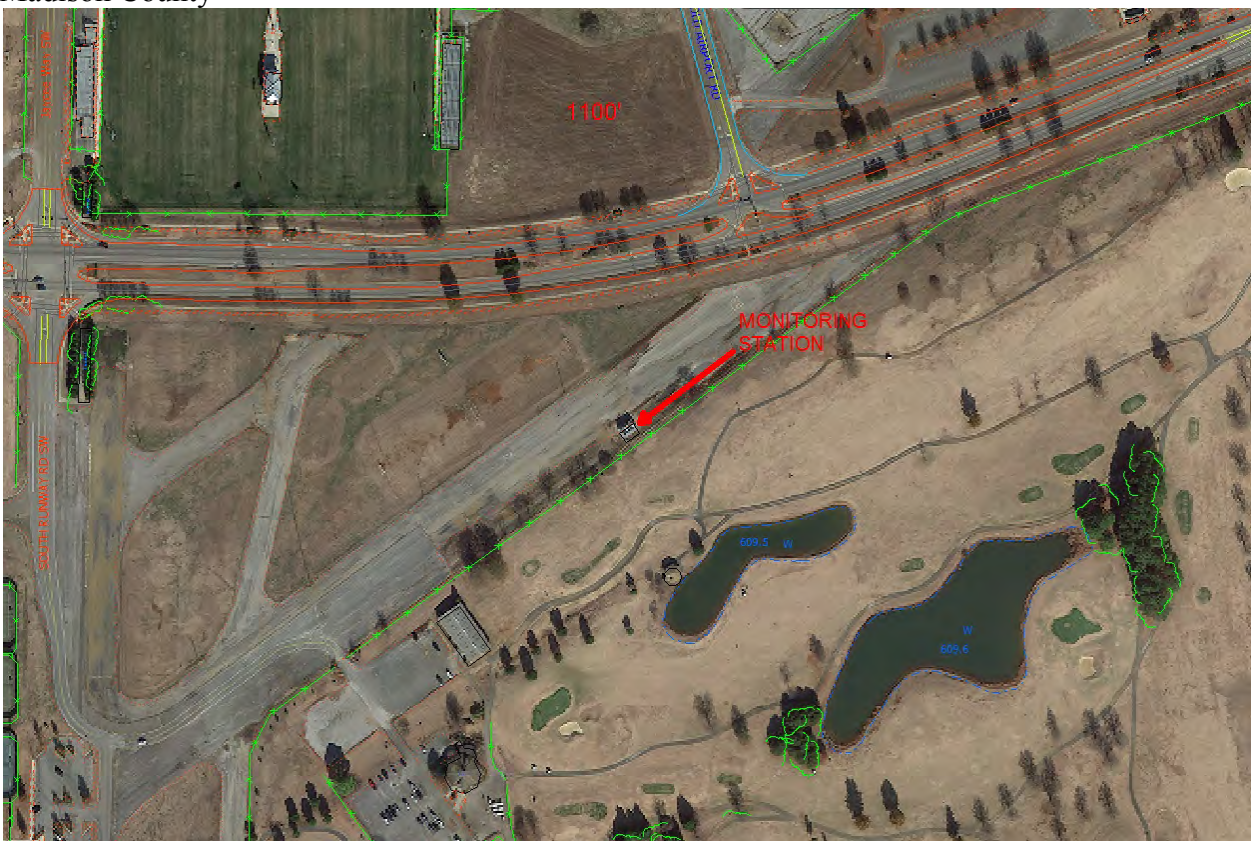
EAST

WEST

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor From roadway (nearest pavement)	Type of ground Cover Around site	Probe material
PM-10	N/A	4.3m	83.8m	77.7m	30.5m	Asphalt Grass	N/A

Old Airport Site
2201 John Hunt Park
Huntsville, Alabama 35805
Madison County

AQS Site ID: 01-089-0014
Latitude: 34.68767
Longitude: -86.58637



AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
PM-10	U	S	Population	H	3	Y	7/01/1988	Active	
PM-10	U	S	Population	H	6	Y	7/01/1988	Active	Collocated
PM 2.5	U	S	Population	L	3	Y	1/01/1999	Active	
PM 2.5	U	S	Population	L	6	Y	1/01/1999	Active	Collocated
PM 2.5	U	S	Population	L		N	10/9/2003	Active	Continuous
Ozone	U	S	Population	UV		Y	1/01/1975	Active	Continuous

NORTH

SOUTH

EAST

WEST

Monitor	Distance between collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor From roadway (nearest pavement)	Type of ground Cover Around site	Probe material
PM-10		4.3m	30.5m	24.4m	91m	Grass, Asphalt	N/A
PM-10	2m	4.3m	30.5m	24.4m	91m	Grass, Asphalt	N/A
R&P 2.5		4.3m	30.5m	24.4m	91m	Grass, Asphalt	N/A
R&P 2.5	2m	4.3m	30.5m	24.4m	91m	Grass, Asphalt	N/A
TEOM		4.5m	30.5m	24.4m	91m	Grass, Asphalt	Teflon
T400		4.5m	30.5m	24.4m	91m	Grass, Asphalt	Teflon

Capshaw Road Site
1130 Capshaw Road
Huntsville, Alabama 35757
Madison County

AQS Site ID: 01-089-0022
Latitude: 34.772727
Longitude: -86.756174

AERIAL PHOTOGRAPH ¼ mile radius

Pollutant	Scale	Type	Monitoring Objective/CBSA	Method	Schedule	NAAQS	Date Began	Date Ended	Comment
Ozone	U	S	Population Exposure	UV		Y	7/1/2011	Active	Continuous

NORTH

SOUTH

EAST

WEST

Monitor	Distance Between Collocated inlets	Height of inlet	Distance of probe or inlet from trees	Distance of probe or inlet from dripline of trees	Distance of probe or monitor From roadway (nearest pavement)	Type of ground Cover Around site	Probe Material
T400	N/A	4.0m	48.8m	45.7m	30m	Grass, Ag Field	Teflon

Network Review Findings

The existing network as summarized in the attached Air Monitoring Network Description complies with 40 CFR Part 58 requirements.

AIR MONITORING NETWORK DESCRIPTION

(As of April 2016)

Site ID	Pollutant(s) Monitored	Methodology	Operating Schedule	Monitoring Objective	Spatial Scale	MSA Represented	Site/Monitor Type	Begin Sampling	End Sampling
01-089-0002 Pulaski Pike	PM10*	SSI Hi – Vol	6 – Day	Population	Neighborhood	Huntsville	SLAMS	01/01/91	Active
01-089-0003 Downtown Garage	PM10	SSI Hi – Vol	Weekday	Population	Neighborhood	Huntsville	SPM Non-Regulatory	04/01/93	Active
01-089-0004 South Parkway	PM10*	SSI Hi – Vol	6 – Day	High Conc.	Middle	Huntsville	SLAMS	06/28/90	Active
01-089-0014 Huntsville Old Airport Road	PM10*	SSI Hi – Vol	6 – Day	Population	Urban	Huntsville	SLAMS	07/01/88	Active
	PM2.5*	SSI Lo – Vol	3 -- Day	Population	Urban	Huntsville	SLAMS	01/01/99	Active
	PM2.5	SSI Lo – Vol	Continuous	Population	Urban	Huntsville	SPM Non-Regulatory	10/09/03	Active
	Ozone*	UV Photometric	Continuous	Population	Neighborhood	Huntsville	SLAMS	01/01/75	Active
01-089-0022 Capshaw	Ozone*	UV Photometric	Continuous	High Conc.	Urban	Huntsville	SLAMS	07/01/11	Active

*Sites used for NAAQS comparison.

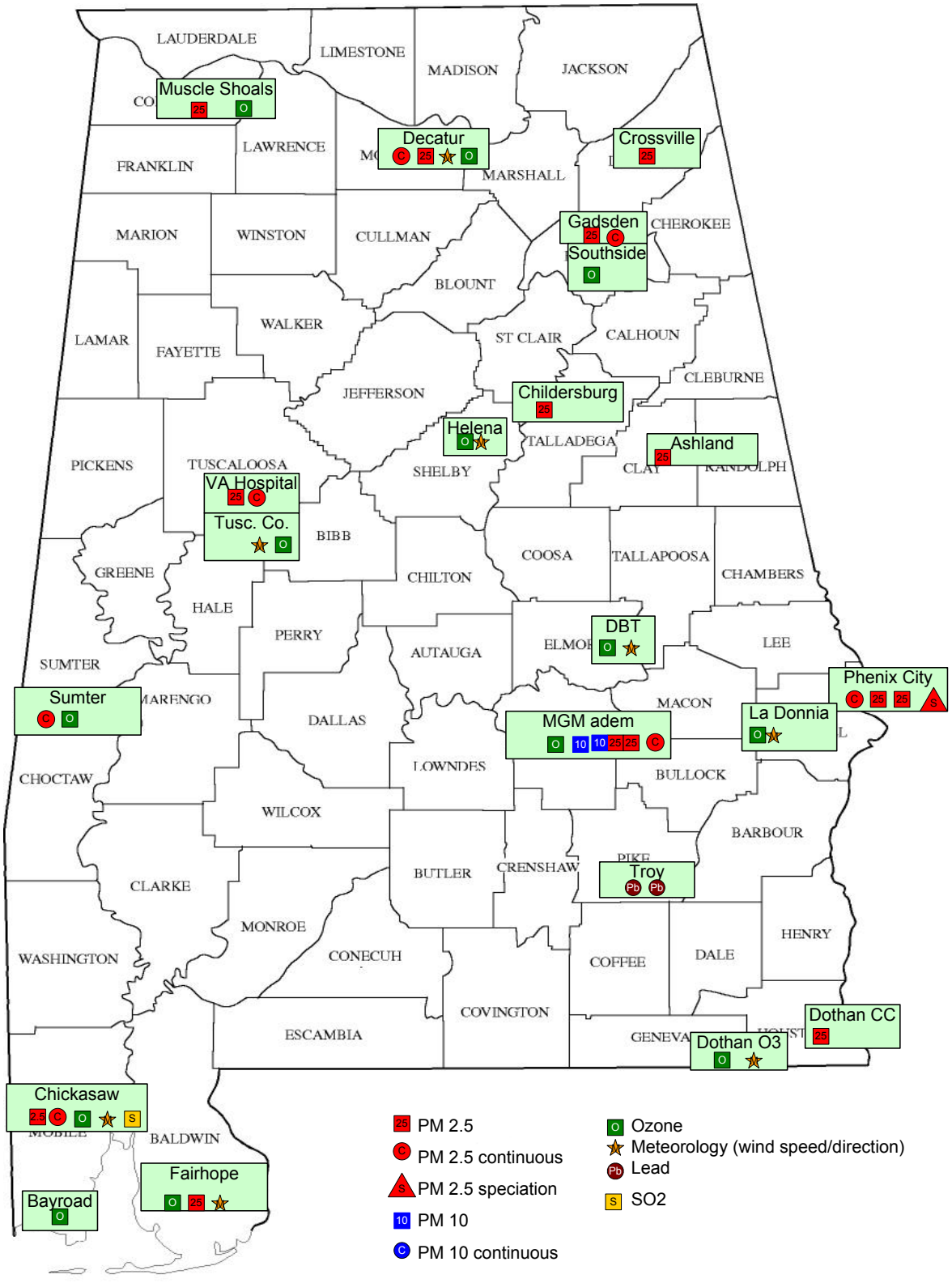
Site ID	Location	Geographical Coordinate	Three Closest Roads	Proposed Changes

01-089-0002 Pulaski Pike	5006 Pulaski Pike Huntsville, AL 35810	Latitude +34.788333 Longitude -86.616111	Pulaski Pike Stag Run Winchester Road	None Proposed
01-089-0003 Downtown Garage	Madison St. – Garage Huntsville, AL 35801	Latitude +34.728740 Longitude -86.585010	Madison Street Gates Street Fountain Circle	None Proposed
01-089-0004 South Parkway	11525 S. Memorial Pkwy Huntsville, AL 35803	Latitude +34.620278 Longitude -86.566389	South Memorial Parkway Redstone Road Hobbs Road	None Proposed
01-089-0014 Airport Road	Old Airport – Airport Rd. Huntsville, AL 35802	Latitude +34.687670 Longitude -86.586370	Airport Road Memorial Parkway Leeman Ferry Road	None Proposed
01-089-0022 Capshaw	1130 Capshaw Road Huntsville, AL 35757	Latitude +34.772727 Longitude -86.756174	Capshaw Road Wall Triana Highway Balch Road	None Proposed

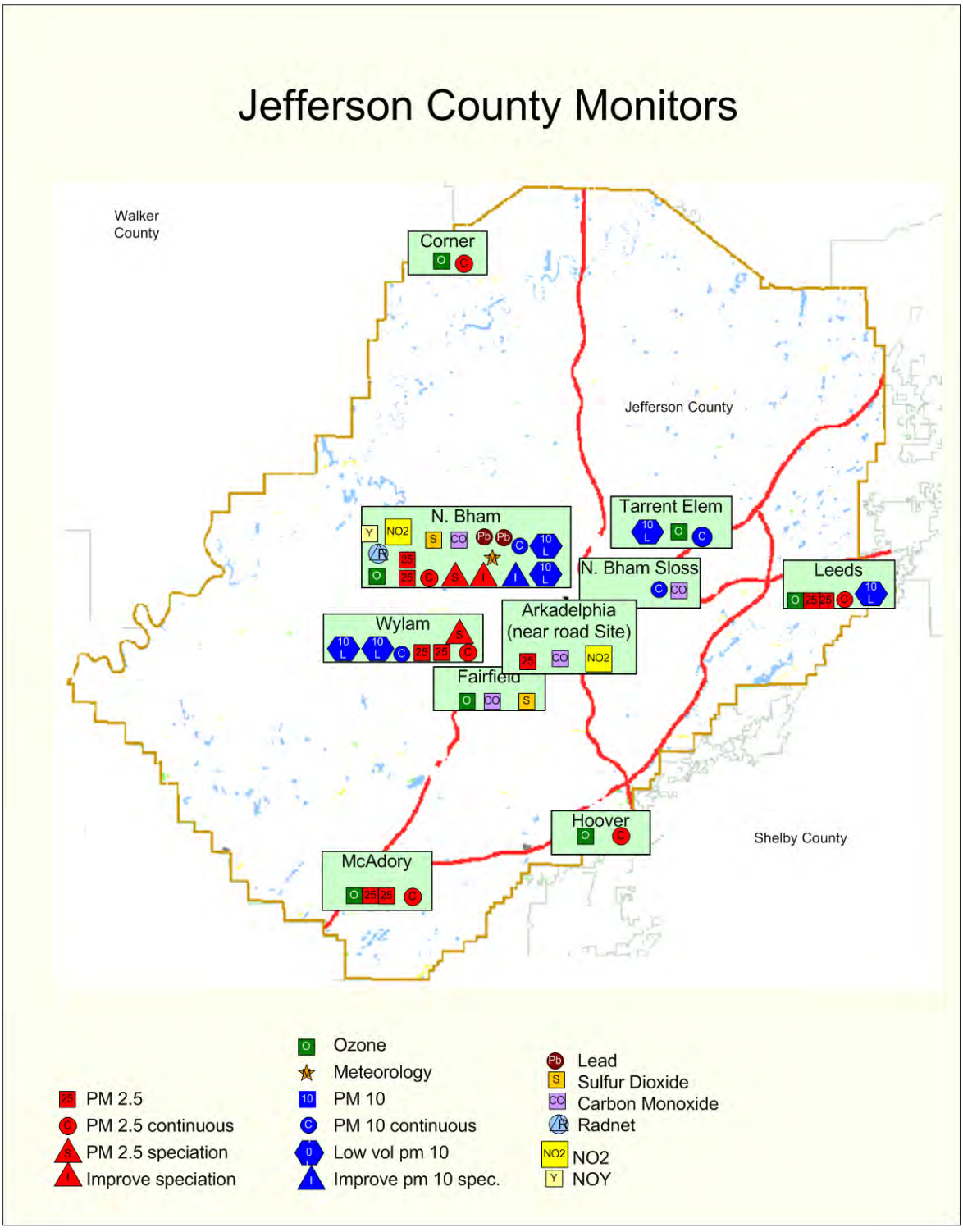
APPENDIX C

Maps

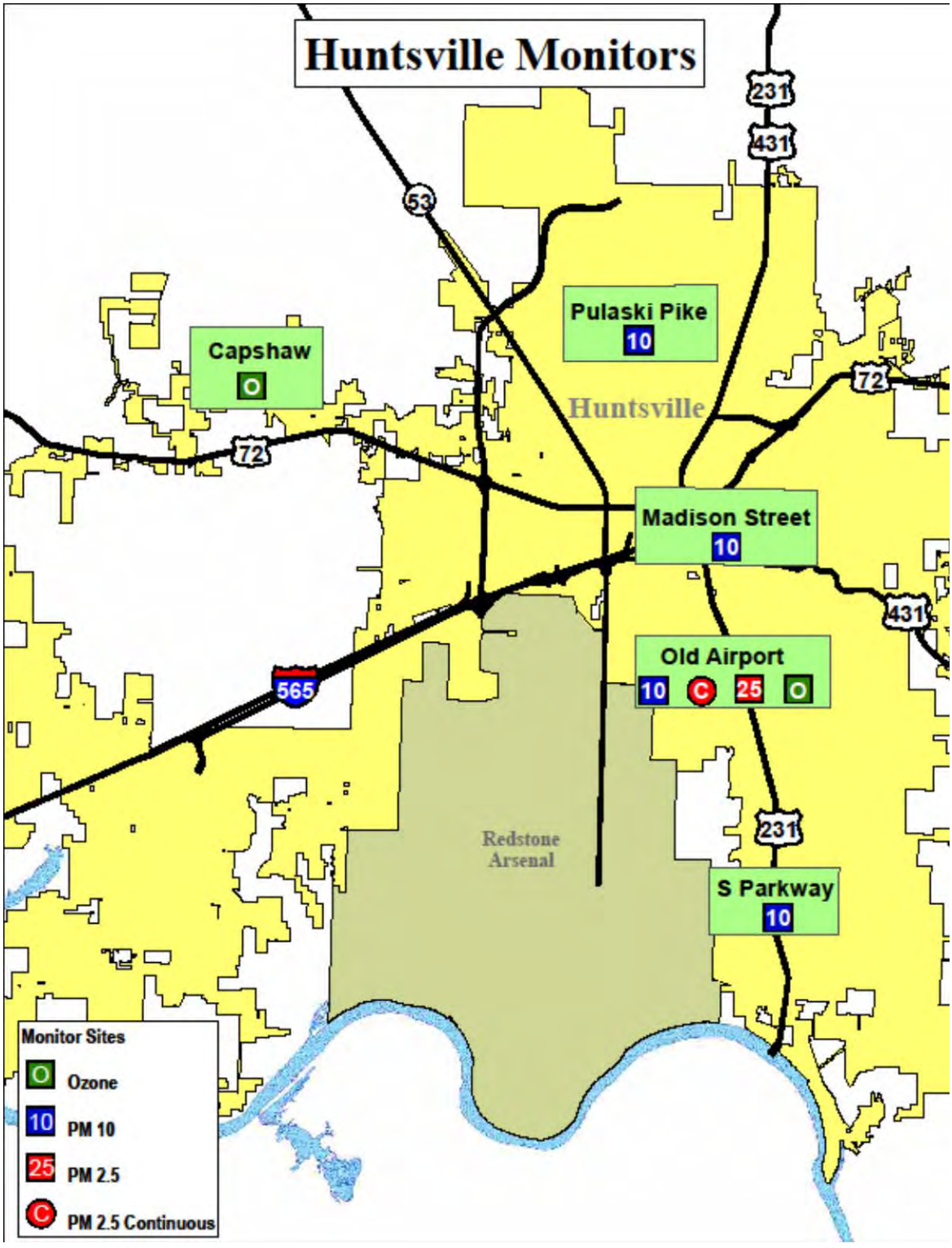
ADEM Monitoring Sites



Jefferson County



City of Huntsville



APPENDIX D

Site Selection for DRR Monitoring Near the Lhoist – Montevallo, Alabama Location

The ADEM Air Division has reviewed modeling associated with the Lhoist-Montevallo facility for the placement of a SO_2 monitor to support compliance with the 1-hour SO_2 NAAQS. The modeling followed recommendations outlined in EPA's Modeling Technical Assistance Document (TAD). The ADEM Air Division agrees that the modeling was performed consistent with the TAD.

In addition, the Air Assessment Unit visited the facility to determine if the proposed sites would meet 40 CFR 58, Appendix E probe siting criteria. Two sites were identified in the submitted report, the Hwy 25 site and the LNA east site. The Hwy 25 site was selected as the preferred site due to logistics and other factors stated in the modeling report.

Site Visits

ADEM visited the LNA east site and confirmed that access and security would be major issues with the site. In addition, the modeled receptors which showed higher concentrations would be located on a fairly steep ridge.

ADEM found that both sites are covered in mature trees.

Obstacles

ADEM visited the Hwy 25 site and determined that the tallest tree is approximately 60 to 70 feet tall. These trees would act as an obstruction to the air flow. Lhoist has committed to remove any trees that would be considered obstacles. Access to the site would be via an existing driveway off of Highway 25 on the neighbor's property. Two of the trees of concern were on this neighbor's property but the Lhoist representative felt this could be resolved during the easement negotiations.

Minor Sources

The Hwy 25 site is located across the street from a shop which performs welding activities. The shop is approximately 70 meters from the site. It does not appear that this would be a significant source of SO_2. Also, there is a natural gas pipeline approximately 125 meters to the northeast of the site. The reduced sulfur emissions from this source should not interfere with the measurement of SO_2.

The Hwy25 site appears to be an acceptable location for the monitoring site. Below is a report of modeling which was performed to inform the placement of an ambient air SO_2 monitor.

SO_2 MODELING TO SUPPORT AMBIENT MONITOR PLACEMENT

Lhoist North America of Alabama, LLC > Montevallo Plant

Prepared By:

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Atlanta, GA 30305
(678) 441-9977

March 2016

Project 151101.0120

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1. INTRODUCTION

1.1. PURPOSE

Lhoist North America (LNA) has selected the option of monitoring under the SO_2 Data Requirements Rule (DRR) for establishing the attainment designation of the area surrounding the LNA facility, located near the town of Calera, Shelby County, Alabama. This site is referred to within this report as the Montevallo facility.

Adequate monitor placement is an important part of a monitoring program and is commonly aided by execution of modeling studies. The goal of this modeling study was to determine the location to best site a single ambient air monitor for SO_2 under the DRR. This document describes the procedures that were conducted in the air dispersion modeling study, aiming to evaluate the 1-hour concentration patterns of sulfur dioxide (SO_2) in the near field surrounding the facility, to assist in justification for the proposed ambient air monitor location.

To the extent possible, the modeling procedures used in assistance for siting the SO_2 ambient monitor were consistent with the applicable guidance documents, including the February 2016 Draft "SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document" (TAD) issued by the United States Environmental Protection Agency (USEPA).[1] The modeling approach is also consistent with the requirements of the final Data Requirements Rule (DDR) for the 2010 1-hour SO_2 primary NAAQS (80 FR 51052, August 21, 2015).

The current version of the TAD references other USEPA modeling guidance documents, including the following clarification memos (1) the August 23, 2010 "Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 NAAQS" and (2) the March 1, 2011 "Additional Clarification Regarding Application W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard" (hereafter referred to as the "additional clarification memo"). In the March 1, 2011 clarification memo, USEPA declares that the memo applies equally to the 1-hour SO_2 NAAQS even though it was prepared primarily for the 1-hour NO_2 NAAQS.

The current actual emission rates of the five facility SO_2 sources evaluated were not used in the modeling, but rather scaled proportionally. Proportional normalization procedure does not disturb the modeling results, because chemical transformations were not evoked. Hence, the concentration distribution pattern would not depend on the magnitude of the emission rates, but more so on the relative proportion of the emission rates from each source. The peak impact area is still defined in the same way as if actual emissions from the unit were modeled. Procedures used in the modeling evaluation were those procedures described in the Monitoring TAD as referenced above.

Attached to this report is a CD (Appendix A) containing all electronic modeling files and support documents as discussed within this report. Appendix B to this report includes a letter, as provided by Argos, which specifies that LNA will not be permitted access to Argos properties for locating an SO_2 ambient monitor.

1.2. FACILITY DESCRIPTION

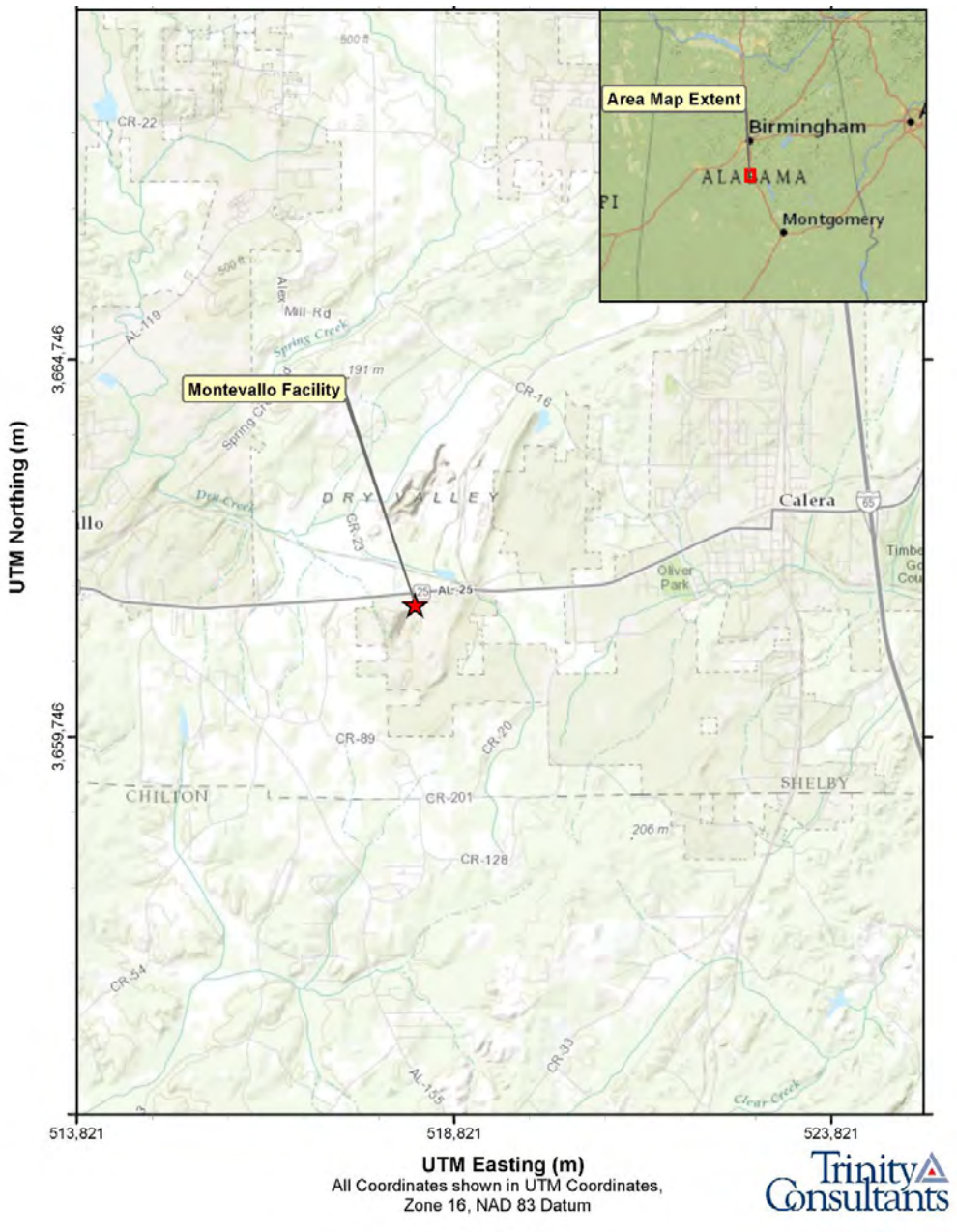
The Montevallo Plant is bordered by Highway 25 to the north, and is located approximately 5 kilometers (km) west of the town of Calera, Alabama and 5 km east of the town of Montevallo, Alabama, as shown on Figure 1-1. The facility is located in an industrial zone of a rural type area in gentle rolling terrain. The facility currently

[1] The referenced TAD has only been released in draft format, and is not expected to be updated per comments from EPA OAQPS. The Monitoring TAD includes a section on the recommended procedures for the use of modeling to inform monitor placement.

operates four (4) lime kilns and a rotary dryer which are reported as sources of SO_2 emissions. The facility has elected the monitoring option to demonstrate compliance with the NAAQS under the SO_2 DRR.

Shelby County is presently designated as "maintenance", "attainment", or "unclassifiable" for all criteria pollutants with respect to the NAAQS.[2]

Figure 1-1. Project Area Map



[2] 40 CFR 81.301 (http://www3.epa.gov/airquality/greenbook/phistory_al.html)

2. MODEL SELECTION AND METHODOLOGY

2.1. SELECTION OF MODEL

AERMOD version 15181 was used in this modeling study. AERMOD is the USEPA guideline model for short-range transport and has the ability to account for the source types and the dispersion environment, required for the modeling analysis of the Montevallo facility. AERMOD is appropriate for use for many different types of dispersion environments including: sources subject to building downwash and sources located in flat or elevated terrain.

Based on USEPA guidance provided in the TAD, all stacks were modeled with their actual physical stack height.[3] In addition, the USEPA's Building Profile Input Program (BPIP-Version 04274) version that is appropriate for use with PRIME algorithms in AERMOD was used to incorporate downwash effects in the model for all modeled point sources. The building dimensions of each structure were used as an input to the BPIPPRM program to determine direction specific building data. PRIME addresses the entire structure of the wake, from the cavity immediately downwind of the building to the far wake.

The AERMOD modeling system is composed of three modular components: AERMAP, the terrain preprocessor; AERMET, the meteorological preprocessor; and AERMOD, the dispersion module. AERMAP is used to extract terrain elevations for selected model objects – emission sources, buildings and receptor points – and to generate the receptor hill heights that are used by AERMOD to drive advanced terrain processing algorithms. National Elevation Database (NED) data available from the USGS are utilized to interpolate surveyed elevations onto user-specified model objects in the absence of more accurate site-specific elevation data.

AERMET generates separate surface file and vertical profile file to pass meteorological observations and turbulence parameters to AERMOD. AERMET meteorological data are refined for a particular analysis based on the choice of micrometeorological parameters that are linked to the land use and land cover (LULC) around the particular facility and/or meteorological site. AERMET combines raw surface and upper air observation to create a complete AERMOD-ready meteorological data set. Wind observations are enhanced by including 1-minute ASOS wind observation, which are processed be the AERMINUTE preprocessor.

AERSURFACE is the land-use preprocessor which is used to determine the surface parameters set characterizing the particular domain.

In this modeling study, AERMOD and all associated pre-processors were used with their current regulatory default options.

2.2. METEOROLOGICAL DATA

Site-specific dispersion models including AERMOD require a sequential hourly record of atmospheric characteristics representative of the region within which the source is located. In the absence of site-specific measurements, the EPA guidelines recommend the use of readily available data from the closest and most representative National Weather Service (NWS) station.

[3] All facility sources are within their determined Good Engineering Practices (GEP) stack height, so modeling of actual stack heights has no impact on the analysis.

The project site does not maintain on-site meteorological records. Therefore, data was compiled from the Shelby county airport surface station (KEET) for the latest complete set of 5-year observations, namely 2010 to 2014, as recommended in the *SO_2 NAAQS Designations Modeling Technical Assistance Document*, issued by the U.S. EPA, in February, 2016. The AERMOD ready surface and profile files were compiled by ADEM for use in this study.

The meteorological data necessary for the dispersion modeling were processed with the latest versions of AERMET and the ancillary utilities AERSURFACE and AERMINUTE. [4]

2.2.1. Surface Data

The closest surface station to the project site is the Shelby County Airport (KEET), near Calera, AL. The airport is located approximately 10km to the north of the project site at latitude 33.178°N, longitude 86.782°W, and elevation 178 meters above mean sea level. The 2010-2014 surface records for KEET were obtained from the National Center for Environmental Information (NCEI, formerly NCDC), as provided by ADEM. Table 2-1 summarizes the data coverage during the modeling period for the combined surface and upper air stations as reported by AERMOD.

Table 2-1. AERMOD Meteorological Data Coverage

KEET + BMX	2010		2011		2012		2013		2014	
	# of Hours	%	# of Hours	%	# of Hours	%	# of Hours	%	# of Hours	%
Total # Hours	8760		8760		8784		8760		8760	
Valid Hours	8451	96.47	8605	98.23	8671	98.71	8661	98.87	8587	98.03
Calm	1492	17.65	1254	14.57	1425	14.25	1999	23.08	479	5.58
Missing	309	3.53	155	1.77	113	1.29	99	1.13	173	1.97

2.2.2. Upper Air Data

Twice-daily upper air observations from the nearest upper air stations – the Birmingham station (KBMX or BMX) located near the Shelby County Airport, Alabaster AL – were used to calculate the vertical temperature gradient for AERMET. The BMX upper air station is located approximately 10 km north of the facility at coordinates 33.172N, 86.770W.

2.2.3. Surface Parameters

AERMET requires specification of site characteristics including surface roughness (z_0), albedo (r), and Bowen ratio (Bo). These parameters were developed by ADEM and best describe the location of the surface station. Since Bowen Ratio varies depending on the soil moisture content, the EPA recommended method was used to determine the applicable Bowen Ratio moisture categories for each year. For the Shelby County Airport, it was determined:

- 2010 and 2011 were in the "Dry" category
- 2012 was in the "Average" category
- 2013 and 2014 were in the "Wet" category.

[4] Shelby County Airport (KEET) 2010-2014 meteorological data as provided by Mr. Michael Leach of ADEM via e-mail to Mr. Justin Fickas of Trinity on October 30, 2015.

2.2.4. Dispersion Environment

The application of AERMOD requires characterization of the local (within 3 kilometers) dispersion environment as either urban or rural, based on a USEPA-recommended procedure (commonly referred to as the Auer Method) that characterizes an area by prevalent land use. This land use approach classifies an area according to 12 land use types. In this scheme, areas of industrial, commercial, and compact residential land characteristics are designated urban. According to USEPA modeling guidelines, if more than 50% of an area within a 3-km radius of the facility is classified as rural, then rural dispersion coefficients are to be used in the dispersion modeling analysis. Conversely, if more than 50% of the area is urban, then the area can be classified as urban.

As per *August Auer*, *1978*[5] guidance, a 6-by-6 km domain centered at the project facility (creating a 3 km distance in each direction from the project location) was considered for the land-use analysis. AERSURFACE (v.13016) was used for the extraction of the land-use values in the domain. The domain was centered at the facility site and the study radius was set to 3km; the original land-use map for this extraction was obtained from USGS by-state archive. The Alabama land-use map has grid resolution of 30-meters and distinguishes 21 land-use categories per 1992 classification. The resulting land-use count and percentages are summarized in Table 2-2 and the domain is shown in Figure 2-1.

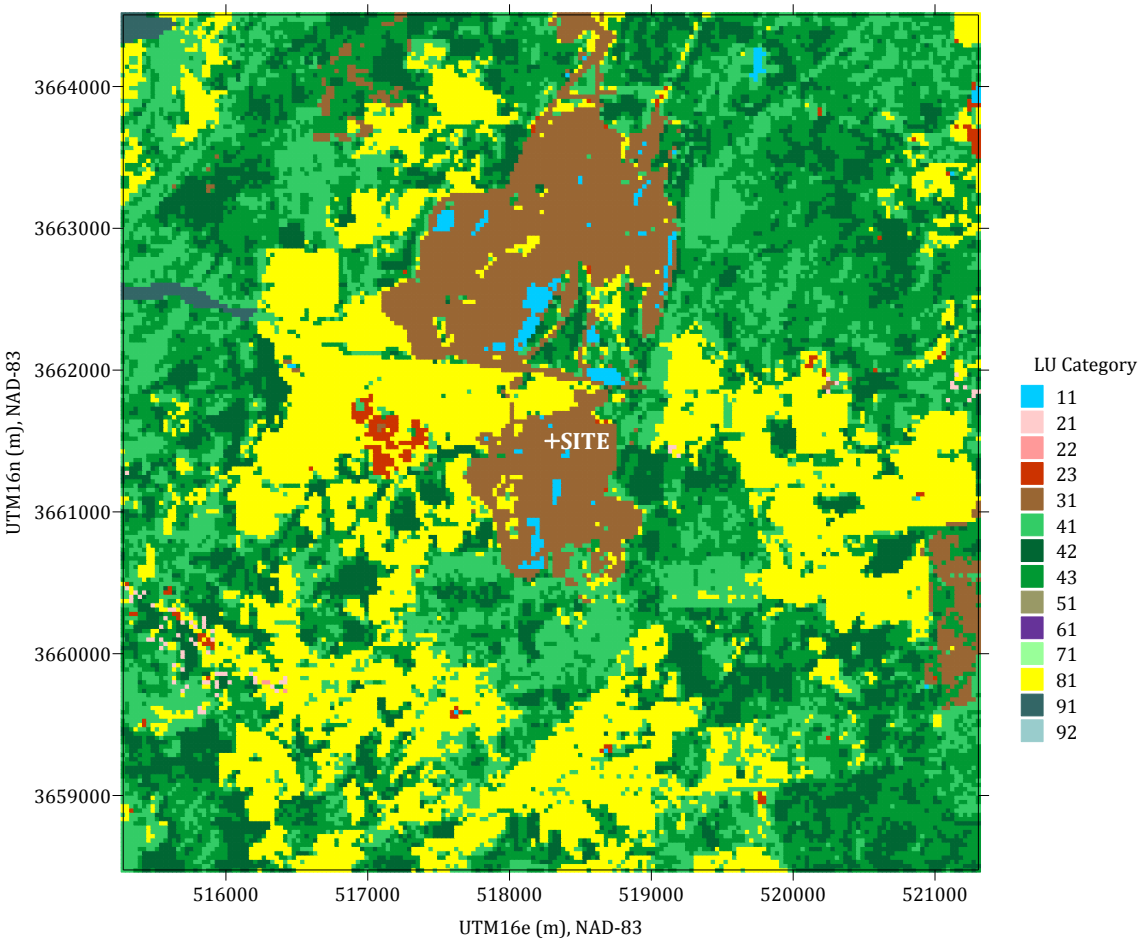
Table 2-2. Land-Use Categories Summary

LULC CAT	Land Category Description	Number of Grid Cells	Frequency (%)	Dispersion Class
11	Open Water	227	0.722	Rural
12	Perennial Ice/Snow	0	0	Rural
21	Low Intensity Residential	51	0.162	Rural
22	High Intensity Residential	3	0.010	Urban
23	Commercial/Industrial/Transp.	177	0.563	Urban
31	Bare Rock/Sand/Clay	0	0	Rural
32	Quarries/Strip Mines/Gravel	3545	11.283	Rural
33	Transitional	184	0.586	Rural
41	Deciduous Forest	5475	17.425	Rural
42	Evergreen Forest	4127	13.135	Rural
43	Mixed Forest	8513	27.094	Rural
51	Shrubland	0	0	Rural
61	Orchards/Vineyard/Other	0	0	Rural
71	Grasslands/Herbaceous	0	0	Rural
81	Pasture/Hay	6518	20.745	Rural
82	Row Crops	2379	7.572	Rural
83	Small Grains	0	0	Rural
84	Fallow	0	0	Rural
85	Urban/Recreational Grasses	150	0.477	Rural
91	Woody Wetlands	71	0.226	Rural
92	Emergent Herbaceous Wetlands	0	0.000	Rural
	TOTAL	31420		
	Rural		99.427	
	Urban		0.573	

[5] "Air Quality Modeling Guidelines", February 1999, Section 5

This summary was generated by AERSURFACE and stored in the run's log file. Additionally, the 21-categories were evaluated according to the *Guidelines* in terms of dispersion classes as being of URBAN or RURAL. The domain is covered more than 99% by rural land features and therefore the selected AERMOD modeling option was rural.

Figure 2-1. Land Cover Map of the 6-by-6 km Domain, Centered at the Facility



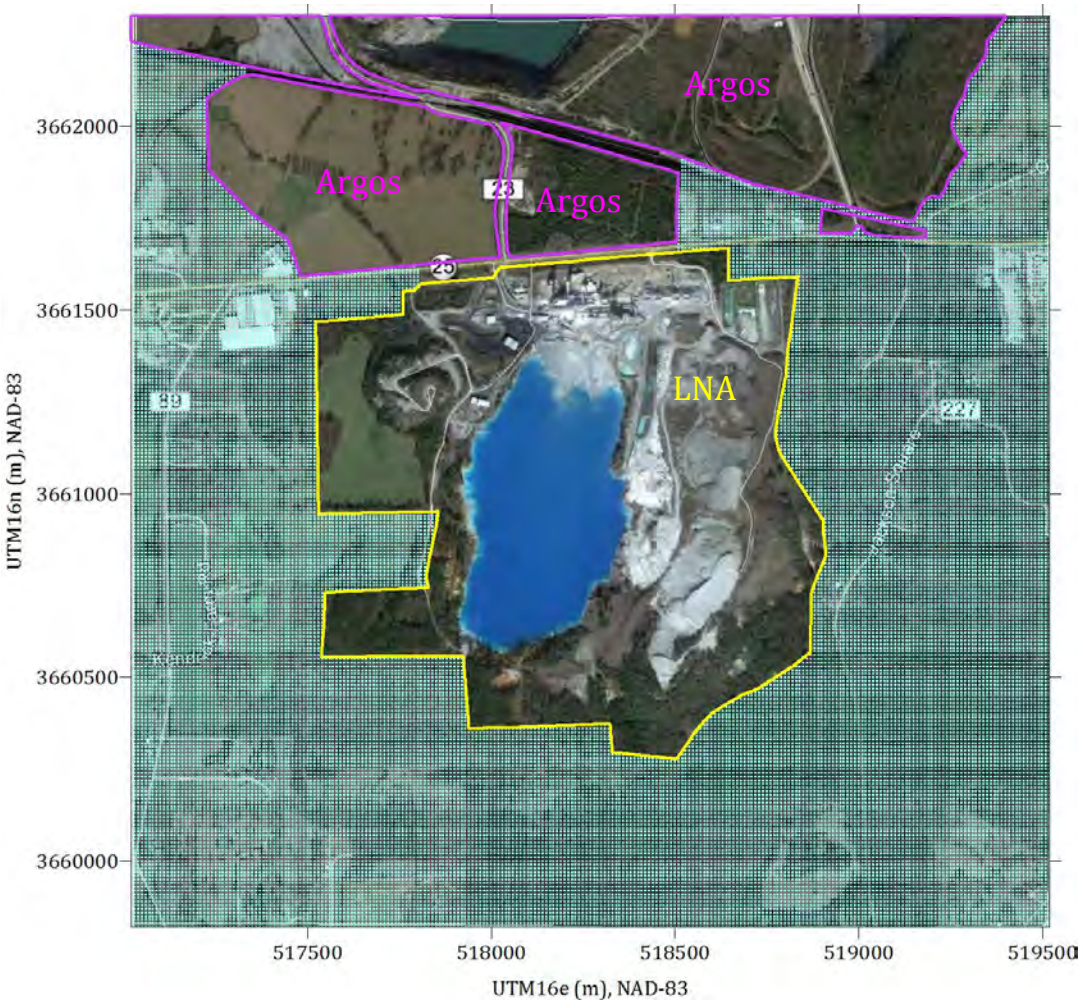
	1992 Land Use Categories Classification		
11	Open Water	43	Mixed Forest
12	Perennial Ice/Snow	51	Shrubland
21	Low Intensity Residential	61	Orchards/Vineyard/Other
22	High Intensity Residential	71	Grasslands/Herbaceous
23	Commercial/Industrial/Transp	81	Pasture/Hay
31	Bare Rock/Sand/Clay	82	Row Crops
32	Quarries/Strip Mines/Gravel	83	Small Grains
33	Transitional	84	Fallow
41	Deciduous Forest	85	Urban/Recreational Grasses
42	Evergreen Forest	91	Woody Wetlands
		92	Emergent Herbaceous Wetlands

2.3. RECEPTOR GRID COORDINATE SYSTEM

For this modeling analysis the Universal Transversal Mercator (UTM) coordinate system was selected in zone 16 and the datum is NAD-83. The location of all emission sources, structure, and receptors are represented with coordinates from this system.

In this analysis a near field dense receptor grid was utilized. The grid extends approximately 1 km off the facility fence line in all directions. The fence line, which determines the ambient air boundary, was covered with receptors 10 or less meters spaced. Beyond the fence line, the extent of the grid is sufficient to resolve the maximum impact areas in the near field around the facility, and is appropriate for determining the proper location for ambient air monitoring system. The grid spacing is 10 meters. No receptors were placed within the facility fence line. Figure 2-2 shows the extent of the modeling domain and the receptor grid over an aerial image. [6]

Figure 2-2. Modeling Receptors and Domain Map



[6] The ambient air boundary shown in Figure 2-2 represents the current fenceline line of the Montevallo facility, and also includes fenceline additions which would be in place as part of an ongoing facility project (yellow LNA boundary).

In addition receptors were excluded from the Argos Cement LLC (Argos) properties north of LNA and on the sections of roads and railroads between the excluded parcels.[7] Such areas were excluded because of inaccessibility due to ownership or being inappropriate locations for placing an ambient air monitor. An area on the northwestern side of the LNA fenceline, between the fence and road, was excluded from the analysis as there is a man-made terrain feature in this area which would make siting of a monitor difficult, and the area is in close proximity to Highway 25. In other modeling areas, receptors are kept on roads and structures only to help more accurately resolve the peak impacts areas. No on-road or building locations were considered in the refined analysis for the actual monitor placement.[8]

Receptor elevations and hill heights required by AERMOD were determined using the AERMAP terrain preprocessor (version 11103). Facility building and source elevations were also estimated with AERMAP. All terrain elevations were extracted from the 1 arc-second National Elevation Dataset (NED) maps provided by the United States Geographical Survey (USGS).

2.4. MODELED EMISSION SOURCES

2.4.1. Representation of Emission Sources

The AERMOD dispersion model allows for emissions units to be represented as point, area, or volume sources. In this study the sources were determined to be of the point type. The lime kiln stacks have unobstructed vertical air flow therefore they were modeled with their actual exit velocity; the rotary kiln stack has and rain cap installed on its tip, therefore the gas exit velocity was set to 0.001m/s. The emission points were represented with their actual stack heights, gas exit velocities and diameters as recommended in the SO_2 monitoring TAD, and all 5 sources evaluated are subject to downwash. Source parameters are listed in Table 2-3.

Table 2-3. Modeling Parameters of Project Emission Sources

Model ID	Description	UTM16 East (m)	UTM16 North (m)	Elev. (m)	SO_2 Rate (g/s)	Height (m)	Temp. (K)	Velocity (m/s)	Diam.
CA01K	Kiln 1 East	518,299	3,661,543	151.28	2.52e-2	22.56	324.82	5.15	1.92
CA01L	Kiln 1 West	518,295	3,661,541	151.17	2.52e-2	22.56	324.82	5.15	1.92
CA02	Kiln 2	518,310	3,661,525	150.91	4.41e-2	28.96	324.82	9.14	2.13
CA03	Kilns 3 & 4	518,394	3,661,476	152.03	9.44e-1	45.72	505.37	20.54	3.23
PS03	Rotary Dryer	518,176	3,661,457	148.08	4.20e-6	11.43	422.04	0.001	0.61

As previously stated the SO_2 emission rates were normalized and are consistent in their distribution with CY2014 emissions reported as part of the Montevallo facility's annual emissions inventory.

[7] Argos property boundaries were obtained from Shelby County, Alabama available GIS information (http://maps.shelbyal.com/). The Argos properties were the only non-LNA property area excluded from the modeling analysis.

[8] A letter, received from Argos indicating that an ambient SO_2 monitor would not be allowed on their property, is included within Appendix B of this report.

2.4.2. GEP Stack Height Analysis

The U.S. EPA has promulgated stack height regulations that restrict the use of stack heights in excess of "Good Engineering Practice" (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations.

This equation is limited to stacks located within 5L of a structure. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure. 5L is defined as five times the lesser of the height or maximum projected width of a nearby structure or terrain feature. The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP. In general, the lowest GEP stack height for any source is 65 meters by default.[9] An evaluation has indicated that none of the emission units stacks evaluated exceed GEP height. Therefore, there should be no concern regarding consideration of actual stack heights.

2.4.3. Building Downwash Analysis

The emission units at the Montevallo Plant were evaluated in terms of their proximity to nearby structures. The purpose of this evaluation is to determine if stack discharges might become caught in the turbulent wakes of these structures leading to downwash of the plumes. Wind blowing around a building creates zones of turbulence that are greater than if the building were absent.

The direction-specific building dimensions used as input to the AERMOD model were calculated using the U.S. EPA sanctioned Building Profile Input Program, PRIME version (BPIP PRIME), version 04274, as incorporated in the *BREEZE®AERMOD Pro* software, developed by Trinity. BPIP PRIME is designed to incorporate the concepts and procedures expressed in the GEP Technical Support document, the Building Downwash Guidance document, and other related documents.[10]

Figure 2-3 shows the building and stack layout as entered in to the modeling. All five stacks included in the modeling were found to be a subject of downwash. Table 2-4, Table 2-5, and Table 2-6 list the buildings and their relevant modeling characteristics.

[9] 40 CFR 51.100(ii)

[10] U.S. EPA, Office of Air Quality Planning and Standards, Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised), Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.

Figure 2-3. Building and Source Layout

Table 2-4. List of Rectangular Buildings Included in the Downwash Analysis

Rectangular Building ID	Description	SWC* UTM16e (m)	SWC* UTM16n (m)	Height (m)	Easting Dimension (m)	Northing Dimension (m)
BLDG02	Lower Bagging	518,165	3,661,514	13.69	14.00	9.00
SALES	Administration Building	518,059	3,661,548	3.05	7.00	14.00
S	Limehouse	518,180	3,661,509	27.15	40.30	15.40
BLDG21	FK Loadout lower roof	518,221	3,661,589	6.10	31.41	6.84
O	Flex Kiln Loadout	518,233	3,661,591	12.77	7.53	7.00
N	Bagging Bin	518,253	3,661,558	14.88	6.50	8.10
H	K2 Scrubber Building	518,311	3,661,516	19.75	15.50	11.40
B	K3/4 Baghouse	518,370	3,661,464	17.18	15.00	21.00
BLDG4	Milling Bldg.	518,193	3,661,471	20.30	38.20	25.90
BLDG5	Kiln 3/4 Burner Bldg.	518,194	3,661,472	20.48	18.10	23.80
BLDG27	Storeroom	518,116	3,661,460	6.61	44.00	21.00
T	Mag Tower	518,223	3,661,498	29.62	7.30	7.10
BLDG33	Coal Shed	518,037	3,661,404	11.43	37.28	24.01
BLDG26	Brick Shed	517,995	3,661,461	6.01	22.28	18.09
BLDG40	Loadout Station	518,237	3,661,424	9.14	35.51	10.38

*SCW means South West Corner

Table 2-5. List of Circular Buildings Included in the Downwash Analysis

Circular Building ID	Description	Center UTM16e (m)	Center UTM16n (m)	Height (m)	Radius (m)
T10	Bin 25 (Pulv Limestone)	518,167	3,661,575	30.72	4.60
T11	#6 USX Bin	518,156	3,661,562	22.01	4.60
T12	#5 USX Bin	518,167	3,661,562	22.01	4.60
T13	#4 USX Bin	518,156	3,661,552	22.01	4.60
T14	#3 USX Bin	518,167	3,661,552	22.01	4.60
T15	#2 USX Bin	518,156	3,661,541	22.01	4.60
T16	#1 USX Bin	518,167	3,661,541	22.01	4.60
T17	No. 7 Bin	518,156	3,661,532	18.65	4.00
T18	Scale Bin	518,167	3,661,532	18.65	4.00
J	K1 Stone Tank	518,299	3,661,533	23.37	4.60
T23	Water Treatment Clarifier	518,416	3,661,466	8.81	7.50
T25	Water Treatment Mixing Tank	518,412	3,661,479	10.24	1.96
T24	Water Treatment Retention Tank	518,406	3,661,479	10.85	1.96
C1	Dust Tank	518,343	3,661,468	29.28	4.00
C2	Dust Tank	518,353	3,661,469	29.28	4.00
T30	Kiln 3 Solid Fuel Tank	518,217	3,661,468	24.41	3.00
T31	Kiln 4 Solid Fuel Tank	518,216	3,661,461	23.81	3.00
T32	Dryer Feed Bin	518,185	3,661,447	19.42	3.00
FG	K3/K4 Stone Tanks	518,335	3,661,487	27.00	4.00
DE	K3/K4 Spray Towers	518,335	3,661,478	27.00	4.00
T34	West Screen System Baghouse	518,237	3,661,507	18.65	4.00
T35	East Screen System Baghouse	518,246	3,661,507	18.65	4.00
T36	#10 Bin Baghouse	518,255	3,661,507	18.65	4.00
T37	#17 Bin Baghouse	518,268	3,661,507	18.65	4.00
T38	#11 Bin	518,278	3,661,507	18.65	4.00
T39	#19 Dolo Bin Baghouse	518,214	3,661,502	18.65	4.00

Table 2-6. List of Polygonal Buildings Included in the Downwash Analysis

Polygonal Building ID	Description	SWC* UTM16e (m)	SWC* UTM16n (m)	Height (m)	Number of Vertices
OFFICE	Administration Building	518,067	3,661,548	4.88	18
LAB	Laboratory Building	518,069	3,661,530	4.88	6
BLDG01	Lower Bagging	518,140	3,661,513	6.98	8
BLDG9	Kiln 1/2 Burner Bldg.	518,202	3,661,525	12.44	6
PQR	Flex Kiln Screen	518,210	3,661,550	33.15	8
BLDG19	Upper Bagging	518,249	3,661,548	6.65	8

*SCW means South West Corner

3. RESULTS AND CONCLUSIONS

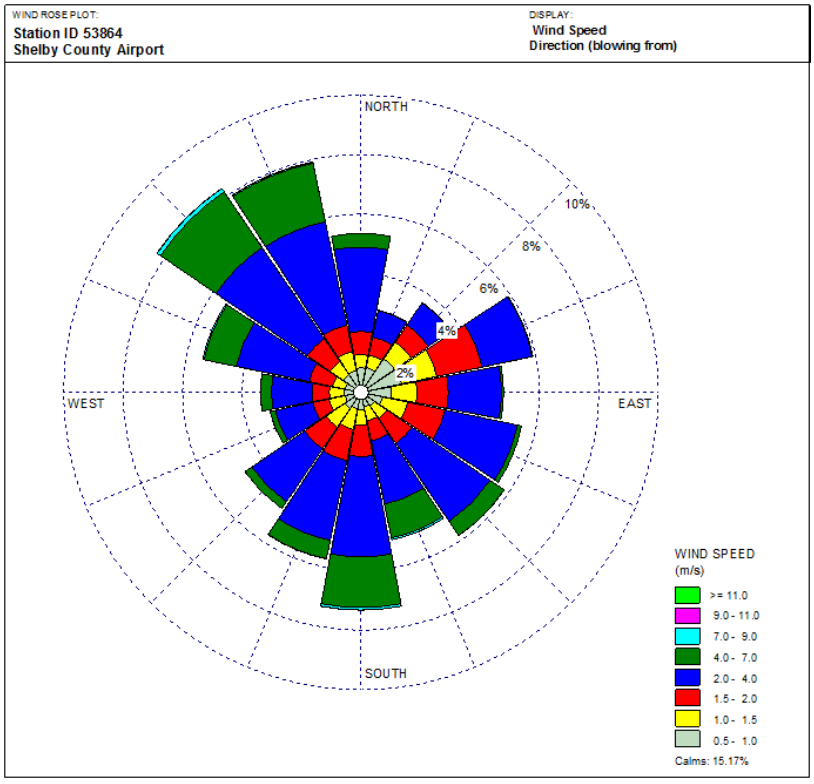
3.1. MODELING RESULTS ANALYSIS

The SO_2 1-hour concentrations were evaluated in form of the NAAQS standard, i.e. the 99th percentile was calculated for each receptor and then concentration values were averaged over the five modeling years. As recommended in the modeling *Guidelines*, the 99th percentile is best represented by the 4th highest daily-maximum 1-hour concentrations, therefore the 4th highest values at each receptor were processed to obtain the design values. As stated in the previous section the normalized emission rates were used in the modeling therefore the resulting concentrations are the Normalized Dazing Values (NDV) rather than the actual predicted concentrations, which is in agreement with recommendations published in the U.S. EPA "*SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document*".

> "*Modeling the normalized hourly SO_2 emissions allows for the calculation of normalized design values (NDV). NDVs do not indicate exceedance or compliance with the NAAQS, but provide a means to understanding the relative magnitude of ambient SO_2 concentrations across an area*."

Air dispersion is highly dependent on the prevailing winds (Figure 3-1). The most frequent wind direction is northwest, followed by south and southeast. Northwesterly and southerly winds tend to be stronger than the ones having more easterly component. The highest probability for light wind is again from the northeast.

Figure 3-1. 5-year Wind Rose, Presenting the Prevailing Winds at KEET



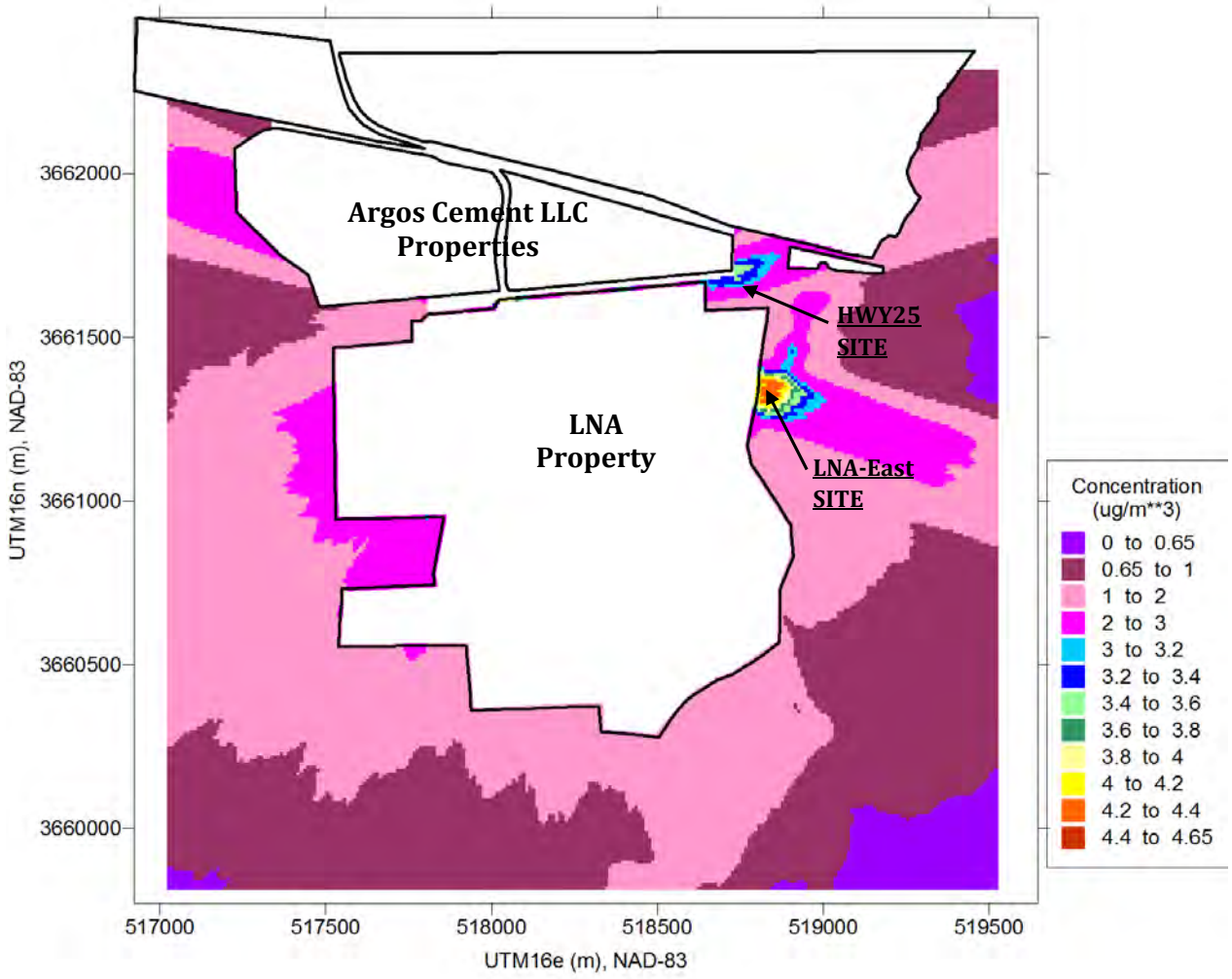
The spatial distribution of the NDVs forms a complex pattern shown on Figure 3-2, on which two areas of high impacts can be distinguished. These areas are recognized as the LNA-East site, and the Highway 25 site.

The highest NDV impact occurs near the LNA East site, but in the assessment of monitor placement the frequency of the impacts, on a H1H MAXDAILY basis, also play a major role. Frequency of impacts analysis at selected locations is provided further below. As specified above, the original modeling analysis, as reflected in Figure 3-2, is on a fine spaced receptor grid of only 10 meters spacing (see Figure 2-2).[11]

As noted previously, the Argos properties were excluded as access to those properties, to locate a monitor, was denied by Argos (see Appendix B). Although a portion of the Highway 25 site high impact area does cross the road to an adjacent property, that property is a small industrial site and would not be conducive for location of a monitor. Therefore, the further analysis focused on the sites termed LNA East, and the Highway 25 site.

[11] Corresponding model runs can be found in the AERMOD_full_grid folder on the modeling CD found in Appendix A.

Figure 3-2. Spatial Distribution of the 99th percentile 1-hour SO_2 Concentrations[12]



The additional analysis consisted of selecting and evaluating a smaller number of receptors around and including each local peak NDV concentration, which could be considered as a potential monitor location. Each cluster consisted of 5 receptor points, which were selected based on the following procedure:

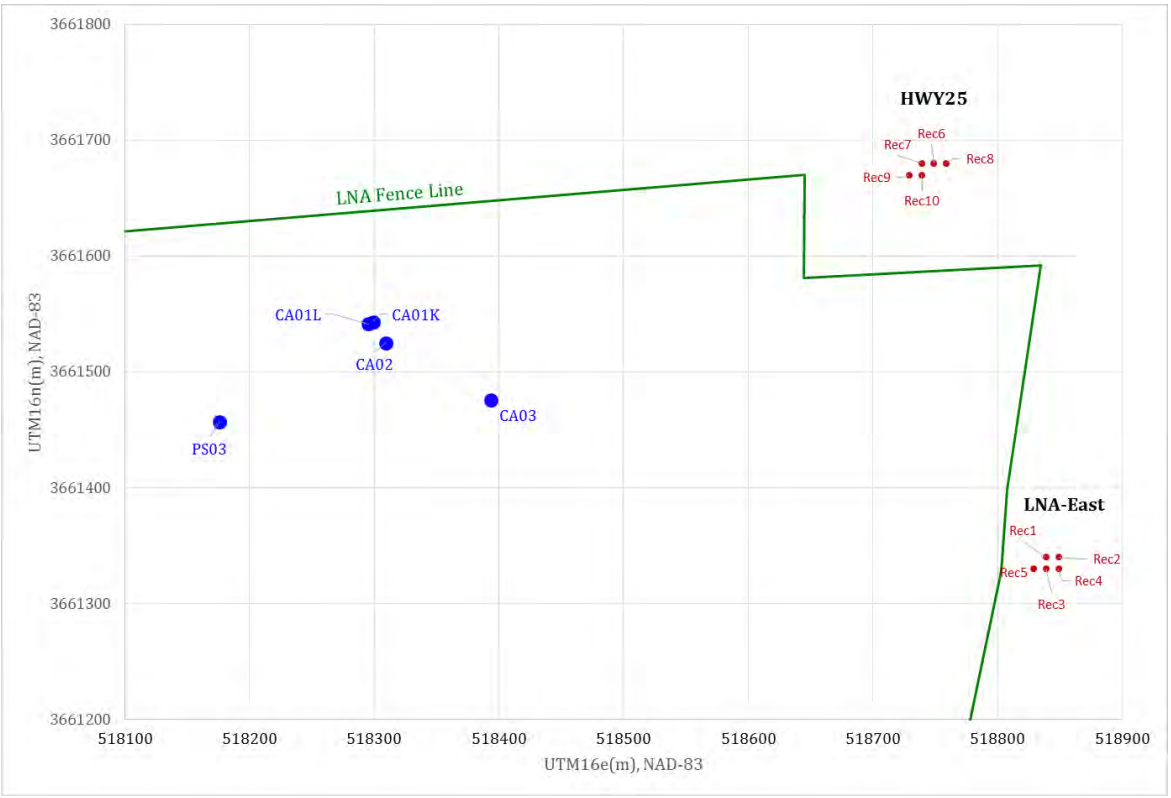
1. The receptors for each hotspot area were first extracted from the H4H (99th percentile) plot file, as provided in the AERMOD_full_grid folder on the modeling CD in Appendix A.
2. These NDVs (H4H 99th percentile values) were then ranked for each area. The top 5 maximum impact receptors (defined by NDV) were then extracted for each area.
3. A spreadsheet, including this analysis, is provided in the AERMOD_full_grid folder on the modeling CD in Appendix A. On the spreadsheet there are 3 tabs provided. One for the entire data output of the H4H plot file,

[12] Modeling input and output files which created Figure 3-2, including plot files, are included on the CD attached to this report.

one for the extracted receptors around the LNA east site, and another for the receptors extracted around the Highway 25 site.

After the two clusters of 5 receptors were selected following the procedure described above, the clusters were evaluated in two aspects – concentration magnitude (H1H maximum daily) and frequency of "hit", where "hit" is used as a term to describe the event of one receptor having the maximum hourly concentration at a particular day. To generate the frequency of occurrence of the maximum daily 1-hr impact at each receptor location, AERMOD was set to output the maximum daily 1-hr concentrations from the set of 10 receptors using the MAXDAILY output option of the model. The two clusters of receptors evaluated are shown on Figure 3-3. [13]

Figure 3-3. HWY25 and LNA East Receptor Locations Evaluated



The data from the SO2-EETa-selected.mxd output file of the model was evaluated as follows[14];

1. On the MAXDAILY tab of the SO2-EETa.mxd.xlsx Microsoft Excel file, the output data from the MAXDAILY file is reviewed.

[13] Corresponding model runs can be found in the AERMOD-selected10 folder on the modeling CD found in Appendix A. Also present within this folder is a Microsoft Excel file which contains an analysis of the MAXDAILY model output file (SO2-EETa-selected.mxd).

[14] This entire procedure is outlined in Appendix A of the EPA SO2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document (Draft February 2016), which is included on the modeling CD in Appendix A of this report.

a. Starting in cell L29, the maximum value (H1H MAXDAILY) of the 10 receptors evaluated, for that day, is determined. Then, starting in cell M29, with an Index function, the receptor corresponding with the maximum value is identified.
b. Starting in cell G3, the frequency of occurrence of the receptor in question having the MAXDAILY 1-hr impact, is determined. This data is then used to determine the overall frequency of occurrence of that receptor having the maximum impact.

The maximum daily 1-hr concentrations at each receptor in the group of 10, create a data set with relatively small standard deviation - the average over the 10 receptor maxima is 4.74 µg/m^3 and the standard deviation is 0.52, the range is [4.12 to 5.35 µg/m^3], which makes them similar from a statistical point of view. Applying a correlation analysis was not considered appropriate, because the two sites are influenced by different wind conditions. More details of the concentration distribution are presented in Table 3-1. The same table also shows the frequency of maximum impact, and it should be noted that the receptor with overall maximum concentration is not the one with most frequent impacts.

The receptor of overall predicted maximum concentration (H1H maximum daily 1-hr concentration) belongs to site LNA-East; the receptor with most frequent maximum impact (H1H maximum daily 1-hr concentration) belongs to the Highway 25 site, at approximately 37%.[15] Overall the Highway 25 site experiences more frequent maximum impacts (59.1%) than the LNA-East site (40.9%).

Table 3-1. Frequency Analysis Results

Site	Receptor ID	Maximum Concentration (H1H MAXDAILY) µg/m^3	Receptor ID	Frequency Count	Frequency % per Receptor	Frequency per Site
LNA East	REC1	5.17	REC1	72	3.95%	745 hits 40.9%
LNA East	REC2	5.12	REC2	133	7.30%	
LNA East	REC3	5.34	REC3	36	1.98%	
LNA East	REC4	5.29	REC4	33	1.81%	
LNA East	REC5	5.31	REC5	471	25.86%	
HWY25	REC6	4.28	REC6	22	1.21%	1,076 hits 59.1%
HWY25	REC7	4.41	REC7	267	14.66%	
HWY25	REC8	4.16	REC8	26	1.43%	
HWY25	REC9	4.12	REC9	668	36.68%	
HWY25	REC10	4.18	REC10	93	5.11%	
MAX	***REC3***	***5.34***	***REC9***	***668***	***36.68%***	
MIN	***REC9***	***4.12***	***REC6***	***22***	***1.21%***	
AVG		***4.74***				
STD		***0.52***				

The modeling results for the 10 receptors of interest were reviewed further and ranked, based on both the frequency of occurrence of the maximum daily impact (H1H) occurring at that receptor location, as well as the ranking of the H1H maximum daily impact at that receptor. In other words, REC4 has the highest H1H

[15] It should be noted that the LNA-East site (REC1-REC5) is located on the side of a steep terrain feature, and location of a monitor at this site would not be recommended.

MAXDAILY concentration of 5.34 µg/m³, so it has a concentration rank of #1. REC9 has the highest frequency county, so its frequency rank was #1. The concentration rank, and frequency rank, were then summed to provide the overall score for that receptor. Table 3-2 provides a further summary of that ranking effort.

Table 3-2. Receptor Ranking Analysis Results

Site	Receptor ID	Maximum Concentration (H1H MAXDAILY) µg/m³	Concentration Rank	Receptor ID	Frequency Count	Frequency Rank	Score	Score Rank
LNA East	REC1	5.17	4	REC1	72	6	10	5
LNA East	REC2	5.12	5	REC2	133	4	9	3
LNA East	REC3	5.34	1	REC3	36	7	8	2
LNA East	REC4	5.29	3	REC4	33	8	11	6
LNA East	REC5	5.31	2	REC5	471	2	4	1
HWY25	REC6	4.28	7	REC6	22	10	17	9
HWY25	REC7	4.41	6	REC7	267	3	9	3
HWY25	REC8	4.16	9	REC8	26	9	18	10
HWY25	REC9	4.12	10	REC9	668	1	11	6
HWY25	REC10	4.18	8	REC10	93	5	13	8

As can be seen from Table 3-2 above, although Receptor 9 (REC9) does not have the highest daily maximum concentration impact as evaluated for the areas of interest, when considering the high frequency of maximum daily impacts at the REC9 location, by scoring the receptor locations as conducted above it provides additional supporting information for selection of the area around REC9 and the Highway 25 site location as the monitor location.

3.2. NON-MODELING FACTORS

The two primary potential site locations (area of maximum impact, LNA-East, and area of most frequent maximum impact, Hwy 25) were further evaluated for non-modeling factors, as outlined below. Both sites are on property currently owned by LNA.

Location **LNA-East**:
- Wooded area; would require additional cost for land clearing and providing site access (i.e. access road)
- Relatively steep hill and hill top (approximately 70 to 130 feet above the mean facility level)
- Reasonably close proximity to existing power (400 feet)
- Security concerns with nearby residents
- LNA owned property, outside ambient air boundary

Location **Highway 25**:
- Wooded area; would require additional cost for preparation
- Some uneven terrain (approximately 20 to 40 feet above the mean facility level)
- Very close proximity to existing power (20 – 50 feet)
- Very close proximity to highway 25 (70 – 85 feet), and accessible via Hwy 25
- LNA owned property, outside ambient air boundary

3.3. CONCLUSIONS

Considering all aspects of the analysis, it was concluded that that the **Highway 25 site location** is the most appropriate location for monitor placement, based on the results of the modeling analysis and the governing non-modeling factors. The location is in the immediate proximity of the facility but not on the primary facility grounds, experiences the highest frequency of maximum daily 1-hr impacts of SO_2 as predicted by the modeling analysis, and is located in a relatively open, accessible, and power-provided area. The proposed location is shown on Figure 3-4.

The approximate coordinates for the proposed monitor location chosen are Lat 33.093465^{0}N and Lon 86.799211^{0}W. These coordinates are within approximately 9.3 meters of the receptor REC9 coordinates and 4.7 meters of REC10. The proposed monitor location is offset from the highest frequency receptor coordinates in order to provide more distance for the monitor location from the nearby roadway. Given the limitations of the model the results were interpreted in terms of being more suggestive of the area of the highest/most frequent impacts rather than as a precise tool for coordinate estimation.

Figure 3-4. Approximate Proposed Monitor Location

APPENDIX A: MODELING CD

APPENDIX B: ARGOS DOCUMENTATION

ARGOS

March 28, 2016

Mr. Michael Will
Senior Environmental Engineer
Lhoist North America
7444 Hwy 25
Calera, AL 35040

Mr. Will:

We have considered the request from Lhoist America to locate a SO_2 ambient air monitoring system on property owned by Argos Cement in Calera. This letter also complies with the Lhoist request to respond by letter. After reviewing the matter from a legal and technical standpoint, we respectfully decline the Lhoist request to locate the system on our property at this time.

Sincerely,

Argos Cement LLC

William Voshell

William Voshell
US Environmental Director

3015 Windward Plaza
Suite 300
Alpharetta, GA 30005