

State of Alabama Ambient Air Monitoring 2009 Consolidated Network Review



Table of Contents

Introduction.....	4
Overview.....	4
Summary of Changes to the Network.....	5
N-CORE.....	5
See Appendix II.Population.....	5
Population.....	6
Minimum monitoring requirements.....	6
Lead.....	8
PM 10.....	8
MSAs.....	8
Ozone.....	9
MSAs.....	11
Mobile.....	11
Montgomery.....	11
Tuscaloosa.....	11
Columbus, Ga.....	11
Birmingham.....	11
Dothan.....	12
Gadsden.....	12
Huntsville.....	12
Decatur.....	12
Florence.....	12
Auburn and Anniston-Oxford.....	12
Sites not located in an MSA.....	12
PM 2.5.....	13
MSAs.....	13
Florence.....	13
Decatur, Tuscaloosa, Dothan.....	13
Gadsden.....	13
Huntsville.....	14
Birmingham.....	14
Mobile.....	14
Columbus, Ga.-Phenix City.....	14
Montgomery.....	14
Auburn and Anniston-Oxford.....	15
Monitors not located in MSAs.....	15
Quality Assurance.....	17
Network Descriptions.....	17
ADEM.....	18
PM10.....	19
Lead.....	19
PM 2.5.....	20
OZONE.....	22
JCDH ANNUAL AIR MONITORING NETWORK PLAN.....	24

Summary of Changes to the Network.....	24
PAMS (Photochemical Assessment Monitoring Stations)	24
SLAMS (State and Local Air Monitoring Stations)	25
Continuous PM _{2.5} SPM (Special Purpose Monitors)	25
Network Review Findings	26
JCDH AIR MONITORING NETWORK DESCRIPTION	27
Ozone	27
Carbon Monoxide	27
Sulfur Dioxide.....	27
Manual PM10 Hi-Vol	27
Manual PM10 Lo-Vol for PMCourse Determination.....	28
Manual PM10 Improve Monitor	28
Continuous PM10	28
Manual PM2.5.....	28
Continuous PM2.5	29
Manual PM2.5 STN Speciation Monitors	29
Manual PM2.5 Improve Speciation Monitor	29
RadNet Monitor	29
HUNTSVILLE.....	30
Network Description.....	30
Annual Network Plan.....	32
APPENDIX I	35
Maps.....	35
ADEM Monitoring Sites.....	36
Jefferson County	37
City of Huntsville.....	38
APPENDIX II	39
NCORE Network Plan.....	39
National Core (NCore) Multi-pollutant Monitoring Stations:	41
Proposed changes to Ambient Air Monitoring Network to accommodate NCore sampling strategy:	41
Monitoring Objective:.....	42
Table 1 Monitors:.....	42
Quality Assurance Status:	43
Area of Representativeness:.....	43
Table 2: Spatial Scales for Each Pollutant.....	43
Site Description and Spacing:.....	45
Site Description and Spacing:	46
NCore and PM _{2.5} SLAMS Siting Criteria.....	46
Table 3 Spacing from Roadways Analysis	47
Site Details:	49

Introduction

Federal Regulations (40 CFR 58) require that State and Local Agencies that operate ambient air quality monitoring networks provide for the annual review of these air quality surveillance systems. This review must identify needed modifications to the network such as termination and relocation of unnecessary stations or establishment of new stations as necessary.

In Alabama the air quality surveillance system is operated by the state environmental agency and two local programs. The agencies are the Alabama Department of Environmental Management (ADEM), the Jefferson County Department of Health (JCDH), and the Huntsville Department of Natural Resources (HDNR). Each of these agencies has performed the required annual review of their portion of the network and this document is a compilation of the reports from each agency.

The following citation from the federal code of regulations is the minimum requirements for this annual review:

40 CFR 58.10

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

- (1) The AQS site identification number.
- (2) The location, including street address and geographical coordinates.
- (3) The sampling and analysis method(s) for each measured parameter.
- (4) The operating schedules for each monitor.
- (5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
- (6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.
- (7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM_{2.5} NAAQS as described in § 58.30.
- (8) The MSA, CBSA, CSA or other area represented by the monitor. annual monitoring network plans and periodic network assessments are subject to approval according to § 58.14.

Overview

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, for public information (such as, participation in EPA's AirNow program), Air Quality Index reporting for larger Metropolitan Statistical Areas MSAs, for use in Air Quality models and to provide data to Air Quality Researchers.

In 40 CFR 58 EPA has set minimum monitoring requirements for the pollutants that are to be compared with the NAAQS. These minimum requirements are for the most part based on population, the level of monitored pollutants and metropolitan statistical area boundaries as defined in the latest US Census information.

Summary of Changes to the Network

The following changes were made to the network since the 2008 monitoring plan. The Montgomery PM 2.5 monitor at the Resurrection School (AQS # 01-101-0007) was moved to the air monitoring site at the Montgomery ADEM office(AQS #01-101-1002).

The 2007 monitoring plan indicated that 6 new continuous monitors would be added to the network. These monitors have been set up in Montgomery, Tuscaloosa, Gadsden, Dothan, Muscle Shoals, and Decatur.

Upcoming changes to the network include:

Since the 2006-2008 design values for PM_{2.5} in Phenix City and Gadsden are below 95 percent of the standard ADEM will revert to 1 in 3 day sample frequency for the FRM monitors in January 2010 or sooner with Region 4 concurrence. This action will conserve significant monitoring resources.

ADEM is in the process of moving the particulate matter monitors from the courthouse location in downtown Phenix City, AQS ID 01-113-0001, to a nearby site that has been approved by the US EPA, Region 4. The AQS ID will be retained at the new site.

Each State is required to operate one **N-Core** (multi-pollutant site). After much discussion with EPA, North Birmingham will be proposed for the N-Core site due to the STN Speciation and IMPROVE samplers already located at the site. This site should be partially operational by January 1, 2010 and fully operational by January 1, 2011. The site will monitor continuously Ozone (O₃), trace level carbon monoxide (CO), sulfur dioxide (SO₂), and oxides of nitrogen (including nitric acid)(NO_y), as well as fine (PM_{2.5}) particles, coarse (PM_{10-2.5}) particles, TSP lead, and black carbon. Elemental carbon, organic carbon, and sulfate will also be monitored continuously at the site. Please see Appendix II on the proposed NCore Monitoring Site at the end of this plan.

The Tarrant, ABC (01-073-6003) PM₁₀ site will be shut down after December 31, 2009 due to the ABC Coke Plant purchasing the property on which the site is located resulting in the fact that the site will no longer be a fenceline site in ambient air. The Continuous PM₁₀ Monitor will be moved to the Tarrant, Elementary School (01-073-6002) site.

N-CORE

See Appendix II.

Population

Alabama has a population of 4,557,808 and 3,180,217 is located in 12 MSAs. Table 1 shows the population of Alabama by MSA.

Metropolitan statistical areas	
Anniston-Oxford, AL	113,419
Auburn-Opelika, AL	133,010
Birmingham-Hoover, AL	1,117,608
Columbus, GA-AL	287,653
Decatur, AL	150,125
Dothan, AL	140,961
Florence-Muscle Shoals, AL	143,791
Gadsden, AL	103,303
Huntsville, AL	342,376
Mobile, AL	406,309
Montgomery, AL	365,924
Tuscaloosa, AL	206,765

Minimum monitoring requirements

This section will cover the minimum number of monitors required by regulation. Additional information about each monitor will be covered later in this document in the Network Description sections.

Appendix D of 40 CFR Part 58 details the monitoring requirements for the criteria pollutants¹. In the latest revisions to Part 58, October 17, 2006, minimum monitoring requirements were removed for Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂) Carbon Monoxide (CO) and Lead (Pb) since there are few areas of the nation where these pollutant levels are close to the NAAQS. Minimum monitoring requirements were revised for Ozone, (O₃), Particulate matter less than 10 microns (PM₁₀), and Particulate matter less than 2.5 microns (PM_{2.5}). The following tables are taken from Part 58 and summarize the requirements by pollutant.

¹ Criteria Pollutants are the pollutants which are defined in 40 CFR Part 50 and are associated with health and welfare based National Ambient Air Quality Standards, NAAQS.

MSA population ^{1,2}	Most recent 3-year design value \geq 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.

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 PM10 data show ambient concentrations exceeding the PM10 NAAQS by 20 percent or more.

3 Medium concentration areas are those for which ambient PM10 data show ambient concentrations exceeding 80 percent of the PM10 NAAQS.

4 Low concentration areas are those for which ambient PM10 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.

MSA population ^{1,2}	Most recent 3-year design value concentrations \geq 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.

These tables indicate that the minimum requirements for these pollutants are based on population, MSAs, and the previous design values (the level of the pollutant). Each of these factors will be addressed by MSA for Alabama.

In addition to the minimum requirements in these tables, MSAs with populations greater than 350,000 are required to report the air quality index daily. Currently, the air quality

index 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/AirDivision/Ozone/Daily%20Data/Historical.htm
JCDH	http://www.jcdh.org/EH/AnR/AnR03.aspx
HDNR	http://www.hsvcity.com/NatRes/airdata.php#blank

Lead

In 2008, the US EPA revised the National Ambient Air Quality Standard for lead. The lead standard was lowered from 1.5ug/m³ for a quarterly average to 0.15ug/m³ based on the highest rolling 3 month average over a 3 year period. EPA set minimum monitoring requirements for source and population oriented monitoring. Source oriented monitoring is required near sources that have emissions greater than or equal to 1 ton per year. Population oriented monitoring is required for CBSAs greater than 500,000. Source oriented monitors must be included in the 2009 Ambient Air Quality Monitoring Plan and Monitors identified in that plan must be operational by 01/01/2010. Population oriented monitors must be included in the 2010 Ambient Air Quality Monitoring Plan and Monitors identified in that plan must be operational by 01/01/2011. Based on current emissions data or modeling ADEM has identified 1 source which emits greater than 1 ton of lead per year (Sanders Lead Co.). ADEM has an existing monitor (AQS ID 01-109-0003) near that source. This monitor appears to be sited in the proper location and ADEM will continue to operate that monitor. Based on current emission data, JCDH and the City of Huntsville have no sources that would require monitoring.

PM 10

PM10 has been a criteria pollutant since 1987. Since that time there has been widespread monitoring of the PM10 levels in Alabama. In 2006 the US EPA modified the NAAQS for PM10 to revoke the annual standard. Currently, there is still a daily standard of 150 ug/m³ based on 3 years of data. Most areas of the state have recorded PM10 levels well below the NAAQS.

MSAs

According to table D4 above, the Birmingham MSA would be classified as high concentration for an area larger than 1,000,000 people. This means that the Birmingham MSA would need 6 to 10 PM10 monitors. Currently there are 10 PM10 monitors in the Birmingham MSA. They are all operated by the JCDH within Jefferson County. PM10 concentrations are highly effected by the presence of local emission sources. Jefferson County has a high concentration of PM10 sources in the Birmingham area. Also, approximately 77% of the MSA population is located in the two counties of Jefferson and Shelby. Sixty percent of the MSA population is located in Jefferson County. Therefore PM10 monitoring is located in high emissions and high population areas of the MSA. Historical monitoring in Walker, Shelby, and Chilton counties have indicated levels in the low concentration range.

All other monitors in Alabama have indicated the PM10 levels to be in the low concentration range. For MSAs less than 250,000 population zero PM10 monitors are required. Mobile and Montgomery have populations between 250,000 and 500,000 and are required to have 0 to 1 monitor in the MSA. Montgomery has 1 site and Mobile has two sites. The Huntsville MSA also falls in this size range and the City of Huntsville currently operates four PM10 monitors. The Columbus, GA- Phenix City, AL MSA has a population of ~287,000 and there is one PM10 monitor in that area operated by the State of Georgia.

The PM10 monitor in Chickasaw, Mobile MSA, is a continuous monitor and supports the Air Quality Index reporting.

Ozone

Minimum monitoring requirements for ozone are based on population and whether the design value is less than 85% of the NAAQS or 85% of the NAAQS or higher. The NAAQS for ozone is 0.075 parts per million of ozone. 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 0.075 ppm. (effective May 27, 2008) Figure 1 is a map of Alabama which shows the MSAs with the population indicated and the level of the design value.

Ozone Network Requirements

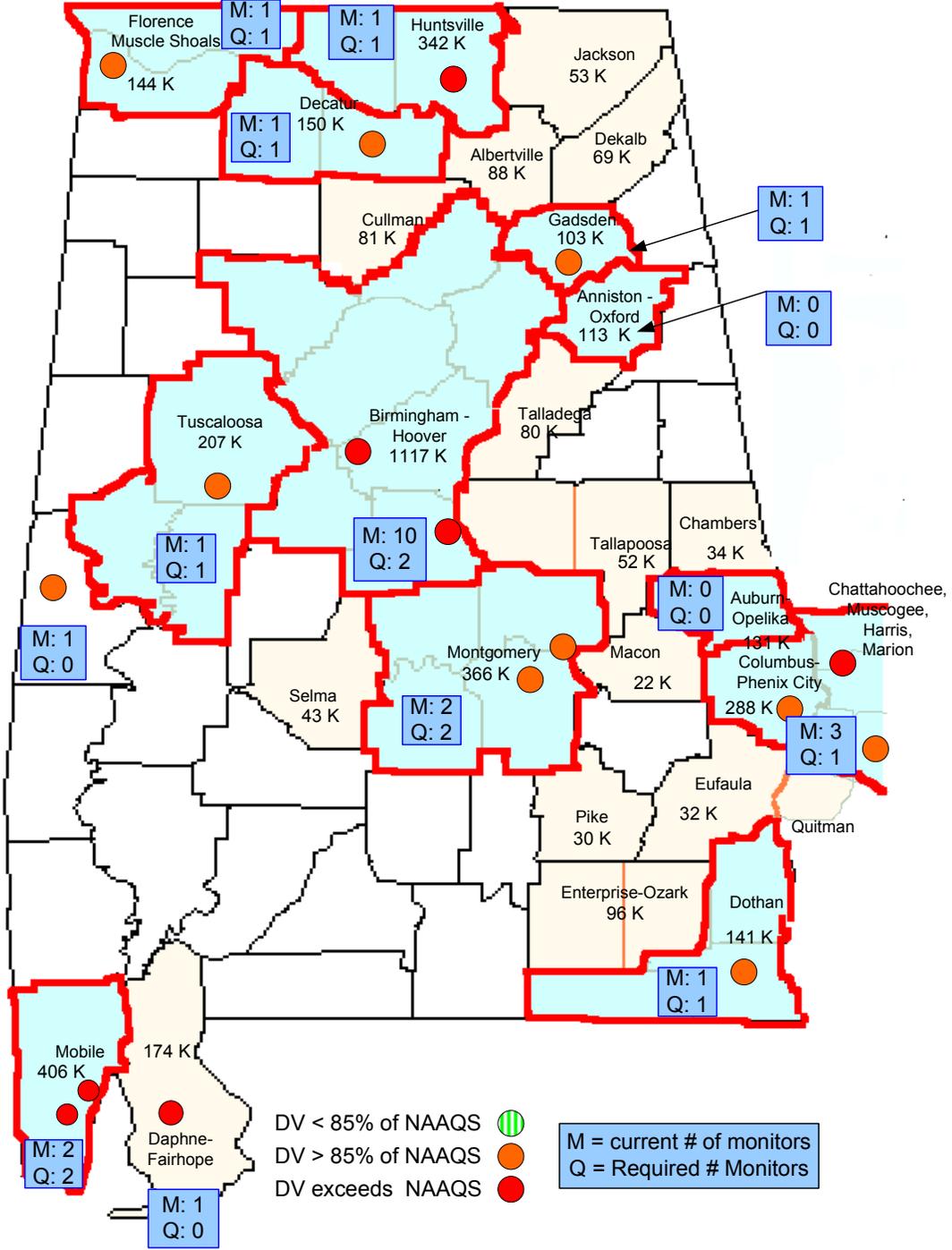


Figure 1

MSAs

Mobile

The Mobile area has one MSA which includes Mobile County and 1 micropolitan area², Baldwin County. The Mobile MSA would be required to have 2 ozone monitoring sites because its population is larger than 350,000 and the design value is greater than 85% of the NAAQS. Mobile County currently has 2 ozone sites. The Baldwin County area is not required to have an ozone monitor. Baldwin County was part of the Mobile MSA in the 2000 Census and is adjacent to the Pensacola MSA. An ozone monitor was added to Baldwin County to provide additional information on ozone transport in the area. This monitor also provides input to EPA's Airnow ozone mapping system. This web based system provides near-real time ozone concentration data to the public. Baldwin County is the largest micropolitan area in the state.

Montgomery

The Montgomery MSA is greater than 350,000 population and greater than 85% of the NAAQS. Two ozone monitors are required for this MSA. There are currently 2 sites, and these will be retained.

Tuscaloosa

The Tuscaloosa MSA design value is greater than 85% of the NAAQS and one monitor is required for that area. There is currently one monitor.

Columbus, Ga.

The Columbus-Phenix City MSA ozone design value is greater than 85% of the NAAQS and the population is between 50,000 and 350,000 therefore, 1 monitor is required for that area. There is currently 1 site maintained by ADEM, west of Phenix City and 2 sites are located in Georgia and operated by the State of Georgia.

Birmingham

The Birmingham MSA design value is greater than 85% of the NAAQS and is required to have 2 Ozone sites. There are currently 10 ozone sites in this MSA. One site is located in Shelby County and is operated by ADEM. Nine sites, operated by the JCDH, are located in Jefferson County. Additional information about these monitors is found in the Network description.

² Micropolitan Statistical Area.--A Core Based Statistical Area associated with at least one urban cluster that has a population of at least 10,000, but less than 50,000.

Dothan

The Dothan MSA population is between 50,000 and 350,000 and the design value is greater than 85% of the NAAQS. Dothan has one required site and this site will be maintained.

Gadsden

The Gadsden MSA population is between 50,000 and 350,000 and the design value is greater than 85% of the NAAQS. Gadsden has one required site, and this site will be maintained.

Huntsville

The Huntsville MSA design value is greater than 85% of the NAAQS and is required to have 1 ozone site. There is currently one ozone site in Huntsville and it is Operated by the City of Huntsville.

Decatur

The Decatur MSA design value is greater than 85% of the NAAQS with a population between 50,000 and 350,000 Decatur is required to have 1 site, and there is currently 1 site.

Florence

The Florence MSA population is between 50,000 and 350,000 and the design value is greater than 85% of the NAAQS and has one required site. This site will be maintained.

Auburn and Anniston-Oxford

Prior to the 2006 changes to the monitoring regulations, ADEM evaluated the ozone monitoring network annually to determine the adequacy of coverage. The MSAs of Auburn and Anniston-Oxford were evaluated and it was determined that due to the close proximity of ozone monitors in neighboring areas which were below the NAAQS, additional monitors would not be needed. The monitors in the adjacent areas still provide adequate monitoring coverage. Since these areas do not have design values, no monitors are required by Appendix D of 40 CFR 50.

Sites not located in an MSA

Sumter County has one ozone monitor that represents rural, background ozone values for the state.

Additional rural ozone monitors are operated for EPA and the Southern Company at Crossville and Centerville, respectively.

PM 2.5

Table D-5 from the Federal Register (above) lists the federal reference method, FRM, monitors that are required for an MSA. In addition to these monitors, the state is required to operate a regional background and a regional transport site. Section 4.7.2 of Appendix D of 40CFR58 also requires a collocated continuous PM2.5 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. The state is also required to operate PM2.5 speciation monitors to characterize the constituents of PM2.5. The number of speciation monitors is determined in consultation with EPA Region IV.

PM 2.5 design values are based on 2006 – 2008 data. A map based on these design values is presented in figure 2 below.

MSAs

A map of required FRMs by MSA is found in figure 2.

Florence

The Florence MSA has design values of $28\text{ug}/\text{m}^3$ for the daily NAAQS and $12.2\text{ ug}/\text{m}^3$ for the annual NAAQS. A design value of $30\text{ ug}/\text{m}^3$ is the lowest value which is greater than or equal to 85% of the daily NAAQS, and a design value of $12.8\text{ ug}/\text{m}^3$ is the lowest value that is greater than or equal to 85% of the annual NAAQS. The annual and daily design values are less than 85% of the NAAQS. This MSA is required to have 0 FRM and 0 continuous PM2.5 monitors. There is currently 1 FRM and 1 continuous monitor located in Muscle Shoals.

Decatur, Tuscaloosa, Dothan

The Decatur, Tuscaloosa, and Dothan MSA design values are less than 85% of the NAAQS, and the population is between 50,000 and 500,000. Each of these MSAs is required to have 0 FRM and 0 continuous monitors. These areas currently have 1 FRM and 1 continuous monitor.

Gadsden

The Gadsden MSA design value is greater than 85 % of the NAAQS and the population is between 50,000 and 500,000. One FRM and one continuous monitor are required. Currently there is one FRM and one continuous monitor.

Huntsville

The Huntsville MSA design value is greater than 85 % of the NAAQS and the population is between 50,000 and 500,000. One FRM and one continuous monitor are required. Currently there is one FRM, one continuous monitor and one speciation monitor.

Birmingham

The Birmingham MSA population is greater than 1 million, and the design value is greater than 85% of the NAAQS. For this area, 3 FRM are required, and 2 continuous monitors are required. Currently there are 10 FRM monitoring sites in this MSA. Two of these sites (Jasper and Pelham) are operated by ADEM. The remaining FRM are located in Jefferson County and are operated by the JCDH. JCDH also operates 8 continuous monitors and 3 speciation monitors in Jefferson County. Further details of the JCDH PM2.5 network can be found in the Network Description section of this document.

Mobile

The Mobile area, which includes the Mobile MSA and Baldwin Micropolitan Statistical Area, has design values less than 85% of the NAAQS. If considered separately, the Mobile and Baldwin areas would not be required to have an FRM. There are currently 3 FRMs and 1 continuous PM2.5 monitor in this area. Also, the continuous monitor is necessary for required AQI reporting. Due to the population in this area these monitors will be continued.

Columbus, Ga.-Phenix City

The Columbus, Ga.-Phenix City, AL MSA is between 50,000 and 500,000 and the annual design value is greater than 85% of the NAAQS. This area is required to have 1 FRM and 1 continuous PM2.5 monitor. There are currently 3 FRMs, 1 continuous monitor and 1 continuous monitor to be deployed at the new particulate matter site in Phenix City, and 2 speciation monitors in this MSA. In the Columbus-Phenix City CMZ, ADEM operates 1 FRM, 1 colocated FRM, 1 speciation monitor, and will deploy 1 continuous PM2.5 monitor at the downtown site. The State of Georgia operates 3 FRM, 1 speciation monitor and 1 continuous monitor in Columbus.

Montgomery

The Montgomery MSA is between 50,000 and 500,000 and the design values are greater than 85 % of the annual NAAQS. One FRM and one continuous monitor is required to be operated in this MSA. There is currently 1 FRM, 1 colocated FRM and 1 continuous monitor operated by ADEM. In addition, ADEM operates a speciation monitor in Montgomery.

Auburn and Anniston-Oxford

In 1999 when the PM2.5 monitoring program was implemented in Alabama, the MSAs of Auburn and Anniston-Oxford were evaluated to determine the need for monitors. It was determined that due to the close proximity of PM2.5 monitors in neighboring areas additional monitors would not be needed. This is a reflection of the fact that PM2.5 can be transported long distances and affects large regions. The monitors in the adjacent areas still provide adequate monitoring coverage. Since these areas do not have design values, no monitors are required by Appendix D.

Monitors not located in MSAs

ADEM operated an FRM in Sumter County as a rural regional background site in West Alabama for 5 years. In 2006 ADEM stopped operating the FRM but currently maintains a continuous monitor at this site. The continuous monitor will track any changes that may occur in background PM2.5 concentrations.

Talladega County is a Micropolitan Statistical Area with a population of 80,000. It is adjacent to the Anniston MSA and the Jefferson County MSA. There is currently 1 FRM located in Childersburg.

There is an FRM located in Ashland in Clay County to serve as a regional transport site in between the large MSAs of Birmingham and Atlanta.

Crossville has been the a rural background site in northeast Alabama. The data from this site is greater than 85% of the NAAQS for the annual standard. ADEM intends to maintain this site.

PM 2.5 Network Requirements (without exceptional events)

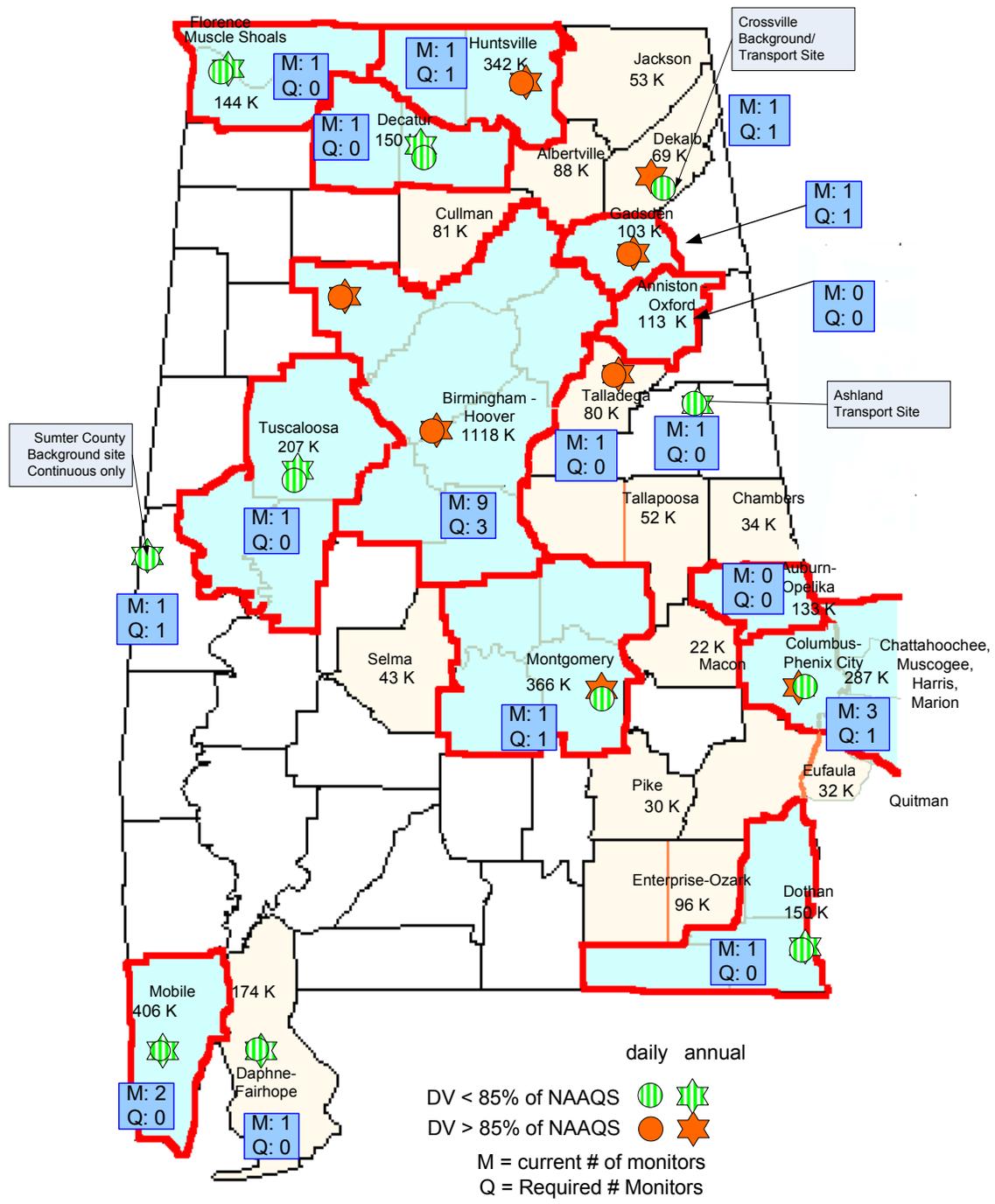


Figure 2

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. Part of the EPA required quality control program for particulate monitors is the use of collocated particulate monitors. 40 CFR 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.

Network Descriptions

A description of the ambient air monitoring networks for each air pollution agency will be presented in this section.

ADEM

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)
Type	
CS	Core 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
NAAQS³	
Y,N	Data suitable for comparison to NAAQS

³ Collocated monitors must be operated in the same manner as the federal reference method but 1 monitor at the site is designated as the main monitor for comparison to the NAAQS.

PM10

Site common name	AQS Site ID	Address/ MSA	Latitude Longitude	SCTALPE	Monitoring objective	Began Sampling	Ended Sampling	METHUEN	SCHEIDT	NAQA	Comment
Mobile – Chickasaw	01-097-0003	Iroquois And Azalea Chickasaw, Mobile Co/Mobile MSA	30.76972 -88.0875	N S M	Highest Concentration (Mobile, AL)	05/22/74	active	T	C	Y	For AQI
Mobile – WKRG Main	01-097-0016	WKRG transmitting Stn, Telegraph Rd. /Mobile MSA	30.72028 -88.05889	N O	Population Exposure (Mobile, AL)	01/01/82	active	S	6	Y	
Mobile – WKRG collocated	01-097-0016	WKRG transmitting Stn, Telegraph Rd. /Mobile MSA	30.72028 -88.05889	N S M	Population Exposure (Mobile, AL)	01/01/82	active	S	6	Y	collocated
Montgomery - MOMS	01-101-1002	1890 Dickenson Drive, Montgomery, Alabama/Montgomery MSA	32.40694 -86.25639	N S	Population Exposure (Montgomery, AL)	06/01/93	active	S	6	Y	

Lead

Site common name	AQS Site ID	Address	Latitude Longitude	SCTALPE	Monitoring objective	Began Sampling	Ended Sampling	METHUEN	SCHEIDT	NAQA	Comment
Troy - Borland	01-109-0003	Henderson Road, Troy, Ala./ not in MSA	31.79056 -85.97917	N S	Highest Concentration (Dothan, AL)	01/01/79	active	S, G	6	Y	
Troy - Borland	01-109-0003	Henderson Road, Troy, Ala. / not in MSA	31.79056 -85.97917	N S M	Highest Concentration (Dothan, AL)	01/01/79	active	S, G	6	Y	collocated

PM 2.5

Site common name	AQS Site ID	Address/ MSA	Latitude Longitude	S C A L E	T Y P E	Monitoring objective	Began Sampling	Ended Sampling	M E T H O D	S C H E D U L E	N A A Q S	Comment
Fairhope	01-003-0010	Fairhope High School/ not in MSA	30.49778 -87.88139	N	S	Population exposure	01/01/00	active	L	3	Y	
Ashland	01-027-0001	Ashland Airport/ not in MSA	33.28111 -85.80222	R	S	Highest Concentration	01/01/99	active	L	3	Y	
Muscle Shoals	01-033-1002	Second Street and Wilson Dam Road/ Florence MSA	34.76056 -87.65056	N	S	Highest Concentration	01/01/99	active	L	3	Y	
Muscle Shoals	01-033-1002	Second Street and Wilson Dam Road/ Florence MSA	34.76056 -87.65056	N	S	Highest Concentration	01/01/99	active	L	C	Y	Collocated continuous
Crossville	01-049-1003	13112 Hwy 68, DeKalb County/ not in MSA	34.2875 -85.96833	N	S P M	General/background	01/01/99	active	L	3	Y	
Brewton	01-053-0002	Bellville Ave. / not in MSA	31.10639 -87.07111	N	S P M	Highest Concentration	01/01/99	active	L	3	Y	Closed at the end of 2007
Gadsden - CC	01-055-0010	1001 Wallace / Gadsden MSA	33.99361 -85.99111	U	S	Population Exposure	01/01/00	active	L	3	Y	
Gadsden - CC	01-055-0010	1001 Wallace / Gadsden MSA	33.99361 -85.99111	U	S	Population Exposure	01/01/00	active	L	C	Y	Colocated Continuous
Dothan	01-069-0002	126 North St, Dothan, Al./ Dothan MSA	31.22621 -85.39082	N	S	Population Exposure	01/01/99	active	L	3	Y	
Dothan	01-069-0002	126 North St, Dothan, Al./ Dothan MSA	31.22621 -85.39082	N	S	Population Exposure	01/01/99	active	L	C	Y	Colocated Continuous
Mobile - Chickasaw	01-097-0003	Iroquois and Azalea, Chickasaw/ Mobile MSA	30.76972 -88.0875	N	CS	Population Exposure	07/19/02	active	L	3	Y	changed to CS (7/01/06)
Mobile - Chickasaw	01-097-0003	Iroquois and Azalea, Chickasaw/ Mobile MSA	30.76972 -88.0875	N	S P M	Population Exposure	07/19/02	active	T	C	N	Continuous monitor

Mobile - Bay Road	01-097-2005	Bay Road at Thomas Rd., Theodore/ Mobile MSA	30.47444 -88.14111	N	S P M	Population Exposure	01/01/99	active	L	3	Y	
Montgomery - MOMS	01-101-0007	Forbes Road, Montgomery, Al./ Montgomery MSA	32.42583 -86.28528	N	CS	Population Exposure	01/01/99	active	L	3	Y	
Montgomery - MOMS	01-101-0007	Forbes Road, Montgomery, Al./ Montgomery MSA	32.42583 -86.28528	N	CS	Population Exposure	01/01/99	active	L	6	Y	Collocated
Montgomery - MOMS	01-101-0007	Forbes Road, Montgomery, Al./ Montgomery MSA	32.42583 -86.28528	N	CS	Population Exposure	01/01/99	active	L	C	Y	Collocated Continuous
Decatur	01-103-0011	Wallace Ctr.Hwy 31, Decatur/ Decatur MSA	34.51861 -86.97694	M	S	Population Exposure	08/12/02	active	L	3	Y	
Decatur	01-103-0011	Wallace Ctr.Hwy 31, Decatur/ Decatur MSA	34.51861 -86.97694	M	S	Population Exposure	08/12/02	active	L	C	Y	Collocated Continuous
Phenix City - Downtown	01-113-0001	Russell County Courthouse/ Columbus, GA MSA	32.47639 -84.99917	N	CS	Highest Concentration	01/01/99	active	L	3	Y	
Phenix City - Downtown	01-113-0001	Russell County Courthouse/ Columbus, GA MSA	32.47639 -84.99917	N	CS	Highest Concentration	01/01/99	active	L	3	Y	collocated
Phenix City - Downtown	01-113-0001	Russell County Courthouse/ Columbus, GA MSA	32.47639 -84.99917	N	CS	Highest Concentration			T	C	N	Continuous, to be installed at new site
Pelham	01-117-0006	Pelham High School/ Birmingham MSA	33.31278 -86.82111	U	S	Highest Concentration	01/01/99	active	L	3	Y	
Sumter	01-119-0002	Sumter County - Kinterbush State Wildlife Mgt Area/ not in MSA	32.36389 -86.20194	R	S	Background/General	03/31/04	Active	T	C	N	continuous
Childersburg	01-121-0002	300 1 st Street, / not in MSA	33.27944 -86.34944	N	S	Highest Concentration	01/01/99	active	L	3	Y	
Tuscaloosa - VA Hospital	01-125-0003	3701 Loop Road East/ Tuscaloosa MSA	33.18903 -87.48421	N	S	Population Exposure	10/01/02	active	L	3	Y	
Jasper	01-127-0002	Beville State Community College/ Birmingham MSA	33.83278 -87.2725	N	S	Population Exposure	01/01/99	active	L	3	Y	

OZONE

Site common name	AQS Site ID	Address	Latitude Longitude	S C A L E	T y p e	Monitoring objective	Began Sampling	Ended Sampling	M E T H O D	S C H E D U L E	N A A Q S	Comment
Fairhope	01-003-0010	Fairhope High School, Fairhope, Alabama/not in MSA	30.49778 -87.88139	N	S P M	Population Exposure (Mobile, AL)	01/01/00	active	U	C	Y	
Muscle Shoals	01-033-1002	Wilson Dam Rd And 2nd St./ Florence MSA	34.76056 -87.65056	N	S P M	Population Exposure (Decatur, AL)	01/01/77	active	U	C	Y	
DBT	01-051-0001	Dewberry Trail, Wetumpka, / Montgomery MSA	32.49833 -86.13667	U	S	Highest Concentration (Montgomery, AL)	03/01/90	active	U	C	Y	
Southside	01-055-0011	1450 Parker Anderson Lane, Southside, Al/ Gadsden MSA	33.9039 -86.0539	N	S	Max Ozone Concentration	04/26/02	active	U	C	Y	
Mobile - Chickasaw	01-097-0003	Iroquois And Azalea Chickasaw/ Mobile MSA	30.76972 -88.0875	N	S	Population Exposure (Mobile, AL)	05/22/74	active	U	C	Y	
Mobile - Bay Road	01-097-2005	Bay Rd. ,Mobile Al. / Mobile MSA	30.47444 -88.14111	U	S	Population Exposure (Mobile, AL), Highest Concentration (Mobile, AL)	05/21/98	active	U	C	Y	
Montgomery - MOMS	01-101-1002	1890 Dickinson Drive, Montgomery, Alabama / Montgomery MSA	32.40694 -86.25639	N	S	Population Exposure (Montgomery, AL)	06/01/93	active	U	C	Y	
Decatur	01-103-0011	P.O. Box 2224 Wallace Development Center/ Decatur MSA	34.51861 -86.97694	U	S	General/Background (Decatur, AL)	04/01/00	active	U	C	Y	
Phenix City - Ladonia	01-113-0002	9 Woodland Drive Ladonia, Al / Columbus MSA	32.46785 -85.0839	U	S P M	Population Exposure (Columbus, GA-AL)	03/01/03	active	U	C	Y	
Helena	01-117-0004	Helena, Bearden Farm /	33.31694	U	S	Population Exposure	01/01/83	active	U	C	Y	

		Birmingham MSA	-86.8250			(Birmingham, AL)						
Sumter Co.	01-119-0002	Sumter Co., Kinterbush State Wildlife Mgt/ not in MSA	32.36389 -86.20194	R	S P M	General/Background	10/09/91	active	U	C	Y	
Tuscaloosa Co.	01-125-0010	11690 Southfork Dr. Duncanville, Al / Tuscaloosa MSA	33.08953 -87.45972	U	S	Population Exposure (Tuscaloosa, AL)	02/01/01	active	U	C	Y	
Dothan	01-069-0004	161 Buford Lane Dothan, Al / Dothan MSA	31.19041 -85.42317	U	S P M	Population Exposure	03/05	active	U	C	Y	

JCDH ANNUAL AIR MONITORING NETWORK PLAN

June 16, 2009

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 Changes to the Network

Upcoming changes to the network include:

Each State is required to operate one N-Core (multi-pollutant site). After much discussion with EPA, North Birmingham will be proposed for the N-Core site due to the STN Speciation and IMPROVE samplers already located at the site. This site should be partially operational by January 1, 2010 and fully operational by January 1, 2011. The site will monitor continuously Ozone (O₃), trace level carbon monoxide (CO), sulfur dioxide (SO₂), and oxides of nitrogen (including nitric acid)(NO_y), as well as fine (PM_{2.5}) particles, coarse (PM_{10-2.5}) particles, TSP lead, and black carbon. Elemental carbon, organic carbon, and sulfate will also be monitored continuously at the site. Please see section on the proposed NCore Monitoring Site at the end of this plan.

The Tarrant, ABC (01-073-6003) site will be shut down after December 31, 2009 due to the ABC Coke Plant purchasing the property on which the site is located resulting in the fact that the site will no longer be a fenceline site in ambient air. The Continuous PM₁₀ Monitor will be moved to the Tarrant, Elementary School (01-073-6002) site.

According to the new lead regulations, sources emitting one ton or more of lead per year would be candidates for lead ambient air monitoring. Based on recent emissions inventory data, a lead source monitoring site is not required.

PAMS (Photochemical Assessment Monitoring Stations)

PAMS monitoring is required in areas classified as serious or above for the 8-hour ozone standard. Jefferson/Shelby Counties are presently classified as an ozone attainment area. Therefore, 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 Birmingham MSA population is 1,090,126 based on the 2005 estimated U.S. census population. Jefferson/Shelby Counties' 3-year design value concentration for 2005-2007 is .089 ppm. MSA's with populations greater than 1,000,000 having a design value $\geq 85\%$ of the O₃ NAAQS are required to operate two ozone sites. For the purpose of mapping and to support our EMPACT website, Jefferson County operates a total of nine ozone monitoring sites and a tenth ozone monitoring site in the Birmingham MSA is located at Shelby County's Helena site (operated by the Alabama Department of Environmental Management).

There are no minimum monitoring requirements for carbon monoxide (CO), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). Due to past monitoring requirements Jefferson County still monitors for CO and SO₂, although concentrations of these pollutants are very low. Monitoring for NO₂ has not been performed for years, but (as mentioned previously) NO_y monitoring will be performed at the NCore site. 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 one 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 over one ton per year in Jefferson County. Based on past monitoring and recent emissions inventory data, a lead source monitoring site is not required.

Jefferson County's PM₁₀ concentrations are greater than 80 percent of the PM₁₀ NAAQS (National Ambient Air Quality Standards). Based on MSA's with populations greater than 1,000,000 and high concentrations (greater than 80 percent of PM₁₀ NAAQS), Jefferson County is required to operate between 6 and 10 sites. Jefferson County operates 10 PM₁₀ sites located in the main industrial valley. These monitors can be operated at very low cost and provide good spatial coverage within the county. Experience has shown that members of the public want ambient air monitoring to be performed in their part of the county, and the PM₁₀ monitoring sites provide a monitoring presence at relatively low cost. Furthermore, the PM₁₀ data provide an indirect indication of PM_{2.5} spatial variability at a tiny fraction of the cost of operating additional PM_{2.5} sites.

The minimum PM_{2.5} monitoring requirements are based on MSA populations and 3-year design value concentrations. Jefferson/Shelby County's 3-year annual design value concentration for 2005-2007 is 18.7 $\mu\text{g}/\text{m}^3$. MSA's with populations greater than 1,000,000 having a design value $\geq 85\%$ of the PM_{2.5} NAAQS are required to operate three PM_{2.5} sites. Although Jefferson County is only required to operate three PM_{2.5} monitoring sites, eight PM_{2.5} monitoring sites are actually operated. Two sites (the North Birmingham and Wylam sites) operate on a daily schedule. Five sites operate on an every third day schedule, while the Leeds site operates on an every sixth day schedule. North Birmingham is the only required collocated site for manual PM_{2.5}.

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, eight continuous PM_{2.5} monitors are actually operated in Jefferson County for the purpose of mapping and to support our EMPACT website.

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 newly designed portable Fourier Transform Infrared (FTIR) instrument was thought to be available for air toxics monitoring by the end of October, 2008. However, due to some unexpected delays, it will not be deployed until October, 2009.

The monitoring site location map can be found in the appendix.

JCDH AIR MONITORING NETWORK DESCRIPTION

(As of June 2009)

Ozone

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-6002	Jefferson	Tarrant Elem. School	33D34M25S	86D46M12S	3/24/80	High Pop. Exposure	Neighborhood	Continuously March-October
01-073-5002	Jefferson	Pinson Elem. School	33D42M10S	86D40M00S	7/21/80	High Conc.	Urban	Continuously March-October
01-073-1003	Jefferson	Fairfield	33D29M05S	86D54M30S	4/26/74	High Pop. Exposure	Neighborhood	Continuously March-October
01-073-1005	Jefferson	McAdory School	33D19M30S	87D00M06S	6/17/87	High Conc.	Urban	Continuously March-October
01-073-2006	Jefferson	Hoover	33D23M23S	86D48M00S	9/1/80	High Pop. Exposure	Neighborhood	Continuously March-October
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	9/1/80	High Pop. Exposure	Neighborhood	Continuously Year-round
01-073-5003	Jefferson	Corner High School	33D48M05S	86D56M33S	3/1/00	Typical Pop.	Urban	Continuously March-October
01-073-1009	Jefferson	Providence	33D27M30S	87D18M16S	3/1/00	Background	Urban	Continuously March-October
01-073-1010	Jefferson	Leeds	33D32M37S	86D32M55S	3/1/01	High Pop. Exposure	Neighborhood	Continuously March-October

Carbon Monoxide

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0028	Jefferson	East Thomas	33D33M25S	86D43M12S	3/1/81	High Pop. Exposure	Micro	Continuously Year-round
01-073-1003	Jefferson	Fairfield	33D29M05S	86D54M30S	12/11/74	High Pop. Exposure	Neighborhood	Continuously Year-round
01-073-6004	Jefferson	N. B'ham Sloss	33D33M04S	86D48M56S	9/25/96	High Conc.	Neighborhood	Continuously Year-round

Sulfur Dioxide

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-1003	Jefferson	Fairfield	33D29M05S	86D54M30S	12/11/74	High Pop. Exposure	Neighborhood	Continuously Year-round

Manual PM10 Hi-Vol

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-1010	Jefferson	Leeds Elem. School	33D32M37S	86D32M55S	4/1/87	Typical Pop.	Neighborhood	1/6 Days
01-073-6002	Jefferson	Tarrant Elem. School	33D34M25S	86D46M12S	12/10/86	High Pop. Exposure	Neighborhood	1/6 Days
01-073-0034	Jefferson	Northside School	E517.798	N3709.619	1/10/89	High Conc.	Neighborhood	1/6 Days
01-073-0034	Jefferson	Northside School	E517.798	N3709.619	1/10/89	Collocated Sampler	Neighborhood	1/6 Days
01-073-1003	Jefferson	Fairfield	33D29M05S	86D54M30S	7/1/94	High Pop. Exposure	Neighborhood	1/6 Days
01-073-1008	Jefferson	Dolomite	E503.300	N3701.600	8/10/92	Typical Pop.	Neighborhood	1/6 Days
01-073-0002	Jefferson	Bessemer	E504.150	N3695.159	12/11/87	Typical Pop.	Neighborhood	1/6 Days

Manual PM10 Lo-Vol for PMCourse Determination

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	1/1/03	High Conc.	Neighborhood	1/6 Days
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	1/1/03	Collocated Sampler	Neighborhood	1/6 Days
01-073-2003	Jefferson	Wylam	33D29M59S	86D55M27S	1/1/03	High Pop. Exposure	Neighborhood	1/6 Days
01-073-5002	Jefferson	Pinson High School	33D42M10S	86D40M00S	1/1/03	Typical Pop.	Urban	1/6 Days
01-073-2006	Jefferson	Hoover	33D23M23S	86D48M00S	1/1/03	High Pop. Exposure	Neighborhood	1/6 Days
01-073-1005	Jefferson	McAdory	33D19M30S	87D00M06S	1/1/03	Typical Pop.	Neighborhood	1/6 Days
01-073-5003	Jefferson	Corner High School	33D48M05S	86D56M33S	1/1/03	Typical Pop.	Urban	1/6 Days
01-073-1009	Jefferson	Providence	33D27M30S	87D18M16S	1/1/03	Background	Urban	1/6 Days
01-073-1010	Jefferson	Leeds	33D32M37S	86D32M55S	1/1/04	Typical Pop.	Neighborhood	1/6 Days

Manual PM10 Improve Monitor

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	4/21/04	High Conc.	Neighborhood	1/3 Days

Continuous PM10

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	1/27/93	High Conc.	Neighborhood	Continuously Year-round
01-073-2003	Jefferson	Wylam	33D29M59S	86D55M27S	10/8/93	High Conc.	Neighborhood	Continuously Year-round
01-073-6003*	Jefferson	Tarrant ABC Coke Plant	33D34M25S	86D46M12S	6/28/94	Point Source	Neighborhood	Continuously Year-round
01-073-6004	Jefferson	N. B'ham Sloss	33D33M04S	86D48M56S	1/24/96	Point Source	Neighborhood	Continuously Year-round

*Site 01-073-6003 to be shut down after December 31, 2010.

Manual PM2.5

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	1/1/99	High Conc.	Neighborhood	Daily
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	1/1/99	Collocated Sampler	Neighborhood	1/6 Days
01-073-2003	Jefferson	Wylam	33D29M59S	86D55M27S	1/1/99	High Pop. Exposure	Neighborhood	Daily
01-073-5002	Jefferson	Pinson High School	33D42M10S	86D40M00S	1/1/99	Typical Pop.	Urban	1/3 Days
01-073-2006	Jefferson	Hoover	33D23M23S	86D48M00S	1/1/99	High Pop. Exposure	Neighborhood	1/3 Days
01-073-1005	Jefferson	McAdory	33D19M30S	87D00M06S	1/1/99	Typical Pop.	Neighborhood	1/3 Days
01-073-5003	Jefferson	Corner High School	33D48M05S	86D56M33S	1/1/00	Typical Pop.	Urban	1/3 Days
01-073-1009	Jefferson	Providence	33D27M30S	87D18M16S	1/1/00	Background	Urban	1/3 Days
01-073-1010	Jefferson	Leeds	33D32M37S	86D32M55S	1/1/04	Typical Pop.	Neighborhood	1/6 Days

Continuous PM2.5

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	7/12/01	High Conc.	Neighborhood	Continuously Year-round
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	2/25/05	High Conc.	Neighborhood	Continuously Year-round
01-073-2003	Jefferson	Wylam	33D29M59S	86D55M27S	7/13/01	High Pop. Exposure	Neighborhood	Continuously Year-round
01-073-5002	Jefferson	Pinson High School	33D42M10S	86D40M00S	7/19/01	Typical Pop.	Urban	Continuously Year-round
01-073-2006	Jefferson	Hoover	33D23M23S	86D48M00S	7/25/01	High Pop. Exposure	Neighborhood	Continuously Year-round
01-073-1005	Jefferson	McAdory	33D19M30S	87D00M06S	7/16/01	Typical Pop.	Neighborhood	Continuously Year-round
01-073-5003	Jefferson	Corner High School	33D48M05S	86D56M33S	7/22/01	Typical Pop.	Urban	Continuously Year-round
01-073-1009	Jefferson	Providence	33D27M30S	87D18M16S	7/19/01	Background	Urban	Continuously Year-round
01-073-1010	Jefferson	Leeds	33D32M37S	86D32M55S	1/1/04	Typical Pop.	Neighborhood	Continuously Year-round

Manual PM2.5 STN Speciation Monitors

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	1/1/01	High Conc.	Neighborhood	1/3 Days
01-073-2003	Jefferson	Wylam	33D29M59S	86D55M27S	10/1/01	High Pop. Exposure	Neighborhood	1/6 Days

Manual PM2.5 Improve Speciation Monitor

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	4/21/04	High Conc.	Neighborhood	1/3 Days

RadNet Monitor

AQS No.	County	Site Name	Latitude	Longitude	Start Date	Objective	Scale	Frequency
01-073-0023	Jefferson	N. B'ham	33D33M04S	86D48M56S	4/19/07	High Conc.	Neighborhood	Continuously Year-round

HUNTSVILLE

Network Description

(As of May 2009)

Site ID	Pollutant(s) Monitored	Methodology	Operating Schedule	Monitoring Objective	Spatial Scale	MSA Represented	Site Type	Begin Sampling	End Sampling
01-089-0002	PM10*	SSI Hi – Vol	6 – Day	Population	Neighborhood	Huntsville	SLAMS	01/01/91	Active
01-089-0003	PM10	SSI Hi – Vol	Weekday	Population	Neighborhood	Huntsville	SPM	04/01/93	Active
01-089-0004	PM10*	SSI Hi – Vol	6 – Day	High Conc.	Middle	Huntsville	SLAMS	06/28/90	Active
01-089-0014	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	6 – Day	Speciation	Urban	Huntsville	SUPLMNTL SPECIATION	01/09/03	Active
	PM2.5	SSI Lo – Vol	Continuous	Population	Urban	Huntsville	SPM	10/09/03	Active
	Ozone*	UV Photometric	Continuous	Population	Neighborhood	Huntsville	SLAMS	01/01/75	Active

*Sites used for NAAQS comparison.

Site ID	Location	Geographical Coordinate	Three Closest Roads	Proposed Changes
01-089-0002	5006 Pulaski Pike Huntsville, AL 35810	Latitude +34°47'18.00" Longitude -86°36'58.00"	Pulaski Pike Stag Run Winchester Road	None Proposed
01-089-0003	Madison St. – Garage Huntsville, AL 35801	Latitude +34°43'43.46" Longitude -86°35'6.04"	Madison Street Gates Street Fountain Circle	None Proposed
01-089-0004	11525 S. Memorial Pkwy Huntsville, AL 35803	Latitude +34°37'13.00" Longitude -86°33'59.00"	South Memorial Parkway Redstone Road Hobbs Road	None Proposed
01-089-0014	Old Airport – Airport Rd. Huntsville, AL 35802	Latitude +34°41'15.61" Longitude -86°35'10.93"	Airport Road Memorial Parkway Leeman Ferry Road	None Proposed

Annual Network Plan

June 1, 2009

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 N-Core (multipollutant site). Huntsville was not selected for an N-Core site.

PAMS (Photochemical Assessment Monitoring Stations)

PAMS monitoring is required in areas classified as serious or above 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 342,376 based on the 2000 decennial U.S. census population. Huntsville's 3-year design value concentration for 2006-2008 is .078 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. Huntsville is required to operate one ozone monitoring site.

There are no minimum monitoring requirements for carbon monoxide (CO), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). Based on past monitoring and emissions inventory data, concentrations of these pollutants are very low. Therefore, monitoring for these pollutants is no longer performed. Lead monitoring (Pb) 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. Generally, sources emitting one ton or more of lead 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 PM₁₀ concentrations are less than 80 percent of the PM₁₀ NAAQS (National Ambient Air Quality Standards). Based on MSA's with populations between 250,000-500,000 and low concentrations (less than 80 percent of PM₁₀ NAAQS), Huntsville is required to operate between 0 and 1 site. Huntsville operates 3 PM₁₀ sites located south, central, and north within 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 PM₁₀ monitoring sites provide a monitoring presence at relatively low cost. Furthermore, the PM₁₀ 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 2005-2007 is 33 µg/m³. MSA's with populations of 50,000 to less than 500,000 having a design value ≥ 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 is required to operate one PM_{2.5} monitoring site. Note: Operating frequency increases to daily sampling when the design value is within ± 5 percent of the daily PM_{2.5} NAAQS (34, 35, and 36 ug/m³). Huntsville is required to operate on a 1 in 3 day schedule.

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.

<u>Site</u>	<u>Pollutant</u>	<u>Monitoring Objective</u>	<u>Current Spatial Scale Based on ADT* For nearest Streets</u>	<u>Scale Meets Objective Yes / No</u>
0002	PM ₁₀	Population	Neighborhood	Yes
0004	PM ₁₀	High Conc.	Middle	Yes
0014	PM ₁₀	Population	Urban	Yes
0014	PM _{2.5}	Population	Urban	Yes
0014	O ₃	Population	Neighborhood	Yes

Notes:

ADT = Average Daily Traffic

Site 0002	Monitor 30.5 m from Pulaski Pike	ADT 16,800	Probe Ht. 4.3 m
Site 0004	Monitor 30.5 m from Mem. Pkwy.	ADT 41,500	Probe Ht. 4.3 m
Site 0014	Monitors 91 m from Airport Road	ADT 16,100	Probe Ht of PM monitors – 4.3 m
	Monitors 548 m from Mem. Pkwy.	ADT 82,750**	Probe Ht of continuous monitor(s) 4.5 m

SPM (Special Purpose Monitors)

The special purpose PM₁₀ 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 required to operate one continuous PM_{2.5} monitor.

<u>Site</u>	<u>Pollutant</u>	<u>Monitoring Objective</u>	<u>Current Spatial Scale Based on ADT* For nearest Streets Neighborhood</u>	<u>Scale Meet Objective Yes / No</u>
0003 (AQI Reporting Site.)	PM ₁₀	Population	Neighborhood	Yes
0014	PM _{2.5}	Population	Urban	Yes

*Traffic count data as provided by the Engineering Department represents 2007-2008 data.

**ADT counts on Memorial Parkway immediately north and south of Airport Road averaged.

Network Review Findings

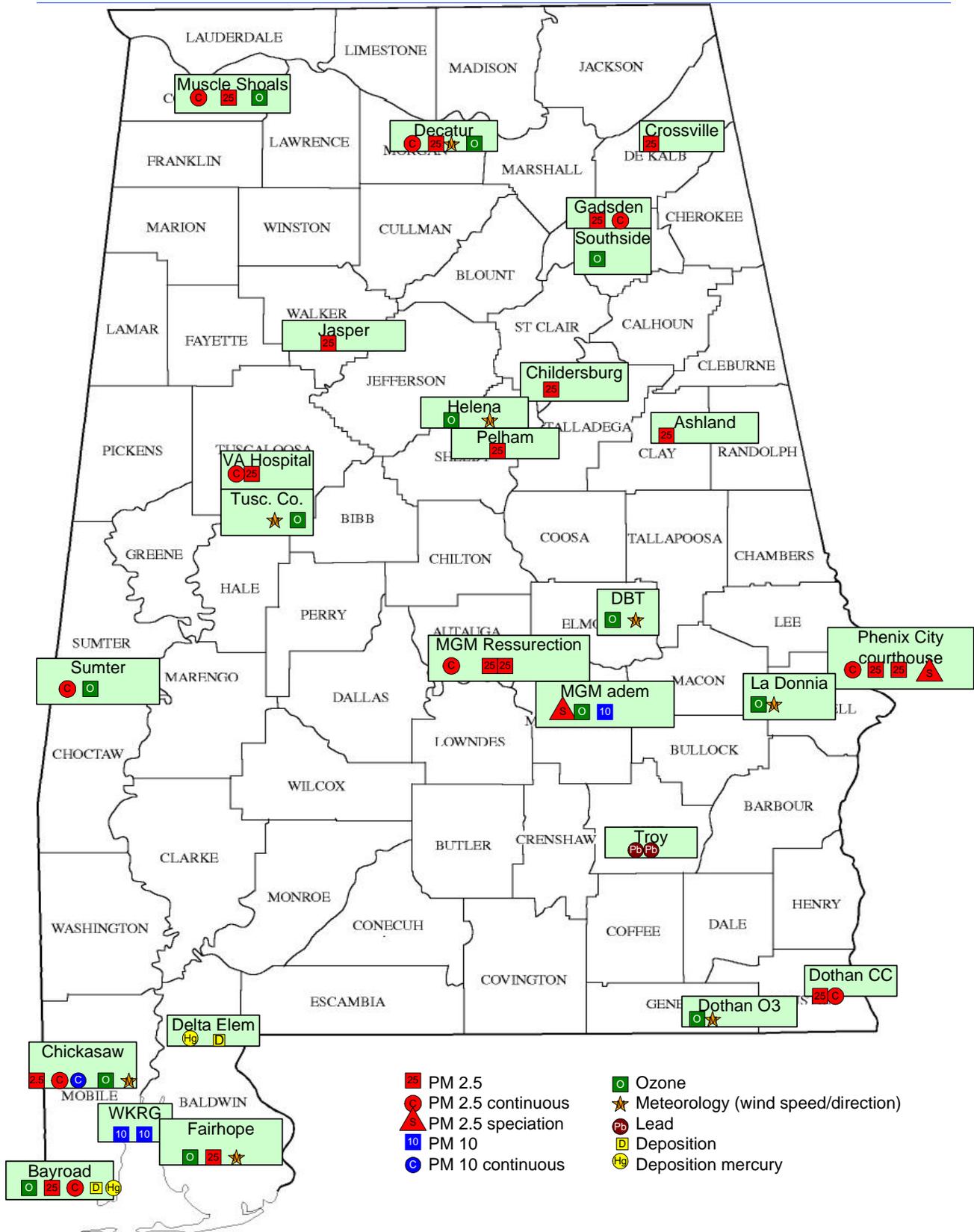
The existing network as summarized in the attached Air Monitoring Network Description complies with 40 CFR Part 58 requirements. The described network should adequately characterize typical population exposure concentrations and compliance status with the NAAQS for pollutants of concern.

A monitoring site location map may be found in the Appendix .

APPENDIX I

Maps

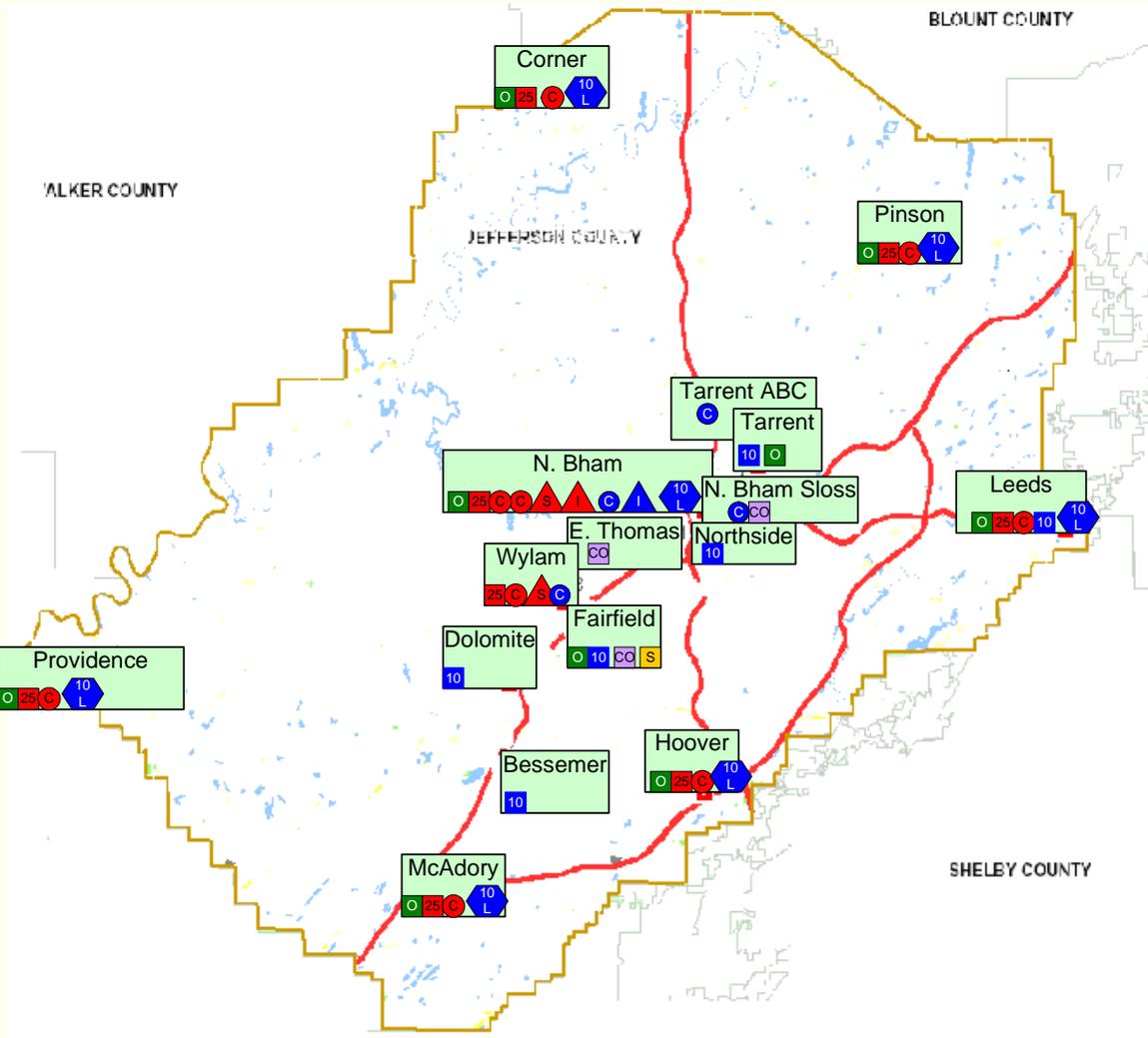
ADEM Monitoring Sites



- 25 PM 2.5
- PM 2.5 continuous
- ▲ PM 2.5 speciation
- 10 PM 10
- PM 10 continuous
- Ozone
- ★ Meteorology (wind speed/direction)
- Pb Lead
- Deposition
- Hg Deposition mercury

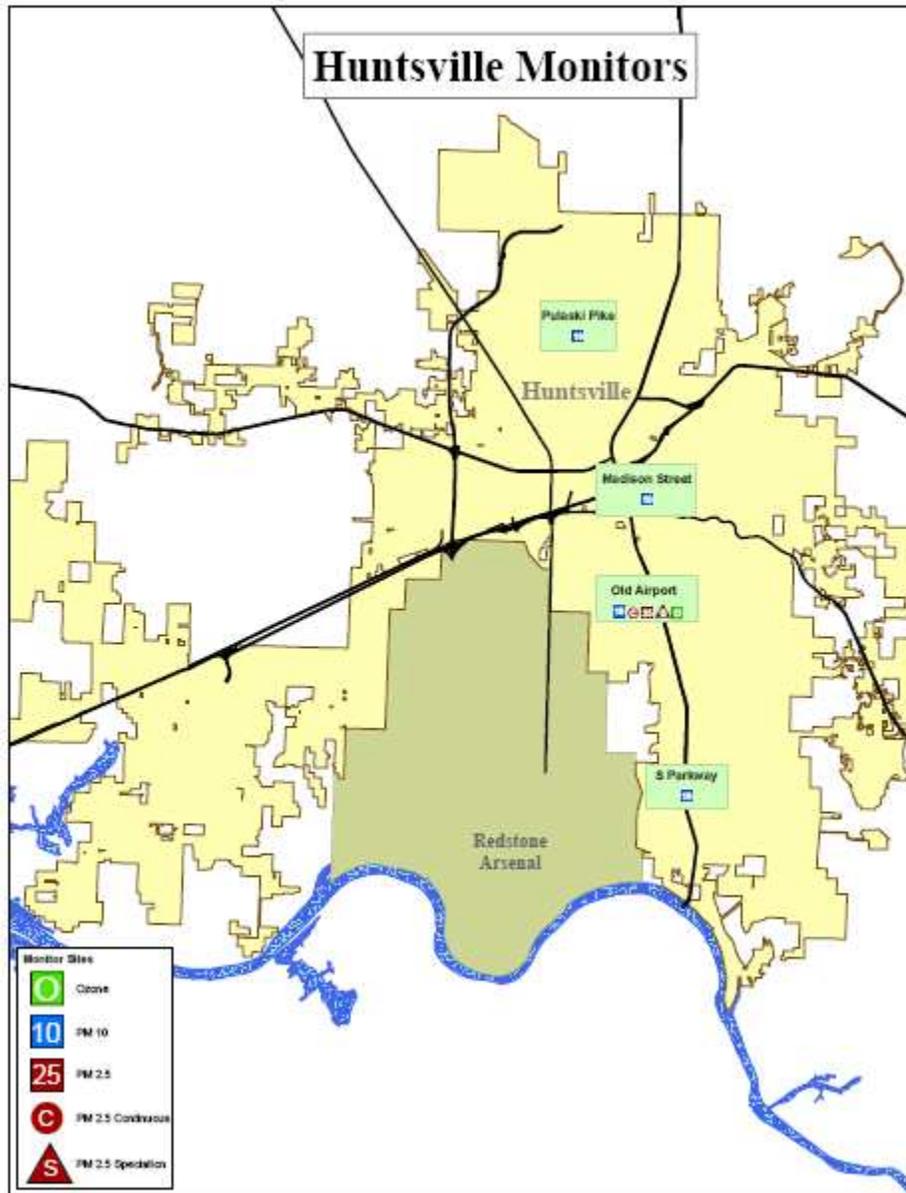
Jefferson County

Jefferson County Monitors



- | | |
|---------------------|------------------------------------|
| PM 2.5 | Ozone |
| PM 2.5 continuous | Meteorology (wind speed/direction) |
| PM 2.5 speciation | Lead |
| PM 10 | Deposition |
| PM 10 continuous | Deposition mercury |
| Improve speciation | Sulfur Dioxide |
| Low vol pm 10 | Carbon Monoxide |
| Improve pm 10 spec. | |

City of Huntsville



APPENDIX II

NCORE Network Plan

**Ambient Air Monitoring Network Plan
For The Proposed North Birmingham
National Core (NCore) Monitoring Site**

Jefferson County,
Alabama,
Birmingham-Hoover, AL CBSA
June 10, 2009

Jefferson County Department of Health (JCDH)
1400 Sixth Avenue South
Birmingham, Alabama 35233

National Core (NCore) Multi-pollutant Monitoring Stations:

In October 2006 the United States Environmental Protection Agency (EPA) issued final amendments to the ambient air monitoring regulations for criteria pollutants. These amendments are codified in 40 CFR parts 53 and 58. The purpose of the amendments was to enhance ambient air quality monitoring to better serve current and future air quality needs. One of the most significant changes in the regulations was the requirement to establish National Core (NCore) multi-pollutant monitoring stations. These stations will provide data on several pollutants at lower detection limits and replace the National Air Monitoring Station (NAMS) networks that have existed for several years. The final network plan must be submitted to EPA by July 1, 2009 and the stations must be operational by January 1, 2011.

The NCore Network addresses the following monitoring objectives:

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

Proposed changes to Ambient Air Monitoring Network to accommodate NCore sampling strategy:

- 1) Establish an NCore multi-pollutant monitoring station at the existing North Birmingham Supersite (010730023) at 3009 28th Street North. The location meets the objective for an urban NCore site and meets neighborhood scale criteria for PM_{2.5}, PM₁₀, Ozone, NO_y, CO, and SO₂.
- 2) Presently PM_{2.5}, PM_{2.5} Speciation, PM₁₀, PM_{10-2.5}, URG Carbon, IMPROVE Speciation, and Ozone are being sampled at the North Birmingham Supersite. PM_{2.5} has been measured by BGI PQ200 FRMs and FEMs daily since January 1, 1999. PM_{2.5} has also been measured by R&P TEOM continuously since July 2001. PM_{2.5} Speciation has also been measured by MetOne SASS every three days since January 2001. PM₁₀ has been measured by R&P TEOM FEM continuously since 1993. PM₁₀ Local Conditions (LC) and PM_{10-2.5} LC have been measured by BGI PQ200 FRMs

every six days since January 1, 2004. URG Carbon has been measured every three days since April 2007. Also, the IMPROVE Speciation has been measured every three days since April 2004 and Ozone has been measured continuously year-round since March 1, 2000.

Monitoring Objective:

Determine compliance with NAAQS; observe pollution trends for national data analysis, provide pollution levels for daily index reporting; and provide data for scientific studies.

Table 1 Monitors:

Monitor Type	Designation	Analysis Method	Frequency of Sampling
ARM Carbon Monoxide (CO)	NCORE	Automated Reference Method utilizing trace level non-dispersive infrared analysis.	Continuously
Total Reactive Nitrogen (NO _y)	NCORE	Automated trace level chemiluminescence analysis.	Continuously
ARM Ozone (O ₃)	NCORE/AQI	Automated Equivalent Method utilizing UV photometry analysis.	Continuously
ARM Sulfur Dioxide (SO ₂)	NCORE	Automated Equivalent Method utilizing trace level UV fluorescence analysis.	Continuously
FRM & FEM PM _{2.5}	NCORE	Manual Reference and Equivalent Methods utilizing gravimetric analysis.	Daily
PM _{2.5} Speciation	NCORE	Multi-species manual collection method utilizing thermal optical, ion chromatography, gravimetric, and X-ray fluorescence analyses.	1/3 days
FRM PM ₁₀	NCORE	Manual Reference Methods utilizing gravimetric analysis (at local conditions).	1/6 days
PM _{2.5} and PM ₁₀ Dichotomous TEOM	NCORE/AQI	Automated Equivalent Method utilizing Tapered Element Oscillating Microbalance/gravimetric analysis	Continuously
PM _{coarse}	NCORE	Manual Reference Method PM ₁₀ utilizing differential gravimetric analysis (at local conditions).	1/6 days
Lead	NCORE/Non-Source Oriented Lead Monitor	Manual Reference Method TSP or Manual Reference Method PM ₁₀	1/6 days
Radiation	RadNet	RadNet fixed station air monitor, manual and automated methods	Continuously + 2 weekly filters
IMPROVE	IMPROVE	Multi-species manual collection method	1/3 days

PM _{2.5} Speciation		utilizing thermal optical, ion chromatography, gravimetric, and X-ray fluorescence analyses.	
Meteorological	NCore	Air quality measurements approved instrumentation for wind speed, wind direction, humidity, barometric pressure temperature, rainfall, and solar radiation	Continuously

Quality Assurance Status:

All Quality Assurance procedures shall be implemented in accordance with 40 CFR 58, Appendix A. JCDH's Quality Assurance Project Plan covers PM_{2.5}, Ozone, NO_x, Speciation, and meteorological measurements. For the trace level instruments, a Quality Assurance Project Plan will be developed and submitted prior to use of the trace level instruments and SOPs will be developed for each new instrument used in the project.

Area of Representativeness:

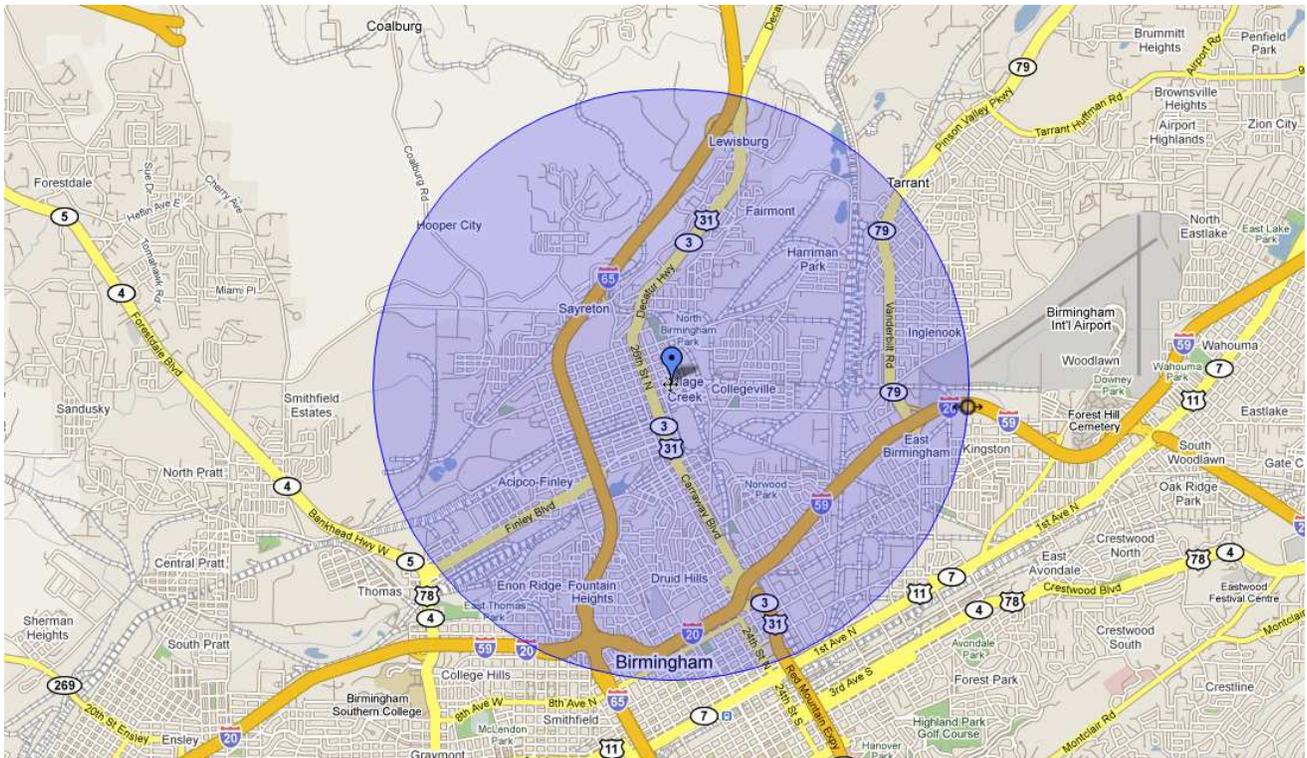
40 CFR Part 58 Appendix D provides design criteria for ambient air monitoring. The monitoring objective for the NCore site is to produce data that represents a fairly large area and therefore the spatial scale of the site is important. The spatial scale defines the physical dimensions of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar. It is determined by the characteristics of the area surrounding the air monitoring site and the site's distance from nearby air pollution sources such as roadways, factories, etc. In the case of urban NCore the spatial scales to be used are neighborhood and urban. Table 2 shows the area of representativeness for each pollutant for the North Birmingham Supersite.

Table 2: Spatial Scales for Each Pollutant

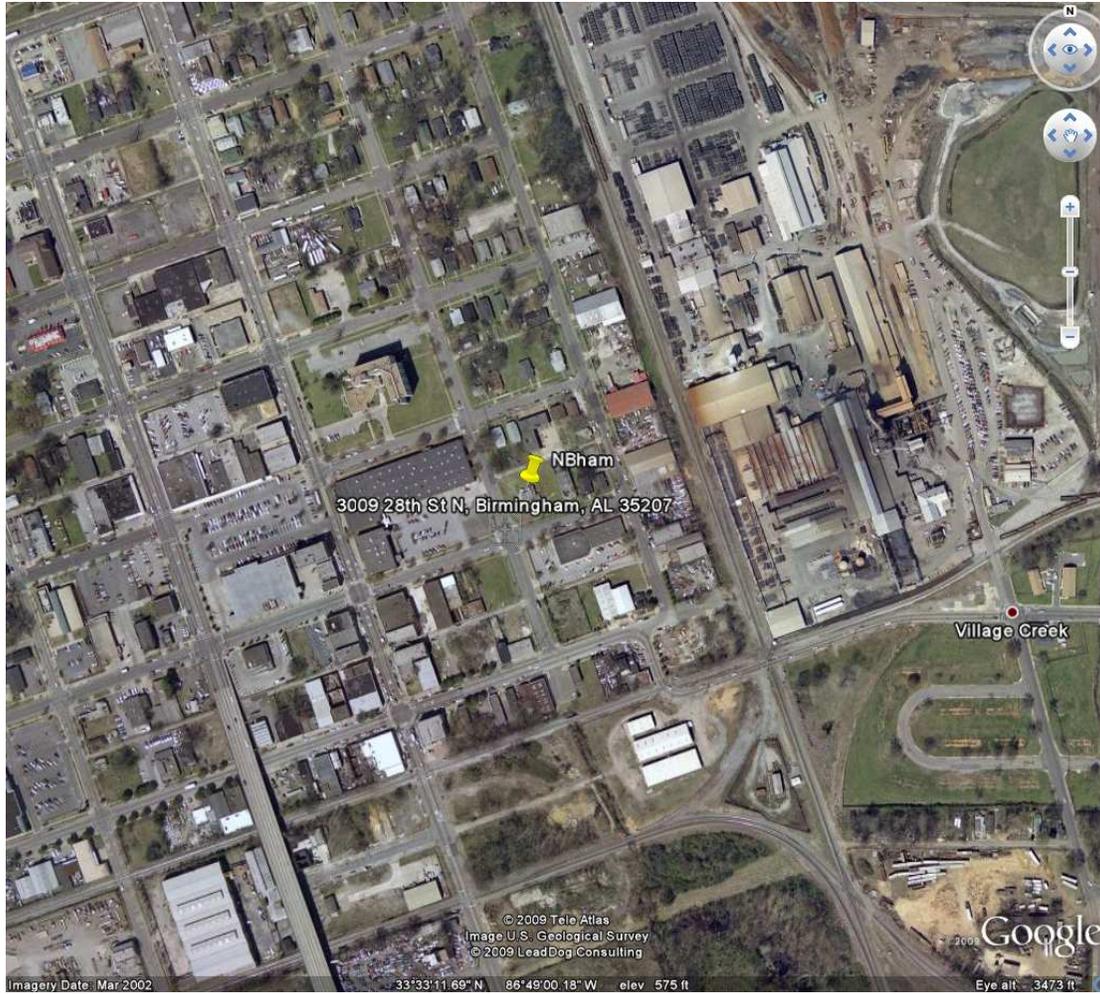
Pollutant	Spatial Scale	Comments
Ozone	Neighborhood Scale	
NO _y	Neighborhood Scale	
Carbon Monoxide	Neighborhood Scale	There is no Urban scale for CO
SO ₂	Neighborhood Scale	There is no Urban scale for SO ₂
PM ₁₀ /PM _{2.5} /Lead	Neighborhood Scale	

For neighborhood scale the area covered is up to a 4 km radius around the air monitoring site. This area is a mix of commercial, heavy industry, and residential. In other words it is representative of most areas in Birmingham. Approximately 20% of the total population for

Birmingham lives within a 4 km radius of the site. This scale also includes 10 schools, 5 parks, and 4 large shopping venues. See map below.



As can be seen from the view above, the proposed NCore site is located north of the urban core and in the center of the heavier industrialized areas of the metro area. The placement of the NCore site downwind of the more industrialized areas complements the existing network which is primarily designed to measure maximum concentration on a neighborhood scale.



The North Birmingham Supersite is located across the street from the Northern Health Center. The location is in the approximate center of Jefferson County and is approximately 4 km from the urban core of Metro Birmingham.

Site Description and Spacing:

Air Quality Control Region: Jefferson County, Alabama (073)

CBSA: Birmingham-Hoover, AL

Site Name: North Birmingham Supersite

AQS ID: 01-073-0023

Location: 3009 28th Street North

County: Jefferson

GPS Coordinates: 33.553042, -86.814878

Date Established: March 12, 1979

Site Approval Status: Pending

NCORE and PM_{2.5} SLAMS Siting Criteria

Appendix E to 40 CFR Part 58-*Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring* contains specific location criteria applicable to NCORE and SLAMS siting. The following measurements and data were obtained for evaluation of compliance with the criteria.

1. **Horizontal Placement of Sampling Probes:**

The gaseous instruments will be placed in a 12'w x 24' l x 8'h air monitoring shelter located next to the existing building and platform with the sample probe inlets being approximately 5 meters above the ground. A 10 meter "nested" meteorological tower will be placed next to the air monitoring shelter to allow for extension of the sampling inlet for the CO, SO₂, and NO_y monitor to reach up to 10 meters.

The manual particulate samplers will be placed on the wooden platform above the sampling shelter. The height of the inlets of the particulate samplers will be approximately 2 meters above the platform (5 meters above ground). The inlets for the continuous particulate samplers will be placed on the platform above the air monitoring shelter with the sample inlets approx. 2 meters above the platform (5 meters above ground). The control units will be located inside the temperature controlled shelter.

2. Spacing from Obstructions:

There are no significant obstructions near the site.

3. Spacing from Roadways:

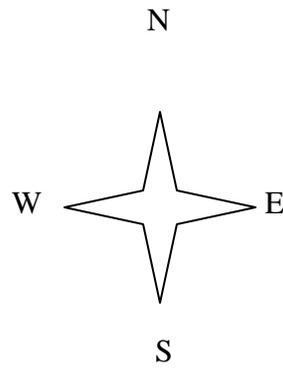
Tables E-1, E-2, and Figure E-1 of 40 CFR Part 58 Appendix E lists the minimum distances from roadways a monitoring probe needs to be based on the average daily traffic (ADT) counts. Table 3 summarizes the findings and includes the minimum separation distance from roadways for each pollutant. ADT counts were obtained from a traffic count map generated by the City of Birmingham Traffic Engineering Department.

Table 3 Spacing from Roadways Analysis

Roadway	ADT	Distance from site (meters)	Minimum Distance Required (meters)			
			Ozone Table E-1	NO/NO _y Table E-1	CO Table E-2	PM Figure E-1
28 th Street	<100	21	10	10	10	15
30 th Avenue	<100	30	10	10	10	15

4. Spacing from Major Sources:

The closest source to the site is the US Pipe and Foundry Plant. The plant produces iron pipe from scrap metal heated in a copula with a baghouse to collect emissions. For CY 2008, the average charged tons of materials per day was calculated to be approximately 1000-1200. The total particulate emission from the plant for 2008 was 28 tons.



Direction	Description	Distance from Site
North	Neighborhood Residences and Tree (which is no longer there)	44 meters
North East	Corner of Building and Neighborhood Residences	35 meters
East	One Story Building	31 meters
South East	Short Trees and Northern Health Center	60 meters
South	Short Trees and Northern Health Center Parking Lot	48 meters
South west	Building	105 meters
West	Tree and Commercial Parking Lot	30 meters
North West	Commercial Building	47 meters



Site Details:

The picture above was taken looking toward the East and shows the sampling platform which is 14'w x 26'l and 10'h. The sample inlets are approximately 5 meters above the ground. The platform supports the PM_{2.5} FRM, the PM₁₀ FRM, PM_{2.5} Speciation, URG Carbon, and the RadNet sampler. It also has room for a future hi-volume TSP lead sampler and the PEP audit equipment. Electrical service to the platform is 100 amps with 5 (20 amp GFCI) outlets strategically placed on the platform to provide power to the instruments.

The air monitoring shelter is located under the sampling platform. The shelter is 12' w x 24'l x 8' h. The platform above the shelter will support the sample inlets for the continuous particulate samplers and has additional room for other samplers if the need arises. The 10 meter meteorological tower will be next to the shelter and will be of the "nested" type to insure that the NO_y convertor is kept vertical and to ease servicing and calibration of the meteorological instruments. The shelter will be wired for 200 amp service and have internet and telephone connections. To maintain temperatures between

30-40 ° C the shelter will have two 18,000 BTU cooling/12,000 BTU heating window units. The shelter insulation is at a minimum R-18.
Long term use of the site should not be an issue since we have already been there for over thirty years.