

Annual Monitoring Plan



KNOX COUNTY

TENNESSEE

HEALTH DEPARTMENT

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1.0 Introduction

In 2007, the U.S Environmental Protection Agency (EPA) finalized amendments to the ambient air monitoring regulations. These amendments revised the technical requirements for certain types of monitoring site, programs and analyzers. Monitoring agencies are required to submit annual monitoring network plans. Knox County Air Quality is a local monitoring agency operating under a certificate of exemption from the State of Tennessee. The regulations from title 40, part 58, Section 10(1) of the Code of Federal Regulations state that: (40 CFR 58.10 (a)(1))

The state, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN, State speciation stations, SPM stations, and/or in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

This document is prepared and submitted to fulfill the requirements of the annual monitoring plan (AMP), as well as provide opportunity for the Knox County Department of Air Quality (Knox County Air Quality) to solicit, evaluate and respond to comments and input from the State of Tennessee Department of Environment and Conservation Division of Air Pollution Control (TDEC-APC) and the public regarding the network. This comprehensive review serves to evaluate whether the current monitoring strategies are meeting the needs of the County, to determine compliance with all current Federal, State, and Local regulations and to aid in the development of future strategies and decisions. It also serves to identify and report the needs for changes within the network and request approval for those changes from US EPA Regional Office.

1.1 Scope and Organization

Knox County Air Quality operates six locations where ambient air quality is routinely measured for air pollutants. The measured data provide the public with information on the status of the air quality. Health researchers, business interests, and others can use the data.

As required by the CFR, this document includes equipment, which have federal reference methods (FRM) or federal equivalent methods (FEM) designations. The terms FRM and FEM denote monitoring instruments that produce measurements of the ambient pollution concentrations that regulations allow to be compared to the national ambient air quality standards (NAAQS) for regulatory purposes. Also included is information regarding non-regulatory and non-criteria pollutant monitoring.

1.2 Description of Monitoring

The criteria pollutants consist of ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), lead (Pb) and particulate matter (PM). Knox County operates monitoring stations for ozone, particulate matter, and lead. Knox County operates an additional EPA monitoring program for the Chemical Speciation Network (CSN).

The ambient air monitoring network is designed by considering several criteria which meet the monitoring objectives. The primary monitoring objective are monitoring compliance with the NAAQS and providing data to the public regarding compliance in a timely manner. Logistics to be considered in design and continuation of a site include:

- Safety, security, and accessibility
- Cost of site, relocation, maintenance, e.g., fencing, roads, vegetation clearing
- Level footprint for shelter, platforms or concrete pads
- Availability of power and communications
- Meeting pollutant specific location objectives

- Funding
- Staffing
- Proximity to other monitors and statistical relevance of data

1.3 Climate and Topography

Knox County is located within the Great Valley of East Tennessee. It is paralleled with an elevated plateau to the west and the Great Smoky Mountains to the east. The valley, characterized by long, narrow ridges, flanked by broad valleys, contains slopes from 700 to 1,500 feet above sea level. The highest peak is 2,064 feet above sea level located in the northeast quadrant. This topography is relevant in monitoring plans due to the influence on inversion events. Additionally, topography can drive pollutant levels with considerations of contributors and recipients of transport pollutants.

Knox County temperatures fall within the humid subtropical climate zone. Temperature is variable due to elevation between valleys and peaks as well as the surrounding plateau and mountains. In the valley, summers are hot and humid, with the average high temperature in July of 88°F. East Tennessee averages cooler than Middle or West Tennessee. The average January low is 28 °F. The average annual precipitation is 57 inches consisting of 51 inches of rain and 6 inches of snow. Weather data gathered from the National Oceanic and Atmospheric Administration (NOAA).

The wind rose for the last five years indicates the winds continue to alternate between blowing from the southwest to blowing from the northeast. Figure 1.1 wind rose data was created with data from the automated surface observing system, utilizing tools provided by Iowa State University of Science and Technology. The wind rose uses the Knoxville McGhee Tyson Airport located in Blount County metrological data from January 1, 2018 through December 31, 2022.

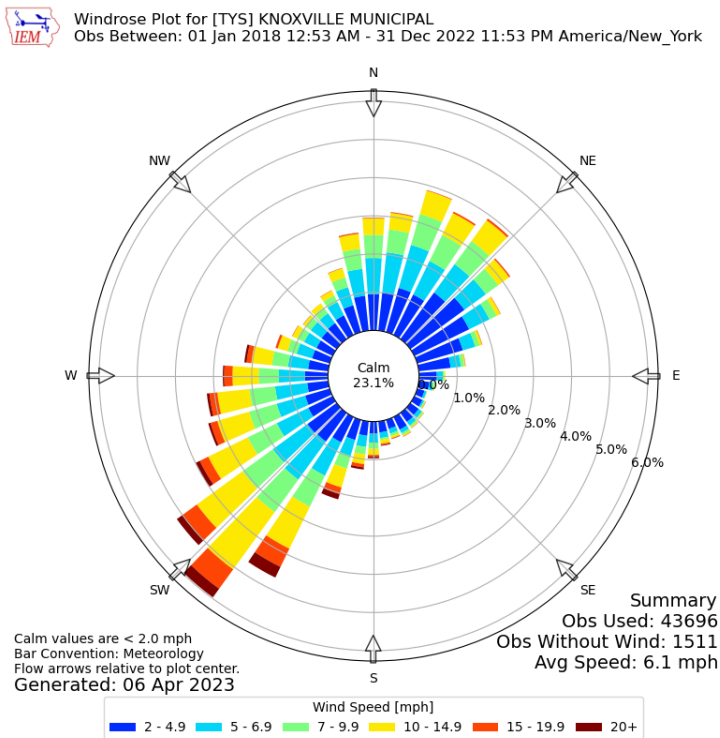


Figure 1.1 Wind Rose Knoxville

1.4 Population

The population for Knox County has been increasing, with a variable growth rate around 1.1% per year. Air monitoring network design considers two different population data metrics: The Core Based Statistical Area (CBSA) and the Metropolitan Statistical Area (MSA). The Knoxville CBSA and MSA, defined by the Office of

Management and Budget in the 2020 delineations, consists of Anderson, Blount, Campbell, Knox, Loudon, Morgan, Roane and Union Counties. Knox County Air Quality works in conjunction with the State of Tennessee for meeting the area monitoring objectives.

Table 1.2 below details the estimated population change over from the 2010 to 2020 census as well as population estimates from 2017-2021. The American Community Survey and the Population Estimate Program, both part of the US Census Bureau, perform population estimates.

Table 1.2 Population Estimates

Geographic Area	Census		Population Estimates (July 1)				
	2010	2020	2018	2019	2020	2021	2022
Anderson County	75,129	77,123	76,287	76,978	77,209	77,567	78,913
Blount County	123,010	135,280	131,331	133,088	135,566	137,649	139,958
Campbell County	40,716	39,272	39,795	39,842	39,277	39,409	39,584
Knox County	432,226	478,971	466,258	470,313	480,126	486,812	494,574
Loudon County	48,556	54,886	53,082	54,068	55,097	56,672	58,181
Morgan County	21,987	21,035	21,534	21,403	21,020	21,101	21,224
Roane County	54,181	53,404	53,258	53,382	53,513	54,056	55,082
Union County	19,109	19,802	19,689	19,972	19,820	19,996	20,452
Knoxville MSA/ CBSA Totals	814,914	879,781	861,234	869,046	881,628	893,262	907,968

1.5 Demographics and Environmental Justice

The department reviews the placement of sites and monitors as part of the 5-year network assessment required in 40 CFR 58.10(d). This review includes meeting the required network objectives as well as ensuring the fair treatment of all Knox County citizens. Knox County Air Quality incorporates the 5-year network assessment with the corresponding annual monitoring plan to ensure public participation through the notice, question, and response process. The next assessment will be included in the 2025 Monitoring and 5-Year Network Assessment Plan.

The USEPA defines environmental justices as:

“The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

Achievement of the environmental justice goal is reached when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work. Knox County Air Quality may utilize a variety of indicators which may include demographics (race, income level, age, etc.), environmental (PM_{2.5}, Traffic Proximity, etc.), and health outcomes (Asthma, Heart Disease, etc.). The next assessment will include the newest demographic information from the 2020 census which is still being processed at the census tract level at this time.

The USEPA Environmental Justice Strategy EJ2020 Action Agenda lists Air Quality as an area of concern. The goal of the agenda is to achieve air quality that meets the PM_{2.5} NAAQS standards in all areas of the country. Knox County is in attainment for the PM_{2.5} NAAQS.

2.0 Monitoring Network

The term ‘ambient air’ is defined in 40 CFR 50.1 as “that portion of the atmosphere, external to buildings, to which the general public has access.” Federal rules implemented by the USEPA require each state to establish a network of monitors to measure concentrations of criteria pollutants in ambient air based upon population, regional air quality, and regulatory concerns. There are 6 monitoring sites operated in Knox County that collect criteria pollutant data (see Table 2.1 and Figure 2.2).

Table 2.1 Station Identification

Station Name	Address	Latitude/Longitude	AQS ID	Criteria Pollutant
Air Lab	939 Stewart St	35.980756,-83.925802	47-093-1013	PM _{2.5} , PM ₁₀
Ameristeel	1526 New York Ave	35.98102,-83.9544	47-093-0023	Lead
East Knox	9315 Rutledge Pike	36.0855,-83.7649	47-093-0021	Ozone
Parton Place	1907 Tennessee Ave	35.9775,-83.95388889	47-093-0024	Lead
Rule	1613 Vermont Ave	35.97773,-83.9504	47-093-1017	PM _{2.5}
Springhill	4711 Mildred Dr.	36.01914,-83.8739	47-093-1020	PM _{2.5} , Ozone

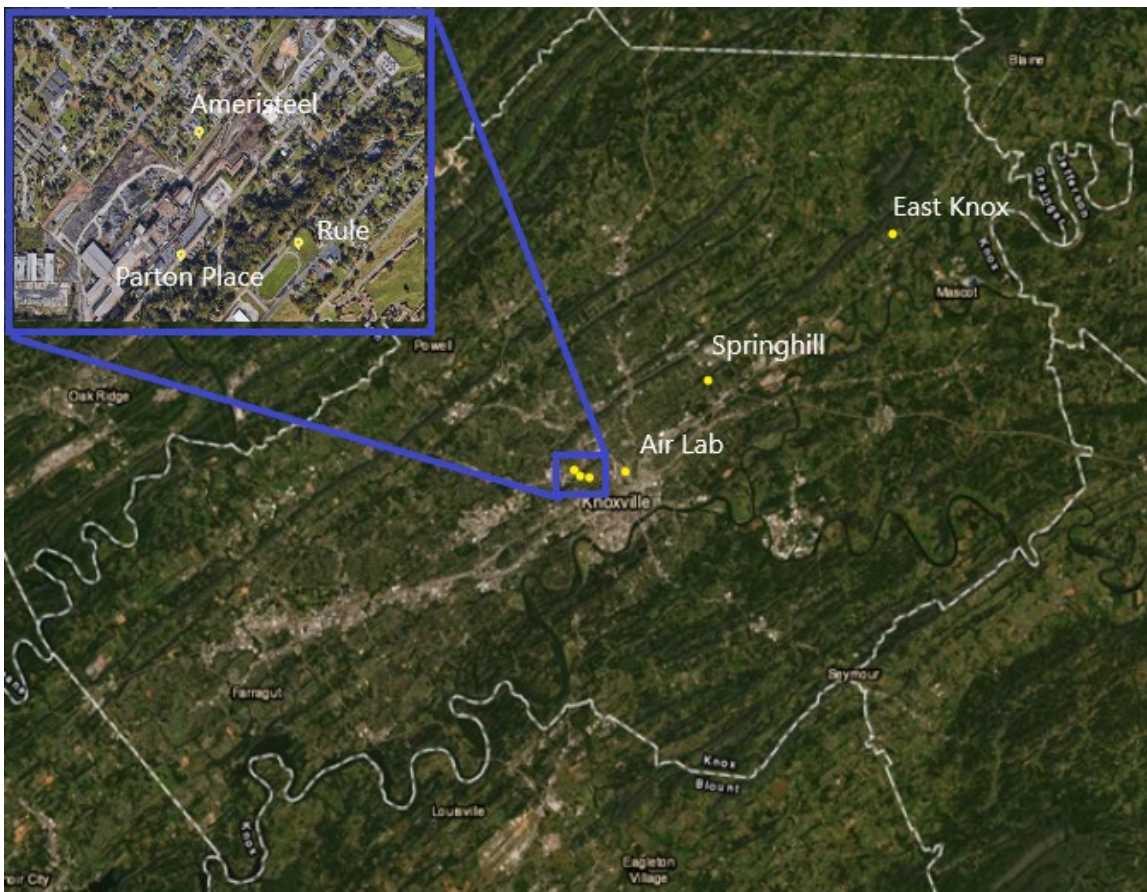


Figure 2.2 Satellite View of Monitoring Stations

2.1 Ozone (O₃) Monitoring

Ozone at ground level can trigger a variety of health effects, particularly in young children, the elderly, and those with existing health conditions. Ground level ozone is created by chemical reactions triggered by sunlight between oxides of nitrogen and volatile organic compounds. Ambient ground level ozone is sampled on a continuous basis from March – October at 2 sites in Knox County and referenced to the NAAQS ozone standard. The minimum number of ozone monitors required by 40 CFR Part 58, Appendix D is summarized in Table 2.3 below.

Table 2.3 Minimum O₃ Requirements ⁽¹⁾

Metropolitan Statistical Area (MSA) population ^(2,3)	Number of Monitors per MSA	
	Most recent 3 year design value ≥85% of NAAQS ⁽⁴⁾	Most Recent 3 year design value <85% of NAAQS ^(4,5)
>10 million	4	2
4-10 million	3	1
350,000- < 4 million	2	1
50,000-349,999 ⁽⁶⁾	1	0

- (1) From 40 CFR Part 58, Appendix D, Table D-2
- (2) Minimum monitoring requirements that apply to the MSA
- (3) Population based on latest available census figures
- (4) O₃ NAAQS levels are defined in 40 CFR Part 50
- (5) Minimum monitoring requirements apply in absence of a design value
- (6) MSA defined as urbanized area of 50,000 or more population.

According to the 2020 Census and the extrapolated US Census Bureau’s Population Estimate Program, the Knoxville MSA falls within the 350,000-<4million population category. Knox County operates ozone monitoring sites at Springhill Elementary (47-093-1020) and East Knox Elementary (47-093-0021).

Table 2.4 summarizes the Daily Max 8-hour O₃ values measured at the monitoring sites during the designated ozone season (March-October) of 2022. Both sites’ 3-year Design Value have dropped below 85% of the NAAQS.

Table 2.4 Ozone Concentrations 2022

Station	Concentrations			Design Value 2022	NAAQS	Is Design Value ≥ 85% of NAAQS
	Minimum	Maximum	Average			
East Knox	0.000	0.062	0.025	0.058	0.070	No
Springhill	0.000	0.062	0.025	0.057	0.070	No

The monitoring directives in 40 CFR Part 58, Appendix D, Section 5 contain specific requirements for the operation of Photochemical Assessment Monitoring Stations (PAMS) in areas classified as serious, severe, or extreme nonattainment for O₃. Knox County does not contain any O₃ nonattainment areas, therefore no PAMS monitoring is required in Knox County.

2.2 Carbon Monoxide (CO) Monitoring

Pursuant to 40 CFR Part 58, Appendix D, Section 4.2 the requirements for CO monitoring sites are closely related to the requirements for near-road NO₂ monitoring sites (see Section 2.3). Table 2.5 below summarizes the number of required CO monitoring sites. As documented in Section 1.4 of this document, the Knoxville CBSA does not meet the population criteria, therefore none are required. There are no CO monitors in Knox County Air Quality’s monitoring program.

Table 2.5 CO Monitoring Requirements

Criteria	Number of Near-Road CO Monitors Required
CBSA ≥ 1,000,000	One, collocated with an NO ₂ monitor or in an alternative location approved by the EPA

2.3 Nitrogen Dioxide (NO₂) Monitoring

Nitrogen dioxide (NO₂) is one of a group of highly reactive nitrogen oxides gasses. NO₂ are created during the combustion process and react at different rates in the atmosphere dependent on sunlight and temperature. They are a precursor to ground level ozone and a component of fine particle pollution.

The minimum number of NO₂ monitoring sites required by 40 CFR Part 58, Appendix D, Section 4.3 is summarized in Table 2.6.

Table 2.6 NO₂ Monitoring Requirements ⁽¹⁾

Requirement Type	Criteria	Minimum Monitors Required
Near road	CBSA Population ≥ 1,000,000	1
	CBSA Population ≥ 2.5 Million	2
	CBSA Population ≥ 1,000,000 and Road Segments with annual average daily traffic counts ≥ 250,000	2
Area- Wide	CBSA Population ≥ 1,000,000	1
Protection of Susceptible and Vulnerable Populations	Any area inside or outside CBSAs	As required by EPA Administrator ⁽²⁾

⁽¹⁾ From 40 CFR Part 58, Appendix D, Section 4.3

⁽²⁾ From 40 CFR Part 58, Appendix D, Section 4.3.4(b)

As documented in Section 1.4 of this document, the Knoxville CBSA does not meet the listed criteria. There are no NO₂ monitors in Knox County Air Quality’s monitoring program.

2.4 Sulfur Dioxide (SO₂) Monitoring

Sulfur dioxide and a group of other sulfur oxides, collectively known as SO_x, are emitted into the atmosphere from burning of fossil fuels by power plants, industrial facilities, locomotives, etc. Short-term exposure to SO_x compounds can harm the respiratory system. Children, the elderly and those with asthma or other breathing conditions are particularly sensitive to sulfur compounds.

The EPA criteria used to determine the numbers of required SO₂ monitors is based upon two metrics: The Core Based Statistical Area (CBSA), and the Population Weighted Emissions Index (PWEI). The emissions are based upon the most current emissions inventory calculations. The Knoxville CBSA PWEI can be calculated as follows:

$$\begin{aligned} \text{Knoxville CBSA 2021 census estimate: } & 907,968 \\ \text{2020 SO}_2 \text{ Emissions (tones per year): } & 1690.66 \\ \text{PWEI} = (907,968 * 1690.66) / 1,000,000 & = 1535.07 \end{aligned}$$

Table 2.7 SO₂ Monitoring Requirements ⁽¹⁾

PWEI	Number of SO ₂ Monitors Required
>1,000,000	3 monitors within the CBSA
100,000 – 1,000,000	2 monitors within the CBSA
5,000- 100,000	1 monitor withing the CBSA

⁽¹⁾ From 40 CFR Part 58, Appendix D, Section 4.4

As illustrated in Table 2.7 above, there are no monitors required for the Knoxville CBSA. The largest emission sources for SO₂ in the CBSA lays outside the county. There are no SO₂ monitors required or located within Knox County.

2.5 Lead (Pb) Monitoring

The lead monitoring design rule in 40 CFR Part 58, Appendix D, Section 4.5 requires monitoring agencies to establish monitoring near industrial facilities that emit more than 0.5 tons per year (tpy) of lead into the atmosphere, and at specified airports. None of the listed airports are located within Knox County, but one facility has historically reported annual lead emissions in excess of the 0.5 tpy emissions threshold. Knox County Air Quality operates 2 lead monitoring sites surrounding the plant which includes one collocated site. The Ameristeel site (47-093-0023) is the source-oriented site required by the rule and includes the QA

collocated monitor. This site was established to provide data at the fence line of the plant on the northeast corner. The second site is a special-purpose sampler, Parton Place (47-093-0024), that was approved in the 2021 Annual Monitoring Plan to review concentrations on the southeast side of the facility. Both sites were operated throughout 2022. Knox County Air Quality is requesting the designation of the Ameristeel site (47-093-0023) as the maximum concentration site and decommission the special-purpose sampler. This request is detailed in section 4.1 of the Plan.

2.6 Particulate Matter (PM₁₀) Monitoring

Particulate matter is a mixture of solid particles and liquid droplets found in the air such as dust, dirt, or soot. PM₁₀ are inhalable particle with diameters that are 10 micrometers and smaller. The minimum number of PM₁₀ monitoring sites required by 40 CFR Part 58, Appendix D, Section 4.6 is shown in Table 2.8.

Table 2.8 PM₁₀ Monitoring Requirements ⁽¹⁾

Population Category	Number of Monitors per MSA ⁽¹⁾		
	High Conc. ⁽²⁾	Medium conc. ⁽³⁾	Low conc. ⁽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⁾ From 40 CFR Part 58, Appendix D, Table D-4. Selection of urban areas and number of stations per MSA within ranges shown are jointly determined by EPA, TDEC, and Air Quality.

⁽²⁾ High concentration areas are those for which data exceeds the NAAQS by 20 % or more.

⁽³⁾ Medium concentration areas are those for which data exceeds 80% of the NAAQS.

⁽⁴⁾ Low concentration areas are those for which data is less than 80% of the NAAQS.

⁽⁵⁾ Low concentration requirements apply in the absence of a design value.

The Knoxville MSA is a low concentration 500,000-1,000,000 population category requiring 1-2 monitors. Air Quality operates one continuous monitor at the Air Lab site, the Teledyne API-T640x.

2.7 Fine Particulate Matter (PM_{2.5}) Monitoring

Fine particulate matter (PM_{2.5}) are inhalable particles with diameters that are generally 2.5 micrometers and smaller. These fine particles can be inhaled deep into the lungs and even into the blood stream. People with heart or lung diseases, children and older adults are most likely to be affected by particle pollution exposure.

The minimum number of PM_{2.5} monitoring sites required by 40 CFR Part 58, Appendix D, Section 4.7 is shown in Table 2.9. In addition to the minimum number of primary monitors required in the network, 40 CFR Part 58, Appendix A requires:

“For each distinct monitoring method designation (FRM or FEM) that a PQAQO is using for a primary monitor, the PQAQO must have 15 percent of the primary monitors of each method designation collocated (values of 0.5 and greater round up); and have at least one collocated quality control monitor (if the total number of monitors is less than three). The first collocated monitor must be a designated FRM monitor”

Table 2.9 PM_{2.5} Monitoring Requirements ⁽¹⁾

MSA Population ⁽²⁾	Number of Monitors per MSA	
	Most recent 3 year design value ≥ 85% of any PM _{2.5} NAAQS ⁽³⁾	Most recent 3-year design value < 85% of any PM _{2.5} NAAQS ⁽³⁾
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 - <500,000	1	0

⁽¹⁾ From 40 CFR Part 58, Appendix D, Table D-5.

⁽²⁾ Population based on latest available census figures.

⁽³⁾ Minimum monitoring requirements apply in absence of design value.

Table 2.10 provides the NAAQS standard and the 2022 design values by site. Based upon the MSA population data and the design values the Knoxville MSA is required to operate 2 primary and 2 collocated PM_{2.5} monitors. The collocation requirement is increased to collocate each method type. Knox County Air Quality operates 5 SLAMS monitors which include 3 primary monitors (all continuous method) and 2 collocated FRM monitors. All continuous monitors are also used for Air Quality Index (AQI) reporting.

Table 2.10 PM_{2.5} NAAQS Comparisons

Site	Design Values(µg/m ³)	
	24 hour	Annual
Air Lab	21	9.0
Rule	22	9.4
Springhill	20	8.6
NAAQS	25	12

Additionally, 40 CFR Part 58, Appendix D, Section 4.7.2 requires that agencies operate continuous analyzers in at least one-half of the required PM_{2.5} monitoring sites and at least one analyzer per MSA must be collocated with a sequential Federal Reference Method (FRM) monitor. All primary monitors in the network are continuous analyzers. The monitors at Rule and Air Lab are both collocated with a sequential FRM monitor.

2.8 Chemical Speciation

The PM_{2.5} monitoring criteria in 40 CFR Part 58, Appendix D, Section 4.7.4 requires that each state continue to conduct PM_{2.5} Chemical Speciation monitoring at locations designated to be part of the National Speciation Trends Network (STN). Air Quality operates one speciation site: Rule (47-093-1017). The samplers were located at Springhill Elementary previously. EPA region 4 was notified of the move November 19, 2022, with an effective date of Jan 1, 2023. The notification letter is attached in Appendix C.

2.9 National Core Monitoring

40 CFR Part 58, Appendix D, Section 3 requires that each state operate at least one NCore multi-pollutant monitoring site. By definition, each NCore site must include monitoring equipment to measure PM_{2.5}, PM_{10-2.5}, speciated PM_{2.5}, O₃, SO₂, CO, NO, NO_x, lead, and basic meteorology. Knox County is not a chosen NCore site within the State of Tennessee.

2.10 AQI Reporting

40 CFR 58.50 requires state or local agencies with individual MSAs with a population exceeding 350,000 to report the air quality index (AQI) daily. Knox County participates in AQI reporting with hourly reports to the AirNow database from all continuous monitors (O₃ and PM_{2.5}). This database provides real-time AQI data and, in conjunction with TDEC, is used for modeling future AQI.

3.0 Monitoring Sites

The following section shall detail the individual sites within the monitoring network, including location, equipment, pollutants monitored and most recent siting evaluation to ensure adherence to 40 CFR Part 58, Appendix E requirements. Satellite diagrams have a grey circle encapsulating the representative spatial scale.

3.1 Air Lab



Figure 3.1 Air Lab Site View



Figure 3.2 Air Lab Satellite Scale

Address	939 Stewart St, Knoxville 37917		<p>This site monitors particulate matter (PM₁₀ & PM_{2.5}) within the city limits of Knoxville in a mixed-use zoning area. This site is closer than 1 kilometer to interstates I-275, I-40, and I-75. Residential and commercial facilities surround it. The Teledyne T640X light scattering monitor is the primary monitor for PM_{2.5} and PM₁₀. It reports PM_{2.5} data to the Air Quality Index (AQI). The Thermo Partisol Plus 2025 is utilized as the quality assurance collocated federal reference method for PM_{2.5}.</p>
AQSID	470931013		
Latitude	35.980756		
Longitude	-83.925769		
Pollutant	PM 2.5	PM 2.5/ PM 10	
Parameter Code	88101	88101, 81102	
Monitor Type	SLAMS	SLAMS	
POC	1	3,4	
Interval	24-Hour	24-Hour	
Collection Frequency	1:06	Hourly	
Method	145	238,239	
FRM/FEM Monitoring Instrument	Thermo Partisol Plus 2025	Teledyne T640X	
Analysis	Gravimetric	Light Scattering	
Ref Method ID	RFPS-0498-118	EQPM-0516-238 EQPM-0516-239	
Monitor Objective Type	QA Collocation	Population Exposure	
Dominant Source	Mobile		
Measurement Scale	Middle Scale		
Land Use Type	Mobile		
Location Setting	Urban and City Center		
Date Established	20070201	20171001	



Siting Evaluation Form

Site Name: Air Lab
 AQSNo: 47-093-1013
 Coordinate 35.980756, -83.925802

Date: 3/15/2023
 Site Address: 939 Stewart St
 Inspected by: Rebecca Larocque

Pollutant	Scale	Probe Height ¹	Flow (hi or Low)	Separation from samplers ¹	Pass/Fail	Distance to Road ¹	Pass/Fail
PM _{2.5} FRM	Middle	4.6	Low	1.7	Pass	15.3	Pass
PM _{2.5/10} Continuous	Middle	4.9	Low			15.8	Pass

Obstruction type ²	Obst. Height ¹	Obst. Distance ^{1,2}	Pass/Fail	Tree	
				Dripline ¹	Pass/ Fail
Closest Tree e	12.2	24.4	Pass	16.4	Pass

¹ All Measurements in meters
² Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume
 Obstruction Distance must be $\geq 2 \times$ (Obst height - probe height)
 Tree Dripline must be >10 m away, prefer >20 m
 Horizontal and vertical distance on rooftop 1m for O₃ gases - 2m for all others
 Unrestricted air flow must be $\geq 270^\circ$

Site Drawing

Estimated Degree of Unrestricted Air Flow: 360°

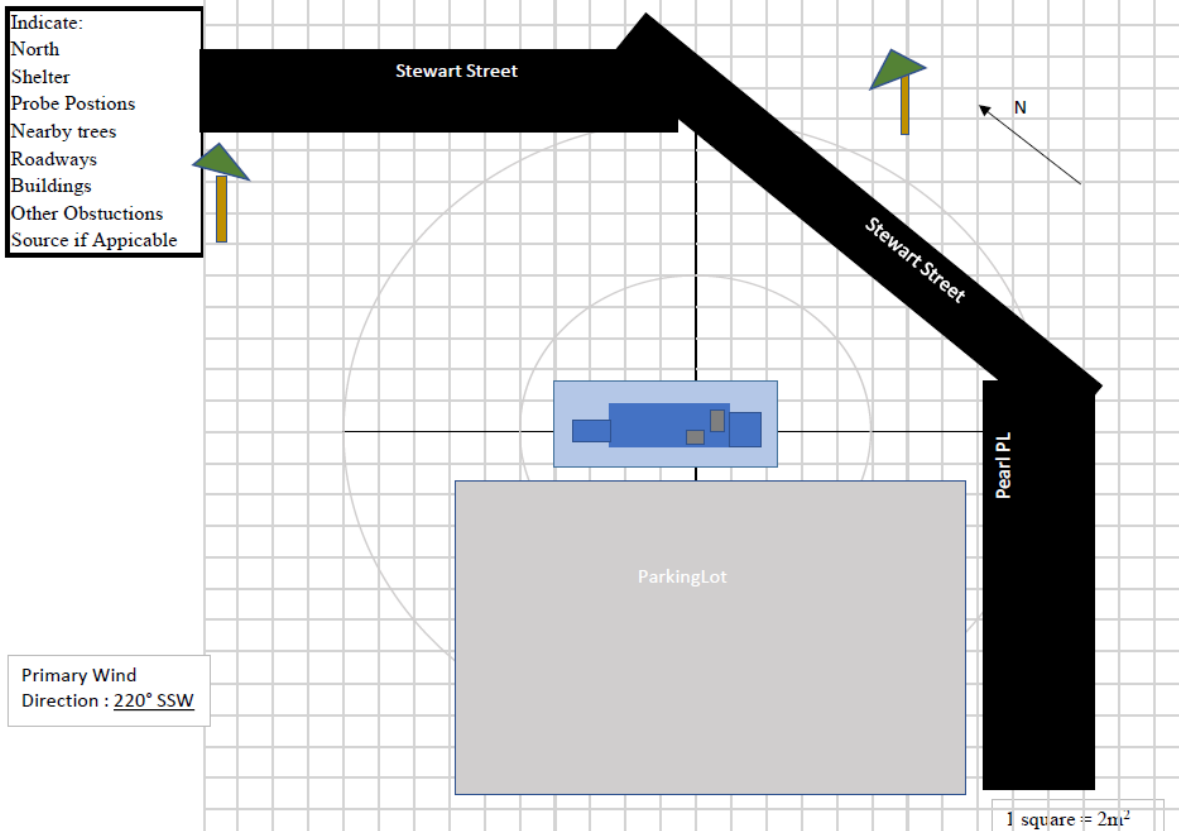


Figure 3.3 Air Lab Site Evaluation

Photos facing out from monitor to cardinal direction

North



South



East



West



Photos from cardinal direction facing in towards monitor

North



South



East



West



Figure 3.4 Air Lab Site Photos

3.2 Ameristeel



Figure 3.5 Ameristeel Site View



Figure 3.6 Ameristeel Satellite Scale

Address	1526 New York Ave, Knoxville 37921		<p>This is a lead only site established as a source-oriented site to fulfill the requirements in 40 CFR Part 58, Appendix D, Section 4.5. It is located in the urban core, downwind of the source. This site was lowered in March 2021 and space added for collocation. This is the maximum concentration site for this pollutant.</p>
AQSID	470930023		
Latitude	35.981040		
Longitude	-83.954311		
Pollutant	Lead	Lead	
Parameter Code	14129	14129	
Monitor Type	SLAMS	SLAMS	
POC	1	2	
Interval	24-Hour	24-Hour	
Collection Frequency	1:06	1:06	
Method	193	193	
FRM/FEM Monitoring Instrument	Hi-Vol Pb-TSP	Hi- Vol Pb-TSP	
Analysis	ICP-Mass Spectroscopy	ICP- Mass Spectroscopy	
Ref Method ID	RFLA-0813-0813	RFLA-0813-0813	
Monitor Objective Type	Source Oriented	QA Collocation	
Dominant Source	Point		
Measurement Scale	Microscale		
Land Use Type	Industrial		
Location Setting	Urban and City Center		
Date Established	20110101	20211101	



Siting Evaluation Form

Site Name: Ameristeel
 AQSNo: 47-093-0023
 Coordinates: 35.98102, -83.9544

Date: 3/15/2023
 Site Address: 1526 New York Ave
 Inspected by: Rebecca Larocque

Pollutant	Scale	Probe Height ¹	Flow (hi or Low)	Separation from samplers ¹	Pass/Fail	Distance to Road ¹	Pass/Fail
Lead	Microscale	2.7	Hi	4.2	Pass	12.8	Pass
Lead Collocate	Microscale	2.7					

Obstruction type ²	Obst. Height ¹	Obst. Distance ^{1,2}	Pass/Fail	Tree	
				Dripline ¹	Pass/ Fail
Small apple trees NNE	3.6	12.2	Pass	10.0	Pass

¹ All Measurements in meters
² Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume
 Obstruction Distance must be $\geq 2 * (\text{Obst height} - \text{probe height})$
 Tree Dripline must be >10 m away, prefer >20 m
 Horizontal and vertical distance on rooftop 1m for O₃ gases - 2m for all others
 Unrestricted air flow must be $\geq 270^\circ$

Site Drawing

Estimated Degree of Unrestricted Air Flow: 360°

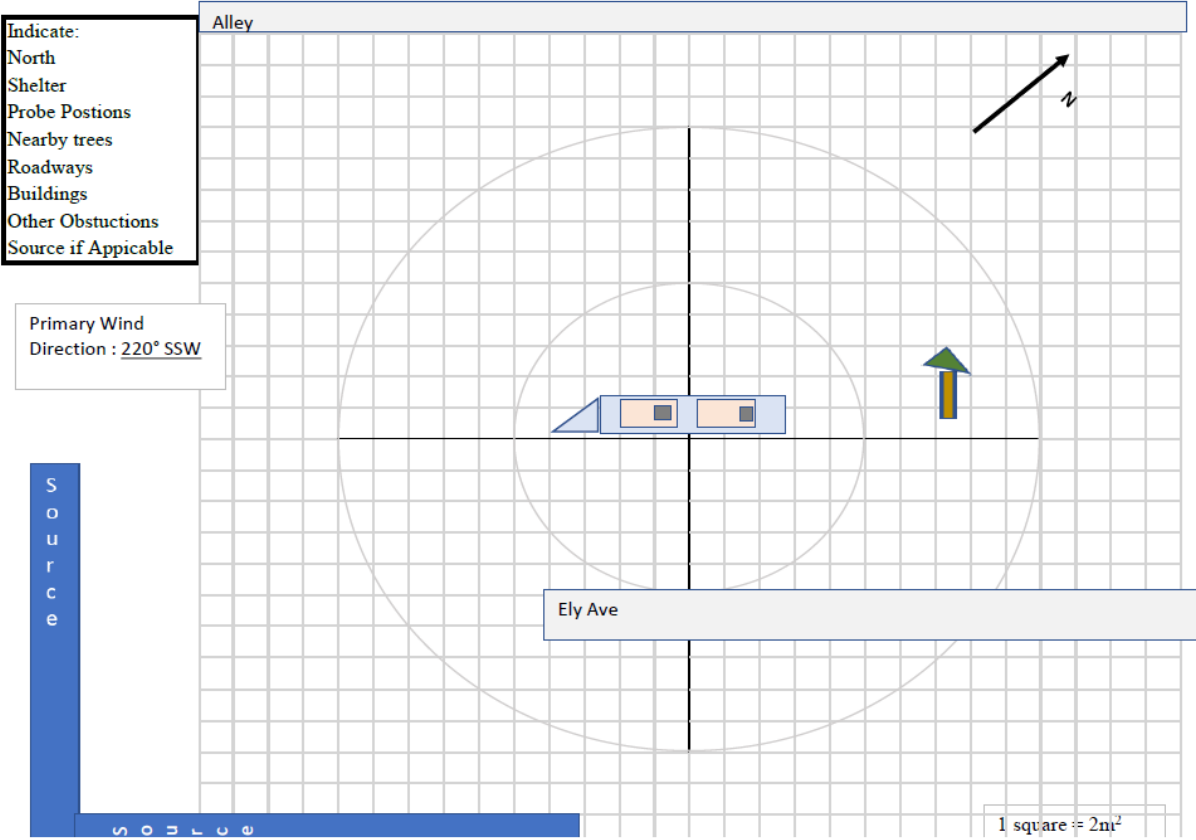


Figure 3.7 Ameristeel Site Evaluation

Photos facing out from monitor to cardinal direction

North



South



East



West



Photos from cardinal direction facing in towards monitor

North



South



East



West



Figure 3.8 Ameristeel Site Photos

3.3 East Knox



Figure 3.9 East Knox Site View

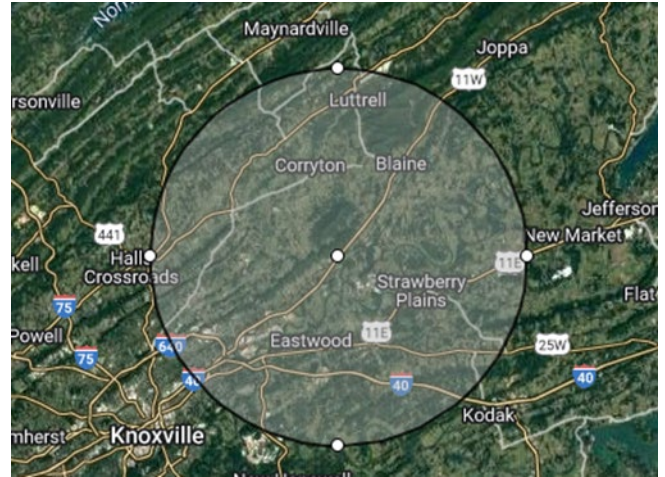


Figure 3.10 East Knox Satellite Scale

Address	9315 Rutledge Pike, Mascot, 37806	<p>This site is located in east Knox County and currently monitors for ozone. The site was initially established in 1981. It is located downwind from the core Knoxville MSA area. The urban scale represented in figure 3.10 above is 15KM radius. This site serves in assessing the highest concentration of ozone in the Knoxville area and used in the AQI forecasting program.</p>
AQSID	470930021	
Latitude	36.085508	
Longitude	-83.764806	
Pollutant	Ozone	
Parameter Code	44201	
Monitor Type	SLAMS	
POC	1	
Interval	24 hour continuous	
Collection Frequency	Minute & hourly	
Method	087	
FRM/FEM Monitoring Instrument	Teledyne 400E	
Analysis	Ultraviolet	
Ref Method ID	EQOA-0992-087	
Monitor Objective Type	Highest Concentration	
Dominant Source	N/A	
Measurement Scale	Urban	
Land Use Type	Agricultural	
Location Setting	Rural	
Date Established	19810601	



Siting Evaluation Form

Site Name: East Knox
 AQSNo: 47-093-0021
 Coordinate 36.0855,-83.7649

Date: 3/15/2023
 Site Address: 9315 Rutledge Pike
 Inspected by: Rebecca Larocque

Pollutant	Scale	Probe Height ¹	Flow (hi or Low)	Separation from samplers ¹	Pass/Fail	Distance to Road ¹	Pass/Fail
Ozone	Urban	3.96	Low	n/a		180	Pass

Obstruction type ²	Obst. Height ¹	Obst. Distance ^{1,2}	Pass/Fail	Tree	
				Dripline ¹	Pass/Fail
Pine West	19.4	33	Pass	>20	Pass
Tallest Pine WSW	18.6	31	Pass	>20	Pass
Mimosa trees	7.8	13.2	Pass	11.2	Pass

This site should be monitored for tree growth carefully, keep smaller brush maintained

¹ All Measurements in meters

² Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume
 Obstruction Distance must be $\geq 2 * (\text{Obst height} - \text{probe height})$
 Tree Dripline must be >10 m away, prefer >20m
 Horizontal and vertical distance on rooftop 1m for O₃ gases - 2m for all others
 Unrestricted air flow must be $\geq 270^\circ$

Site Drawing

Estimated Degree of Unrestricted Air Flow:

360

- Indicate:
- North
- Shelter
- Probe Postions
- Nearby trees
- Roadways
- Buildings
- Other Obstructions
- Source if Applicable

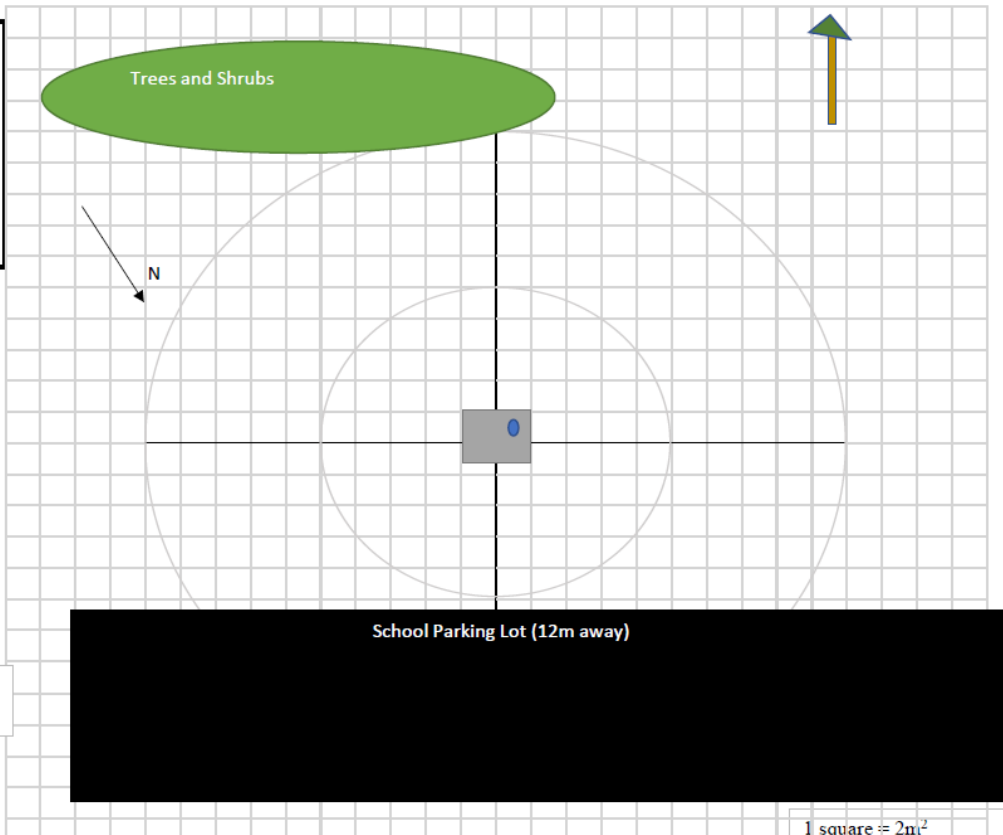


Figure 3.11 East Knox Site Evaluation

Photos facing out from monitor to cardinal direction

North



South



East



West



Photos from cardinal direction facing in towards monitor

North



South



East



West



Figure 3.12 East Knox Site Photos

3.4 Parton Place



Figure 3.13 Parton Place Site View



Figure 3.14 Parton Place Satellite Scale

Address	1904 Tennessee Ave, Knoxville, 37921	<p>This site was established as a special purpose monitor for a minimum of 1 year to review the emissions from the CMC Steel Plant on the Southwest side of the property. It was approved in the 2021 Air Monitoring Plan and established in November 2021. The property is 25 feet wide and 144 feet long. This site has 2 approved waivers as required by 40 CFR Part 58, Appendix E. See section 4.3 of this document and Appendix B for additional information.</p> <p>This site is requested for removal see section 4.1 for additional information on this request.</p>
AQSID	470930024	
Latitude	35.977749	
Longitude	-83.954933	
Pollutant	Lead	
Parameter Code	14129	
Monitor Type	SPM	
POC	1	
Interval	24-hour average	
Collection Frequency	1:06	
Method	193	
FRM/FEM Monitoring Instrument	High Volume Pb-TSP	
Analysis	ICP – Mass Spectroscopy	
Ref Method ID	RFLA-0813-813	
Monitor Objective Type	Source Oriented	
Dominant Source	Point	
Measurement Scale	Microscale	
Land Use Type	Industrial	
Location Setting	Urban and City Center	
Date Established	20211101	



Siting Evaluation Form

Site Name: Parton Place
 AQSNo: 47-093-0024
 Coordinate 35° 58' 39 N°, 83° 57' 14" W

Date: 3/15/2023
 Site Address: 1907 Tennessee Ave, 37921
 Inspected by: Rebecca Larocque

Pollutant	Scale	Probe Height ¹	Flow (hi or Low)	Separation from samplers ¹	Pass/Fail	Distance to Road ¹	Pass/Fail
Lead	Micro	2.1M	Hi	n/a	n/a	5.8M	Pass

Obstruction type ²	Obst. Height ¹	Obst. Distance ^{1,2}	Pass/Fail	Tree	
				Dripline ¹	Pass/ Fail
House	3.1M	3.9 M	Pass		
Tree	10.8M	7.4M		6.1M	

¹ All Measurements in meters
² Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume
 Obstruction Distance must be $\geq 2 * (\text{Obst height} - \text{probe height})$
 Tree Dripline must be >10 m away, prefer >20m
 Horizontal and vertical distance on rooftop 1m for O₃ gases - 2m for all others
 Unrestricted air flow must be > 270 °

Site Drawing

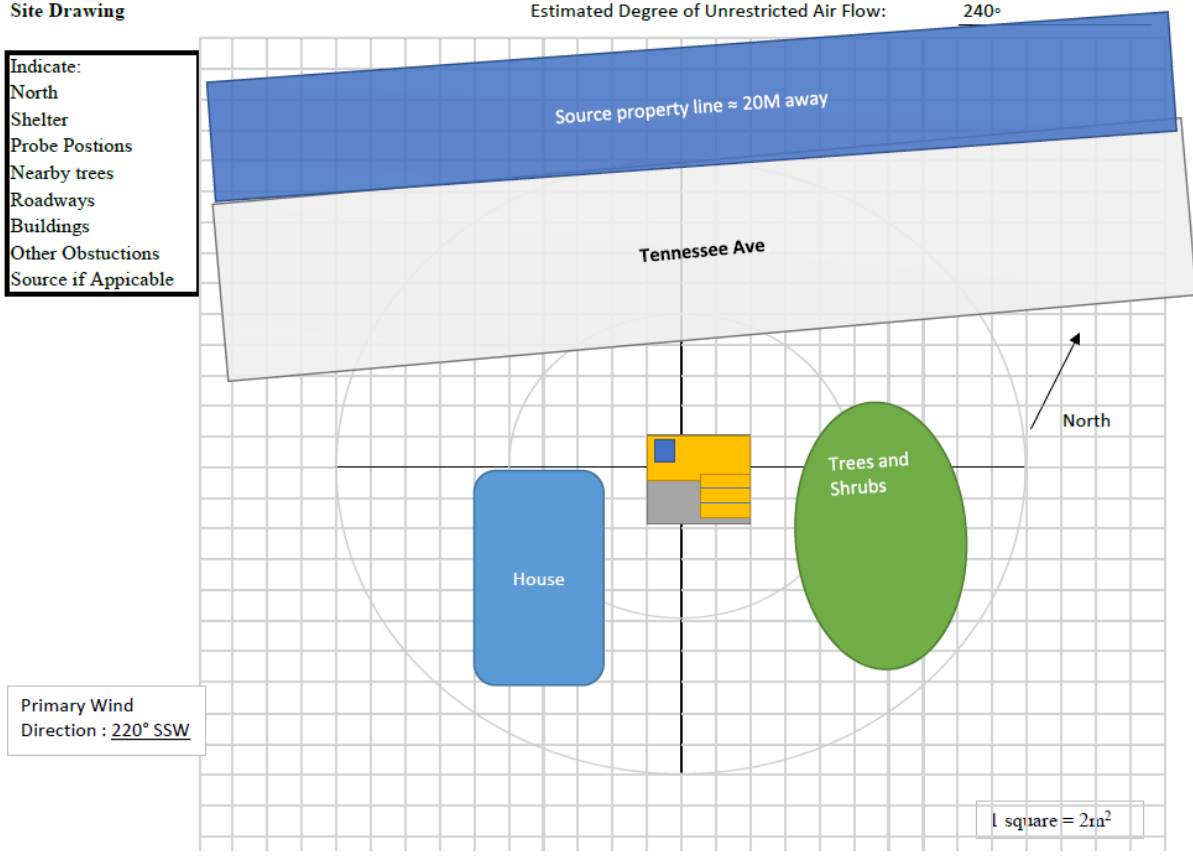


Figure 3.15 Parton Place Site Evaluation

Photos facing out from monitor to cardinal direction

North



South



East



West



Photos from cardinal direction facing in towards monitor

North



South



East



West



Figure 3.16 Parton Place Site Photos

3.5 Rule



Figure 3.17 Rule Site View



Figure 3.18 Rule Satellite Scale

Address	1613 Vermont Ave, Knoxville 37921				The Rule site serves as a population exposure site for PM _{2.5} and a QA collocated site. Starting Jan 1, 2023, it is the location of the Chemical Speciation samplers. It is located in a residential area that is less than .5 kilometers southeast of several industries. Additionally, the scale of the site includes 3 identified environmental justice communities: Lonsdale, Beaumont, and Mechanicsville.
AQSID	470931017				
Latitude	35.948074				
Longitude	-83.950666				
Pollutant	PM _{2.5}	PM _{2.5}	PM _{2.5} Speciated		
Parameter Code	88101	88101	88502	88502	
Monitor Type	SLAMS	SLAMS	CSN supplemental	CSN supplemental	
POC	1	3	5	5	
Interval	24-Hour	24-Hour - continuous	24 - Hr Average		
Collection Frequency	1:6	Hourly	1:06	1:06	
Method	145	236	898	838	
FRM/FEM Monitoring Instrument	Thermo Partisol 2025i	Teledyne T640	Met One Super Sass	URG 3000	
Analysis	Gravimetric	Light Scattering	Gravimetric	Gravimetric	
Ref Method ID	RFPS-0498-118	EQPM-0516-236	n/a		
Monitor Objective Type	QA Collocation	Population Exposure			
Dominant Source	Mobile				
Measurement Scale	Neighborhood				
Land Use Type	Residential				
Location Setting	Urban and City Center				
Date Established	20020101	20201101	20020619	20020619	



Siting Evaluation Form

Site Name: Rule
 AQSNo: 47-093-1017
 Coordinate 35.97773, -83.9504

Date: 3/15/2023
 Site Address: 1613 Vermont Ave
 Inspected by: Rebecca Larocque

Pollutant	Scale	Probe Height ¹	Flow (hi or Low)	Separation from samplers ¹	Pass/Fail	Distance to Road ¹	Pass/Fail
PM _{2.5}	Neighborhood	2.2	Low	2.5	Pass	>42M	Pass
PM _{2.5} continuous	Neighborhood	2.43	Low	2.1	Pass	> 42 M	Pass
URG Speciation	Neighborhood	2.2	Low	2.1	Pass	> 42 M	Pass
SASS speciation	Neighborhood	2	Low	2.5	Pass	> 42 M	Pass

Obstruction type ²	Obst. Height ¹	Obst. Distance ^{1,2}	Pass/Fail	Tree	
				Dripline ¹	Pass/ Fail
Water Tower	23.4M	65.2M	Pass		
Tallest tree W	9.2M	32M	Pass	>20M	Pass

¹ All Measurements in meters

² Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume
 Obstruction Distance must be $\geq 2 \times$ (Obst height - probe height)
 Tree Dripline must be >10 m away, prefer >20m
 Horizontal and vertical distance on rooftop 1m for O₃/gases - 2m for all others

Site Drawing

Estimated Degree of Unrestricted Air Flow: 360°

- Indicate:
- North
- Shelter
- Probe Postions
- Nearby trees
- Roadways
- Buildings
- Other Obstructions
- Source if Applicable

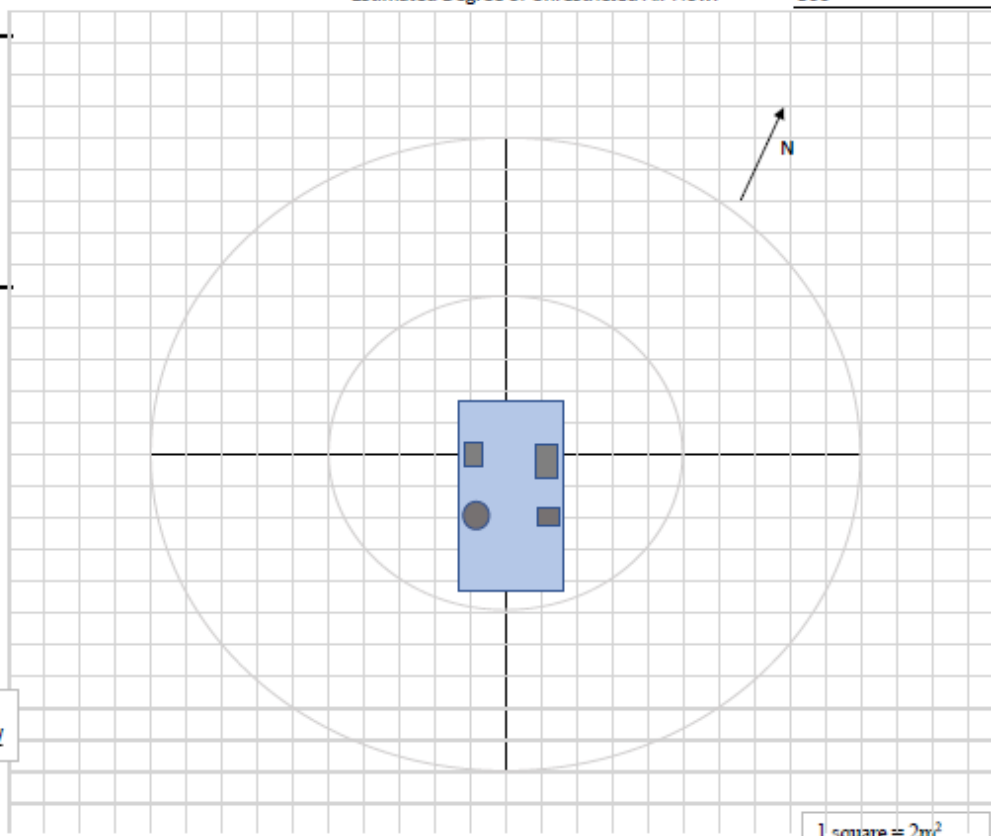


Figure 3.19 Rule Site Evaluation

Photos facing out from monitor to cardinal direction

North



South



East



West



Photos from cardinal direction facing in towards monitor

North



South



East



West



Figure 3.20 Rule Site Photos

3.6 Springhill



Figure 3.21 Springhill Site View



Figure 3.22 Springhill Satellite Scale

Address	4711 Mildred Drive, Knoxville, 37914		<p>The Springhill site is a neighborhood scale site located downwind of the urban core of Knoxville where ozone precursors are likely to occur. The Chemical Speciation samplers were removed from this site as of Jan 1, 2023, due to planned removal of aging platform.</p>
AQSID	470931020		
Latitude	36.01920		
Longitude	-83.87390		
Pollutant	Ozone	PM _{2.5}	
Parameter Code	44201	88101	
Monitor Type	SLAMS	SLAMS	
POC	1	3	
Interval	24-Hour - continuous	24-Hour - continuous	
Collection Frequency	Hourly	Hourly	
Method	087	236	
FRM/FEM Monitoring Instrument	Teledyne T400	Teledyne T640	
Analysis	Ultraviolet	Light Scattering	
Ref Method ID	EQOA-0992-087	EQPM-0516-236	
Monitor Objective Type	Population Exposure		
Dominant Source	Mobile		
Measurement Scale	Neighborhood		
Land Use Type	Residential		
Location Setting	Suburban		
Date Established	20020101	19900101(pollutant) 20201101 (method)	



Siting Evaluation Form

Site Name: Springhill
 AQSNo: 47-093-1020
 Coordinate 36.0114, -83.8739

Date: 3/15/2023
 Site Address: 4711 Mildred Drive
 Inspected by: Rebecca Larocque

Pollutant	Scale	Probe Height ¹	Flow (hi or Low)	Separation from samplers ¹	Pass/Fail	Distance to Road ¹	Pass/Fail
Ozone	Neighborhood	4.3	Low	2.1	Pass	36.2	Pass
PM2.5	Neighborhood	5.1	Low	1.2	Pass	37.8	Pass

Obstruction type ²	Obst. Height ¹	Obst. Distance ^{1,2}	Tree		
			Pass/Fail	Dripline ¹	Pass/ Fail
Tree NE	16.4	24.6	Pass	19	Pass
Tallest Pine E	21.6	28		19.4	Pass
small brush line				15.3	Pass

¹ All Measurements in meters

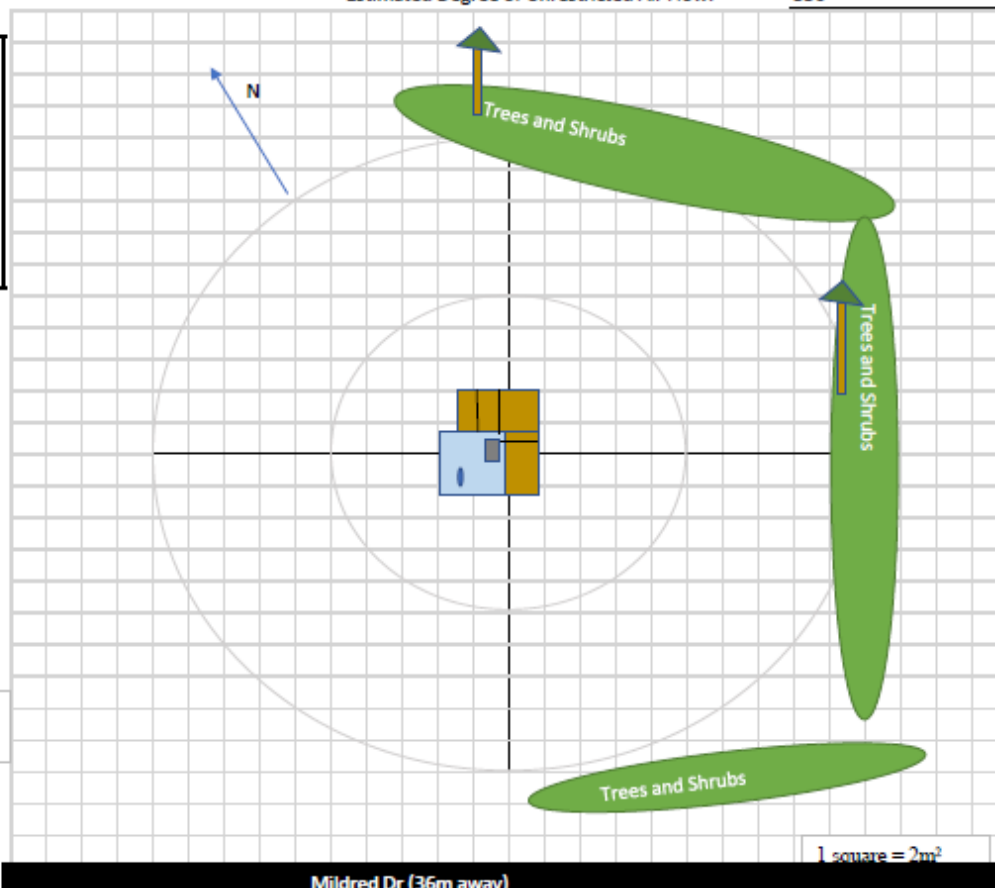
² Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume
 Obstruction Distance must be $\geq 2 * (\text{Obst height} - \text{probe height})$
 Tree Dripline must be >10 m away, prefer >20 m
 Horizontal and vertical distance on rooftop 1m for O₃/gases - 2m for all others
 Unrestricted air flow must be $\geq 270^\circ$

Site Drawing

Estimated Degree of Unrestricted Air Flow: 330°

Indicate:
 North
 Shelter
 Probe Postions
 Nearby trees
 Roadways
 Buildings
 Other Obstructions
 Source if Applicable



Primary Wind Direction : 220° SSW

Figure 3.23 Springhill Site Evaluation

Photos facing out from monitor to cardinal direction

North



South



East



West



Photos from cardinal direction facing in towards monitor

North



South



East



West



Figure 3.24 Springhill Site Photos

4.0 Proposed Changes

The EPA Region 4 governing authority approves Knox County's distribution of monitors and the location of the collocated sites for compliance with Federal regulations. Any changes will be undertaken in partnership and direct advisement with the EPA (and TDEC, when applicable). Before decommissioning any SLAMS monitor, Knox County Air Quality will follow the procedure listed in 40 CFR 58.14, "System Modifications". Any proposed changes to the air monitoring network will be documented in the Annual Monitoring Plan.

Changes to the monitoring network may occur outside the Annual Monitoring Plan (AMP) and planning process due to unforeseen circumstances resulting from eviction or other situations that occur after the AMP has been posted for public inspection and approved by the EPA Regional Administrators. Any changes to the network due to circumstances beyond Knox County Air Quality's control will be communicated in writing to the EPA Regional Authority, (and TDEC authorities, when applicable), and identified in the subsequent Annual Monitoring Plan.

4.1 Decommission and Relocations

4.1.1 Relocation

The speciation monitors were relocated from the Springhill Elementary Site (47-093-1020) to the Rule site (47-093-1017) on January 1, 2023. The letter sent to US EPA Region 4 Nov 8, 2022 regarding the necessity of the move is attached in appendix C. The update is reflected in the site evaluations included in section 3 of this document.

4.1.2 Decommission

In the 2021 AMP, Knox County proposed establishing the Parton Place Monitoring site as a special-purpose monitor to measure Pb concentrations on the southeast side of the source facility based on air dispersion modeling. This special-purpose monitor location was requested to establish which site measures the maximum ambient Pb concentration. Knox County requests that the Ameristeel Site (47-093-0023) be designated as the primary SLAMS monitor at the maximum concentration site and decommission the Parton Place special-purpose monitoring.

The maximum rolling 3-month average over the study period was .044 $\mu\text{g}/\text{l3}$ at the Ameristeel site. The top 10 values of the 12 months of rolling averages were all at the Ameristeel site.

Figure 4.1 below illustrates the rolling 3-month average comparison between the two sites. The comparison demonstrates that the Ameristeel Site (47-093-0023) represents the highest concentration site.

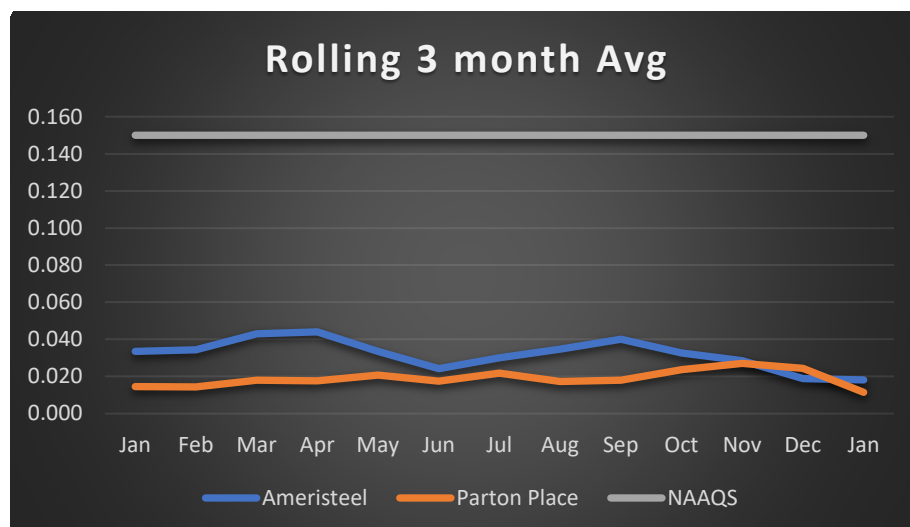


Figure 4.1 Site Comparison Rolling 3 Month Average

Second, the Parton Place site (47-093-0024) has less than a 10% probability that it will exceed 80% of the applicable NAAQS, as demonstrated using the monthly and 3-month averages during the study period. The equation used for this demonstration:

$$X + \frac{t * s}{\sqrt{n}} < 0.8 * NAAQS$$

Where X is the average monthly concentration for a minimum of 15 months, and also the 3-month rolling average for a minimum of 12 months, t is the t value for n-1 degrees of freedom at the 90% confidence level, s is the standard deviation of the design values, n is the number of design values, and NAAQS is the standard of interest.

The statistics in Table 4.1 indicate that this test is also passed. The plant production rate was 87.5% of its permitted maximum. The low average emissions rate demonstrated at the site allows for expansion up to the permitted maximum production rate. The Parton Place sited sampler has less than a 10% probability that it will exceed 80% of the applicable NAAQS.

Table 4.1 Parton Place Removal Statistics

Year	Month	Run1	Run2	Run3	Run4	Run 5	Run 6	Average	Rolling 3 month Avg	
2021	Nov	0.006	0.002	0.041	0.011	0.012		0.014		
2021	Dec	0.013	0.03	0.028	0.004	0.002		0.015		
2022	Jan	0.003	0.009	0.002	0.003	0.053		0.014	0.015	
2022	Feb	0.04	0.004	0.01	0.011	0.005		0.014	0.014	
2022	Mar	0.002	0.113	0.007	0.002	0.006		0.026	0.018	
2022	Apr	0.014	0.019	0.004	0.014			0.013	0.018	
2022	May	0.013	0.009	0.021	0.071	0.005		0.024	0.021	
2022	Jun	0.011	0.025	0.003	0.035	0.006		0.016	0.018	
2022	Jul	0.004	0.096	0.007	0.007	0.013		0.025	0.022	
2022	Aug	0.005	0.003	0.036	0.002	0.008		0.011	0.017	
2022	Sep	0.023	0.027	0.012	0.017	0.011		0.018	0.018	
2022	Oct	0.071	0.118	0.003	0.007	0.013		0.042	0.024	
2022	Nov	0.003	0.005	0.057	0.002	0.037		0.021	0.027	
2022	Dec	0.017	0.008	0.007	0.017	0.002	0.008	0.010	0.024	
2023	Jan	0.002	0.003	0.003	0.006	0.005		0.004	0.011	
								Statistics		
								Average	0.018	0.019
								Standard Deviation	0.0091	0.0044
								T value	1.761	1.796
								n	15	12
								90% Confidence	0.022	0.021

4.2 Replacements and Reassignments

Knox County Air Quality plans to replace the aging shelter at Springhill Elementary Site (47-093-1020) and remove the external wooden platform. This would include moving the PM continuous monitor (T640) from a small external shelter to within a new walk-in shelter with the ozone equipment. This is pending funding and would be scheduled for after the close of ozone season 2023.

As described in the 2022 plan, Knox County continues to work on upgrading with scheduled deployment of the brushless lead motors, new 8872 data loggers, and shelters for the PM continuous motors.

4.3 Approved Waiver Requests and Renewals

The placement of monitors is generally determined by the defined monitoring objective. 40 CFR Part 58, Appendix E contains specific location criteria applicable to SLAMS sites. Tradeoffs may be necessary to locate a site for collection of optimally representative data. 40 CFR Part 58, Appendix E, Section 10 establishes the waiver provisions for waiving of one or more siting criteria for a monitoring site providing that the agency can adequately demonstrate the need for establishing the monitoring site at that location. Knox County Air Quality has 2 approved waivers of siting criteria detailed in Table 4.1 below. These waivers are renewed every 5 years during the network assessment process. Appendix B of this plan contains the approval letters.

Table 4.2 Approved Siting Criteria Waivers

Site	Approval Date	Criteria Waived
Parton Place (47-093-0024)	8/26/21	Must have unrestricted airflow 270 degrees around the probe
Parton Place (47-093-0024)	4/29/22	Should be greater than 20 meters from the dripline of tree(s) and must be 10 meters from dripline when the tree(s) act as an obstruction

Appendix A -Equipment List

Description		Serial Number	Condition	Put in service	Comments:
Air Lab Site: 47-093-1013					
PM 2.5 Sequential	Thermo Partisol Plus 2025	2025TW215712111	Good	2022	
Data Logger	ESC 8832	SN A3760K	Fair	2010	
PM10/ PM2.5 continuous	Teledyne T640X	SN1100	Good	2020	
Rule Site: 47-093-1017					
Pm2.5 Continuous	Teledyne T640	SN675	New	2020	
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN 20251W209521601	Good	2018	installed 2020
Carbon Sampler	URG 3000N	SN 3N-B0224	Fair	2007	Repair 2020
Carbon Sampler	Controller module	3N-B0409	Fair	2007	
PM 2.5 Speciation	Met One Super SASS	SN G9188	Fair	2008	
Pm2.5 Continuous	Teledyne T640	SN972	Good	2020	
Ameristeel Site: 47-093-0023					
TSP Hi-Vol	General Metal Works	SN P04304	Good	Unknown	
TSP Hi-Vol	Anderson/GMW	SN P04302	Good	Unknown	
Parton Place Site: 47-093-0024					
TSP Hi-Vol	General Metal Works	SN P02875	Good	Unknown	
Spring Hill Site: 47-093-1020					
Pm2.5 Continuous	Teledyne T640	SN675	New	2020	
Ozone Calibrator	teledyne/ API 703U	316	Good	2021	
Ozone Analyzer	Teledyne / API T400	4005	Good	2018	
Data Logger	ESC 8872	1308	New	2022	
East Knox Site: 47-093-0021					
Ozone Analyzer	Teledyne / API T400	4006	Good	2018	
Ozone Calibrator	teledyne/ API 703U	379	New	2022	
Data Logger	ESC 8832	A 3757 K	Fair	2010	
Back-up equipment located at the Air Lab					
Ozone Analyzer	Teledyne / API T400	6647	New	2022	New Back Up
Ozone Analyzer	Teledyne / API 400E	2259	Poor	2011	Classroom demos
Ozone Calibrator	teledyne/ API 703U	317	Good	2021	Bench Standard
Ozone Calibrator	Teledyne / API 703E	188	Poor	2009	
Ozone Calibrator	Teledyne / API 703E	189	Fair	2009	Back up Calibrator
Ozone Calibrator	teledyne/ API 703U	179	Good	2017	audit standard
Data Logger	ESC 8832	A 3758 K	Poor	2010	
Data Logger	ESC 8832	A 3759 K	Fair	2010	Back up logger
Data Logger	ESC 8872	1141	New	2021	Bench Loggers
Data Logger	ESC 8872	1309	New	2022	New to be deployed
PM 10 Continuous	Thermo BAM 5014i	CM14521015	Poor	2015	not working
PM 2.5 Continuous	TEOM 1405	SN 1405A209531006	fair	2011	back up for AQI
PM 2.5 Sequential	Thermo Partisol Plus 2025	SN B218950606	Fair	2007	Remote Connection issues
Hi-Vol Orifice	Anderson/GMW	P3619	Good	Unknown	
Hi-Vol Orifice	Anderson/GMW	P2861	Good	Unknown	
Hi-Vol Orifice	Anderson/GMW	P4306	Good	Unknown	
Hi Vol Orifice	Anderson/GMW	SN P3084	Good	Unknown	
Hi Vol Orifice	Anderson/GMW	SN P999	Good	Unknown	
Hi Vol Orifice	General Metal Works	SN P1938	Good	Unknown	
Hi Vol Orifice	TISCH	P-11179	New	2022	
Hi Vol Orifice	TISCH	P-11180	New	2022	
Hi Vol Orifice	TISCH	P-11181	New	2022	
Pm2.5 Continuous	Teledyne T640	SN910	Good	2020	
PM10/ PM2.5 continuous	Teledyne T640X	SN192	Good	2018	
Unknown status: acquired from TDEC					
Carbon Sampler	URG module	3N-B0359	unknown	unknown	
Carbon Sampler	URG module	3N-B0767	unknown	Unknown	
Carbon Sampler	URG Controller	3N-B0700	unknown	Unknown	
Carbon Sampler	URG Controller	3N-B0704	unknown	Unknown	
Carbon Sampler	URG controller	3N-B0773	unknown	Unknown	

Appendix B Waiver Approvals



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

August 26, 2021

Mr. Brian Rivera
Director
Knox County Air Quality Management
1403 Davanna Street
Knoxville, Tennessee 37917

Dear Mr. Rivera:

Thank you for submitting the Knox County 2021 Annual Ambient Air Monitoring Network Plan (Network Plan) dated July 1, 2021. The Network Plan is required by 40 Code of Federal Regulations (CFR) §58.10. The Network Plan covers the ambient air monitoring network operated by the Knox County Air Quality Management (KCAQM) in Tennessee.

The U.S. Environmental Protection Agency (EPA) understands that the KCAQM provided a 30-day public comment period from May 24, 2021 through June 23, 2021, and received no comments other than those submitted by the EPA which were responded to by the KCAQM. The public comment period and response to comments satisfies the requirements 40 CFR §58.10(a)(1).

In its 2020 Annual Network Plan, the KCAQM requested to discontinue the Burnside lead (Pb) monitor (AQS ID: 47-093-0027) which is a source-oriented monitor associated with the Commercial Metals Company Steel US Plant (formerly Ameristeel). (The Burnside lead monitor is one of two source-oriented monitors associated with this company, the other being the Ameristeel lead monitor with AQS ID: 47-093-0023.) The EPA denied the request but indicated that the EPA would support it once the KCAQM established a monitoring site per 40 CFR Part 58, Appendix D 4.5 in the area of expected maximum Pb concentration. The EPA requested that the KCAQM establish a new site along Tennessee Avenue to measure Pb concentrations near the facility before the Burnside lead monitor can be removed. That new site is to be located to the southeast of the Commercial Metals Company Steel US Plant based on the results of air dispersion modeling provided by the KCAQM. In the 2021 Annual Network Plan, the KCAQM proposed to establish the new Parton Place monitoring site (AQS ID: 47-093-0024) along Tennessee Avenue as a special purpose monitor. A minimum of 15 months of data from the Parton Place and Ameristeel (AQS ID: 47-093-0023) monitoring sites will be compared to determine which site measures the maximum ambient Pb concentration. The data analysis will be presented along with a request to establish the primary SLAMS monitor at the maximum concentration site and decommission the other site in a subsequent Annual Network Plan, expected in July of 2023.

With this approval of the Parton Place site, the KCAQM will begin surveying, clearing, and construction with a goal of commencing monitoring in November of 2021. The EPA approves the Parton Place Pb

monitoring site proposal described in the 2021 Annual Network Plan. After vegetative clearing and placement of the monitor, the EPA requests that the KCAQM submit photographs as well as the final measurements, including unrestricted airflow, to the EPA. The EPA approves the Burnside monitor shut down request once the new Parton Place site is in operation.

The EPA also approves the KCAQM's request that for the Parton Place monitoring site, the EPA waive the siting criteria requirement found in 40 CFR Part 58, Appendix E, Table E-4, that states that a monitor "[m]ust have unrestricted airflow 270 degrees around the probe for sampler." As noted in 40 CFR Part 58, Appendix E, section 10.1, a waiver may be granted for a new site if "[t]he site can be demonstrated to be as representative of the monitoring area as it would be if the siting criteria were being met" and "[t]he monitor or probe cannot reasonably be located so as to meet the siting criteria because of physical constraints (e.g., inability to locate the required type of site the necessary distance from roadways or obstructions)." The EPA has determined that the Parton Place site will be as representative of the monitoring area as it would be if the siting criteria were being met because it is a source-oriented monitor and there will be no obstructions between the source and the monitor. Additionally, the new monitoring site cannot reasonably be located so as to meet the siting criteria because it is on the only property on the southeast site of the source that the KCAQM was able to obtain access to with a modeled receptor site ranked higher than the current Ameristeel monitoring site (AQS ID: 47-093-0023).

The EPA has not completed its review of the other parts of the KCAQM Network Plan. The approval provided in this letter has been expedited to support the establishment of the site prior to the end of the year. The EPA's response to the other sections of the Network Plan will be provided in a separate letter by the 120-day regulatory due date.

Thank you for working with us to monitor air pollution and promote clean air in Tennessee. If you have any questions or concerns, please contact Todd Rinck at (404) 562-9062 or Sara Waterson at (404) 562-9061.

Sincerely,

CAROLINE
FREEMAN

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Date: 2021.08.26
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Caroline Y. Freeman
Director
Air and Radiation Division

cc: Mr. Bradley King
Environmental Manager 3, Division of Air Pollution Control



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 29, 2022

Mr. Brian Rivera
Director
Knox County Air Quality Management
140 Dameron Avenue
Knoxville, Tennessee 37917

Dear Mr. Rivera:

On April 18, 2022, the Knox County Air Quality Management (KCAQM) submitted to the U.S. Environmental Protection Agency a Network Plan Addendum (Addendum) to the County's 2021 Annual Ambient Air Monitoring Network Plan (Network Plan).

The air monitoring regulations in 40 CFR §58.10(a)(1) require that a Network Plan Addendum be made available for public inspection and comment for at least 30 days before submission to the EPA for approval. KCAQM made the Addendum available for public comment in The Knoxville FOCUS and on the KCQAM website from March 14 - April 13, 2022, and no comments were received.


In the 2021 Annual Network Plan, the KCAQM proposed to establish the new Parton Place monitoring site (AQS ID: 47-093-0024) along Tennessee Avenue as a special purpose monitor. The new site, Parton Place, was approved by EPA in a letter to KCAQM dated August 26, 2021. The property was surveyed and cleared in September 2021 and the site build was completed November 3, 2021. KCAQM completed a site assessment once the property was cleared and found that due to the size constraints of the property, 25 feet wide by 144 feet long, that all siting criteria could not be met. A walnut tree located on an adjacent property east of the site has a dripline that is 5 meters from the monitor.

The EPA approves the KCAQM's request to waive the siting criteria requirement for the Parton Place monitoring site. The requirement is found in 40 CFR Part 58, Appendix E, Table E-4, and states that the distance from trees to probe inlet "[s]hould be greater than 20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction." As noted in 40 CFR Part 58, Appendix E, section 10.1, a waiver may be granted for a new site if "[t]he site can be demonstrated to be as representative of the monitoring area as it would be if the siting criteria were being met" and "[t]he monitor or probe cannot reasonably be located so as to meet the siting criteria because of physical constraints (e.g., inability to locate the required type of site the necessary distance from roadways or obstructions)." The EPA has determined that the Parton Place site will be as representative of the monitoring area as it would be if the siting criteria were being met because it is a source-oriented monitor and there will be no obstructions between the source and the monitor. The Parton Place site is on the only property on the southeast side of the source that the KCAQM was able to obtain access to with a modeled receptor site ranked higher than the current Ameristeel monitoring site (AQS ID: 47-093-0023).

Thank you for working with us to monitor air pollution and promote clean air in Tennessee. If you have any questions or concerns, please contact Katy Lusky at (404) 562-9130 or Sara Waterson at (404) 562-9061.

Sincerely,

**CAROLINE
FREEMAN**

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Date: 2022.04.29 09:21:09 -04'00'

Caroline Y. Freeman
Director
Air and Radiation Division

cc: Mr. Bradley King
Environmental Manager 3, Division of Air Pollution Control

Appendix C – Speciation Relocation



Knox County Health Department

140 Dameron Avenue, Knoxville, TN 37917

November 8th, 2022

Caroline Y. Freeman, Director
Air and Radiation Division
US EPA Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth St., SW
Atlanta, GA 30303

Dear Ms. Freeman

Knox County Air Quality plans to relocate the supplemental chemical speciation site located at Springhill Elementary School (47-093-1020) to the Rule site (47-093-1017) starting January 1st, 2023.

The Springhill site, located at 4711 Mildred Avenue, Knoxville Tennessee, has an old wooden platform build in 1998 that supports the chemical speciation monitors and the PM 2.5 continuous monitor. The platform connects to an 8' L x 6' W walk-in shelter that houses one ozone monitor. This platform needs repairs to ensure employee safety. While investigating whether to repair or replace the platform, it was discovered that the platform was not built to code specifications and would need to be replaced. To avoid the high cost of building a new platform, Air Quality decided to put the PM 2.5 continuous monitor in the walk-in shelter with the ozone monitor and relocate the chemical speciation monitors to the Rule site. The Rule site, located at 1613 Vermont Avenue, Knoxville Tennessee was chosen as it has ample room for the chemical speciation monitors and is the site of highest concentration for PM 2.5 in Knox County's network. The Rule site also scores in the 80th percentile or more for all indexes (except underground storage tanks) compared to the U.S using EPA's Environmental Justice Screening and Mapping Tool version 2.1. Air Quality will include these changes in the 2023 Annual Air Monitoring Network Plan as well as notify the contract lab supplying the chemical speciation filters.

If you have any questions or need additional information, please contact Amber Talgo at 865-215-5942 or amber.talgo@knoxcounty.org.

Sincerely,

A handwritten signature in blue ink that reads "Amber E. Talgo".

Amber E. Talgo
Air Monitoring Program Manager

cc. Sara Waterson, US EPA
Todd Rink, US EPA
Brian Rivera, KCHD