2024 Tennessee Annual Monitoring Network Plan

Tennessee Department of Environment and Conservation

Air Pollution Control Division

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Annual Air Monitoring Network Plan Acronym Glossary

AADT ..... Annual Average Daily Traffic
AMNP ..... Annual Monitoring Network Plan
AQI ..... Air Quality Index
AQS ..... Air Quality Subsystem
BAM ..... Beta Attenuation Monitor
CASTNET ..... Clean Air Status and Trends Network
CBSA ..... Core-Based Statistical Area
CFR ..... Code of Federal Regulations
CO ..... Carbon Monoxide
DAPC ..... Division of Air Pollution Control
DRR ..... Data Requirements Report
DV ..... Design Value
EFO ..... Environmental Field Office
EPA ..... Environmental Protection Agency
ERT ..... Environmental Response Trust
FEM ..... Federal Equivalent Method
FRM ..... Federal Reference Method
µg/m3 ..... Micro Grams per Cubic Meters
MSA ..... Metropolitan Statistical Area
NAAQS ..... National Ambient Air Quality Standards
NCO ..... Nashville Central Office
NCore ..... National Core Monitoring Station
NEI ..... National Emissions Inventory
NFO ..... Nashville Field Office
NPS ..... National Park Service
NO2 ..... Nitrogen Dioxide
NO_x ..... Nitrogen Oxides
NO_y ..... Reactive Oxides of Nitrogen
O_3 ..... Ozone
PAMS ..... Photochemical Assessment Monitoring Station
Pb ..... Lead
$PM_{2.5}$ ..... Particles with an average aerodynamic diameter of 2.5 microns or less
PM_{10} ..... Particles with an average aerodynamic diameter of 10 microns or less
PWEI ..... Population Weighted Emission Index
POC ..... Parameter Occurrence Code
ppb ..... Parts Per Billion
ppm ..... Parts Per Million
PQAO ..... Primary Quality Assurance Organization
PSD ..... Prevention of Significant Deterioration
SLAMS ..... State and Local Air Monitoring Stations
SO_2 ..... Sulfur Dioxide
SPM ..... Special Purpose Monitor
TEOM ..... Tapered Element Oscillating Microbalance
TDEC ..... Tennessee Department of Environment and Conservation
Tpy ..... Tons per year
TVA ..... Tennessee Valley Authority

Introduction to the 2024/25 Annual Monitoring Network Plan for Tennessee

The annual monitoring network plan (AMNP) that is presented in the following pages will address each of the requirements specified in the Code of Federal Regulations (CFR). An overview of the geography, general climate, wind patterns, and population trends is included to provide background information that will help the reader understand the current air monitoring network and the reasons for the placement of the existing monitoring sites. The actual regulatory requirements that specify the number and arrangement of air monitoring sites are found in 40 CFR 58. The sections that provide this guidance are also included in the report to help better understand the actual monitoring needs in each area.

In many instances, the areas for which monitoring is required are based on population criteria in which population must be considered to allow for monitoring in the areas where people may be affected or exposed to the various criteria pollutants of concern. Additional monitoring sites are needed to address impacts to communities where source-related emission density might be elevated. Other considerations must also be addressed when selecting and operating air monitoring sites. The local influences of some types of sources (roadway dust or emissions) may be factors that require monitoring sites to be spaced certain distances from those sources. In near-road or roadway monitoring activities, the monitors must be located very close to the potential sources of mobile emissions.

The USEPA defines environmental justice 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."*

Entities can strive for environmental justice through taking steps to ensure that everyone enjoys the same degree of protection from environmental and health hazards and is provided equal access to the decision-making process to have a healthy environment in which to live, learn, and work. The Tennessee Department of Environment and Conservation (TDEC) promotes these environmental justice goals of equal protection and equal access for all Tennesseans.

The principal areas in Tennessee with air monitoring sites are depicted with a graphic showing each of the monitoring sites' locations. The sites are further identified with a site number, an Air Quality Site Identification (AQSID), and the types of pollutants being monitored at each location. Tables containing the relevant information for each site are also included. The tables are provided in two sections following the location graphic and can be found within each area's section of the report and relieve the reader from searching tables at the end of the report for information about a given site.

Each of the four local programs operating an air monitoring network in Tennessee provided a separate annual review. The local program's annual monitoring network plan will be submitted at the same time as the State of Tennessee's annual air monitoring network plan. Where revisions were noted in the local networks, those revisions were added to the State's overall plan.

The State of Tennessee is required to evaluate the ambient air monitoring network each year following requirements specified in 40 CFR Subpart B 58.10 and 40 CFR 58 Appendix DAppendix C. All ambient air monitoring sites are meeting these regulatory requirements. Air monitoring site evaluations can be found in Appendix E. The National Park Service (NPS) operates several air monitoring sites located within the Great Smoky

Mountains National Park (GSMNP). The National Park Service (NPS) is responsible for generating, reviewing, and validating the data generated by these monitoring sites. The Environmental Protection Agency (EPA) has determined that these sites fall under the Primary Quality Assurance Organization (PQAO) oversight of the NPS and, as such, are the responsibility of the NPS. As a courtesy, TDEC DAPC provides an overview of these sites in the Tennessee Annual Monitoring Network Plan.

Proposed Revisions to Tennessee's Ambient Air Monitoring Network

TDEC DAPC proposes no changes in the air monitoring network for 2024-25.

Special Projects

Tennessee Air Quality Sensor Evaluation

The Tennessee Department of Environment and Conservation-Division of Air Pollution Control (TDEC-DAPC) conducted a study on small sensor technologies for air quality characterization. The study tested $PM_{2.5}$ and gaseous sensors, finding high data recovery and no major sensor degradation after one year. PurpleAir $PM_{2.5}$ sensors showed good agreement with the $PM_{2.5}$ FEM monitor after data adjustments, suggesting potential for quantitative air quality applications. For more information on the results of the *TDEC-DAPC Air Quality Sensors Evaluation*, please visit our StoryMap.

TDEC-DAPC plans to continue sensor technology research and is currently utilizing an expanded network of PurpleAir sensors for increased $PM_{2.5}$ AQI coverage and collocation with regulatory PM monitors across the state. Data from our sensor network is available to the public on the PurpleAir website as well as AirNow's Fire & Smoke map.

The Purpose of Tennessee's Ambient Air Monitoring Network

There are several criteria used to determine the need for ambient air quality monitoring. These criteria are as follows:

- EPA National Ambient Air Quality Standards (NAAQS) criteria pollutants monitoring network requirements for the NCore, formally NAMS (National Air Monitoring Site); SLAMS (State and Local Air Monitoring Stations); and SPM (Special Purpose Monitoring) monitoring networks can be found in 40 CFR Appendix D to Part 58.
- The CFR sets forth regulations for air quality monitoring requirements implemented by the states and the EPA. These requirements are primarily organized around population and emission density in each area with the number of required monitors and the monitors' distribution within the networks specified by these regulations. Additionally, 40 CFR, Part 58, Appendix D specifies criteria for designing the NCore and SLAMS networks. The EPA must approve the design or modifications to these networks.
- Additional federal regulations also specify requirements for the Prevention of Significant Deterioration (PSD) monitoring networks. This monitoring requirement is triggered as part of a PSD permit application review. There is no representative contemporaneous ambient air quality data for the area near the proposed PSD source site. Under these criteria, either pre or post-construction monitoring may be required to be conducted in the area near the facility, likely to be impacted (as determined by modeling) by emissions.
- Air quality monitoring must be conducted to alert citizens in given areas to elevated air pollutants in cities or communities of designated population levels required to provide Air Quality Index (AQI) reports to the general public.
- Conducting air quality monitoring will address the need for background air quality data.
- Special air quality monitoring studies are conducted based on identified needs for monitoring data in each area.
- Citizen complaints and enforcement investigations related to air quality are other reasons for air quality monitoring, usually in or around a specific area related to the complaint or investigation.
- Where warranted, requests from citizens for special air monitoring studies are also reasons for air monitoring activities.
- The federal regulations also specify the frequency, method, location requirements, equipment, quality assurance procedures, and reporting of data collected from the ambient air monitoring networks.

Pollutant-specific requirements for establishing the need for ambient monitoring and the number of required monitors are found in Appendix C. Currently, all areas in Tennessee and Tennessee's CBSAs are fulfilling the requirements for operating each type of ambient monitor(s) as well as the requirements for reporting the AQI. This is being accomplished through a joint effort by the State of Tennessee and other agencies located within the state and its CBSAs.

The following sections detail how the various requirements found in 40 CFR Part 58 are being met and, when relevant, by which criteria pollutant monitors. Individual monitors listed may belong to the State of Tennessee or other agencies' operating monitors in the state and its multi-state CBSAs.

Air Quality Index Reporting

The following table demonstrates how Tennessee is meeting the minimum requirements for AQI reporting for particles with an average aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) and O_3 (ozone):

Metropolitan Statistical Area	2020 Census	2023 Census Est.	Required to Have AQI Reporting	Daily AQI/Air Quality Forecasts Provided
Chattanooga, TN-GA	562648	580971	Yes	Yes
Clarksville, TN-KY	320518	340495	No	Yes
Cleveland, TN	126164	129612	No	No
Jackson, TN	180500	181826	No	No
Johnson City, TN	207276	213198	No	Yes, based on the combined population of both areas.
Kingsport-Bristol, TN-VA	307610	313025	No	
Knoxville, TN	903322	946264	Yes	Yes, in addition, the GSMNP has a separate AQI/Forecast provided.
Memphis, TN-MS-AR	1345436	1335674	Yes	Yes
Morristown, TN	119182	124054	No	Not specifically but is included in the Knoxville forecast.
Nashville-Davidson—Murfreesboro—Franklin, TN	2014420	2102573	Yes	Yes

$PM_{2.5}$ Monitoring

The following table lists the currently active $PM_{2.5}$ SLAMS monitoring sites that fulfill the minimum $PM_{2.5}$ requirements found in 40 CFR Part 58, Appendix D for all MSAs in the state:

Metropolitan Statistical Area	Required Number of Monitors	Monitors (AQSID)
Chattanooga, TN-GA CBSA# 16860	1	13-295-0004[1,2]
		47-065-4002[1]
Clarksville, TN-KY CBSA # 17300	0	47-125-2001
Jackson, TN CBSA # 27180	0	47-113-0010
Kingsport, TN-VA CBSA #28700	0	47-163-1007
Knoxville, TN CBSA# 28940	1	47-093-1013[1]
		47-093-1020
		47-093-1017[1]
		47-105-0109[1]
Memphis, TN-AR-MS CBSA# 32820	2	05-035-0005
		28-033-0002
		47-157-0024[1]
		47-157-0075[1]
		47-157-0100
Nashville, TN CBSA# 34980	2	47-037-0023[1]
		47-037-0040
		47-165-0007[1]

[1] Site operates a collocated FEM/FRM monitor
[2] Relocated site was formerly 13-295-0002

$PM_{2.5}$ Continuous Monitoring

The following table lists the currently active $PM_{2.5}$ monitoring sites that fulfill the minimum continuous $PM_{2.5}$ requirements found in 40 CFR Part 58, Appendix D for all MSAs in the state:

Core-Based Statistical Area	Required Number of Monitors	Monitors (AQSID)
Chattanooga, TN-GA CBSA # 16860	1	13-295-0004[1,2]
		47-065-4002[1]
Athens, TN CBSA # 11940	0	47-107-1002
Clarksville, TN-KY CBSA # 17300	0	47-125-2001
Cookeville, TN CBSA # 18260	0	47-141-0005
Dyersburg CBSA # 20540	0	47-045-0004
Jackson, TN CBSA # 27180	0	47-113-0010
Kingsport, TN-VA CBSA #28700	0	47-163-1007
Lawrenceburg, TN CBSA # 29980	0	47-099-0003
Knoxville, TN CBSA # 28940	1	47-009-0011[3]
		47-105-0004[3]
		47-105-0109[1]
		47-093-1013[1]
		47-093-1017[1]
		47-093-1020
Memphis, TN-AR-MS CBSA # 32820	1	28-033-0002
		47-157-0075[1]
		05-035-0005[1]
Nashville, TN CBSA # 34980	1	47-037-0023[1]
		47-037-0040
		47-119-2007[3]
		47-165-0007[1]

[1] Site operates a collocated FEM/FRM monitor.
[2] Relocated site was formerly 13-295-0002
[3]Non-SLAMS monitor

PM2.5 Background and Transport Sites

The following sites meet the requirement for the State's operation of 1 background and 1 regional transport site:

Metropolitan Statistical Area	Required Number of Monitors	Monitors (AQSID)
Background	1	47-099-0003
Regional Transport	1	47-009-0101

PM_{10} Monitoring

PM_{10} monitoring is currently being conducted by Nashville's Metro Public Health Department of Davidson County, the Shelby County Health Department in Memphis, and the Knox County Health Department. There are no collocation requirements for PM_{10} in the state. The minimum requirements for PM_{10} monitoring are met by a combination of EPA waivers and by the following SLAMS sites:

Metropolitan Statistical Area	Required Number of Monitors	Monitors (AQSID)
Chattanooga, TN-GA CBSA# 16860	1	Waived
Knoxville, TN CBSA# 28940	1	47-093-1013
Memphis, TN-AR-MS CBSA# 32820	2	47-157-0024
		47-157-0075
Nashville, TN CBSA# 34980	2	47-037-0023
		Waived

Ozone Monitoring

TDEC DAPC operates eight ozone monitoring sites. Information that is more detailed can be found in Appendix E. The following table outlines the monitors that satisfy the minimum number of ozone SLAMS monitors required by 40 CFR Part 58, Appendix D, Section 4.1 in each MSA:

Metropolitan Statistical Area	Required Number of Monitors	Monitors (AQSID)
Chattanooga, TN-GA CBSA# 16860	2	47-065-1011
		47-065-4003
Clarksville, TN-KY CBSA# 17300	1	21-047-0006
Kingsport-Bristol-Bristol, TN-VA CBSA# 28700	1	47-163-2002
		47-163-2003
	2	47-001-0101

Metropolitan Statistical Area	Required Number of Monitors	Monitors (AQSID)
Knoxville, TN CBSA# 28940		47-009-0101
		47-009-0102[1,2]
		47-093-0021
		47-093-1020
		47-105-0109
Morristown, TN CBSA# 34100	1	47-089-0002
Memphis, TN-AR-MS CBSA# 32820	2	05-035-0005
		28-033-0002
		47-157-0021
		47-157-0075
		47-157-1004
Nashville, TN CBSA# 34980	2	47-037-0011
		47-037-0026
		47-165-0007
		47-187-0106
		47-189-0103
Sevierville, TN CBSA# 42940	1	47-155-0101[1,2]
		47-155-0102[1,2]

[1]Non-SLAMS monitor
[2]Site operated by the National Park Service

Carbon Monoxide (CO) Monitoring

The requirement for CO SLAMS near-road monitoring is met in the Nashville CBSA by the CO monitor operating at the near-road site and in the Memphis, TN-AR-MS CBSA as outlined below:

Metropolitan Statistical Area	Required Number of Monitors	Monitors (AQSID)
Memphis, TN-AR-MS CBSA# 32820	1	47-157-0100
Nashville, TN CBSA# 34980	1	47-037-0040

Nitrogen Dioxide (NO_2) Monitoring

NO_2 SLAMS monitoring requirements for operating near-road monitors are met for both the Nashville and the Memphis, TN-AR-MS CBSAs, as detailed below:

Metropolitan Statistical Area	Required Number of Near-Road Monitors	Monitors (AQSID)
Memphis, TN-AR-MS CBSA# 32820	1	47-157-0100
Nashville, TN CBSA# 34980	1	47-037-0040

Area-wide NO_2 monitoring is also met in the same CBSAs, where the State of Arkansas operates the area-wide NO_2 monitor to satisfy the requirements for the Memphis, TN-AR-MS requirement. This site is operated as agreed to in a memorandum of agreement between Memphis and the states of Arkansas and Mississippi; the required sites are listed below:

Metropolitan Statistical Area	Required Number of Area-Wide Monitors	Monitors (AQSID)
Memphis, TN-AR-MS CBSA# 32820	1	05-035-0005
Nashville, TN CBSA# 34980	1	47-037-0011

SO_2 Monitors

The minimum number of SO_2 monitors is determined by calculating the population weighted emissions index (PWEI) for each CBSA as defined in 40 CFR Part 58, Appendix D, Section 4.4 and detailed in Table 5. The following monitors satisfy the PWEI requirements for all CBSAs in the state:

Metropolitan Statistical Area	Required Number of PWEI Monitors	Monitors (AQSID)
Kingsport-Bristol-Bristol, TN-VA CBSA# 28700	1[1]	47-163-6001
Memphis, TN-AR-MS CBSA# 32820	0	47-157-0075
Nashville, TN CBSA# 34980	0	47-037-0040

[1]PWEI monitor is required by the Regional Administrator (RA) not by the calculated PWEI

The Regional Administrator may require additional monitoring stations per 40 CFR Part 58, Appendix D Sec. 4.4.3. These additional monitors may be required in areas that have the potential to violate or contribute to the

violation of the NAAQS, in areas not suitable for modeling, or in areas with susceptible and vulnerable populations, which are not monitored under the PWEI requirements.

The Region 4 Administrator has required the State to operate an enhanced SO_2 monitoring network of 1 PWEI site and 3 additional sites within the 2010 1-hr SO_2 NAAQS nonattainment area in the Kingsport-Bristol-Bristol, TN-VA CBSA.

Metropolitan Statistical Area	Required Number of RA Monitors	Monitors (AQSID)
Kingsport-Bristol-Bristol, TN-VA CBSA# 28700	3	47-163-6002
		47-163-6003
		47-163-6004

Lead (Pb) Monitoring:

The State operates a single lead monitoring site in Sullivan County, Tennessee near the currently shutdown Exide facility. This site is located within the boundary of the current Bristol lead maintenance area. The State is also required to operate a source-oriented lead sampler at the Commercial Metals Company (CMC) Steel US plant, formally Gerdau in Knoxville. This monitoring is being conducted by the Knox County Health Department. The requirements for lead sampling are met by the following sites:

Source	Required Number of Monitors	Monitors (AQSID)
Exide, Sullivan County	1	47-163-3004[1]
CMC Steel Plant, Knox County	1	47-093-0023
		47-093-0024[2]

[1]Site operates a collocated monitor

[2] Non-Slams monitor

National Core Monitoring Station

In October 2006, the United States EPA established the National Core (NCore) multi-pollutant monitoring network in its final amendments to the ambient air monitoring regulations for criteria pollutants (codified in 40 CFR parts 53 and 58). It is the expectation that each state will have at least one NCore site. Nationwide, approximately 50 sites will be in urban locations and 20 sites in rural areas. The multi-pollutant monitoring approach at NCore sites will benefit health assessments, emissions strategy development, and future monitoring efforts. By providing data users, such as researchers and policymakers, with a robust suite of collocated pollutant and meteorological data, NCore sites will better characterize the numerous chemical and physical interactions between pollutants than what is traditionally available at compliance-oriented monitoring sites. Shelby County operates the only required NCore site in Tennessee. The Shelby County AMNP details this site. The Look Rock rural NCore site is an optional site operated by NPS.

Near-Road Monitors:

There are currently two near-road sites in Tennessee and operated in local program counties (Davidson and Shelby). The near-road monitoring network was initiated as part of the 2010 NO_2 NAAQS review and has become a multi-pollutant (CO, NO_2, NO, NO_x, $PM_{2.5}$) monitoring network. In cooperation with state, local, and tribal air

agencies, the EPA has tracked the installation of near-road NO2 monitoring stations across the country. As part of this effort, the EPA has created a list of sites and captured critical meta-data about their target roads and general operations. Additional information on near-road monitoring networks can be found at https://www.epa.gov/amtic/no2-monitoring-near-road-monitoring and in Monitoring Network Requirements.

Prevention of Significant Deterioration (PSD) monitoring:

The Prevention of Significant Deterioration (PSD) permitting program is a Clean Air Act preconstruction review program for new and modified major stationary sources of air pollution (e.g., power plants, manufacturing facilities). The program requires that the area where the source is located be classified as either in attainment or unclassifiable with the National Ambient Air Quality Standards (NAAQS). The NAAQS establishes maximum pollution concentration levels to protect public health and welfare from harmful levels of nitrogen oxides, ozone, sulfur dioxide, particulates, carbon monoxide, and lead. A PSD increment is the maximum allowable increase in concentration towards the NAAQS from the baseline concentration for a pollutant. The baseline concentration is set for each existing pollutant at the time that the first complete PSD permit application affecting the area is submitted. PSD increments prevent the air quality in clean areas from completely consuming remaining air quality to the level set by the NAAQS. This monitoring requirement is triggered when there is insufficient ambient air quality data necessary to determine compliance with the NAAQS. Under these criteria, either pre or post construction monitoring may be required to be conducted in the area near the facility being constructed.

Currently, TDEC DAPC does not operate any PSD monitors.

Clean Air Status and Trends Network (CASTNET)

The Clean Air Status and Trends Network (CASTNET) monitoring network is designed to measure air quality in rural areas year-round. CASTNET sites in Tennessee and the state's metropolitan statistical areas (MSAs) are managed by the EPA's Clean Air Markets Division and operated by an EPA contractor. There are four CASTNET sites in rural areas of Tennessee and Kentucky. The three CASTNET sites in Tennessee are as follows:

Table 1: CASTNET Sites in Tennessee Areas

Site	AQSID	County	Location	2021 to 2023 Ozone DV (ppm)
Edgar Evins (ESP127)	47-041-9991	DeKalb	Edgar Evins State Park, Smithville, TN 37166	0.060
Speedwell (SPD111)	47-025-9991	Claiborne	718 Russell Hill Rd, Speedwell, TN 37870	0.060
Look Rock (GRS420)	47-009-0101	Blount	Great Smoky Mountains National Park	0.067

$PM_{2.5}$ Chemical Speciation Network (CSN)

The $PM_{2.5}$ Chemical Speciation Network is operated in accordance with 40 CFR Part 58, Appendix D Sec 4.7.4, where the requirement for CSN monitors is as follows:

> Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the $PM_{2.5}$ Speciation Trends Network (STN). The selection and modification of these STN sites must

be approved by the Administrator. The PM 2.5 chemical speciation urban trends sites shall include analysis for elements, selected anions and cations, and carbon.

The EPA currently funds three CSN sites in Tennessee's CBSAs:

Metropolitan Statistical Area	CSN Monitors (AQSID)
Chattanooga, TN-GA CBSA# 16860	13-295-0004[1]
Knoxville, TN CBSA# 28940	47-093-1017[2]
Memphis, TN-AR-MS CBSA# 32820	47-157-0075

[1]Relocated site was formerly 47-295-0002
[2]CSN site was previously located at site 47-093-1020

Photochemical Assessment Monitoring Station (PAMS)

The EPA's PAMS program began in the 1990s and was revised during the 2015 ozone NAAQS review. These revisions called for ozone precursor monitoring to be conducted during peak months (June-August) at NCore sites in CBSA's with populations ≥ 1 million. The number of required PAMS sites in the US was lowered from 75 to 43, with 16 of those being new PAMS sites. The NCore site in the Memphis CBSA (47-157-0075) is one of the required new PAMS sites. To meet the requirements in the regulations promulgated in October 2015, all PAMS Required Sites were to be operational and reporting quality assured and validated data for the required parameters to the EPA's Air Quality System by June 1, 2019. Due to a number of issues related to the startup of PAMS, the new start date was postponed to June 2021. Beginning June 1, 2021, the Shelby County Health Department Air Monitoring Branch began PAMS monitoring at the NCore site in the Memphis CBSA (47-157-0075).

Monitoring Sites and Discussion

All TDEC DAPC-operated sites meet the siting criteria as found in Appendix E to 40 CFR Part 58 for probe and monitoring path for $PM_{2.5}$, O_3, Pb, and SO_2. These sites will be reevaluated annually for compliance with this criterion. These sites are part of the State of Tennessee ambient air monitoring criteria pollutant monitoring network and are operated to ensure continued compliance with Appendix D to 40 CFR Part 58 network design requirements. Current site evaluations with photographs, distance measurements and confirmation of meeting the siting criteria requirements are provided in Appendix E to this plan.

The individual monitoring sites below have graphs included of their daily measured parameters, displayed according to their respective daily design value statistic when applicable. Sites that have changed $PM_{2.5}$ monitoring methods are depicted together. They are displayed according to their new and historical parameter occurrence code (POC). For $PM_{2.5}$ federal reference monitors (FRMs), POCs 1 and 2 are used and for federal equivalent $PM_{2.5}$ monitors (FEMs), POCs 3 and 4 are used.

Freels Bend – Anderson County

Address	Freels Bend Study Area Melton Lake Oak Ridge
AQSID	47-001-0101
CBSA	28940
Lat, Lon	35.965504, -84.22319
Parameter Code	44201
Parameter Name	O_3
Monitor Type	SLAMS
POC	1
Int	W
Collection Frequency	Hourly
Method	087
FRM/FEM Instrument	Model T400 Ozone Analyzer
Analysis	Ultraviolet Absorption
Ref Mtd ID	EQOA-0992-087
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Urban Scale
Land Use Type	Forest
Location Setting	Rural

The Freels Bend site is in Anderson County, Tennessee and currently supports ambient air monitoring for ozone. The Freels Bend site was initially established in 1992 and is located west of Knoxville and southeast of Oak Ridge, Tennessee. This site is an upwind site from the core Knoxville MSA. This site serves in assessing upwind ozone levels entering the Knoxville area. This site was determined to remain in operation over five years (2024 through 2028). The Knoxville MSA has six ozone sites and is required to have only two. This site is also employed in the air quality index (AQI) forecasting program and currently is attaining the standards for ozone.

This site previously monitored for SO_2 in addition to ozone but due to changes in SO_2 monitoring requirements, TDEC DAPC ended SO_2 monitoring on December 31, 2019.

Maryville – Blount County

Address	2007 Sequoyah Avenue Maryville TN 37803
AQSID	47-009-0011
CBSA	28940
Lat, Lon	35.768847, -83.942152
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SPM
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022 FEM
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban

The Maryville site is in Blount County, Tennessee and currently supports ambient air monitoring for fine particulate matter. This site is located south of Knoxville and northwest of the GSMNP. This site is an upwind site from the core Knoxville MSA. The Maryville $PM_{2.5}$ monitoring site began on May 1, 2000, as a part of the original $PM_{2.5}$ state network. Because of the importance this site serves in assessing the upwind $PM_{2.5}$ levels entering the Knoxville area, this site was determined to remain in operation over five years (2024 through 2028). The Knoxville MSA has four $PM_{2.5}$ SLAMS sites and is only required to have one to meet the minimum requirements. This site is also employed in the AQI forecasting program and is used to help assess impacts from precursor transport into Tennessee from Georgia and North Carolina.

Dyersburg – Dyer County

Address	175-B Greenwood Street, Dyersburg TN 38024
AQSID	47-045-0004
CBSA	20540
Lat, Lon	36.05266, -89.382157
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SLAMS
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban

The Dyersburg site is in Dyer County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located northwest of Jackson and north-northeast of Memphis, Tennessee. This site is downwind from the core Memphis MSA. Monitoring for $PM_{2.5}$ began at the Dyersburg site on August 22, 1998, as a part of the original $PM_{2.5}$ state network. Because of the importance this site serves in assessing the $PM_{2.5}$ levels outside of the Memphis area, this site was determined to remain in operation over five years (2024 through 2028). This site is also employed in the AQI forecasting program and is used to help assess impacts from precursor transport into Tennessee from adjacent states.

New Market – Jefferson County

Address	Forester Rd, New Market, TN 37820
AQSID	47-089-0002
CBSA	34100
Lat, Lon	36.105629, -83.602077
Parameter Code	44201
Parameter Name	O_3
Monitor Type	SLAMS
POC	1
Int	W
Collection Frequency	Hourly
Method	087
FRM/FEM Instrument	Model T400 Ozone Analyzer
Analysis	Ultraviolet Absorption
Ref Mtd ID	EQOA-0992-087
Monitor Objective	Max Ozone Concentration
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Agricultural
Location Setting	Rural

The New Market site is in Jefferson County, Tennessee and currently supports ambient air monitoring for ozone. The site is located east-northeast of Knoxville and west-southwest of Morristown, Tennessee, downwind from the core Knoxville MSA and within the Morristown MSA. Ozone monitoring began at the New Market site on March 1, 1999, and meets the requirement for having one ozone site in the Morristown MSA. This site is used with the ozone AQI forecasting program for verification and to help address transport downwind of the Knoxville MSA. Because of the importance this site serves in assessing ozone levels outside and downwind of the Knoxville area, this site was determined to remain in operation over five years (2024 through 2028).

Loretto – Lawrence County

Address	60 Busby Rd, Loretto, TN 38469
AQSID	47-099-0003
CBSA	29980
Lat, Lon	35.116878, -87.419725
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SLAMS
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Upwind background, population exposure
Dominant Source	Area
Measurement Scale	Regional Scale
Land Use Type	Agricultural
Location Setting	Rural

The Loretto ambient air monitoring site is in Lawrence County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located on the southern border of Tennessee, north of Alabama. The site is southwest of Nashville and southeast of Jackson, Tennessee. This site is part of the Nashville combined statistical area (CSA) and is in the Lawrenceburg micropolitan area (CBSA) in Tennessee. Loretto $PM_{2.5}$ ambient air monitoring began on January 14, 2019 and replaced the original ambient air $PM_{2.5}$ monitoring state site location at 355 Busby Rd, Loretto, TN 38469. The Loretto ambient air monitoring site is part of the $PM_{2.5}$ AQI forecasting program and serves as a background ambient air $PM_{2.5}$ monitoring site. It was determined to remain in operation over five years (2024 through 2028).

Loudon – Loudon County

Address	2175 Roberts Road, Loudon, TN 37774		
AQSID	47-105-0109		
CBSA	28940		
Lat, Lon	35.721095, -84.343035		
Parameter Code	44201	88101	88101
Parameter Name	O_3	$PM_{2.5}$ Continuous	$PM_{2.5}$ Continuous
Monitor Type	SLAMS	SLAMS	SLAMS
POC	1	3 (Primary)	4 (Collocated)
Int	W	1	1
Year	2014	2017	2018
Collection Frequency	Hourly	Hourly	Hourly
Method	087	209	209
FRM/FEM Instrument	Model T400 Ozone Analyzer	Met One BAM 1022	Met One BAM 1022
Analysis	Ultraviolet Absorption	Real Time Beta Attenuation Mass Monitor	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQOA-0992-087	EQPM-1013-209	EQPM-1013-209
Monitor Objective	Population Exposure	Population Exposure	Population Exposure
Dominant Source	Area		
Measurement Scale	Neighborhood		
Land Use Type	Residential		
Location Setting	Suburban		

The Loudon site is located at 2175 Roberts Road, in Loudon County, TN 37774. The Loudon site supports ambient air monitoring for $PM_{2.5}$ and O_3. It is located southwest of Knoxville and northeast of Chattanooga. This site is upwind of the Knoxville MSA and downwind from the Chattanooga MSA. Monitoring for $PM_{2.5}$ began at the Loudon site on August 1, 2003, as a part of a Loudon air quality study and complaint investigation. Ozone monitoring began at the Loudon site in March of 2004. The Loudon site is serving as one of two collocated $PM_{2.5}$ ambient air monitoring sites. Monitoring at this site is used by the AQI forecasting program for verification for the Knoxville MSA and was determined to remain in operation over five years (2024 through 2028).

Athens – McMinn County

Address	Saint Mark AME Zion Church: 707 North Jackson St, Athens, TN 37303
AQSID	47-107-1002
CBSA	11940
Lat, Lon	35.450115, -84.596195
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SPM
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Commercial
Location Setting	Urban and Center City

The Athens site is in McMinn County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located northeast of Chattanooga and southwest of Knoxville, Tennessee downwind from the Chattanooga MSA, located in the Athens micropolitan area. $PM_{2.5}$ monitoring began at the Athens site on February 3, 2000, as a part of the original $PM_{2.5}$ state network. The FEM continuous $PM_{2.5}$ sampler replaced the FRM sampler on July 1, 2017 and is part of the $PM_{2.5}$ AQI forecasting program. This site serves to quantify air quality in this developing area of the state and was determined to remain in operation for five years (2024 through 2028).

Jackson – Madison County

Address	North Park Soccer Complex, 210 Demonbreun Drive, Jackson, TN 38305
AQSID	47-113-0010
CBSA	27180
Lat, Lon	35.705319, -88.81964
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SLAMS
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban

The Jackson site is in Madison County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located northeast of Memphis, southeast of Dyersburg and is part of the Jackson MSA in Tennessee. Monitoring for $PM_{2.5}$ began at the new Jackson site on March 26, 2019, and replaces the original Jackson ambient air $PM_{2.5}$ monitoring state site location at 1371-A North Parkway, Jackson, TN 38301. The Jackson MSA has a single FEM continuous $PM_{2.5}$ sampler and is a supplemental SLAMS $PM_{2.5}$ site. This site was determined to remain in operation over five years (2024 through 2028) primarily because it provides valuable upwind $PM_{2.5}$ data for the Nashville AQI forecast.

Columbia – Maury County

Address	1600 Nashville Hwy, Columbia, TN
AQSID	47-119-2007
CBSA	34980
Lat, Lon	35.65188, -87.0096
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SPM
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Commercial
Location Setting	Urban and Center City

The Columbia site is in Maury County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located south-southwest of Nashville and northwest of Lewisburg, Tennessee. This site is located upwind, within the Nashville MSA. $PM_{2.5}$ monitoring began at the Columbia site on December 25, 1998, as a part of the original $PM_{2.5}$ state network. This site assists with the $PM_{2.5}$ AQI forecasting program. The FEM continuous $PM_{2.5}$ sampler replaced the FRM sampler on July 1, 2017. This site was determined to remain in operation over five years (2024 through 2028) primarily because it is the only $PM_{2.5}$ site in this region.

Clarksville – Montgomery County

Address	1200 West Creek Coyote Trail, Clarksville, TN
AQSID	47-125-2001
CBSA	17300
Lat, Lon	36.611411, -87.384666
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SLAMS
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban

The Clarksville site is in Montgomery County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located within the Clarksville city limits northwest of Nashville, Tennessee, and is located within the Clarksville, TN-KY MSA. Monitoring for $PM_{2.5}$ at 1200 West Creek Coyote Trail, Clarksville, TN began on April 3, 2019. It replaces the original Clarksville ambient air $PM_{2.5}$ monitoring site location at 1514 Golf Club Ln, Clarksville, TN 37043. This site assists with the $PM_{2.5}$ AQI forecasting program. The Clarksville MSA has a single FEM continuous $PM_{2.5}$ sampler that is a supplemental SLAMS $PM_{2.5}$ site for the MSA. The new site will remain in operation over five years (2024 through 2028) primarily because it is the only continuous $PM_{2.5}$ site in the MSA.

Cookeville – Putnam County

Address	630 East 20th Street, Cookeville TN 38501
AQSID	47-141-0005
CBSA	18260
Lat, Lon	36.185702, -85.492107
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SPM
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban

The Cookeville site is in Putnam County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is located east of Nashville, on the Highland Rim, just west of the Cumberland Plateau. It is not located in or near an MSA but is within the largest micropolitan statistical area in the state. $PM_{2.5}$ monitoring began at the Cookeville site on August 15, 2006, after the site was relocated. This site was determined to remain in operation over five years (2024 through 2028) primarily because it is the only $PM_{2.5}$ site in this region.

Harriman – Roane County

Address	Harriman High: 1002 N. Roane St., Harriman, TN 37748
AQSID	47-145-0004
CBSA	28940
Lat, Lon	35.939078, -84.542802
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SPM
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Urban
Land Use Type	Industrial
Location Setting	Suburban

The Harriman site is in Roane County, Tennessee and currently supports air monitoring for $PM_{2.5}$. This site is located west of Knoxville and west-southwest of Oak Ridge, Tennessee. It is upwind from the Knoxville MSA. $PM_{2.5}$ monitoring began at the Harriman site on January 1, 1998, as a part of the original $PM_{2.5}$ state network. This site is also part of the $PM_{2.5}$ AQI forecasting program. This site was determined to remain in operation over five years (2024 through 2028). The Knoxville MSA has four operating $PM_{2.5}$ SLAMS sites and is required to have one $PM_{2.5}$ monitoring site.

Kingsport ($PM_{2.5}$) – Sullivan County

Address	1649 D Street Kingsport TN 37664
AQSID	47-163-1007
CBSA	28700
Lat, Lon	36.538761, -82.521599
Parameter Code	88101
Parameter Name	$PM_{2.5}$ Continuous
Monitor Type	SLAMS
POC	3
Int	1
Collection Frequency	Hourly
Method	209
FRM/FEM Instrument	Met One BAM 1022
Analysis	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQPM-1013-209
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Urban
Land Use Type	Residential
Location Setting	Suburban

The Kingsport site is in Sullivan County, Tennessee and currently supports ambient air monitoring for $PM_{2.5}$. This site is in the far northeast corner of the state and is south of the state of Virginia. This site is upwind of Bristol, TN-VA and located within the Kingsport-Bristol-Bristol, Tennessee-Virginia MSA, in the Kingsport city limits. $PM_{2.5}$ monitoring began at the Kingsport site on October 1, 1998, as a part of the original $PM_{2.5}$ state network. It is also part of the $PM_{2.5}$ AQI forecasting program. The Kingsport MSA has a single FEM continuous $PM_{2.5}$ sampler and is a supplemental SLAMS $PM_{2.5}$ site for the MSA. This site was determined to remain in operation over five years (2024 through 2028) primarily because it is the only $PM_{2.5}$ site in this region.

Blountville – Sullivan County

Address	Indian Springs School Shawnee Drive Blountville, TN 37664
AQSID	47-163-2002
CBSA	28700
Lat, Lon	36.541365, -82.424555
Parameter Code	44201
Parameter Name	O_3
Monitor Type	SLAMS
POC	1
Int	W
Collection Frequency	Hourly
Method	087
FRM/FEM Instrument	Model T400 Ozone Analyzer
Analysis	Ultraviolet Absorption
Ref Mtd ID	EQOA-0992-087
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Rural

The Blountville site is in Sullivan County, Tennessee and currently supports ambient air monitoring for ozone. It is located east of Kingsport, near Blountville, TN. This site is downwind from the city of Kingsport. Monitoring for ozone at the Blountville site began January 1, 1980, and is used with the ozone AQI forecasting program for verification and to help address the ozone impacts in the Kingsport-Bristol-Bristol Tennessee-Virginia and Johnson City MSAs. The Kingsport MSA has two ambient air ozone sites operating and is required to have only one ambient air ozone site. This site was determined to remain in operation over five years (2024 through 2028) primarily because of its location within the Kingsport-Bristol-Bristol MSA.

Kingsport O_3 – Sullivan County

Address	3301 Bloomingdale Rd. Kingsport TN 37660
AQSID	47-163-2003
County Name	Sullivan
CBSA	28700
Lat, Lon	36.58211, -82.485742
Parameter Code	44201
Parameter Name	O_3
Monitor Type	SLAMS
POC	1
Int	W
Collection Frequency	Hourly
Method	087
FRM/FEM Instrument	Model T400 Ozone Analyzer
Analysis	Ultraviolet Absorption
Ref Mtd ID	EQOA-0992-087
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Residential
Location Setting	Suburban

The Kingsport site is in Sullivan County, Tennessee and currently supports ambient air monitoring for ozone. It is in the far northeast corner of the state and is south of the State of Virginia near the Tennessee-Virginia line. This site is upwind of Gate City, VA and downwind of the Kingsport city limits. Kingsport is also a part of the Kingsport-Bristol-Bristol Tennessee-Virginia MSA and provides data for the AQI forecasting program. Ozone monitoring began at the Kingsport site on April 1, 1995. The Kingsport MSA has two ambient air ozone sites operating and is required to have only one ambient air ozone site. This site was determined to remain in operation over five years (2024 through 2028) primarily because of its location within the Kingsport-Bristol-Bristol MSA.

Exide – Sullivan County

Address	364 Exide Drive, Bristol TN 37620	
AQSID	47-163-3004	
County Name	Sullivan	
CBSA	28700	
Lat, Lon	36.52443, -82.273296	
Parameter Code	14129	14129
Parameter Name	Pb	Pb
Monitor Type	SLAMS	SLAMS
POC	1 (Primary)	2 (Collocated)
Int	7	7
Collection Frequency	1 In 6	1 In 6
Method	193	193
FRM/FEM Instrument	Pb-TSP/ICP Spectra (ICP-MS)	Pb-TSP/ICP Spectra (ICP-MS)
Analysis	Inductively Coupled Plasma-Mass Spectrometry Acid Filter Extract with Hot Nitric Acid	Inductively Coupled Plasma-Mass Spectrometry Acid Filter Extract with Hot Nitric Acid
Ref Mtd ID	EQL-0512-201	EQL-0512-201
Monitor Objective	Source Oriented	
Dominant Source	Point	
Measurement Scale	Urban Scale	
Land Use Type	Industrial	
Location Setting	Urban and Center City	

The Exide site is in Sullivan County, Tennessee and currently supports ambient air monitoring for lead. It is located east of Kingsport and northeast of Blountville on the Tennessee-Virginia state line. This site is downwind from Johnson City and Blountville and is in the Kingsport Bristol MSA. Lead monitoring began at the Exide site on January 1, 2010, to verify lead NAAQS compliance at a lead battery plant. This area is now classified as attainment for the 2008 lead NAAQS. The former lead source shut down in 2013, surrendered its air permits on November 3, 2014, and has removed all lead processing emission sources. Following a bankruptcy filing in May 2020, the Bristol Exide property was transferred to an Environmental Response Trust (ERT) in October 2020. The ERT then transferred the title to Phoenix Investments, LLC in March 2021 following a Limited Site Investigation. The Limited Site Investigation conducted by Key Engineering Group and Strata Group, of Lexington, Kentucky included soil sampling conducted outside the former lead battery plant by taking a total 18 soil samples from depths between 0 to 15.5 feet below ground. The soil analysis concluded that the historical Exide operations did not result in a release to the soils outside the building. In April 2021, a cleanup of the interior was initiated and is ongoing. No other existing lead emitting sources are in the area around the monitor. The site is expected to remain in operation in 2024.

Ross N Robinson – Sullivan County

Address	Wilburn Drive, Kingsport, TN 37664
AQSID	47-163-6001
County Name	Sullivan
CBSA	28700
Lat, Lon	36.532616, -82.516306
Parameter Code	42401
Parameter Name	SO_2
Monitor Type	SLAMS
POC	1
Int	1
Collection Frequency	Hourly
Method	100
FRM/FEM Instrument	Teledyne T100 SO_2 Analyzer
Analysis	Ultraviolet Fluorescence
Ref Mtd ID	EQSA-0495-100
Monitor Objective	Source Oriented
Dominant Source	Point
Measurement Scale	Urban Scale
Land Use Type	Residential
Location Setting	Suburban

The Ross N Robinson site is in Sullivan County, Tennessee and currently supports ambient air monitoring for SO_2. The Ross N Robinson monitor is located within the 3-km SO_2 nonattainment area surrounding the Tennessee Eastman Chemical Plant and became operational on July 21, 2016. This monitoring site is operated to satisfy the PWEI requirements for the Kingsport, TN CBSA and secondly, as a part of a network of four SO_2 monitoring sites designed to characterize the maximum expected concentrations in the nonattainment area.

Skyland Dr. – Sullivan County

Address	Skyland Drive at Bagwell St., Kingsport, TN
AQSID	47-163-6002
County Name	Sullivan
CBSA	28700
Lat, Lon	36.521066, -82.502454
Parameter Code	42401
Parameter Name	SO_2
Monitor Type	SLAMS
POC	1
Int	1
Collection Frequency	Hourly
Method	100
FRM/FEM Instrument	Teledyne T100 SO_2 Analyzer
Analysis	Ultraviolet Fluorescence
Ref Mtd ID	EQSA-0495-100
Monitor Objective	Source Oriented
Dominant Source	Point
Measurement Scale	Urban Scale
Land Use Type	Residential
Location Setting	Suburban

The Skyland Drive ambient air monitoring site is in Sullivan County, Tennessee and currently supports ambient air monitoring for SO_2. The site is located within the 3-km SO_2 nonattainment area surrounding the Tennessee Eastman Chemical Plant and became operational on September 1, 2016. The site was established to characterize the maximum expected concentrations in the nonattainment area. This site is one of 4 sites in the Kingsport, TN CBSA designed to characterize the maximum expected concentrations in the nonattainment area.

Andrew Johnson Elementary School – Sullivan County

Address	1001 Ormond Drive, Kingsport, TN
AQSID	47-163-6003
County Name	Sullivan
CBSA	28700
Lat, Lon	Lat: 36.526359; Long: -82.528677
Parameter Code	42401
Parameter Name	SO_2
Monitor Type	SLAMS
POC	1
Int	1
Collection Frequency	Hourly
Method	100
FRM/FEM Instrument	Teledyne T100 SO_2 Analyzer
Analysis	Ultraviolet Fluorescence
Ref Mtd ID	EQSA-0495-100
Monitor Objective	Source Oriented
Dominant Source	Point
Measurement Scale	Urban Scale
Land Use Type	Residential
Location Setting	Suburban

The Andrew Johnson Elementary School ambient air monitoring site is in Sullivan County, Tennessee and currently supports ambient air monitoring for SO_2. The site is located within the 3-km SO_2 nonattainment area surrounding the Tennessee Eastman Chemical Plant. This site began monitoring for SO_2 on January 1, 2019. This site is one of four sites in the Kingsport, TN CBSA designed to characterize the maximum expected concentrations in the nonattainment area.

Happy Hill – Sullivan County

Address	2105 Happy Hill Road, Kingsport, TN
AQSID	47-163-6004
County Name	Sullivan
CBSA	28700
Lat, Lon	Lat: 36.513026; Long: -82.550498
Parameter Code	42401
Parameter Name	SO_2
Monitor Type	SLAMS
POC	1
Int	1
Collection Frequency	Hourly
Method	100
FRM/FEM Instrument	API Model 100 E SO_2 Analyzer
Analysis	Ultraviolet Fluorescence
Ref Mtd ID	EQSA-0495-100
Monitor Objective	Source Oriented
Dominant Source	Point
Measurement Scale	Urban Scale
Land Use Type	Residential
Location Setting	Suburban

The Happy Hill Road ambient air monitoring site is in Sullivan County, Tennessee and currently supports ambient air monitoring for SO_2. The site is located within the 3-km SO_2 nonattainment area surrounding the Tennessee Eastman Chemical Plant. The Happy Hill Road site was established and operational on October 10, 2018, but officially began collecting data for NAAQS comparison on January 1, 2019. This site is one of four sites in the Kingsport, TN CBSA designed to characterize the maximum expected concentrations in the nonattainment area.

Hendersonville - Sumner County

Address	Rockland Recreational Area, Old Hickory Dam, Hendersonville, TN		
AQSID	47-165-0007		
CBSA	34980		
Lat	36.29756, -86.653137		
Parameter Code	44201	88101	88101
Parameter Name	O_3	$PM_{2.5}$	$PM_{2.5}$ Continuous
Monitor Type	SLAMS	SLAMS	SLAMS
POC	1	1 (Collocated)	3 (Primary)
Int	W	7	1
Collection Frequency	Hourly	1 in 3	Hourly
Method	087	118	209
FRM/FEM Instrument	Model T400 Ozone Analyzer	R&P Model 2025/Thermo Scientific 2025i	Met One BAM 1022
Analysis	Ultraviolet Absorption	Gravimetric	Real Time Beta Attenuation Mass Monitor
Ref Mtd ID	EQOA-0992-087	RFPS-1006-145	EQPM-1013-209
Monitor Objective	Highest Conc	Population Exposure	
Dominant Source	Area	Area	
Measurement Scale	Urban	Urban	
Land Use Type	Industrial	Industrial	
Location Setting	Rural	Rural	

The Hendersonville site is in Sumner County, Tennessee and currently supports ambient air monitoring for ozone and $PM_{2.5}$. This site is located northeast of Nashville and west-southwest of Gallatin, Tennessee. This site is downwind from Nashville and is considered part of the Nashville MSA. Ozone monitoring began on January 1, 1973, and is conducted for the ozone AQI forecasting program for verification and to help address NAAQS compliance in the Nashville MSA. Monitoring for $PM_{2.5}$ at the Hendersonville site began on October 1, 1998, as a part of the original $PM_{2.5}$ state network. This site is also part of the PM fine AQI forecasting program. An FEM continuous $PM_{2.5}$ sampler replaced the collocated FRM sampler on January 1, 2018. This site was determined to remain in operation over five years (2024 through 2028) primarily because it is the ozone DV site for the Nashville MSA and is downwind from the Nashville fine particulate precursor sources. The Nashville MSA has five ozone monitors operating and is only required to have two.

Fairview –Williamson County

Address	Fairview Middle School: 7200 Cumberland Dr, Fairview, TN
AQSID	47-187-0106
CBSA	34980
Lat, Lon	35.949765, -87.138246
Parameter Code	44201
Parameter Name	O_3
Monitor Type	SLAMS
POC	1
Int	W
Collection Frequency	Hourly
Method	087
FRM/FEM Instrument	Model T400 Ozone Analyzer
Analysis	Ultraviolet Absorption
Ref Mtd ID	EQOA-0992-087
Monitor Objective	Population Exposure
Dominant Source	Area
Measurement Scale	Urban Scale
Land Use Type	Agricultural
Location Setting	Rural

The Fairview site is in Williamson County, Tennessee and currently supports ambient air monitoring for ozone. It is located southwest of Nashville and northwest of Franklin, Tennessee. This site is upwind from the core Nashville MSA. Ozone monitoring at the Fairview site began on October 30, 2001, is conducted for the ozone AQI forecasting program and to help address upwind ozone concentrations entering the Nashville MSA. The Nashville MSA has five ozone sites operating and is only required to have two ozone sites. Due to this site's importance in assessing the area ozone levels outside and upwind of the Nashville area, it was determined to remain in operation over five years (2024 through 2028).

Cedars of Lebanon – Wilson County

Address	Cedar Forest Rd., Lebanon, TN
AQSID	47-189-0103
CBSA	34980
Lat, Lon	36.060895, -86.286291
Parameter Code	44201
Parameter Name	O_3
Monitor Type	SLAMS
POC	1
Int	W
Collection Frequency	Hourly
Method	087
FRM/FEM Instrument	Model T400 Ozone Analyzer
Analysis	Ultraviolet Absorption
Ref Mtd ID	EQOA-0992-087
Monitor Objective	Highest Concentration
Dominant Source	Area
Measurement Scale	Urban Scale
Land Use Type	Forest
Location Setting	Rural

The Cedars site is in Wilson County, Tennessee and currently supports ambient air monitoring for ozone. This site is located east of Nashville and north of Murfreesboro, Tennessee. This site is downwind from Murfreesboro, Tennessee and is located within the Nashville MSA. The Cedars site began monitoring for ozone on May 1, 1998, and supports the ozone AQI forecasting program for verification and to help address downwind ozone levels in the Nashville MSA. The Nashville MSA has five ozone sites operating and is only required to have two ozone sites. Because of the importance that this site serves in assessing the area ozone levels outside and downwind of the Nashville area, this site was determined to remain in operation over five years (2024 through 2028).

National Park Service Monitors

The NPS air monitoring sites are included as a courtesy to the readers of the TDEC DAPC 2021 AMNP. These sites are included because they are collecting, and reporting data previously used for attainment decisions in Tennessee and that can be used for future determinations. The NPS sites are not a part of the TDEC DAPC air monitoring networks and TDEC DAPC does not report their data to the EPA AQS data systems; however, these data may continue to be used to support air quality forecasting by TDEC in the area.

Cades Cove – Blount County (GSM NP)

Address	Great Smoky Mountains NP - Cades Cove
AQSID	47-009-0102
CBSA	28940
Lat, Lon	35.603056, -83.783611
Parameter Code	44201
Parameter Name	O_3
Monitor Type	Non-EPA Federal
POC	1
Int	W
Collection Frequency	Hourly
Method	53
FRM/FEM Instrument	Thermo Electron 49
Analysis	Ultraviolet
Ref Mtd ID	EQOA-0880-047
Monitor Objective	Highest Concentration
Dominant Source	0
Measurement Scale	Regional Scale
Land Use Type	Forest
Location Setting	Rural

The Cades Cove site is in Blount County, Tennessee and currently supports ambient air monitoring for ozone and meteorological parameters. The Cades Cove site was initially established on May 1, 1994 and is located within the Tennessee portion of the Great Smoky Mountains National Park. This site is within and southeast of the Knoxville MSA. It is used with the ozone AQI forecasting program for verification and to help address ozone levels found in the GSMNP. It is the responsibility of the NPS to operate, maintain, and conduct all QA/QC activities at this site in accordance with 40 CFR Part 58. The National Park Service is responsible for verifying, validating, and certifying the ozone data collected.

Look Rock – Blount County (GSM NP)

Address	Great Smoky Mountains NP Look Rock	
AQSID	47-009-0101	
CBSA	28940	
Lat, Lon	35.6334799, -83.941605999999993	
Parameter Code	44201	88502
Parameter Name	O_3	$PM_{2.5}$ Continuous
Monitor Type	SLAMS	SPM
POC	1	1
Int	W	1
Collection Frequency	Hourly	Hourly
Method	053	716
FRM/FEM Instrument	Thermo Electron 49	None
Analysis	Ultraviolet	TEOM Gravimetric 50 deg C
Ref Mtd ID	EQOA-0880-047	None
Monitor Objective	General Background	
Dominant Source	0	
Measurement Scale	0	
Land Use Type	Forest	
Location Setting	Rural	

The Look Rock site is in Blount County, Tennessee and currently supports ambient air monitoring for ozone and other pollutants. The Look Rock site was initially established in 1980 and is located within the Tennessee portion of the Great Smoky Mountains National Park. This site is within and southeast of the Knoxville MSA. Ozone monitoring began on July 23, 1998, and $PM_{2.5}$ monitoring began on May 1, 2002. This site is one of two NCore sites in the state and serves as the park's Interagency Monitoring of Protected Visual Environments (IMPROVE). The Look Rock site is used with the PM Fine AQI forecasting program for verification and to help address fine particulate levels found in the GSMNP area. This site is operated and maintained by the NPS. The NPS is responsible for verifying, validating, and certifying the ozone data collected.

Cove Mountain – Sevier Country (GSM NP)

Address	Great Smoky Mountain NP- Cove Mountain
AQSID	47-155-0101
CBSA	42940
Lat, Lon	35.6966669999999, -83.609722
Parameter Code	44201
Parameter Name	O_3
Monitor Type	NON-EPA FEDERAL
POC	1
Int	W
Collection Frequency	Hourly
Method	47
FRM/FEM Instrument	Thermo Electron 49
Analysis	Ultraviolet
Ref Mtd ID	EQOA-0880-047
Monitor Objective	General/Background
Dominant Source	Area
Measurement Scale	Neighborhood
Land Use Type	Forest
Location Setting	Rural

The Cove Mt. site is in Sevier County, Tennessee and currently supports ambient air monitoring for ozone and meteorological parameters. It is located within the Tennessee portion of the Great Smoky Mountains National Park. This site is outside and southeast of the Knoxville MSA. Ozone monitoring began at Cove Mountain site on July 1, 1988. This site is used with the ozone AQI forecasting program for verification and to help address ozone levels found in the GSMNP area. This site is operated and maintained by the NPS. The NPS is responsible for verifying, validating, and certifying the ozone data collected.

Clingman's Dome – Sevier County (GSM NP)

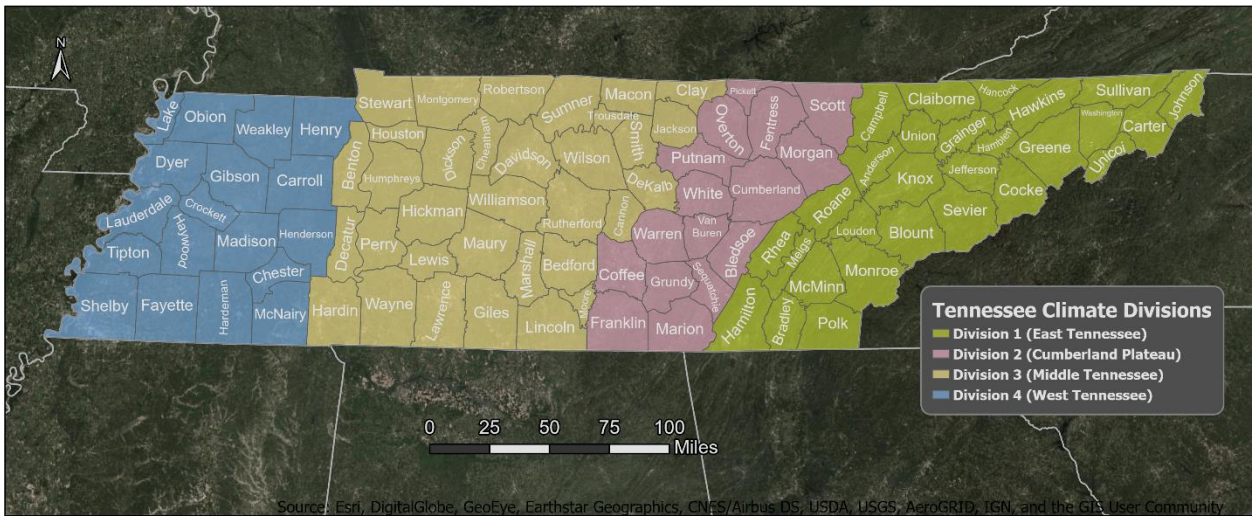
Address	Great Smoky Mountain Np Clingman's Dome
AQSID	47-155-0102
CBSA	42940
Lat, Lon	35.562778, -83.4981
Parameter Code	44201
Parameter Name	O_3
Monitor Type	NON-EPA FEDERAL
POC	1
Int	W
Year	2014
Collection Frequency	Hourly
Method	47
FRM/FEM Instrument	Thermo Electron 49
Analysis	Ultraviolet
Ref Mtd ID	EQOA-0880-47
Monitor Objective	Highest Concentration
Dominant Source	Area
Measurement Scale	Regional Scale
Land Use Type	Forest
Location Setting	Rural

The Clingman's Dome site is in Sevier County, Tennessee and currently supports ambient air monitoring for ozone and meteorological parameters. This site is located within the Tennessee portion of the Great Smoky Mountains National Park. This site is outside and southeast of the Knoxville MSA. The Clingman's Dome site began ozone monitoring on April 1, 1993. This site is used with the ozone AQI forecasting program and to help address ozone levels found in the GSMNP area. This site is located at the highest point inside of Tennessee and is on the border of Tennessee and North Carolina. The elevation of the site poses challenges in maintenance and access as the site is often impacted in the late fall and through-out the winter and spring by excessive snow fall and icing events that prevent access to the site. The ozone data collection season at this site is truncated due to the site access issues in March and April and in some years in October due to early snowfall events. This site is operated and maintained by the NPS. The NPS is responsible for verifying, validating, and certifying the ozone data collected.

Tennessee Geographic Regions, Descriptions and Climate

Tennessee Climate

The following discussion of Tennessee's climate is provided by the Tennessee Climate Office at East Tennessee State University.



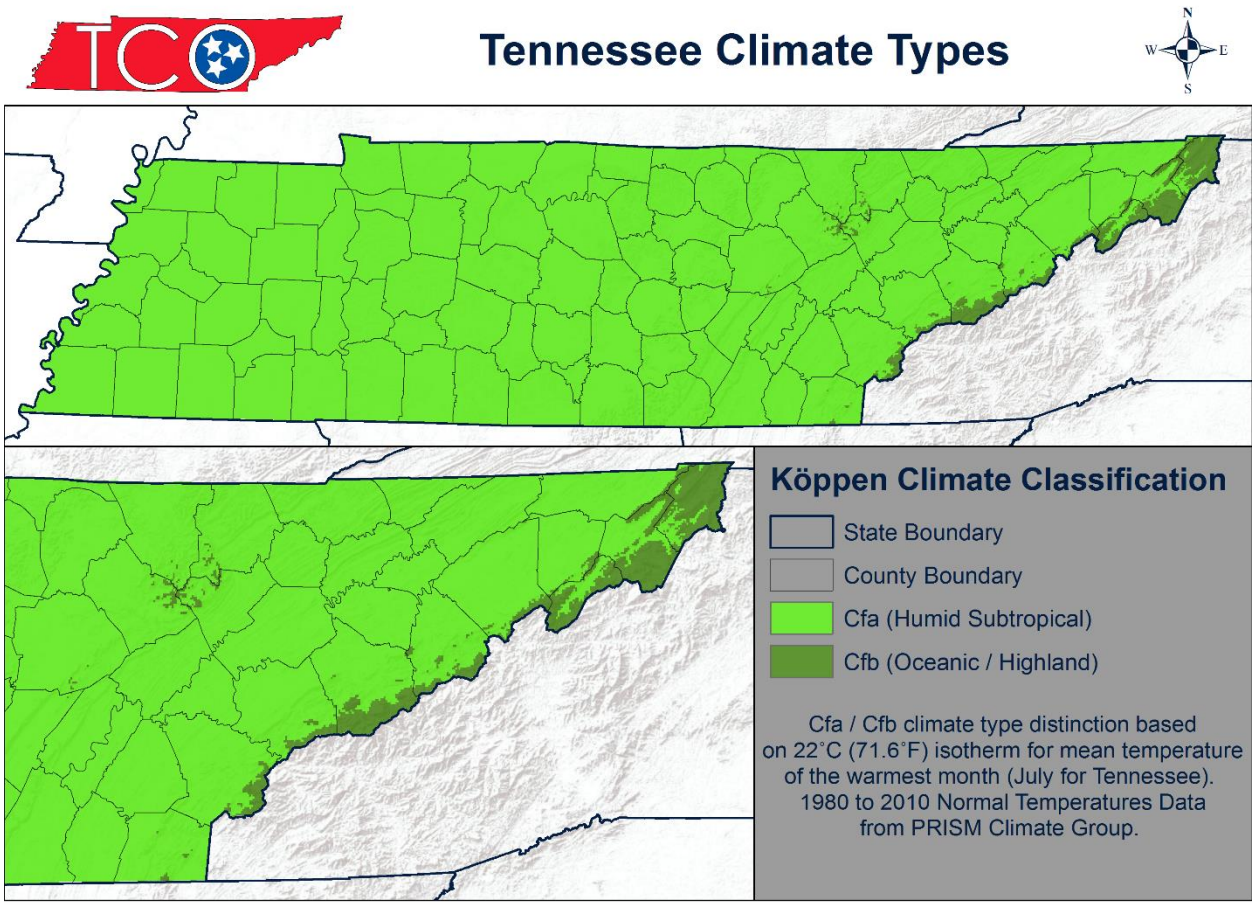
There are 344 climate divisions in the continental United States. Tennessee is divided into four unique climate divisions. Click Here for more information.

Topographic Features - The topography of Tennessee is quite varied, stretching from the lowlands of the Mississippi Valley to the mountain peaks in the east. The westernmost part of the state, between the bluffs overlooking the Mississippi River and western valley of the Tennessee River, is a region of gently rolling plains sloping gradually from 200 to 250 feet in the west to about 600 feet above sea level in the hills overlooking the Tennessee River. This region is defined as Division 4 (West Tennessee). The hilly Highland Rim, in a wide circle touching the Tennessee River Valley in the west and the Cumberland Plateau in the east, together with the enclosed Central Basin make up the whole of Middle Tennessee. The Highland Rim ranges from about 600 feet in elevation along the Tennessee River to 1,000 feet in the east and rises 300 to 400 feet above the Central Basin which is a rolling plain of about 600 feet average elevation, but with a crescent of hills reaching to over 1,000 feet south of Nashville. This region is defined as Division 3 (Middle Tennessee). The Cumberland Plateau, with an average elevation of 2,000 feet extends roughly northeast-southwest across the state in a belt 30 to 50 miles wide, being bounded on the west by the Highland Rim and overlooking the Great Valley of East Tennessee on the east. This region is defined as Division 2 (Cumberland Plateau). The Great Valley, paralleling the Plateau to the west and the Great Smoky Mountains to the east, is a funnel-shaped valley varying in width from about 30 miles in the south to about 90 miles in the north. Within the valley, which slopes from 1,500 feet in the north to 700 feet in the south, is a series of northeast-southwest ridges. Along the Tennessee-North Carolina border lie the Great Smoky Mountains, the most rugged and elevated portion of Tennessee, with numerous peaks from 4,000 to 6,000 feet. This region is defined as Division 4 (East Tennessee).

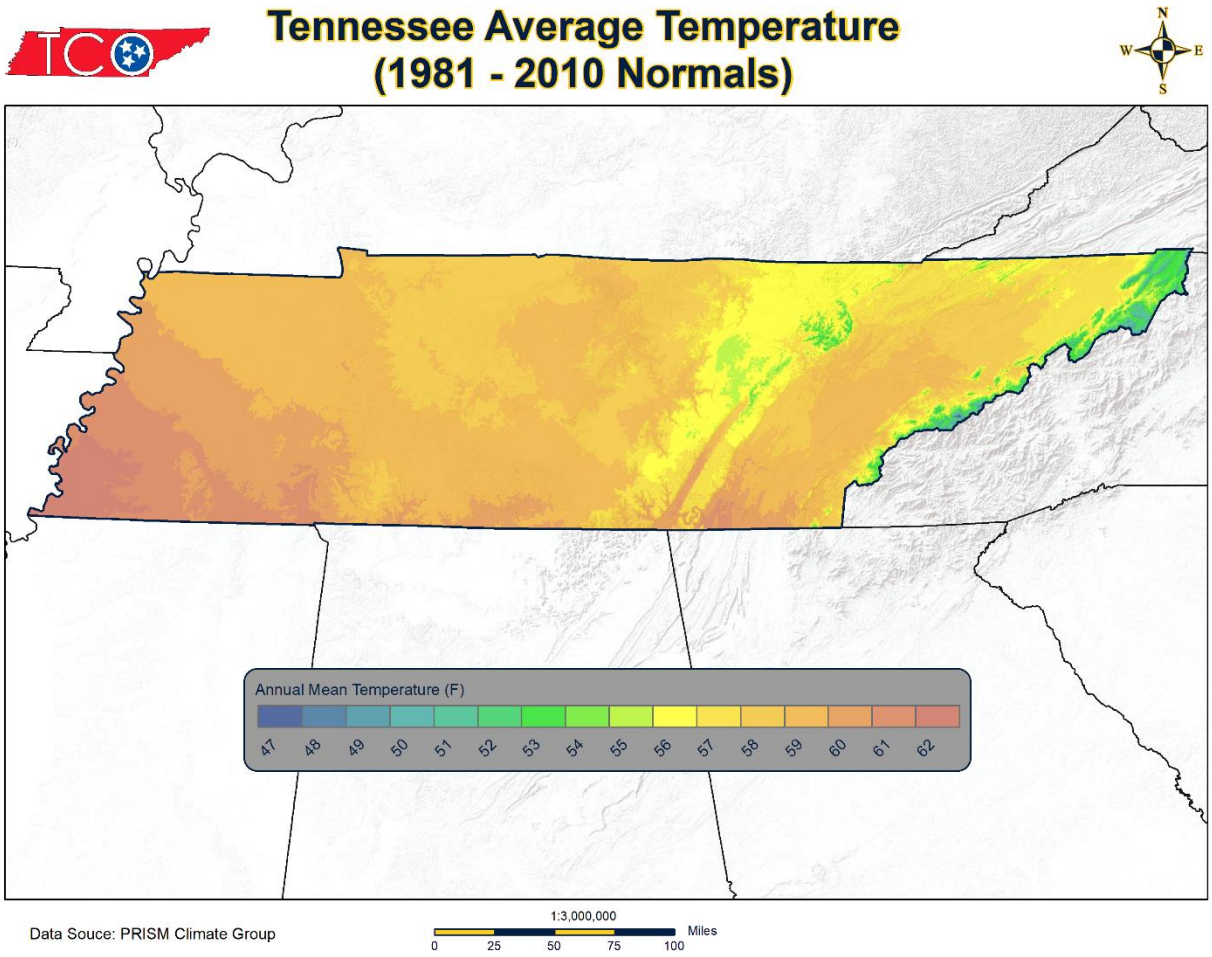
Tennessee, except for a small area east of Chattanooga, lies entirely within the drainage of the Mississippi River system. The extreme western section of the state is drained through several relatively small rivers directly into the Mississippi River. Otherwise, drainage is into either the Cumberland or Tennessee Rivers, both of which flow

northward near the end of their courses to join the Ohio River along the Kentucky-Illinois border. The Cumberland River, which drains north-central portions of Tennessee, rises in the Cumberland Mountains in Kentucky, flows southwestward, then south into Tennessee reaching the Nashville area before tuning northward to re-enter Kentucky. The Tennessee River is formed by the juncture of the Holston and French Broad rivers at Knoxville. It flows southwesterly along the Alabama-Mississippi line, and then flows northward across the state into Kentucky. Besides the headwater streams, other important tributaries include the Clinch, Nolichucky, Watauga, Little Tennessee, Hiawassee, Elk, Duck, Obion, and Hatchie Rivers.

Temperature - Most aspects of the state's climate are related to the widely varying topography within its borders. The decrease of temperature with elevation is quite apparent, amounting to, on average, three degrees Fahrenheit (°F) per 1,000 feet increase in elevation. Thus, higher portions of the state, such as the Cumberland Plateau and the mountains of the east, have lower average temperature than the Great Valley of East Tennessee, which they flank, and other lower parts of the state. In the Great Valley temperature increases from north to south, reaching a value at the south end comparable to that of Middle and West Tennessee where elevation variations are a generally minor consideration. Across the state, the average annual temperature varies from over 62° F in the extreme southwest to near 46° F atop the highest peaks of the east. It is of interest to note that average January temperature atop a 6,000-foot peak in the Great Smoky Mountains (e.g., Mt. LeConte) is equivalent to that in Central Ohio, while average July temperature is comparable to the southern edge of the Hudson Bay in Canada. While most of the state has warm, humid summers and mild winters, this must be qualified to include variations with elevation. Thus, with increasing elevation, summers become cooler and more pleasant while winters become colder with increasing winds and dangerous snowfall events. Most of Tennessee is in the Humid Subtropical climate type, while higher elevations are in the Oceanic/Highland climate type. Extremely small areas over 6,000' in elevation may be considered part of the Humid Continental (Dfb) climate type.



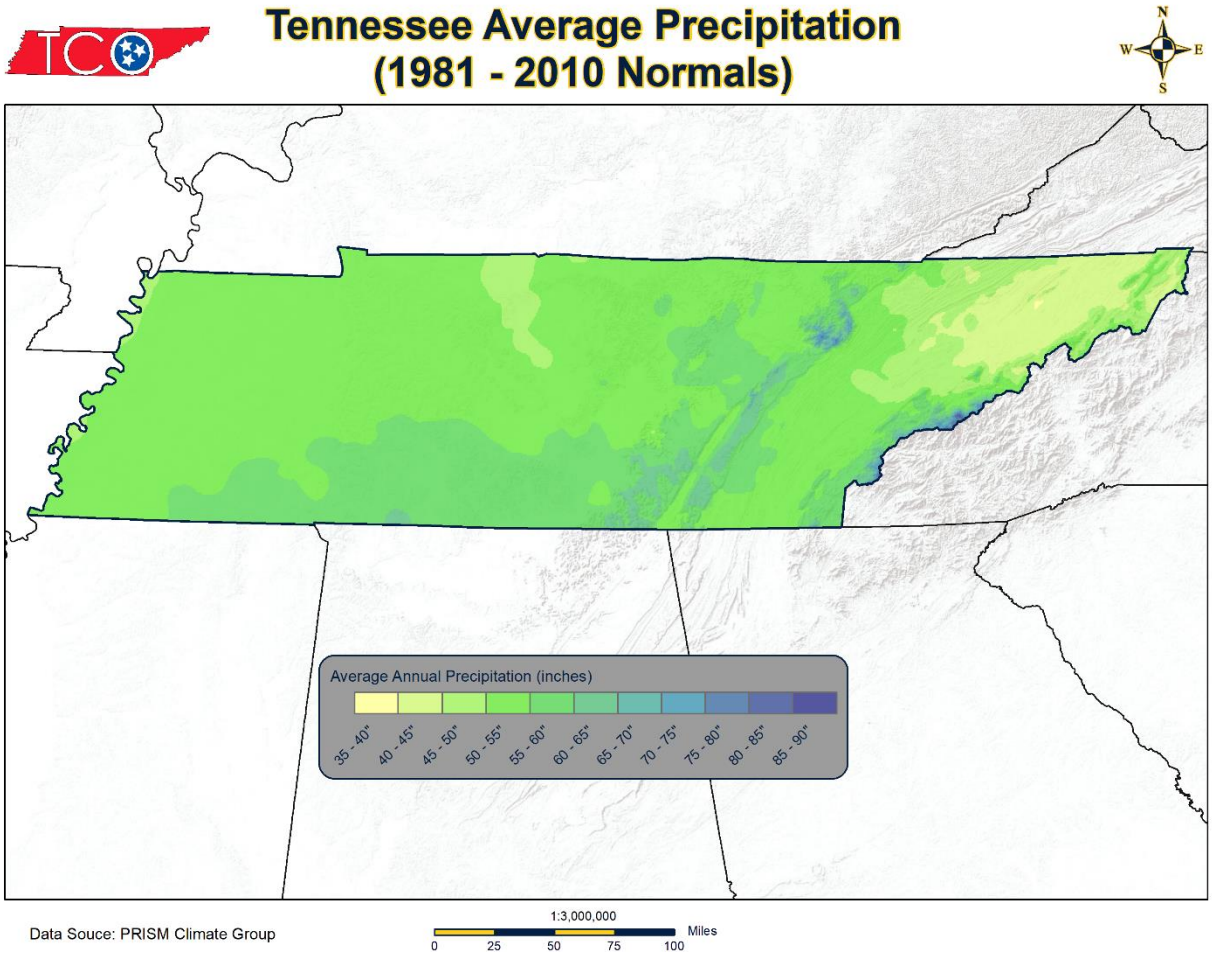
This dependence of temperature on elevation is of considerable importance to a variety of interests. Temperature, together with precipitation, plays an important role in determining what plant and animal life are adaptable to the area. In the Great Smoky Mountains, for example, the variations in elevation from 1,000 to 6,000 feet with attendant variations in temperature contribute to a remarkable variety of plant life. You can explore plant hardiness zones in Tennessee using the USDA Interactive Map. There are currently six zones in Tennessee (5b, 6a, 6b, 7a, 7b, and 8a). The relative coolness of the mountains also contributes to the popularity of that area during the warmer part of the year.



Length of growing season is linked to topography in a way like temperature, varying from an average of 237 days at low-lying Memphis to a near 130 days on the highest mountains in the east. Most of the state is included in the range of 180 to 220 days. Shorter growing seasons than this are confined to the mountains forming the state's eastern border and to the northern part of the Cumberland Plateau. Longer growing seasons are found in counties bordering the Mississippi River, parts of the Central Basin of the Middle Tennessee, and the southern end of the Great Valley of East Tennessee (around Chattanooga).

Precipitation - Since the principal source of moist air for this area is the Gulf of Mexico, there exists a gradual decrease of average precipitation from south to north. This effect is largely obscured, however, by the overruling influence of topography. Air forced to ascend, cools and condenses out a portion of its moisture. Thus, average precipitation in West Tennessee ranges from 46 to 54 inches, increasing from Mississippi bottomlands to the slight hills farther east. In Middle Tennessee, the variation is from a minimum of 45 inches in the Central Basin to 50 to 55 inches in the surrounding hilly Highland Rim. Over the elevated Cumberland Plateau, average annual precipitation is generally from 50 to 55 inches. In contrast, average annual precipitation in the Great Valley of East Tennessee increases from near 40 inches in northern portions to over 50 inches in the south. The northern minimum, lowest for the entire state, results from the shielding influence of the Great Smoky Mountains to the southeast and the Cumberland Plateau to the northwest. The mountainous eastern border of the state is the

wettest, having average annual precipitation ranging up to 80+ inches on the higher, and well-exposed peaks of the Great Smoky Mountains.



Over most of the state, the greatest precipitation occurs during the winter and early spring due to the more frequent passage of large-scale storms over and near the state during those months. A secondary maximum of precipitation occurs in midsummer in response to thunderstorm activity. This is especially pronounced in the mountains of the east where July rainfall exceeds the precipitation of any other month. Lightest precipitation, observed in the fall, is brought about by the prevalence of slow moving, rain suppressing high pressure areas. Although all parts of Tennessee are generally well supplied with precipitation, there occurs on the average one or more prolonged dry spells each year during summer and fall. Studies illustrate the beneficial effects of supplemental irrigation of crops, despite usually bountiful annual precipitation. Irrigation can be especially important during 'flash drought' events, which occur from time to time and can have major agricultural and economic impacts.

Average annual snowfall varies from four to six inches in the southern and western parts of the state and in most of the Great Valley of East Tennessee to more than 10 inches over the northern Cumberland Plateau and the

mountains of the east. Mt. LeConte (6,594'), on average, receives ~75 inches of snowfall each year, although some years receive over 100 inches of snowfall. Over most of the state, due to relatively mild winter temperatures, snow cover rarely persists for more than a few days.

The most important flood season is during the winter and early spring when frequent low-pressure systems bring general rains of high intensity. During this period both widespread flooding and local flash floods can occur. During the summer, heavy thunderstorm rainfalls frequently result in local flash flooding. In the fall, while flood-producing rains are rare, a substantial tropical system on occasion causes serious floods. The numerous dams constructed along the Tennessee and Cumberland rivers are major features in the control of floodwaters in the state.

The dams of the Tennessee and Cumberland River systems and associated lakes, in addition to vastly reducing flood damage have facilitated water transportation, provide abundant low-cost hydroelectric power, and create extensive recreation areas. Fishing, boating, swimming, and camping along the many lakes, together with the several state and national parks/forests/wildlife management areas, make tourism one of the major industries in the state.

Climate and the Economy - Water resources of Tennessee have been a major factor in the state's industrial growth. The bountiful and good quality water supply influenced the location of industry, especially chemical processing plants. Three major waterways, the Mississippi, Cumberland, and Tennessee Rivers, are suitable for commercial traffic. Finally, the availability of low-cost hydroelectric power from the multipurpose dams of the Cumberland and Tennessee rivers and tributaries spurs industry of all types. The principal types of manufacturing products are textile mill products, primary metals, fabricated metals, and lumber products.

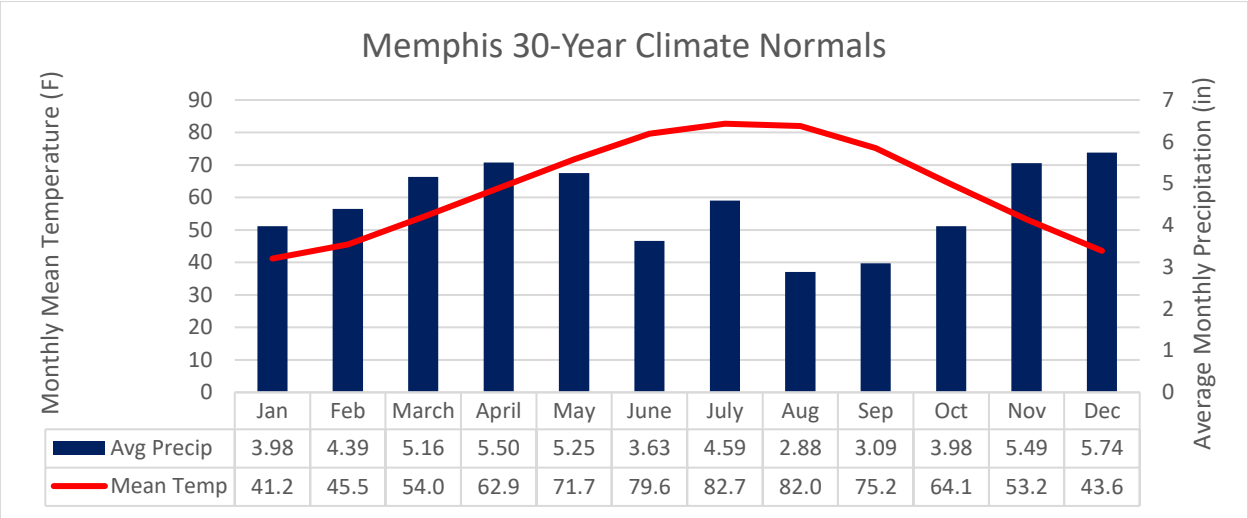
Although surpassed in monetary value by industrial activity, agriculture remains a vital feature of Tennessee's economic life. The wide range of climates and environments in Tennessee, from river bottom to mountaintop, coupled with a wide range of soils, has resulted in many crops that thrive in the state.

Forests represent an additional important segment of Tennessee's natural resources related to the climate of the state. Timberland, containing principally hardwood types, covers approximately one-half of the total area of Tennessee. This has led to a highly diversified woodworking industry and made the area around Memphis the center of production for wood flooring. The temperate climate of the state is very favorable for logging operations, allowing full-scale activity during nine months of the year and to a lesser extent during the winter months.

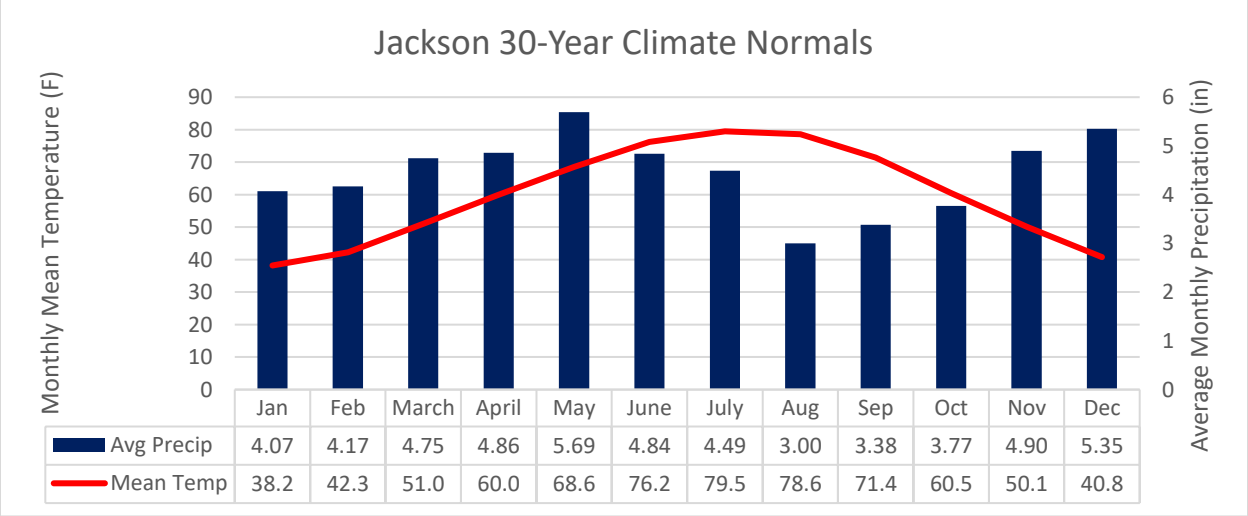
Climate descriptions of Tennessee - Generally, Tennessee has a temperate climate, with warm summers and mild winters. However, the state's varied topography leads to a wide range of climatic conditions.

The warmest parts of the state, with the longest growing season, are the Gulf Coastal Plain, the Central Basin, and the Sequatchie Valley. In the Memphis area in the southwest, the median date of the last killing frost is March 22, and the growing season is about 235 days. Memphis has an annual mean temperature of 63°F (17°C), 41°F (4°C) in January and 83°F (28°C) in July. In the Nashville area, the median date of the last killing frost is April 6, and the growing season lasts about 204 days. Nashville has an annual mean of 59°F (15°C), ranging from 38°F (3°C) in January to 79°F (26°C) in July. In the Knoxville area the median last killing frost is April 6, and the growing season lasts about 211 days. The city's annual mean temperature is 59°F (15°C), with averages of 38°F (3°C) in January and 78°F (26°C) in July. In some parts of the mountainous east, where the temperatures are considerably lower, the growing season is as short as 130 days. To explore additional frost/freeze data Click Here. The record high

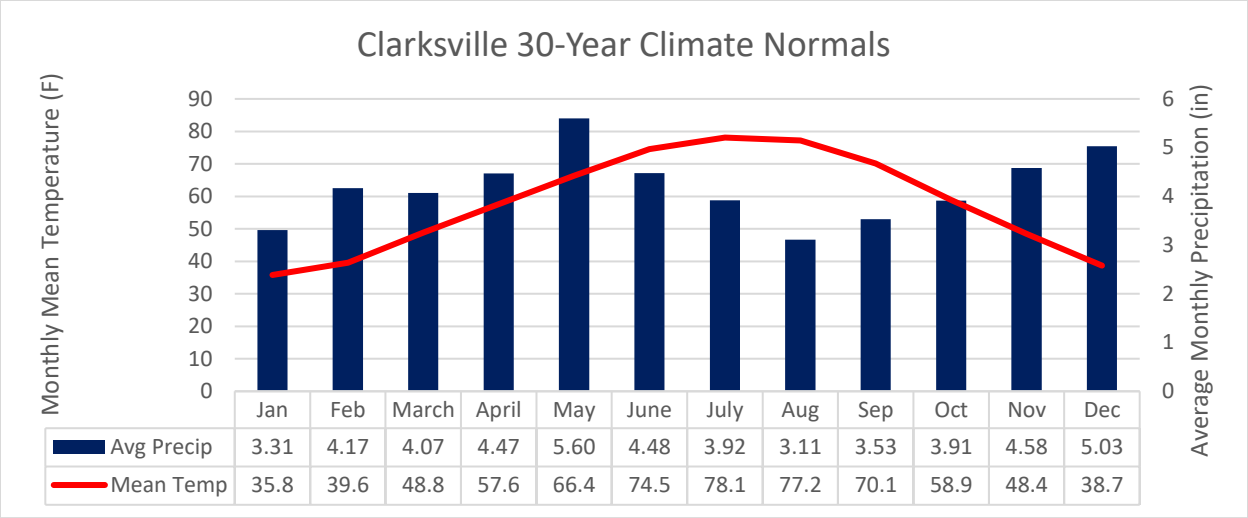
temperature for the state is 113°F (45°C), set at Perryville on 9 August 1930; the record low, –32°F (–36°C), was registered at Mountain City on 30 December 1917. A selection of climographs developed using long-term climate data, where available, can be viewed below. These include Memphis, Jackson, Clarksville, Nashville, Chattanooga, Crossville, Knoxville, and Bristol (the Tri-Cities).



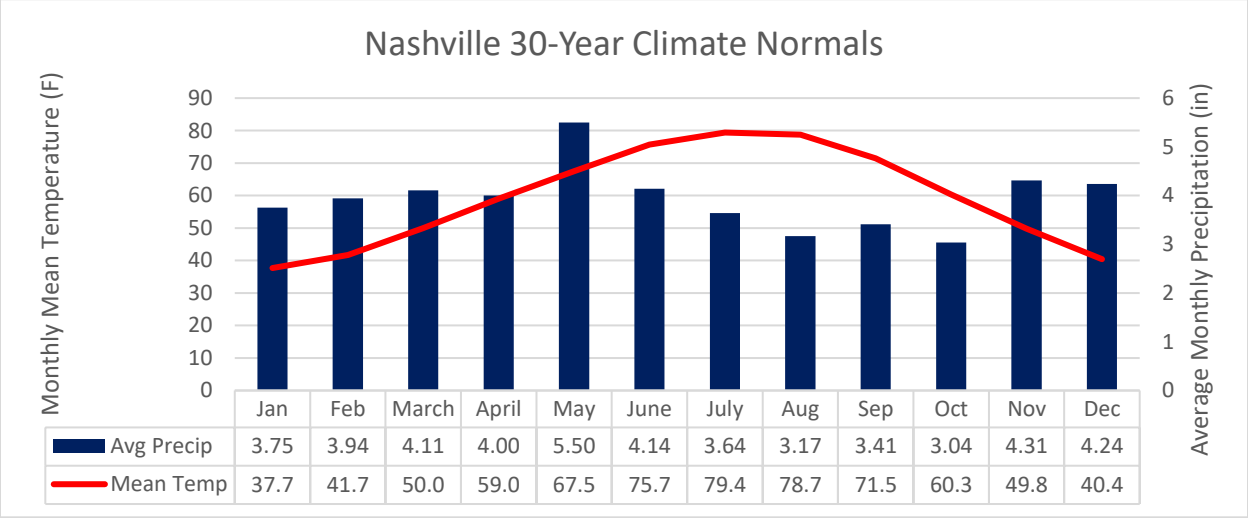
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	3.98	4.39	5.16	5.50	5.25	3.63	4.59	2.88	3.09	3.98	5.49	5.74
Mean Temp	41.2	45.5	54.0	62.9	71.7	79.6	82.7	82.0	75.2	64.1	53.2	43.6



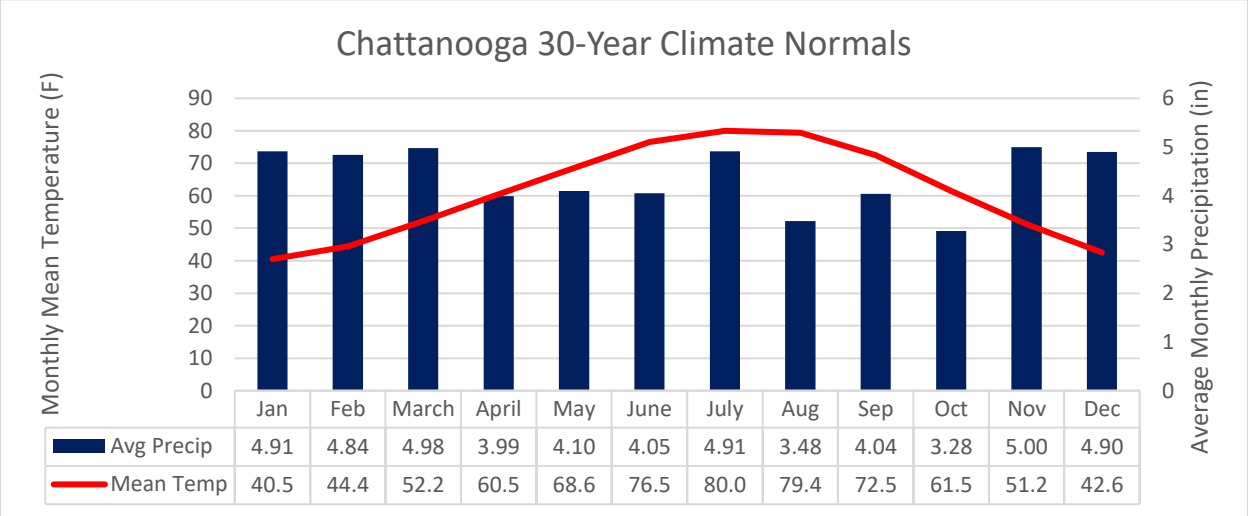
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	4.07	4.17	4.75	4.86	5.69	4.84	4.49	3.00	3.38	3.77	4.90	5.35
Mean Temp	38.2	42.3	51.0	60.0	68.6	76.2	79.5	78.6	71.4	60.5	50.1	40.8



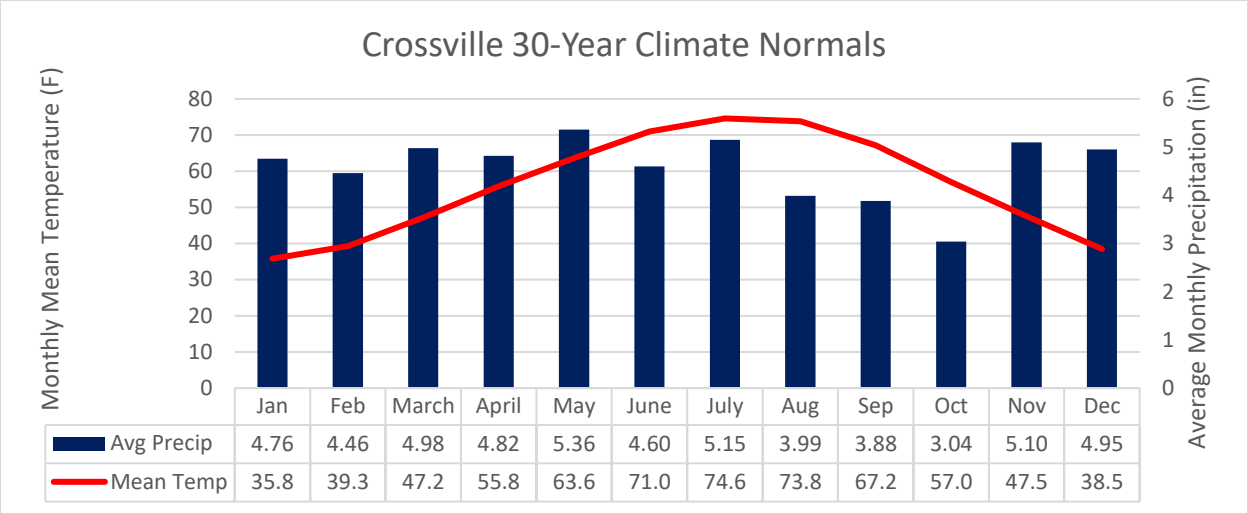
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	3.31	4.17	4.07	4.47	5.60	4.48	3.92	3.11	3.53	3.91	4.58	5.03
Mean Temp	35.8	39.6	48.8	57.6	66.4	74.5	78.1	77.2	70.1	58.9	48.4	38.7



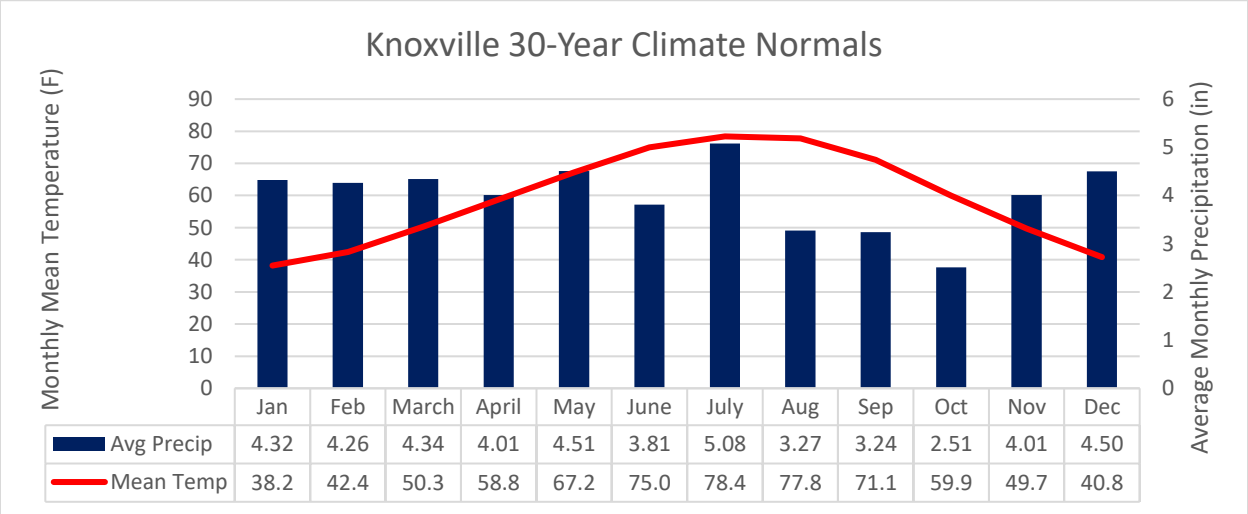
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	3.75	3.94	4.11	4.00	5.50	4.14	3.64	3.17	3.41	3.04	4.31	4.24
Mean Temp	37.7	41.7	50.0	59.0	67.5	75.7	79.4	78.7	71.5	60.3	49.8	40.4



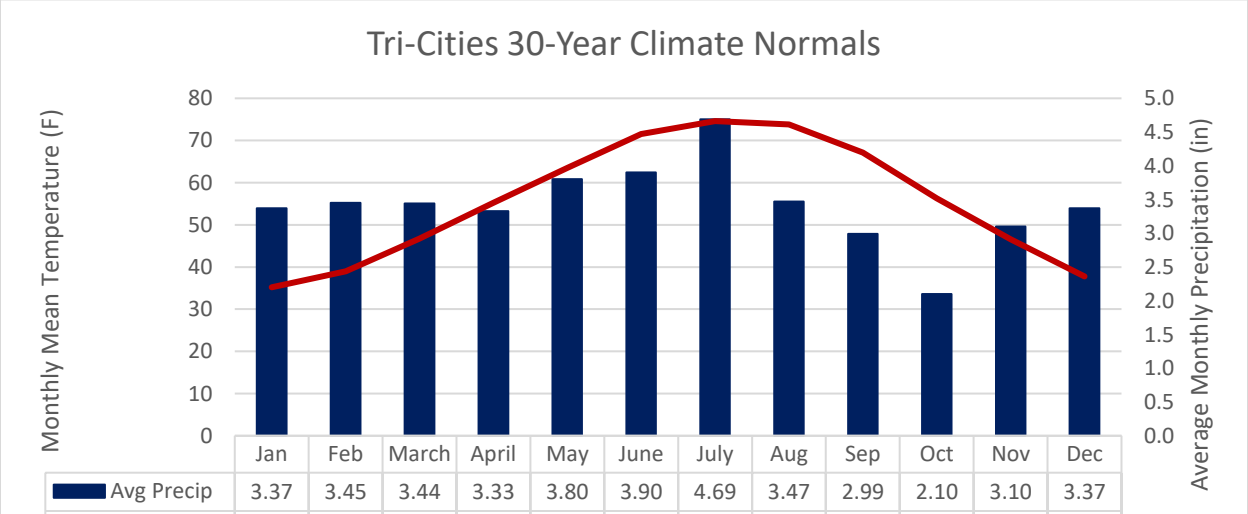
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	4.91	4.84	4.98	3.99	4.10	4.05	4.91	3.48	4.04	3.28	5.00	4.90
Mean Temp	40.5	44.4	52.2	60.5	68.6	76.5	80.0	79.4	72.5	61.5	51.2	42.6



	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	4.76	4.46	4.98	4.82	5.36	4.60	5.15	3.99	3.88	3.04	5.10	4.95
Mean Temp	35.8	39.3	47.2	55.8	63.6	71.0	74.6	73.8	67.2	57.0	47.5	38.5



	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	4.32	4.26	4.34	4.01	4.51	3.81	5.08	3.27	3.24	2.51	4.01	4.50
Mean Temp	38.2	42.4	50.3	58.8	67.2	75.0	78.4	77.8	71.1	59.9	49.7	40.8



	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Avg Precip	3.37	3.45	3.44	3.33	3.80	3.90	4.69	3.47	2.99	2.10	3.10	3.37
Mean Temp	35.2	39.0	46.7	55.2	63.5	71.5	74.6	73.8	67.1	56.3	46.6	37.8

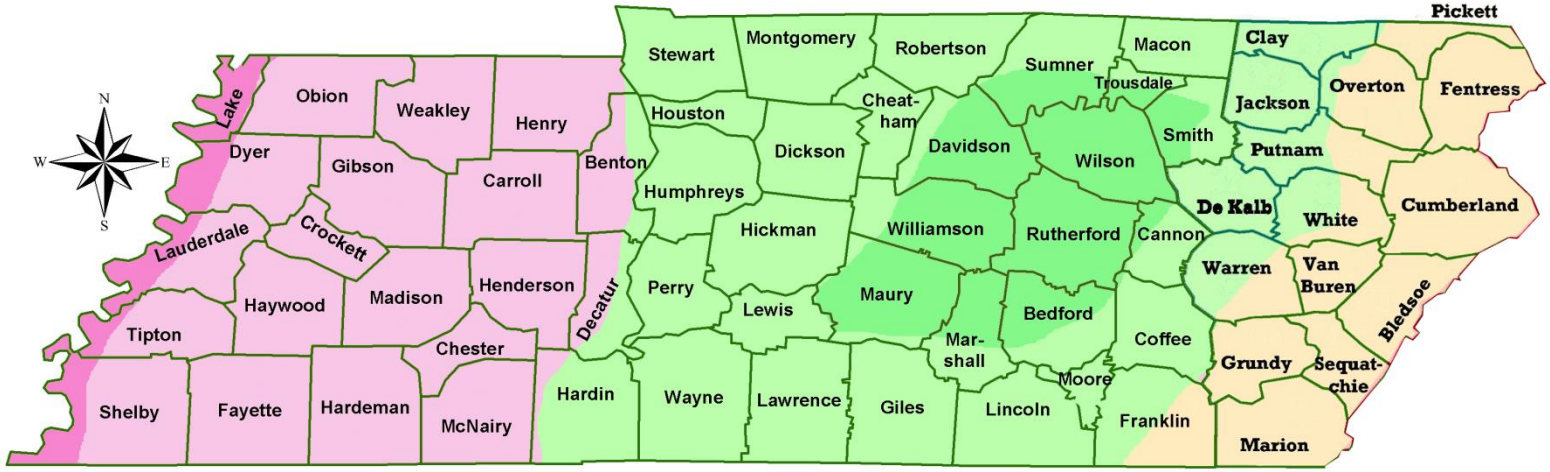
Source:

East Tennessee State University > Tennessee Climate Office > Tennessee Climatology

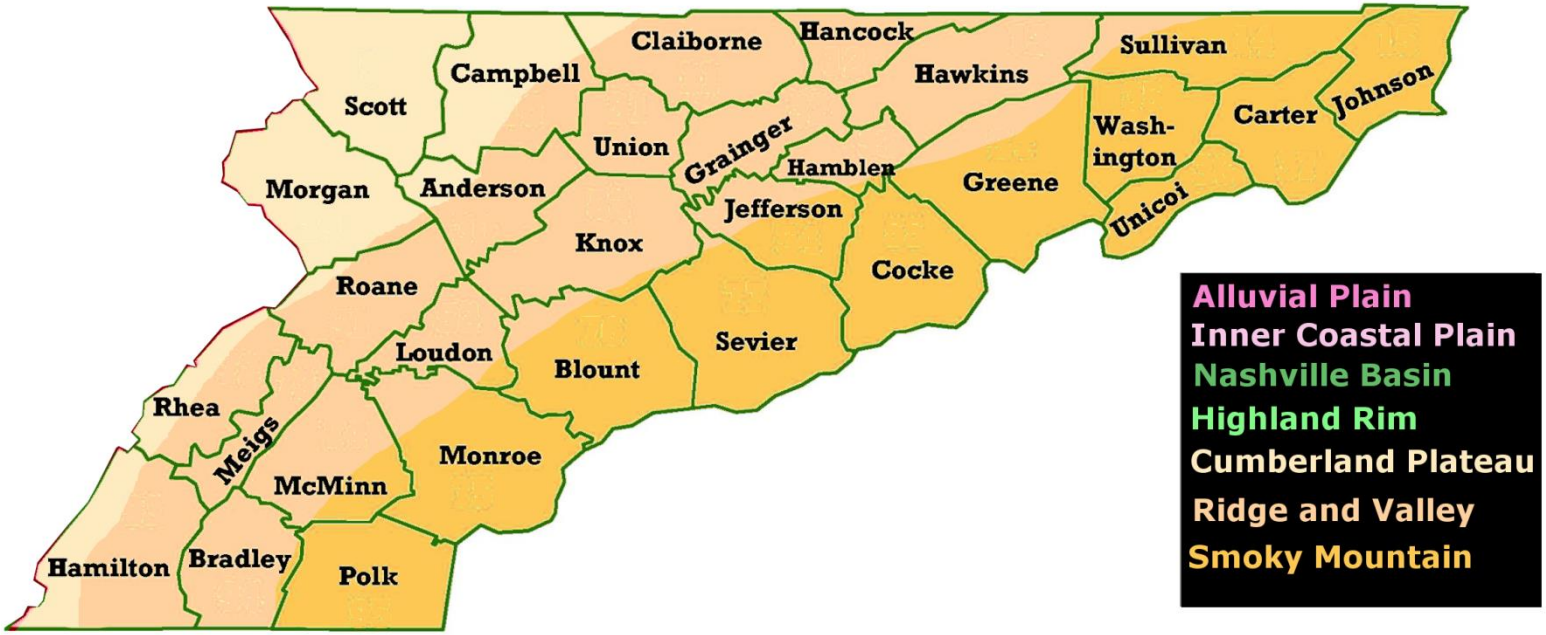
https://www.etsu.edu/cas/geosciences/tn-climate/tn-climatology.php

Map of Tennessee Geographic Regions

Central Time Zone Regions (CST UTC-6:00, CDT UTC-5:00)



Eastern Time Zone Regions (CST UTC-5:00, CDT UTC-4:00)


Claiborne
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Morgan
Anderson
Greene
Jefferson
Unicoi
Knox
Cocke
Roane
Loudon
Blount
Sevier
Rhea
Meigs
Monroe
McMinn
Hamilton
Bradley
Polk
Alluvial Plain
Inner Coastal Plain
Nashville Basin
Highland Rim
Cumberland Plateau
Ridge and Valley
Smoky Mountain

3-Yr (2019-2021) Wind Rose Data for 10 TN Area ASOS Stations

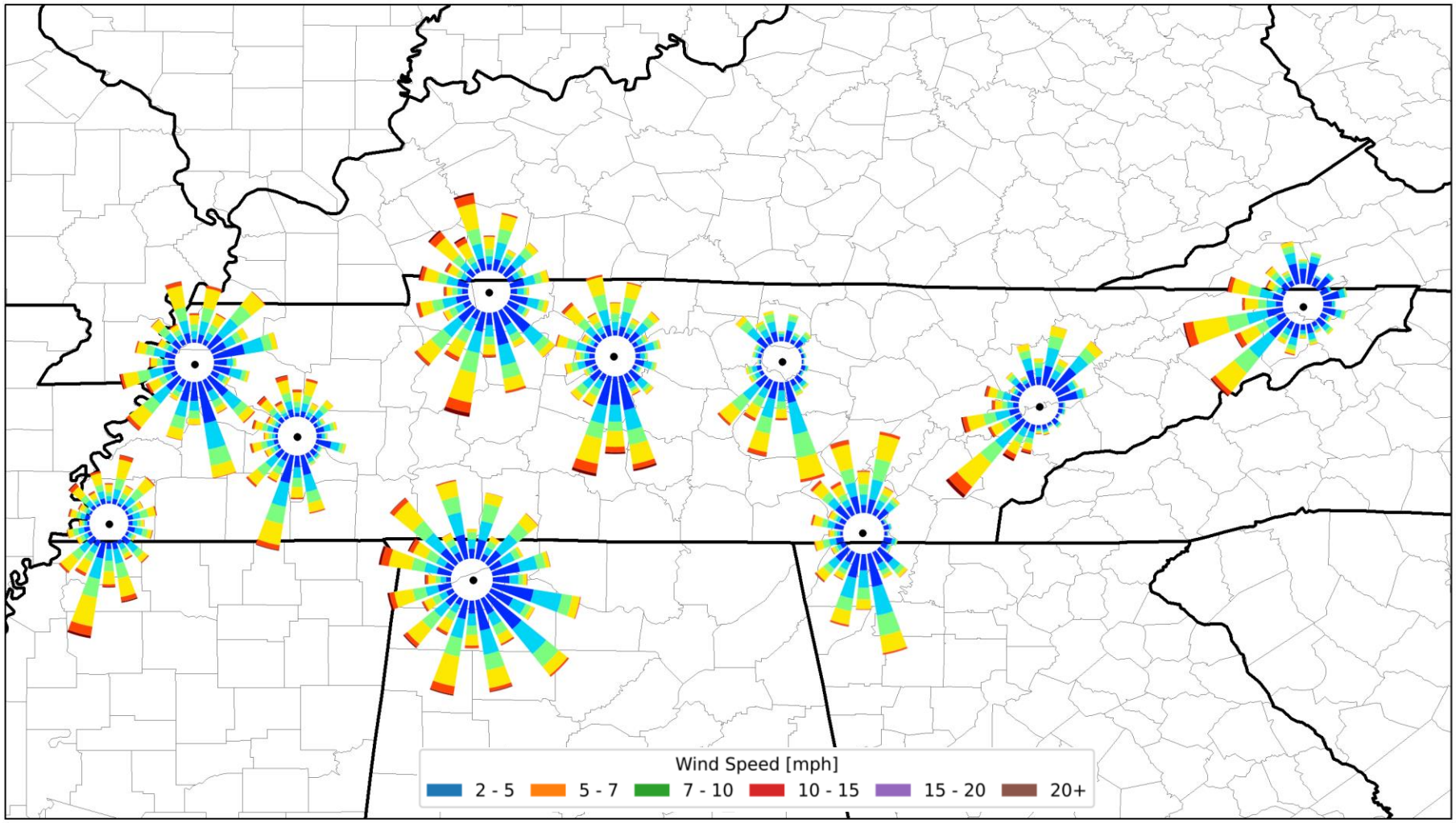


Table 2: Tennessee Metropolitan Statistical Areas and Population Estimates

Annual Resident Population Estimates for Metropolitan and Micropolitan Statistical Areas and Their Geographic Components for Puerto Rico: April 1, 2020 to July 1, 2023					
Geographic Area	April 1, 2020 Estimates Base	Population Estimates			
		2020	2021	2022	2023
Chattanooga, TN-GA	562,648	563,952	567,446	574,461	580,971
Clarksville, TN-KY	320,518	321,827	328,949	335,527	340,495
Cleveland, TN	126,164	126,394	127,469	128,317	129,612
Jackson, TN	180,500	180,559	180,480	181,418	181,826
Johnson City, TN	207,276	207,476	207,171	210,223	213,198
Kingsport-Bristol, TN-VA	307,610	307,750	308,690	311,040	313,025
Knoxville, TN	903,322	905,896	916,415	932,921	946,264
Memphis, TN-MS-AR	1,345,436	1,346,172	1,342,637	1,338,667	1,335,674
Morristown, TN	119,182	119,458	119,907	121,827	124,054
Nashville-Davidson--Murfreesboro--Franklin, TN	2,014,420	2,021,744	2,033,369	2,071,019	2,102,573

Source Link: Census.gov

Table 3: Tennessee Micropolitan Statistical Areas and Population Estimates

Annual Estimates of the Resident Population for Micropolitan Statistical Areas in Tennessee April 1, 2020 to July 1, 2023					
Geographic Area	April 1, 2020 Estimates Base	Population Estimate (as of July 1)			
		2020	2021	2022	2023
Athens, TN Micro Area	66,025	66,151	66,940	67,953	69,369
Cookeville, TN Micro Area	141,333	141,738	143,393	145,478	148,226
Crossville, TN Micro Area	61,151	61,379	62,391	63,482	64,760
Dyersburg, TN Micro Area	36,808	36,716	36,609	36,440	36,498
Fayetteville, TN Micro Area	35,320	35,331	35,435	36,006	36,169
Greeneville, TN Micro Area	70,158	70,344	70,565	71,292	72,577
Lawrenceburg, TN Micro Area	44,160	44,181	44,768	45,502	46,114
Lewisburg, TN Micro Area	34,327	34,475	35,059	35,857	36,961
Martin, TN Micro Area	32,903	32,903	32,883	33,043	33,084
McMinnville, TN Micro Area	40,946	41,052	41,468	42,001	42,638
Newport, TN Micro Area	35,999	36,045	36,364	36,849	37,404
Paris, TN Micro Area	32,200	32,149	32,246	32,382	32,554
Sevierville, TN Micro Area	98,381	98,562	99,435	98,806	99,415
Shelbyville, TN Micro Area	50,237	50,385	51,184	51,964	53,055
Tullahoma-Manchester, TN Micro Area	64,356	64,609	65,634	66,495	67,381
Union City, TN Micro Area	30,793	30,775	30,459	30,374	30,411
Winchester, TN Micro Area	42,770	42,845	43,196	44,119	44,654

Source Link: Census.gov

Metropolitan and Micropolitan Statistical Areas Totals: 2020-2023 (census.gov)

Table 4: Tennessee County Population Data Trends

(Estimates Based on 2020 by US Census Bureau)

Annual Estimates of the Resident Population for Counties in Tennessee: April 1, 2020 to July 1, 2023					
Geographic Area	**April 1, 2020 Estimates Base**	**Population Estimate (as of July 1)**			
		2020	**2021**	**2022**	**2023**
Tennessee	**6,910,786**	**6,926,091**	**6,963,709**	**7,048,976**	**7,126,489**
Anderson County, Tennessee	77,147	77,320	77,615	78,929	80,234
Bedford County, Tennessee	50,237	50,385	51,184	51,964	53,055
Benton County, Tennessee	15,867	15,855	15,837	15,994	16,103
Bledsoe County, Tennessee	14,917	14,956	14,837	14,824	15,060
Blount County, Tennessee	135,287	135,657	137,611	139,810	141,456
Bradley County, Tennessee	108,620	108,828	109,755	110,539	111,579
Campbell County, Tennessee	39,275	39,301	39,455	39,564	40,223
Cannon County, Tennessee	14,507	14,565	14,537	14,807	15,063
Carroll County, Tennessee	28,444	28,434	28,295	28,418	28,860
Carter County, Tennessee	56,348	56,371	56,080	56,485	57,022
Cheatham County, Tennessee	41,064	41,131	41,498	41,764	42,254
Chester County, Tennessee	17,344	17,375	17,465	17,558	17,606
Claiborne County, Tennessee	32,041	32,072	32,061	32,357	32,654
Clay County, Tennessee	7,580	7,588	7,586	7,656	7,714
Cocke County, Tennessee	35,999	36,045	36,364	36,849	37,404
Coffee County, Tennessee	57,888	58,139	58,983	59,779	60,633
Crockett County, Tennessee	13,912	13,908	13,990	13,862	13,982
Cumberland County, Tennessee	61,151	61,379	62,391	63,482	64,760
Davidson County, Tennessee	715,878	716,059	700,860	707,351	712,334
Decatur County, Tennessee	11,436	11,433	11,402	11,549	11,656
DeKalb County, Tennessee	20,078	20,189	20,500	21,002	21,225
Dickson County, Tennessee	54,307	54,440	55,174	55,727	56,729
Dyer County, Tennessee	36,808	36,716	36,609	36,440	36,498
Fayette County, Tennessee	41,721	41,870	42,616	43,338	44,175
Fentress County, Tennessee	18,487	18,533	18,835	19,335	19,696
Franklin County, Tennessee	42,770	42,845	43,196	44,119	44,654
Gibson County, Tennessee	50,411	50,444	50,468	50,826	51,045
Giles County, Tennessee	30,341	30,340	30,401	30,540	30,721
Grainger County, Tennessee	23,530	23,569	23,800	24,185	24,681
Greene County, Tennessee	70,158	70,344	70,565	71,292	72,577
Grundy County, Tennessee	13,528	13,543	13,587	13,779	13,955
Hamblen County, Tennessee	64,500	64,542	64,360	65,167	66,216
Hamilton County, Tennessee	366,209	367,251	369,005	374,602	379,864

Annual Estimates of the Resident Population for Counties in Tennessee: April 1, 2020 to July 1, 2023					
Geographic Area	April 1, 2020 Estimates Base	Population Estimate (as of July 1)			
		2020	2021	2022	2023
Hancock County, Tennessee	6,661	6,627	6,794	6,846	6,956
Hardeman County, Tennessee	25,464	25,440	25,260	25,511	25,567
Hardin County, Tennessee	26,824	26,804	26,871	27,065	27,229
Hawkins County, Tennessee	56,724	56,721	57,202	57,903	58,600
Haywood County, Tennessee	17,863	17,826	17,691	17,518	17,328
Henderson County, Tennessee	27,834	27,824	27,906	27,907	28,070
Henry County, Tennessee	32,200	32,149	32,246	32,382	32,554
Hickman County, Tennessee	24,911	24,972	25,080	25,481	25,826
Houston County, Tennessee	8,288	8,308	8,298	8,247	8,393
Humphreys County, Tennessee	18,988	18,998	19,178	19,023	19,209
Jackson County, Tennessee	11,617	11,633	11,771	12,015	12,363
Jefferson County, Tennessee	54,682	54,916	55,547	56,660	57,838
Johnson County, Tennessee	17,949	17,990	18,053	18,046	18,375
Knox County, Tennessee	478,966	480,516	485,941	495,380	500,669
Lake County, Tennessee	7,009	6,995	6,596	6,500	6,347
Lauderdale County, Tennessee	25,139	25,123	24,878	24,741	24,610
Lawrence County, Tennessee	44,160	44,181	44,768	45,502	46,114
Lewis County, Tennessee	12,583	12,606	12,852	12,912	13,066
Lincoln County, Tennessee	35,320	35,331	35,435	36,006	36,169
Loudon County, Tennessee	54,887	55,129	56,785	58,244	60,591
McMinn County, Tennessee	53,270	53,343	53,921	54,695	55,678
McNairy County, Tennessee	25,855	25,857	25,846	25,993	26,163
Macon County, Tennessee	25,217	25,267	25,673	26,214	26,793
Madison County, Tennessee	98,833	98,832	98,557	99,172	99,193
Marion County, Tennessee	28,838	28,870	28,919	29,050	29,382
Marshall County, Tennessee	34,327	34,475	35,059	35,857	36,961
Maury County, Tennessee	100,969	101,826	104,942	107,996	110,760
Meigs County, Tennessee	12,755	12,808	13,019	13,258	13,691
Monroe County, Tennessee	46,248	46,394	46,649	47,680	48,594
Montgomery County, Tennessee	219,996	221,281	227,741	234,899	239,872
Moore County, Tennessee	6,468	6,470	6,651	6,716	6,748
Morgan County, Tennessee	21,030	21,042	21,107	21,207	21,573
Obion County, Tennessee	30,793	30,775	30,459	30,374	30,411
Overton County, Tennessee	22,509	22,590	22,831	22,993	23,327
Perry County, Tennessee	8,382	8,381	8,493	8,705	8,891
Pickett County, Tennessee	5,004	5,000	5,069	5,103	5,128
Polk County, Tennessee	17,544	17,566	17,714	17,778	18,033
Putnam County, Tennessee	79,853	80,071	81,250	82,470	83,844

Annual Estimates of the Resident Population for Counties in Tennessee: April 1, 2020 to July 1, 2023					
Geographic Area	April 1, 2020 Estimates Base	Population Estimate (as of July 1)			
		2020	2021	2022	2023
Rhea County, Tennessee	32,873	32,938	33,189	33,689	33,924
Roane County, Tennessee	53,396	53,517	54,088	55,129	56,096
Robertson County, Tennessee	72,805	72,953	74,031	75,398	76,776
Rutherford County, Tennessee	341,483	343,298	351,194	360,682	367,101
Scott County, Tennessee	21,848	21,876	21,891	21,999	22,171
Sequatchie County, Tennessee	15,825	15,848	16,448	16,918	17,161
Sevier County, Tennessee	98,381	98,562	99,435	98,806	99,415
Shelby County, Tennessee	930,020	929,763	923,382	916,357	910,042
Smith County, Tennessee	19,913	19,971	20,169	20,470	20,538
Stewart County, Tennessee	13,656	13,706	13,808	13,994	14,222
Sullivan County, Tennessee	158,162	158,246	159,212	160,862	162,135
Sumner County, Tennessee	196,285	197,416	200,505	203,721	207,994
Tipton County, Tennessee	60,974	61,042	61,059	61,650	62,015
Trousdale County, Tennessee	11,609	11,635	11,605	12,077	12,271
Unicoi County, Tennessee	17,925	17,886	17,631	17,591	17,756
Union County, Tennessee	19,804	19,845	20,013	20,473	20,741
Van Buren County, Tennessee	6,168	6,174	6,293	6,430	6,493
Warren County, Tennessee	40,946	41,052	41,468	42,001	42,638
Washington County, Tennessee	133,003	133,219	133,460	136,147	138,420
Wayne County, Tennessee	16,231	16,222	16,329	16,266	16,066
Weakley County, Tennessee	32,903	32,903	32,883	33,043	33,084
White County, Tennessee	27,354	27,444	27,541	28,000	28,692
Williamson County, Tennessee	247,724	249,552	256,065	260,738	264,460
Wilson County, Tennessee	147,748	148,659	152,036	158,593	163,674
Vintage 2023 data products are associated with Data Management System projects P-6000042, P-7501659, and P-7527355. The U.S. Census Bureau reviewed these data products for unauthorized disclosure of confidential information and approved the disclosure avoidance practices applied to this release (CBDRB-FY24-0085).					
Note: The estimates are developed from a base that integrates the 2020 Census, Vintage 2020 estimates, and 2020 Demographic Analysis estimates. For population estimates methodology statements, see https://www.census.gov/programs-surveys/popest/technical-documentation/methodology.html. All geographic boundaries for the 2023 population estimates series are as of January 1, 2023.					
Annual Estimates of the Resident Population for Counties in Tennessee: April 1, 2020 to July 1, 2023 (CO-EST2023-POP-47) **Source: U.S. Census Bureau, Population Division** **Release Date: March 2024**					

County Population Totals: 2020-2022 (census.gov); Index of /programs-surveys/popest/datasets (census.gov)

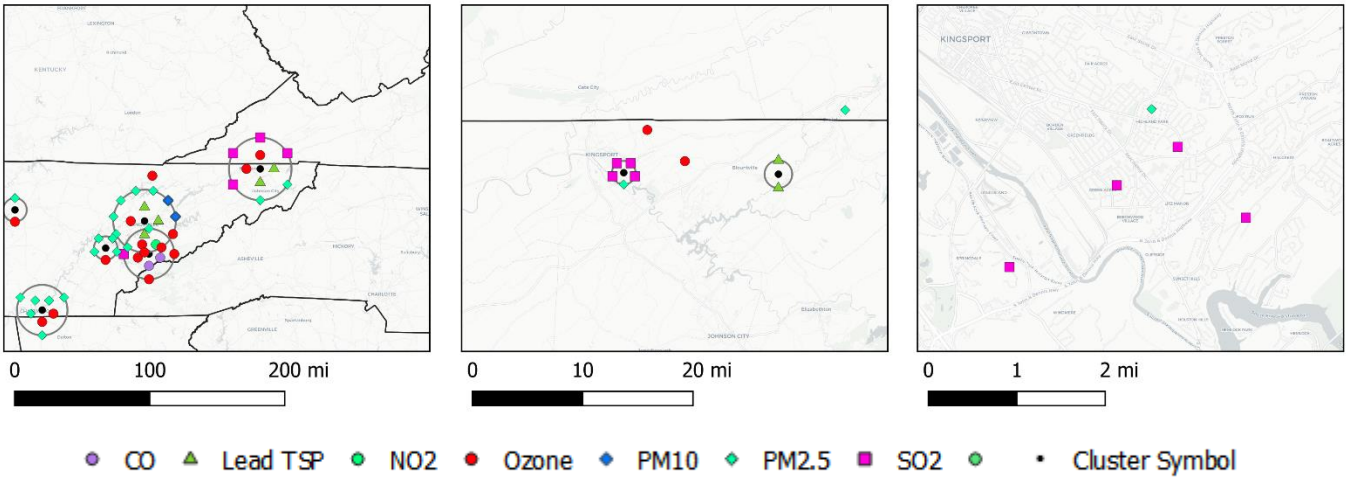
The following maps depict the most recent statistical area boundaries. The first map groups metropolitan and micropolitan areas by their combined statistical area (CSA) and shades the areas accordingly. In July, 2023 the Office of Management and Budget released revised CSA and CBSA county delineations. Changes to the state's geographic areas did not result in any needed changes to Tennessee's ambient air quality monitoring network. These changes are summarized below:

Metropolitan Statistical Area Changes:
Nashville: addition of Hickman Co
Knoxville: addition of Grainger Co
Morristown: removal of Grainger Co
Memphis: addition of Benton Co, MS

Micropolitan Statistical Area Changes
Athens: Addition of Meigs Co
-Dayton: Removed Micro Area (Rhea Co)
Tullahoma: Removal of Franklin Co
+Winchester: New Micro Area (Franklin Co)
Cookeville: Addition of White Co
+Fayetteville: New Micro Area (Lincoln Co)
-Brownsville: Removal of Micro Area (Haywood Co)

CSA Changes
Chattanooga: Removal of Calhoun Micro (Gordon Co GA)
Chattanooga: Addition of Meigs Co (Athens Micro)
Chattanooga: Addition of Scottsboro Micro (Jackson Co AL)
Chattanooga: Removal of Dayton Micro (Rhea Co)
-Jackson: Removal of CSA
Johnson City: Addition of Greeneville Micro (Greene Co)
Memphis: Addition of Clarksdale Micro (Coahoma Co MS)
Memphis: Addition of Benton Co
Nashville: Addition of Tullahoma-Manchester Micro (Coffee Co & Moore Co)
Nashville: Addition of Winchester Micro (Franklin Co)
Huntsville: Addition of Fayetteville Micro (Lincoln Co)

The second map depicts the metropolitan area boundaries (dashed lines) and groups all the active air quality monitors together in clusters. Due to the difficulty in plotting sites with multiple pollutants and sites that are located in close proximity, the monitors are displayed using the cluster method, where all monitors in an area are grouped together and concentric rings plot the symbols of each monitor by the pollutant they measure around the group's centroid. The outer ring represents the area of monitors being grouped. The example below shows this concept at multiple scales.


KINGSPORT
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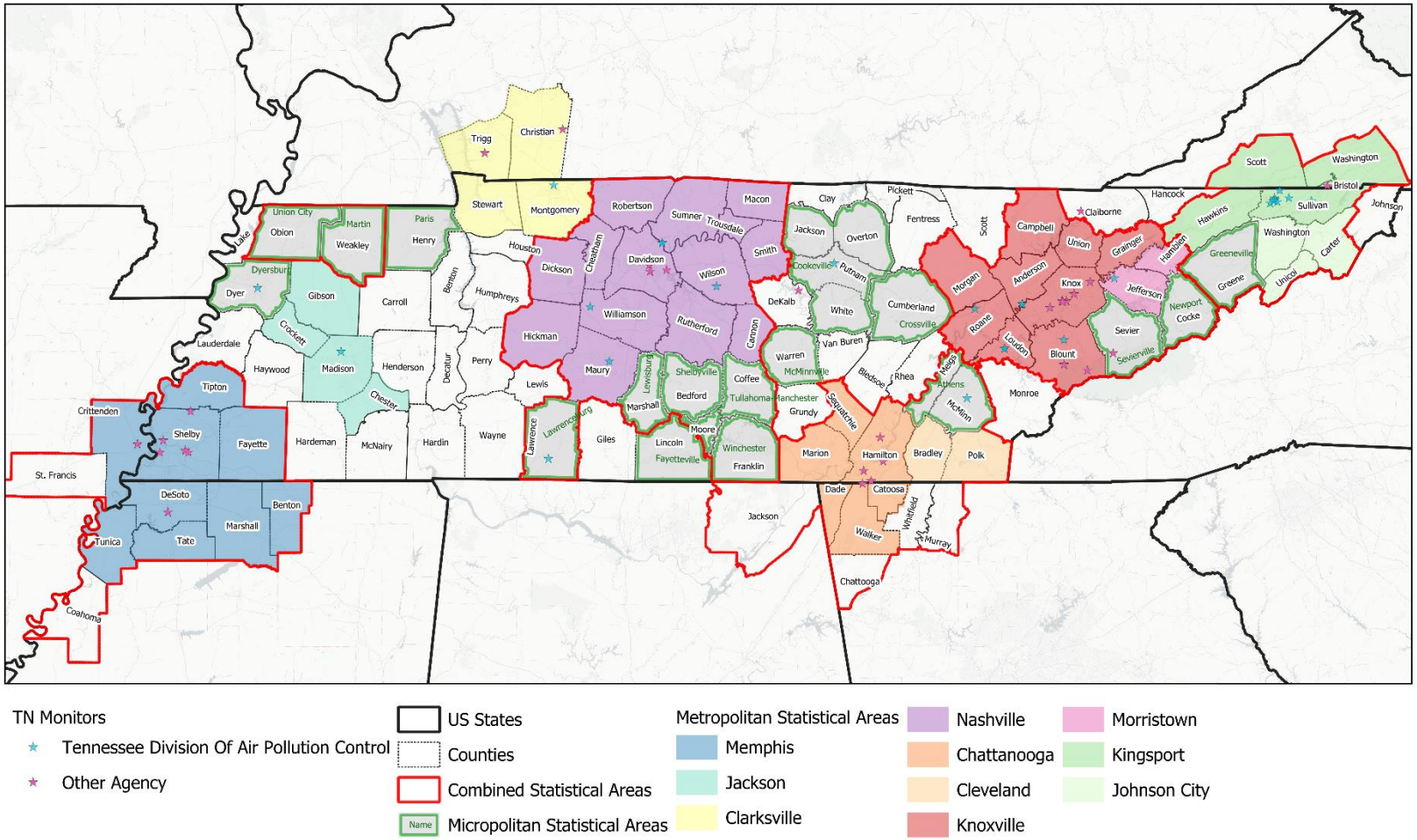
CO
Lead TSP
NO2
Ozone
PM10
PM2.5
SO2
Cluster Symbol

Combined/Metropolitan/Micropolitan Statistical Areas of Tennessee

July 2023

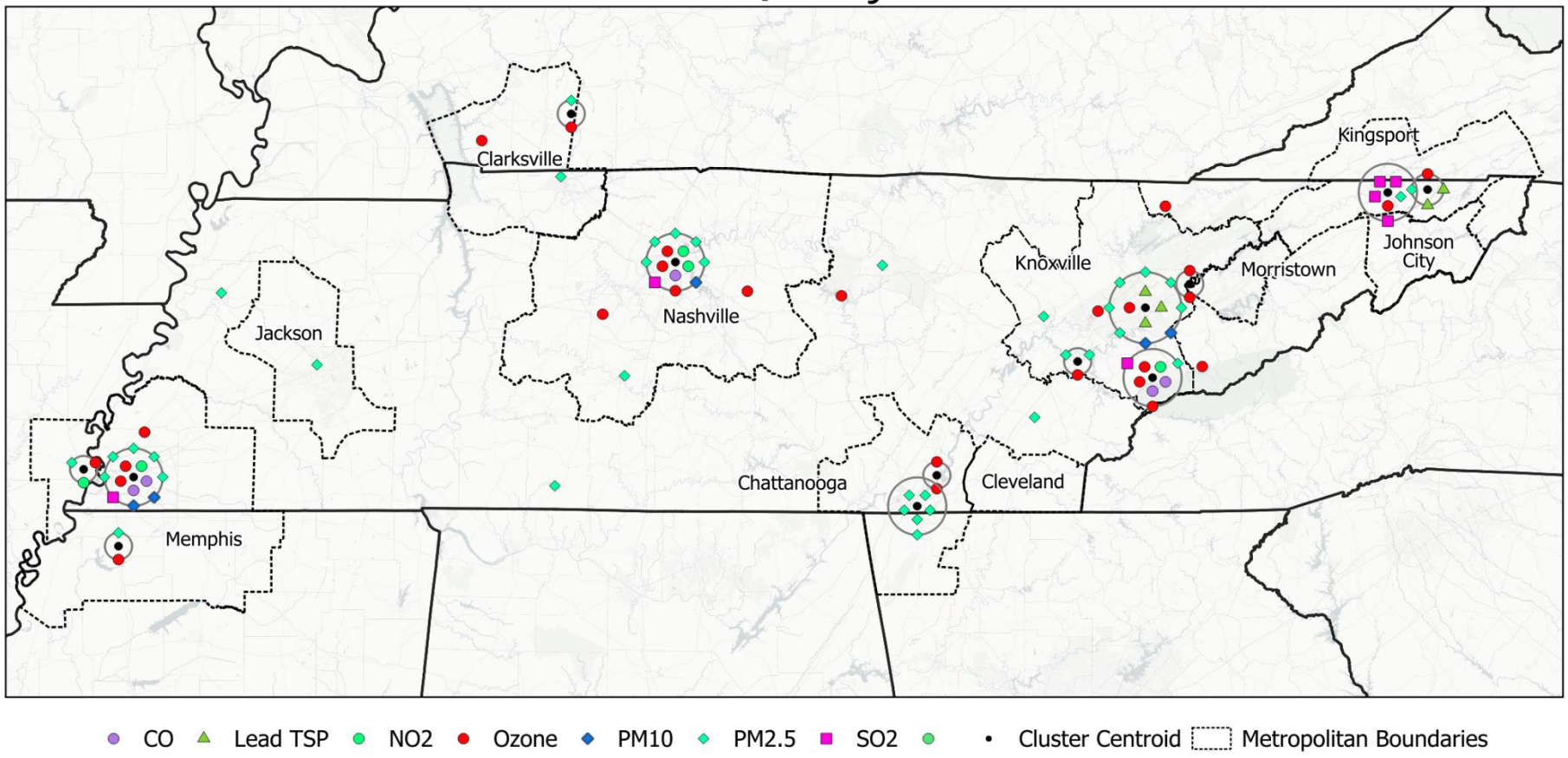


TN Monitors
- Tennessee Division Of Air Pollution Control
- Other Agency

US States
Counties
Combined Statistical Areas
Name Micropolitan Statistical Areas

Metropolitan Statistical Areas
- Memphis
- Jackson
- Clarksville
- Nashville
- Chattanooga
- Cleveland
- Knoxville
- Morristown
- Kingsport
- Johnson City

TN Area Air Quality Monitors



Appendix A Tennessee Monitoring Site Agreement Letters

Kentucky

TN Department of Environment & Conservation

February 16, 2021

Ms. Melissa Duff
Director
Kentucky Division for Air Quality
Kentucky Department for Environmental Protection
300 Sower Boulevard
2nd Floor
Frankfort, KY 40601

Dear Ms. Duff:

The United States Environmental Protection Agency's (EPA) revised monitoring regulations found in 40 CFR Part 58, Appendix D states in part "The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator." This revision of the CFR also describes the minimum monitoring requirements for the NAAQS pollutants. Tennessee and Kentucky share the Clarksville, TN-KY MSA, which is comprised of Trigg and Christian counties in Kentucky and Montgomery and Stewart counties in Tennessee.

CBSA Code	Geographic Area	Legal/Statistical Area Description	2019 Pop Estimate	2010 Census
17300	Clarksville, TN-KY	Metropolitan Statistical Area	307820	273949

The Tennessee Division of Air Pollution Control (TDEC DAPC) currently operates one (1) PM2.5 FEM continuous monitor at site 47-125-2001. This provides sufficient characterization of the particulate air quality in the entire Clarksville, TN-KY MSA and complies with the requirements for both population and concentration-based monitoring identified in the regulations found at 40 CFR 58, Appendix D.

The Kentucky for Air Quality currently operates one (1) seasonal ozone monitor at site 21-047-0006. This site characterizes the ozone air quality in the entire Clarksville, TN-KY MSA and complies with the requirements for both population concentration-based monitoring identified in 40 CFR Part 58, Appendix D.

TDEC DAPC would like to invite Kentucky's Division for Air Quality to participate in Tennessee's annual ambient air monitoring network review. Tennessee commits to notifying Kentucky in advance of any proposed relocations or monitor shutdowns in the Clarksville, TN-KY MSA and respectfully requests that Kentucky provide

Division of Air Pollution Control
William Snodgrass Tennessee Tower • 15th Floor • Nashville, TN 37243
312 Rosa L. Parks Avenue • Nashville, TN 37243
Tel: 615-532-0554 • Fax: 615-532-0614
Air.Pollution.Control@tn.gov

Department of Environment & Conservation

notification to Tennessee in advance of any proposed equipment shutdowns or relocations within the Clarksville, TN-KY MSA. Advanced notice would allow both parties to make adequate monitoring arrangements to ensure the MSA monitoring requirements are being met. If you have technical questions, contact Bradley King at 615-687-7042 or Bradley.King@tn.gov. I may be contacted at 615-532-9668 or Michelle.B.Walker@tn.gov.

Sincerely,

Michelle W. Owenby

Michelle Walker Owenby
Director
Division of Air Pollution Control
Department of Environment and Conservation

Division of Air Pollution Control
William Snodgrass Tennessee Tower • 15th Floor • Nashville, TN 37243
312 Rosa L. Parks Avenue • Nashville, TN 37243
Tel: 615-532-0554 • Fax: 615-532-0614
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Kentucky Response

ANDY BESHEAR
GOVERNOR

REBECCA W. GOODMAN
SECRETARY

ANTHONY R. HATTON
COMMISSIONER

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601
TELEPHONE: 502-564-2150
TELEFAX: 502-564-4245

June 21, 2021

Ms. Michelle Walker Owenby
Director
Tennessee Division of Air Pollution Control
William Snodgrass Tennessee Tower, 15th Floor
312 Rosa L. Parks Avenue
Nashville, TN 37243

RE: Clarksville, TN-KY MSA Monitoring Agreement

Dear Ms. Owensby:

In a letter from your office dated February 16, 2021, the Tennessee Division of Air Pollution Control (TDAPC) agreed to operate a continuous $PM_{2.5}$ monitor in order to meet the minimum network design requirements stated in 40 CFR 58, Appendix D for the Clarksville, TN-KY metropolitan statistical area (MSA). The Kentucky Division for Air Quality (KDAQ) appreciates TDAPC's cooperation and appreciates the invitation to participate in TDAPC's annual air monitoring network review.

KDAQ currently operates one (1) continuous $PM_{2.5}$ FEM monitor and one (1) continuous ozone monitor at the Hopkinsville site (21-047-0006) in Christian County, KY. In accordance with Table D-2 of 40 CFR 58, Appendix D, one (1) ozone monitor is required to be operated in the Clarksville, TN-KY MSA, based upon currently available population estimates from the US Census Bureau, as well 2018-2020 three-year ozone design values (DV). $PM_{2.5}$ monitoring is not currently required in the MSA, based upon the minimum monitoring requirements found in 40 CFR 58, Appendix D.

Geographic Area	Code	2019 USCB Population Est.	2018-2020 3-Year O_3 DV	2018-2020 3-Year $PM_{2.5}$ DV
Christian County, KY	21-047	70,461	0.058	8.1
Trigg County, KY	21-221	14,651	0.061 (CASTNET)	-
Montgomery County, TN	47-125	208,993	-	7.3 *
Stewart County, TN	47-161	13,715	-	6.8 *
Clarksville, TN-KY MSA	**17300**	**307,820**	**0.061**	**8.1**

**Does not meet data completeness requirements*

To satisfy regulatory requirements, KDAQ agrees to continue to operate one (1) ozone monitor at the Hopkinsville site. While $PM_{2.5}$ monitoring is not currently required for the MSA, KDAQ will continue to operate the continuous $PM_{2.5}$ FEM at the Hopkinsville site, as it is currently the design value monitor for the MSA. When possible, KDAQ agrees to provide advanced notification to TDAPC in the event that shutdown or relocation of either the ozone or $PM_{2.5}$ monitor is necessary.

KDAQ commits to sharing with TDAPC all quality-assured ambient air monitoring data collected in the Kentucky portion of the Clarksville, TN-KY MSA. KDAQ also welcomes TDAPC's participation in Kentucky's annual network review process. If you have any questions or concerns, please contact Jennifer Miller at 502-782-6708.

Sincerely,

for Melissa Duff,
Director

MKD/jfm

Electronic cc:
-Bradley King, TDAPC
-Jenna Nall, KDAQ

Virginia

TN Department of Environment & Conservation

February 16, 2021

Michael Dowd
Director
Air and Renewable Energy Division
Virginia Department of Environmental Quality
P.O. Box 1105
Richmond, VA 23218

Dear Mr. Dowd:

The United States Environmental Protection Agency's (EPA) revised monitoring regulations found in 40 CFR Part 58, Appendix D states in part: "The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator." This revision of the CFR also describes the minimum monitoring requirements for the NAAQS pollutants. Tennessee and Virginia share the Kingsport-Bristol-Bristol, TN-VA MSA, which is comprised of Scott and Washington counties in Virginia and Hawkins and Sullivan counties in Tennessee.

CBSA Code	Geographic Area	Legal/Statistical Area Description	2019 Pop Estimate	2010 Census
28700	Kingsport-Bristol-Bristol, TN-VA	Metropolitan Statistical Area	307202	309544

The Tennessee Division of Air Pollution Control (TDEC DAPC) currently operates one (1) FEM $PM_{2.5}$ continuous monitor at site 47-163-1007, two (2) seasonal ozone monitors at sites 47-163-2002 and 47-163-2003, one (1) collocated lead monitoring site (47-163-3004), and four (4) SO_2 monitoring sites; Skyland Drive (47-163-6002), Ross N Robinson (47-163-6001), Happy Hill (47-163-6004), and Andrew Johnson (47-163-6003) all in Sullivan County. These monitoring sites are sufficient to properly characterize the particular air quality in the Kingsport-Bristol-Bristol, TN-VA MSA and comply with the requirements for both population and concentration-based monitoring identified in the revised monitoring regulations found in 40 CFR Part 58, Appendix D.

The TDEC DAPC SO_2 monitoring network also satisfies the need for more "robust" monitoring to adequately characterize the Kingsport SO_2 non-attainment area in Sullivan County, Tennessee. The monitoring sites in the TDEC DAPC SO_2 monitoring network are located in close proximity to the maximum receptor areas indicated in the models included with the attainment/maintenance plan.

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Air.Pollution.Control@tn.gov

TN Department of Environment & Conservation

TDEC DAPC would like to invite Virginia's Department of Environmental Quality to participate in the Tennessee's annual ambient monitoring network review. Tennessee commits to notifying Virginia in advance of any proposed monitor shutdowns or relocations within the Kingsport-Bristol-Bristol, TN-VA MSA and respectfully requests that Virginia notify Tennessee of any monitoring network additions or changes within the Kingsport-Bristol-Bristol, TN-VA MSA. Advanced notice would allow both parties to make adequate monitoring arrangements to ensure the MSA monitoring required are being met. If you have technical questions, please contact Bradley King at 615-687-7042 or Bradley.King@tn.gov. I may be contacted at 615-532-9668 or Michelle.B.Walker@tn.gov.

Sincerely,

Michelle W. Owenby

Michelle Walker Owenby
Director
Division of Air Pollution Control
Department of Environment and Conservation

Division of Air Pollution Control
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312 Rosa L. Parks Avenue • Nashville, TN 37243
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Air.Pollution.Control@tn.gov

Virginia Response

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 1111 E. Main Street, Suite 1400, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

June 29, 2021

Michelle Walker Owenby, Director
Division of Air Pollution Control
Wm. Snodgrass Tennessee Tower – 15th floor
Nashville, TN 37243

Dear Ms. Owenby,

In your letter dated February 16, 2021 you identified the Kingsport-Bristol-Bristol, TN-VA Metropolitan Statistical Area (MSA) as including Scott and Washington Counties within the Commonwealth of Virginia and that Tennessee maintains several air pollution monitoring devices within the Tennessee jurisdictions of that MSA. Included in this listing are identified four (4) separate Sulfur Dioxide (SO_2) monitors that are intended to characterize the Non-attainment Area for SO_2 in Sullivan County. Your letter is intended to address the requirement located in 40 CFR Part 58, Appendix D that State agencies that share MSAs are required to meet the monitoring requirements of the MSA independently in the absence of an agreement between the affected states.

Virginia maintains one (1) air monitoring location in the affected MSA; Site ID. 51-520-0006 PM2.5 FRM monitor at Highland View Elementary School in Bristol, Virginia. This site has been in operation since January, 1999. Virginia commits to notifying Tennessee in advance of any proposed shutdown of this monitor or relocation within the Kingsport-Bristol-Bristol, TN-VA MSA and any additions of any monitoring systems within the MSA. Please let me know if you have any questions or comments regarding the above commitment.

Sincerely,

Michael G. Dowd

Digitally signed by: Michael G. Dowd
DN: CN = Michael G. Dowd email = michael.dowd@deq.virginia.gov + US O = Va. Dept. of Environmental Quality OU = Director, Air and Renewable Energy Division
Date: 2021.06.29 16:01:33 -05'00'

Michael G. Dowd
Director, Division of Air and Renewable Energy

LEE HARRIS
MAYOR

SHELBY COUNTY HEALTH DEPARTMENT

Public Health
Prevent. Promote. Protect.
Shelby County Health Department

MICHELLE A. TAYLOR, MD DRPH, MPA
HEALTH DIRECTOR & OFFICER

May 9, 2024

Ms. Michelle Walker Owenby, Air Director
Tennessee Department of Environment and Conservation Air Pollution Control Division
Davy Crockett Tower
500 James Robertson Parkway, 7th Floor
Nashville, Tennessee 37243

Mr. Jaricus Whitlock, P.E., Chief, Air Division
Mississippi Department of Environmental Quality
Office of Pollution Control
P.O. Box 2261
Jackson, Mississippi 39225

Demetria Kimbrough, Associate Director, Office of Air Quality
Division of Environmental Quality
Arkansas Department of Energy and Environment
5301 Northshore Drive
North Little Rock, AR 72118

Dear All,
In accordance with the provisions of the Memorandum of Agreement (MOA) signed in May and June of between the Shelby County Health Department (SCHD), Mississippi Department of Environmental Quality (MDEQ), and the Arkansas Department of Energy and Environment-Division of Environmental Quality (DEQ), this letter serves as a notification that each respective agency in the MOA have been contacted by the SCHD. Although no changes have occurred, there are a few planned changes later in the year (see chart below) within the SCHD and DEQ portions of the network. With this MOA, all agencies are meeting EPA monitoring requirements.

If you have any questions, please call me at (901) 222-9193.

Sincerely,

Kasia Smith Alexander
Bureau Director, Environmental Health and Sustainability Bureau
Shelby County Health Department

MEMORANDUM OF AGREEMENT ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR THE MEMPHIS, TN- MS- AR METROPOLITAN STATISTICAL AREA (MSA)

Participating Agencies:

Shelby County Health Department (SCHD)
Air Pollution Control Program

Mississippi Department of Environmental Quality (MDEQ)
Office of Pollution Control, Air Division

Arkansas Department of Energy and Environment
Division of Environmental Quality (DEQ)

PURPOSE / OBJECTIVE / GOALS

The purpose of this Memorandum of Agreement (MOA) is to inform the entities of the Memphis, Tennessee-Mississippi-Arkansas Metropolitan Statistical Area of monitoring network changes. The MOA between SCHD, MDEQ, and DEQ is to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less ($PM_{2.5}$), and ozone; as well as other criteria pollutants air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will formalize and reaffirm the collective agreement in order to provide adequate criteria pollutant monitoring for the Memphis, TN-MS-AR MSA as required by 40 CFR 58 Appendix D, Section 2, (e).

$PM_{2.5}$ MSA monitoring network include:

County	Federal Referenced Method $PM_{2.5}$	Federal Equivalent Method $PM_{2.5}$	Continuous $PM_{2.5}$	Speciation $PM_{2.5}$	Collocated $PM_{2.5}$
Shelby County, TN **SCHD**	**4** (includes 2 at Alabama, 1 at NCore, and 1 at the Near Road station*)	**3***		**1**	**2**
Crittenden County, AR **DEQ**	**1**	**1****	**1**		
DeSoto County, MS **MDEQ**		**1**			

*The SCHD plans to replace two FRM PM2.5 samplers with a T640x at Alabama Ave, later this year. Plans also include adding a T640x at Near Rd site
**The DEQ has added a T640 at the Marion, AR site.

Criteria Air Pollutant MSA monitoring network include:

County	PM_{10}	$PM_{10-2.5}$	O_3	$NO_z/NO_y/NO/NO_2$	CO	SO_2
Shelby County, TN **SCHD**	4 (1 TEOM at Alabama Ave., 3-T640x at NCore, Near Rd., & Alabama Ave***	1	3	3 (includes 1 NO/ NO_2/NO_x at Near Road Station, 1 NO/NO_y (trace) at NCore/, 1 True NO_2 (trace) at NCore-PAMS)	2 (includes 1 trace at NCore and 1 at the Near Road Station)	1 (trace at NCore)
Crittenden County, AR **DEQ**			1	1		
DeSoto County, MS **MDEQ**			1			

***The SCHD plans to replace the continuous PM10 TEOM with a T640x at Alabama Ave, and add PM10 at the Near Rd. site with a new T640x later this year. After the replacement, there will be three PM 10 samplers (all T640x), two FRM $PM_{2.5}$ samplers, and three FEM $PM_{2.5}$ (same T640x) samplers operating in Shelby County.

RESPONSIBILITIES / ACTIONS

Each of the parties to this Agreement is responsible for ensuring that its obligations under the MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than one quarter) or permanent change in the monitoring network.

LIMITATIONS

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates SCHD, MDEQ, or DEQ to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.

- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate agreements that will be affected in writing by representatives of the parties.

- This MOA does not create any right or benefit enforceable by law or equity against SCHD, MDEQ, or DEQ, their officers or employees, or any other person. This MOA does not apply to any entity outside SCHD, MDEQ, or DEQ.

- No proprietary information or intellectual property is anticipated to arise out of this MOA.

TERMINATION

This Memorandum of Agreement may be revised upon the mutual consent of SCHD, MDEQ and DEQ. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.

Mississippi Response

STATE OF MISSISSIPPI
TATE REEVES
GOVERNOR
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
CHRIS WELLS, EXECUTIVE DIRECTOR

May 17, 2023

Mr. Goldstein,

I have reviewed the Memorandum of Agreement between Crittenden County Arkansas and Shelby County Tennessee. The Mississippi Department of Environmental Quality (MDEQ) has not made any changes or have plans to change our monitoring efforts at the Desoto County Mississippi monitoring site. MDEQ will continue to operate the continuous $PM_{2.5}$ (API T640) and ozone instruments for 2024.

Thanks,
Michael Jordan

Michael Jordan
Air Monitoring Section, Chief
Mississippi Department of Environmental Quality
515 East Amite Street
Jackson, Ms 39201
p. 601-961-5790
c. 601-573-6574

OFFICE OF POLLUTION CONTROL
Post Office Box 2261·Jackson, Mississippi 39225-2261·Tel: (601) 961-5171·Fax: (601) 354-6612·www.mdeq.ms.gov
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Arkansas Response

ARKANSAS
ENERGY & ENVIRONMENT

May 31, 2023

Ms. Michelle Walker Owenby, Air Director
Tennessee Department of Environment and Conservation
Air Pollution Control Division
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave., 15th Floor
Nashville, TN 37243-1531

Ms. Melissa Fortenberry, Air Division Chief
Mississippi Department of Environmental Quality
Office of Pollution Control, Air Division
P.O. Box 2261
Jackson, MS 39201

Karen Cook-Pryor, Deputy Administrator
Pollution Control Section
Shelby County Health Department
1826 Sycamore View Road
Memphis, TN 38134

Dear All,

In accordance with the provisions of the Memorandum of Agreement signed in May and June of 2008 between the Shelby County Health Department (SCHD), Mississippi Department of Environmental Quality (MDEQ), and the Arkansas Department of Energy and Environment, Division of Environmental Quality (DEQ), this letter serves as a notification that no changes have been made in our current network and DEQ is currently meeting all EPA monitoring requirements.

Sincerely,

David Witherow, PE
Associate Director, Office of Air Quality
Division of Environmental Quality
Arkansas Department of Energy and Environment

ARKANSAS DEPARTMENT OF ENERGY AND ENVIRONMENT

Appendix B Sections of the CFR Referred to in the 2024/25 AMNP

§ 58.10 Annual monitoring network plan and periodic network assessment.

(a)

(1) Beginning July 1, 2007, the state, or where applicable local, agency shall submit to the Regional Administrator an annual monitoring network plan which shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations. The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement. The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments.

(2) Any annual monitoring network plan that proposes network modifications (including new or discontinued monitoring sites, new determinations that data are not of sufficient quality to be compared to the NAAQS, and changes in identification of monitors as suitable or not suitable for comparison against the annual PM2.5 NAAQS) to SLAMS networks is subject to the approval of the EPA Regional Administrator, who shall approve or disapprove the plan within 120 days of submission of a complete plan to the EPA.

(3) The plan for establishing required NCore multipollutant stations shall be submitted to the Administrator not later than July 1, 2009. The plan shall provide for all required stations to be operational by January 1, 2011.

(4) A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting 1.0 tpy or greater shall be submitted to the EPA Regional Administrator no later than July 1, 2009, as part of the annual network plan required in paragraph (a)(1) of this section. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting 1.0 tpy or greater to be operational by January 1, 2010. A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy shall be submitted to the EPA Regional Administrator no later than July 1, 2011. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy to be operational by December 27, 2011.

(5)

(i) A plan for establishing or identifying an area-wide NO2 monitor, in accordance with the requirements of Appendix D, section 4.3.3 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2012. The plan shall provide for these required monitors to be operational by January 1, 2013.

(ii) A plan for establishing or identifying any NO2 monitor intended to characterize vulnerable and susceptible populations, as required in Appendix D, section 4.3.4 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2012. The plan shall provide for these required monitors to be operational by January 1, 2013.

(iii) A plan for establishing a single near-road NO2 monitor in CBSAs having 1,000,000 or more persons, in accordance with the requirements of Appendix D, section 4.3.2 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2013. The plan shall provide for these required monitors to be operational by January 1, 2014.

(iv) A plan for establishing a second near-road NO2 monitor in any CBSA with a population of 2,500,000 persons or more, or a second monitor in any CBSA with a population of 1,000,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts, in accordance with the requirements of appendix D, section 4.3.2 to this part, shall be submitted as part of the Annual Monitoring Network Plan to the EPA Regional Administrator by July 1, 2014. The plan shall provide for these required monitors to be operational by January 1, 2015.

(6) A plan for establishing SO2 monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator by July 1, 2011 as part of the annual network plan required in paragraph (a) (1). The plan shall provide for all required SO2 monitoring sites to be operational by January 1, 2013.

(7) A plan for establishing CO monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator. Plans for required CO monitors shall be submitted at least six months prior to the date such monitors must be established as required by section 58.13.

(8)

(i) A plan for establishing near-road PM2.5 monitoring sites in CBSAs having 2.5 million or more persons, in accordance with the requirements of appendix D to this part, shall be submitted as part of the annual monitoring network plan to the EPA Regional Administrator by July 1, 2014. The plan shall provide for these required monitoring stations to be operational by January 1, 2015.

(ii) A plan for establishing near-road PM2.5 monitoring sites in CBSAs having 1 million or more persons, but less than 2.5 million persons, in accordance with the requirements of appendix D to this part, shall be submitted as part of the annual monitoring network plan to the EPA Regional Administrator by July 1, 2016. The plan shall provide for these required monitoring stations to be operational by January 1, 2017.

(9) The annual monitoring network plan shall provide for the required O3 sites to be operating on the first day of the applicable required O3 monitoring season in effect on January 1, 2017 as listed in Table D-3 of appendix D of this part.

(10) A plan for making Photochemical Assessment Monitoring Stations (PAMS) measurements, if applicable, in accordance with the requirements of appendix D paragraph 5(a) of this part shall be submitted to the EPA Regional Administrator no later than July 1, 2018. The plan shall provide for the required PAMS measurements to begin by June 1, 2019.

(11) An Enhanced Monitoring Plan for O3, if applicable, in accordance with the requirements of appendix D paragraph 5(h) of this part shall be submitted to the EPA Regional Administrator no later than October 1, 2019 or two years following the effective date of a designation to a classification of Moderate or above O3 nonattainment, whichever is later.

(12) A detailed description of the PAMS network being operated in accordance with the requirements of appendix D to this part shall be submitted as part of the annual monitoring network plan for review by the EPA Administrator. The PAMS Network Description described in section 5 of appendix D may be used to meet this requirement.

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

(1) The AQS site identification number.

(2) The location, including street address and geographical coordinates.

(3) The sampling and analysis method(s) for each measured parameter.

(4) The operating schedules for each monitor.

(5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.

(6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.

(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM2.5 NAAQS as described in § 58.30.

(8) The MSA, CBSA, CSA or other area represented by the monitor.

(9) The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.

(10) Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.

(11) Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM10 monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.

(12) The identification of required NO2 monitors as near-road, area-wide, or vulnerable and susceptible population monitors in accordance with Appendix D, section 4.3 of this part.

(13) The identification of any PM2.5 FEMs and/or ARMs used in the monitoring agency's network where the data are not of sufficient quality such that data are not to be compared to the NAAQS. For required SLAMS where the agency identifies that the PM2.5 Class III FEM or ARM does not produce data of sufficient quality for comparison to the NAAQS, the monitoring agency must ensure that an operating FRM or filter-based FEM meeting the sample frequency requirements described in § 58.12 or other Class III PM2.5 FEM or ARM with data of sufficient quality is operating and reporting data to meet the network design criteria described in appendix D to this part.

(c) The annual monitoring network plan must document how state and local agencies provide for the review of changes to a PM2.5 monitoring network that impact the location of a violating PM2.5 monitor. The affected state or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

(d) The state, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby states and tribes or health effects studies. The state, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The assessments are due every five years beginning July 1, 2010.

(e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to § 58.14.

[71 FR 61298, Oct. 17, 2006, as amended at 72 FR 32210, June 12, 2007; 73 FR 67059, Nov. 12, 2008; 73 FR 77517, Dec. 19, 2008; 75 FR 6534, Feb. 9, 2010; 75 FR 35601, June 22, 2010; 75 FR 81137, Dec. 27, 2010; 76 FR 54341, Aug. 31, 2011; 78 FR 16188, Mar. 14, 2013; 78 FR 3282, Jan. 15, 2013; 80 FR 65466, Oct. 26, 2015; 81 FR 17279, Mar. 28, 2016; 81 FR 96388, Dec. 30, 2016]

Appendix C Monitoring Network Requirements

Ozone Monitoring Network Requirements

40 CFR 58 Subpart G, Appendix D to Part 58 current as of April 3, 2024

4.1 Ozone (O_3) Design Criteria. (a) State, and where appropriate, local agencies must operate O_3 sites for various locations depending upon area size (in terms of population and geographic characteristics) and typical peak concentrations (expressed in percentages below, or near the O_3 NAAQS). Specific SLAMS O_3 site minimum requirements are included in Table D-2 of this appendix. The NCore sites are expected to complement the O_3 data collection that takes place at single-pollutant SLAMS sites, and both types of sites can be used to meet the network minimum requirements. The total number of O_3 sites needed to support the basic monitoring objectives of public data reporting, air quality mapping, compliance, and understanding O_3-related atmospheric processes will include more sites than these minimum numbers required in Table D-2 of this appendix. The EPA Regional Administrator and the responsible State or local air monitoring agency must work together to design and/or maintain the most appropriate O_3 network to service the variety of data needs in an area.

TABLE D–2 OF APPENDIX D TO PART 58 SLAMS MINIMUM O_3 MONITORING REQUIREMENTS

MSA population[1, 2]	**Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS[3]**	**Most recent 3-year design value concentrations <85% of any O_3 NAAQS[3,4]**
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000 [5]	1	0

1. Minimum monitoring requirements apply to the metropolitan statistical area (MSA).
2. Population based on latest available census figures.
3. The ozone (O_3) 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.

(b) Within an O_3 network, at least one O_3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area. More than one maximum concentration site may be necessary in some areas. Table D-2 of this appendix does not account for the full breadth of additional factors that would be considered in designing a complete O_3 monitoring program for an area. Some of these additional factors include geographic size, population density, complexity of terrain and meteorology, adjacent O_3 monitoring programs, air pollution transport from neighboring areas, and measured air quality in comparison to all forms of the O_3 NAAQS (i.e., 8-hour and 1-hour forms). Networks must be designed to account for all of these area characteristics. Network designs must be re-examined in periodic network assessments. Deviations from the above O_3 requirements are allowed if approved by the EPA Regional Administrator.

CO Monitoring Network Requirements

40 CFR 58 Subpart G, Appendix D to Part 58

4.2.1 General Requirements. (a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO2 monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of

1,000,000 or more persons. If a CBSA has more than one required near-road NO2 monitor, only one CO monitor is required to be collocated with a near-road NO2 monitor within that CBSA.

(b) If a state provides quantitative evidence demonstrating that peak ambient CO concentrations would occur in a near-road location which meets microscale siting criteria in Appendix E of this part but is not a near-road NO2 monitoring site, then the EPA Regional Administrator may approve a request by a state to use such an alternate near-road location for a CO monitor in place of collocating a monitor at near-road NO2 monitoring site.

NO_2 Monitoring Network Requirements

40 CFR 58 Subpart G, Appendix D to Part 58

4.3.2 Requirement for Near-road NO_2 Monitors

(a) Within the NO_2 network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales. PAMS sites collecting NO_2 data that are situated in an area of expected high NO_2 concentrations at the neighborhood or larger spatial scale may be used to satisfy this minimum monitoring requirement when the NO_2 monitor is operated year round. Emission inventories and meteorological analysis should be used to identify the appropriate locations within a CBSA for locating required area-wide NO_2 monitoring stations. CBSA populations shall be based on the latest available census figures.

(1) The near-road NO_2 monitoring sites shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO_2 concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part. Where a state or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO_2 concentrations are expected to occur, the monitoring agency shall consider the potential for population exposure in the criteria utilized to select the final site location. Where one CBSA is required to have two near-road NO_2 monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation.

(b) Measurements at required near-road NO_2 monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO_2, and NO_X.

SO_2 Monitoring Network Requirements

40 CFR 58 Subpart G, Appendix D to Part 58

4.4 Sulfur Dioxide (SO_2) Design Criteria.

4.4.1 General Requirements. (a) State and, where appropriate, local agencies must operate a minimum number of required SO2 monitoring sites as described below..

4.4.2 Requirement for Monitoring by the Population Weighted Emissions Index. (a) The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO_2 monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of SO_2 in tons per year emitted within the CBSA area, using an aggregate of the most recent county

level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO_2 monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO_2 monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required within that CBSA.

(1) The SO2 monitoring site(s) required as a result of the calculated PWEI in each CBSA shall satisfy minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types (as defined in section 1.1.1 of this appendix): population exposure, highest concentration, source impacts, general background, or regional transport. SO_2 monitors at NCore stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors under this part. Any monitor that is sited outside of a CBSA with minimum monitoring requirements to assess the highest concentration resulting from the impact of significant sources or source categories existing within that CBSA shall be allowed to count towards minimum monitoring requirements for that CBSA.

Table 5: TDEC DAPC Interpretation of the PWEI SO_2 Monitoring Requirements

CBSA AREA NAME	POP ESTIMATE 2023	2020 SO_2 NEI Tons	PWEI 2022	PWEI 2023	SO_2 Monitors Required
Chattanooga, TN-Ga	580,971	146	84	85	0
Clarksville, TN-KY	340,495	7,842	2,640	2,670	0
Cleveland, TN	129,612	61	8	8	0
Jackson, TN	181,826	180	33	33	0
Johnson City, TN	213,198	30	6	6	0
Kingsport-Bristol-Bristol, TN-VA	313,025	4,633	1,442	1,450	0
Knoxville, TN	946,264	1,634	1,484	1,546	0
Memphis, TN-MS-AR	1,335,674	785	1,046	1,049	0
Morristown, TN	124,054	41	6	5	0
Nashville-Davidson-Murfreesboro-Franklin, TN	2,102,573	1,814	3,713	3,814	0

*NEI data not including mobile sources of SO2

4.4.3 *Regional Administrator Required Monitoring.* (a) The Regional Administrator may require additional SO_2 monitoring stations above the minimum number of monitors required in 4.4.2 of this part, where the minimum monitoring requirements are not sufficient to meet monitoring objectives. The Regional Administrator may require, at his/her discretion, additional monitors in situations where an area has the potential to have concentrations that may violate or contribute to the violation of the NAAQS, in areas impacted by sources which are not conducive to modeling, or in locations with susceptible and vulnerable populations, which are not monitored under the minimum monitoring

provisions described above. The Regional Administrator and the responsible State or local air monitoring agency shall work together to design and/or maintain the most appropriate SO_2 network to provide sufficient data to meet monitoring objectives.

4.4.4 SO2 Monitoring Spatial Scales. (a) The appropriate spatial scales for SO2 SLAMS monitors are the microscale, middle, neighborhood, and urban scales. Monitors sited at the microscale, middle, and neighborhood scales are suitable for determining maximum hourly concentrations for SO2. Monitors sited at urban scales are useful for identifying SO2 transport, trends, and, if sited upwind of local sources, background concentrations.

4.4.5 *NCore Monitoring.* (a) SO_2 measurements are included within the NCore multipollutant site requirements as described in paragraph (3)(b) of this appendix. NCore-based SO_2 measurements are primarily used to characterize SO_2 trends and assist in understanding SO_2 transport across representative areas in urban or rural locations and are also used for comparison with the SO_2 NAAQS. SO_2 monitors at NCore sites that exist in CBSAs with minimum monitoring requirements per section 4.4.2 above shall be allowed to count towards those minimum monitoring requirements.

Lead Monitoring Network Requirements

40 CFR 58 Subpart G, Appendix D to Part 58

4.5 *Lead (Pb) Design Criteria.* (a) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (http://www.epa.gov/ttn/chief/eiinformation.html) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure.

(i) One monitor may be used to meet the requirement in paragraph 4.5(a) for all sources involved when the location of the maximum Pb concentration due to one Pb source is expected to also be impacted by Pb emissions from a nearby source (or multiple sources). This monitor must be sited, taking into account logistics and the potential for population exposure, where the Pb concentration from all sources combined is expected to be at its maximum.

(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50 percent of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under § 58.10(d).

(iii) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near each of the airports listed in Table D-3A for a period of 12 consecutive months commencing no later than December 27, 2011. Monitors shall be sited to measure the maximum Pb concentration in ambient air, taking into account logistics and the potential for population exposure, and shall use an approved Pb-TSP Federal Reference Method or Federal Equivalent Method. Any monitor that exceeds 50 percent of the Pb NAAQS on a rolling 3-month average (as determined according to 40 CFR part 50, Appendix R) shall become a required monitor under paragraph 4.5(c) of this Appendix, and shall continue to monitor for Pb unless a waiver is granted allowing it to stop operating as allowed by the provisions in

paragraph 4.5(a)(ii) of this appendix. Data collected shall be submitted to the Air Quality System database according to the requirements of 40 CFR part 58.16.

$PM_{2.5}$ Monitoring Network Requirements

40 CFR 58 Subpart G, Appendix D to Part 58

4.7.1 General Requirements. (a) State, and where applicable local, agencies must operate the minimum number of required $PM_{2.5}$ SLAMS sites listed in Table D-5 of this appendix. The NCore sites are expected to complement the $PM_{2.5}$ data collection that takes place at non-NCore SLAMS sites, and both types of sites can be used to meet the minimum $PM_{2.5}$ network requirements. Deviations from these $PM_{2.5}$ monitoring requirements must be approved by the EPA Regional Administrator.

Table D-5 of Appendix D to Part 58—$PM_{2.5}$ Minimum Monitoring Requirements

MSA population[1, 2]	Most recent 3-year design value ≥85% of any $PM_{2.5}$ NAAQS[3]	Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS[3, 4]
>1,000,000	3	2
500,000-1,000,000	2	1
50,000-<500,000[5]	1	0

[1]Minimum monitoring requirements apply to the metropolitan statistical area (MSA).

[2]Population based on latest available census figures.

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

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

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

(b) Specific Design Criteria for $PM_{2.5}$. The required monitoring stations or sites must be sited to represent area-wide air quality. These sites can include sites collocated at PAMS. These monitoring stations will typically be at neighborhood or urban-scale; however, micro-or middle-scale PM2.5 monitoring sites that represent many such locations throughout a metropolitan area are considered to represent area-wide air quality.

(1) At least one monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration.

(2) For CBSAs with a population of 1,000,000 or more persons, at least one PM2.5 monitor is to be collocated at a near-road NO2 station required in section 4.3.2(a) of this appendix.

(3) For areas with additional required SLAMS, a monitoring station is to be sited in an area of poor air quality.

(4) Additional technical guidance for siting PM2.5 monitors is provided in references 6 and 7 of this appendix.

(c) The most important spatial scale to effectively characterize the emissions of particulate matter from both mobile and stationary sources is the neighborhood scale for PM2.5. For purposes of establishing monitoring sites to represent large homogenous areas other than the above scales of representativeness and to characterize regional transport,

urban or regional scale sites would also be needed. Most PM2.5 monitoring in urban areas should be representative of a neighborhood scale.

(1) Micro-scale. This scale would typify areas such as downtown street canyons and traffic corridors where the general public would be exposed to maximum concentrations from mobile sources. In some circumstances, the micro-scale is appropriate for particulate sites. SLAMS sites measured at the micro-scale level should, however, be limited to urban sites that are representative of long-term human exposure and of many such microenvironments in the area. In general, micro-scale particulate matter sites should be located near inhabited buildings or locations where the general public can be expected to be exposed to the concentration measured. Emissions from stationary sources such as primary and secondary smelters, power plants, and other large industrial processes may, under certain plume conditions, likewise result in high ground level concentrations at the micro-scale. In the latter case, the micro-scale would represent an area impacted by the plume with dimensions extending up to approximately 100 meters. Data collected at micro-scale sites provide information for evaluating and developing hot spot control measures.

(2) Middle scale —People moving through downtown areas, or living near major roadways, encounter particle concentrations that would be adequately characterized by this spatial scale. Thus, measurements of this type would be appropriate for the evaluation of possible short-term exposure public health effects of particulate matter pollution. In many situations, monitoring sites that are representative of microscale or middle-scale impacts are not unique and are representative of many similar situations. This can occur along traffic corridors or other locations in a residential district. In this case, one location is representative of a number of small scale sites and is appropriate for evaluation of long-term or chronic effects. This scale also includes the characteristic concentrations for other areas with dimensions of a few hundred meters such as the parking lot and feeder streets associated with shopping centers, stadia, and office buildings.

(3) Neighborhood scale —Measurements in this category would represent conditions throughout some reasonably homogeneous urban sub-region with dimensions of a few kilometers and of generally more regular shape than the middle scale. Homogeneity refers to the particulate matter concentrations, as well as the land use and land surface characteristics. Much of the PM2.5 exposures are expected to be associated with this scale of measurement. In some cases, a location carefully chosen to provide neighborhood scale data would represent the immediate neighborhood as well as neighborhoods of the same type in other parts of the city. PM2.5 sites of this kind provide good information about trends and compliance with standards because they often represent conditions in areas where people commonly live and work for periods comparable to those specified in the NAAQS. In general, most PM2.5 monitoring in urban areas should have this scale.

(4) Urban scale —This class of measurement would be used to characterize the particulate matter concentration over an entire metropolitan or rural area ranging in size from 4 to 50 kilometers. Such measurements would be useful for assessing trends in area-wide air quality, and hence, the effectiveness of large scale air pollution control strategies. Community-oriented PM2.5 sites may have this scale.

(5) Regional scale —These measurements would characterize conditions over areas with dimensions of as much as hundreds of kilometers. As noted earlier, using representative conditions for an area implies some degree of homogeneity in that area. For this reason, regional scale measurements would be most applicable to sparsely populated areas. Data characteristics of this scale would provide information about larger scale processes of particulate matter emissions, losses and transport. PM2.5 transport contributes to elevated particulate concentrations and may affect multiple urban and State entities with large populations such as in the eastern United States. Development of effective pollution control strategies requires an understanding at regional geographical scales of the emission sources and atmospheric processes that are responsible for elevated PM2.5 levels and may also be associated with elevated O3 and regional haze.

4.7.2 Requirement for Continuous PM2.5 Monitoring. The State, or where appropriate, local agencies must operate continuous PM2.5 analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies. State and local air monitoring agencies must use methodologies and quality assurance/quality control (QA/QC) procedures approved by the EPA Regional Administrator for these required continuous analyzers.

4.7.3 Requirement for PM2.5 Background and Transport Sites. Each State shall install and operate at least one PM2.5 site to monitor for regional background and at least one PM2.5 site to monitor regional transport. These monitoring sites may be at community-oriented sites and this requirement may be satisfied by a corresponding monitor in an area having similar air quality in another State. State and local air monitoring agencies must use methodologies and QA/QC procedures approved by the EPA Regional Administrator for these sites. Methods used at these sites may include non-federal reference method samplers such as IMPROVE or continuous PM2.5 monitors.

4.7.4 PM2.5 Chemical Speciation Site Requirements. Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the PM2.5 Speciation Trends Network (STN). The selection and modification of these STN sites must be approved by the Administrator. The PM2.5 chemical speciation urban trends sites shall include analysis for elements, selected anions and cations, and carbon. Samples must be collected using the monitoring methods and the sampling schedules approved by the Administrator. Chemical speciation is encouraged at additional sites where the chemically resolved data would be useful in developing State implementation plans and supporting atmospheric or health effects related studies.

PM_{10} Monitoring Network Requirements

4.6 Particulate Matter (PM_{10}) Design Criteria.>(a) Table D-4 indicates the approximate number of permanent stations required in MSAs to characterize national and regional PM10 air quality trends and geographical patterns. The number of PM10 stations in areas where MSA populations exceed 1,000,000 must be in the range from 2 to 10 stations, while in low population urban areas, no more than two stations are required. A range of monitoring stations is specified in Table D-4 because sources of pollutants and local control efforts can vary from one part of the country to another and therefore, some flexibility is allowed in selecting the actual number of stations in any one locale. Modifications from these PM10 monitoring requirements must be approved by the Regional Administrator.

TABLE D-4 OF APPENDIX D TO PART 58 - PM 10 MINIMUM MONITORING REQUIREMENTS (APPROXIMATE NUMBER OF STATIONS PER MSA) 1

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

[1] Selection of urban areas and actual numbers of stations per area will be jointly determined by EPA and the State agency.

[2] High concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM 10 NAAQS by 20 percent or more.

[3] Medium concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM 10 NAAQS.

[4] Low concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM 10 NAAQS.

[5] These minimum monitoring requirements apply in the absence of a design value.

Index reporting requirements

40 CFR 58 Subpart G, 58.50 Revised as of October 26, 2015.

58.50 Index reporting.

(a) The state or where applicable, local agency shall report to the general public on a daily basis through prominent notice an air quality index that complies with the requirements of Appendix G: Annual Site Evaluations to this part.

(b) Reporting is required for all individual MSA with a population exceeding 350,000.

(c) The population of a MSA for purposes of index reporting is the most recent decennial U.S. census population.

NCore Monitoring Network Requirements and PM $_{10-2.5}$

40 CFR 58 Subpart G, Appendix D to Part 58 Revised as of December 30, 2016

(a) Each State
(i.e. the fifty States, District of Columbia, Puerto Rico, and the Virgin Islands) is required to operate at least one NCore site. States may delegate this requirement to a local agency. States with many MSAs often also have multiple air sheds with unique characteristics and, often, elevated air pollution. These States include, at a minimum, California, Florida, Illinois, Michigan, New York, North Carolina, Ohio, Pennsylvania, and Texas. These States are required to identify one to two additional NCore sites in order to account for their unique situations. These additional sites shall be located to avoid proximity to large emission sources. Any State or local agency can propose additional candidate NCore sites or modifications to these requirements for approval by the Administrator. The NCore locations should be leveraged with other multipollutant air monitoring sites including PAMS sites, National Air Toxics Trends Stations (NATTS) sites, CASTNET sites, and STN sites. Site leveraging includes using the same monitoring platform and equipment to meet the objectives of the variety of programs where possible and advantageous.

(b) The NCore sites must measure, at a minimum, PM2.5 particle mass using continuous and integrated/filter-based samplers, speciated PM2.5, PM10-2.5 particle mass, O3, SO2, CO, NO/NOY, wind speed, wind direction, relative humidity, and ambient temperature.

(1) Although the measurement of NOy is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NOy compared to the conventional measurement of NOX, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NOy and NOX measured concentrations, the Administrator may allow for waivers that permit NOX monitoring to be substituted for the required NOy monitoring at applicable NCore sites.

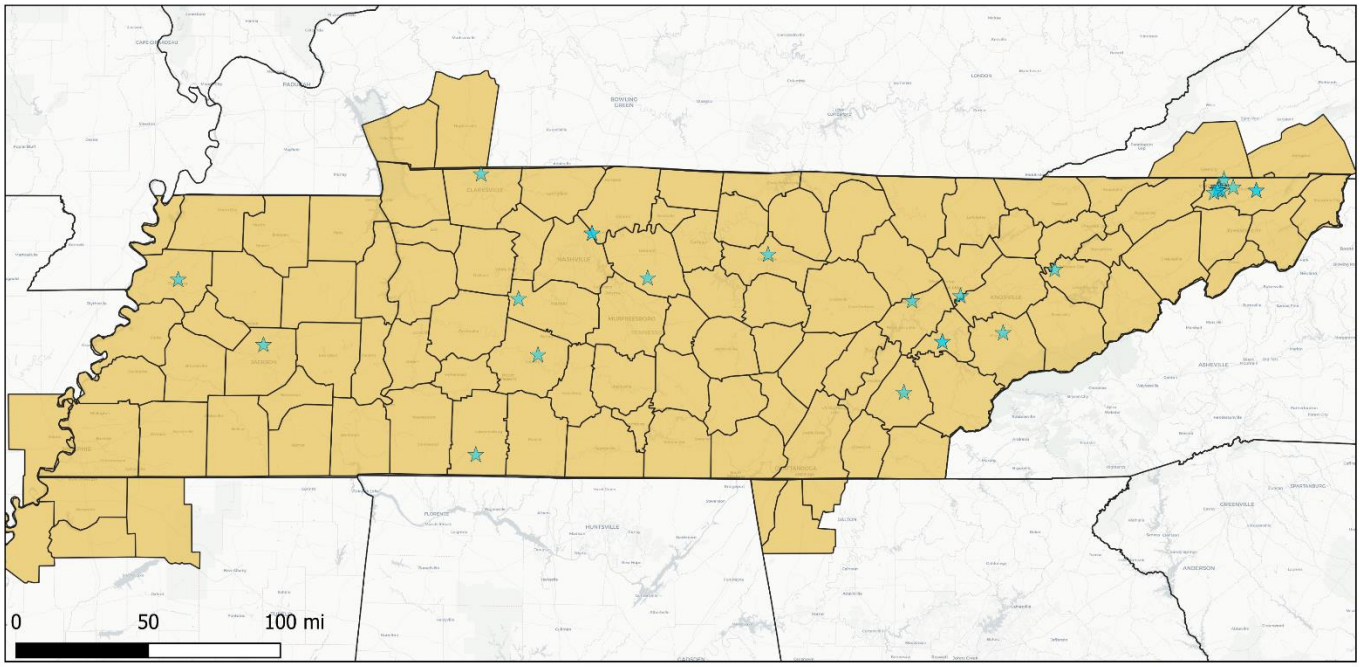
(2) The EPA recognizes that, in some cases, the physical location of the NCore site may not be suitable for representative meteorological measurements due to the site's physical surroundings. It is also possible that nearby meteorological measurements may be able to fulfill this data need. In these cases, the requirement for meteorological monitoring can be waived by the Administrator.
40 CFR 58 Subpart G, Appendix D to Part 58 revised as of December 30, 2016

Coarse Particulate Matter ($PM_{10-2.5}$) Design Criteria.

4.8.1 General Monitoring Requirements. (a) The only required monitors for $PM_{10-2.5}$ are those required at NCore Stations.
(b) Although microscale monitoring may be appropriate in some circumstances, middle and neighborhood scale measurements are the most important station classifications for PM10-2.5 to assess the variation in coarse particle concentrations that would be expected across populated areas that are in proximity to large emissions sources.

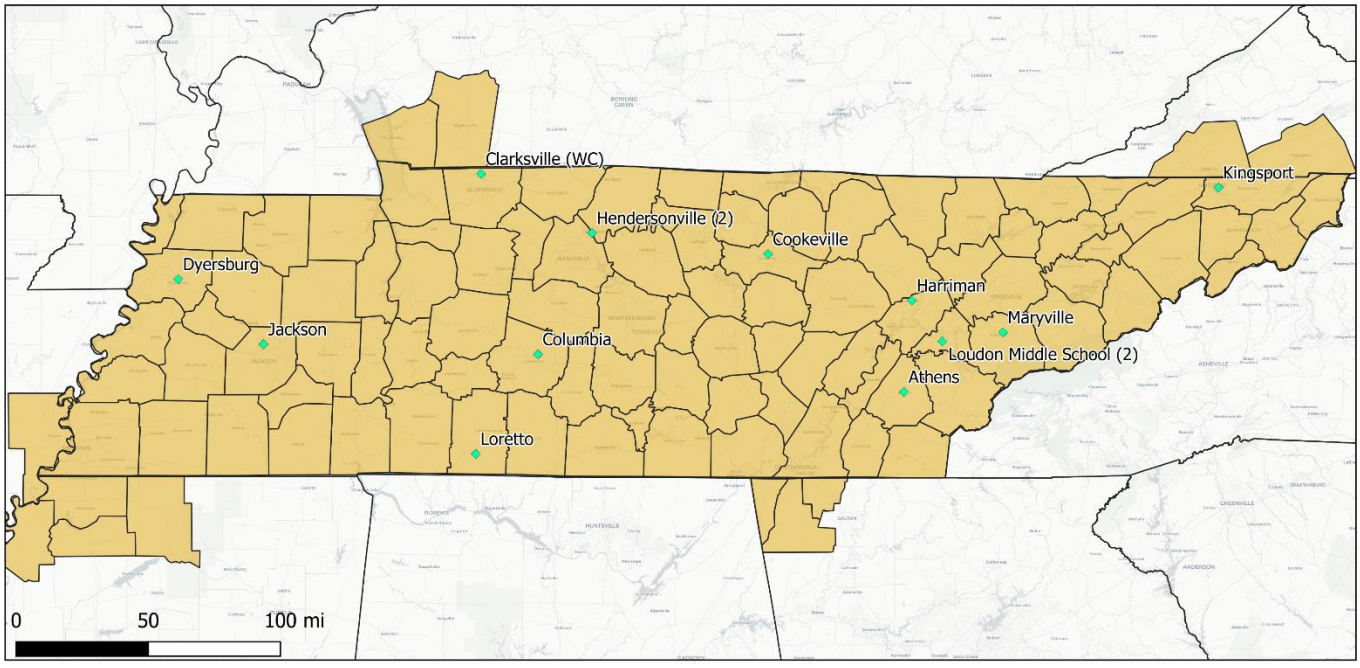
Appendix D TDEC DAPC Monitor Maps

All Monitoring Sites Operated by TDEC DAPC and the National Park Service



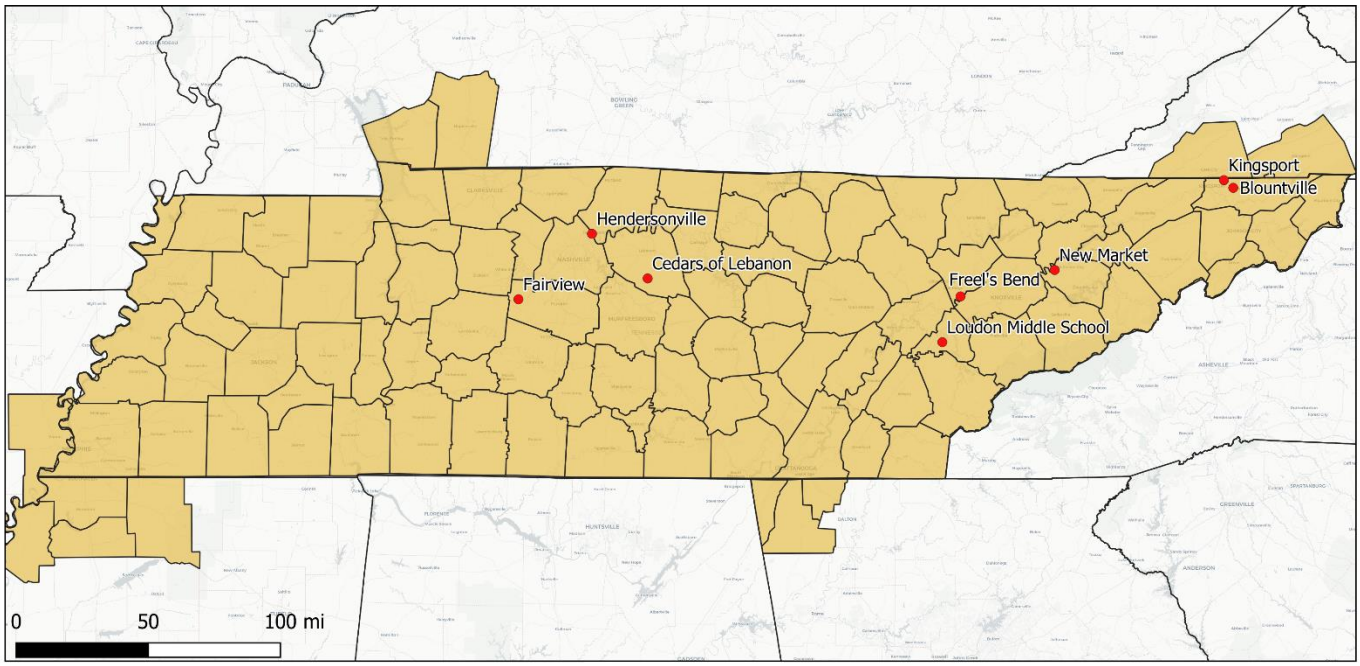
TDEC Monitor

$PM_{2.5}$ Monitor Locations



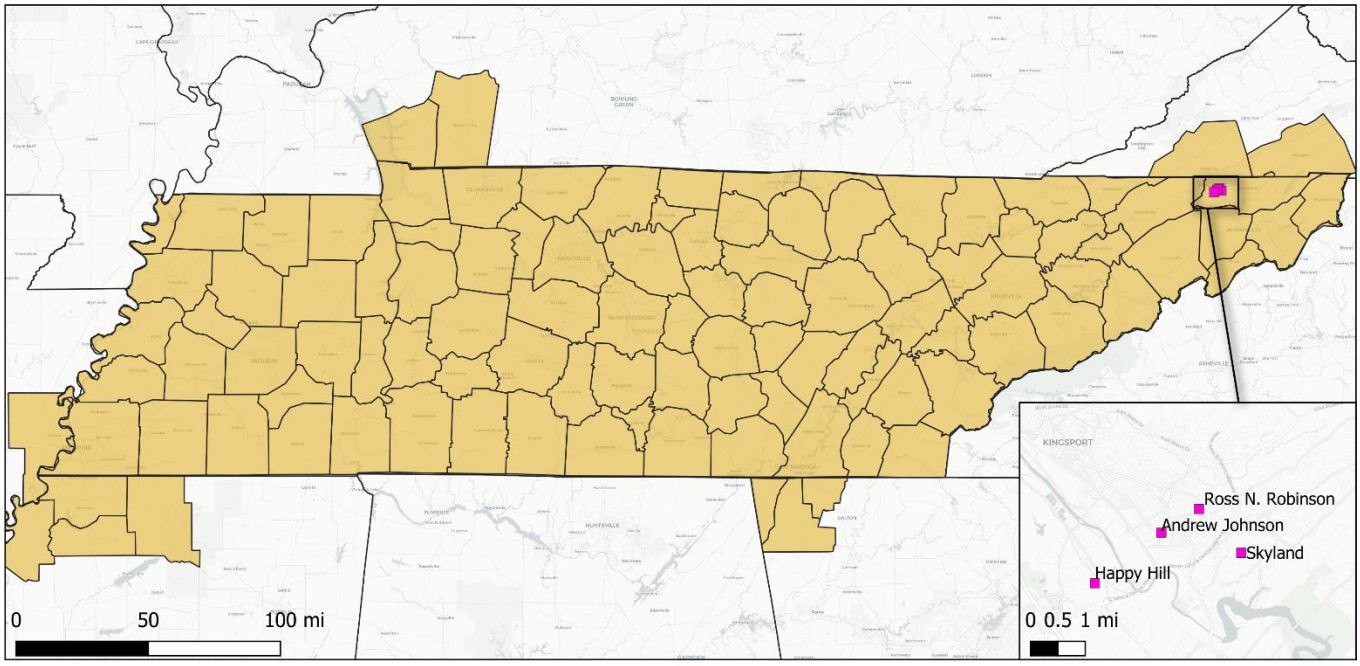
PM2.5 Monitors

Ozone Monitor Locations



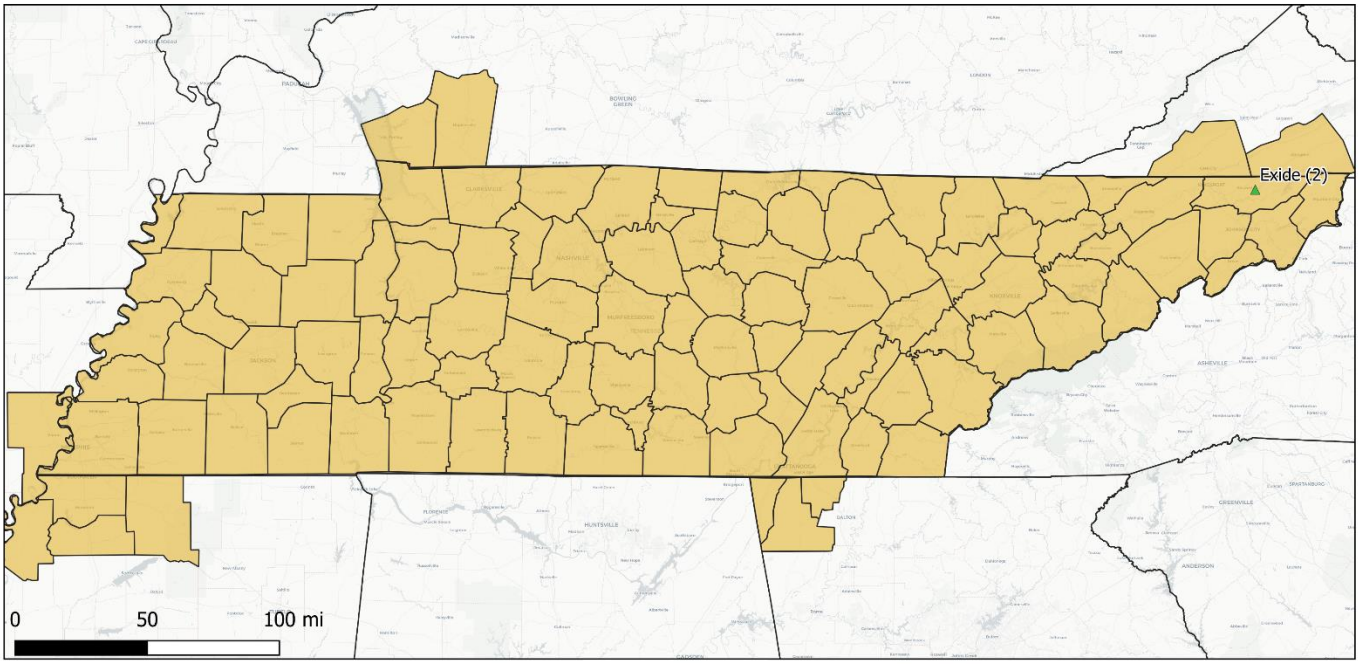
Ozone Monitors

SO_2 Monitor Locations



SO2 Monitors

Lead Monitor Locations



Appendix E Annual Site Evaluations & Documentation

2024 Tennessee monitoring site evaluation documentation can be found at TDEC DAPC's Air Quality Monitoring & Forecasting website:

https://www.tn.gov/environment/air/monitoring-forecasting.html

Appendix F Tennessee 2023 Annual Ongoing Data Requirements Report

Draft
Tennessee 2023 Annual Ongoing Data Requirements Report

Annual Reporting of Emissions for

TVA-Cumberland

(TVA-Allen, and TVA-Johnsonville are Exempted from the Annual Reporting Requirement)

Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard

April 23, 2024

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LIST OF TABLES

Annual Reporting of Emissions:

1.0 PURPOSE AND BACKGROUND

The Tennessee Department of Environment and Conservation Division of Air Pollution Control (TDEC APC) has prepared this report as the state's Annual Ongoing Data Requirements Report for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS) as an appendix to its Annual Monitoring Network Plan. This report is intended to fulfill the annual reporting requirements of 40 CFR Part 51 Subpart BB, "*Data Requirements Rule for Characterizing Air Quality for the Primary SO_2 NAAQS*". The Annual Ongoing Data Requirements Report is due to the EPA on July 1, 2020, to meet the reporting requirements in 40 CFR 51.1205 (b)[1]

> "(b) *Modeled areas*. For any area where modeling of actual SO_2 emissions serve as the basis for designating such area as attainment for the 2010 SO_2 NAAQS, the air agency shall submit an annual report to the Environmental Protection Agency (EPA) Regional Administrator by July 1 of each year, either as a stand-alone document made available for public inspection, or as an appendix to its Annual Monitoring Network Plan (also due on July 1 each year under 40 CFR 58.10), that documents the annual SO_2 emissions of each applicable source in each such area and provides an assessment of the cause of any emissions increase from the previous year. The first report for each such area is due by July 1 of the calendar year after the effective date of the area's initial designation."

In Tennessee, the following counties shown in Table 1 are the areas subject to the Annual Ongoing Data Requirements Report. The listed Tennessee Valley Authority (TVA) facilities are the sources that required 2012-2014 modeling within these areas.

Table 1: TN DRR Areas and 2012-2014 Modeled Sources

County	Facility[2]	Maximum 1-hour SO_2 Impact[3]		Impact Distance
		µg/m3	ppb	km
Stewart	TVA - Cumberland Fossil Plant	121.8	46.5	3.19 (SW)
Humphreys	TVA - Johnsonville Fossil Plant	127.6	48.7	2.08 (E)
Shelby	TVA -Allen Fossil Plant	172.9	66.0	1.44 (N)

[1] 80 FR 51052, DRR for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary NAAQS, August 21, 2015.

[2] The modeling packages for these facilities were originally submitted to EPA Region 4 on the following dates and were submitted again on November 10, 2016, to EPA Region 4:

TVA - Cumberland Fossil (CUF) Plant: September 21, 2016 .

TVA - Johnsonville Fossil (JOF) Plant: October 12, 2016 .

TVA - Allen Fossil (ALF) Plant: November 2, 2016 .

[3] Maximum impacts are based on actual emissions for the affected units and permitted allowable emissions for the near-by sources, if any included.

2.0 TECHNICAL ANALYSIS

On January 13, 2017[4], TDEC APC submitted a letter to Environmental Protection Agency (EPA) requesting that Humphreys, Shelby and Stewart Counties, Tennessee be designated as attainment/unclassifiable for the 2010 SO2 NAAQS based on TDEC APC's analysis, performed in accordance with EPA's technical assessment guidance, regarding the air quality surrounding the TVA plants and the rest of these counties. The air quality analyses were based on modeling of actual SO2 emissions (2012-2014) from sources in and around these counties. On January 9, 2018, U.S. EPA designated these three counties as attainment/unclassifiable[5] for the 2010 SO_2 NAAQS. Therefore, these areas are subject to the ongoing verification requirements under 40 CFR 51.1205(b), and the TDEC APC is submitting this Annual Ongoing Data Requirements Report to meet the reporting requirements for these modeled areas.

Per 40 CFR 51.1205 (b), TDEC APC is required to document the annual SO2 emissions of each applicable source in the *modeled areas*. Table 2 lists the TVA Power Stations within these *modeled areas* and details their annual actual SO2 emissions in tons from 2012 to 2022. The air program acquired all the emission data from the Tennessee Emissions Inventory Program and confirmed the emission data matched the one in EPA's Clean Air Market Division (CAMD) Acid Rain Program (ARP) database.

Table 2. Actual SO_2 Emissions in Stewart, Humphreys, and Shelby Counties for TVA DRR Sources

Area	Modeled Source (Facility ID)	TVA Actual SO2 Emissions from TnEIP (tons/year)										
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Stewart County	TVA - Cumberland Fossil Plant (81-0011)	10,101	7,962	9,396	8,849	10,123	6,650	7,408	7,209	7,178	7,766	5,782
Humphreys County	TVA - Johnsonville Fossil Plant (43-0011)	17,812	12,072	17,518	29,631	9,202	6,330	22	13	17	62	Exempt
Shelby County	TVA – Allen Fossil Plant (79-0528)	9,609	9,989	9,750	6,950	7,693	7,635	916	14	7	58	Exempt

The actual modeled emissions for the DRR 2012-2014 modeling are shown in Table 3 f or TVA Power Stations.

[4] This letter addresses revisions to the May 26, 2011, letter in revising Tennessee's sulfur dioxide designation recommendations for sources subject to the Data Requirements Rule for the 2010 SO_2 NAAQS.
[5] Federal/Register Notice Published January 9, 2018 [83 FR 1098, pages 1158-1159].

Table 3. Modeled 2012-2014 SO2 Emissions in Stewart, Humphreys, and Shelby Counties for TVA Sources

Area	Modeled Source (Facility ID)	TVA Actual SO2 Emissions (tons/year)			Max-Modeled Design Value (ppb)
		2012	2013	2014	2012-2014
Stewart County	TVA - Cumberland Fossil Plant (81-0011)	10,103	7,964	9,396	46.5
Humphreys County	TVA - Johnsonville Fossil Plant (43-0011)	11,599	9,672	17,519	48.7
Shelby County	TVA – Allen Fossil Plant (79-0528)	9,651	10,026	9,781	66.0

NOTE:

[a] SO2 Hourly NAAQS = 75 ppb.

[b] TVA Cumberland two boilers were modeled only, and no other nearby sources included.

[c] TVA Johnsonville modeled with (DuPont and Hood Containers nearby sources at allowable emission rates of 59.7 and 50.8 tpy respectively).

[d] TVA Allen was modeled with the nearby (Nucor Steel Memphis source at allowable emission rate of 201.5 tpy).

The total reduction in SO2 emissions for TVA DRR sources between the modeled 2012-2014 period and the latest 2020-2022 period are shown in table 4 for Stewart, Humphreys, and Shelby Counties

Table 4. Total SO2 Emissions Reductions in Stewart, Humphreys, and Shelby Counties for TVA DRR Sources

Area	Modeled Source (Facility ID)	TVA Actual SO2 Emissions (tons/year)		Emissions Reductions (tons/year)
		2012-2014 Total (From Table 3)	2020-2022 Total (From Table 2)	
Stewart County	TVA - Cumberland Fossil Plant (81-0011)	27,463	20,726	-6,737
Humphreys County	TVA - Johnsonville Fossil Plant (43-0011)	38,790	Exempt	Insignificant
Shelby County	TVA – Allen Fossil Plant (79-0528)	29,458	Exempt	Insignificant

For **Stewart County**, table 2 shows that the 2022 annual emissions from TVA-Cumberland Power Station decreased from the 2021 emissions by 1,984 tons and are less than any of the years during the 3-year period that were included in the initial DRR modeling (i.e., 2012-2014) as shown in table 3. Additionally, there is a total SO2 emissions reduction of 6,737 tpy between the modeled 2012-2014 period and the latest 2020-2022 period as shown in table 4, therefore no additional modeling analysis is needed. The two coal-fired boilers are potentially slated for retirement in 2026 (unit 1) and in 2028 (unit 2) and be replaced with combined-cycle gas plant for electric power generation.

For **Humphreys County**, TVA-Johnsonville was exempted from further annual reporting of actual emissions based on 2019-2021 exemption modeling demonstration and its SO2 emissions were deemed insignificant based on the modeling demonstration for a maximum impact was below 50% of the 1-hour SO2 NAAQS (see attachment).

For **Shelby County,** TVA-Allen was exempted from further annual reporting of actual emissions based on 2019-2021 exemption modeling demonstration and its SO2 emissions were deemed insignificant based on the modeling demonstration for a maximum impact was below 50% of the 1-hour SO2 NAAQS (see attachment).

3.0 PUBLIC INSPECTION PERIOD

As required in 40 CFR 51.1205, TDEC APC has made this report as an appendix to its Annual Monitoring Network Plan.

4.0 CONCLUSIONS

This submittal satisfies the DRR annual reporting and verification of emissions for the year 2023 as demonstrated with the latest 2020-2022 emissions for the TVA DRR sources in TN. Namely: TVA-Cumberland.

Tennessee has also demonstrated through the 2019-2021 modeling for TVA-Allen and TVA-Johnsonville that both power plants qualify for exemption from the ongoing annual reporting of emissions based on the DV modeling results that are below 50% of the SO2 hourly NAAQS. EPA has approved the exemption request for both plants on March 11, 2024 (for TVA-Johnsonville) and on March 21, 2024 (for TVA-Allen). (See attachment).

The TVA-Cumberland is potentially slated for shutdown and retirement of the two coal-fired power boilers in 2026 (unit 1) and in 2028 (unit 2) and conversion of the plant to a combined-cycle gas-fired power plant utilizing mainly gas-fired combustion turbines (CTs), which is same as TVA-Allen (now ACT) and TVA-Johnsonville (now JCT) and potentially be exempted from annual reporting of emissions in the foreseeable future.

ATTACHMENT

EPA-APPROVED EXEMPTION LETTERS FROM ANNUAL REPORTING OF EMISSIONS FOR TVA-ALLEN AND TVE-JOHNSONVILLE

TVA-Allen Exemption Letter

REGION 4 ADMINISTRATOR

ATLANTA, GA 30303

March 21, 2024

David Salyers
Commissioner
Tennessee Department of Environment
and Conservation William R. Snodgrass
Tennessee Tower
312 Rosa L. Park Avenue, Tennessee Tower, 2nd Floor Nashville,
Tennessee 37243

Dear Commissioner Salyers:

This letter is in response to your request for the U.S. Environmental Protection Agency to terminate requirements under the Data Requirements Rule (DRR)[1] for the 2010 1-hour sulfur dioxide (SO_2) primary national ambient air quality standard (NAAQS) for ongoing verification that applies to the Tennessee Valley Authority (TVA) Allen Combined-Cycle facility (formerly Allen Fossil Plant) (TVA Allen) in Shelby County, Tennessee. The request to terminate the ongoing DRR annual emissions reporting requirements for TVA Allen was transmitted to the EPA by your office on June 29, 2023. Tennessee's request to terminate the ongoing SO2 emissions reporting requirements for Shelby County is approved for reasons discussed further below.

The EPA designated Shelby County, Tennessee, attainment/unclassifiable[2] on January 9, 2018, effective, April 9, 2018, based on an air dispersion modeled characterization of actual emissions for the TVA Allen facility and nearby SO_2 emitting sources. The DRR provides that "[f]or any area where modeling of actual SO_2 emissions serve[s] as the basis for designating such area as attainment for the 2010 SO_2 NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator" providing specified types of information, including a recommendation as to the need for further modeling to assess whether the area is continuing to attain the NAAQS. *See* 40 CFR 51.1205(b).
However, "[a]n air agency will no longer be subject to [these requirements] if it provides air quality modeling demonstrating that air quality values at all receptors in the analysis are no greater than 50 percent of the 1-hour SO_2 NAAQS, and such demonstration is approved by the EPA Regional Administrator."

[1] 40 CFR part 51, subpart BB.

[2] *See* 83 FR 1098.

Tennessee's June 29, 2023, termination request is based on an air dispersion modeling characterization for the TVA Allen facility and nearby SO_2 emitting sources in Shelby County which may have a potential impact in the area of analysis where maximum concentrations of SO_2 are expected. The modeling analysis assessed actual hourly varying SO_2 emissions data for the TVA Allen facility which resulted in a 1-hour maximum SO_2 concentration of 17.1 micrograms per cubic meter ($\mu g/m^3$), equivalent to 6.53 parts per billion (ppb), which is below the 2010 1-hour SO_2 standard of 196.4 $\mu g/m^3$ or 75 ppb for purposes of terminating the ongoing emission reporting requirements pursuant to 40 CFR 51.1205(c).

The EPA has evaluated Tennessee's modeling analysis and associated supporting documentation and concludes that the State appropriately characterized SO_2 air quality in the vicinity of TVA Allen. The EPA has included its technical assessment of the modeling analysis supporting Tennessee's termination request in the enclosed technical support document. The EPA agrees that the modeling analysis for the TVA Allen facility in Shelby County, based on hourly SO_2 actual emissions, provides for a maximum hourly SO_2 concentration below the 1-hour standard, thus demonstrating attainment. Therefore, I approve Tennessee's request to terminate the ongoing SO_2 emissions reporting requirements for Shelby County. Consequently, no further annual emission reports are required for TVA Allen facility pursuant to 40 CFR 51.1205(b) and (c).

Thank you all for the work your agency does to support improved air quality. If you have any questions, please contact Sarah Taft, Acting Director of the Air and Radiation Division, at (513) 569- 7037.

Sincerely,

JEANEANNE GETTLE

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Date: 2024.03.21 15:08:38 -04'00'

Jeaneanne M. Gettle,
Acting Regional Administrator

TVA-Johnsonville Exemption Letter

REGION 4
ADMINISTRATOR
ATLANTA, GA 30303

March 11, 2024

David Salyers, Commissioner
Tennessee Department of Environment and Conservation
(TDEC)
William R. Snodgrass Tennessee Tower
312 Rosa L. Park Avenue, Tennessee Tower, 2nd Floor
Nashville, Tennessee 37243

Dear Commissioner Salyers:

This letter is in response to your request for the U.S. Environment al Protection Agency to terminate requirements under the Data Requirements Rule (DRR)[1] for the 2010 1-hour sulfur dioxide (50 2) primary national ambient air quality standards (NAAQS) for ongoing verification that applies to the Tennessee Valley Authority (TVA) Johnsonville Combustion Turbine Plant (former ly Johnsonville Fossil Plant) (TVA Johnsonville) in Humphreys County, Tennessee. The request to terminate the ongoing ORR annual emissions reporting requirements for TVA Johnsonville was transmitted to the EPA by your office on June 29, 2023.

The EPA designated Humphreys County, Tennessee, attainment/ unclassifiable [2] on January 9, 2018, effective, April 9, 2018, based on an air dispersion modeled characterization of actual emissions for the TVA Johnsonville facility and nearby 502 emitting sources. The ORR provides that "[f]or any area where modeling of actual 50 2 emissions serve[s] as the basis for designating such area as attainment for the 2010 50 2 NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator" providing specified types of information, including a recommendation as to the need for further modeling to assess whether the area is continuing to attain the NAAQS. *See* 40 CFR 51.1205(b).
However, "[a]n air agency will no longer be subject to [these requirements] if it provides air quality modeling demonstrating that air quality values at all receptors in the analysis are no greater than 50 percent of the 1-hour 50 2 NAAQS, and such demonstration is approved by the EPA Regional Administrator ." *See* 40 CFR 51.1205(b)(2).

1 4 0 CFR part 51, subpart BB.
2 *See* 83 FR 1098 .

Tennessee's June 29, 2023, termination request is based on an air dispersion modeling characterization for the TVA Johnsonville facility and nearby S02 emitting sources in Humphreys County which may have a potential impact in the area of analysis where maximum concentrations of S0 2 are expected. The modeling analysis assessed actual hourly varying S02 emissions data for the TVA Johnsonville facility which resulted in a 1-hour maximum S02 concentration of 94.8 micrograms per cubic meter ($\mu g/m^3$), equivalent to 36.1 parts per billion (ppb), which is below the 2010 1-hour S0 2 standard of 196.4 $\mu g/m^3$ or 75 ppb pursuant to 40 CFR 51.1205(c) for purposes of terminating the ongoing emission reporting requirements.

The EPA has evaluated Tennessee's modeling analysis and associated supporting documentation and concludes that the State appropriately characterized 502 air quality in the vicinity of TVA Johnsonville. The EPA has included its technical assessment of the modeling analysis supporting Tennessee's termination request in the enclosed technical support document. The EPA agrees that the modeling analysis for the TVA Johnsonville facility in Humphreys County , based on hourly 50 2 actual emissions, provides for a maximum hourly S02 concentration below 50 percent of the 1-hour standard . Therefore, I approve Tennessee's request to terminate the ongoing S02 emissions reporting requirements for Humphreys County. Consequently, no further annual emission reports are required for TVA Johnsonville facility pursuant to 40 CFR 51.120S(b) and (c).

Thank you all for the work your agency does to support improved air quality . If you have any questions, please contact Sarah Taft, Acting Director of the Air and Radiation Division, at (513) 569-7037.

Sincerely,

CESAR ZAPATA Digitally signed by CESAR ZAPATA Date: 2024.03.11 16:34:36 -04'00'

Jeaneanne M. Gettle
Acting Regional Administrator

Enclosure

cc: Greg Young, Deputy Commissioner, TDEC
Michel le Walker Owenby, Environmental Program Administrator, TDEC Air Pollution Control
Jimmy Johnston , Environment al Program Director, TDEC Air Pollution Control
Michelle Oakes, Regulatory Development/SIP manager, TDEC Air Pollution Control