



June 30, 2025

James McDonald, Ph.D.  
Director, Air and Radiation Division  
U.S. Environmental Protection Agency, Region 6  
1201 Elm Street, Suite 500  
Dallas, Texas 75270-2102

Re: 2025 Combined 5 Year Network Assessment and Annual Network Plan

Please find enclosed the 2025 Combined 5 Year Network Assessment and Annual Network Plan (ANP) from the Oklahoma Department of Environmental Quality (Oklahoma DEQ). This document was posted on our website for the required 30-day public comment period and is now ready for submittal to your office. One public comment was received. The public comment and response are provided under Appendix E of the following document.

The Asset Management inventory report requested by EPA will be a separate submission from the Oklahoma DEQ 2025 Combined 5 Year Network Assessment and ANP. The SO<sub>2</sub> Annual Report requested by EPA and required under 40 CFR §51.1205 will be a separate submission from the Oklahoma DEQ 2025 Combined 5 Year Network Assessment and ANP. Should staff find that further changes are necessary, please address those in the official response to our submittal.

We look forward to EPA's response and working with your staff to ensure that our network continues to be the best possible in order to better protect the environment and the health of Oklahoma's citizens. Should you have any questions regarding this submittal, feel free to contact Ryan Biggerstaff at 405.702.4140 or Bryan Sims at 405.702.4139.

Sincerely,

A handwritten signature in blue ink that reads "Cheryl E. Bradley".

Cheryl E. Bradley  
Environmental Programs Manager  
Data and Planning Section

**Oklahoma Department of Environmental Quality  
Air Quality Division  
2025**

**Combined  
5-Year Network Assessment  
And  
Annual Network Plan**



Oklahoma Department of Environmental Quality  
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## **Abbreviations**

<b>Abbreviation</b>	<b>Meaning</b>
AAGVP	Ambient Air Gas Verification Program
ANP	Annual Network Plan
AOC	Area of Concern
AQD	Air Quality Division
AQI	Air Quality Index
AQS	Air Quality System
AV	Air Vision
CAA	Clean Air Act
CBSA	Core-Based Statistical Area
CFR	Code of Federal Regulations
CSN	Chemical Speciation Network
CO	Carbon Monoxide
DRR	Data Requirements Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
MAAC	Maximum Acceptable Ambient Concentration
MDN	Mercury Deposition Network
MFC	Mass Flow Controller
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NATTS	National Air Toxics Trend Station
NCORE	National Core Multi-Pollutant Site
NO	Nitric Oxide
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
NO <sub>y</sub>	Reactive Nitrogen
NTN	National Trends Network
O <sub>3</sub>	Ozone
OCS	Oklahoma Climatological Survey
Oklahoma DEQ	Oklahoma Department of Environmental Quality
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter less than 10 μm
PM <sub>2.5</sub>	Particulate Matter less than 2.5μm
PQAO	Primary Quality Assurance Organization
PSD	Prevention of Significant Deterioration
PWEI	Population Weighted Emission Index
QA	Quality Assurance
QAPP	Quality Assurance Project Plans
QC	Quality Control
RA40	Regional Administrator Required Monitoring
SIP	State Implementation Plan
SO <sub>2</sub>	Sulfur Dioxide
SOP	Standard Operating Procedures
SPM	Special Purpose Monitor
TAC	Toxic Air Contaminants
TAPI	Teledyne Advanced Pollution Instruments
TE	Thermo Environmental
TEOM/FDMS	Tapered Element Oscillating Microbalance/Filter Dynamics Measurement System
TSA	Technical System Audits
TSP	Total Suspended Particulates
VOC	Volatile Organic Compound
ZSP	Zero, Span, and Precision Check

## **Introduction**

The U.S. Environmental Protection Agency (EPA) requires each state or local monitoring agency, where applicable, to conduct network assessments once every five years [40 Code of Federal Regulations (CFR) 58.10(d)]. Oklahoma is a rural state with four state Metropolitan Statistical Areas (MSAs) (Oklahoma City, Tulsa, Lawton, and Enid) and one state-shared MSA with Arkansas (Fort Smith). Oklahoma DEQ will take a straightforward approach toward meeting the requirements posed by 40 CFR 58.10(d):

- Address if network meets requirements as defined in 40 CFR 58, Appendix D.
- Determine if new sites are necessary.
- Determine if existing sites can be removed.
- Evaluate/discuss new technologies and the possibility of their incorporation into the network.

This report also documents the annual review of the air-monitoring network operated by the Oklahoma Department of Environmental Quality's (Oklahoma DEQ) Air Quality Division (AQD). When finalized as a combined 5-Year Network Assessment and Annual Network Plan (ANP), it will be submitted by July 1, 2025, to the EPA as required by 40 CFR 58.10 and provide the framework for establishing and maintaining Oklahoma's air quality surveillance system. AQD uses data collected by this network for comparison to the National Ambient Air Quality Standards (NAAQS). AQD maintains its ambient air monitoring network in accordance with the quality assurance requirements of 40 CFR 58, Appendix A; performs within specifications in accordance with 40 CFR 58, Appendix B; follows procedures outlined within 40 CFR 58, Appendix C; designs its network in accordance with 40 CFR 58, Appendix D; and locates its sites to meet all requirements of 40 CFR 58, Appendix E.

Below is a summary of changes that have been implemented since the last ANP and are either approved by Region 6 EPA or are Special Purpose Monitors (SPM):

- 40-019-0297 (Healdton): Ozone SPM halted collection on 12/02/2024
- 40-069-0324 (Tishomingo): Ozone SPM halted collection on 12/02/2024
- 40-067-0671 (Waurika): Ozone SPM halted collection on 12/10/2024
- 40-085-0300 (Burneyville): Ozone SPM began collection on 02/27/2025
- 40-075-0711 (Great Plains State Park): Ozone SPM began collection on 03/04/2025
- 40-121-0416 (Savanna): Lead Monitoring moved to new approved location and began operating on 03/08/2025

Table 1 is a list of all currently existing ambient air monitoring sites that AQD operates and maintains as of 04/17/2025. Table 3 is a list of proposed changes. "Air Quality System (AQS) Site ID#" in column one is a unique identification number assigned to each monitoring site in the state network. AQS is a national air-monitoring database maintained by the EPA.

AQD made the Combined 5-Year Network Assessment and ANP available for public inspection and comment from 05/16/2025 through 06/16/2024 by posting the document on its website (40 CFR 58.10(a)(1)). An image of this posting will be included in Appendix D of this document.

## **Contact Information**

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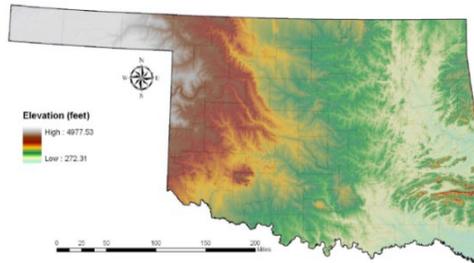
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## Area Served

### Oklahoma Topography



**Figure 1: Oklahoma Elevations above Sea Level.**

Characteristic of its location in the Great Plains, Oklahoma's terrain is flat on the western side of the state. Rolling hills begin around central Oklahoma and stretch into eastern Oklahoma. There are some aberrations from the mostly flat plains in the west (Wichita Mountains), in the south (Arbuckle Mountains), and in the east (Ouachita Mountains and the mountains of the Arkansas River Valley).<sup>1</sup>

Oklahoma generally sees a gain in elevation moving from east to west, ranging from 287 feet above sea level in southeastern Oklahoma to 4,973 feet above sea level in the far northwestern panhandle. Deviations such as the Ouachita Mountains in southeast Oklahoma see elevations up to 2,800 feet.<sup>2</sup> Oklahoma has several diverse features outside of mountain ranges, such as the Black Mesa complex in the panhandle. The Ozark Plateau in the northeastern section of Oklahoma contains rolling hills patterned with steep river valleys.



**Figure 2: River Basins within the Mississippi River Basin**  
(Source: LSU College of Agriculture)

Oklahoma is comprised of two river basins – the Arkansas-White River Basin and the Red River Basin – that are part of the larger Mississippi River Basin.<sup>3</sup> Within the state, the Arkansas River Basin is comprised of tributaries Cimarron, Canadian, Verdigris, and Neosho, draining the upper two-thirds of the state.<sup>4</sup> Oklahoma's Red River Basin is comprised of the Washita and Kiamichi Rivers. It drains the lower third of the state and serves as the southern border.<sup>5</sup>

<sup>1</sup> <https://www.ou.edu/ocs/oklahoma-climate>

<sup>2</sup> <https://www.okhistory.org/publications/enc/entry?entry=OU001>

<sup>3</sup> <http://www.lsuagcenter.com/profiles/lbenedict/articles/page1515431998585>

<sup>4</sup> <https://coyotegulch.blog/2018/04/02/arkansas-river-basin-water-forum-april-11-12-2018/>

<sup>5</sup> <https://geology.com/lakes-rivers-water/oklahoma.shtml>

## Oklahoma Climate

The climate of Oklahoma varies greatly from west to east. Prevailing winds from the south and southeast pull warm, moist air from the Gulf of Mexico over much of the central to southeastern portions of the state, creating a humid subtropical environment. These patterns bring the moisture needed for the state's spring and autumn storm seasons. A great deal of the moisture from the Gulf of Mexico does not reach the north to northwest sections of the state; with few other sources to provide moisture to Oklahoma, most of that area's climate is closer to semi-arid.<sup>1</sup>

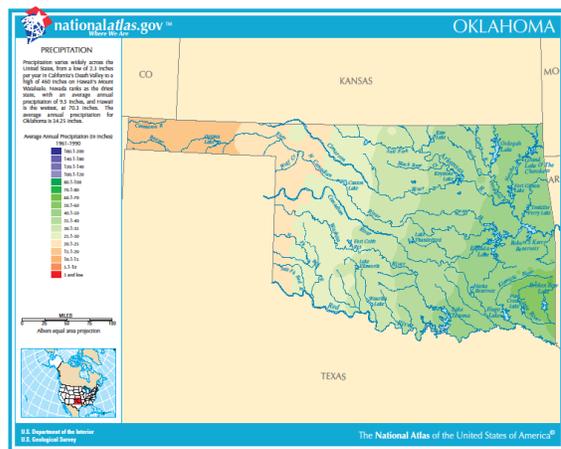


Figure 3: Oklahoma Precipitation Map

Temperatures tend to climb from mid to late spring into the summer, often reaching or exceeding 100°F. Temperatures do not often drop again until mid-autumn, leading to much longer, harsher summers and often milder, shorter winters. Winter temperatures rarely drop below 0°F.<sup>2</sup>

Oklahoma's rain patterns show a sharp gradient between the east (56 inches on average, yearly over approximately 115 days) and west (17 inches on average, yearly over approximately 45 days). This pattern is reversed for winter weather, with most snow falling in the western portions of the state. Most precipitation falls in May and September. The panhandle remains an outlier, seeing its most significant amount of rain in July.<sup>3</sup>

Between Oklahoma's temperature and humidity, relative humidity throughout the state averages from 60% to 70% and often negatively impacts air quality monitoring. Most instruments are housed within air-conditioned buildings to maintain temperature stability. With dewpoints reaching into the 80s in the summer months, condensation within instruments, sample lines, or manifolds is possible. Most PM<sub>2.5</sub> monitors have heated inlets to counteract this issue but may have difficulty removing all moisture on Oklahoma's most humid days (Figure 6). The use of an EPA-approved Nafion™ dryer upstream of one UV-based ozone analyzer has shown promising results. This practice may be further implemented across AQD's Ozone (O<sub>3</sub>) monitoring network.

Drought and flooding are recurring parts of the Oklahoma weather cycle. Periods of drought in Oklahoma can last anywhere from months to years, creating an elevated chance of wildfires and costing the state billions of dollars in farm damage. Flooding can occur at any time but is often associated with the increase in spring and autumn rain. Flash flooding is still a major threat to many Oklahomans as urban and suburban areas continue to develop and expand, creating more opportunity for runoff.<sup>4</sup> Oklahoma Climatological Survey's (OCS) Climate Trends graphic

<sup>1</sup> <https://www.ou.edu/ocs/oklahoma-climate>

<sup>2</sup> <http://cig.mesonet.org/climateatlas/doc60.html>

<sup>3</sup> <https://cig.mesonet.org/climateatlas/doc60.html>

<sup>4</sup> <https://www.ou.edu/ocs/oklahoma-climate>

(Figure 4) shows the evolution of Oklahoma's precipitation history since the modern record began in 1895.<sup>1</sup>

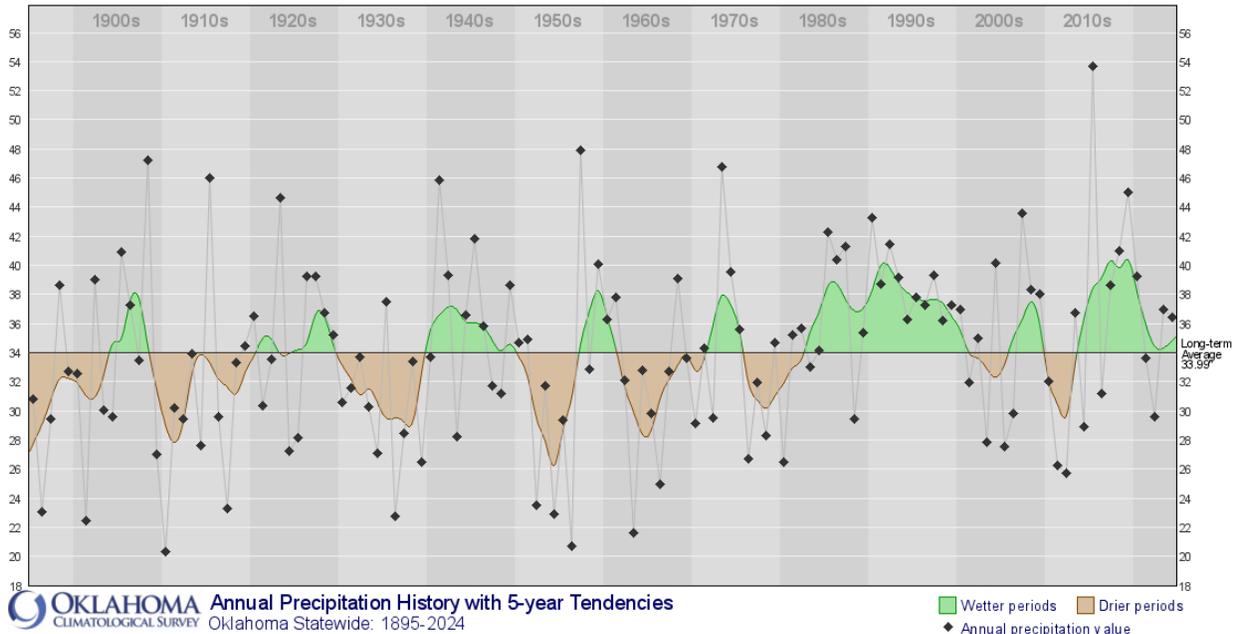


Figure 4: Graph shows Annual Precipitation with 5-year tendencies beginning in 1895.

## Oklahoma Topography and Climate Effects on Air Pollution and Monitoring

### Topography

There are relatively few deep river basins or valleys in Oklahoma that serve to trap air pollution for any extended period. Therefore, O<sub>3</sub> episodes tend to be of short duration. Due to the relatively flat terrain and prevailing south winds, the Oklahoma City, Tulsa, and Lawton areas can be influenced by O<sub>3</sub> transport from the Dallas/Ft. Worth area during transport events, lasting for only a day or a few days at a time. On a more localized scale, the Arkansas River Valley (located west of Tulsa) winds through an area of small hills, which can funnel O<sub>3</sub> and precursors toward the Keystone Lake area on days with an easterly wind. These transport events are rare and usually last 24 hours. Transport events differ from stagnation events in their wind speeds. Transport events occur when winds bring O<sub>3</sub> and its precursors from outside of Oklahoma, most notably when the predominant southerly wind pattern brings mobile emissions from Houston and/or

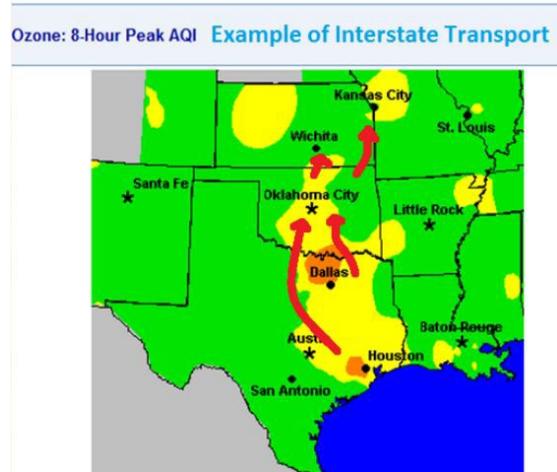


Figure 5: Example of Interstate Transport of Ozone illustrated by 8-hour peak AQI values.

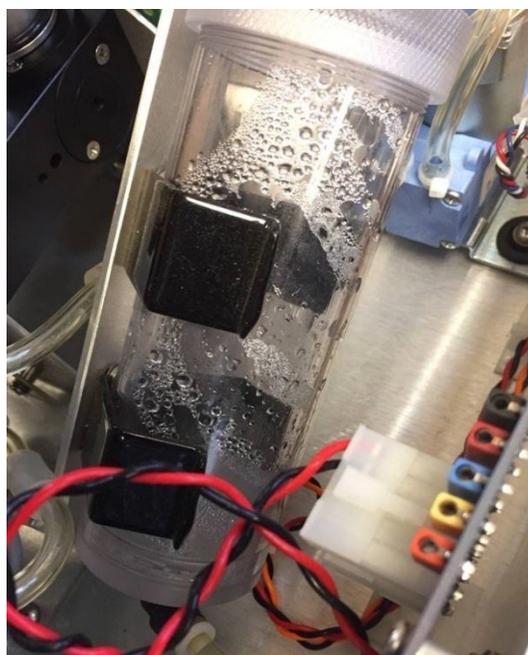
<sup>1</sup>[http://climate.ok.gov/index.php/climate/climate\\_trends/precipitation\\_history\\_annual\\_statewide/CD00/prcp/Annual/oklahoma\\_climate](http://climate.ok.gov/index.php/climate/climate_trends/precipitation_history_annual_statewide/CD00/prcp/Annual/oklahoma_climate)

Dallas/Ft. Worth into the state, as seen in Figure 5.<sup>1</sup> Stagnation events occur when O<sub>3</sub> levels are high at ground level due to low or no wind conditions for extended periods. The O<sub>3</sub> created in this scenario is due to locally emitted precursors. Stagnation events occur often, but extended events lasting over a week occur about once every ten years, usually during summer when high atmospheric pressure causes clear skies, heat, and calm conditions. During those stagnation events, the O<sub>3</sub> levels at monitoring sites in an MSA can reach unhealthy levels.

Regional-scale particulate pollution is highest in the lower elevations of eastern Oklahoma and gradually decreases to very low levels as one moves west towards higher elevations. The bulk of fine particulate values in eastern Oklahoma appear to be mostly related to smoke from wildfires and prescribed burning.

## Climate

Air pollution concentrations are greatly influenced by the climate. Prevailing south-southeast winds occasionally bring O<sub>3</sub> and O<sub>3</sub> precursors from the south, causing unhealthy concentrations of O<sub>3</sub> in the southern half of the state. Inhalable particulates may also reach unhealthy concentrations when wildfires occur during the dry months of February, March, and April. Pollution events caused by air stagnation occur frequently throughout the summer, mostly during the months of July through August. These events, along with O<sub>3</sub> transport events, are among the easiest to predict and provide advance notice through the Ozone Alert program. Staff meteorologists consult daily weather models and EPA's AIRNOW forecast models in making these determinations. While Ozone Alert predictions are not 100% accurate, the ability to make scientifically sound decisions in forecasting is improving as model accuracy improves. While heavy rainfall events tend to clear out pollution for short periods of time (up to a few days), there appears to be



**Figure 6: Condensation found in a Teledyne Advanced Pollution Instrument (TAPI) T640.**

no correlation between statewide pollution concentrations (which increase from west to east), and statewide average annual rainfall amounts (which increase from west to east). Frontal passages, or fronts, commonly move through the state from northwest to southeast and bring cleaner air masses through the state for a few days at a time. Some pollutants, specifically O<sub>3</sub>, can concentrate in higher values along the boundaries between warm moist air and cool dry air. It is difficult, if not impossible, to predict the location and duration of these types of O<sub>3</sub> events. Several instances of localized high O<sub>3</sub> concentrations have been observed because of this phenomenon, wherein one or two local monitoring sites register unusually high values and the remainder of O<sub>3</sub> sites do not.

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<sup>1</sup><http://envirofok.org/wp-content/uploads/2017/03/Air-Carrie-Schroeder-Presentation.pdf>

## Population

Oklahoma is a rural state of approximately 4,095,393 people.<sup>1</sup>

CBSA	County	Population
Oklahoma City	Oklahoma	1,497,821
	Cleveland	
	Canadian	
	Grady	
	Logan	
	McClain	
	Lincoln	
Tulsa	Tulsa	1,059,803
	Rogers	
	Wagoner	
	Creek	
	Osage	
	Okmulgee	
	Pawnee	
Fort Smith	Le Flore	232,848
	Sequoyah	
	Sebastian	
	Crawford	
	Franklin	
Lawton	Comanche	126,899
	Cotton	
Stillwater	Payne	84,199
Shawnee	Pottawatomie	74,446
Muskogee	Muskogee	66,752
Enid	Garfield	62,007
Bartlesville	Washington	54,060
Tahlequah	Cherokee	48,729
Ardmore	Carter	49,135
Ponca City	Kay	43,437
McAlester	Pittsburg	43,395
Duncan	Stephens	44,075
Durant	Bryan	50,305
Ada	Pontotoc	38,310
Miami	Ottawa	30,404
Weatherford	Custer	39,105
Altus	Jackson	24,541
Elk City	Beckham	22,248
Guymon	Texas	20,557
Woodward	Woodward	19,991

County not in CBSA	Population
Delaware	41,771
Mayes	41,144
McCurtain	30,805
Caddo	26,337
Garvin	26,149
Seminole	23,351
Adair	19,821
McIntosh	19,710
Atoka	14,600
Marshal	16,147
Kingfisher	15,820
Choctaw	14,174
Craig	14,506
Murray	13,754
Hughes	13,371
Haskell	11,811
Okfuskee	11,364
Noble	10,896
Pushmataha	10,800
Washita	10,839
Johnston	10,293
Latimer	9,509
Nowata	9,561
Love	10,423
Blaine	8,573
Woods	8,582
Kiowa	8,257
Major	7,569
Tillman	6,736
Jefferson	5,374
Greer	5,433
Alfalfa	5,712
Coal	5,414
Beaver	5,025
Dewey	4,268
Grant	4,123
Harper	3,209
Roger Mills	3,304
Ellis	3,601
Harmon	2,315
Cimarron	2,133

<sup>1</sup> <https://www.census.gov/quickfacts/fact/table/OK#>

## Demographics

The state of Oklahoma continues to see the most growth within the Oklahoma City core-based statistical area (CBSA), with the Tulsa CBSA growing at a much slower rate and occasionally seeing slight declines. Oklahoma's population is continuing to shift from rural areas to these larger CBSAs.

## Area Emissions Sources

Oklahoma has an industrial base that dates to the oil boom era of the early twentieth century. Although many refineries were established, only five remain and are all located in the eastern half of the state. There are several oil storage facilities in the state as well, with the largest located in Cushing in east-central Oklahoma. Five coal-fired power plants in the eastern half of Oklahoma have begun to move partially, if not completely, from coal to natural gas. Since 2015, Oklahoma has seen over a 75% drop in coal usage from 24,867,032 megawatt hours in 2015 to 5,198,647 megawatt hours in 2023 by the electric power industry. This has been replaced by a jump in natural gas usage by over 30% and wind usage by over 160%.<sup>13</sup>

The number of major sources has continued to drop from 314 in 2020 to 285 in 2024. An increase in major sources does not appear likely for the next five years as the shift to a service-based economy and renewable energies continues; however, Oklahoma sources tend to fluctuate based on the condition of the economy. Being primarily centered on oil and gas, Oklahoma emissions are as volatile as the market.

Oklahoma's fire season occurs in spring or autumn and contributes to Particulate Matter (PM) and O<sub>3</sub> precursors. To conserve Oklahoma's local flora and prevent massive wildfire outbreaks, land management operations carry out prescribed burns, the largest being in the southeastern forests and the northeastern tallgrass prairies. Though these are conducted with basic smoke management practices, Oklahoma DEQ maintains PM<sub>2.5</sub>, Particulate Matter less than 10 µm (PM<sub>10</sub>), and O<sub>3</sub> monitors near locations that might be affected by smoke from these burns.

Pollutant emissions trends graphs will be included in pollutant-specific discussions later within this assessment.

## **Current Air Quality Conditions**

All Oklahoma counties are currently designated to be in attainment of all NAAQS.

It is worth noting, however, that since the last five-year network assessment, the measured concentrations of some pollutants have been near or exceeding NAAQS threshold levels. This is especially true for O<sub>3</sub>, with over half of monitored locations showing 2024 3-year design values above the acceptable NAAQS level, and for PM<sub>2.5</sub>, whose NAAQS threshold has recently been lowered by 25% to a level at or near the upper readings of many monitored locations.

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<sup>13</sup>Administration, U.E. (2019, 10 22). Electricity. Retrieved from EIA: <https://www.eia.gov/electricity/data/state/>

## O<sub>3</sub>

The EPA is currently in the process of reviewing the 2015 O<sub>3</sub> NAAQS of 0.070 ppm, with a projected expectation to be able to provide notice of a final decision in 2030. Once completed, the Clean Air Act (CAA) requires EPA to then perform an initial designation process within 2 years of a new or revised NAAQS.

As long-term cycles of meteorological conditions can have a great impact on O<sub>3</sub> concentrations, it is uncertain whether Oklahoma CBSAs will be in attainment of the existing standard at the time attainment designations are made.

## PM<sub>2.5</sub>

The EPA finalized a new PM<sub>2.5</sub> Primary Annual NAAQS from its previous value of 12.0 µg/m<sup>3</sup> to that of 9.0 µg/m<sup>3</sup> on February 7, 2024. Secondary PM<sub>2.5</sub> standards, and primary and secondary PM<sub>10</sub> standards, were retained without revision. EPA is expected to make final designation decisions based on 2024 3-year design values. AQD has submitted final Monitoring data for 2024 to EPA, and although having one sampling location in Moore, OK that has recorded a 3-year design value at the threshold of exactly 9.0 µg/m<sup>3</sup>, anticipates maintaining an attainment designation for all areas.

## **Oklahoma Monitoring Network**

### Network Logistics

The Monitoring Section of AQD is comprised of two geographically divided sections: East and West. Please see Appendix B for staffing patterns. Sites and instruments are checked for quality and maintained on schedule as per the Oklahoma DEQ Ambient Air Monitoring QAPP. The data collection process for Oklahoma DEQ is as follows:

#### *Continuous Monitors*

- A. The Site Data Logger - Each ambient air monitoring site with a continuous monitor has a data logger as its central storage location for data. All data loggers are standardized Agilaire LLC, model 8872 PC-based loggers. The 8872 logger uses SQL Express as its database management system. The database and front-end software were developed by Agilaire LLC specifically to use for ambient air monitoring systems. The logger software, AV-Trend, manages communications for many types of continuous instruments. The two main types Oklahoma DEQ uses are Modbus-capable and non-Modbus capable (analog).
  1. Modbus-Capable Instruments - Modbus-capable instruments make up the majority of Oklahoma's ambient air monitoring network. Examples of these instruments are Ozone, Sulfur Dioxide, Nitrogen Dioxide, Carbon Monoxide, Particulate Matter 10 and 2.5 (FEM) and Hydrogen Sulfide. Each of these instruments connects directly with the site data logger or through a standard switch that, in turn, connects to the

data logger. The AV-Trend software polls each instrument on the network at regular intervals as defined by that instrument's communications driver, which can be customized to meet the network's needs on a parameter-by-parameter basis. It does so using Modbus protocol across an Ethernet cable. Once polled, that data is averaged by the data logger every one minute to get a one-minute average that is stored in the SQL database. Every hour, the software averages 60 1-minute averages to get an hourly average that is also stored in the SQL database. The formatting of this data is easily customizable according to each parameter's needs.

2. Non-Modbus Capable (Analog) Instruments - Examples of analog instruments in the Oklahoma air monitoring network are mostly confined to meteorological data, i.e. wind speed/direction, ambient temperature, site temperature, and relative humidity. These instruments connect directly to the data logger and the electrical signal generated by the instrument is interpreted by an ADAM device that is user-configurable and user-customizable. Once the signal is translated by the ADAM from a signal to a value, that value is stored in the same SQL database described above. One-minute and hourly averages are calculated and averaged in the same way.

All continuous data now exists in the site logger database, ready to be transmitted to the central polling computer.

- B. The AirVision Central Polling Computer - The AirVision (AV) central polling computer's software, also developed by Agilaire LLC, is the permanent storage location for all of Oklahoma's ambient air monitoring data. It is located in the Air Monitoring Section of the Oklahoma DEQ's main Oklahoma City office. This software, and its back-end SQL database, was designed to mirror that of each site's database so that they are compatible. The AV software is customized to poll each site's data logger at regular intervals. If the poll is successful, the data will be transferred from the site to the central polling computer. Each data point is transmitted in floating-point format. The software is customizable in how to display the data to make it meaningful. Once polled, the data can then be subject to the QA process.
- C. General Communications - The AV polling computer relies heavily on an IP-based communications system whose success is largely out of the control of the software itself. Once a poll is initiated to a specific site's IP address, the data request must travel through the Oklahoma DEQ building's IT infrastructure, out to the State of Oklahoma's IT infrastructure, to our wireless carrier's cellular communications tower network and data center, back out to their transmission towers, which can then be received by the site's cellular modem. The modem will send the request to the data logger, which will respond to the request with the requested packet of data. That data stream then reverses and it is sent back to the AV polling computer in the OKC office. This polling process, if successful, takes less than one second. Over 99% of all polling requests are successful.

## *Filter-Based Monitors*

- A. Lead - Lead sample collection day details are recorded manually by each operator at the time of sample setup and collection. They are recorded on each sample's individual envelope. Envelopes are then sent en masse to the analytical laboratory. Once analyzed, the laboratory sends relevant measurement data back to the Oklahoma DEQ, where it is QA'd and subsequently submitted to the AQS database.
- B. PM - PM filter data is collected with a combination of manual and digital means. The manual data is collected on the sample forms that pertain to chain of custody. The digital data, like flow, temperature, and pressure, are downloaded manually by each operator on each site visit. This data is then uploaded to the Oklahoma DEQ network for permanent storage. At regular intervals, this data is transmitted via email to the analytical lab. Once analyzed, the laboratory sends relevant measurement data back to the Oklahoma DEQ, where it is QA'd and subsequently submitted to the AQS database.

## Quality Assurance

### Summary:

Oklahoma DEQ has multiple levels of quality assurance (QA) and quality control (QC) checks for all equipment. Instruments are evaluated by operators, primarily by using precision checks and Level I zero, span, and precision checks (ZSPs). PM monitors are typically evaluated using a 1-point flow rate verification by the operator. Oklahoma DEQ's Primary Quality Assurance Organization (PQAO) is the QA section for the AQD. Appendix B shows the QA section is separate from the monitoring section as per the EPA's Quality Assurance Handbook for Air Pollution Measurement Systems Volume II, providing an additional independent review of all air quality data.<sup>14</sup> QA activities include implementing independent site audits, Chemical Speciation Network (CSN) Technical System Audits (TSAs) and performance evaluation audits, data validation, review and revision of Quality Assurance Project Plans (QAPPs) and Standard Operating Procedures (SOPs), and certification and repair of all multi-gas transfer standards. Historically, in an attempt to provide an additional layer of verification of gas quality, gases for ZSPs and QA audits were purchased separately by Monitoring and QA from two different suppliers. AQD will now utilize a single statewide contract for all gasses and has begun utilizing EPA's Ambient Air Protocol Gas Verification Program (AAPGVP) to ensure that gasses purchased by AQD compare to those utilized by EPA auditors. The Monitoring and QA sections use separate transfer standards and gas standards for QC and QA checks, respectively.

For further information on procedures, please refer to the Oklahoma DEQ Ambient Air Monitoring Quality Assurance Project Plan.

### Assessment:

Oklahoma DEQ is of the opinion that its QA and QC procedures, as outlined in the QAPPs and SOPs, are robust enough to identify most data issues. As pollution levels decrease, the Monitoring

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<sup>14</sup> [https://www3.epa.gov/ttn/amtic/files/ambient/pm25/qa/Final%20Handbook%20Document%201\\_17.pdf](https://www3.epa.gov/ttn/amtic/files/ambient/pm25/qa/Final%20Handbook%20Document%201_17.pdf)

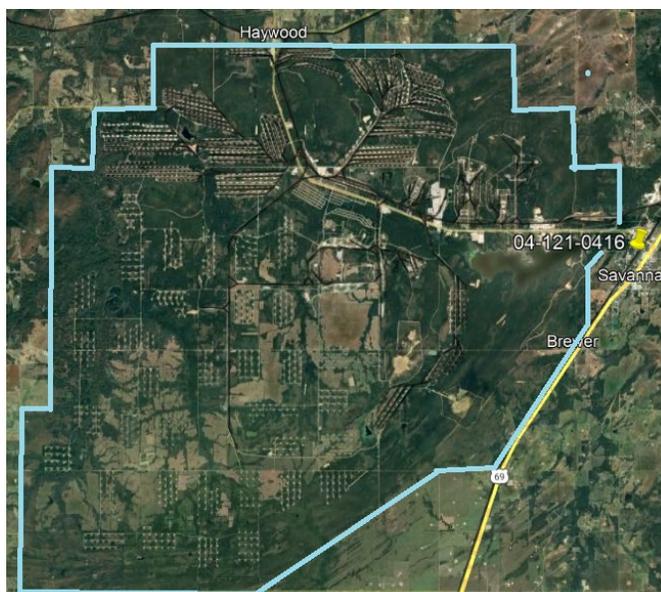
and QA sections intend to make spatial network adjustments and instrument changes for more accurate monitoring. QA is phasing out the current Mass Flow Controller (MFC) range calibrators for extended range calibrators that will work with lower concentrations. Both Monitoring and QA may transition to lower concentration gas bottles to make the adjustment more manageable. Currently Oklahoma DEQ is sending gas bottles to the AAGVP to verify concentrations and provide an extra layer of validation since Monitoring and QA gas bottles are purchased from the same producer.

## Criteria Pollutants

### *Lead*

#### Summary:

TSP and lead NAAQS were promulgated in 1971. At that time, samples were taken at many locations throughout Oklahoma. TSP and lead were measured by the same type of monitors and filter media. After the filter media was weighed for TSP, it was analyzed for lead. Lead and TSP monitoring were discontinued after 1999. TSP transitioned to PM<sub>10</sub> and the lead monitoring network requirements were relaxed nationally to require only one population-based site per EPA region and source-oriented sites for facilities emitting greater than five tons per year. Before this monitoring rule was implemented, several years of samples showed concentrations below detectable limits. Area source lead concentrations in ambient air trended downward drastically throughout the nation following the ban on leaded gasoline in the early 1970s.



**Figure 7: Current lead site as of publication date, monitoring the ammunition plant to the west.**

Oklahoma DEQ installed and operated two lead sites because of the 2010 lead NAAQS revision and an additional third site for the National Core Multi-Pollutant Site (NCore) lead requirement. Sites are operated using standard hi-volume sampler technology (TSP) and filters are analyzed by a private lab using Federal Reference or Equivalent analysis methods. Oklahoma DEQ chose not to use the EPA national contract for lead analysis.

Site 40-143-1127 (Tulsa Central) was an NCore required lead site. Site 40-121-0416 (Savanna) began operating to meet the source monitoring requirement for the McAlester Army Ammunition Plant. Site 40-037-0146 (Sapulpa) had two lead monitors put in place – a primary and collocated – to monitor the Ardagh Glass facility, which had previously exceeded the emission threshold of 0.5 tons/year for required monitoring. The NCore site's lead monitoring was discontinued with the

elimination of the NCore lead monitoring rule at the end of 2016, following three years of measured concentrations well below the standard. Operation of the Savanna site was discontinued at the end of 2013 following three years of measured concentrations below or very near the minimum detectable limit, except for two sample values. It was then reinstated in August of 2016 at the EPA’s request due to an emissions increase at the ammunition plant.

Assessment:

Please see Table 1 for a list of our current lead monitors and a complete list of associated information.

Currently, the only location being monitored due to exceeding the 0.5 ton/year limit is the McAlester Army Ammunition Plant which is being monitored by the 40-121-0416 (Savanna) site.

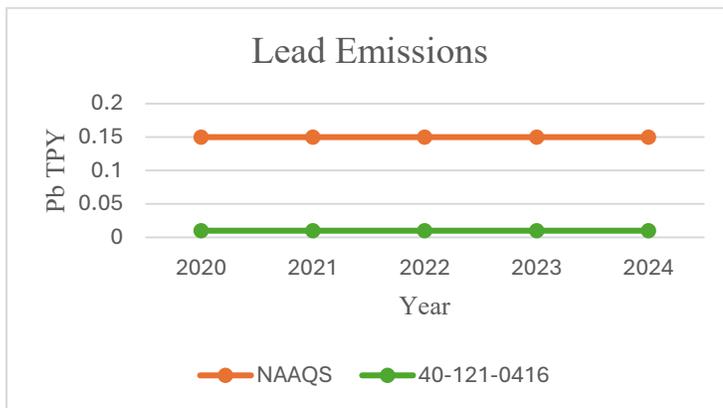


Figure 8: Annual Lead emission in tons per year

There are two lead-emitting facilities now also exceeding the 0.5 tons/year threshold:

- Mid-American Steel and Wire Co. in Madill, Oklahoma.
- Ardagh Glass in Sapulpa, Oklahoma.

Oklahoma DEQ is in the early stages of adding Lead sites to Madill, Oklahoma and Sapulpa, Oklahoma. DEQ will work with EPA to ensure that these monitoring sites are selected and approved based on all applicable site selection criteria.

*Particulate Matter < 2.5µm (PM<sub>2.5</sub>)*

Summary:

Monitoring for PM<sub>2.5</sub> began with promulgation of the PM<sub>2.5</sub> NAAQS in 1996. Oklahoma DEQ was tasked with establishing 23 sites for the initial PM<sub>2.5</sub> network. Sampling began in 1997, but the Federal Reference Method (FRM) quality control issues delayed collection of valid data until 1999. The size of the FRM network has been reduced incrementally over the years. Conversely, Oklahoma DEQ has increased the number of FEM continuous samplers in order to enhance the

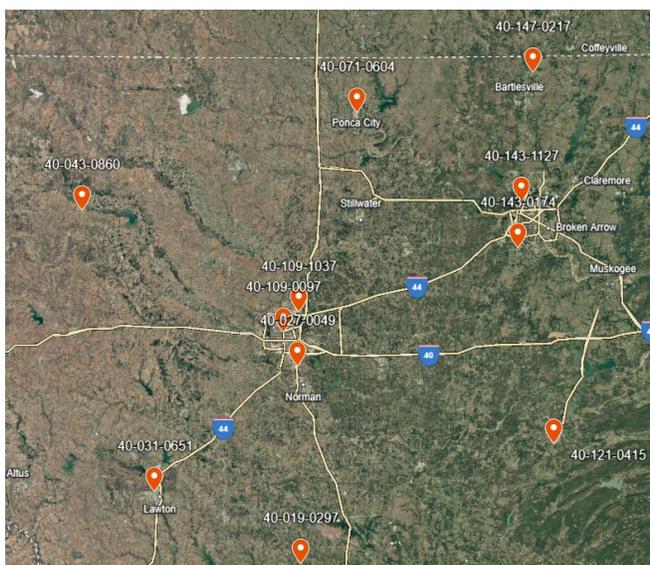


Figure 9: PM<sub>2.5</sub> continuous monitoring sites in the ODEQ network.

Air Quality Health Advisory program and allow for the collection of higher resolution data for health studies.

The few remaining FRM sites utilize Thermo Environmental (TE) 2025i technology and filters are analyzed by a private lab using Federal Reference or Equivalent analysis methods.

Beginning in late 2017, the continuous network transitioned from the TE SHARP 5030/5030i monitors to Teledyne Advanced Pollution Instruments (TAPI) T640/T640x monitors. This portion of the network supports the agency's daily Air Quality Index (AQI) reporting and Health Advisory program.

Currently the Oklahoma DEQ network maintains nine TAPI T640 monitors and two TAPI T640x monitors. Oklahoma DEQ's network is currently at the minimum number of allowable FRMs and AQD is not looking to further reduce this network. Any further changes to the network will likely be an addition or restructuring of current FEM instruments.

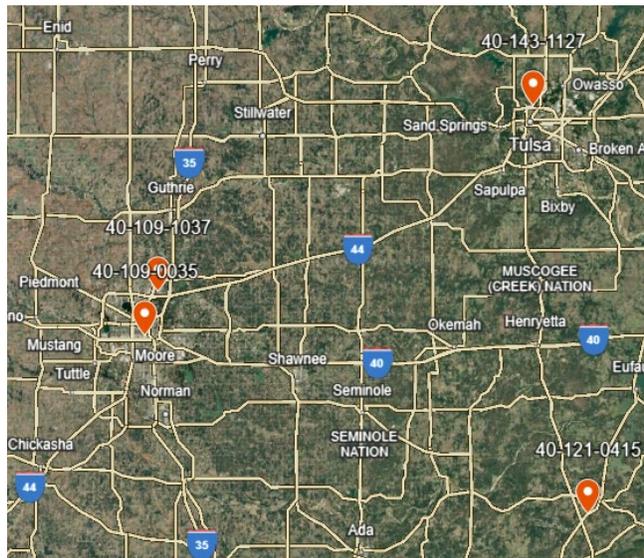


Figure 10: PM<sub>2.5</sub> non-continuous monitoring in the ODEQ network. Site 1127 is collocated (Tulsa CBSA).

Oklahoma DEQ continues to recognize the following advantages of continuous monitors:

1. Less travel required for operation and maintenance.
2. Higher resolution (hourly) of data when samplers are operating properly.
3. No lab cost involved in data collection.
4. Real-time data access to notify the public when concentrations reach unhealthy levels for sensitive groups for Air Quality health advisories.

Despite difficulties faced by Oklahoma DEQ in finding quality instruments, Oklahoma DEQ has maintained an extensive PM<sub>2.5</sub> monitoring network for both NAAQS comparison and Oklahoma's own Air Quality Health Advisory network. All NAAQS-comparable sites have maintained numbers well below the 24-hour NAAQS standard.

Assessment:

Please see Table 1 for a list of our current PM<sub>2.5</sub> monitors and a complete list of associated information.

Generally, Oklahoma drought and smoke trends have been on the rise over the last five years, making continuous monitoring a necessity to the Oklahoma Air Quality health advisory program. These monitors have been particularly useful during the springtime burn season. While some fires are local in size, the continuous network works well for larger fires such as the burning that occurs annually in the Flint Hills of Kansas and Oklahoma. An additional SPM has been added in the

northeastern section of Oklahoma (Nowata County) near the border of Kansas to gather data on the springtime Flint Hills burning. Oklahoma’s daily PM<sub>2.5</sub> problems (high values) appear to stem almost exclusively from large seasonal agricultural burns. Those burns consist of a mix between prescribed burns and wildfires.

Oklahoma DEQ’s experience with the TF TEOM/FDMS technology, the TF SHARP technology, and the TAPI T640 monitors has been marked by problems. The initial ease of use and stability of data generated by the TAPI T640/T640X monitors was promising and resulted in a large nationwide acceptance of the method. Unfortunately, after many years of data were collected, it became apparent to EPA as well as state, local and tribal monitoring organizations that much of the data being generated was biased high when compared to the filter-based FRM devices. This resulted in a collaborative effort between TAPI and EPA to not only adjust and reapprove the function of the TAPI device, but to also retroactively correct biased data. AQD believes this correction falls short of its goal, and that these FEM devices currently in use in AQD’s monitoring network are currently still generating erroneously high data. As such, AQD has begun the process of procuring replacement devices.

The previously used TE SHARP 5030/5030i monitors have since been updated to a model 5030iQ. These will replace half of the TAPI monitors in AQD’s network. An open bid process now will be utilized for procurement of a second type of device to allow for data collocations/comparisons and additional ease of avoiding such large-scale system overhauls in the future, should similar problems arise. Oklahoma DEQ will then continue to look for advances in PM<sub>2.5</sub> monitoring to improve network design. Oklahoma DEQ’s network is currently at the minimum number of allowable FRMs and are not looking to further reduce this network. Any further changes to the network will likely be an addition or restructuring of current FEM instruments.

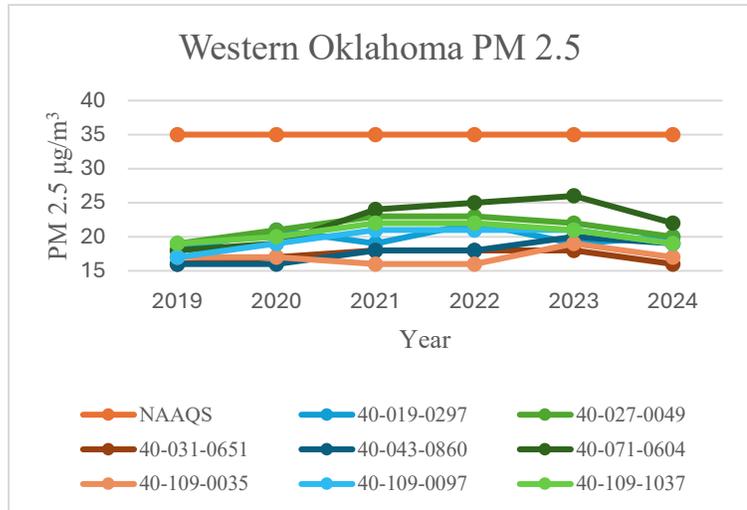


Figure 11: Western Oklahoma 98th percentile of PM<sub>2.5</sub> averaged over 3 years, compared to the NAAQS 24-hour standard. Sites without three continuous years of data were not graphed.

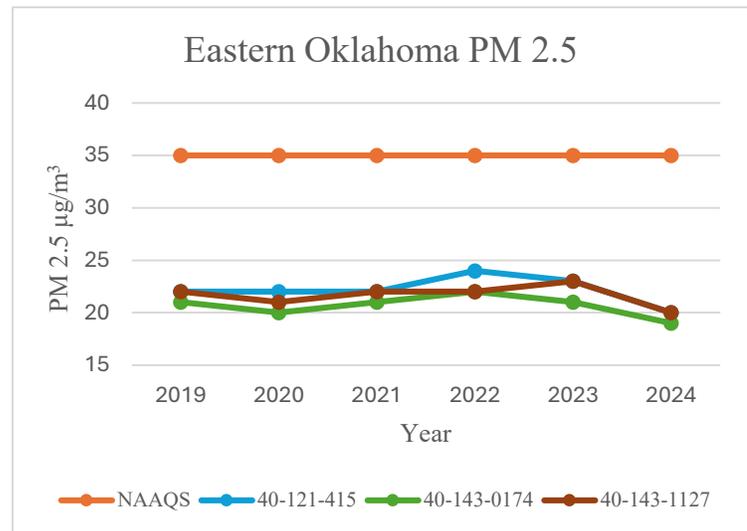


Figure 12: Western Oklahoma 98th percentile of PM<sub>2.5</sub> averaged over 3 years, compared to the NAAQS 24-hour standard. Sites without three continuous years of data were not graphed.

Oklahoma DEQ has also begun to investigate other non-regulatory-grade instruments and small sensors such as the Purple Air monitors. These smaller, easily portable PM<sub>2.5</sub> monitors could test potential siting areas for appreciable pollutant levels before establishing compliance or Special Purpose Monitoring sites. Monitoring of intrastate and interstate fire emissions could occur as fires develop, providing better real-time data to the AQ health advisory program to the benefit of Oklahoma citizens.

Oklahoma DEQ's current PM<sub>2.5</sub> network meets minimum requirements. The network will likely not be expanded beyond its current size aside from potential special projects to monitor fire emissions and hydrocarbons from oil fields. Oklahoma DEQ plans to maintain its non-required continuous network for its Health Advisory program and is working with vendors to improve data quality and completeness.

Oklahoma DEQ will continue to observe current EPA directives/technological advances and update the network as appropriate.

*Particulate Matter < 10µm (PM<sub>10</sub>)*

#### Summary:

The first Oklahoma TSP site opened in Tulsa in 1972. In 1987, the TSP NAAQS was replaced by the PM<sub>10</sub> NAAQS. Originally, PM<sub>10</sub> samplers in Oklahoma City and Tulsa were operated by the City/County Health Departments. Responsibility for these monitors was transferred to Oklahoma DEQ in the mid-1990s. Over the years, Oklahoma has operated more than 20 different sites collecting data. Oklahoma DEQ has not detected any PM<sub>10</sub> values that necessitate having more than the minimum number of required samplers in any MSA.

Currently, the Oklahoma PM<sub>10</sub> network consists of two TAPI T640x continuous samplers. These were installed at AQS Site # 40-143-1127 (Tulsa Central) and AQS Site # 40-109-1037 (OKC North), replacing the previous TE TEOM instrument at the latter. Oklahoma DEQ also operates nine TAPI T640 base model instruments, which report both PM<sub>2.5</sub> and PM<sub>10</sub> (Figure 13). The PM<sub>10</sub> on the base model, though not NAAQS-comparable, benefits the state's AQI and Health Advisory network.

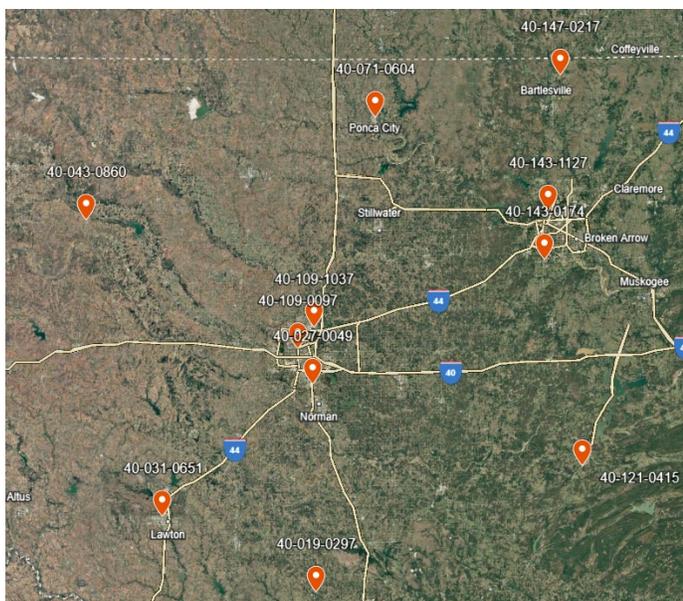


Figure 13: PM<sub>10</sub> continuous sites in the ODEQ network.

Oklahoma DEQ also operates three required filter-based PM<sub>10</sub> 2025i instruments: one at the NCore site, and a primary and additional collocated 2025i at AQS Site # 40-109-0035 (Central Fire Station) Oklahoma City site (Figure 14). These instruments are used to monitor long-term trends and population exposure.

Assessment:

Please see Table 1 for a list of our current PM<sub>10</sub> monitors and a complete list of associated information.

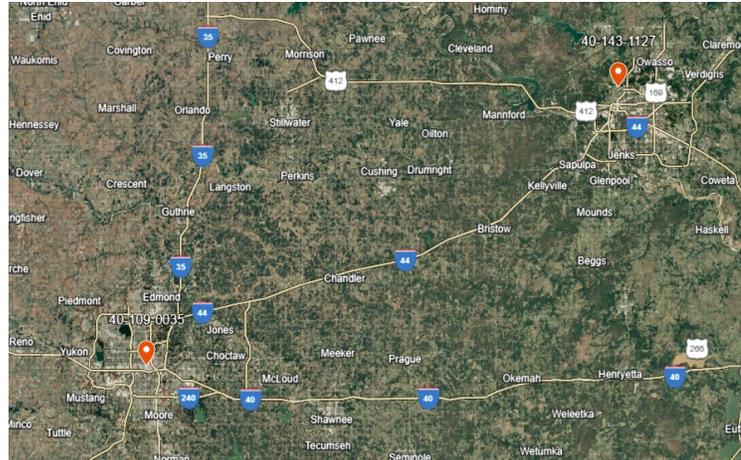


Figure 14: PM<sub>10</sub> non-continuous sites in the ODEQ network. Site 40-109-0035 in the OKC CBSA is collocated.

The Oklahoma DEQ is continuing to reduce the PM<sub>10</sub> network in Oklahoma to maintain population monitoring, as lower PM sizes are increasingly becoming a primary concern.

Until recently, Oklahoma DEQ’s network was robust enough to determine PM<sub>10</sub> pollutant trends and geographical distribution. However, now that Tulsa has exceeded a population of 1 million, another PM<sub>10</sub> instrument will need to be added to the MSA as required by 40 CFR 58, Appendix D §4.6. AQD plans to accomplish this with the addition of a continuous FEM PM<sub>10</sub> monitor at Tulsa’s newly required Near-Road NO<sub>2</sub> monitoring site. No further changes are expected to be made to the PM<sub>10</sub> network outside of this unless mandated by EPA.

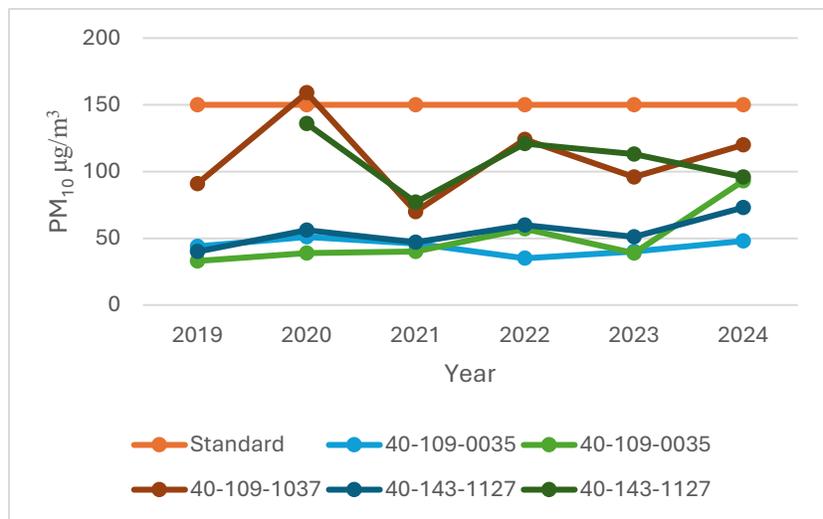


Figure 15: Oklahoma monitoring data for PM<sub>10</sub> 1<sup>st</sup> highest max values not to be exceeded more than once per year on average over 3 years.

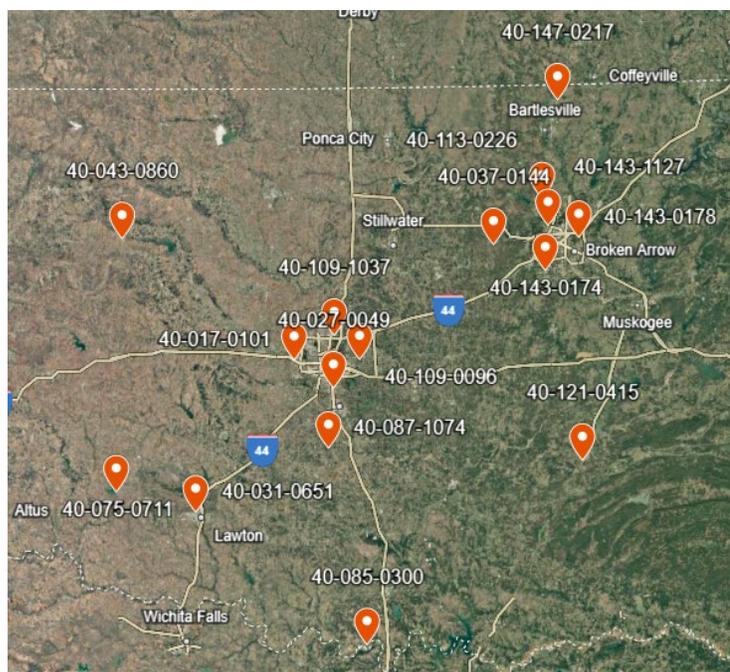
## Ozone (O<sub>3</sub>)

### Summary:

The Oklahoma ozone monitoring network began operating in the early 1970s. Sixteen sites are currently in operation (Figure 16). Most are situated in the four cardinal directions from the two major MSA centers in Oklahoma: Oklahoma City and Tulsa. Oklahoma City has an extra ozone site located at AQS Site # 40-087-1074 (Kessler), and Tulsa has an extra ozone site located at AQS Site # 40-143-1127 (Tulsa Central). There is also one monitor at AQS site # 40-031-0651 (Lawton) to cover the Lawton MSA.

Outside of the MSAs, Oklahoma DEQ installed regional-scale monitors at AQS Site # 40-121-0415 (McAlester) and AQS Site # 40-043-0860 (Seiling). McAlester primarily detects regional transport while Seiling detects background ozone levels. These sites were specifically chosen to fill large geographical gaps in the Oklahoma DEQ network and to determine rural background concentrations. Their geographic distribution also assists the health advisory program.

The remaining sites are SPMs. Three more special purpose monitors are situated near state borders to monitor interstate transport. One monitor, AQS Site # 40-147-0217 (Copan), is in the northeast of Oklahoma to detect burning in the Flint Hills region of Eastern Kansas and Northeastern Oklahoma. Two monitors at the southern Red River border, AQS Site # 40-075-0711 (Great Plains State Park) and AQS Site # 40-085-0300 (Burneyville) serve to identify ozone transport from northern Texas. These two sites each have two variable locations, moving every two years for more efficient coverage and use of monitoring personnel. As these monitors are not used for NAAQS-comparison purposes, DEQ feels that greater good with less effort and fewer expended resources could be accomplished by transitioning all of these variable-location monitoring sites to low-cost sensor-based platforms that always remain open at all sites. The process of procuring devices for this purpose has begun. These sites will likely be transitioned to this new format of data collection before the end of 2025.



**Figure 16: Ozone monitoring sites in the ODEQ network. Note the two Red River SPMs along the southern border.**

Assessment:

Please see Table 1 for a list of our current O<sub>3</sub> monitors and a complete list of associated information.

Oklahoma DEQ has implemented several changes to the O<sub>3</sub> network since the last 5-Year Network Assessment. AQS Site # 40-087-1074 (Kessler) began operating May 05, 2021. AQS Site # 40-075-0711 (Great Plains State Park) began operating February 02, 2021.

Oklahoma DEQ is also coordinating with the Glenpool Public School System to move AQS Site # 40-143-0174 (Glenpool) south of its current location by approximately one mile. Oklahoma DEQ will continue to watch the site closely to ensure that it maintains siting criteria.

Oklahoma DEQ has identified that these additions and adjustments in the current network ensure the ability to determine ozone trends and geographical distribution. Oklahoma DEQ is of the opinion that the current configuration has been beneficial and necessary for supplementing EPA’s ozone mapping program and gives Oklahoma DEQ the ability to alert the public of harmful concentrations in near real-time on high ozone days via the AQ Health Advisories.

No further changes are expected to the network outside of this unless changes are mandated by EPA. -

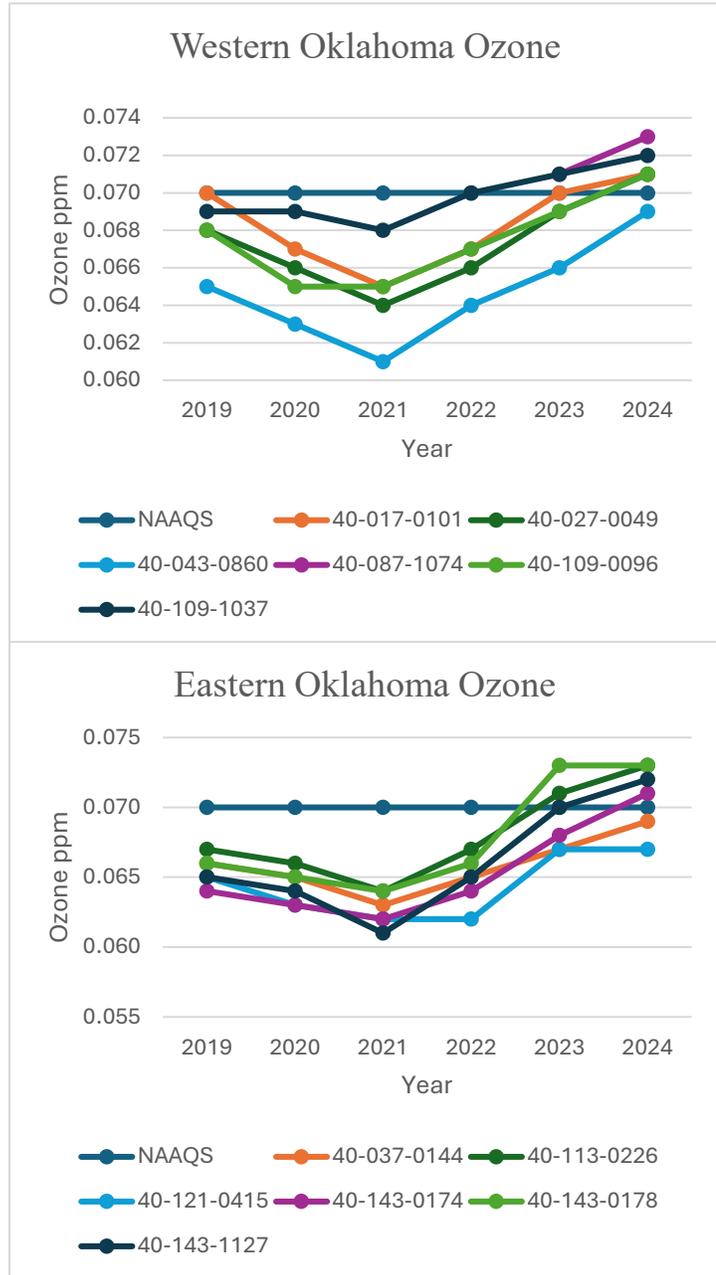


Figure 17: Western and Eastern Oklahoma ozone annual 4th high 8-hour rolling average over 3 years compared to the NAAQS.

## Sulfur Dioxide (SO<sub>2</sub>)

### Summary:

The SO<sub>2</sub> monitoring network was originally developed in 1980 beginning with six sites using a source-specific approach and has been expanded to include population exposure. One monitor is population-based, and four monitors are a combination of both. Population-based AQS Site # 40-109-1037 (OKC North) serves to determine background levels for the Prevention of Significant Deterioration (PSD) program. AQS Site # 40-071-0604 (Ponca City) is in an area of major SO<sub>2</sub> sources and will be operated as long as resources are available. In Tulsa, AQS Site # 40-143-0175 (Tulsa Newblock) and AQS Site # 40-143-0235 (Tulsa TCWD) are both source and population-based. The third Tulsa SO<sub>2</sub> monitor is a trace-level monitor at the NCore Site, AQS Site # 40-143-1127 (Tulsa Central).

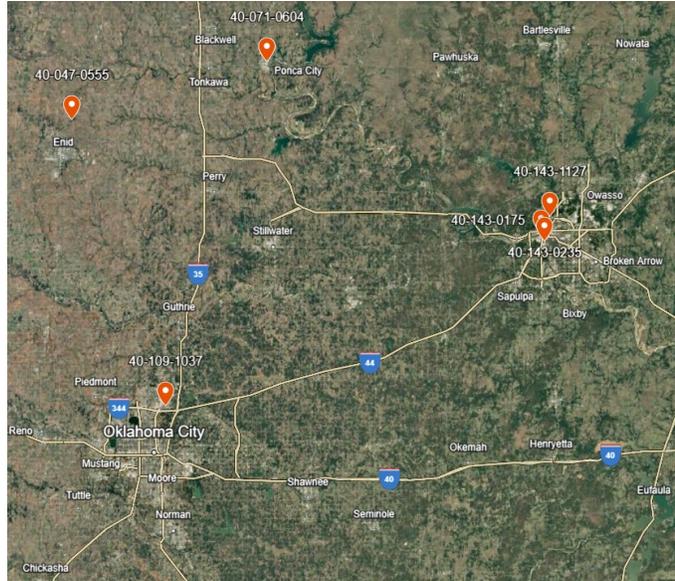


Figure 18: All SO<sub>2</sub> monitoring sites in the ODEQ network.

EPA's 2015 Data Requirements Rule (DRR) required that states show, through modeling or monitoring, that many previously unmonitored locations were in compliance with the 2010 1-hour SO<sub>2</sub> NAAQS. In Oklahoma, this resulted in the addition of three new monitoring locations. Since that time, AQS Site # 40-143-0170 in Fort Gibson, OK was shut down on August 20, 2020, and AQS Site # 40-143-0188 in Pryor, OK was shut down on August 12, 2020, due to the design values being less than 50% of the NAAQS. However, one site, AQS Site # 40-047-0555 (Oxbow/Kremlin) in Kremlin, OK continues to be closely monitored.

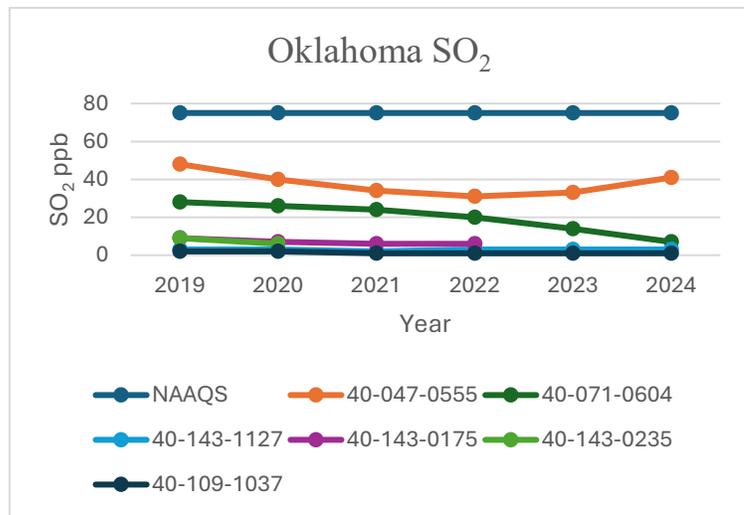


Figure 19: 3-Year Average Design Value of SO<sub>2</sub> concentrations at all sites.

AQS Site # 40-143-0179 shut down on November 23, 2020, as it was considered redundant with AQS Site # 40-143-0175 (Tulsa Newblock) and the siting criteria was being threatened by

encroaching trees. Due to a parking lot repaving project, the SO<sub>2</sub> monitor at site 40-143-0235 was unable to obtain enough valid data in 2022 to calculate a valid 3-year average design value for years 2023 and 2024. This monitor began reporting valid data again on 12/19/2022. This issue is now fully resolved. Valid design values will be able to be calculated beginning with 2025.

SO<sub>2</sub> monitoring is required where Population Weighted Emission Index (PWEI) values dictate. See Table 5 for the latest PWEI calculations. The only CBSA requiring a source-oriented SO<sub>2</sub> sampler is Tulsa, with a PWEI value of 4,117 tons/million people. There is no requirement for SO<sub>2</sub> monitoring in the Oklahoma City CBSA, which has a PWEI of 542 tons/million people.

Assessment:

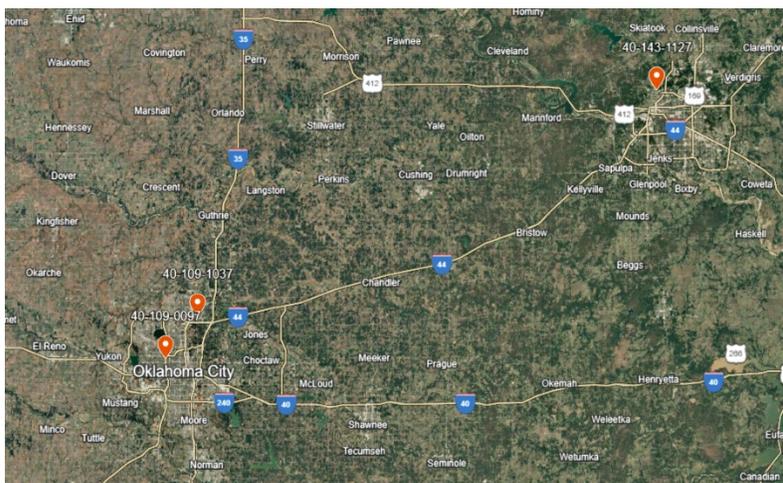
Please see Table 1 for a list of our current SO<sub>2</sub> monitors and a complete list of associated information.

Oklahoma DEQ exceeds the minimum SO<sub>2</sub> network requirements. The agency reviews PWEI values annually for the Tulsa and Oklahoma City CBSAs but does not envision a network expansion because of increased emissions. See Table 5 for the latest PWEI calculations.

### *Nitrogen Dioxide (NO<sub>2</sub>) and Reactive Nitrogen (NO<sub>y</sub>)*

Summary:

The NO<sub>2</sub> monitoring network was established to collect data for NAAQS comparison under 40 CFR 58 monitoring regulations and to supplement the O<sub>3</sub> network. Data are also used to determine background concentrations in the PSD program. Monitors used for collection of NO<sub>2</sub> data within AQD's network also collect data on Nitric Oxide (NO) concentrations in air. The two compounds combined are commonly referred to as Oxides of Nitrogen (NO<sub>x</sub>).



**Figure 20: NO<sub>2</sub> monitoring sites in the ODEQ network. NCore site 40-143-1127 also monitors NO<sub>y</sub>.**

AQD reports these additional measurements to EPA's AQS. EPA requires an additional device at NCore monitoring sites to collect data on reactive nitrogen compounds, commonly referred to as "NO<sub>y</sub>." At its peak in the mid-1970s, the NO<sub>2</sub> network consisted of over 20 sites. Over the years, that network has been reduced dramatically due to low annual mean concentrations compared to the 53-ppb annual mean standard. As of January 2020, the network has been reduced to three sites. These three sites are located in our largest CBSAs, Oklahoma City and Tulsa, which also contain the highest annual NO<sub>2</sub> emissions.

The three sites currently in operation include 40-143-1127 (Tulsa Central), 40-109-0097 (OKC Near Road), and 40-109-1037 (OKC North). The NO<sub>2</sub> at 40-143-1127 (Tulsa Central) runs alongside the NO<sub>y</sub> for comparison purposes.

Assessment:

Please see Table 1 for a list of our current NO<sub>x</sub> monitors and a complete list of associated information.

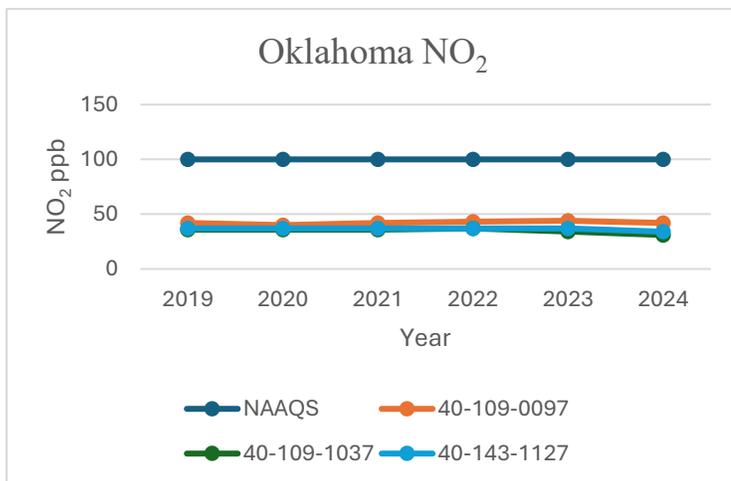


Figure 21: 98th percentile of 1-hour daily maximum NO<sub>2</sub> concentrations, averaged over 3 years.

The Tulsa MSA has the second largest population in Oklahoma behind the Oklahoma City MSA, with an estimated population of 1,059,803 based on the 2024 Census Data Estimates found on the US Census Bureau website, (<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-metro-and-micro-statistical-areas.html>).

As per 40 CFR 58, Appendix D § 4.3.2(a), the Tulsa MSA will now require a near-road NO<sub>2</sub> monitoring site, as the population has exceeded 1,000,000 persons. DEQ is nearing completion of the establishment of a new Near Road NO<sub>2</sub> monitoring site, with operation anticipated to begin around Summer 2025. Additionally, a Photochemical Assessment Monitoring Station (PAMS) site requiring a direct NO<sub>2</sub> monitor will have to be installed in the CBSA. This device will function differently than the aforementioned NO<sub>x</sub> monitors but will be redundant in its reporting of NAAQS-comparable NO<sub>2</sub> data. As such, after the new Direct NO<sub>2</sub> monitor is fully operational, DEQ will likely seek to end operation of the NO<sub>x</sub> monitor at Tulsa’s NCore monitoring site.

As all other existing NO<sub>x</sub> sites are required and essential, Oklahoma DEQ is not making any additional long-term plans to reduce this network. Furthermore, recently observed concentrations in Population Exposure monitoring sites do not indicate a need for expansion; no further changes are expected to the network outside of this unless changes are mandated by EPA.

### Carbon Monoxide (CO)

Summary:

The CO monitoring network was originally designed as a population-exposure effort. Attainment of the CO NAAQS was achieved in the late 1980s after automobile emission controls improved and the older, higher polluting models of fleet vehicles were removed from service. At the time, the larger CO network included some monitors which were situated using microscale site location criteria, i.e. close to neighborhoods and busy automobile traffic areas. Microscale sites for CO are no longer required for state or local networks; however, there are requirements for siting of a CO monitor at Near-Road NO<sub>2</sub> sites in cities with populations over 1 million and a trace monitor at

the state NCore site. Oklahoma DEQ meets one of these requirements at the Near-Road site in AQS Site # 40-109-0097 (OKC Near Road). Our trace monitor is located at the NCore site, AQS Site # 40-143-1127 (Tulsa Central).

With regards to major sources, the two largest metropolitan statistical areas (Oklahoma City and Tulsa) are experiencing downward trends for CO from Title V sources. Aside from the Near-Road and NCore requirement, one site is currently operational at AQS Site # 40-109-1037 (OKC North). This site is NAAQS-comparable. These two sites remain useful for ongoing trends analysis in the Oklahoma City MSA. After microscale siting requirements were eliminated in 2006, reductions in the CO network resulted in the current configuration of these three sites.

Assessment:

Please see Table 1 for a list of our current CO monitors and a complete list of associated information.

The Tulsa MSA has the second largest population in Oklahoma behind the Oklahoma City MSA, with an estimated population of 1,059,803 based on the 2024 Census Data Estimates found on the US Census Bureau website,

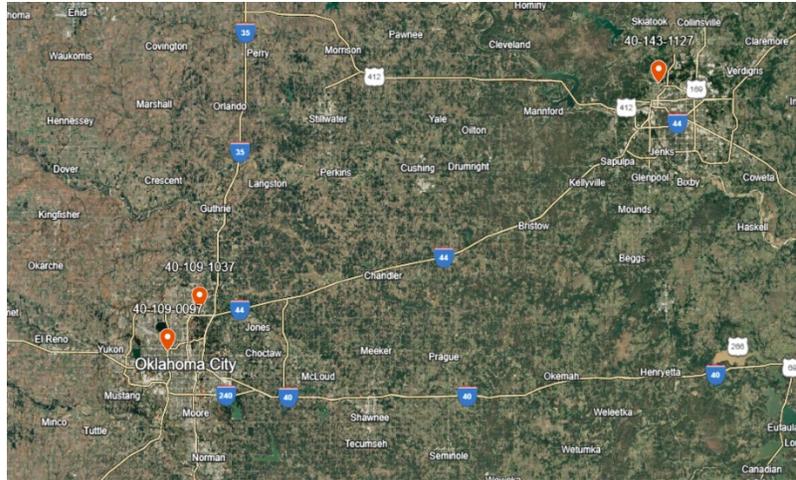


Figure 22: CO monitoring sites in the ODEQ network.

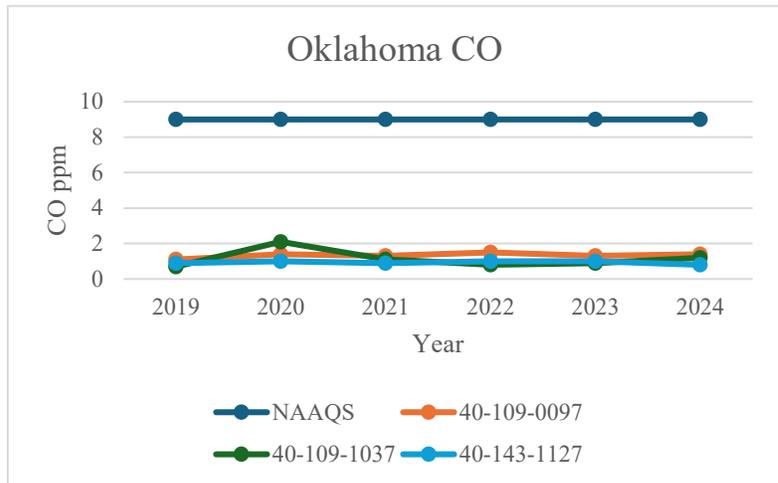


Figure 23: CO 8-hour averages.

(<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-metro-and-micro-statistical-areas.html>).

As per 40 CFR 58, Appendix D § 4.3.2(a), the Tulsa MSA will now require a near-road NO<sub>2</sub> monitoring site, as the population has exceeded 1,000,000 persons. DEQ is nearing completion of the establishment of a new Near Road NO<sub>2</sub> monitoring site, with operation anticipated to begin around Summer 2025. This site requires and will also house a CO monitor.

Site redundancy is a non-issue for this network due to the wide spatial distribution and coverage of the sites. Oklahoma DEQ is not aware of new CO monitoring technologies that should be considered for deployment in the next few years. ODEQ does expect an expansion per CFR requirements once the Tulsa additions have been completed.

### Toxics

Until recently, Oklahoma DEQ ran an extensive toxics network of seven sites across the state to address community concerns. Several of these sites were shut down due to budgetary constraints and low measured ambient concentrations in those areas over a monitoring period of two years.

DEQ maintains a list of Toxic Air Contaminants (TAC) of concern. When these toxins routinely violate the Maximum Acceptable Ambient Concentration, (MAAC) an Area of Concern (AOC) can be designated. DEQ operates three air toxics sites, one National Air Toxics Trends Station (NATTS) in Tulsa (TMOK) and two non-NATTS sites, one in Oklahoma City (OCOK), and one in Tulsa (TOOK).

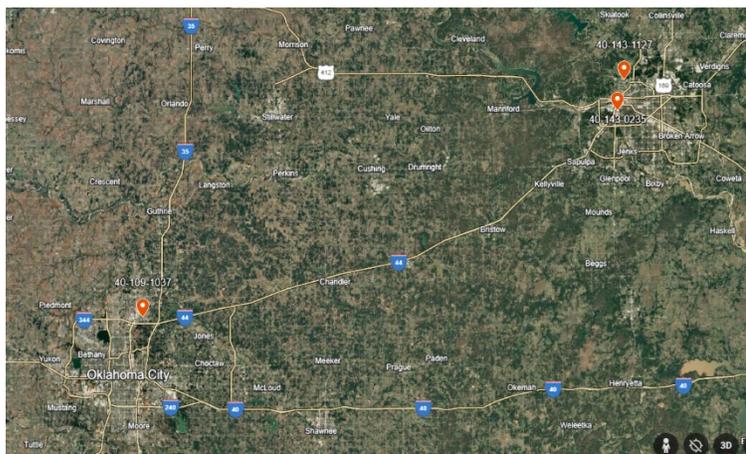


Figure 24: Oklahoma DEQ Toxic Monitoring Sites

In 2023, DEQ opened a new non-NATTS air toxics short term special study monitoring site in partnership with the Quapaw Nation Environmental Department in Commerce, Oklahoma (COOK). This site was in operation for 12 months and has now closed. DEQ and the Quapaw Nation Environmental Department determined that continued monitoring was not necessary following the data evaluation.

Tulsa (TMOK) is comparable to Oklahoma City (OCOK) due to their siting locations in their respective cities. Tulsa (TOOK) is an outlier being more of an industrial station. Primarily, we see many of Oklahoma’s concentrations affected by temperatures, often increasing in the summer and decreasing in the cooler winter months.

### Special Projects

#### Small Sensors Study

The Village Green bench in Oklahoma City (Figure 25) is set up for the ongoing Oklahoma DEQ small sensors study, which includes ozone sensors. Though the data is not submitted to AQS, it is an asset to the Oklahoma DEQ’s AQ Health Advisory Network and has begun being utilized as a testing platform for small low-cost sensors.



Figure 25: Village Green Bench

## **Summary and Conclusions for the Assessment**

- Overall, the network is efficient. Some changes are still expected to occur over the next five years to improve network quality and become more effective in meeting both state and federal goals for air monitoring, including:
  - Utilizing new small sensors for site placement to the benefit of the network.
  - Tulsa CBSA has surpassed 1 million people, initiating the establishment of a PAMS and a Near-Road site. The following monitors will be added.
    - PAMS
      - Hourly averaged speciated volatile organic compounds (VOCs),
      - Three 8-hour averaged carbonyl samples per day on a 1 in 3-day schedule, or hourly averaged formaldehyde,
      - Hourly averaged true nitrogen dioxide (NO<sub>2</sub>)
      - Hourly averaged atmospheric pressure,
      - Hourly precipitation,
      - Hourly averaged mixing-height,
      - Hourly averaged solar radiation, and
      - Hourly averaged ultraviolet radiation.
    - Near-Road
      - Hourly averaged nitrogen dioxide (NO<sub>2</sub>)
      - Hourly averaged carbon monoxide (CO)
      - Hourly averaged black carbon
      - Hourly averaged particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>)
- The state is using up-to-date technology in all aspects of its network, including monitoring and data collection. A robust network of PM<sub>2.5</sub> and O<sub>3</sub> sites near the state's three largest MSAs provide the infrastructure for the required AQI and will be continued.
- The state's Air Quality Health Advisory Program benefits its citizens and will continue as long as resources allow. The additional O<sub>3</sub> and PM<sub>2.5</sub> samplers operated for this program provide a valuable health service and should be continued.
- Special purpose monitors along the Red River provide valuable information regarding O<sub>3</sub> transport across state lines and will be expanded in the use of low-cost sensor technology.
- The small sensors study is an asset to Oklahoma DEQ and should be continued.
- The NATTS program is a valuable asset to the state of Oklahoma and Oklahoma DEQ looks forward to further coordination with the EPA on this objective.
- In light of current world events, Oklahoma DEQ has realized the need for changes in the network to address extenuating circumstances and full site coverage. While adjustments are currently being made, we will continue to improve our capabilities, coordination, and communication to address possible scenarios.

## Tables

Table 1. Air Monitoring Site Information:

AQS Site #	Address/ Location	Latitude	Longitude	Pollutants Measured	Sampling/Analysis Method	Station Type	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comp.	CSA - CBSA <sup>1</sup>
40-109-0035 (Central Fire Station)	N.W. 5th and Shartel, OKC	35.472920	-97.527090	PM <sub>2.5</sub>	Sequential FRM/ Micro-gravimetric filter weighing	SLAMS	(1 in 6)	Population Exposure	Neighborhood	Yes	OKC- Shawnee CSA-OKC CBSA
				PM <sub>10</sub>	Sequential FRM/ Micro-gravimetric filter weighing	SLAMS	(1 in 6)	Population Exposure	Neighborhood	Yes	
				PM <sub>10</sub>	Sequential FRM/ Micro-gravimetric filter weighing	SLAMS	(1 in 12) Collocated	Quality Assurance Collocation	Neighborhood	Yes	
				PM <sub>10</sub> - PM <sub>2.5</sub>	Paired Gravimetric	SPM	(1 in 6)	Population Exposure	Neighborhood	No	
40-027-0049 (Moore)	S.E. 19th St., Moore Water Tower, Moore	35.320105	-97.484099	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Urban	Yes	OKC- Shawnee CSA-OKC CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SPM <sup>3</sup>	Continuous	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Urban	No	
40-109-0096 (Choctaw)	12880 A N.E. 10th, Choctaw	35.477801	-97.303044	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Urban	Yes	OKC- Shawnee CSA-OKC CBSA
40-109-0097 (OKC Near Road)	3112 N. Grand Blvd, OKC	35.503070	-97.577981	NO <sub>2</sub>	Chemiluminescence	SLAMS	Continuous	Highest Concentration/ Near-Road	Micro	Yes	OKC- Shawnee CSA-OKC CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SLAMS	Continuous	Population Exposure	Micro	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Micro	No	
				CO	Gas Filter Correlation	SLAMS	Continuous	Population Exposure	Micro	Yes	
				Black Carbon	Optical Absorption	SLAMS	Continuous	Population Exposure	Micro	No	
40-017-0101 (Yukon)	12575 NW 10 <sup>th</sup> , Water Tower, Yukon	35.479215	-97.751503	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Neighborhood	Yes	OKC- Shawnee CSA-OKC CBSA
40-037-0144 (Mannford)	City Water Plant, Mannford	36.105481	-96.361196	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Urban	Yes	Tulsa- Muskogee- Bartlesville CSA-Tulsa CBSA

AQS Site #	Address/Location	Latitude	Longitude	Pollutants Measured	Sampling/Analysis Method	Station Type	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comp.	CSA - CBSA <sup>1</sup>
40-143-0174 (Glenpool)	502 E. 144th Pl., Tulsa South, Tulsa	35.953708	-96.004975	Ozone	U.V. Absorption	SLAMS	Continuous	Upwind Background	Urban	Yes	Tulsa–Muskogee - Bartlesville CSA-Tulsa CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SPM <sup>3</sup>	Continuous	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Urban	No	
40-143-0175 (Tulsa Newblock)	1710 W. Charles Page Blvd. Tulsa	36.149877	-96.011664	SO <sub>2</sub> <sup>4</sup>	U.V. Fluorescence	SLAMS	Continuous	Source Oriented	Neighborhood	Yes	Tulsa–Muskogee-Bartlesville CSA-Tulsa CBSA
				H <sub>2</sub> S	U.V. Fluorescence	SPM <sup>5</sup>	Continuous	Source Oriented	Neighborhood	No	
40-143-0178 (Tulsa East)	18707 E. 21st St., Tulsa East, Tulsa	36.133802	-95.764537	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Urban	Yes	Tulsa–Muskogee-Bartlesville CSA-Tulsa CBSA
40-147-0217 (Copan)	7740 N. 4000 Rd, Copan	36.908115	-95.882350	Ozone	U.V. Absorption	SPM	Continuous	Regional Transport	Regional	No <sup>6</sup>	Tulsa–Muskogee-Bartlesville CSA-Bartlesville MSA
				PM <sub>2.5</sub>	Broadband spectroscopy	SPM <sup>3</sup>	Continuous	Regional Transport	Regional	No <sup>6</sup>	
				PM <sub>10</sub>	Broadband spectroscopy	SPM	Continuous	Regional Transport	Regional	No <sup>6</sup>	
40-113-0226 (Skiatook)	1521 S. Lombard, Skiatook	36.355860	-96.012430	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Urban	Yes	Tulsa–Muskogee-Bartlesville CSA-Tulsa CBSA
40-143-0235 (Tulsa TCWD)	2443 S. Jackson Ave., Tulsa	36.126945	-95.998941	SO <sub>2</sub> <sup>4</sup>	U.V. Fluorescence	SLAMS	Continuous	Source Oriented	Middle	Yes	Tulsa – Muskogee - Bartlesville CSA - Tulsa CBSA
				H <sub>2</sub> S	U.V. Fluorescence	SPM	Continuous	Source Oriented	Middle	No	
40-019-0297 (Healdton)	Memorial Dr., Healdton City Lake, Healdton	34.244189	-97.462931	PM <sub>2.5</sub>	Broadband Spectroscopy	SLAMS	Continuous	Regional Transport	Regional	Yes	Not in CSA-Ardmore CBSA
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Regional Transport	Regional	No	
40-085-0300 (Burneyville)	Noble-Foundation Red River Research Farm, Burneyville	33.880812	-97.275896	Ozone	U.V. Absorption	SPM	Continuous	Regional Transport	Regional	No <sup>6</sup>	Not in CSA/MSA - Ardmore CBSA

AQS Site #	Address/Location	Latitude	Longitude	Pollutants Measured	Sampling/Analysis Method	Station Type	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comp.	CSA - CBSA <sup>1</sup>
40-121-0415 (McAlester)	104 Airport Rd., McAlester Municipal Airport, McAlester	34.885608	-95.784410	Ozone	U.V. Absorption	SLAMS	Continuous	Regional Transport	Regional	Yes	Not in CSA- McAlester CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SLAMS	Continuous Primary	Population Exposure	Regional	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Urban	No	
				PM <sub>2.5</sub>	Sequential FRM/Micro-gravimetric Filter Weighing	SLAMS	(1 in 6) Collocated	Quality Assurance/ Method Collocation	Regional	Yes	
40-121-0416 (Savanna)	117 Liberty St., Savanna	34.829396	-95.843642	Lead	Hi-Volume	SLAMS	(1 in 6)	Source Oriented	Neighborhood	Yes	Not in CSA- McAlester CBSA
				Lead	Hi-Volume	SLAMS	(1 in 12) Collocated	Quality Assurance	Neighborhood	Yes	
40-047-0555 (Oxbow/ Kremlin)	11826 N 30th St, Kremlin	36.512363	-97.845959	SO <sub>2</sub> <sup>4</sup>	U.V. Fluorescence	SLAMS	Continuous	Source Oriented	Neighborhood	Yes	Not in CSA- Enid CBSA
40-071-0604 (Ponca City)	306 E Otoe, Ponca City	36.697186	-97.081350	SO <sub>2</sub> <sup>4</sup>	U.V. Fluorescence	SLAMS	Continuous	Population Exposure/ Source Oriented	Neighborhood	Yes	Not in CSA- Ponca City CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SLAMS	Continuous	Population Exposure	Neighborhood	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Neighborhood	No	
40-031-0651 (Lawton)	2211 NW 25 <sup>th</sup> , Lawton	34.632980	-98.428790	Ozone	U.V. Absorption	SLAMS	Continuous	Population Exposure	Urban	Yes	Not in CSA- Lawton CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SPM <sup>3</sup>	Continuous	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Urban	No	
40-075-0711 (Great Plains State Park)	Great Plains State Park, 22487 E 1566 R, Mountain Park	34.745832	-98.967698	Ozone	U.V. Absorption	SPM	Continuous	Regional Transport	Regional	No <sup>6</sup>	Not in CSA/ CBSA
40-043-0860 (Seiling)	Seiling Municipal Airport, Seiling	36.158414	-98.931973	Ozone	U.V. Absorption	SLAMS	Continuous	General Background	Regional	Yes	Not in CSA/ CBSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SLAMS	Continuous	General Background	Regional	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	General Background	Regional	No	

AQS Site #	Address/ Location	Latitude	Longitude	Pollutants Measured	Sampling/Analysis Method	Station Type	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comp.	CSA - CBSA <sup>1</sup>
40-109-1037 (OKC North)	2501 E. Memorial Rd., Oklahoma Christian University, OKC	35.614131	-97.475083	SO <sub>2</sub> <sup>4</sup>	U.V. Fluorescence	SLAMS	Continuous	Population Exposure	Urban	Yes	OKC- Shawnee CSA-OKC CBSA
				Ozone	U.V. Absorption	SLAMS	Continuous	Highest Concentration	Urban	Yes	
				CO	Gas Filter Correlation	SLAMS	Continuous	General Background	Urban	Yes	
				NO <sub>2</sub>	Chemiluminescence	SLAMS	Continuous	Max Precursor Emissions Impact/ Area-wide NO <sub>2</sub> and RA40 NO <sub>2</sub> for OKC CBSA	Urban	Yes	
				Chemical Speciation	Low Volume Gravimetric/Micro- gravimetric filter weighing	SLAMS	(1 in 6)	Population Exposure	Urban	No	
				PM <sub>2.5</sub>	Sequential FRM/ Micro-gravimetric filter weighing	SLAMS	(1 in 3) Collocated	Population Exposure/ Method Collocation	Urban	Yes	
				PM <sub>2.5</sub>	Broadband Spectroscopy	SLAMS	Continuous Primary	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SLAMS	Continuous	Population Exposure	Urban	Yes	
40-087-1074 (Kessler)	Kessler, McClain County	34.984686	-97.522753	Ozone	U.V. Absorption	SLAMS	Continuous	Background	Urban	Yes	OKC- Shawnee CSA-OKC CBSA

AQS Site #	Address/ Location	Latitude	Longitude	Pollutants Measured	Sampling/Analysis Method	Station Type	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comp.	CSA - CBSA <sup>1</sup>
40-143-1127 (Tulsa Central)	3520 1/2 N. Peoria, North Tulsa- Fire Station #24, Tulsa	36.204902	-95.976537	Ozone	U.V. Absorption	NCore/ SLAMS	Continuous	Maximum Precursor Emissions Impact	Urban	Yes	Tulsa- Muskogee- Bartlesville CSA-Tulsa CBSA
				Trace Level NO <sub>2</sub>	Chemiluminescence	NCore/ SLAMS	Continuous	Maximum Precursor Emissions Impact/ Area-wide NO <sub>2</sub> and RA40 NO <sub>2</sub> for Tulsa CBSA	Urban	Yes	
				Trace level NO <sub>y</sub>	Chemiluminescence	NCore/ SLAMS	Continuous	Maximum Precursor Emissions Impact	Urban	No	
				Trace level CO	Gas Filter Correlation	NCore/ SLAMS	Continuous	Population Exposure	Urban	Yes	
				Trace level SO <sub>2</sub> <sup>4</sup>	U.V. Fluorescence	NCore/ SLAMS	Continuous	Population Exposure	Urban	Yes	
				PM <sub>2.5</sub>	Sequential FRM/ Micro-gravimetric filter weighing	NCore/ SLAMS	(1 in 3) Primary	Population Exposure	Urban	Yes	
				PM <sub>2.5</sub>	Sequential FRM/ Micro-gravimetric filter weighing	NCore/ SLAMS	(1 in 6) Collocated	Quality Assurance Collocation	Urban	Yes	
				PM <sub>2.5</sub>	Broadband Spectroscopy	NCore/ SPM <sup>3</sup>	Continuous	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	NCore/ SPM <sup>3</sup>	Continuous	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Sequential FRM/ Micro-gravimetric filter weighing	NCore/ SLAMS	(1 in 3)	Population Exposure	Urban	Yes	
				PM <sub>10</sub> - PM <sub>2.5</sub>	Paired Gravimetric – “calculated”	NCore/ SPM	(1 in 3)	Population Exposure	Urban	No	
				Chemical Speciation	Low Volume Gravimetric/Micro- gravimetric filter weighing	NCore/ SLAMS	(1 in 3)	Population Exposure	Urban	No	

<sup>1</sup> Combined Statistical Area and Core-Based Statistical Area abbreviated to CSA and CBSA, respectively, for all tables.

<sup>2</sup> Oklahoma City has been abbreviated to OKC for all tables.

<sup>3</sup> PM<sub>2.5</sub> SPM monitors are used to support the state’s Health Advisory Program and will remain SPMs.

<sup>4</sup> AQS shows two SO<sub>2</sub> monitors due to reports being entered for both hourly and 5-minute data.

<sup>5</sup> H<sub>2</sub>S SPMs are used to monitor major sources in the Tulsa area in response to the state-implemented H<sub>2</sub>S ambient standard and will remain SPMs.

All AQD sites and monitors conform to 40 CFR, Subchapter C, Part 58 Appendix A, Appendix C (see methods in column 6 of table 2), and Appendices D & E.

<sup>6</sup> 40-147-0217, 40-019-0297, 40-069-0324, 40-067-0671, are intentionally designed as SPMs to capture less than 3 years of data and therefore will not be compared to NAAQS values for the purpose of attainment/non-attainment.

Note – The PM<sub>2.5/10</sub> (2 parameters/1 monitor) listed as “broadband spectroscopy” at 40-109-1037 and 40-143-1127 are API Model T640x instruments designated NAAQS comparable for PM<sub>2.5</sub> and PM<sub>10</sub>. All others are API Model T640 instruments designated NAAQS comparable for PM<sub>2.5</sub> and non-NAAQS comparable for PM<sub>10</sub>.

Table 2. AQD NAAQS Monitor Instrument Types

<b>Pollutant Measured</b>	<b>Manufacturer</b>	<b>Instrument</b>
PM <sub>2.5</sub> – FRM PM <sub>10</sub> – FRM	Thermo Environmental	2025i Sequential Air Sampler
PM <sub>2.5</sub> – Continuous FEM	Teledyne API	T640
PM <sub>2.5</sub> – Continuous FEM PM <sub>10</sub> – Continuous FEM	Teledyne API	T640X
PM <sub>2.5</sub> – Speciation	URG	3000N
	Met One	SASS
Ozone	Teledyne API	T400
	Thermo Environmental	49iQ
	Ecotech	Serinus 10
CO	Teledyne API	T300
	Teledyne API	T300U
	Thermo Environmental	48iQ
NO <sub>x</sub>	Thermo Environmental	42iQ
	Teledyne API	T200U
	Ecotech	Serinus 40
NO <sub>y</sub>	Thermo Environmental	42iY
SO <sub>2</sub>	Thermo Environmental	43iQ
	Teledyne API	T100
	Teledyne API	T100U
H <sub>2</sub> S	Teledyne API	T101
	Thermo Environmental	450iQ
Lead	Tisch	High Volume Air Sampler TE-5170V
Black Carbon	Magee Scientific	Aethalometer AE33

DEQ will be submitting an instrument inventory to EPA by July 1, 2025. The detailed inventory list is not part of the ANP but will be submitted separately.

Table 3. AQD Network Proposed Changes

*Monitoring Sites to be Relocated*

AQS Site #	Address/ Location	Latitude	Longitude	Pollutants Measured	Sampling/ Analysis Method	Station Type	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comparable	CSA- MSA/CBSA
40-143-0174 <sup>1</sup> (Glenpool)	502 E. 144th Pl., Tulsa South, Tulsa	35.953708	-96.004975	Ozone	U.V. Absorption	SLAMS	Continuous	Upwind Background	Urban	Yes	Tulsa- Muskogee- Bartlesville CSA- Tulsa MSA
				PM <sub>2.5</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Urban	Yes	
				PM <sub>10</sub>	Broadband Spectroscopy	SPM	Continuous	Population Exposure	Urban	No	

<sup>1</sup>40-143-0174: DEQ is currently discussing the relocation of Site 40-143-0174 with the Glenpool Public School System. The site is on the verge of not meeting siting criteria as specified by 40 CFR 58 Appendix E §5.a. EPA will be provided with specifics of the location including latitude, longitude, and pictures of the proposed site upon completion of a contract with the city.

**Table 4: Network Requirements**

Parameter	Number of Monitors Required in Part 58 App D	Reason(s) for Requirement Part 58 App D	Number of Other Non-Required SLAMS/SPM Monitors Currently in Operation	Reason(s) for Optional Monitors	Total Monitors Operated
Ozone	2	OKC MSA/Population			2
	2	Tulsa MSA/Population			2
	1	Lawton MSA/Population			1
	1	NCore			1
			4	SPM and/or Transport	4
			6	AQI/Advisories	6
<b>Total</b>	<b>6</b>		<b>10</b>		<b>16</b>
Carbon Monoxide	1	Near-Road			1
	1	NCore			1
			1	Background	1
<b>Total</b>	<b>2</b>		<b>1</b>		<b>3</b>
Nitrogen Dioxide	1	Near-Road			1
	1	NCore ; Area-wide NO <sub>2</sub> and RA40 NO <sub>2</sub> for Tulsa MSA			1
	1	Area-wide NO <sub>2</sub> and RA40 NO <sub>2</sub> for OKC MSA			1
<b>Total</b>	<b>3</b>				<b>3</b>
NO <sub>y</sub>	1	NCore			1
<b>Total</b>	<b>1</b>				<b>1</b>
Sulfur Dioxide	1	NCore			1
	1	SO <sub>2</sub> DRR <sup>2</sup>			1
	1	Tulsa CBSA PWEI			1
			2	Major Source	2
		1	OKC MSA/Population	1	
<b>Total</b>	<b>5</b>		<b>3</b>		<b>6</b>
Hydrogen Sulfide			2	Population/State Standard	2
<b>Total</b>			<b>2</b>		<b>2</b>
Lead	1	Sources > 0.5 tons/year			1
	1	QA Collocation			1
<b>Total</b>	<b>2</b>				<b>2</b>
PM <sub>2.5</sub> <sup>3</sup>	2	OKC MSA/Population			2
	1	Tulsa MSA - Population/NCore			1
	2	Method Collocation			2
	1	QA Collocation			1
	1	Background			1
	1	Transport			1
	1	Near-Road			1
			6	AQI/Advisories	6
		1	SPM/Transport	1	
<b>Total</b>	<b>9</b>		<b>7</b>		<b>16</b>

Parameter	Number of Monitors Required in Part 58 App D	Reason(s) for Requirement Part 58 App D	Number of Other Non-Required SLAMS/SPM Monitors Currently in Operation	Reason(s) for Optional Monitors	Total Monitors Operated
PM <sub>10</sub> <sup>1,4</sup>	2	OKC MSA/Population			2
	1	Tulsa MSA/NCore			1
	1	QA Collocation			1
			1	AQI/Advisories (NAAQS Comparable)	1
			1	Background (Non-NAAQS Comparable)	1
			6	AQI/Advisories (Non-NAAQS Comparable)	6
			2	SPM/Transport (Non-NAAQS Comparable)	2
<b>Total</b>	<b>4</b>		<b>10</b>		<b>14</b>
PM <sub>10-2.5</sub> (Coarse)	1	NCore			1
			1	Supplemental	1
<b>Total</b>	<b>1</b>		<b>1</b>		<b>2</b>

<sup>1</sup>There are 9 sites utilizing the API T640 technology, currently collecting non-NAAQS PM<sub>10</sub> data.

<sup>2</sup>Though listed as being required under 40 CFR 58 Appendix D, the DRR monitors are required under 40 CFR 51.

<sup>3</sup>Per 40 CFR 58 Table D-5 of Appendix D, while the Enid MSA has a population of >50,000, it has met the minimum monitoring requirements due to the Enid MSA PM<sub>2.5</sub> being <85% of PM<sub>2.5</sub> NAAQS. Per 40 CFR 58 Table D-5 of Appendix D, the Tulsa MSA has a population of >1,000,000 and an expected design value of ≥85%, therefore it may not meet the minimum monitoring requirement. DEQ anticipates the addition of a PM<sub>2.5</sub> monitor at the planned Tulsa Near Road location to alleviate this deficit. Per 40 CFR 58 Table D-5 of Appendix D,

<sup>4</sup>Per 40 CFR 58 Table D-4 of Appendix D, while the Lawton MSA has a population of >100,000, DEQ has met the minimum monitoring requirements due to Lawton MSA PM<sub>10</sub> being <80% of PM<sub>10</sub> NAAQS.

Note – This chart reflects existing network conditions.

**Table 5: PWEI<sup>1</sup> Numbers for Determination of Minimum SO<sub>2</sub> Sites**

MSA/CBSA	Counties	2023 SO <sub>2</sub> Emissions <sup>2</sup> (tons)	Total Emissions <sup>2</sup> (tons)	2024 Population <sup>3</sup> (people)	PWEI <sup>2</sup> (million persons-tons per year)
Oklahoma City	Oklahoma County	111	362	1,497,821	542
	Cleveland County	5			
	Canadian County	168			
	Grady County	40			
	Logan County	1			
	McClain County	37			
	Lincoln County	0			
Tulsa	Tulsa County	297	3,885	1,059,803	4,117
	Rogers County	3,241			
	Wagoner County	14			
	Creek County	206			
	Osage County	2			
	Okmulgee County	124			
	Pawnee County	1			
Lawton	Comanche County	4	4	126,899	0
	Cotton County	0			
Stillwater	Payne County	5	5	84,199	0
Shawnee	Pottawatomie County	5	5	74,446	0
Muskogee	Muskogee County	2,475	2,475	66,752	165
Enid	Garfield County	14,193	14,193	62,007	880
Bartlesville	Washington County	0	0	54,060	0
Tahlequah	Cherokee County	4	4	48,729	0
Ardmore	Carter County	296	299	49,135	14
	Love County	3			
Ponca City	Kay County	312	312	43,437	13
McAlester	Pittsburg County	31	31	43,395	1
Duncan	Stephens County	64	64	44,075	2
Durant	Bryan County	257	257	50,305	12
Ada	Pontotoc County	224	224	38,310	8
Miami	Ottawa County	8	8	30,404	0
Weatherford	Custer County	6	6	39,105	0
Altus	Jackson County	1	1	24,541	0
Elk City	Beckham County	62	62	22,248	1
Guymon	Texas County	16	16	20,577	0
Woodward	Woodward County	8	8	19,991	0

<sup>1</sup>40 CFR Appendix D to Part 58 §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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> monitor is required within that CBSA.

<sup>2</sup>Values truncated to whole tons or whole million persons-tons per year people.

<sup>3</sup>All population estimates based on the 2024 Census estimations found at <https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-metro-and-micro-statistical-areas.html>

## **Appendix A: Further Comments**

### **Monitoring of NAAQS Parameters:**

DEQ is monitoring for all NAAQS parameters in the state of Oklahoma as well as additional parameters such as H<sub>2</sub>S.

### **Near-Road and PM<sub>2.5</sub> Addition to Tulsa:**

EPA's current regulatory requirements from 40 CFR Appendix D to Part 58 § 4.3.2(a) states as follows:

*Within the NO<sub>2</sub> network, there must be one microscale near-road NO<sub>2</sub> monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO<sub>2</sub> monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or 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 to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.*

The Tulsa MSA has the second largest population in Oklahoma behind the Oklahoma City MSA, with an estimated population of 1,059,803 based on the 2024 Census Data Estimates found on the US Census Bureau website, (<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-metro-and-micro-statistical-areas.html>).

As per 40 CFR Appendix D to Part 58 § 4.3.2(a), the Tulsa MSA will now require a near-road NO<sub>2</sub> monitoring site, as the population has exceeded 1,000,000 persons. DEQ has begun the process of grant application and site evaluations to establish a new Near Road NO<sub>2</sub> monitoring site, with operation anticipated to begin around Summer 2025.

Per 40 CFR 58 Table D-5 of Appendix D, the Tulsa MSA has a population of >1,000,000 and an upcoming expected design value of ≥85%, therefore it may not meet the minimum monitoring requirement. DEQ anticipates the addition of a PM<sub>2.5</sub> monitor at the planned Tulsa Near Road location to alleviate this deficit.

### **Photochemical Assessment Monitoring Station Addition to Tulsa:**

EPA's current regulatory requirements from 40 CFR Appendix D to Part 58 § 5(a) states as follows:

*State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.*

The Tulsa MSA has the second largest population in Oklahoma behind the Oklahoma City MSA, with an estimated population of 1,059,803 based on the 2024 Census Data Estimates found on the US Census Bureau website, (<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-metro-and-micro-statistical-areas.html>).

As per 40 CFR Appendix D to Part 58 § 4.3.2(a), the Tulsa MSA will now require a Photochemical Assessment Monitoring Station (PAMS) monitoring site, as the population has exceeded 1,000,000 persons. DEQ has begun the process of grant application to establish new PAMS monitoring equipment at Tulsa site 1127, with operation anticipated to begin around Summer 2025.

#### Prevention of Significant Deterioration Air Monitoring:

The DEQ monitoring network meets all requirements found in 40 CFR 58, Appendix B. PSD monitoring is currently not necessary for the DEQ.

#### Maintenance Plans for Discontinuation of SLAMS Monitors:

Oklahoma currently is in attainment with all NAAQS and is not under a State Implementation Plan (SIP).

#### Division of MSA/CBSA Monitoring Responsibilities with other Agencies:

DEQ understands some of its monitoring area is shared with Tribal Nations and Arkansas Energy and Environment. DEQ has no standing agreements with Tribal Nations or Arkansas Energy and Environment for the division of monitoring responsibilities to fulfill monitoring requirements at this time. DEQ will continue to monitor the situation and maintain its current connections with these two entities and address any deficiencies should they arise.

#### National Air Toxics Trends Station, State Air Toxics Monitoring Network, and National Atmospheric Deposition Programs:

DEQ maintains a list of Toxic Air Contaminants (TAC) of concern. When these toxins routinely violate the Maximum Acceptable Ambient Concentration, (MAAC) an Area of Concern (AOC) is designated. DEQ operates three air toxics sites, one National Air Toxics Trends Station (NATTS) in Tulsa (TMOK) and two non-NATTS sites, one in Oklahoma City (OCOK), and one in Tulsa (TOOK).

TMOK is comparable to OCOK due to their siting locations in their respective cities. TOOK is an outlier being more of an industrial station. Primarily, we see many of Oklahoma's concentrations affected by temperatures, often increasing in the summer and decreasing in the cooler winter months.

Additionally, DEQ operates four Mercury Deposition Network (MDN) sites, OK01, OK04, OK06, OK31 and one National Trends Network (NTN) site, OK01. See chart below for detailed location data.

Site Identifier	Address/Location	Latitude	Longitude	Pollutants Measured
40-143-0235 TOOK	2443 S. Jackson Ave., Tulsa	36.126945	-95.998941	Toxics
40-109-1037 OCOK	2501 E. Memorial Rd., Oklahoma Christian University, OKC	35.614131	-97.475083	Toxics
40-143-1127 TMOK	3520 1/2 N. Peoria, North Tulsa- Fire Station #24, Tulsa	36.204902	-95.976537	Toxics
OK01	McGee Creek State Park	34.315439	-95.8894	Mercury NTN
OK04	Lake Murray State Park	34.103233	-97.070817	Mercury
OK06	Wichita Mountains Wildlife Refuge	34.73425	-98.709517	Mercury
OK31	Copan, Oklahoma	36.908115	-95.88235	Mercury

### Lead (Pb) Monitoring:

Currently only one lead monitoring site location, with an associated collocated sampler, is operated at 117 Liberty St., Savanna Oklahoma, AQS Site # 40-121-0416 (Savanna).

40 CFR 58 Appendix D Section 4.5 states “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/einformation.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”. Please note, the quoted CFR language includes a link which is no longer valid. The updated National Emission Inventory link is <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>.

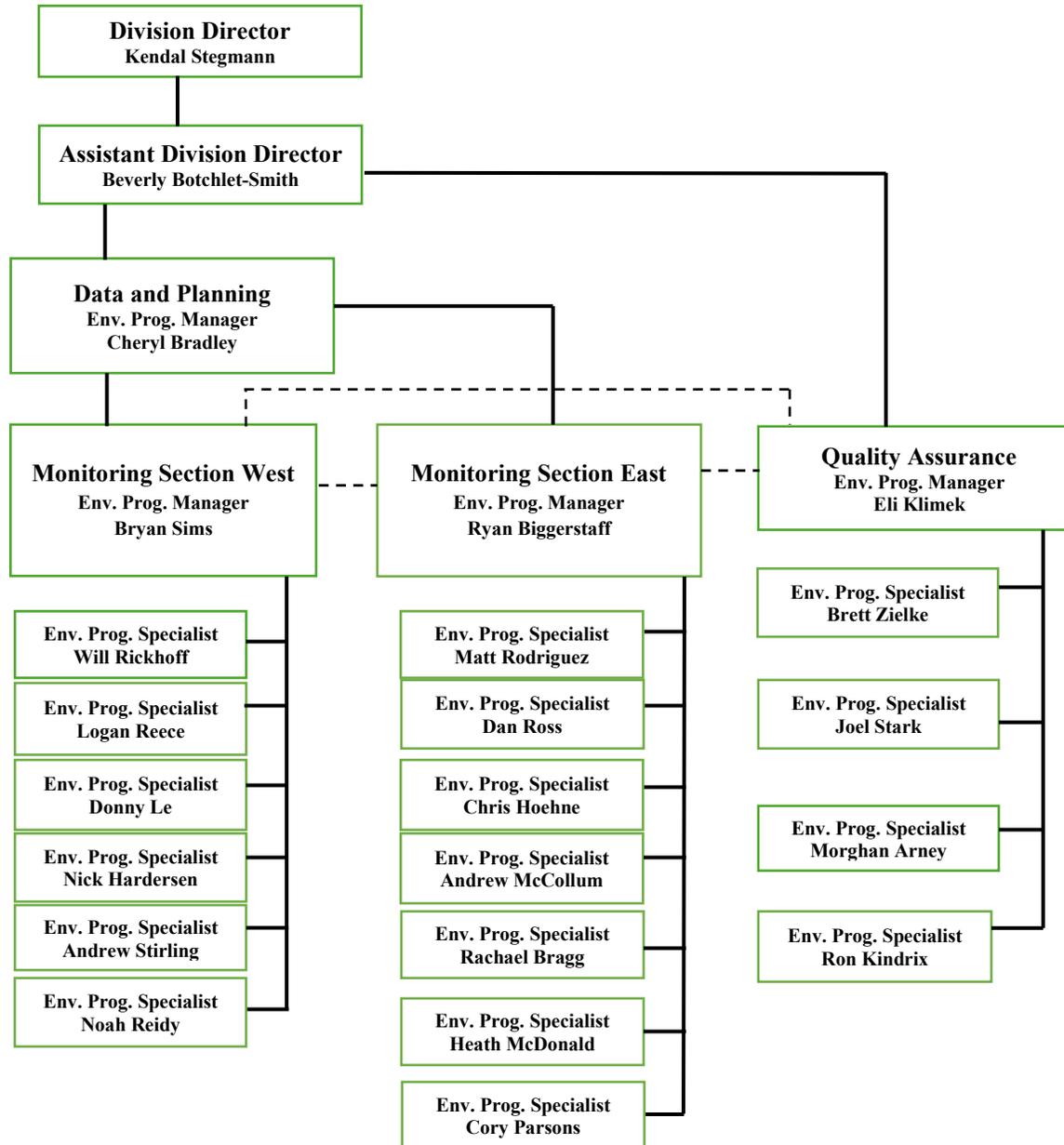
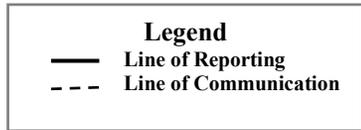
The 2020 National Emissions Inventory includes air emissions sources of both criteria and hazardous air pollutants with data available for many facilities and county totals. However, as this data is compiled on a triennial basis, DEQ has many datasets reflecting more up to date information. In all cases possible, the most recent site-specific data is utilized in making these determinations.

DEQ has recently learned of two areas in the state that may require Pb monitoring. Based on additional reviews of NEI data, recently revised data, and historic emissions inventories, new Pb monitoring may be required in the areas of Sapulpa, OK and Madill, OK. DEQ will continue to evaluate and will work with EPA Region 6 on this matter as needed.

### Review of Site Conditions:

The DEQ home office currently has inadequate laboratory space for use by monitoring staff when conducting instrument maintenance and repair operations. This has also affected our ability to maintain accurate inventories. Multiple solutions to this issue are being evaluated.

## Appendix B: Monitoring and Quality Assurance Staffing



## **Appendix C: EPA Response to 2024 Annual Network Plan**



**REGION 6**

DALLAS, TX 75270

October 18, 2024

Ms. Cheryl E. Bradley  
Environmental Programs Manager  
Data and Planning Section  
Oklahoma Department of Environmental Quality  
Oklahoma City, Oklahoma

Dear Ms. Bradley:

Thank you for your correspondence to the U.S. Environmental Protection Agency from the Oklahoma Department of Environmental Quality submitting the Oklahoma 2024 Annual Monitoring Network Plan (2024 Plan) for ambient air. The EPA has completed its review of the 2024 Plan to ensure it meets the minimum requirements of 40 Code of Federal Regulations Part 58 and its appendices.

We appreciate your efforts in submitting a timely 2024 Plan, which we received on June 28, 2024. Also, we appreciate the efforts of the ODEQ to manage and maintain the ambient air monitoring network in Oklahoma in compliance with the Clean Air Act.

The network review process presents an opportunity for the EPA and the ODEQ to collaborate on the air monitoring network design. See 40 CFR Part 58 Appendix D, Section 1.1.2. The EPA has conducted its review of the 2024 Plan including proposed network modifications to ensure the air quality surveillance system continues to meet applicable requirements. The EPA is approving your 2024 plan as meeting the minimum requirements per 40 CFR Part 58 and Appendices, including Section 58.10 and Section 58.14. The EPA appreciates the discussion regarding establishing new near-road NO<sub>2</sub> and PAMS monitoring sites in the Tulsa area. Going forward, please keep us updated regarding plans for these monitoring sites. Also, the EPA acknowledges the update regarding environmental justice considerations, including the ODEQ's non-NAAQS transport monitoring, and toxics monitoring, neither of which is specifically required by federal monitoring requirements in 40 CFR Part 58; rather, it is at the discretion of Oklahoma. Details regarding these requirements, and other specifics from our review of the 2024 Plan, are enclosed. We are available to discuss our review with you if you have any questions. For the 2024 Plan, this approval action is consistent with EPA's determination that the 2024 Plan meets federal requirements for Oklahoma's ambient air monitoring network.

As described in EPA's enclosed Technical Comments, the EPA is also approving the 2024 Plan consistent with EPA's October 1, 2020, approval of Oklahoma's request under section 10211(a) of SAFETEA to administer this program in certain areas of Indian country.

We note, however, that the EPA is currently reviewing our October 1, 2020, SAFETEA approval and anticipates engaging in further discussions with tribal governments and the State of Oklahoma as part of this review. The EPA also notes that the October 1, 2020, approval is the subject of a pending challenge in federal court. (*Pawnee v. Regan*, No. 20-9635 (10th Cir.)). Pending completion of the EPA's review, the EPA is proceeding with this action in accordance with the October 1, 2020, approval. The EPA may make any appropriate adjustments to the approval of Oklahoma's 2024 Plan to reflect the outcome of the SAFETEA review. Additional details about the EPA's SAFETEA approval are enclosed.

As a reminder, next year a Five-Year Network Assessment is due on July 1, 2025, in accordance with 40 CFR Part 48.10(d), and “. . . must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals . . . and other at-risk populations . . .”

We look forward to our continued partnership with the ODEQ on our common goal to establish and maintain an approvable and comprehensive monitoring. If you have any questions, please contact me at (214) 665-7593, or your staff may contact Air and Radiation Division, Air Monitoring & Grants Branch Manager Jeffrey Robinson at (214) 665-6435 or at [robinson.jeffrey@epa.gov](mailto:robinson.jeffrey@epa.gov).

Sincerely,

 Digitally  
signed by  
DAVID GARCIA  
Date: 2024. 10. 18  
10:24:35 -05' 00'

David F. Garcia  
Director  
Air and Radiation Division

Enclosure: Technical Comments

## **Technical Comments**

### **2024 Annual Monitoring Network Plan**

The Oklahoma 2024 Annual Monitoring Network Plan (ANP) was received on June 28, 2024 (2024 Plan). In accordance with the requirements of 40 Code of Federal Regulations (CFR) Part 58 and its appendices, the U.S. Environmental Protection Agency (EPA) has reviewed the 2024 Plan and our comments are provided below. These comments reflect the EPA's efforts in collaboration with the Oklahoma Department of Environmental Quality (ODEQ) to maintain minimum monitoring requirements required under Part 58.

#### **General Comments – Indian country**

Following the U.S. Supreme Court decision in *McGirt v Oklahoma*, 140 S.Ct. 2452 (2020), the Governor of the State of Oklahoma requested approval under Section 10211(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005: A Legacy for Users, Pub. Law 109-59, 119 Stat. 1144, 1937 (August 10, 2005) (SAFETEA), to administer in certain areas of Indian country (as defined at 18 U.S.C. § 1151) the State's environmental regulatory programs that were previously approved by the EPA outside of Indian country.

On October 1, 2020, the EPA approved Oklahoma's SAFETEA request to administer all of the State's EPA-approved environmental regulatory programs, including the Ambient Air Quality Surveillance requirements in 40 CFR Part 58 [specifically, the 2021 Annual Monitoring Network Plan (2021 Plan)<sup>1</sup>], in the requested areas of Indian country. As requested by Oklahoma, the EPA's approval under SAFETEA does not include Indian country lands, including rights-of-way running through the same, that: (1) qualify as Indian allotments, the Indian titles to which have not been extinguished, under 18 U.S.C. § 1151(c); (2) are held in trust by the United States on behalf of an individual Indian or Tribe; or (3) are owned in fee by a Tribe, if the Tribe (a) acquired that fee title to such land, or an area that included such land, in accordance with a treaty with the United States to which such Tribe was a party, and (b) never allotted the land to a member or citizen of the Tribe (collectively "excluded Indian country lands").

EPA's approval under SAFETEA expressly provided that to the extent EPA's prior approvals of Oklahoma's environmental programs excluded Indian country, any such exclusions are superseded for the geographic areas of Indian country covered by the EPA's approval of Oklahoma's SAFETEA request.<sup>2</sup> The approval also provided that future revisions or amendments to Oklahoma's approved environmental regulatory programs would extend to the covered areas of Indian country (without any further need for additional requests under SAFETEA).

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<sup>1</sup> 40 CFR Part 58.10.

<sup>2</sup> The EPA approved the 2021, 2022, and 2023 Plans in accordance with EPA's October 1, 2020. SAFETEA approval. The EPA's approval of Plans prior to 2021 relating to Oklahoma's ambient air quality, including the 2020 Annual Monitoring Network Plan approved on October 22, 2020, were not approved to apply in areas of Indian country located in the state. Such prior limitations are superseded by the EPA's approval of Oklahoma's SAFETEA request.

As explained above, the EPA is approving Oklahoma's 2024 Annual Monitoring Network Plan. Consistent with EPA's October 1, 2020, SAFETEA approval, this 2023 Plan will apply to all Indian country within the State of Oklahoma, other than the excluded Indian country lands.<sup>3</sup>

### **General Comments – Clean Air Act**

We appreciate the ODEQ's submittal of the 2024 Plan in accordance with 40 CFR §58.10. Operation of monitoring network in accordance with 40 CFR Part 58 and Appendices A, B, C, D, and E. We appreciate the ODEQ's operation of the ambient air monitoring network in accordance with minimum federal requirements defined in 40 CFR Part 58 and Appendices A through E, including the National Ambient Air Quality Standards (NAAQS) monitoring network.

Air Quality System (AQS). Thank you for your efforts to ensure that the information in the ANP and the AQS is complete and consistent. Please continue to update the AQS, and to correlate the details of each monitoring location in the ANP with the AQS.

### **Environmental Justice Considerations**

The EPA recognizes that the 2024 Plan meets the minimum federal regulatory requirements outlined at 40 CFR 58.10 and Appendices A through E. The EPA acknowledges the update regarding environmental justice considerations provided in the 2024 Plan, including the ODEQ's non-NAAQS transport monitoring, and toxics monitoring, neither of which is specifically required by federal monitoring requirements in 40 CFR Part 58; rather, it is at the discretion of Oklahoma. (See the 2024 Plan, Appendix C).

### **Ozone (O3) Monitoring** (40 CFR Part 58, Appendix D Section 4.1)

The ODEQ is meeting the minimum requirements for its ozone monitoring network design.

The EPA appreciates the updates on ozone Special Purpose Monitors (SPMs) (AQS IDs: 40-147-0207 and 40-147-0217).

We look forward to receiving information in the future from the ODEQ regarding a proposed short relocation of the existing Glenpool ozone monitoring site in Tulsa (AQS ID: 40-143-0174).

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<sup>3</sup> In accordance with Executive Order 13990, the EPA is currently reviewing our October 1, 2020, SAFETEA approval and is engaging in further consultation with tribal governments and discussions with the state of Oklahoma as part of this review. The EPA also notes that the October 1, 2020, approval is the subject of a pending challenge in federal court. (*Pawnee v. Regan*, No. 20-9635 (10th Cir.)). Pending completion of EPA's review, the EPA is proceeding with this action in accordance with the October 1, 2020, approval. The EPA may make any appropriate adjustments to the approval of Oklahoma's 2022 Plan and SO2 Annual Report to reflect the outcome of the SAFETEA review.

**Carbon Monoxide (CO) Monitoring** (40 CFR Part 58, Appendix D Section 4.2)

The ODEQ is meeting the minimum requirements for its carbon monoxide (CO) monitoring network design. See the section below, Near-Road (NO<sub>2</sub>) Monitoring, regarding near-road monitoring requirements for CO.

**Nitrogen Dioxide (NO<sub>2</sub>) Monitoring** (40 CFR Part 58, Appendix D Section 4.3)

The ODEQ is meeting the minimum requirements for its nitrogen dioxide (NO<sub>2</sub>) monitoring network design. See the section below, Near-Road (NO<sub>2</sub>) Monitoring, regarding near-road monitoring requirements for NO<sub>2</sub>.

**Near-Road (NO<sub>2</sub>) Monitoring** (40 CFR 58 Appendix D Section 4.3.2)

The ODEQ is meeting the minimum requirements for its near-road NO<sub>2</sub> monitoring network design, pending the addition of a near-road NO<sub>2</sub> monitoring site in the Tulsa area. Near-road monitoring sites are required to measure nitrogen oxides (NO<sub>x</sub>), including nitric oxide (NO) and NO<sub>2</sub>. Monitors for CO and PM<sub>2.5</sub> are also required to be collocated with a near-road NO<sub>2</sub> monitor in CBSAs with 1 million or more persons. The EPA thanks the ODEQ for including plans to establish a new near-road NO<sub>2</sub> monitoring site in Tulsa (with operation anticipated to begin around Summer 2025). We look forward to receiving information in the future from the ODEQ regarding the near road NO<sub>2</sub> monitoring site; please provide the EPA with a site location once it has been identified.

**Photochemical Assessment Monitoring Stations (PAMS)** (40 CFR Part 58, Appendix D Section 5)

The ODEQ is meeting the minimum requirements for its PAMS monitoring network design, pending the addition of a PAMS monitoring site in the Tulsa area. PAMS sites are required to measure ozone precursors and meteorological measurements. The EPA thanks the ODEQ for including plans to establish a new PAMS monitoring site in Tulsa (with operation anticipated to begin around Summer 2025). We look forward to receiving information in the future from the ODEQ regarding the PAMS monitoring site; please provide the EPA with a site location once it has been identified.

**Sulfur Dioxide (SO<sub>2</sub>) Monitoring** (40 CFR Part 58, Appendix D Section 4.4)

The ODEQ is meeting the minimum requirements for its SO<sub>2</sub> monitoring network design. The EPA acknowledges that no changes were proposed to the Oklahoma SO<sub>2</sub> network in the 2024 Plan.

**Lead (Pb) Monitoring** (40 CFR Part 58, Appendix D Section 4.5)

The ODEQ is meeting the minimum network design requirements for ambient air quality monitoring for Pb.

We received a request from the ODEQ on June 8, 2024, proposing to relocate the existing Pb monitoring site in Savanna (AQS ID: 40-121-0416). This request is under review and separate response will be provided..

**Particulate Matter (PM) Monitoring** (40 CFR Part 58, Appendix D Section 4.6 and 4.7)

The ODEQ is meeting the minimum network design requirements for ambient air quality monitoring for particulate matter (PM).

**Particulate Matter of 2.5 Microns or Less (PM2.5)** (40 CFR Part 58, Appendix D Section 4.7)

The plan to relocate the PM2.5 monitor at the Tulsa Glenpool site (AQS ID 40-143-0174) will be reviewed when specifics of the new location are provided.

See the section above, Near-Road (NO2) Monitoring, regarding near-road monitoring requirements for PM2.5.

**PM2.5 Quality Assurance Collocation**

For the PM2.5 monitors which the ODEQ operates using Federal Reference Method (FRM) number 145, collocation is met at the North Tulsa site (AQS ID 401431127).

For the PM2.5 monitors which the ODEQ operates using Federal Equivalent Method (FEM) number 236, collocation is met at the McAlester site (AQS ID 401210415).

For the PM2.5 monitors which the ODEQ operates using FEM number 238, collocation is met at the Oklahoma City North site (AQS ID 401091037).

**Multiple PM Measurements from an individual monitor**

The EPA appreciates the continued use of the T640X monitors to report both NAAQS and non-NAAQS measurements throughout ODEQ's monitoring network.

**Particulate Matter of 10 Microns or Less (PM10)** (40 CFR Part 58, Appendix D Section 4.6)

For the 2024 plan, we note that monitoring requirements in Tulsa will change, as the most recent U.S. Census population estimate for the Tulsa MSA is over 1,000,000 or more persons. The establishment of a new PM10 monitor will be required. We look forward to working with ODEQ on this as needed.

The plan to relocate the PM10 monitor at the Tulsa Glenpool site (AQS ID 401430174) will be reviewed when specifics of the new location are provided.

**PM10 Quality Assurance Collocation**

For the PM10 Manual monitors which the ODEQ operates using Federal Reference Method (FRM) number 127, collocation is met at the Central Fire Station site (AQS ID 401090035).

# Appendix D: Posting for Public Comment

2025 Combined 5-Year Network Assessment and Annual Network Plan - May 16, 2025

The screenshot displays the Oklahoma Department of Environmental Quality (DEQ) website. The browser address bar shows the URL: [deq.ok.gov/air-quality-division/ambient-monitoring/](http://deq.ok.gov/air-quality-division/ambient-monitoring/). The website header includes the DEQ logo and navigation links: ABOUT DEQ, PERMITS, RULES & REGULATIONS, ENVIRONMENTAL COMPLAINTS, DIVISIONS, and CONTACT. A search bar is also present.

The main content area is titled "AMBIENT AIR MONITORING". A prominent yellow box contains the following text:

The **Combined 5-Year Network Assessment and 2025 Annual Monitoring Network Plan** is available for public review and comment through June 16, 2025. It contains planned Oklahoma DEQ ambient monitoring network changes for the upcoming year as well as an evaluation of overall network effectiveness and ability to meet the requirements in Appendix D to Part 58, Title 40 of the Code of Federal Regulations. Comments should be submitted to the attention of Ryan Biggerstaff and Bryan Sims, Environmental Programs Managers, Air Quality Division, PO Box 1677, Oklahoma City, OK 73101 or email Ryan Biggerstaff and Bryan Sims.

Below this, the text states: "The Air Monitoring Section operates a statewide network of ambient (outdoor) air pollution monitors. These monitors serve three primary functions:"

1. To determine compliance with the Clean Air Act's pollution standards
2. To inform the public on the state of Oklahoma's air quality
3. To monitor areas of special or immediate concern

Three columns of links are provided:

- National Ambient Air Quality Standards (NAAQS)**  
NAAQS Table and Current Highs – lists each standard and highest monitored values for the current year  
These standards define the maximum permissible concentrations for
- Informing the Public**  
Our primary methods of informing the public are:  
AQI (Air Quality Index), Ozone & PM Alerts, Health Advisories  
Current Air Quality & AQI Forecasts – includes map and table of current
- Special Studies**  
Air Toxics including Mercury (Hg)  
Hydrogen Sulfide (H<sub>2</sub>S) – a toxic gas which is monitored at two locations  
Smoke Management

A sidebar on the left lists "AIR QUALITY DIVISION" categories: A QD Contact Information, A QD Contacts by Topic, Ambient Air Monitoring, Air Permits, Emissions Inventory, Air Compliance/Enforcement, Lead-Based Paint, Rules & Planning, and Forms & Public Participation.

Overlaid on the right side of the screenshot are a "Notifications" panel showing "No new notifications" and a calendar for May 2025. The calendar highlights the current date, Friday, May 16, 2025.

## Appendix E: Public Comments and Responses

One public comment was received during the public comment period. The public comment and corresponding response are included below.

### Public Comment 1

**From:** Craig Kreman <[craig.kreman@quapawnation.com](mailto:craig.kreman@quapawnation.com)>  
**Sent:** Friday, June 20, 2025 8:26 AM  
**To:** Ryan Biggerstaff <[Ryan.Biggerstaff@deq.ok.gov](mailto:Ryan.Biggerstaff@deq.ok.gov)>; Bryan Sims <[Bryan.Sims@deq.ok.gov](mailto:Bryan.Sims@deq.ok.gov)>  
**Cc:** [dana.hummell@quapawnation.com](mailto:dana.hummell@quapawnation.com)  
**Subject:** [EXTERNAL] Combined 5-Year Air Monitoring Network Assessment and Annual Network Plan available for review  
**Importance:** High

ODEQ,

Had some confusion on varying commenting periods with the regional haze notice of public comment period. Please see our comments below.

On behalf of the Quapaw Nation Environmental Office, we appreciate the opportunity to provide comments on the Oklahoma Department of Environmental Quality's (ODEQ) 2025 Combined 5-Year Network Assessment and Annual Network Plan (ANP). We recognize the extensive work undertaken by ODEQ to maintain and improve the state's ambient air monitoring network and commend the agency's efforts to meet federal requirements under 40 CFR Part 58. As you may be aware, the Quapaw Nation has several monitoring sites within their jurisdictional boundaries that meet federal requirements under 40 CFR Part 58.

As a sovereign Tribal Nation with a vested interest in the health and environmental quality of our citizens and lands, we offer the following comments and recommendations:

We commend ODEQ for its collaboration with the Quapaw Nation Environmental Office in 2023 to establish a short-term air toxics monitoring site in Commerce, Oklahoma. The data collected provided valuable insight into local air quality conditions. We encourage continued partnerships and data-sharing initiatives between ODEQ and tribal environmental programs, especially in areas with historical contamination or vulnerable populations.

We note ODEQ's concerns about the performance of TAPI T640 monitors and the potential for high bias in PM<sub>2.5</sub> readings. We support the agency's decision to procure alternative instruments and encourage transparent reporting of data quality issues and corrective actions. Given the health risks associated with fine particulate matter, especially for sensitive populations, ensuring accurate and reliable data is necessary.

We are encouraged by ODEQ's exploration of low-cost sensor technologies and their potential use in rural and underserved areas. We recommend that ODEQ consider deploying such sensors in and around tribal lands, including the Quapaw Nation, to enhance spatial coverage and support community-based air quality initiatives.

The Quapaw Nation Environmental Office appreciates the opportunity to comment on the 2025 ANP and supports ODEQ's continued efforts to maintain a robust and responsive air monitoring network. We look forward to ongoing collaboration and dialogue to protect the air quality and health of all Oklahomans, including tribal communities.

Please do not hesitate to contact our office for further discussion or partnership opportunities.

Take care,

Craig Kreman, PE, CFM  
Environmental Engineer  
Quapaw Nation  
918-533-3085

### Oklahoma DEQ Public Comment Response 1

Oklahoma DEQ thanks you for the thorough review of the Combined 5-Year Air Monitoring Network Assessment and Annual Network Plan during the public comment period and providing a comment. Collaborations such as the 2023 short term air toxics monitor in Commerce, Oklahoma, are opportunities that Oklahoma DEQ appreciates and will continue to seek out. With the increased availability and affordability of low cost sensor platforms, Oklahoma DEQ anticipates the increase in opportunities for collaborative work with entities across the state to help enhance coverage for rural and underservice communities.