State of Kansas

2019 Ambient Air Monitoring Network Plan

Department of Health and Environment
Division of Environment
Bureau of Air – Monitoring and Planning

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Purpose and Introduction

The Kansas Ambient Air Monitoring Network Plan is an annual report required by the Code of Federal Regulations (40 CFR 58 §58.10) that is submitted to EPA by July 1 of each year. The purpose of this plan is to provide evidence the Kansas Ambient Air Monitoring Network meets current federal air monitoring requirements, a periodic assessment of the ambient air monitoring network, including specific information on each monitoring site, and to propose any changes that will take place during the network plans valid dates, in this case, calendar year 2019.

The Kansas Department of Health and Environment (KDHE) Bureau of Air's Air Monitoring and Planning Section operate the Kansas Ambient Air Monitoring Network in cooperation with two local agencies to monitor ambient air quality throughout Kansas. This air quality data helps determine compliance with National Ambient Air Quality Standards (NAAQS). In conjunction with the annual emissions inventory, the data collected are used to address ways to reduce pollution levels and to evaluate pollution trends over time.

As required by 40 CFR 58 §58.10, the Kansas Department of Health & Environment Bureau of Air's draft 2019 Network Plan is being made available to the public on the Kansas Department of Health and Environment's (KDHE) website for a 30-day public examination. This notice is provided for the purpose of informing the public of this activity, and to provide an opportunity for interested parties to offer additional relevant information and comments to the KDHE. The Bureau of Air must receive written comments no later than **June 25, 2018**, to assure consideration prior to submission of this plan.

Comments from the interested public shall be addressed to:

Kansas Department of Health and Environment
Bureau of Air
1000 SW Jackson, Suite 310
Topeka, KS 66612-1366
Attention: Jayson Prentice

Comments may also be submitted electronically to the following: Jayson.Prentice@ks.gov

Network Overview

The Kansas Ambient Air Monitoring Network consists of 19 sites throughout Kansas as shown in Figure 1. Sites satisfy a number of purposes including monitoring compliance with the NAAQS, reporting of the Air Quality Index (AQI) to AirNow, determining pollution trends, and establishing background conditions. Air monitoring sites within Kansas are included as a part of the following monitoring networks:

- National Core Monitoring (NCore)
- Mercury Deposition Network (MDN) / National Atmospheric Deposition Network (NADP)
- Interagency Monitoring of Protected Visual Environments (IMPROVE)
- Chemical Speciation Network (CSN)
- State and Local Air Monitoring Stations (SLAMS)
- Air Quality Index (AQI)
- Special Purpose Monitors (SPM)

In 1999, because of the promulgation of the $PM_{2.5}$ NAAQS the Kansas Ambient Air Quality Network completed a primary disinvestment in PM_{10} sampling; established five multi-pollutant sites; expanded the ozone monitoring network in Kansas City Metropolitan Statistical Area (MSA); and added two IMPROVE sites.

In 2009, the monitoring plan for NCore was submitted to and accepted by EPA Region VII. This plan included two monitoring locations, one urban and one rural, however due to EPA funding issues only the urban site has been established and is operating at this time.

Additional modifications have been made to the network as required by 40 CFR 58 §58.10 for oxides of Nitrogen (NO_x) and Sulfur Dioxide (SO_2), and the network meets completion requirements established for Carbon Monoxide (CO), Particulate Matter (PM), and Ozone (O_3). This includes equipment upgrades to increase data capture for PM_{10} and $PM_{2.5}$ by replacing aging sequential equipment with continuous monitors in 2017.

Site information, including parameters monitored and network affiliation, is available within Table 1.

Figure 1. 2018 Kansas Ambient Air Monitoring Network

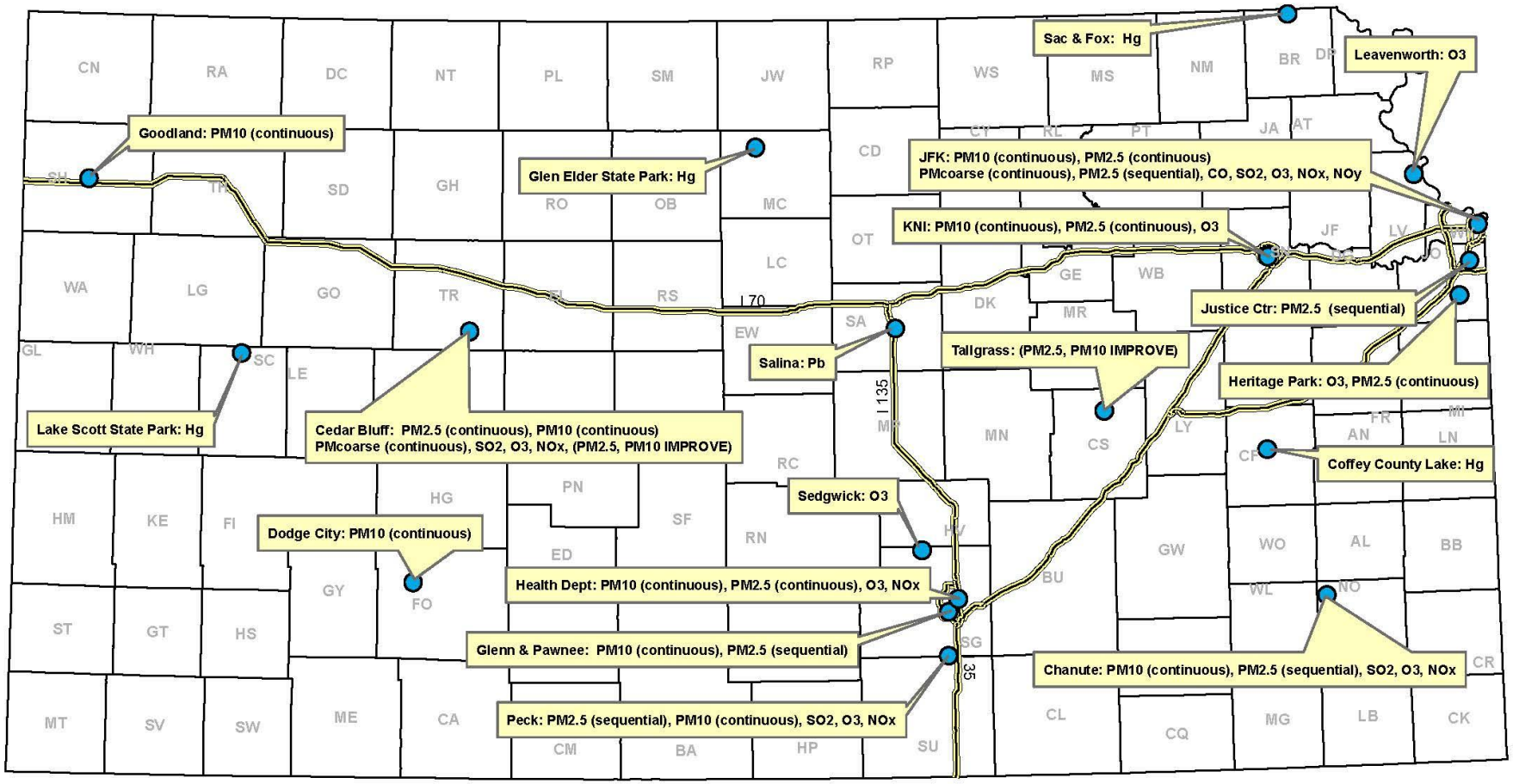


Table 1. Kansas Ambient Air Monitoring Network sites, network affiliation and parameters monitored, 2018

AQS Site ID	Site Name	Network Affiliation							Parameters Monitored											
		NCore	SLAMS	IMPROVE	MDN/NADP	CSN	AQI	SPM	Carbon Monoxide	Lead	Oxides of Nitrogen	Ozone	$PM_{2.5}$ Filter	$PM_{2.5}$ Continuous	PM_{10} Filter	PM_{10} Continuous	PM Coarse	Sulfur Dioxide	Mercury	Meteoro-logical
20-209-0021	JFK/NCore	X				X	X		X		X	X	X	X		X	X	X		X
20-195-0001	Cedar Bluff		X	X			X				X	X		X		X	X	X		
20-057-0002	Dodge City		X				X									X				
20-181-0003	Goodland		X				X									X				
20-169-0004	Salina		X							X										
20-173-0018	Sedgwick		X				X					X								
20-173-0010	Wichita HD		X			X	X				X	X		X		X				
20-173-0009	Pawnee & Glenn		X				X						X			X				
20-191-0002	Peck		X				X				X	X	X			X		X		
20-017-0001	Tallgrass			X									X		X					
20-177-0013	KNI		X				X					X		X		X				
20-103-0003	Leavenworth		X				X					X								
20-091-0007	Justice Center		X										X							
20-091-0010	Heritage Park		X				X					X		X						
20-133-0003	Chanute		X				X				X	X	X			X		X		
N/A	Village Green							X				X		X						X
N/A	Lake Scott				X														X	
N/A	Glen Elder				X														X	
N/A	Sax & Fox				X														X	
N/A	Coffey County				X														X	

National Core Monitoring (NCore) Network

In October 2006, the EPA established the National Core (NCore) multi-pollutant monitoring network in its final amendments to the ambient air monitoring regulations for criteria pollutants (codified in 40 CFR parts 53 and 58). EPA requires each state to have at least one NCore site. Nationwide, there are approximately 80 sites, mostly in urban areas.

The NCore monitoring network addresses the following monitoring objectives that are equally valued at each site:

- timely reporting of data to the public through AIRNow, air quality forecasting, and other public reporting mechanisms;
- support development of emission strategies through air quality model evaluation and other observational methods;
- accountability of emission strategy progress through tracking long-term trends of criteria and non-criteria pollutants and their precursors;
- compliance through establishing non-attainment/attainment areas by comparison with the NAAQS;
- support of scientific studies ranging across technological, health, and atmospheric process disciplines; support long-term health assessments that contribute to ongoing reviews of the NAAQS); and
- support ecosystem assessments, recognizing that national air quality networks benefit ecosystem assessments and, in turn, benefit from data specifically designed to address ecosystem analysis.

At a minimum, NCore monitoring sites must measure the parameters listed in Table 2.

Table 2: Required NCore Parameter List

Measurements	Comments
$PM_{2.5}$ FRM mass	Typically, 24-hour average at least every 3rd day
Continuous $PM_{2.5}$ mass	1-hour reporting interval; FEM or pre-FEM monitor
$PM_{2.5}$ speciation	Organic and elemental carbon, major ions, and trace metals (24-hour average, every 3rd day)
$PM_{10-2.5}$ mass	Filter-based or continuous
Ozone (O_3)	all gases through continuous monitors
Carbon Monoxide (CO)	capable of trace levels where needed
Sulfur Dioxide (SO_2)	capable of trace levels where needed
Nitrogen Oxide (NO)	capable of trace levels where needed
Total reactive nitrogen (NO_y)	capable of trace levels where needed
Surface meteorology	wind speed and direction, temperature, RH

In 2009, the Kansas City, Kansas urban core multi-pollutant monitoring site was designated as an NCore station. This site is located close to Nebraska Avenue and North 10th street in Kansas City, Kansas close to the John F. Kennedy Community Center. This site is referenced as the JFK NCore site (AQS ID 20-209-0021), located at N 39.11722; W -94.63560.

Figure 2. Kansas City, KS JFK NCore Site Map

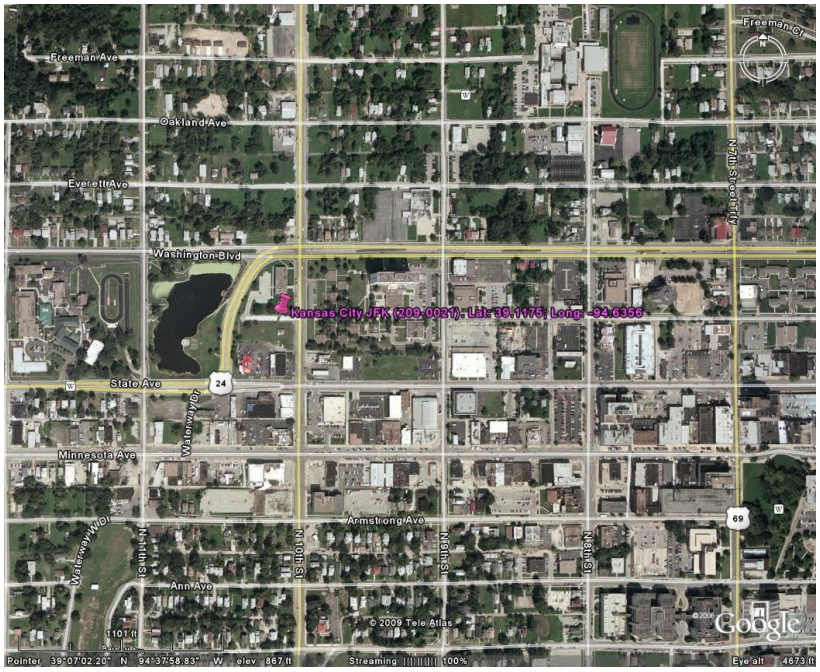


Figure 3. Kansas City, KS JFK/NCore Site

Figure 4. Kansas City, KS JFK/NCore Site

IMPROVE Visibility Monitoring Network[1]

The IMPROVE Aerosol Network is a cooperative air quality monitoring effort between federal land managers; regional, state, and tribal air agencies; and the EPA. The program was developed in 1985 to aid in developing Federal and State Implementation plans for the protection of visibility in Class I areas. Class I areas are National Parks and other wilderness areas that are designated by the United States Department of Agriculture (USDA). The IMPROVE network presently comprises 168 monitoring sites nationally.

The objectives of the IMPROVE network are:

- to establish current visibility and aerosol conditions in Class I areas;
- to identify chemical species and emission sources responsible for existing man-made visibility impairment;
- to document long-term trends for assessing progress towards the national visibility goal; and
- with the enactment of the Regional Haze Rule, to provide regional haze monitoring representing all visibility-protected federal class I areas where practical.

The Kansas Ambient Air Monitoring Network includes two IMPROVE sites. The Tallgrass Prairie National Preserve (AQS ID 20-017-0001) site is located at N 38.43361; W -96.5594, northwest of Strong City, Kansas on Kansas Highway 177. The Cedar Bluff Reservoir site (AQS ID 20-195-0001) is located at N 38.77027; W -99.76361, on the south side of Cedar Bluff Reservoir in Trego County. The Cedar Bluff Reservoir site also serves as a SLAMS multi-pollutant background site.

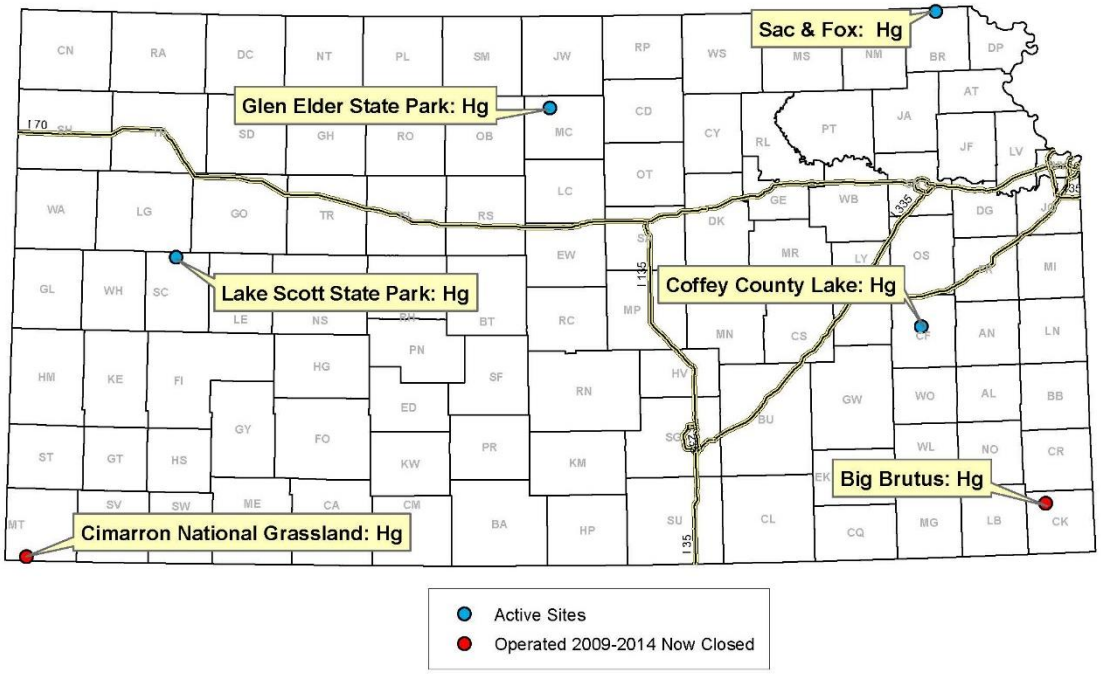
Mercury Deposition Network

The Mercury Deposition Network (MDN), coordinated through the National Atmospheric Deposition Program (NADP), is designed to study and quantify the atmospheric fate and deposition of mercury. The network is used to develop a national database of weekly concentrations of total mercury in precipitation and the seasonal and annual trends of total mercury in wet deposition. More information is available at http://nadp.sws.uiuc.edu/mdn/.

[1] Interagency Monitoring of Protected Visible Environments

The Kansas Mercury Wet Deposition Network developed in response to KSA 75-5673, which originally required that the Kansas Department of Health and Environment (KDHE) establish a statewide mercury deposition network consisting of at least six monitoring sites. Monitoring was to be completed for a period long enough to determine trends (five or more years). Legislative changes enacted in 2014 kept a network in place but allowed the KDHE to re-examine the network size and location of the original six sites as established. The locations of existing and future sites in the states of Nebraska and Oklahoma were considered to optimize regional mercury network coverage and to assure compatibility with MDN. The current Kansas Mercury Wet Deposition Monitoring Network (KMDN) consists of four sites distributed across the state. A more detailed report on the KMDN is available at http://www.kdheks.gov/bar/air-monitor/mercury/Hg_Report.pdf. A map of the network appears in Figure 5.

Figure 5. Kansas Mercury Deposition Network and closed sites.



Lead (Pb) Monitoring Network

Source-oriented Monitoring

According to 40 CFR Part 58, Appendix D, paragraph 4.5(a), state and, where appropriate, local agencies are required to conduct ambient air monitoring for lead (Pb) considering lead sources that are expected to or have been shown to contribute to a maximum lead concentration in ambient air in excess of the NAAQS. At a minimum, there must be one source-oriented SLAMS

site located to measure the maximum lead concentration in ambient air resulting from each lead source that emits one-half (0.5) or more tons per year. At the time of the EPA rulemaking only one source in Kansas exceeded the one-half ton threshold. This source is in Salina, Kansas at the Exide Technologies facility.

According to 40 CFR Part 58, Appendix D, paragraph 4.5(a), source-oriented monitors are to be sited at the location of predicted maximum concentration in ambient air considering the potential for population exposure, and logistics. Typically, dispersion modeling will be required to identify the location of predicted maximum concentration.

Dispersion modeling performed by KDHE determined the area of maximum concentration for sampler placement. KDHE prepared a Monitoring Plan for airborne lead in 2009.

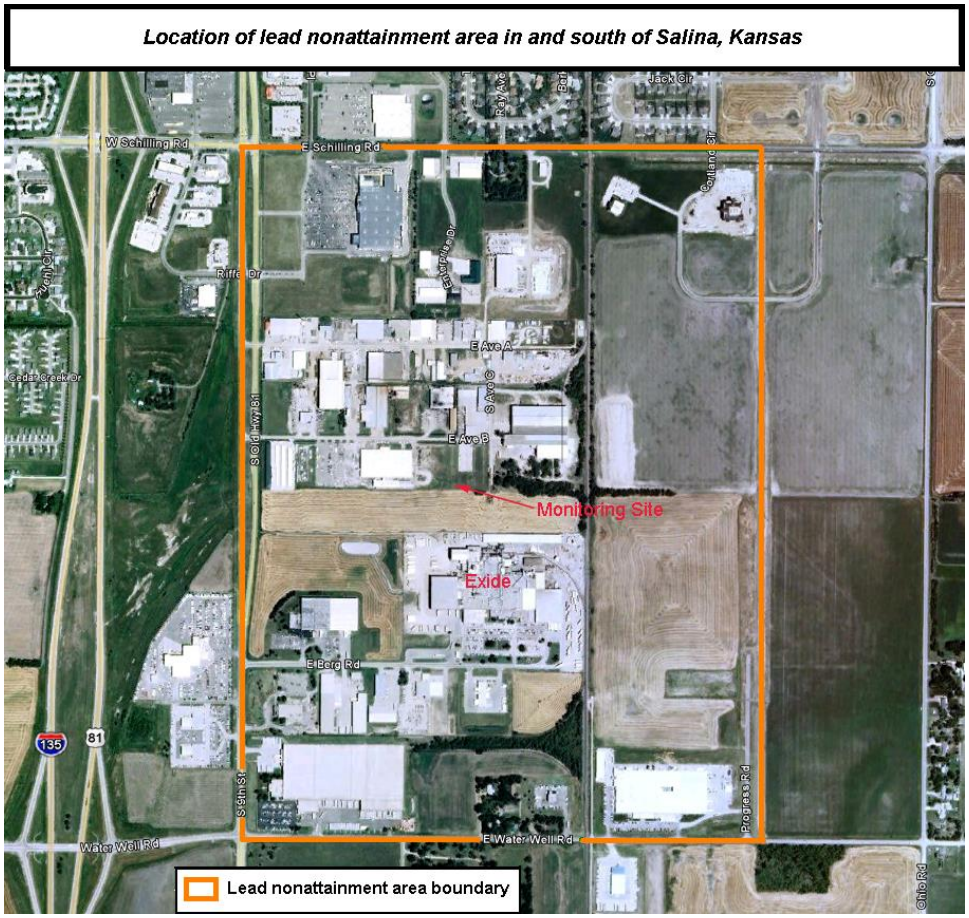
The lead monitoring site near the Exide Technologies facility at Salina, KS is designated with AQS site ID 20-169-0004 and is located at N 38.77644; W -97.6074. A high volume (HiVol), total suspended particulate (TSP) sampler is running at the site on a 1 in 6-day schedule and began sampling on February 2, 2010. KDHE installed an additional high volume (HiVol), total suspended particulate (TSP) sampler at the Salina monitoring site to use for collocation purposes in 2013. This monitor runs on the same 1 in 6-day sampling schedule as the existing lead monitor and is installed next to the existing monitor as shown in Figure 6.

The lead NAAQS requires three consecutive years of a 3-month rolling average to be at or below 0.15 $\mu g/m^3$ to be classified as attaining the standard. The lead monitoring site operated near Exide Technologies facilities is currently not meeting this requirement and is classified non-attainment. The location of the monitor compared to the Exide Technologies facility is shown in Figure 7, and the lead non-attainment area is shown in Figure 8.

Figure 6. Salina, KS Lead Source Monitoring Site

Figure 7. Salina, KS Lead Source Monitoring Site

Figure 8. Salina, KS Lead Non-Attainment Area



Population based Lead Monitoring

EPA also requires lead monitoring in large urban areas. These monitors are typically located with National Core multi-pollutant ambient monitoring sites (NCore sites). Lead monitoring at these sites began January 1, 2012. KDHE located a high volume (HiVol), total suspended particulate (TSP) sampler at the JFK NCore site in Kansas City, Kansas to fulfill this requirement. It began running on a 1 in 6-day schedule on December 27, 2011 and took its first sample on January 4, 2012. On March 28, 2016, EPA published a rule entitled, "*Revisions to Ambient Monitoring Quality Assurance and Other Requirements*". This EPA rule allowed for the discontinuance of population-based lead monitoring at NCore sites if states provided three years of data showing the monitor was below the lead standard. With more than four years of lead data showing a maximum three-month rolling average of 0.01 $\mu g/m^3$ lead monitoring at the JFK NCore site was discontinued with the last operating sample occurring on June 29, 2016.

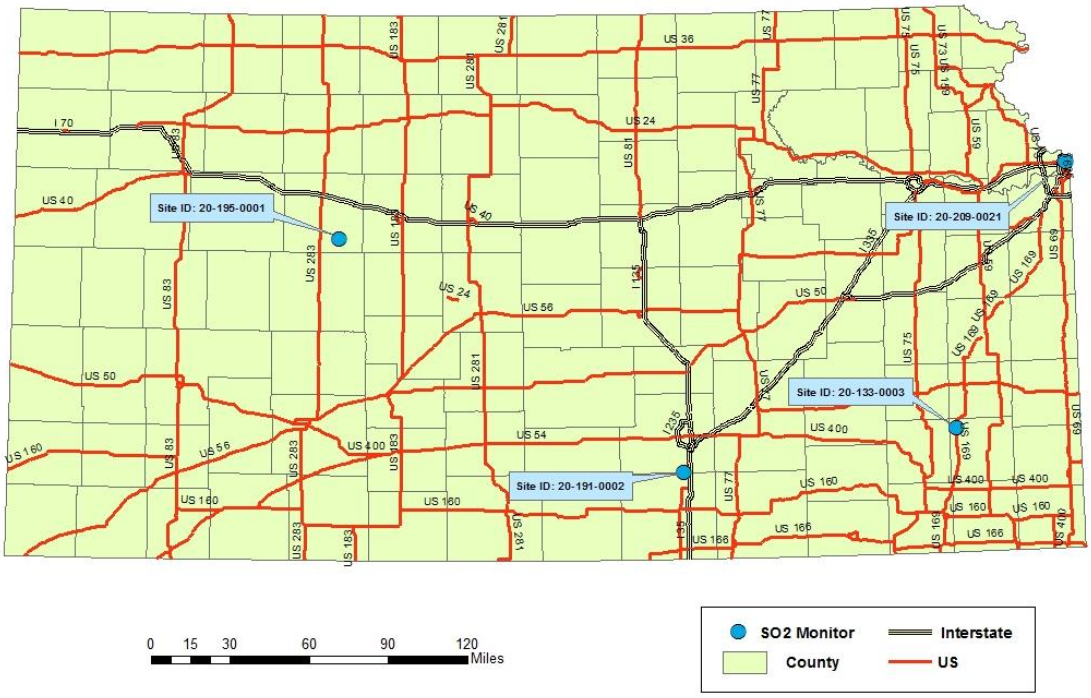
Sulfur Dioxide Monitoring Network

On June 2, 2010, EPA revoked the primary annual and 24-hour SO_2 standards from 30 ppb and 140 ppb, respectively, to a 1-hour standard of 75 ppb. The new SO_2 rule, published June 22, 2010, also stated the following requirements.

- Any new monitors must be in operation by January 1, 2013.
- Monitoring required in Core Based Statistical Areas (CBSAs) based on population size and SO_2 emissions.
- Additional monitoring is required based on the state's contribution to national SO_2 emissions, monitors could be placed either within or outside a CBSA.
- Reporting requirement added to include maximum 5-minute block average of each hour.

KDHE currently monitors for SO_2 at sites shown in Figure 9. The sites include Cedar Bluff (AQS ID 20-195-0001), Peck (AQS ID 20-191-0002), Chanute (AQS ID 20-133-0003), and JFK NCore (AQS ID 20-209-0021).

Figure 9. Kansas Sulfur Dioxide Monitoring Sites, 2018

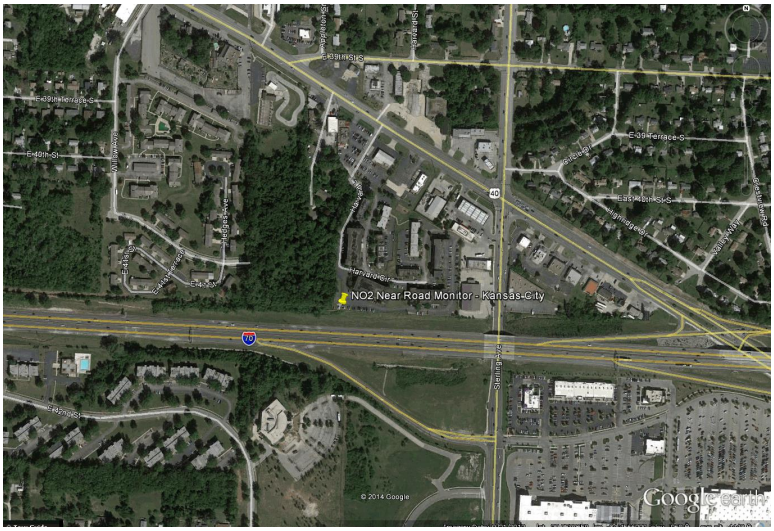


Nitrogen Dioxide Monitoring Network

40 CFR 58 Appendix D requires states to install and operate one microscale near-road NO_2 monitoring station within each CBSA with a population of 1,000,000 or more. An additional near-road NO_2 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. Based upon the latest U.S. census CBSA figure of 2,009,342 the Kansas City CBSA is required to have one microscale near-road NO_2 monitoring station. Based on the criteria established, one monitor site was installed in 2013 in the Kansas City CBSA by the Missouri Department of Natural Resources Air Pollution Control Program and is located near I-70 and Sterling Avenue (N 39.04791; -94.45051) and is shown in Figures 10 and 11.

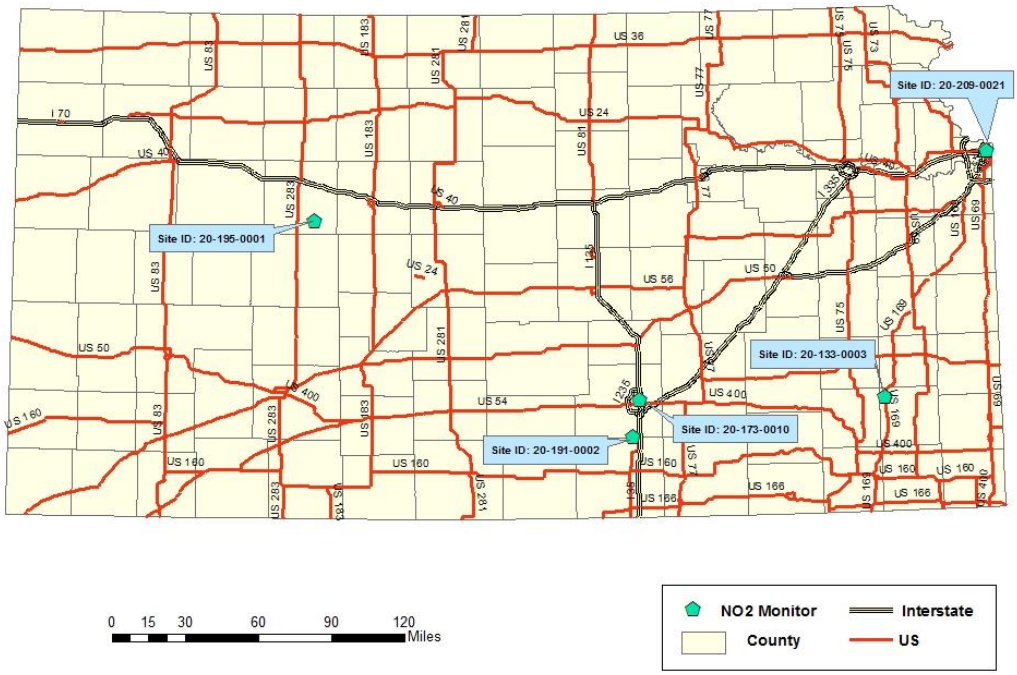
Figure 10. Kansas City Near-Road NO_2 Station

Figure 11. Kansas City Near-Road NO_2 Station



Monitoring requirements are also established for area-wide NO_2 monitoring. Requirements state there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales. The Kansas City CBSA is the only required area within the state of Kansas to operate an area-wide NO_2 monitor, and this requirement is satisfied by the JFK NCore monitoring site (AQS ID 20-209-0021). Additional NO_2 monitoring is conducted as a part of the SLAMS network at Cedar Bluff (AQS ID 20-195-0001), Peck (AQS ID 20-191-0002), Wichita Health Department (AQS ID 20-173-0010), and Chanute (AQS ID 20-133-0003).

Figure 12. Kansas Nitrogen Dioxide Monitoring Sites, 2018



Ozone Monitoring Network

Ozone Standard and Monitoring Requirements

The current NAAQS for O_3 is set at 0.070 parts per million (ppm) for both the primary standard and the secondary standard, established by calculating the annual fourth-highest daily maximum 8-hour concentration, averaged over three years. Monitoring requirements are established using Metropolitan Statistical Area (MSA) population and the most recent 3-year design value concentrations.

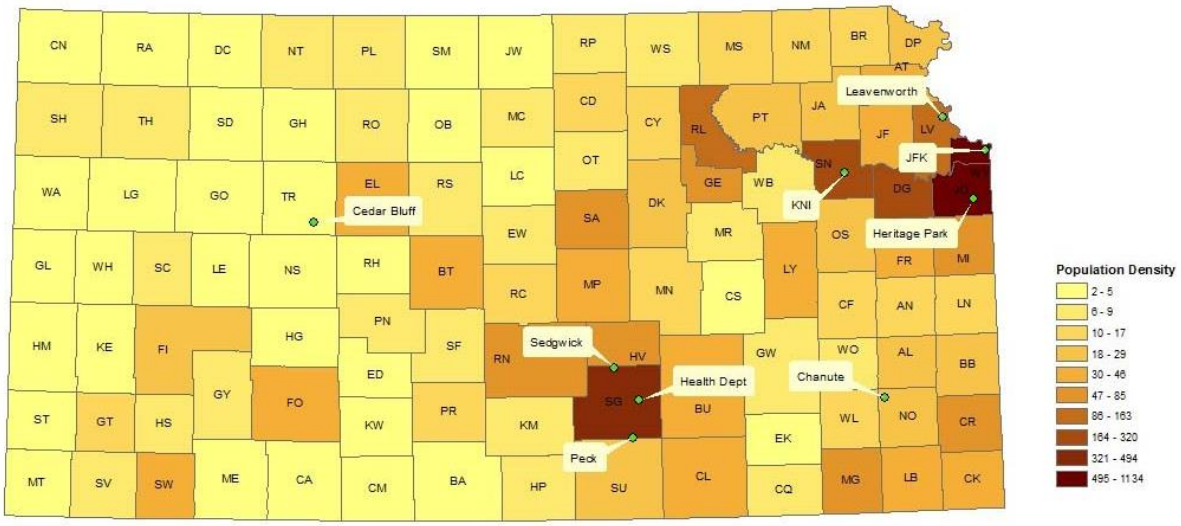
Kansas Ozone Monitoring Network

The current Kansas O_3 monitoring network includes nine monitors located throughout the state. Monitors locations and appropriate spatial scales are provided in Table 3. Monitor locations are also shown in Figure 13 combined with a Kansas population density map. No collocated ozone measurements are available in Kansas. The implementation of the 2015 Ozone NAAQS beginning in 2017 includes an expanded ozone season in Kansas from March 1 to October 31. Kansas ozone monitors are operated year-around.

Table 3. State of Kansas Ozone Monitor Network.

Site Name	AQS Site ID	Latitude	Longitude	Spatial Scale
Heritage Park	20-091-0010	38.838575	-94.746424	Neighborhood
Leavenworth	20-103-0003	39.327391	-94.951020	Neighborhood
Chanute	20-133-0003	37.67696	-95.47594	Regional
Sedgwick	20-173-0018	37.897506	-97.492083	Neighborhood
Wichita Health Dept.	20-173-0010	37.702066	-97.314847	Urban
Topeka KNI	20-177-0013	39.024265	-95.711275	Urban
Peck	20-191-0002	37.476890	-97.366399	Neighborhood
Cedar Bluff	20-195-0001	38.770081	-99.763424	Regional
JFK/NCore	20-209-0021	39.117219	-94.635605	Urban

Figure 13. Kansas Population Density Map and the Location of Ozone Monitors.



$PM_{2.5}$ Monitoring Network

$PM_{2.5}$ Standard and Monitoring Requirements

On December 14, 2012, the U.S. Environmental Protection Agency (EPA) changed the primary annual National Ambient Air Quality Standard (NAAQS) for fine particles to 12.0 micrograms per cubic meter (µg/m^3) and retained the 24-hour fine particle standard of 35 µg/m^3. They also retained the existing secondary standards for $PM_{2.5}$ to address PM-related effects such as visibility impairment, ecological effects, damage to materials and climate impacts. This includes an annual standard of 15.0 µg/m^3 and a 24-hour standard of 35 µg/m^3.

The primary annual standard is based on a three-year average of the weighted annual mean. The primary 24-hour standard is based on a three-year 98th percentile average of 24-hour values. Current minimum monitoring requirements for $PM_{2.5}$ as provided by 40 CFR 58 §58.10 are shown in Table 4.

Table 4. $PM_{2.5}$ Minimum Monitoring Requirements (Number of Stations per MSA)

Population Category	3-yr design value > 85% of NAAQS	3-yr design value < 85% of NAAQS
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 - 500,000	1	0

[1] Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
[2] Population based on latest available census figures.
[3] The $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
[4] These minimum monitoring requirements apply in the absence of a design value.
[5] Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

In addition to the minimum number of monitors required, at least one-half (fifty percent) of the minimum required sites must be operated with continuous $PM_{2.5}$ analyzers. This requires at least two continuous analyzers within the state of Kansas. Each state must also operate at least one site to monitor for regional background, and at least one site for regional transport. Table 5 outlines the minimum monitoring requirements and number of existing monitors for each Kansas MSA based upon population and design value criteria.

Table 5. Minimum Number of $PM_{2.5}$ Monitors Required in Kansas MSA

MSA	Population (2017 estimate)	Number of Existing $PM_{2.5}$ Monitors	$PM_{2.5}$ Monitors Required
Kansas City, MO-KS	2,108,358	3 (KS side only)	2
Wichita, KS	680,989	3	1
Topeka, KS	233,149	1	0
Manhattan, KS	131,938	0	0
Lawrence, KS	120,793	0	0

Kansas $PM_{2.5}$ Monitoring Network

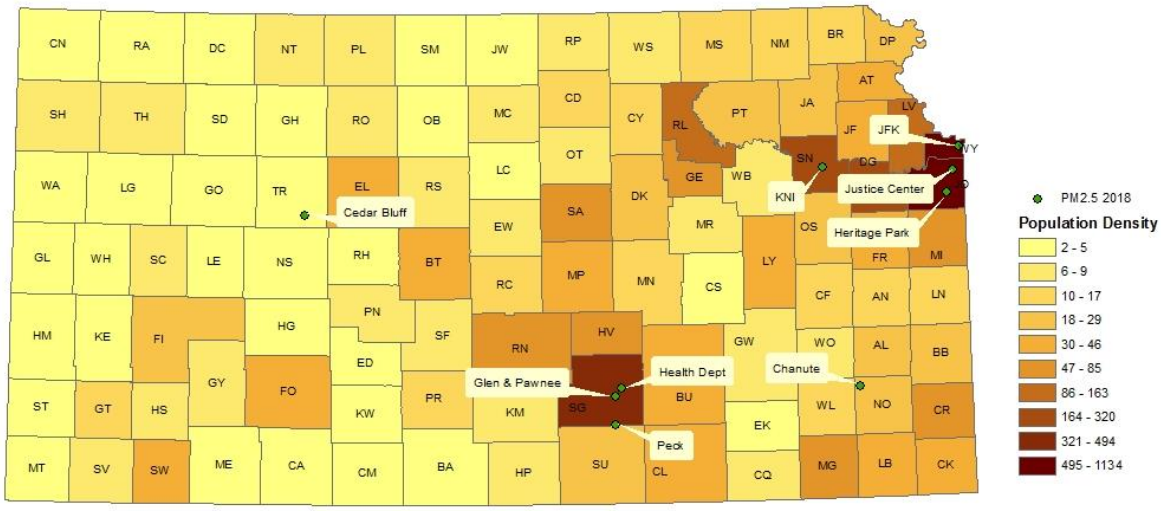
The Kansas $PM_{2.5}$ monitoring network includes ten monitors located throughout the state at nine different monitoring sites. When the current 2018 Kansas Ambient Air Monitoring Network Plan changes are complete there will be five filter-based (sequential) and five continuous monitors. One monitoring site (JFK/NCore) operates both a continuous and a collocated sequential monitor. Table 6 includes current monitor locations and type for the Kansas $PM_{2.5}$ monitoring network

Table 6. State of Kansas $PM_{2.5}$ Monitor Site ID and Location

Site Name	City	AQS Site ID	Latitude	Longitude	Filter	Continuous
Cedar Bluff	Cedar Bluff	20-195-0001	38.77008	-99.76342	NO	YES
Justice Center	Overland Park	20-091-0007	38.97445	-94.68701	YES	NO
Heritage Park	Olathe	20-091-0010	38.83857	-94.74642	NO	YES
Pawnee & Glenn	Wichita	20-173-0009	37.65111	-97.36221	YES	NO
Health Dept.	Wichita	20-173-0010	37.70206	-97.31484	NO	YES
KNI	Topeka	20-177-0013	39.02426	-95.71127	NO	YES
Peck	Peck	20-191-0002	37.47689	-97.36639	YES	NO
Chanute	Chanute	20-133-0003	37.67696	-95.47594	YES	NO
JFK/NCore	Kansas City	20-209-0021	39.11721	-94.63560	YES	YES

Figure 14 shows the population density in Kansas along with the $PM_{2.5}$ monitoring sites. All monitors have three-year design values at or below the 85% of the NAAQS concentration category.

Figure 14. Population Density Map and the Location of $PM_{2.5}$ Monitors



PM_{10} Monitoring Network

Current PM_{10} Standard and Monitoring Requirements

The current national ambient air quality standard (NAAQS) for PM_{10} is 150 µg/m^3 for both the primary standard and the secondary standard. This standard is not to be exceeded more than once per year on average over 3 years. Current minimum monitoring requirements for PM_{10} as provided by 40 CFR 58 §58.10 are shown in Table 7.

Table 7. PM_{10} Minimum Monitoring Requirements (Number of Stations per MSA)[1]

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

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

Table 8, outlines the minimum monitoring requirements and number of existing monitors for each Kansas MSA accounting for population and design value criteria.

Table 8. Minimum Number of PM_{10} Monitors Required in Kansas MSA

MSA	Population (2017 estimate)	Number of Existing PM_{10} Monitors	PM_{10} Monitors Required
Kansas City, MO-KS	1,957,443	1 (KS side only)	2 - 4
Wichita, KS	680,989	3	1 – 2
Topeka, KS	233,149	1	0
Manhattan, KS	131,938	0	0
Lawrence, KS	120,793	0	0

State of Kansas Current PM_{10} Monitoring Network

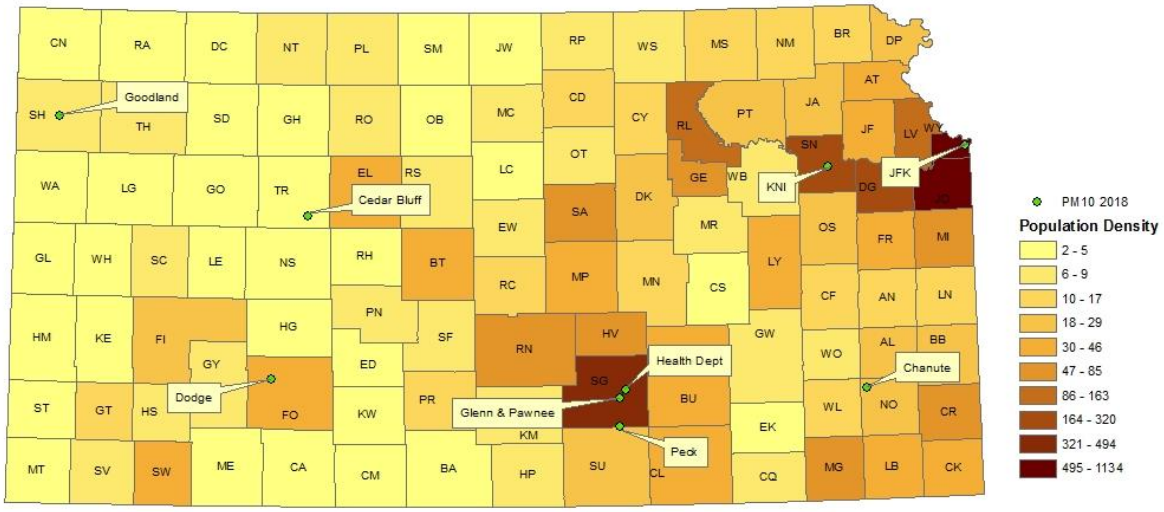
Current Kansas PM_{10} monitoring network includes nine monitors at nine monitoring sites throughout the state. All PM_{10} monitors operating in the state of Kansas are continuous. Table 9 includes monitor locations and type for the Kansas PM_{10} monitoring network.

Table 9. State of Kansas PM_{10} Monitor Site ID and Location.

Site Name	City	AQS Site ID	Latitude	Longitude
Dodge City	Dodge City	20-057-0002	37.77530	-100.03544
Glen & Pawnee	Wichita	20-173-0009	37.65111	-97.36221
Health Dept.	Wichita	20-173-0010	37.70206	-97.31484
Chanute	Chanute	20-133-0003	37.67630	-95.47464
Goodland	Goodland	20-181-0001	39.34845	-101.71340
JFK/NCore	Kansas City	20-209-0021	39.11721	-94.63560
Cedar Bluff	Cedar Bluff	20-195-0001	38.77027	-99.76361
KNI	Topeka	20-177-0013	39.02426	-95.71127

Figure 15 shows the population density in Kansas along with the PM_{10} monitoring sites. All monitors have three-year design values at or below the 80% of the NAAQS concentration category.

Figure 15. State of Kansas Population Density Map and the Location of PM_{10} Monitors

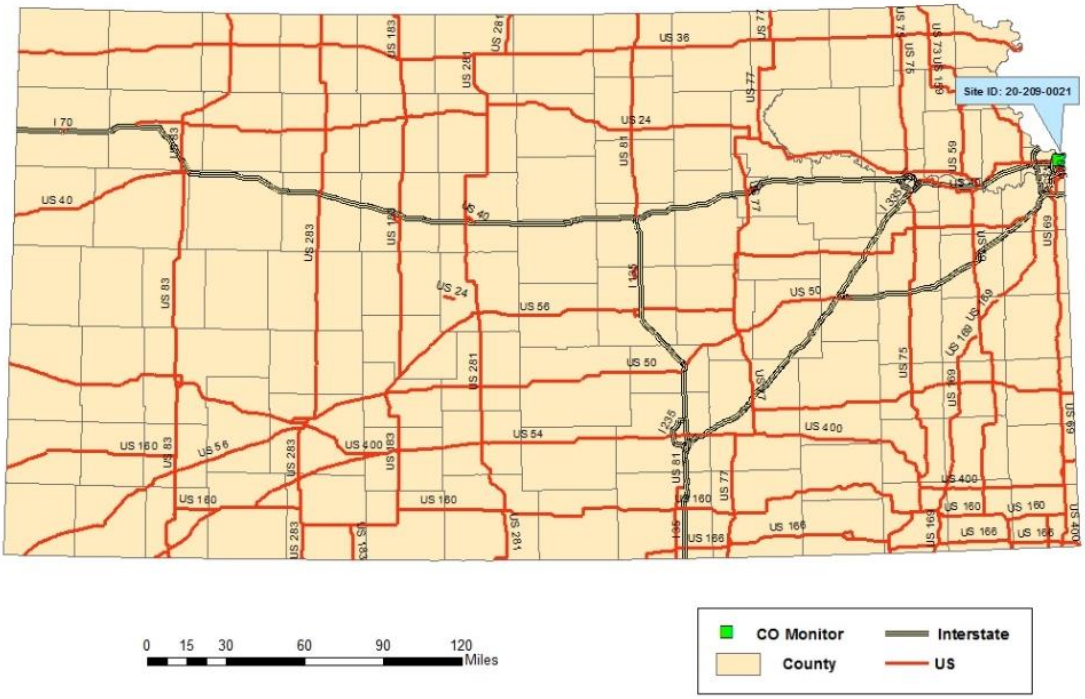


Carbon Monoxide

The Carbon Monoxide NAAQS is an 8-hour average no greater than 9 parts per million and a 1-hour average no greater than 35 parts per million, neither to be exceeded more than once per year. Monitoring requirements include a CO monitor at a collocated site with the near-road NO_2 monitor in CBSAs having a population more than 1,000,000 or more. The Missouri Department of Natural Resources Air Pollution Control Program operates the Kansas City CBSA near-road NO_2 monitor and the required collocated CO monitor.

The Kansas Ambient Air Monitoring Network includes a single CO monitoring site at the JFK/NCore site (AQS ID 20-209-0021) in Kansas City, KS. This site is a part of NCore criteria requirements.

Figure 16. Kansas Carbon Monoxide Monitoring Site, 2018



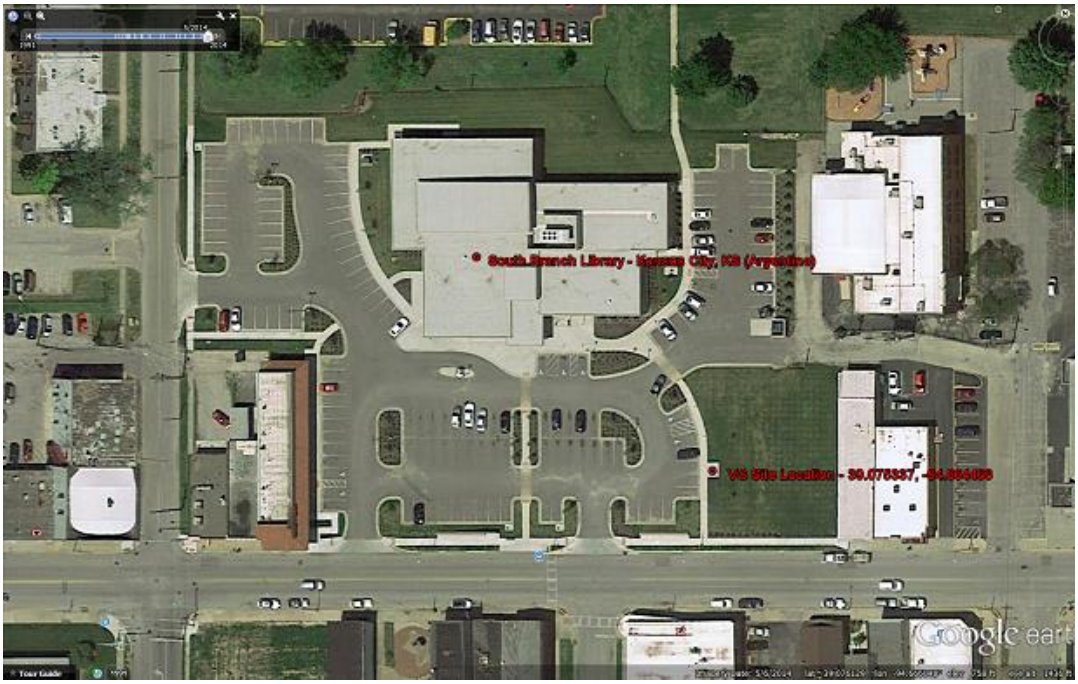
Special Monitoring Projects

Village Green

The U.S. Environmental Protection Agency (EPA) has developed an innovative, solar and wind-powered air-monitoring system designed and incorporated into a park bench that measures ozone, fine particle pollution $PM_{2.5}$, wind speed and direction, temperature and humidity. The study, called the Village Green Project, is conducted in partnership with the Kansas Department of Health and Environment, Bureau of Air and USD #500 in Kansas City, KS to advance air quality measurement capabilities to states, tribes and local communities.

The prototype monitoring system is located outside the Kansas City, KS South Branch Library (Figure 17).

Figure 17. Village Green Monitoring Site location (South Branch Library, KC, KS)



KDHE and EPA began running the system in the spring of 2015. This project stems from a growing national interest in using new sensor technologies to learn more about air quality conditions and trends near schools, playgrounds, parks and neighborhoods.

The project's three goals are to:

- engage communities in air pollution awareness
- increase air pollution monitoring coverage

- advance EPA's ability to measure and communicate air pollution information in real-time at lower cost and maintenance

KDHE was one of five original sites chosen by EPA to expand their Village Green Monitoring Research Project (Figures 18 – 19). The park bench air monitoring station is primarily for technology demonstration and public education purposes and it is not part of the Agency's regulatory network of air monitoring stations.

Figure 18. Village Green Monitoring Site

Figure 19. Village Green Monitoring Site

Quality Assurance/Quality Control (QA/QC) Program

The purpose of the QA/QC program is to assure the quality of data obtained from the KDHE air monitoring networks. The KDHE meets or exceeds the quality assurance requirements defined in 40 CFR 58 and all applicable appendices.

The QA/QC program includes but is not limited to the following activities:

- instrument performance audits,
- monitor siting evaluations,
- one-point QC checks and checks for zero and span,
- bias determinations,
- flow rate audits,
- leak checks, and
- data validation

For independent quality assurance activities, the KDHE participates in the National Performance Audit Program and the Performance Evaluation Program for criteria pollutant monitoring and performance.

As the Primary Quality Assurance Organization (PQAO) for ambient air monitoring activities in Kansas, the KDHE operates under an EPA approved Quality Management Plan (QMP) and utilizes Quality Assurance Project Plans (QAPP) for each statewide monitoring network. The primary purpose of the QAPP is to provide an overview of the project, describe the need for the measurements, and define QA/QC activities to be applied to the project. All other ambient air monitoring initiatives including state, tribal and industrial projects must have a KDHE approved monitoring plan for each specific project.

Kansas Ambient Air Network Plan Activities - 2019

Sequential $PM_{2.5}$ and aging continuous PM_{10}

It is the intention that the Bureau of Air, Monitoring and Planning staff will continue to work towards replacing aging sequential $PM_{2.5}$ monitors with continuous $PM_{2.5}$ monitors. KDHE will consider a paired system for PM_{10} and $PM_{2.5}$ where appropriate. Replacement will be dependent upon funding available and the sustainability of current operating equipment.

Ozone

It is the intention that the Bureau of Air, Monitoring and Planning staff will establish a schedule to replace aging ozone monitors throughout the network. Replacement will be dependent upon funding available and the sustainability of current operating equipment.

PAMS at NCore/JFK

Photochemical Assessment Monitoring Site (PAMS) is to be in Kansas City, KS along with the NCORE/JFK site (20-209-0021). Upon full implementation the site will operate during the summer months as an enhanced ozone monitoring site to obtain more comprehensive and representative data on ozone air pollution.

Purple Air Sensors

KDHE will explore the usability of air sensor devices manufactured by Purple Air. KDHE anticipates testing the devices in strategic locations during the 2019 prescribed burn season and other air quality projects.

Site Specific Activities for 2019

20-181-0003; Goodland – PM_{10} continuous

The Goodland site was originally established in 1969. The sequential monitor was located on the roof of the Goodland Fire Station. Due to age of the equipment and the goal of increasing continuous monitoring for particulate matter; a shelter and continuous monitor were established in April of 2017. The current location is north of the Goodland City Pool.

Plans for 2019 – Monitoring efforts will continue at this site; no changes are anticipated.

20-195-0001; Cedar Bluff – Continuous $PM_{2.5}$, PM_{10} and PM course, SO_2, Ozone and NO_X[2]
The Cedar Bluff site located at Cedar Bluff Reservoir in Trego County was established in 2000 There were no changes to this site during the last planning period.

Plans for 2019 - Monitoring efforts will continue at this site; no changes are anticipated.

20-057-0002; Dodge City – PM_{10} continuous
The Dodge City site was established in 2008. A possible relocation of this site has been discussed in 2018 due to a recent sale of land the monitor is located on, however at this time no changes in location are anticipated.

Plans for 2019 - Monitoring efforts will continue at this site; no changes are anticipated.

20-169-0004; Salina – Pb primary and Pb collocated
The Salina site was established in 2010 and a second (collocated) monitor was installed in 2013. There were no changes to this site during the last planning period.

Plans for 2019 – Monitoring efforts will continue at this site; no changes are anticipated.

20-173-0018; Sedgwick – Ozone
The Sedgwick site was established in 2008. There were no changes to this site during the last planning period.

Plans for 2019 – Monitoring efforts will continue at this site; no changes are anticipated.

20-173-0010; Wichita Health Department – Continuous $PM_{2.5}$ and PM_{10}, Ozone and NO_x
The Wichita Health Department site was established in 1973. There were no changes to this site during the last planning period.

Plans for 2019 – Monitoring efforts will continue at this site. This site is prioritized for the replacement of the existing PM_{10} and $PM_{2.5}$ with a paired system for continuous monitoring due to aging and malfunctioning equipment.

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[2] This site also includes an IMPROVE protocol site operated by the KS Department of Wildlife Parks and Tourism.

20-173-1012; K96 & Hydraulic – Continuous $PM_{2.5}$ and PM_{10} SITE CLOSED 3/26/2018

The K96 site was established in 1980 and in now closed. This monitoring site included two monitors that were nearing end of support, a filter-based $PM_{2.5}$ in 2018 and a continuous PM_{10} in 2020. As intended the K96 & Hydraulic site was removed from the network in March of 2018. The filter $PM_{2.5}$ was retired to use in whole or as parts for other filter-based $PM_{2.5}$ monitors as this equipment will surpass end of support in 2018. The continuous PM_{10} was relocated to Peck, KS (20-191-0002) to establish a more comprehensive multi-pollutant site.

20-173-0009; Glenn and Pawnee – Continuous PM_{10} and Sequential $PM_{2.5}$

The Glenn and Pawnee site in Wichita, KS was established in 1972. There were no changes to this site during the last planning period.

Plans for 2019 – Monitoring efforts will continue at this site; no changes are anticipated.

20-191-0002; Peck – Sequential $PM_{2.5}$, and continuous PM_{10}, SO_2, Ozone and NO_x

The Peck site was established in 1999. The continuous PM_{10} monitor was moved from the now closed K96 & Hydraulic site to the Peck site to expand this multi-pollutant neighborhood and regional transport site. The PM_{10} monitor has been operating since March 2018. In May of 2018, this site received a new ozone monitor capable of network reporting of diagnostic parameters.

Plan for 2019 – Monitoring efforts will continue at this site; no changes are anticipated.

20-103-0003; Leavenworth – Ozone

The Leavenworth site was established in 2004. There were no changes to this site during the last planning period.

Plan for 2019 - Monitoring efforts will continue at this site; no changes are anticipated.

20-209-0021; JFK/NCore – Sequential $PM_{2.5}$ collocated, continuous $PM_{2.5}$ (primary), PMcourse, CO, SO_2, Ozone, NO_x and NO_y

The JFK site was established in 1999. The site became a National Core (NCore) site in 2013. The NCore site will be the site for PAMS implementation. This is anticipated to begin in late 2019 as funding is available.

Plan for 2019 – Monitoring efforts will continue at this site. For PAMS implementation, monitoring staff at KDHE and the Unified Government currently attend trainings and monthly

meeting in preparation of operating new equipment and providing quality assured data. KDHE anticipates implementation to begin as funding is available from EPA.

20-091-0007; Justice Center, Overland Park, KS – Sequential $PM_{2.5}$

The Justice Center site was established in 1991. The sequential $PM_{2.5}$ monitor will no longer be supported by the manufacturer at the end of 2018. It is the intention that when this monitor can no longer be maintained it will be removed and the Justice Center site will be closed. As per 40 CFR 58 §58.14(c), the $PM_{2.5}$ monitor at Justice Center is eligible for removal as it has shown attainment during the prior five years and has a probability of less than 10 percent of exceeding 80 percent of the applicable NAAQS. The $PM_{2.5}$ monitor at Justice Center has a calculated 10th percentile maximum value of 8.34 $\mu g/m^3$, which is less than 80 percent (9.6 $\mu g/m^3$) of the applicable annual primary NAAQS (12 $\mu g/m^3$). The $PM_{2.5}$ monitor at Justice Center also has a calculated 10th percentile maximum value of 18.15 $\mu g/m^3$, which is less than 80 percent (28 $\mu g/m^3$) of the applicable 24-hour primary and secondary NAAQS (35 $\mu g/m^3$).

Plan for 2019 – The Justice Center site will continue to operate although there are plans to close this site upon major mechanical failure of the monitor.

20-091-0010; Heritage Park, Olathe, KS – Continuous $PM_{2.5}$ and Ozone

The Heritage Park site was established in 2003. There were no changes to this site during the last planning period. The Heritage Park site received significant roof repair and adaptation of tripod mounted $PM_{2.5}$ inlet in the spring of 2018 to maintain the site.

Plan for 2019 – Monitoring efforts will continue at this site; no changes are anticipated.

20-177-0013; KNI (Topeka) – Continuous $PM_{2.5}$, PM_{10} and Ozone

The KNI site was established in 2006. The site included a sequential $PM_{2.5}$ monitor until summer of 2017. The aging equipment reached the end of useful life and a continuous $PM_{2.5}$ monitor was purchased and installed at KNI, therefore maintaining monitoring efforts in Shawnee County and increasing continuous monitoring for $PM_{2.5}$.

Plan for 2019 - Monitoring efforts will continue at this site; no changes are anticipated.

20-133-0003; Chanute – Sequential $PM_{2.5}$, continuous PM_{10}, Ozone, NO_x and SO_2
The Chanute site was established in 2014. There were no changes to this site during the last planning period.

Plans for 2019 - Monitoring efforts will continue at this site; no changes are anticipated.

Interagency Monitoring of Protected Visible Environments (IMPROVE) (2)
Tallgrass (Chase County)
Cedar Bluff (Trego County, located with site 20-195-0001)

Plans for 2019 – Operations will continue. It is anticipated that UC Davis will upgrade telecommunications with the Tallgrass monitor.

National Atmospheric Deposition Sites/Mercury Deposition Network (4)
Lake Scott (Scott County)
Glen Elder (Mitchell County)
Sac and Fox (Brown County)
Coffey County Lake (Coffey County)

Plans for 2019 - Operations will continue with an annual report of activities posted to the KDHE website for the previous year's sample period.

Public Comments