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Proposed Revisions to the Kansas Ambient Air Monitoring Network: 2015 - 2016 Annual Monitoring Plan

The Clean Air Act mandates an ambient air quality surveillance system in state and local jurisdictions. The U.S. Environmental Agency (EPA) codified the national air monitoring regulations in 40 Code of Federal Regulations (C.F.R.) Part 58. The regulations require state and local monitoring agencies to conduct a periodic assessment of ambient air monitoring networks and propose any changes in an annual air monitoring network plan. Annual network plans need to be submitted to EPA by July 1st of every year. As required by 40 C.F.R. Part 58.10, the Bureau of Air's draft 2015-16 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. Written comments must be received by the Bureau of Air no later than June 16, 2015, to assure consideration prior to submission of this plan. Comments from the interested public should be addressed to:

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

Comments may also be submitted electronically to the following: dwatson@kdheks.gov

Air Monitoring

The Bureau of Air's, Air Monitoring and Planning Section administers the air monitoring and modeling program and the emissions inventory program. In cooperation with two local agencies, section staff operates the Kansas Ambient Air Monitoring Network, which provides air quality data from 16 sites across the state (Figure 1). The monitoring data is analyzed to determine compliance with federal standards for criteria pollutants and to evaluate air quality trends. In addition, the department has 4 mercury wet deposition monitoring sites located across the state. Staff members also conduct an annual emissions inventory of pollutants emitted from permitted facilities and other sources for the entire state. Staff who conduct air quality modeling use the emission inventory data. Modeling helps to better understand the causes of air pollution and to develop pollution reduction strategies in targeted areas. Such pollution reduction strategies are incorporated into state and regional plans to protect the public health, welfare and environment from the negative effects of air pollution.

2015 Kansas Air Monitoring Sites

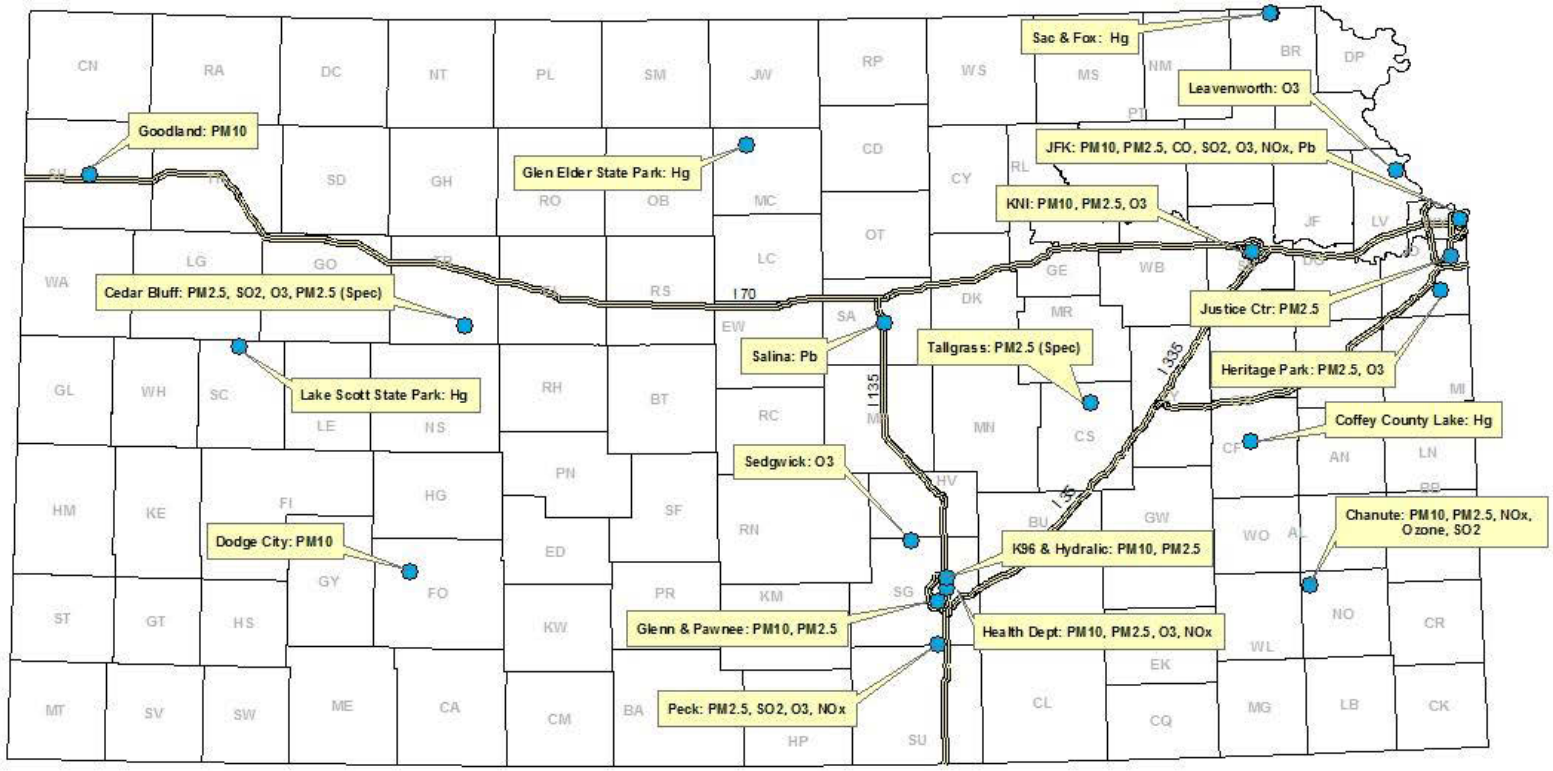


Figure 1. 2015 Kansas Ambient Air Monitoring Network

National Monitoring Network Design

The EPA developed a National Ambient Air Monitoring Strategy (NAAMS). The goal of the strategy is "to improve the scientific and technical competency of existing air monitoring networks to be more responsive to the public, and the scientific and health communities, in a flexible way that accommodates future needs in an optimized resource-constrained environment" (National Ambient Air Monitoring Strategy Document). As part of the Strategy, a network design has been implemented called the National Core Network (NCore). This network accommodates the overall strategic goals as well as determine air quality trends, report to the public, assess emission reduction strategy effectiveness, provide data for health assessments and help determine attainment / non-attainment status. NCore introduces a multi-pollutant monitoring component, and addresses the following major objectives:

• **Provide timely reporting of data to the public** through the AIRNow Web site (www.airnow.gov), air quality forecasting and other public reporting mechanisms;

• **Support the development of emission reduction strategies** through air quality model evaluation and other observational methods;

• **Provide accountability of emission reduction strategy progress** through tracking long-term trends of criteria and non-criteria pollutants and their precursors;

• **Support long-term health assessments** that contribute to ongoing review of National Ambient Air Quality Standards (NAAQS);

• **Evaluate compliance with NAAQS** through designation of attainment / non-attainment areas; and

• **Support scientific studies** ranging across technological, health, and atmospheric process disciplines.

The KDHE ambient air quality monitoring program has accomplished the network reconfiguration needed to meet NCore objectives. Since 1999, as a result of implementing a major network reconfiguration associated with promulgation of the National Ambient Air Quality Standard (NAAQS) for $PM_{2.5}$, the State of Kansas has:

1) completed a primary disinvestment in PM_{10} sampling;

2) established five multi-pollutant sites, including one rural background, two rural transport and two urban trends sites;

3) expanded the ozone monitoring network in the Kansas City metropolitan area to optimize spatial distribution of monitors, adequately monitor background and transport and provide better coverage for AirNow mapping; and

4) added two IMPROVE-protocol (regional haze) sites.

In 2009, KDHE prepared a Monitoring Plan for NCore, which included two monitoring locations, one urban and one rural. The two monitoring locations were proposed and accepted by EPA Region VII on October 30, 2009. Because of funding issues, only the urban site has been developed at this time.

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 expects each state to have at least one NCore site. Nationwide, there will be approximately 75 sites, mostly in urban areas.

The NCore monitoring network addresses the following monitoring objectives which 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 nonattainment/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 National Ambient Air Quality Standards (NAAQS); and
- support of 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 1.

Table 1: NCore Parameters

Parameter	Comments
$PM_{2.5}$ speciation	Organic and elemental carbon, major ions and trace metals (24 hour average every 3rd day)
$PM_{2.5}$ FRM mass	24 hour average every third day
continuous $PM_{2.5}$ mass	one hour reporting interval
continuous $PM_{(10-2.5)}$ mass	in anticipation of a $PM_{(10-2.5)}$ standard
lead (Pb)	24 hour sample every sixth day (first sample is required on December 29, 2011)
ozone (O_3)	continuous monitor consistent with other O_3 sites
carbon monoxide (CO)	continuous monitor consistent with other CO sites
carbon monoxide (CO) trace level	continuous monitor capable of trace levels (low ppb and below)
sulfur dioxide (SO_2)	continuous monitor consistent with other SO_2 sites
sulfur dioxide (SO_2) trace level	continuous monitor capable of trace levels (low ppb and below)
oxides of nitrogen (NO_X)	continuous monitor consistent with other NO_X sites
total reactive nitrogen (NO/NO_y)	continuous monitor capable of trace levels (low ppb and below)
surface meteorology	wind speed and direction, temperature, barometric pressure, and relative humidity

20-209-0021; Kansas City:
This site (Figs. 2-5), which currently serves as an urban core multi-pollutant monitoring station, is designated as a NCore station. The site is located close to Nebraska Ave and North 10th Street, Kansas City, Kansas (N 39.117219; W -94.635605).

Figure 2. Kansas City, KS JFK NCore Site Map

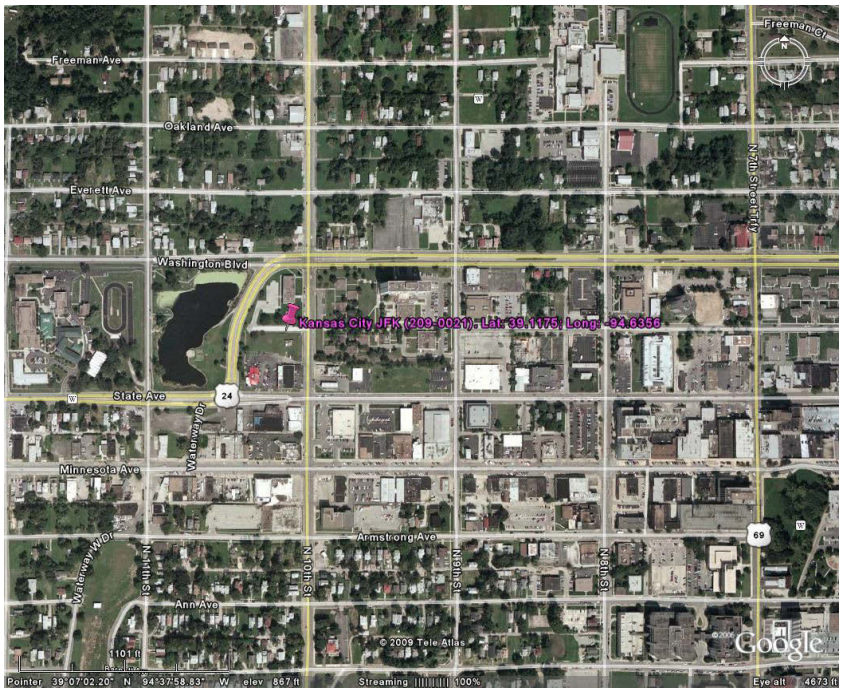


Figure 3. Kansas City, KS JFK NCore Site

Figure 4. Kansas City, KS JFK NCore Site

Figure 5. Kansas City, KS JFK NCore Site

IMPROVE Visibility Monitoring Network

20-017-0001; Tallgrass Prairie National Preserve:

This site operates as an Interagency Monitoring of Protected Visual Environments (IMPROVE) protocol sampler. The site is located at N 38.433611; W -96.55944, northwest of Strong City, Kansas on Kansas Highway 177.

20-195-0001; Cedar Bluff Reservoir:

This location was chosen in Western Kansas to serve as a background site for several pollutants, including NO_2, SO_2, ozone, PM_{10} and $PM_{2.5}$. It also operates as an IMPROVE protocol sampler site. The site is located at N 38.77027; W -99.76361, on the south side of Cedar Bluff Reservoir in Trego County.

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 Pb sources that are expected to or have been shown to contribute to a maximum Pb 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 Pb concentration in ambient air resulting from each Pb source that emits one-half (0.5) or more tons per year. A search of reported emissions for 2007 revealed that only one source in Kansas exceeds the one-half ton threshold. This source is located at Salina.

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 taking into account the potential for population exposure, and logistics. Typically, dispersion modeling will be required to identify the location of predicted maximum concentration.

Dispersion modeling was performed by KDHE to determine the area of maximum concentration for sampler placement. KDHE prepared a Monitoring Plan for Airborne Lead in 2009.

The Pb site near the Exide Technologies facility at Salina, KS has been designated with AQS site ID 020-169-0004. A high volume (HiVol), total suspended particulate (TSP) sampler is running at the site on a 1/6 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 1/6 day sampling schedule as the existing lead monitor and was installed next to the existing monitor. The monitoring site is located at the following legal description:

SOUTH INDUSTRIAL AREA, S1, T15, R3, BLOCK 2, ACRES 13.4, LTS 21-
30 EXC E 32 LT 30

Figure 6. Salina, KS Pb Source Monitoring Site

Figure 7. Salina, KS Pb Source Monitoring Site

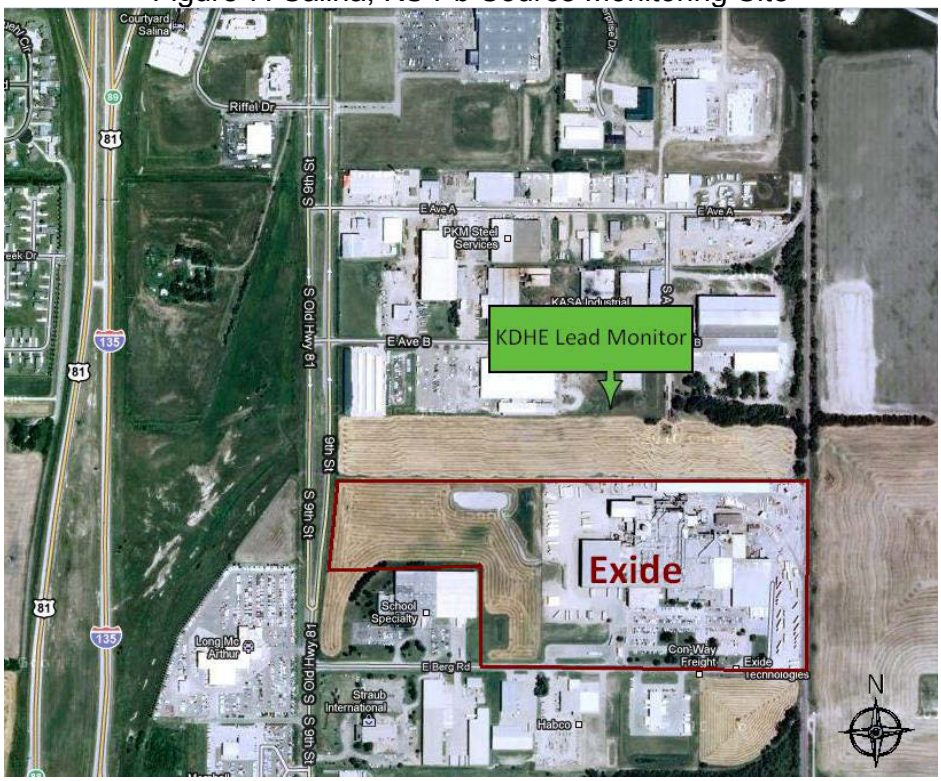
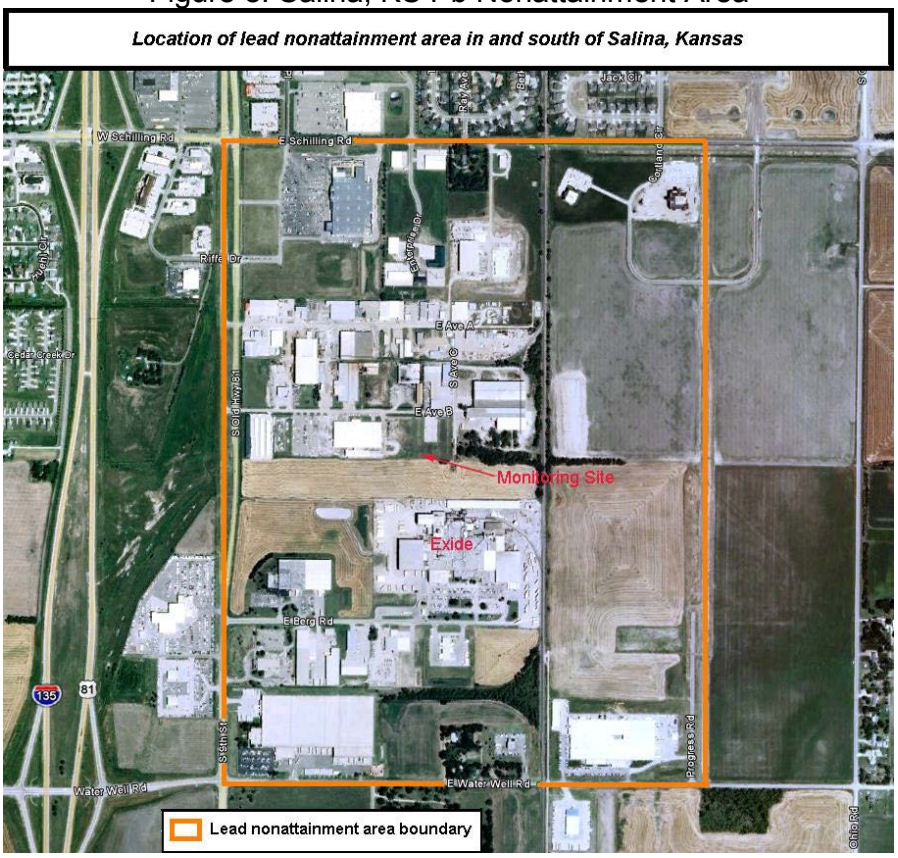


Figure 8. Salina, KS Pb Nonattainment Area



Population based Lead Monitoring

EPA also requires lead monitoring in large urban areas. These monitors are located along with multi-pollutant ambient monitoring sites (known as the "NCore network"). 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 is running at the site on a 1/6 day schedule and began running December 27, 2011 and took its first sample on January 4, 2012. Because of low values recorded at these NCore based lead monitor sites across the country, EPA has proposed to eliminate this monitoring requirement. As of April 2015, this proposal has not yet become finalized and lead monitoring will continue at this site.

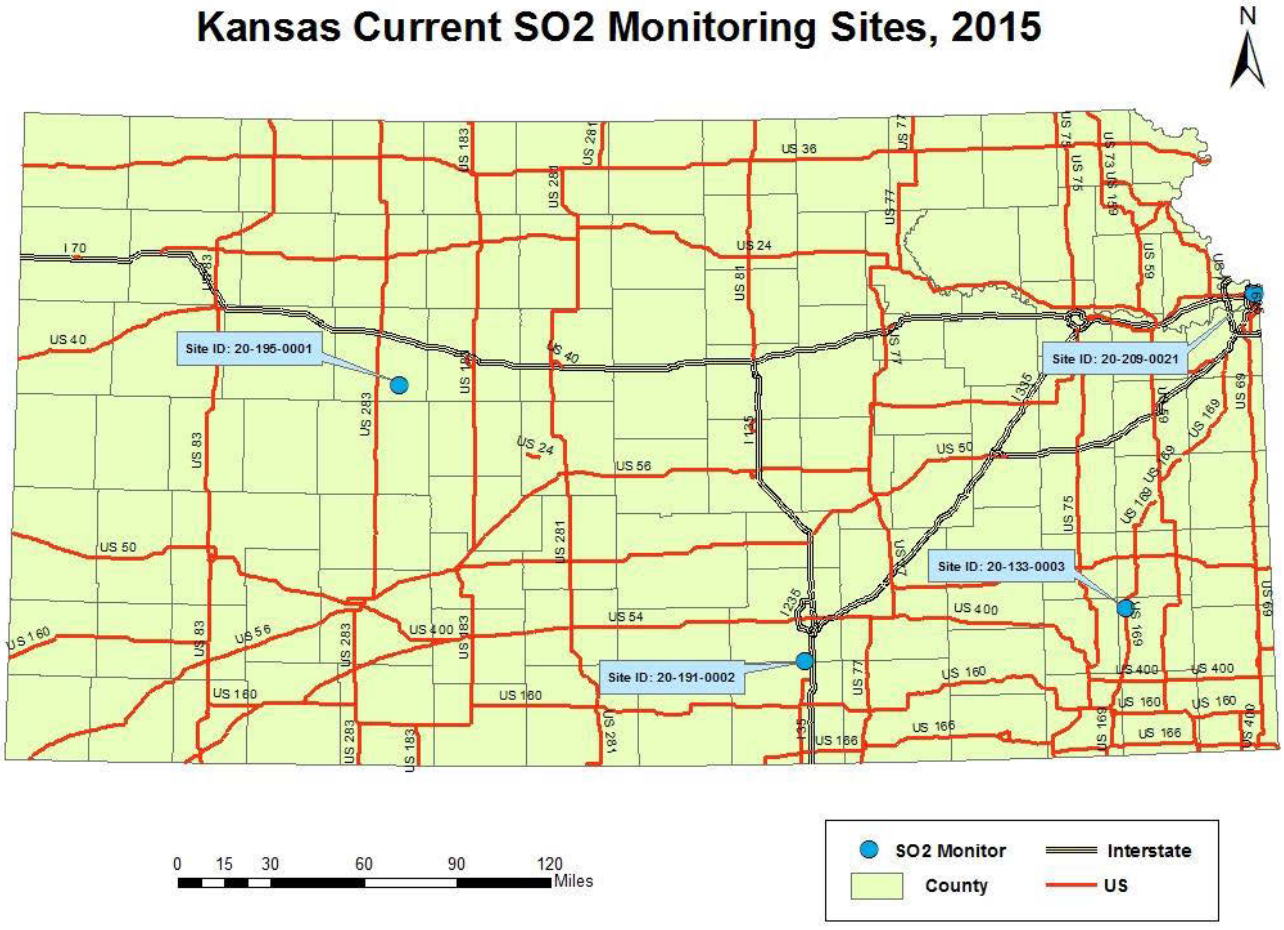
Sulfur Dioxide Monitoring Network

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:

- Any new monitors must be in operation by January 1, 2013.
- Monitoring required in Core Based Statistical Areas (CBSA's) based on population size and SO_2 emissions.

- Additional monitoring would also be required based on the state's contribution to national SO_2 emissions, which could be placed either within or outside a CBSA's.
- Reporting requirement added to include maximum 5-minute block average of each hour.

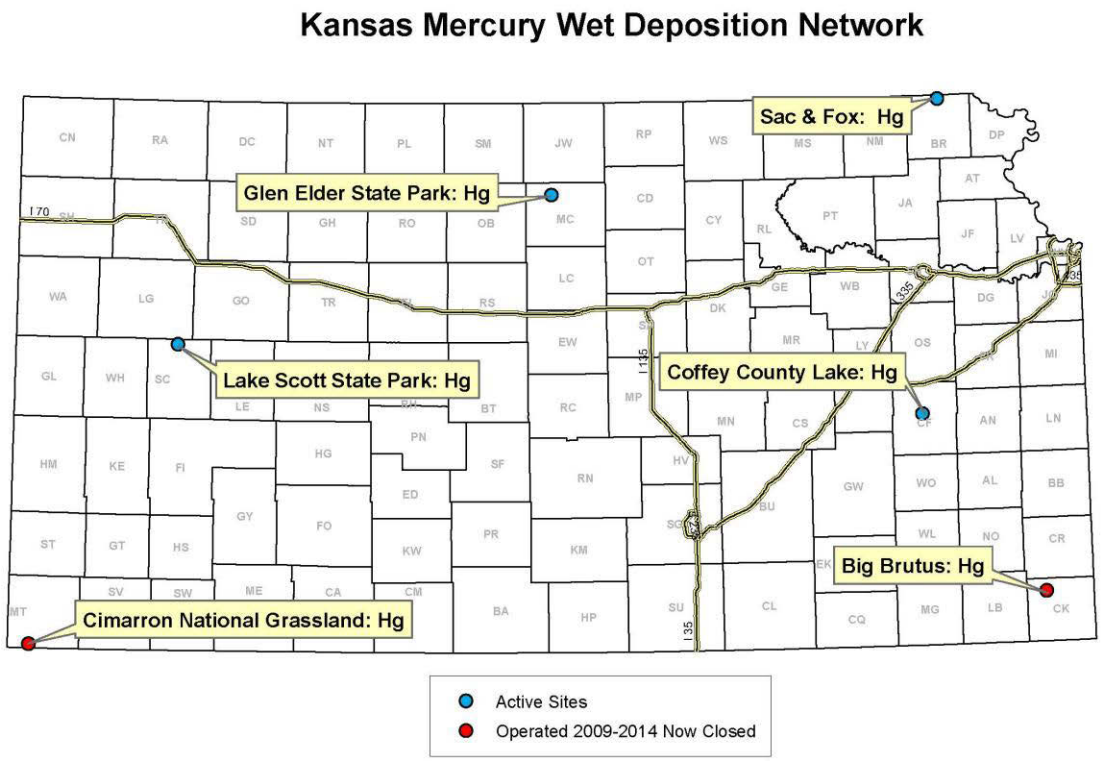
KDHE currently monitors for SO_2 at the following sites; Cedar Bluff, Peck (Wichita), Chanute and JFK (Kansas City).



Mercury Deposition Monitoring Network

KSA 75-5673 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 for a period of time long enough to determine trends (five or more years) was also specified. Legislative changes were enacted in 2014 that keep a network in place but allow the KDHE to re-examine the network size and location of the original six sites as established in response to KSA 75-5673. KDHE has reconfigured the network to now include four sites across the state. These network changes will continue to assure compatibility with the national Mercury Deposition Network (MDN). The MDN, coordinated through the National Atmospheric Deposition Program (NADP), is designed to study and quantify the atmospheric fate and deposition of mercury. The MDN collects weekly samples of wet deposition (rain and snow) for analysis to determine total mercury. The current Kansas Mercury Wet Deposition Monitoring Network (KMDN) consists of four sites distributed across the state. The locations of existing and future sites in the states of Nebraska and Oklahoma were also taken into consideration to optimize regional mercury network coverage. A more detailed report on this network may be found at http://www.kdheks.gov/bar/air-monitor/mercury/Hg_Report.pdf. A map of the network appears below in Figure 9.

Figure 9. 2015 Kansas Mercury Deposition Network and recently closed sites.



Nitrogen Dioxide Monitoring Network

The state is required by 40 CFR 58 Appendix D to install and operate one microscale near-road NO_2 monitoring station and it is to be operational by January 1, 2017. The state is beginning to perform preliminary analysis on the selection of an appropriate near-road monitoring site in Wichita and will await funding to establish this site. (EPA is currently discussing the possibility of not proceeding with the implementation of this phase of the NO_2 Rule. As of the development of this plan, no final decisions have been made.) EPA amended the applicability requirements of 40 CFR 58 Appendix D in March of 2013 to address the near road monitoring network and introduced a phased approach to implementation of the network.

Two criteria have been set up for NO_2 monitoring:

- Near-road NO_2 monitoring; 1 micro-scale site would be required in CBSAs >= 350,000 at a location of expected highest hourly NO_2 concentrations sited near a major road with high AADT (Annual Average Daily Traffic) counts.
- Community-wide; required in CBSAs >= 1 million at a location of expected highest NO_2 concentrations representing neighborhood or larger (urban) spatial scale.

Based on the near-road criteria, one monitor site was installed in 2013 in the Kansas City Metropolitan Area by the Missouri Department of Natural Resources Air Pollution Control Program and is located near I-70 and Sterling Avenue (39.047911, -94.450513, Figures 10-11). Based on the community-wide criteria, the Kansas City CBSA would be required to have a monitor and the JFK NCore monitoring site (20-209-0021) satisfies this requirement.

Figure 10. Kansas City Near-Road NO_2 Station, 2015

Figure 11. Kansas City Near-Road NO_2 Station, 2015

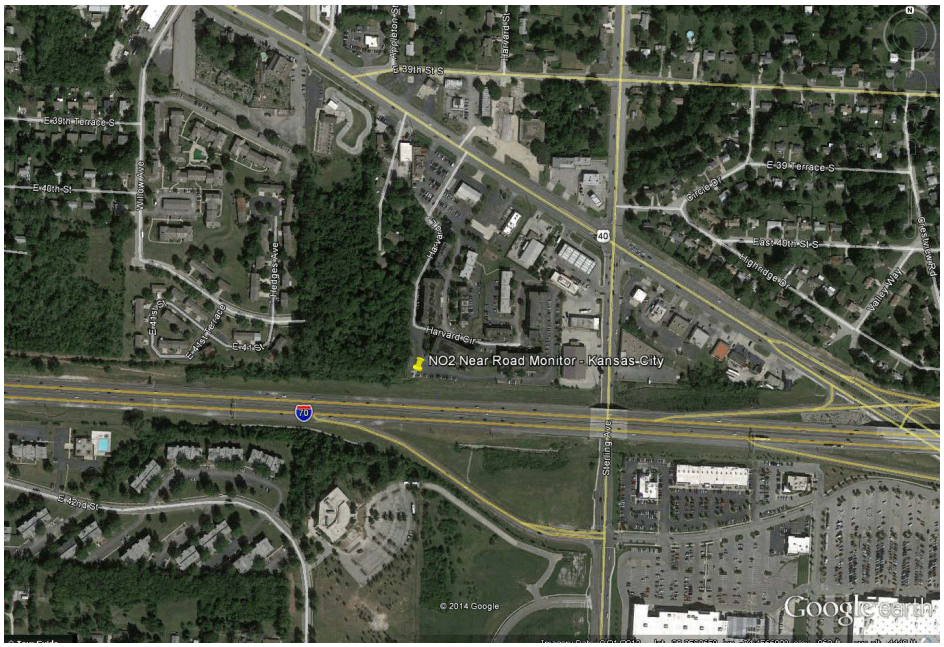
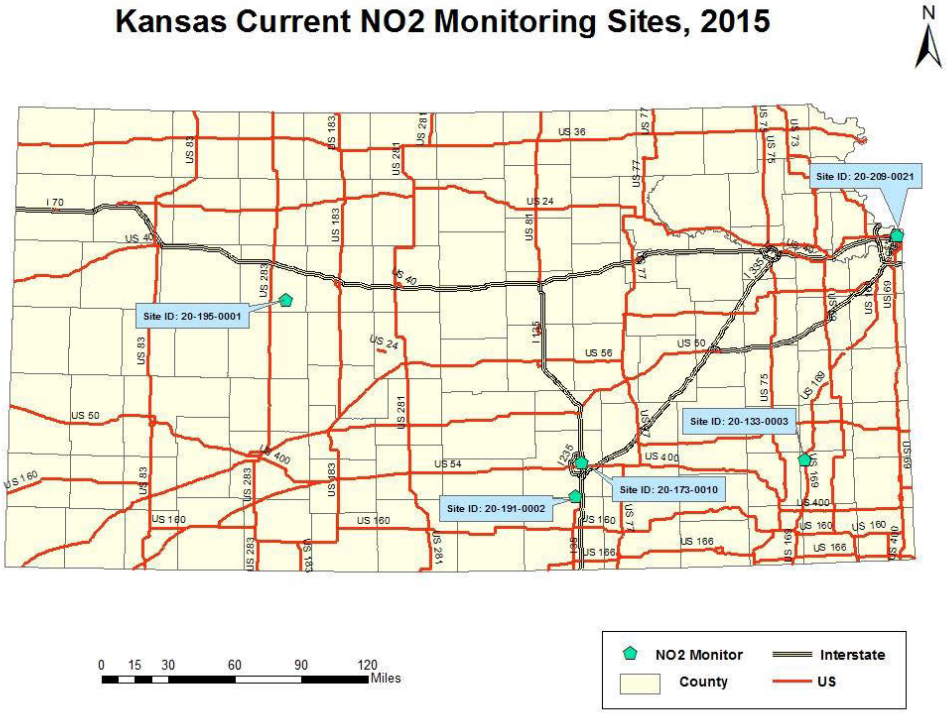


Figure 12. Kansas Nitrogen Dioxide Monitoring Sites, 2015



Ozone Monitoring Network

Current O_3 Standard and Monitoring Requirements

The current NAAQS for O_3 is set at 0.075 parts per million (ppm) for both the primary standard and the secondary standard.

State of Kansas Current O_3 Monitoring Network

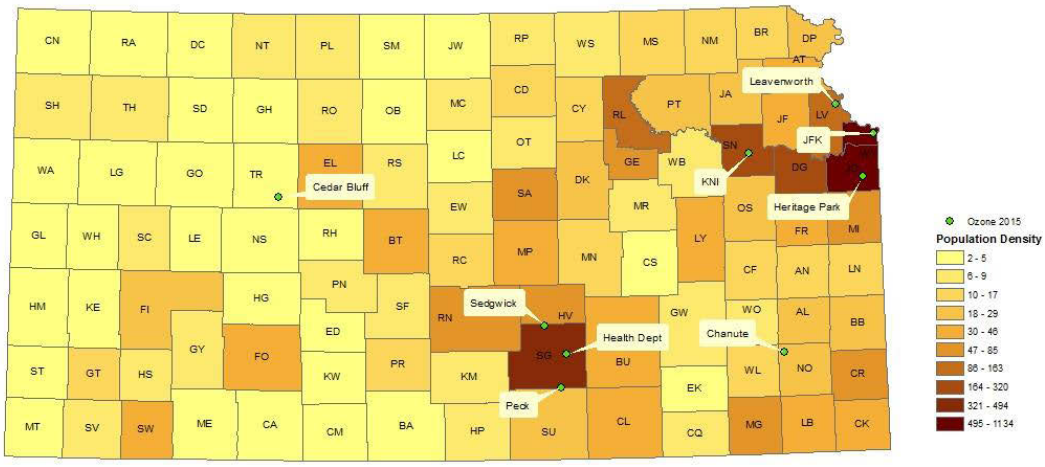
The current Kansas O_3 monitoring network includes 9 monitors located throughout the state. Monitors are listed in Table 3 along with detailed site information. No collocated O_3 measurements are available in Kansas.

Table 3. State of Kansas O_3 Monitor Site ID and Location.

Site Name	Site ID	Latitude	Longitude	Address
Heritage Park	091 - 0010	38.838575	-94.746424	13899 W 159th (Heritage Park)
Leavenworth	103 - 0003	39.327391	-94.951020	2010 Metropolitan
Chanute	133 - 0003	37.67696	-95.47594	1500 West 7th Street
Sedgwick	173 - 0018	37.897506	-97.492083	12831 W. 117N Sedgwick, KS
Wichita Health Dept.	173 - 0010	37.702066	-97.314847	Health Dept., 1900 East 9th St.
Topeka KNI	177 - 0013	39.024265	-95.711275	2501 Randolph Avenue
Peck	191 - 0002	37.476890	-97.366399	707 E 119th St South, Peck Comm. Bldg.
Cedar Bluff	195 - 0001	38.770081	-99.763424	Cedar Bluff Reservoir, Pronghorn & Muley
Kansas City JFK	209 - 0021	39.117219	-94.635605	1210 N. 10th St., JFK Recreation Center

Figure 13 shows the population density of the State of Kansas along with the monitoring sites. Among these monitors, Wichita HD, Topeka KNI, Peck and Kansas City JFK are urban scale monitors measuring population exposure; Sedgwick is an urban scale monitor measuring highest concentration; Heritage Park, Chanute and Leavenworth are neighborhood scale monitors measuring population exposure; Peck is a regional scale monitors measuring regional transport; and Cedar Bluff is regional scale monitor measuring the general background O_3 concentration in the state of Kansas.

Figure 13. State of Kansas Population Density Map and the Location of O_3 Monitors.



$PM_{2.5}$ Monitoring Network

Current $PM_{2.5}$ 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 ($\mu g/m^3$) and retained the 24-hour fine particle standard of 35 $\mu g/m^3$. 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$\mu g/m^3$ and a 24-hour standard of 35$\mu g/m^3$.

The primary annual standard is based on a 3 year average of the weighted annual mean. The primary 24-hour standard is based on a 3 year 98th percentile average of 24-hour values. Current minimum monitoring requirements for $PM_{2.5}$ are shown in Table 4 (http://edocket.access.gpo.gov/2006/pdf/06-8478.pdf).

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, there are also requirements for a minimum number of continuous monitors to be deployed. Fifty percent of the minimum required number of monitoring sites are required to be a continuous $PM_{2.5}$ monitor. For Kansas this means that at a minimum two continuous $PM_{2.5}$ monitors need to be operated in the state.

Applying the minimum monitoring requirements to Kansas urban areas, population totals and historical $PM_{2.5}$ measurements results in the design requirements shown in Table 5. According to Tables 4 and 5, $PM_{2.5}$ monitors could be removed from the Wichita area and the Kansas City area assuming the Missouri side of Kansas City retains a $PM_{2.5}$ monitor(s).

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

MSA	Population (2010)	Number of Existing $PM_{2.5}$ Monitors	$PM_{2.5}$ Monitors Required
Wichita, KS	623,061	3	1
Topeka, KS	233,870	1	0
Lawrence, KS	110,826	0	0
Kansas City, MO-KS	2,035,334	3 (KS side only)	2

State of Kansas Current $PM_{2.5}$ Monitoring Network

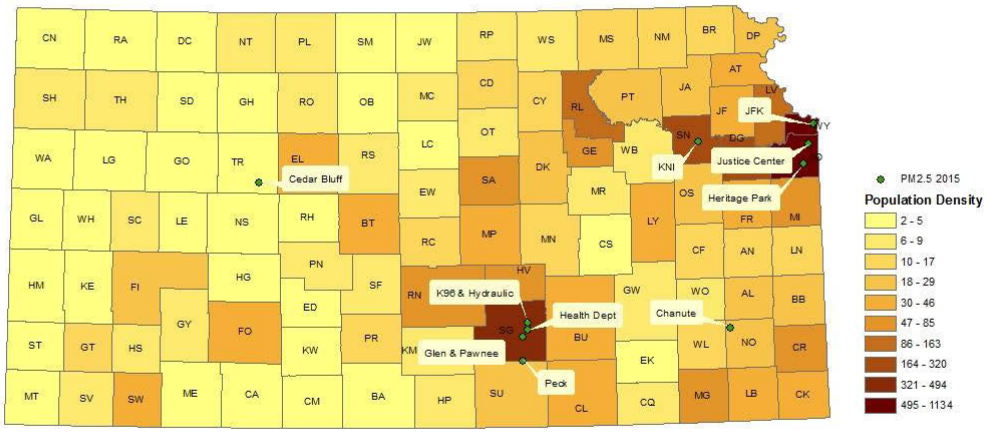
Current Kansas $PM_{2.5}$ monitoring network includes 13 monitors located throughout the state at 10 different monitoring sites. Ten of the monitors are filter based while the remaining two monitors are continuous Tapered Element Oscillating Microbalance (TEOM). Only one of the TEOM monitors, located at JFK, is equipped with a Filter Dynamics Measurement System (FDMS, 1405DF) and is considered a federal reference monitor. Monitor locations and type are listed in Table 6 along with detailed site information. One site has collocated filterable and continuous $PM_{2.5}$ measurements, at JFK in Kansas City. In addition, a 1405DF continuous federal reference monitor has been recently installed (May 4, 2015) at the Cedar Bluff Site but is currently not included in this table.

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

Site Name	Site ID	City	Address	Lat_DD	Lon_DD	$PM_{2.5}$	$CPM_{2.5}$
Cedar Bluff	195 - 0001	Cedar Bluff	Cedar Bluff Reservoir, Pronghorn & Muley	38.770081	-99.763424	NO	YES
Justice Center	091 - 0007	Overland Park	85th And Antioch	38.974457	-94.687013	YES	NO
Heritage Park	091 - 0010	Olathe	13899 W 159th (Heritage Park)	38.838575	-94.746424	YES	YES
K-96 and Hydraulic	173 - 1012	Wichita	K-96 and Hydraulic	37.747085	-97.316912	YES	NO
Glenn & Pawnee	173 - 0009	Wichita	Glenn & Pawnee	37.651114	-97.362212	YES	NO
Health Dept.	173 - 0010	Wichita	Health Dept., 1900 East 9th St.	37.702066	-97.314847	YES	NO
KNI	177 - 0013	Topeka	2501 Randolph Avenue	39.024265	-95.711275	YES	NO
Peck	191 - 0002	Peck	707 E 119th St South,Peck Community Bldg	37.476890	-97.366399	YES	NO
Chanute	133 - 0003	Chanute	1500 West 7th Street	37.67696	-95.47594	YES	NO
JFK	209 - 0021	Kansas City	1210 N. 10th St.,JFK Recreation Center	39.117219	-94.635605	YES	YES

Figure 14 shows the population density of the State of Kansas along with the $PM_{2.5}$ monitoring sites. All of these monitors have 3 year design values at or below the 85% of the NAAQS concentration category.

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



PM_{10} Monitoring Network

Current PM_{10} Standard and Monitoring Requirements

Current national ambient air quality standards (NAAQS) for PM_{10} has been set to 150 micrograms per meter cubed for both the primary standard and the secondary standard (http://www.epa.gov/ttn/naaqs/standards/pm/data/fr20061017.pdf). This standard is not to be exceeded more than once per year on average over 3 years. Current minimum monitoring requirements for PM_{10} are shown in Table 7 (http://edocket.access.gpo.gov/2006/pdf/06-8478.pdf).

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

Population Category	High Concentration[2]	Medium Concentration[3]	Low Concentration[4]
> 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 PM10 NAAQS.

Applying the minimum monitoring requirements to Kansas urban areas, population totals and historical PM_{10} measurements results in the design requirements shown in Table 8. According to Tables 7 and 8, PM_{10} monitors could be removed from the Wichita area and the Kansas City area assuming the Missouri side of Kansas City retains a PM_{10} monitor.

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

MSA	Population (07/08/2008)	Number of Existing PM_{10} Monitors	PM_{10} Monitors Required
Wichita, KS	603,716	3	1 – 2
Topeka, KS	229,619	1	0 – 1
Lawrence, KS	114,748	0	0
Kansas City, MO-KS	2,002,047	2 (KS side only)	2 – 4

State of Kansas Current PM_{10} Monitoring Network

Current Kansas PM_{10} monitoring network includes 10 monitors located throughout the state at 8 monitoring sites. Three of the monitors are filter based while the other seven monitors

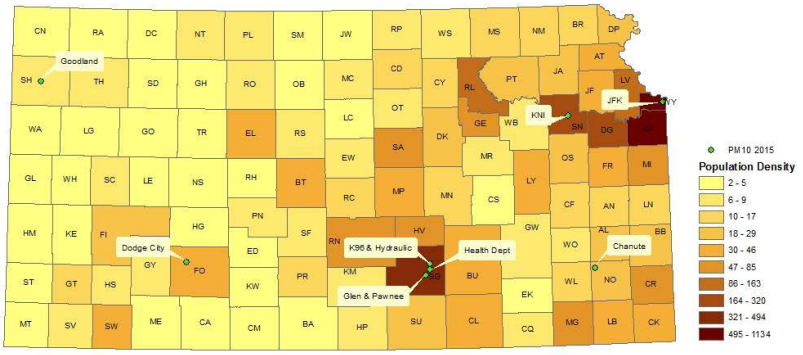
are continuous. Monitor locations and type are listed in Table 9 along with detailed site information.

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

Site Name	Site ID	City	Address	Lat_DD	Lon_DD	Filter PM_{10}	Cont. PM_{10}
Dodge City	057 - 0002	Dodge City	Dodge City Community College	37.775303	-100.035440	NO	YES
Glen & Pawnee	173 - 0009	Wichita	Glen & Pawnee	37.651114	-97.362212	NO	YES
Health Dept	173 - 0010	Wichita	Health Dept., 1900 East 9th St.	37.702066	-97.314847	NO	YES
Chanute	133 - 0002	Chanute	1500 West Seventh	37.676308	-95.474649	NO	YES
Goodland	181 - 0001	Goodland	City Fire Sta , 1010 Center	39.348452	-101.713405	YES	NO
JFK	209 - 0021	Kansas City	1210 N. 10th St.,JFK Recreation Center	39.117219	-94.635605	YES + colocated	YES
K-96 And Hydraulic	173 - 1012	Wichita	K-96 And Hydraulic	37.747085	-97.316912	NO	YES
KNI	177 - 0013	Topeka	2501 Randolph Avenue	39.024265	-95.711275	NO	YES

Figure 15 shows the population density of the State of Kansas along with the monitoring sites. All of these monitors have 3 year design values in the Low (< 80% of the NAAQS) concentration category.

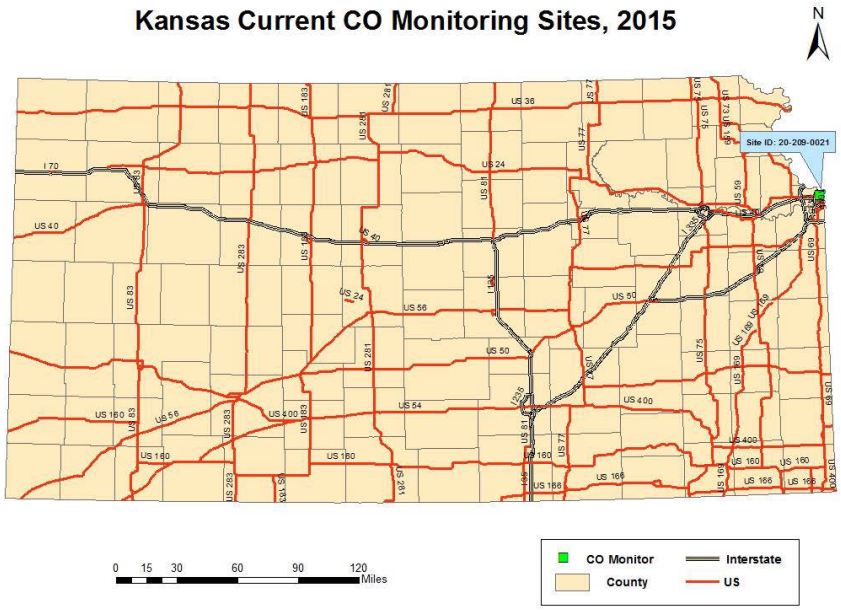
Figure 15. State of Kansas Population Density Map and the Location of PM_{10} Monitors.



Carbon Monoxide

EPA conducted a review of the CO NAAQS and decided to retain the existing standards in 2011. The BOA currently has one CO monitoring site in the state (Figure 16). It is located at the JFK NCore site in Kansas City, KS.

Figure 16. Kansas Carbon Monoxide Monitoring Site, 2015



Special Monitoring Projects

BNSF Intermodal

The KDHE and the BNSF Railway Company have established a continuous $PM_{2.5}$ and PM_{10} monitoring site near the new BNSF Kansas City Intermodal Facility to determine traffic impacts on near road air quality. The site is located on the SE corner of 191st Street and Homestead Road in Johnson County (Figures 17-18). KDHE will conclude its two year special monitoring study at this site in the fall of 2015. This site will be removed at that time.

Figure 17. Monitoring Site location for BNSF Intermodal Facility

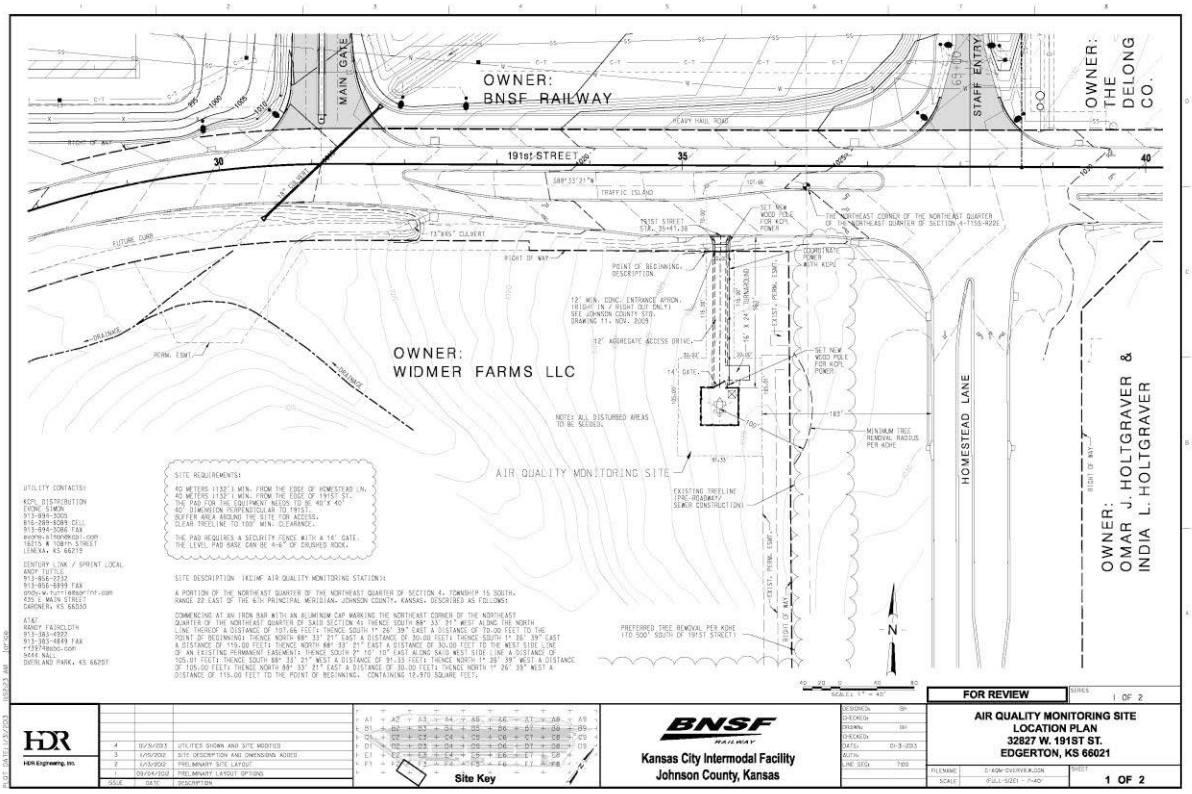


Figure 18. Monitoring Site location for BNSF Intermodal Facility

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 being 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 new Kansas City, KS South Branch Library (Figure 19).

Figure 19. 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 QA 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,
- precision and span checks,
- 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.

List of Proposed Changes to the Kansas Ambient Air Monitoring Network

20-195-0001; Cedar Bluff;
This is a comprehensive site in Western Kansas (38.770081, -99.763424) BOA has installed a new combination continuous $PM_{10}/PM_{2.5}$ monitor (1405DF) at this site in May 2015. The existing stand-alone $PM_{2.5}$ monitor at the site has been removed.

20-181-0001; Goodland;
It is the intention of the BOA to remove the Goodland PM_{10} filter based monitor once the continuous PM10/PM2.5 (1405DF) monitor is installed at the Cedar Bluff site (Installed in May 2015). The BOA will run both monitors for a period of time to analyze the data comparability of the two sites before removing the Goodland monitor.

20-173-0010; Wichita HD;
Installation of a new combination continuous $PM_{10}/PM_{2.5}$ monitor at this site in 2015-16 is being considered.

20-173-0009; Wichita Glenn & Pawnee;
Because of safety concerns associated with this site being located on the roof of the fire station, the BOA is currently working to move the site to ground level. In addition, once the new combination continuous $PM_{10}/PM_{2.5}$ monitor is located at the Health Department site, the BOA will remove the continuous PM_{10} monitor from this site. The BOA will also consider adding a collocated $PM_{2.5}$ monitor to this site once the PM_{10} monitor is removed.

20-091-0010; Heritage Park Johnson Co.;
The BOA has moved an existing continuous $PM_{2.5}$ monitor from the JFK NCore (Wyandotte Co.) site to this site to replace the existing filter based monitor.

20-177-0013; KNI Topeka;
The BOA is considering adding a combination continuous $PM_{10}/PM_{2.5}$ monitor to this site.

The BOA is considering purchasing 2-3 small Community Based Sized Monitors to use in special air monitoring studies.

Public Comments

Sierra Club –

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Sierra Club

Craig Volland – Chair
609 North 72nd Street • Kansas City, KS 66112
(913) 334-0556

Kansas Chapter Air Quality Committee
www.kansas.sierraclub.org

June 9, 2015 Certified Mail, Return Receipt Requested

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

Attention: Doug Watson

Subject: Comment on Draft *2015 - 2016 Ambient Air Monitoring Network Plan* for Kansas

We thank personnel from EPA Region 7 and KDHE for meeting with representatives of the Kansas Chapter of the Sierra Club on May 27, 2015 to discuss the Flint Hills burning issue and for alerting us to this opportunity to comment on KDHE's new plan for ambient air monitoring. We are herein registering our concerns with the current monitoring system in Kansas that we feel does not adequately assess and warn the public about the health impacts of the annual burning of rangeland in the Flint Hills.

The Current Deficiencies. Other than continuous ozone monitors in Topeka and Chanute to the east, there are currently no air quality monitors in the vicinity of the Flint Hills physiographic region capable of generating pollutant data for EPA's *Air Now* air quality alert system. KDHE's Flint Hills smoke management efforts are focused on convincing landowners to burn earlier in the year. Traditional practice has called for burning in early to mid-April. While this would help to reduce ozone formation, we have no data to conclude that it would necessarily reduce the emission and downwind secondary formation of $PM_{2.5}$ fine particulate.

Ozone. Considering the predominantly southerly winds in eastern Kansas, there is currently no coverage between Topeka and the Cedar Bluff monitoring station west of Hayes, a distance of some 230 miles. The Konza Prairie ozone monitor near Manhattan was capable of providing some coverage, but it was shut in 2013.

$PM_{2.5}$. There is no timely coverage of any kind between Kansas City, Kansas and the Cedar Bluff monitoring station west of Hayes, a distance of some 280 miles.

At present we are, in effect, relying on continuous monitors located in Lincoln and Omaha, Nebraska to indicate whether there is a threat to the health of the general public and to accurately record its scale. Since the plume typically reaches these cities early the next day, it is too late to warn citizens who live in small towns and rural areas in and around the northern Flint Hills of Kansas.

At our May 27 meeting on this subject, some EPA Region 7 and KDHE BOA personnel expressed skepticism that burning-related $PM_{2.5}$ NAAQS exceedances had occurred with significant frequency in the past. Apparently they have. Attached is a list of values, recorded in EPA's AQS archive, which did exceed the current standard of 35 ugM3. It's very likely that there are other instances, but all the PM2.5 monitors in the vicinity of the Flint Hills have been filter-based and operated only every third day.

For example, during the 2009 and 2010 burn periods, PM2.5 monitors in the vicinity of the Flint Hills were not operating on the same day that ozone exceedances were recorded in Wichita and Topeka which would have been indicative of heavy burning. Wichita hosts several PM2.5 filter-based monitors, but they all operate on the same day and thus provide no coverage on the intervening two days.

We are mindful that KDHE has generally complied with EPA rules oriented toward monitoring ambient air in large population centers. The rules also provide for other monitors in areas believed to be relatively close to a violation (85%+ of the NAAQS "design value"). But how would KDHE & EPA know what the design values are in the vast areas of Northeast and North-Central Kansas that are downwind of the annual burning and are rarely, if ever, monitored? We are not saying any particular agency person is at fault. Nonetheless we conclude the following concerning KDHE current monitoring network:

1. The intensive burning of rangeland in the Flint Hills occurs every year and can be reliably predicted to occur during an approximately six-week period from March 15 to May 1.

2. The monitoring network is not designed to monitor a large area-source of dangerous pollutants that the Flint Hills becomes when rangeland is intensively burned on a large scale.

3. The network is not capable of measuring an exceedance of the NAAQS for ozone north of Wichita and west of Topeka associated with the Flint Hills burning, and is not capable of consistently warning the public on a timely basis.

4. The network is not capable of measuring on a timely basis an exceedance of the NAAQS for $PM_{2.5}$ fine particulate anywhere in the vicinity of the Flint Hills associated with the Flint Hills burning, and is not capable of warning the public on a timely basis.

5. The network is not capable of providing public exposure data that would validate any assessment of health impacts in the vicinity of the Flint Hills.

6. The current monitoring plan violates the first principle of the Clean Air Act that is to protect the public health.

7. The current monitoring plan fails to provide equal protection to small-town and rural citizens downwind of the burning compared to the residents of large cities with robust monitoring capabilities.

According to the *2010 Kansas Statistical Abstract*, some 613,000 people live in 24 Kansas Counties in the Flint Hills or immediately adjacent to the Flint Hills and in the path of the prevailing winds. This does not include Wichita or Sedgwick Co. This population will include children, the elderly and people suffering from respiratory or cardiovascular disease who are particularly sensitive to air pollutants.

We hereby request that KDHE revise the air quality monitoring system to remediate these deficiencies. KDHE states in the draft that they are considering the location of continuous PM2.5 monitors in Wichita and Topeka. That would be helpful but does not go far enough. Considering the southerly winds typically extant during heavy burn days there needs to be continuous ozone and PM2.5 monitor in Manhattan or Junction City to assess the plume moving due north of the burning and in Abilene or Salina to assess any plume moving to the northwest.

Some of the needed measurements could be accomplished with temporary or portable monitors that could be deployed elsewhere for special studies at other times of the year. However a set of permanent monitors needs to be located in the vicinity of Manhattan and Junction City which are known to be hit with heavy smoke most years. Some 24,000 students regularly attend Kansas State University in Manhattan, and Ft. Riley near Junction City is a major military installation.

EPA is ultimately responsible for the enforcement of the Clean Air Act, and we expect the agency to provide a major share of financing for these improvements as may be appropriate.

One editorial note. The draft plan says KDHE has moved a continuous PM2.5 monitor from the JFK NCORE site in KCK to the Heritage Park station in Johnson County. However this is not shown in table 6, which shows only a filter-type unit.

Thank you for the opportunity to comment of your draft plan.

With best regards,

Craig Volland
Chair, Air Quality and Agriculture Committees
Kansas Chapter, Sierra Club

cc: EPA Region 7 Air Division
Nebraska Department of Environmental Quality
Lincoln-Lancaster County Health Dept.
Wichita Environmental Health Dept.
Mid America Regional Council
Riley County Health Department
Flint Hills Community Health Center
Kansas City, Mo. Air Quality Program
Johnson Co. Environmental Div.

Attachment.

Monitored Values of PM2.5 since 1999 in Kansas that did exceed or would have exceeded the current NAAQS of 35 ug/M3. The current standard was promulgated in 2006

2003

4-12 Topeka 57.1 ug/m3
4-12 Topeka 63.9
4-12 Emporia 58.8

2011

4-12 Topeka 40.8 ug/m3

2014

4-05 Wichita 49.5 ug/m3
4-05 Wichita 50.5
4-05 Wichita 42.5
4-05 Sumner County 50.6

KDHE response to Sierra Club comments

1. Sierra Club Comment: Page 1, Paragraph 1 - We are herein registering our concerns with the current monitoring system in Kansas that we feel does not adequately assess and warn the public about the health impacts of the annual burning of rangeland in the Flint Hills.

KDHE Response: *As part of the development of the Kansas Flint Hills Smoke Management Plan (SMP), KDHE has been releasing yearly press announcements alerting citizens about the upcoming prescribed fire season in the state. These releases describe to the public the reasons for these burns, when they occur and steps that they can take to limit the potential health impacts from the smoke that these fires may produce. In addition, during the season, KDHE has alerted the public when we feel that the potential exists for numerous fires and heavy smoke may impact parts of the state. We also notify downwind states/communities of potential impacts. Although the existing monitoring network was not designed solely for monitoring the Flint Hills region, it is based on criteria set down by the Environmental Protection Agency (40 CFR Part 58, Appendix D)*

2. Sierra Club Comment: Page 1, Paragraph 2 - Other than continuous ozone monitors in Topeka and Chanute to the east, there are currently no air quality monitors in the vicinity of the Flint Hills physiographic region capable of generating pollutant data for EPA's *Air Now* air quality alert system.

KDHE Response: *KDHE maintains several monitoring stations located near the Flint Hills Physiographic Region. These include five monitoring sites in the Wichita area, one in Chanute and one in Topeka. These sites range from 14-27 miles from the edge of the Flint Hills Region and monitor for Particulate Matter and Ozone, two pollutants of concern from the prescribed fires.*

3. Sierra Club Comment: Page 1, Paragraph 2 - KDHE's Flint Hills smoke management efforts are focused on convincing landowners to burn earlier in the year. Traditional practice has called for burning in early to mid-April. While this would help to reduce ozone formation, we have no data to conclude that it would necessarily reduce the emission and downwind secondary formation of $PM_{2.5}$ fine particulate.

KDHE Response: *Although spreading out the burns is one fire management practice (FMP) described in the Flint Hills SMP, KDHE describes several FMPs that ranchers could employ to mitigate the effects of burning on air quality. These ranged from the basic question of whether they needed to burn this year, overall air quality on the day of their burn, transport wind, mixing height/dispersion characteristics, timing of day, relative humidity/fuel moisture/air temperature, ignition and burn techniques and cloud cover. These FMPs will have co-benefits for potential reductions of both ozone and $PM_{2.5}$.*

3. Sierra Club Comment: Page 1, Paragraph 4 – $PM_{2.5}$. There is no timely coverage of any kind between Kansas City, Kansas and the Cedar Bluff monitoring station west of Hayes, a distance of some 280 miles.

KDHE Response: *KDHE does not have any continuous $PM_{2.5}$ monitors at the present time located north of the Flint Hills. We do have a network of continuous PM_{10} and ozone monitors located around the Flint Hills in Topeka, Wichita and Chanute. It is our experience from analysis, that in many smoke related events, PM_{10}, Ozone and $PM_{2.5}$ values will rise as the plume moves across the monitoring stations. An example of this is from the April 6, 2011 event and is included here for reference. KDHE uses this data, along with other information, to make informed decisions as to whether to issue air quality advisories*

during the burn season. KDHE also coordinates with downwind states to share information about the burning in the Flint Hills and the potential impacts on air quality. In addition, as mentioned in this document, KDHE is considering adding a combination continuous PM_{10}/$PM_{2.5}$ monitor to the Topeka KNI site.

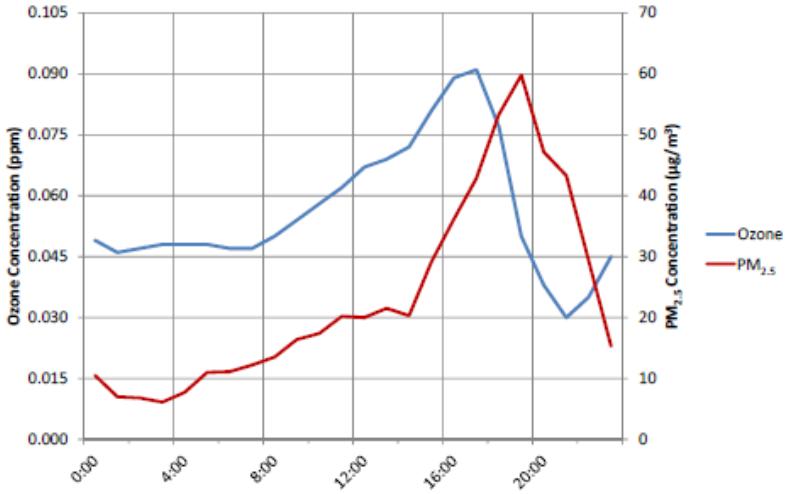

Figure 4-8. Hourly ozone and $PM_{2.5}$ concentrations at Mine Creek on April 6, 2011. Ozone and $PM_{2.5}$ concentrations both increased rapidly at 15:00, likely indicating the arrival of smoke.

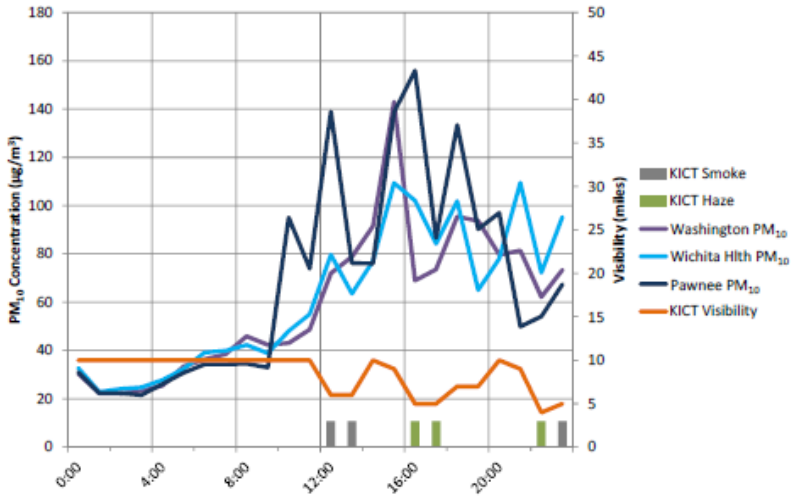

Figure 4-9. Hourly PM_{10} concentrations (left axis) and visibility (right axis) at Wichita area monitors on April 6, 2011. Grey and green bars at bottom of chart indicate hourly reports of smoke and haze, respectively, by KICT airport observers. PM_{10} concentrations increased rapidly in coincidence with reductions in visibility and reports of smoke and haze, indicating the arrival of smoke.

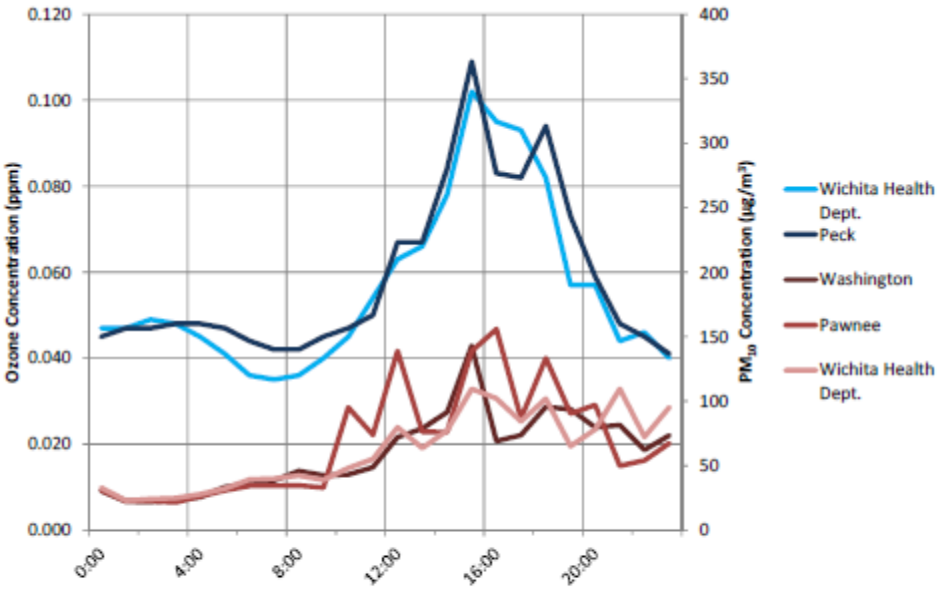

Figure 4-10. Hourly ozone (blue colors, top two lines) and PM_{10} (red colors, bottom three lines) concentrations at Wichita area monitors on April 6, 2011. Ozone and PM_{10} concentrations increased rapidly at 12:00 in the Wichita area, coincident with passage of a cold front and arrival of smoke from the north.

4. Sierra Club Comment: Page 2, Paragraph 1 – At our May 27 meeting on this subject, some EPA Region 7 and KDHE BOA personnel expressed skepticism that burning-related PM2.5 - NAAQS exceedances had occurred with significant frequency in the past. Apparently they have. Attached is a list of values, recorded in EPA's AQS archive, which did exceed the current standard of 35ug/m^3. It's very likely that there are other instances, but all the $PM_{2.5}$ monitors in the vicinity of the Flint Hills have been filter-based and operated only every third day.

KDHE Response: *KDHE compares ambient air monitor data values to the National Ambient Air Quality Standards (NAAQS) in affect at the time of the recorded value. In this case, the values mentioned in the attachment for 2003 were not exceedances when compared to the existing 24-hour $PM_{2.5}$ standard in affect at that time of 65ug/m^3. In fact, compared to the current $PM_{2.5}$ 24-hour standard of 35ug/m^3that was promulgated in September 2006, there have only been two recorded days of exceedances in April due to burning in the Flint Hills. KDHE does not believe that two days of exceedances in nine years constitutes "significant frequency".*

5. Sierra Club Comment: Page 3, Paragraph 5 – The draft plan says KDHE has moved a continuous PM2.5 monitor from the JFK NCORE site in KCK to the Heritage Park station in Johnson County. However this is not shown in table 6, which shows only a filter-type unit.

KDHE Response: *This omission has been noted and corrected on the document.*

Although not specifically designed for the Flint Hill's fires, the proposed network plan contains sites (Wichita, Kansas City, Topeka and Chanute) that predict and record data influenced by the fires. This data is used to inform and alert the public to potential air quality impacts from the smoke generated from the prescribed fires in the Flint Hills and other areas of the state and other states that may have

fires. KDHE maintains an ambient air monitor network that meets the requirements set forth by the federal government with the resources and personnel available to maintain that network. It is KDHE's goal to replace all filter based monitors with continuous monitors as resources allow.