Kentucky

Ambient Air Quality

Annual Report

2000

June 2001

Natural Resources & Environmental Protection Cabinet
Department for Environmental Protection
Division for Air Quality
803 Schenkel Lane
Frankfort, Kentucky 40601

TABLE OF CONTENTS

FOREWORD

The Kentucky Ambient Air Quality Annual Report is produced by the Technical Services Branch of the state Division for Air Quality. This report presents the results of monitoring that was conducted in the calendar year 2000 to measure the outdoor concentrations of air pollutants in the Commonwealth.

The primary source of data for this report is the Air Quality Surveillance Network operated by the Kentucky Division for Air Quality. The report also contains monitoring data submitted by the Air Pollution Control District of Jefferson County, the U.S. Parks Service and some industries.

Network Design and Operation

The state has operated an air quality monitoring network since July 1967. The 2000 network included 121 monitors in 33 counties.

The monitoring station locations are selected with U.S. Environmental Protection Agency guidance and, in general, are established near high population areas or air pollution sources. Each year the site locations are reviewed to ensure that adequate coverage is being provided.

Many staff hours are devoted to operation of the monitoring network. Division staff routinely visit the sites to calibrate and maintain the monitoring equipment, collect particulate and acid rain samples, and verify and document data from the continuous monitors.

Because it is very important that the air monitoring data is accurate and precise, the Division for Air Quality has an extensive quality assurance program. Staff members audit every air monitor quarterly to ensure that each is operating properly. This audit includes monitors operated by the Air Pollution Control District of Jefferson County and those operated by industrial sources.

Monitoring data is used in several ways. The data is used to demonstrate compliance with and/or progress made toward meeting ambient air quality standards and to identify pollution trends. The data is also used to evaluate public health impacts and the possible need to initiate emergency control procedures.

The public has access to the information through this annual report and, on a daily basis, through the toll-free air quality index message number: 1-800-AIR-IN-KY. This is a 24-hour toll-free report on Kentucky's air quality. During the summer months, the public can also access daily ozone level reports through EPA's AIRNOW website at www.epa.gov/airnow.

Report Organization

This report contains sections on each criteria pollutant with the monitoring data contained in a table arranged alphabetically by county. Air toxics data and acid rain data are contained in separate sections.

The report has been composed and arranged in an attempt to make it "user friendly." Included in the report are: a National Ambient Air Quality Standards table; a table listing monitors by county; maps indicating monitor locations; pollutant trends graphs; and a division directory.

If you have suggestions or questions concerning this report or need additional copies, contact Jerry Sudduth, Technical Services Branch, Division for Air Quality, 803 Schenkel Lane, Frankfort, KY 40601.

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Ambient Air Quality Standards

POLLUTANT	MAXIMUM CONCENTRATION	
	PRIMARY STANDARD	SECONDARY STANDARD
Carbon monoxide		
8 hour average	9 ppm (1)	9 ppm (1)
1 hour average	35 ppm (1)	35 ppm (1)
Sulfur oxides		
24 hour average	0.14 ppm (1)	--
annual average	0.03 ppm	--
3 hour average	--	0.50 ppm (1)
Nitrogen dioxide		
Annual average	0.05 ppm	0.05 ppm
Lead		
Calendar Quarter average	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Ozone		
1 hour average	0.12 ppm (4)	0.12 ppm (4)
8 hour average	0.08 ppm (5)	0.08 ppm (5)
Particulate Matter (measured as PM_{10})		
24 hour average	150 $\mu g/m^3$ (3)	150 $\mu g/m^3$ (3)
annual average	50 $\mu g/m^3$ (2)	50 $\mu g/m^3$ (2)
Particulate Matter (measured as $PM_{2.5}$)		
24 hour average	65 $\mu g/m^3$ (6)	65 $\mu g/m^3$ (6)
annual average	15 $\mu g/m^3$ (7)	15 $\mu g/m^3$ (7)

The federal Clean Air Act, as amended by the U.S.Congress in 1970, 1977 and 1990, directs the U.S. Environmental Protection Agency (EPA) to establish NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) defining maximum allowable ambient (outdoor) concentrations for criteria pollutants. The term "criteria pollutants" derives from the requirement that EPA must set criteria or standards for each.

There are two standard goal levels for each of the criteria pollutants. The PRIMARY STANDARD is designed to protect the public health. The SECONDARY STANDARD is designed to protect public health and welfare. Welfare covers damage to plants and animals, impairment of visibility and property damage.

Units of measure in chart are micrograms of pollutants per cubic meter of air ($\mu g/m^3$) and parts of pollutants per million (ppm) parts of air.

Footnotes:

(1) This average is not to be exceeded more than once per year.
(2) The standard is attained when the expected annual arithmetic mean concentration is less than or equal to 50 $\mu g/m^3$.
(3) The standard is attained when the expected number of days per calendar year with a twenty-four (24) hour average concentration above 150 $\mu g/m^3$ is equal to or less than one (1).
(4) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm (235 $\mu g/m^3$) is equal to or less than one (1).
(5) The standard is attained when the 3 year average of the annual fourth-highest daily maximum 8-hr average ozone concentration is less than or equal to 0.08 ppm.
(6) The standard is attained when the 3 year average of the annual 98th percentile is less than or equal to 65 $\mu g/m^3$.
(7) The standard is attained when the 3 year average of annual means is less than or equal to 15 $\mu g/m^3$.

2000 Kentucky Air Monitoring Network Sites by County

County	$PM_{2.5}$	PM_{10}	SO_2	NO_2	CO	O_3	Pb	AcidRn	WS/WD
Bell	1	1			1	1			1
Boone						1			
Boyd	1	3	1	1	1	1			1
Bullitt	1	1		1		1			1
Campbell	1	1	1	1		1			
Carter	1					1		1	1
Christian	1								
Daviess	1	2	1	1	1	1			
Edmonson[1]						1		1	
Fayette	2	2	1	1	1	2			
Franklin	1								
Graves						1			1
Greenup			1			1			
Hancock			1			1			
Hardin	1	1				1			
Harlan		1							
Henderson	1	1	1	1	1	2			
Jefferson[2]	4	6	3	2	5	3			1
Jessamine						1			1
Kenton	1	1		1	1	1			1
Livingston		1	1			2			1
McCracken	1	2	1	1	1	1			
McLean						1			1
Madison	1	1							
Marshall		1							

2000 Kentucky Air Monitoring Network Sites by County

County	$PM_{2.5}$	PM_{10}	SO_2	NO_2	CO	O_3	Pb	AcidRn	WS/WD
Oldham						1			
Perry	1	1				1			
Pike	1	1				1			
Pulaski		1				1			
Scott						1			
Simpson						1			1
Warren	1	1		1		1			
Whitley		1							
Total	22	30	12	11	12	32	0	2	11

[1] Operated by the National Park Service.
[2] Operated by the Air Pollution Control District of Jefferson County.

2000 Industrial Air Monitoring Network Sites by County

County	$PM_{2.5}$	PM_{10}	SO_2	NO_2	CO	O_3	Pb	AcidRn	WS/WD
Christian						1			
Henderson			2						
Scott						1			
Trigg						1			
Webster			1						
Wayne,WV			3	1		1			
Total	0	0	6	1	0	4	0	0	0

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless, poisonous gas that is produced by the incomplete combustion of carbon containing fuels. The primary source of carbon monoxide is the exhaust from motor vehicles which includes highway and non-road vehicles such as construction equipment. Other sources include industrial processes and coal, kerosene and wood burning stoves in homes.

The main health effect of carbon monoxide is its tendency to reduce the oxygen carrying capacity of blood. Carbon monoxide enters the bloodstream in the lungs where it binds chemically with the hemoglobin in red blood cells. Hemoglobin normally carries oxygen to organs and tissues but because CO binds with the hemoglobin over 200 times more readily than oxygen, the amount of oxygen absorbed into the bloodstream is greatly reduced when CO is present. Depending on the level of exposure, CO can cause fatigue and headaches and can impair vision and reflexes. Unconsciousness and even death may occur at high concentrations. The severity of the effects is related to the length of exposure and concentration level of CO.

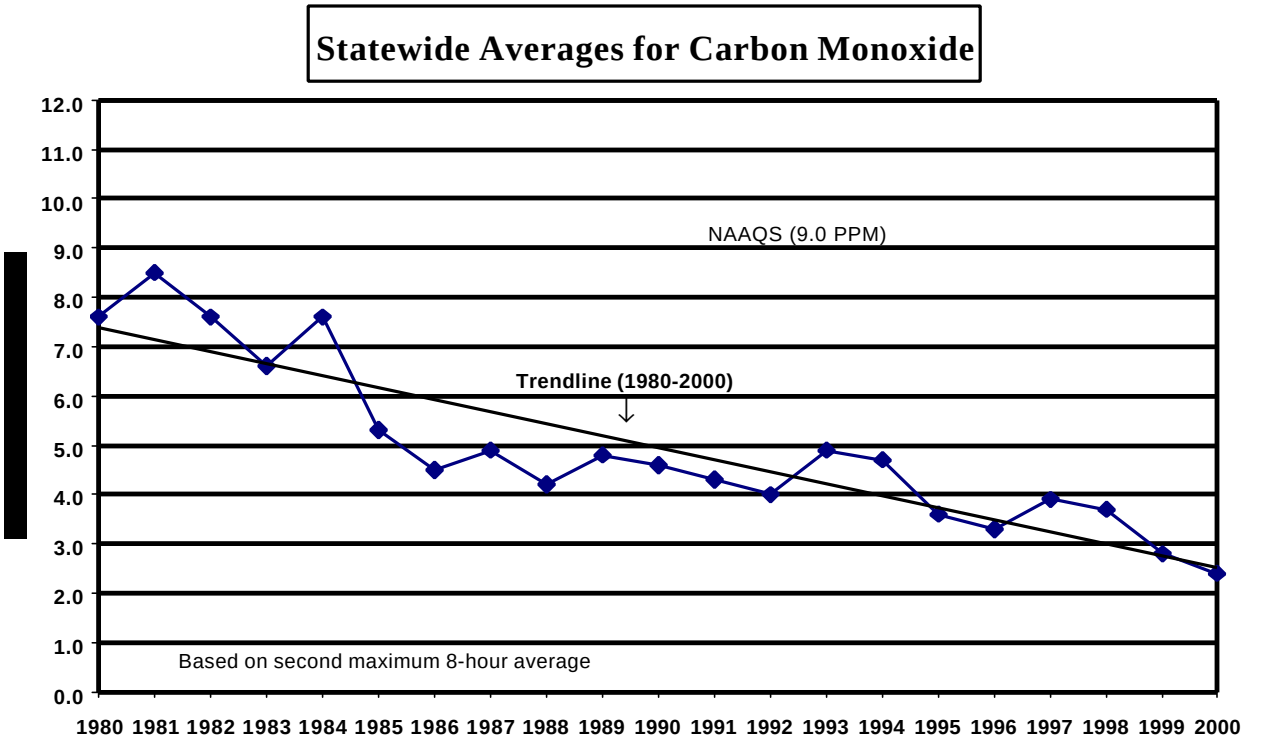
Carbon monoxide is monitored continuously by analyzers which operate using the non-dispersive infrared photometry method. In this method, ambient air is drawn into a sample cell and a beam of infrared light is passed through it. Carbon monoxide absorbs infrared light and any decrease in the intensity of the beam is due to the presence of CO. The decrease is directly related to the concentration of CO in the ambient air. A detector measures the difference between the sample cell beam and a duplicate beam passing through a reference cell with no CO present. The difference is translated into a measure of the CO present in the ambient air. Data from the analyzer is transmitted by telemetry for entry into an automated data storage system. In 2000 the Division for Air Quality and the Air Pollution Control District of Jefferson County (APCDJC) operated twelve CO monitors in Kentucky.

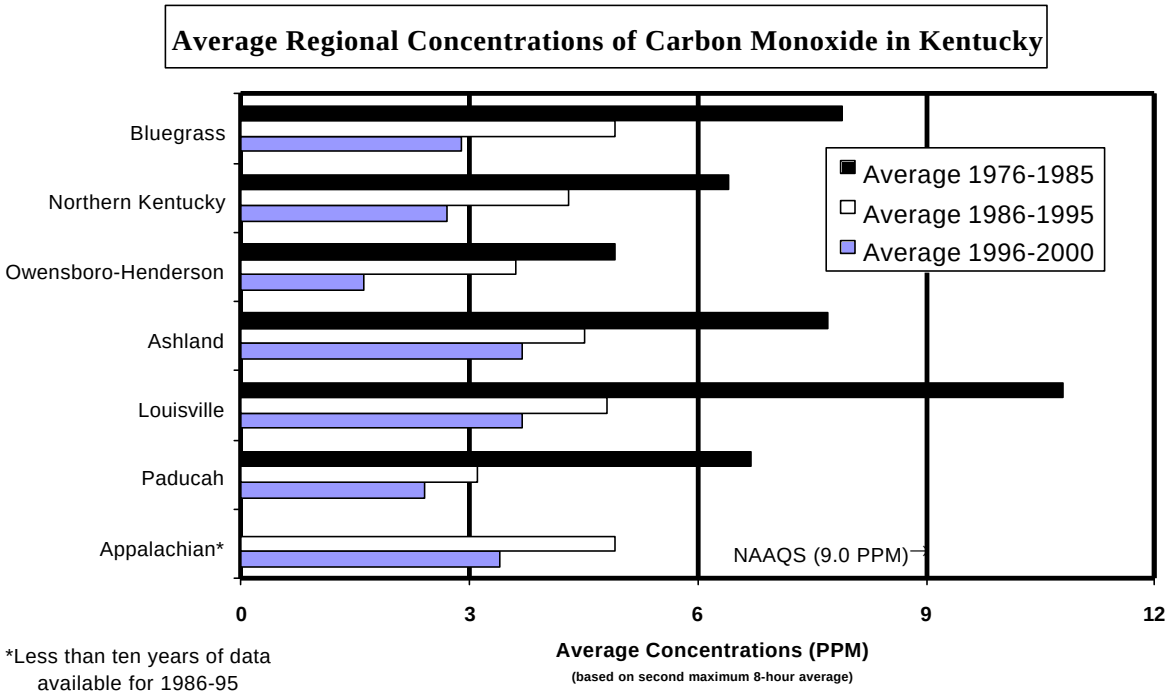
Primary NAAQS:	8-hour average not to exceed 9 ppm more than once per year. 1-hour average not to exceed 35 ppm more than once per year.
Secondary NAAQS:	Same as primary standard**.**

Neither the one-hour or 8-hour standards were exceeded in 2000. The last exceedance of a standard occurred on January 7, 1998 at Ashland site 21-019-0014 when an 8-hour average of 11.7 ppm was recorded. Prior to the exceedance in Ashland, the most recent exceedance occurred in February 1993 in Louisville where an eight-hour average of 9.5 ppm was recorded at site 21-111-0052. All Kentucky counties are currently in attainment of the standards for carbon monoxide.

Statewide and regional carbon monoxide levels show declining trends, primarily due to improved emission controls on motor vehicles (see Figure 1).

A statistical summary of carbon monoxide data collected in 2000 follows on page 8.





*Less than ten years of data available for 1986-95

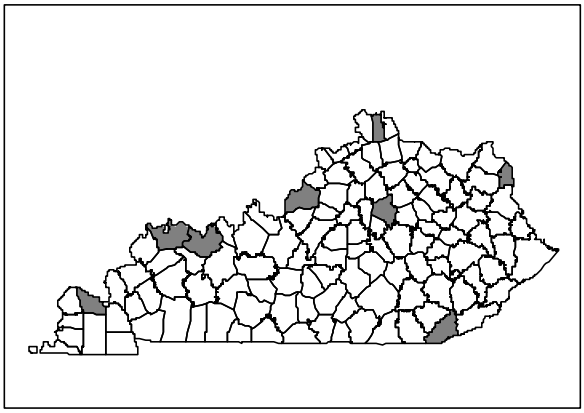
Figure 1. Carbon Monoxide trends

Criteria Pollutant Summary Report - 2000

Pollutant: Carbon Monoxide
Method: Instrumental/Non-Dispersive Infrared Photometry
Data Interval: Hourly
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour Average 35 PPM
8-Hour Average 9 PPM
Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	1-Hr Averages			8-Hr Averages		
				1st max	2nd max	Obs> 35.0	1st max	2nd max	Obs > 9.0
Bell	34th and Dorchester Middlesboro	21-013-0002	8102	4.6	4.1	0	3.1	3.0	0
Boyd	32nd and Railroad St Ashland	21-019-0015	8173	2.5	2.3	0	1.7	1.2	0
Daviess	US 60 and Pleasant Valley Rd, Owensboro	21-059-0005	7343	1.1	1.0	0	0.6	0.6	0
Fayette	650 Newtown Pike Lexington	21-067-0012	8491	3.0	2.8	0	1.9	1.7	0
Henderson	North Green Street Henderson	21-101-0013	8269	2.9	2.6	0	1.7	1.6	0
Jefferson [1]	424 W. Muhammad Ali Blvd, Louisville	21-111-0045	7397	6.0	4.8	0	3.7	2.5	0
Jefferson [1]	3510 Goldsmith Lane Louisville	21-111-0046	5056	4.5	4.3	0	3.8	3.8	0
Jefferson [1]	7201 Watson Lane Louisville	21-111-0051	7852	3.1	2.7	0	1.8	1.7	0
Jefferson [1]	7800 Preston Highway Okolona	21-111-0052	8159	13.2	10.7	0	4.8	4.0	0
Jefferson [1]	1735 Bardstown Road Louisville	21-111-1019	8236	6.1	4.8	0	3.2	2.7	0
Kenton	1401 Dixie Highway Covington	21-117-0007	8150	4.1	3.2	0	2.4	1.9	0
McCracken	2901 Powell Street Paducah	21-145-1024	7896	3.5	3.3	0	2.6	2.6	0

[1] Carbon monoxide monitors located in Jefferson County are operated by the Air Pollution Control District of Jefferson County.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless gas that has a pungent odor at concentrations exceeding 0.5 ppm. Sulfur dioxide is produced by the combustion of sulfur containing fuels, ore smelting, petroleum processing and the manufacture of sulfuric acid. Nationwide, coal-fired power plants are the largest sources of sulfur dioxide. Other industrial sources include petroleum refineries and paper mills.

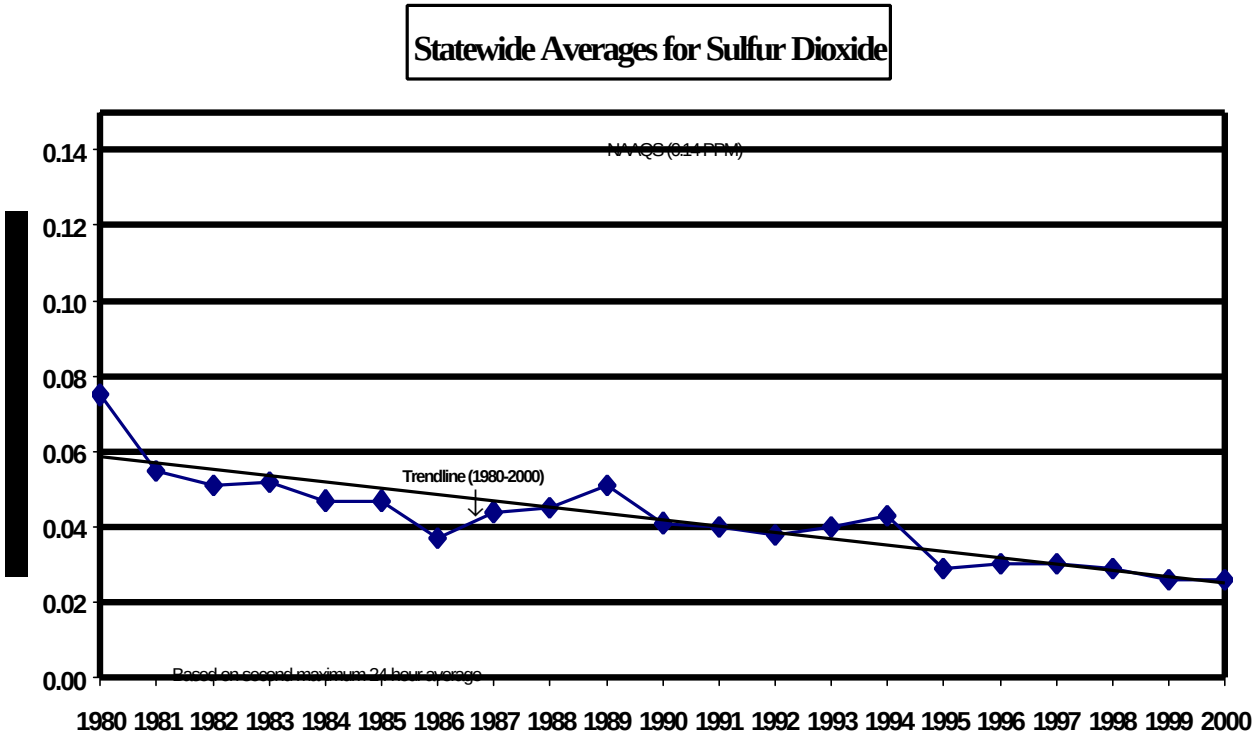
The primary health effect of sulfur dioxide is that it aggravates pre-existing respiratory, cardiovascular and pulmonary diseases. Asthmatics, children and the elderly are especially susceptible to the effects of sulfur dioxide pollution. Sulfur dioxide can also damage the foliage of trees and agricultural crops. It can also combine with moisture in the atmosphere to form sulfuric acid (H_2SO_4) which is a component of acid precipitation that causes acidification of soil and water and the erosion of building surfaces.

Sulfur dioxide is measured continuously by analyzers which use the ultraviolet (UV) fluorescence method. Fluorescent analyzers irradiate an ambient air sample with ultraviolet light. Sulfur dioxide molecules absorb a portion of this energy, then re-emit the energy at a characteristic wavelength of light. The light energy emitted by the sulfur dioxide molecules is proportional to the concentration of sulfur dioxide present in the sample. A photo multiplier cell measures the light emitted and converts it to a parts per million measurement. Data from the analyzer is transmitted by telemetry for entry into an automated data storage system. In 2000 the Division for Air Quality and the Air Pollution Control District of Jefferson County (APCDJC) operated twelve SO_2 monitors in Kentucky.

Primary NAAQS:	Annual Arithmetic Mean not to exceed 0.03 ppm. 24-hour concentrations not to exceed 0.14 ppm more than once per year.
Secondary NAAQS:	3-hour concentrations not to exceed 0.50 ppm more than once per year.

There were no exceedances of any of the sulfur dioxide standards in 2000. The last exceedance of a sulfur dioxide standard occurred in November 1981 when the monitor at Louisville site 21-111-0032 recorded a 24-hour average of 0.159 ppm. Statewide and regional sulfur dioxide levels have declining trends over the past twenty years due at least in part to successful efforts of power plants to curb SO_2 emissions (see Figure 2).

A statistical summary of sulfur dioxide data collected in 2000 follows on page 11.



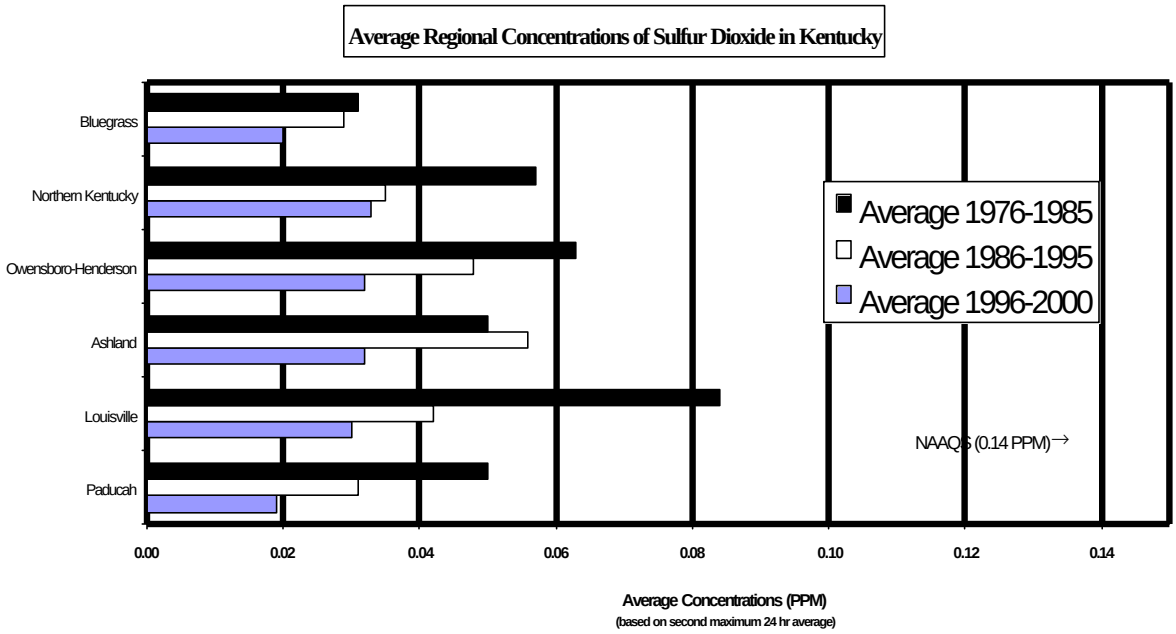
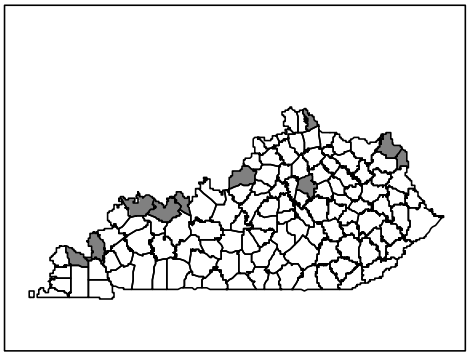


Figure 2. Sulfur Dioxide trends

Criteria Pollutant Summary Report - 2000

Pollutant: Sulfur Dioxide
Method: Instrumental
Ultra-Violet Fluorescence
Data Interval: Hourly
Units: Parts-per-million (PPM)



National Ambient Air Quality Standards (NAAQS)

Primary	NAAQS:	Annual Arithmetic Mean	0.03 PPM
		24-Hour Average	0.14 PPM
Secondary	NAAQS:	3-Hour Average	0.50 PPM

County	Site	AIRS-ID	# Obs	Annual Mean	24-Hr Average			3-Hr Average		
					1st max	2nd max	Obs> .14	1st max	2nd max	Obs> .50
Boyd	32nd and Railroad St Ashland	21-019-0015	8269	.007	.022	.020	0	.072	.065	0
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	8373	.007	.043	.040	0	.160	.082	0
Daviess	US 60 & Pleasant Valley Rd, Owensboro	21-059-0005	8085	.005	.030	.018	0	.074	.070	0
Fayette	650 Newtown Pike Lexington	21-067-0012	7428	.005	.021	.020	0	.040	.039	0
Greenup	Scott & Center Streets Worthington	21-089-0007	8367	.007	.026	.024	0	.045	.044	0
Hancock	2nd & Caroline Avenue Lewisport	21-091-0012	8312	.005	.023	.018	0	.068	.066	0
Henderson	North Green Street Henderson	21-101-0013	8160	.006	.043	.034	0	.096	.069	0
Jefferson[1]	4800 Kaufman Lane Louisville	21-111-0032	8692	.007	.036	.036	0	.092	.085	0
Jefferson[1]	7201 Watson Lane Louisville	21-111-0051	8655	.007	.029	.028	0	.081	.081	0
Jefferson[1]	4201 Algonquin Pkwy Louisville	21-111-1041	7018	.008	.049	.030	0	.109	.102	0
Livingston	Bloodworth Road, off KY 453	21-139-0004	8337	.005	.017	.017	0	.052	.047	0
McCracken	2901 Powell Street Paducah	21-145-1024	8379	.002	.014	.014	0	.030	.027	0

[1] Sulfur dioxide monitors located in Jefferson County are operated by the Air Pollution Control District of Jefferson County.

Nitrogen Dioxide

Nitrogen dioxide is a reddish brown gas that is produced during the high temperature combustion of fossil fuels. During combustion, nitrogen and oxygen are combined, or oxidized, to form a family of highly reactive gases called nitrogen oxides (NO_x) which includes nitrogen dioxide (NO_2) and nitrogen oxide (NO). In addition to the nitrogen dioxide produced during combustion, the NO produced may, in the presence of sunlight, undergo a photochemical reaction which will also form NO_2. The rate of reaction is dependent upon the intensity of the sunlight. Major combustion or oxidation sources that produce nitrogen dioxide include motor vehicles, power plants, incinerators, industrial boilers and some chemical processes.

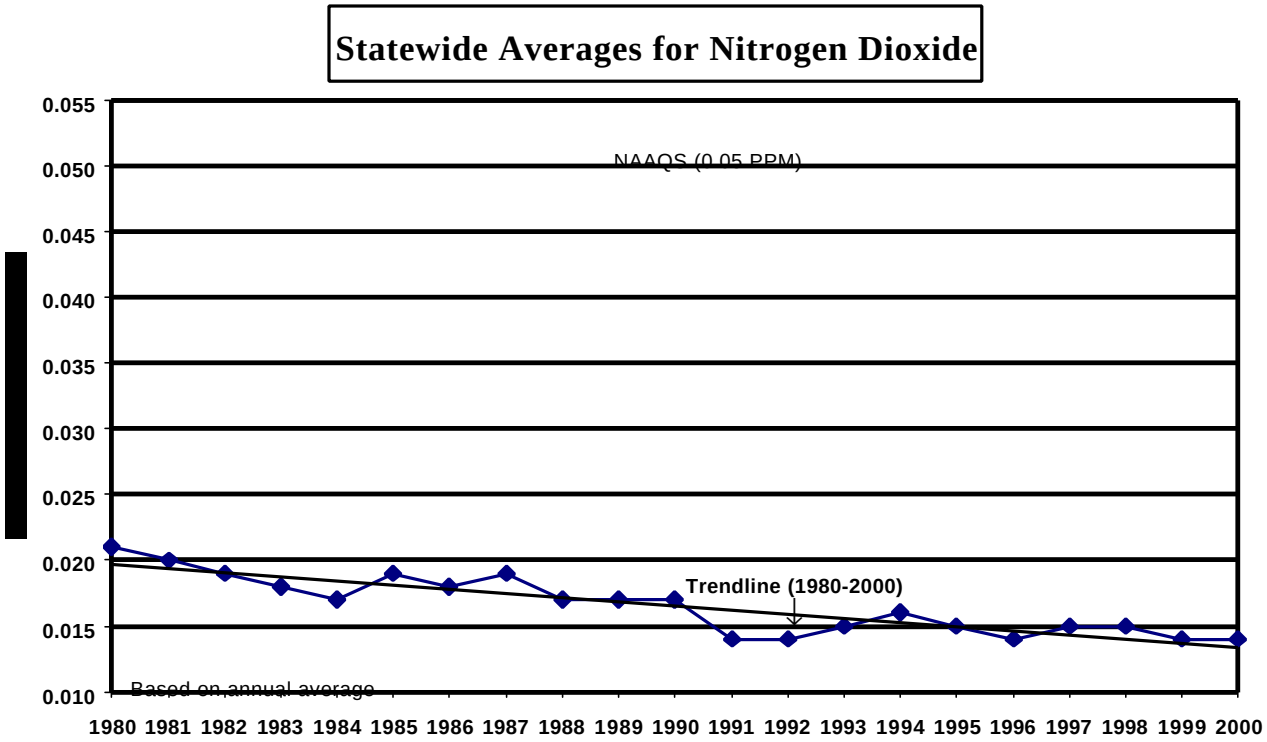
The primary health effect of nitrogen dioxide is as a lung irritant which can cause an increase in respiratory rate, a decrease in lung function and can increase the susceptibility of the respiratory system to infection. Nitrogen dioxide can also be considered detrimental to human health due to its association in the formation of ozone and the resulting health effects caused by that pollutant. Nitrogen dioxide is also a contributor to the formation of acid precipitation which can damage plant and aquatic life and cause the deterioration of stone and masonry-type buildings and statues.

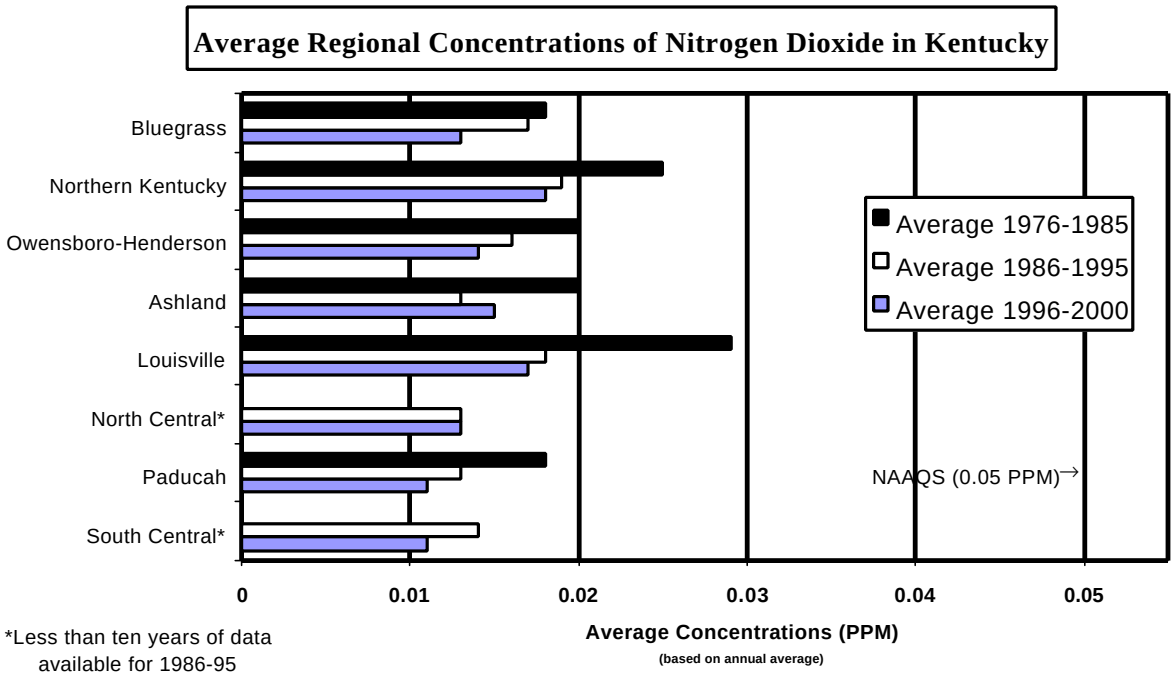
Nitrogen dioxide is monitored continuously by analyzers which utilize the principle of photometric detection of the chemiluminescence (light) resulting from the gas phase reaction of nitric oxide and ozone. When these two gases react, light at a specific wavelength is produced. In operation, sample air is drawn into the analyzer and split into two streams. The first stream is reacted directly with ozone (which is produced by a generator in the analyzer) and the light energy produced is proportional to the NO in the sample. Since NO_2 does not react with ozone, the second stream of air passes through a catalytic converter that converts the NO_2 in the sample to NO. That stream is then reacted with ozone which will provide a total measurement of nitrogen oxides (NO_x) in the sample. The assumption is that the majority of the NO_x value is not NO_2. By subtracting the NO value obtained by the first stream from the NO_x value obtained in the second stream, a NO_2 value is obtained. Data from the analyzer is transmitted by telemetry for entry into an automated data storage system. In 2000 the Division for Air Quality and the Air Pollution Control District of Jefferson County operated eleven nitrogen dioxide monitors in Kentucky.

Primary NAAQS:	Annual Arithmetic Mean not to exceed 0.05 ppm.
Secondary NAAQS:	Same as primary standard.

There were no exceedances of the NO_2 standard in 2000 and there have been no recorded exceedances of the NAAQS since the inception of sampling in 1970. Statewide and regional nitrogen dioxide levels show steady downward trends likely due to the use of pollution control devices on motor vehicles, power plants and industrial boilers (see Figure 3).

A statistical summary of nitrogen dioxide data collected in 2000 follows on page 14.





*Less than ten years of data available for 1986-95

Figure 3. Nitrogen Dioxide trends

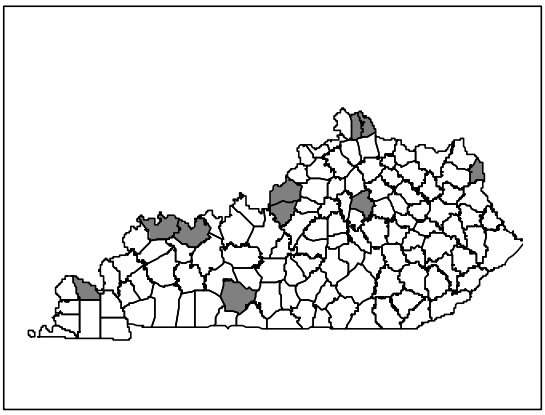
Criteria Pollutant Summary Report - 2000

Pollutant: Nitrogen Dioxide
Method: Instrumental/Gas-Phase Chemiluminescence
Data Interval: Hourly
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean 0.05 PPM

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	Annual Mean	1-Hr Average	
					1st max	2nd max
Boyd	32nd and Railroad Streets, Ashland	21-019-0015	8313	.015	.068	.066
Bullitt	2nd & Carpenter Streets, Shepherdsville	21-029-0006	8069	.013	.119	.092
Campbell	700 Alexandria Pike, Fort Thomas	21-037-0003	8338	.015	.076	.070
Daviess	US 60 and Pleasant Valley Rd, Owensboro	21-059-0005	8208	.011	.063	.061
Fayette	650 Newtown Pike, Lexington	21-067-0012	8366	.013	.068	.062
Henderson	North Green Street, Henderson	21-101-0013	8243	.016	.073	.073
Jefferson[1]	7201 Watson Lane, Louisville	21-111-0051	7494	.013	.061	.058
Jefferson[1]	1918 Mellwood Avenue, Louisville	21-111-1021	3753	.024[2]	.089	.079
Kenton	1401 Dixie Highway, Covington	21-117-0007	7873	.018	.074	.072
McCracken	2901 Powell Street, Paducah	21-145-1024	8325	.010	.064	.063
Simpson	Oakland Elementary School, Oakland	21-227-0008	7984	.010	.070	.065

[1] Nitrogen dioxide monitors located in Jefferson County are operated by the Air Pollution Control District of Jefferson County.

[2] Does not meet minimum observations criteria.

Ozone

Ozone is a colorless gas which is not emitted directly into the atmosphere from sources but forms in the atmosphere from a photochemical reaction between volatile organic compounds and nitrogen oxides in the presence of sunlight. Sources of volatile organic compounds include motor vehicle exhaust, dry cleaning and paint solvents and evaporation of gasoline from storage and transfer facilities. Sources of nitrogen oxides include emissions from motor vehicles, boilers, incinerators and power plants.

In the upper atmosphere, naturally occurring stratospheric ozone (commonly called the ozone layer), shields the earth's surface from the sun's harmful ultraviolet rays. However, tropospheric or ground level ozone causes irritation of the respiratory system and is particularly harmful to those persons with asthma and circulatory problems. Ozone can also cause damage to crops and increase the deterioration of rubber, paints and fabrics.

Ozone is monitored during the period from March 1 thru October 31 each year when meteorological conditions are most conducive to the formation of ozone. During this period, ozone is monitored continuously by analyzers which operate using the ultraviolet photometry method of analysis. In this method, ambient air is drawn into a sample cell and a beam of ultraviolet light is passed thru it. Ozone absorbs ultraviolet light and a decrease in the intensity of the light indicates the presence of ozone. The intensity of the light is first measured with no ozone present to determine a reference value. An ambient sample is then introduced and the intensity of the resultant light is measured by an ultraviolet detector. The amount of light absorbed by the sample indicates the level of ozone present. Data from the analyzers is transmitted by telemetry for entry into an automated data storage system. In 2000 the Division for Air Quality, the National Park Service at Mammoth Cave and the Air Pollution Control District of Jefferson County (APCDJC) operated thirty-two ozone monitors in Kentucky.

Primary NAAQS:	Maximum one-hour average concentration of 0.12 ppm. Average number of expected exceedences per year not to exceed 1.0 over the last three years. Maximum 8-hour average concentration of 0.08 ppm (based on a three - year average of the annual fourth highest daily maximum 8-hour averages).
Secondary NAAQS:	Same as primary standard.

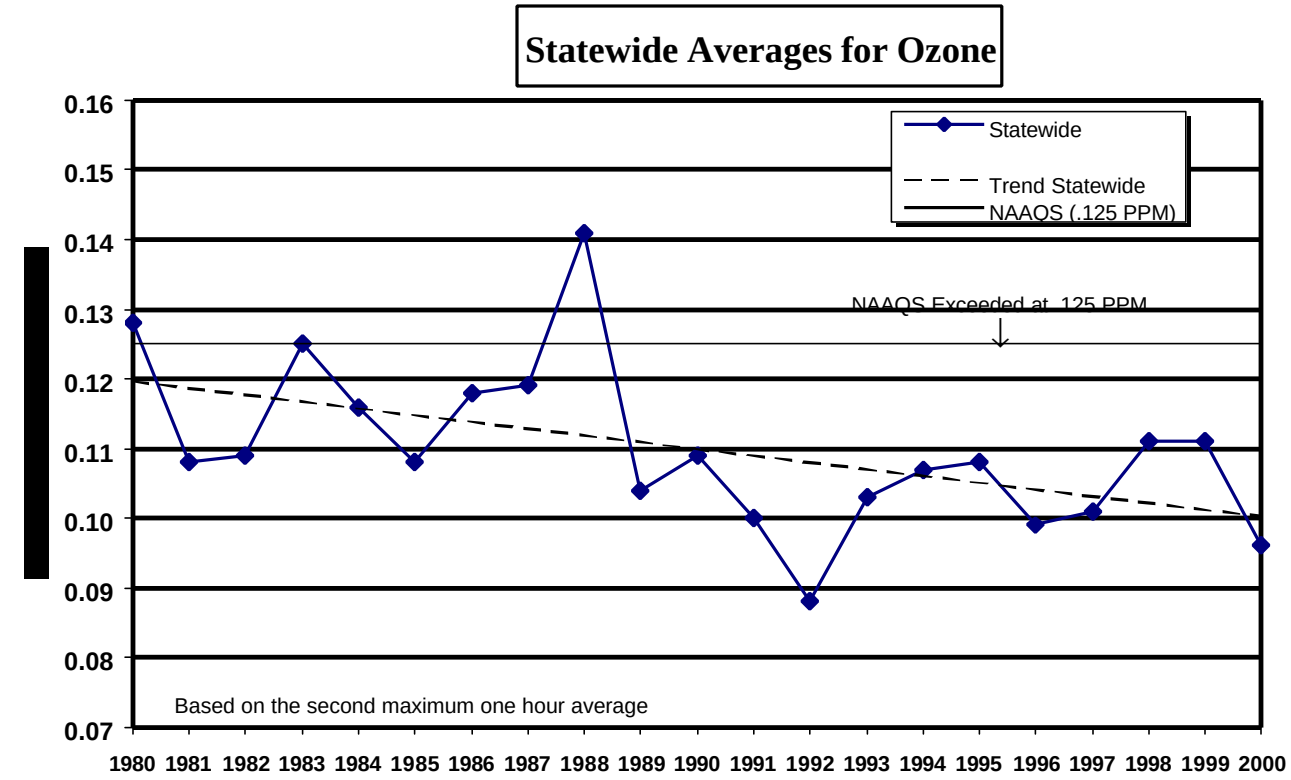
The one-hour ozone standard is written with two decimal places, however actual monitoring data is recorded to three decimal places and must be rounded to two places for comparison to the standard. Therefore the standard is exceeded when a daily one-hour average is greater than or equal to 0.125 ppm. Due to maintenance, repairs and calibration of the analyzers it is impossible to collect 100% of the possible hourly values occurring during the ozone season. Therefore a formula has been developed to estimate the "expected number of exceedances" that would have occurred if 100% of

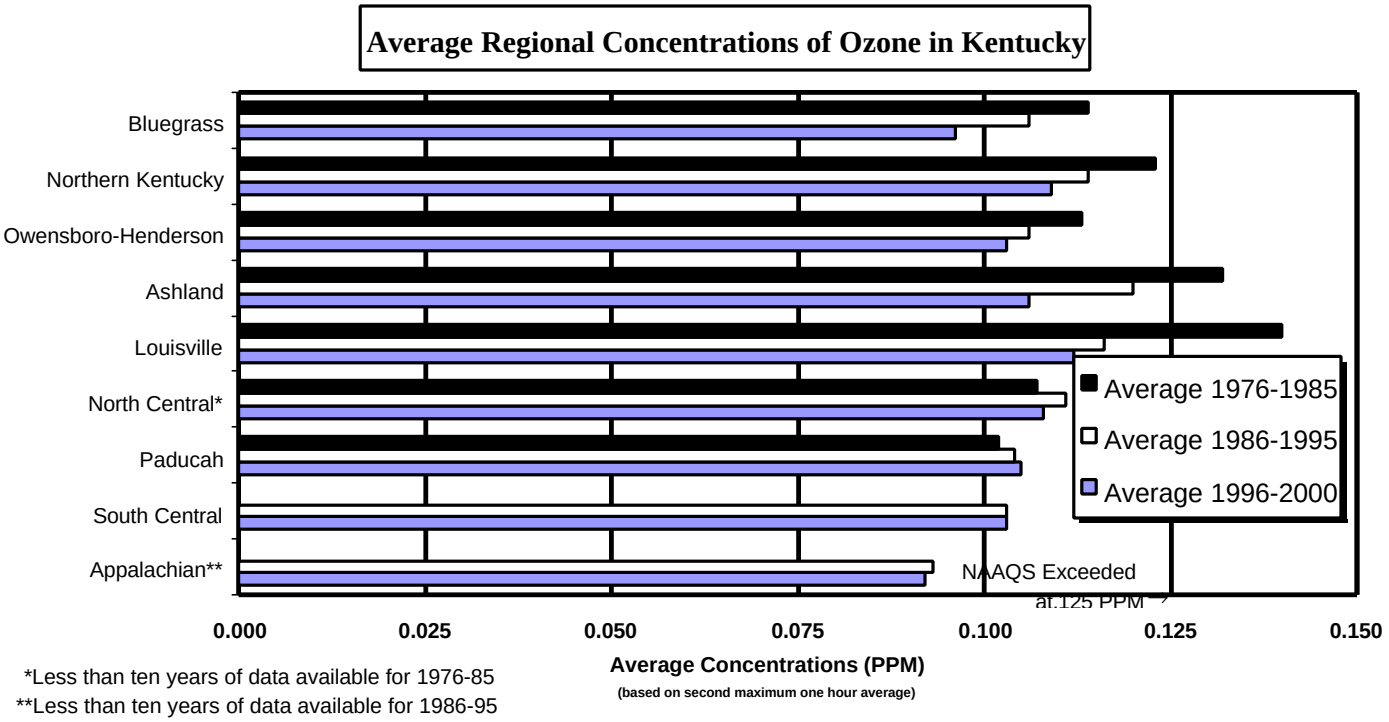
the possible data values had been collected. The expected number of exceedances calculated for each monitor is used to determine attainment of the one hour standard. The standard is attained when the expected number of exceedances for a monitor is less than or equal to 1.0 averaged over the last three calendar years. During the period 1998-2000, no monitor had an average expected number of exceedances greater than 1.0 (see one-hour ozone multi-year expected exceedances on pages 20-21).

There has been a general decline in ozone levels over the past twenty-five years based on one-hour data as seen in Figure 4. This downward trend is the result of emission controls on vehicles, such as catalytic converters, and controls on industrial sources of VOC's and nitrogen oxides. A statistical summary of one-hour ozone data collected in 2000 follows on pages 18-19.

In November 1997 the federal EPA adopted a new eight-hour ozone standard based on scientific and medical research which indicated that extended exposure to lower levels of ozone may be as harmful as short term exposure to elevated levels. The new eight-hour standard is set at 0.08 ppm and is exceeded when an average level of ozone over an eight hour period is 0.085 ppm or greater. The standard is attained if the fourth highest daily 8-hour average for each of the three most recent years are averaged and that average is less than 0.085 ppm. Eight-hour multi-year averages for 1998-2000 can be found on pages 22-23. In 2000 there were 65 exceedances of the 8-hour standard with twenty-two monitors recording at least one 8-hour exceedance. Only preliminary attainment designations have been made based on eight-hour readings.

A statistical summary of eight-hour ozone data collected in 2000 follows on pages 18-19.





*Less than ten years of data available for 1976-85
**Less than ten years of data available for 1986-95

Figure 4. Ozone trends

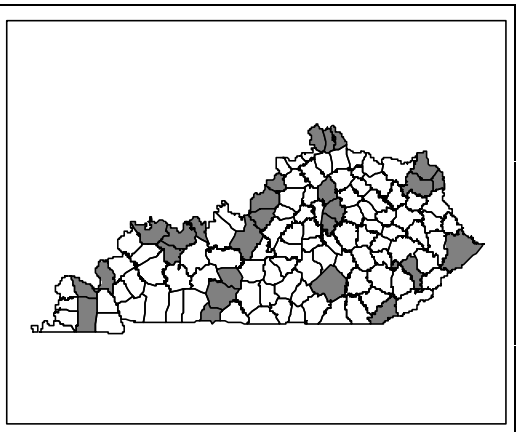
Criteria Pollutant Summary Report - 2000

Pollutant: Ozone
Method: Ultra-Violet Photometry
Data Interval: Hourly
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM
8-hour (3-year average of 4th max.) 0.08 PPM

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	1-Hr Average			8-Hr Average				
				Obs >0.12	1st max	2nd max	Obs >0.08	1st max	2nd max	3rd max	4th max
Bell	34th & Dorchester Middlesboro	21-013-0002	5854	0	.115	.113	7	.101	.100	.091	.090
Boone	KY 338 & Rabbit Hash Rd, Eastbend	21-015-0003	5854	0	.111	.109	3	.097	.094	.087	.083
Boyd	32nd and Railroad St Ashland	21-019-0015	5844	0	.095	.094	1	.085	.084	.079	.079
Bullitt	2nd & Carpenter St Shepherdsville	21-029-0006	5661	0	.097	.096	2	.090	.086	.082	.082
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	5797	0	.111	.110	6	.102	.097	.095	.093
Carter	Camp Webb Grayson Lake	21-043-0500	5693	0	.087	.086	0	.082	.081	.080	.080
Daviess	US 60 and Pleasant Valley, Owensboro	21-059-0005	5627	0	.085	.082	0	.076	.074	.074	.074
Edmonson[1]	Alfred Cook Road Mammoth Cave	21-061-0501	8268	0	.119	.103	4	.098	.090	.090	.088
Fayette	Iron Works Pike Lexington	21-067-0001	5693	0	.074	.072	0	.067	.067	.065	.062
Fayette	650 Newtown Pike Lexington	21-067-0012	5821	0	.091	.086	0	.084	.077	.077	.076
Graves	Byerly Farm on KY 1949, Symsonia	21-083-0003	5857	0	.119	.104	2	.095	.087	.082	.080
Greenup	Scott & Center St Worthington	21-089-0007	5779	0	.099	.089	1	.085	.080	.077	.077
Hancock	2nd & Caroline Lewisport	21-091-0012	5731	0	.102	.092	0	.083	.082	.080	.079
Hardin	801 North Miles St Elizabethtown	21-093-0006	5718	0	.104	.091	2	.088	.085	.083	.079
Henderson	North Green Street Henderson	21-101-0013	5693	0	.095	.092	0	.084	.080	.079	.078
Henderson	Baskett Fire Dept. Baskett	21-101-0014	5644	0	.096	.090	1	.085	.079	.078	.078
Jefferson[2]	7601 Bardstown Rd Louisville	21-111-0027	5817	0	.113	.108	5	.102	.092	.092	.090
Jefferson[2]	7201 Watson Lane Louisville	21-111-0051	5676	0	.093	.092	1	.087	.078	.077	.076
Jefferson[2]	1918 Mellwood Ave Louisville	21-111-1021	5106	0	.103	.100	3	.090	.089	.088	.084

Ozone Summary Report Continued

County	Site	AIRS-ID	# Obs	1-Hr Average			8-Hr Average				
				Obs >0.12	1st max	2nd max	Obs >0.08	1st max	2nd max	3rd max	4th max
Jessamine	DOT Garage US27 Nicholasville	21-113-0001	5681	0	.095	.083	1	.090	.078	.077	.077
Kenton	1401 Dixie Highway Covington	21-117-0007	5597	0	.112	.110	4	.103	.099	.092	.087
Livingston	DOT Garage US60 Smithland	21-139-0003	5859	0	.097	.092	1	.085	.084	.079	.078
Livingston	Bloodworth Farm Off KY 453	21-139-0004	5794	0	.112	.097	2	.098	.087	.084	.082
McCracken	2901 Powell Street Paducah	21-145-1024	5808	0	.120	.103	3	.107	.095	.087	.084
McLean	3962 KY 815 Guffie	21-149-0001	5633	0	.098	.094	0	.081	.080	.079	.079
Oldham	DOT Garage, Morgan Road, Buckner	21-185-0004	5358	0	.115	.112	4	.095	.094	.093	.085
Perry	Perry Co Horse Park Hazard	21-193-0003	3638	0	.091	.087	0	.082	.080	.073	.072
Pike	101 North Mayo Trail Pikeville	21-195-0002	5664	0	.088	.088	0	.081	.079	.078	.078
Pulaski	Clifty Street Somerset	21-199-0003	5839	0	.098	.096	4	.093	.093	.088	.087
Scott	Fire Station on KY32 Sadieville	21-209-0001	5249	0	.082	.082	0	.076	.075	.073	.071
Simpson	DOT Garage on KY 1008, Franklin	21-213-0004	5845	0	.113	.102	4	.094	.093	.090	.085
Warren	Oakland Elementary School, Oakland	21-227-0008	5863	0	.114	.104	4	.098	.090	.090	.088

[1] Monitor operated by the National Park Service at Mammoth Cave.
[2] Monitor operated by the Air Pollution Control District of Jefferson County.

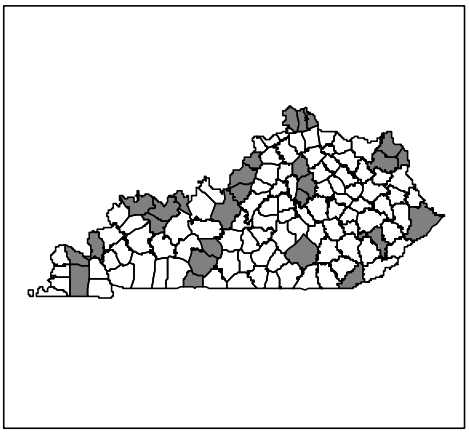
Criteria Pollutant Multi-year Summary Report -2000
3 Year Average of One-hour Expected Exceedances

Pollutant: Ozone
Method: Ultra-Violet Photometry
Data Interval: Hourly
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM
8-Hour (3-year average of 4th max.) 0.08 PPM

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	1998		1999		2000		3 year expected avg
			Actual	Expect	Actual	Expect	Actual	Expect	
Bell	34th & Dorchester Middlesboro	21-013-0002	0	0	0	0	0	0	0.0
Boone	KY 338 & Rabbit Hash Road, Eastbend	21-015-0003	0	0	0	0	0	0	0.0
Boyd	32nd & Railroad Streets Ashland	21-019-0015	0	0	0	0	0	0	0.0
Bullitt	2nd & Carpenter Streets Shepherdsville	21-029-0006	0	0	0	0	0	0	0.0
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	*	*	*	*	0	0	*
Carter	Camp Webb Grayson Lake	21-043-0500	0	0	0	0	0	0	0.0
Daviess	US 60 & Pleasant Valley Road, Owensboro	21-059-0005	1	1.0	0	0	0	0	0.3
Edmonson[1]	Alfred Cook Road Mammoth Cave	21-061-0501	0	0	1	1.0	0	0	0.3
Fayette	Iron Works Pike Lexington	21-067-0001	0	0	0	0	0	0	0.0
Fayette	650 Newtown Pike Lexington	21-067-0012	0	0	0	0	0	0	0.0
Graves	Byerly Farm, KY 1949 Symsonia	21-083-0003	0	0	0	0	0	0	0.0
Greenup	Scott & Center Streets Worthington	21-089-0007	2	2.1	0	0	0	0	0.7
Hancock	2nd & Caroline Streets Lewisport	21-091-0012	0	0	0	0	0	0	0.0
Hardin	801 North Miles Street Elizabethtown	21-093-0006	*	*	*	*	0	0	*
Henderson	North Green Street Henderson	21-101-0013	0	0	0	0	0	0	0.0
Henderson	Baskett Fire Dept Baskett	21-101-0014	0	0	0	0	0	0	0.0
Jefferson[2]	7601 Bardstown Road Louisville	21-111-0027	1	1.0	0	0	0	0	0.3
Jefferson[2]	7201 Watson Lane Louisville	21-111-0051	1	1.0	0	0	0	0	0.3
Jefferson[2]	1918 Mellwood Ave Louisville	21-111-1021	1	1.0	0	0	0	0	0.3

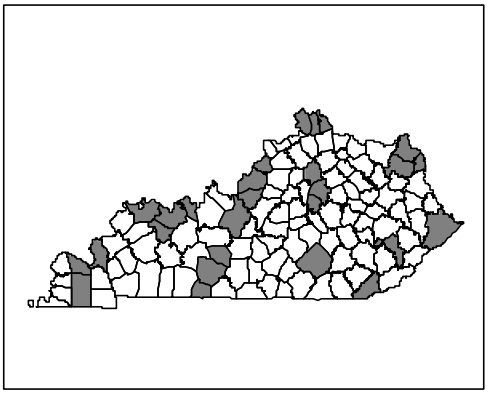
Ozone 3 Year 1-Hour Averages Continued

County	Site	AIRS-ID	1998		1999		2000		3 year expected Avg
			Actual	Expect	Actual	Expect	Actual	Expect	
Jessamine	DOT Garage US 27 Nicholasville	21-113-0001	0	0	0	0	0	0	0.0
Kenton	1401 Dixie Highway Covington	21-117-0007	1	1.0	0	0	0	0	0.3
Livingston	DOT Garage US 60 Smithland	21-139-0003	2	2.1	0	0	0	0	0.7
Livingston	Bloodworth Farm off KY 453	21-139-0004	1	1.0	0	0	0	0	0.3
McCracken	2901 Powell Street Paducah	21-145-1024	1	1.0	0	0	0	0	0.3
McLean	3962 KY 815 Guffie	21-149-0001	0	0	0	0	0	0	0.0
Oldham	DOT Garage, Morgan Rd Buckner	21-185-0004	1	1.0	1	1.2	0	0	0.7
Perry	Perry County Horse Park Hazard	21-193-0003	*	*	*	*	0	0	*
Pike	101 North Mayo Trail Pikeville	21-195-0002	0	0	0	0	0	0	0.0
Pulaski	Clifty Street Somerset	21-199-0003	0	0	0	0	0	0	0.0
Scott	Fire Station on KY 32 Sadieville	21-209-0001	0	0	0	0	0	0	0.0
Simpson	DOT Garage, KY 1008 Franklin	21-213-0004	0	0	0	0	0	0	0.0
Warren	Oakland Elementary Sch Oakland	21-227-0008	*	*	*	*	0	0	*

[1] Monitor operated by the National Park Service at Mammoth Cave.
[2] Monitor operated by the Air Pollution Control District of Jefferson County.

Criteria Pollutant Multi-year Summary Report - 2000
8-Hour 4th Maximum 3 Year Average

Pollutant: Ozone
Method: Ultra-Violet Photometry
Data Interval: Hourly
Units: Parts-per-million (PPM)



National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM
8-Hour (3-year average of 4th max.) 0.08 PPM

Secondary NAAQS: Same as Primary Standard

County	Site	AIRS-ID	1998 4th max	1999 4th max	2000 4th max	3 year Avg. 4th max
Bell	34th & Dorchester Middlesboro	21-013-0002	.087	.081	.090	.086
Boone	KY 338 & Rabbit Hash Road Eastbend	21-015-0003	.084	.091	.083	.086
Boyd	32nd & Railroad Streets Ashland	21-019-0015	.077	.094	.079	.083
Bullitt	2nd & Carpenter Streets Shepherdsville	21-029-0006	.090	.093	.082	.088
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	*	*	.093	*
Carter	Camp Webb Grayson Lake	21-043-0500	.096	.093	.080	.089
Daviess	US 60 & Pleasant Valley Rd Owensboro	21-059-0005	.086	.090	.074	.083
Edmonson[1]	Alfred Cook Road Mammoth Cave	21-061-0501	.098	.098	.088	.094
Fayette	Iron Works Pike Lexington	21-067-0001	.083	.087	.062	.077
Fayette	650 Newtown Pike Lexington	21-067-0012	.089	.091	.076	.085
Graves	Byerly Farm on KY 1949 Symsonia	21-083-0003	.086	.098	.080	.088
Greenup	Scott & Center Streets Worthington	21-089-0007	.098	.095	.077	.090
Hancock	2nd & Caroline Streets Lewisport	21-091-0012	.095	.093	.079	.089
Hardin	801 North Miles Street Elizabethtown	21-093-0006	*	*	.079	*
Henderson	North Green Street Henderson	21-101-0013	.078	.081	.078	.079
Henderson	Baskett Fire Dept Baskett	21-101-0014	.082	.096	.078	.085
Jefferson[2]	7601 Bardstown Road Louisville	21-111-0027	.096	.097	.090	.094
Jefferson[2]	7201 Watson Lane Louisville	21-111-0051	.095	.100	.076	.090
Jefferson[2]	1918 Mellwood Avenue Louisville	21-111-1021	.088	.086	.084	.086

Ozone 3 Year 8-Hour Continued

County	Site	AIRS-ID	1998 4th Max	1999 4th Max	2000 4th Max	3 year Avg. 4th max
Jessamine	DOT Garage US 27 Bypass Nicholasville	21-113-0001	.089	.082	.077	.082
Kenton	1401 Dixie Highway Covington	21-117-0007	.091	.091	.087	.089
Livingston	DOT Garage US 60 Smithland	21-139-0003	.093	.101	.078	.090
Livingston	Bloodworth Farm off KY 453 Livingston County	21-139-0004	.086	.092	.082	.086
McCracken	2901 Powell Street Paducah	21-145-1024	.090	.093	.084	.089
McLean	3962 KY 815 Guffie	21-149-0001	.085	.103	.079	.089
Oldham	DOT Garage, Morgan Rd Buckner	21-185-0004	.101	.103	.085	.096
Perry	Perry County Horse Park Hazard	21-193-0003	*	*	.072	*
Pike	101 North Mayo Trail Pikeville	21-195-0002	.085	.081	.078	.081
Pulaski	Clifty Street Somerset	21-199-0003	.084	.095	.087	.088
Scott	Fire Station on KY 32 Sadieville	21-209-0001	.088	.081	.071	.080
Simpson	DOT Garage, KY 1008 Franklin	21-213-0004	.090	.096	.085	.090
Warren	Oakland Elementary School Oakland	21-227-0008	*	*	.088	*

[1] Monitor operated by the National Park Service at Mammoth Cave.
[2] Monitor operated by the Air Pollution Control District of Jefferson County.

Particulate Matter - (PM_{10} / $PM_{2.5}$)

Particulate matter is a broad classification of non-gaseous pollutants that consists of very fine solid particles and liquid droplets or aerosols. Particulates are produced from many sources, including utility plants, wood burning stoves, leaf burning, vehicle exhaust, incinerators, rock quarries, coal processing, smelting, construction, farming and roadways. Common forms of particulates include fly ash, soot, soil, minerals, fibers, metals, oil aerosols and tire rubber.

The primary health effects of particulates are that they aggravate respiratory and cardiovascular disease and in large amounts increase the death rates of sufferers. The elderly, children, and people with chronic lung disease are especially sensitive to particulate matter. Particulate matter can soil and damage a wide range of man-made items such as building surfaces and may damage vegetation by interfering with plant photosynthesis due to the formation of a film on leaves reducing exposure to sunlight. Particulate pollution can also produce haze which diminishes visibility and the amount of sunlight reaching the earth.

Particulate matter is categorized according to particle diameter due to the health impacts caused by particles of differing sizes. Particles that are greater than fifty microns (50μm) in diameter rapidly settle out of the air due to gravity and pose a limited health risk. Particles that are less than fifty microns in diameter remain suspended in the air for longer periods and are classified as Total Suspended Particulates (TSP). The larger of these particles (between 10 and 50 microns) rarely penetrate deeply into the human respiratory system but are trapped and removed by the body's natural defenses. Early research on the effects of smaller or "fine particulate matter" indicated that particles ten microns in diameter or less posed the greatest risk to human health. Particulate matter ten microns or less in diameter is referred to as PM_{10} and is a subset of fine particles within the TSP category. Particles in the PM_{10} range are small enough to evade the body's natural defense systems and penetrate into the lungs, where tissue is damaged and the immune system is weakened.

Primary NAAQS:	Annual Arithmetic Mean not to exceed 50 $\mu g/m^3$ (based on a three-year average). Maximum 24-hour concentration of 150 $\mu g/m^3$. Average number of expected exceedances per year not to exceed 1.0 over last three years.
Secondary NAAQS:	Same as primary standard.

As a result of the research on fine particulate matter, the U. S. EPA adopted a PM_{10} standard on July 1, 1987 replacing the previous TSP standard. In 2000, the Division for Air Quality and the Air Pollution Control District of Jefferson County operated a combined network of thirty PM_{10} samplers in Kentucky. Twenty-three of those are intermittent type samplers that operate for twenty-four hours every sixth day. These samplers operate by drawing a measured volume of air thru a pre-weighed filter over a 24 hour period. Before reaching the filter the air passes through an impaction chamber where larger particles fall out of the airstream while particles smaller than ten microns pass on to the sample filter where they are collected. After completion of the sample run the filter is removed from the sampler and reweighed to determine the mass of the particulates collected. Sample

results are entered manually into a data storage system. The Division for Air Quality also operates seven continuously operating PM_{10} samplers that provide results daily. These samplers determine sample weights electronically and transmit results by telemetry for entry into an automated data storage system.

There was one exceedance of the 24-hour PM_{10} standard in 2000. It occurred on January 7 at Louisville site 21-111-0043 where a 24-hour sample of 152 $\mu g/m^3$ was collected. Prior to 2000 the only exceedance of a PM_{10} standard occurred on August 27, 1990 in Ashland where a 24-hour value of 182 $\mu g/m^3$ was collected. All Kentucky counties are currently in attainment with the PM_{10} standards. Statewide and regional PM_{10} levels have shown declining trends as seen in Figure 5.

A statistical summary of PM_{10} data collected during 2000 follows on pages 27-28.

$PM_{2.5}$

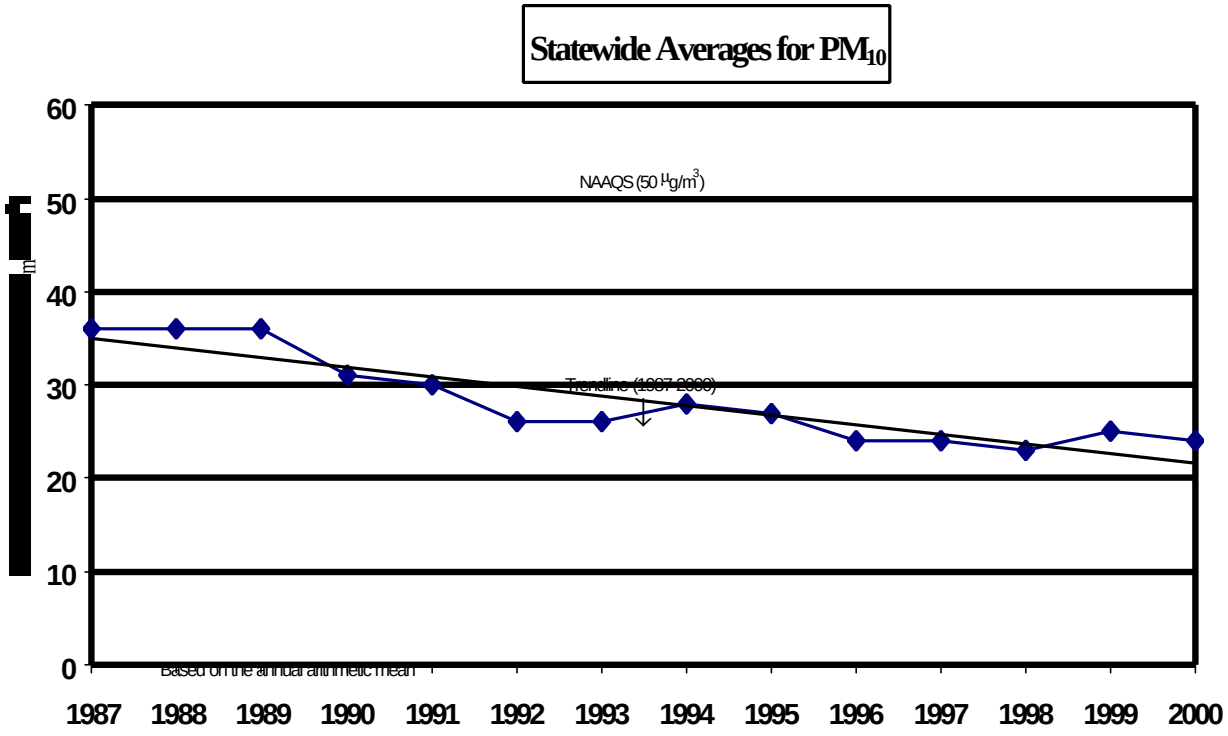
Medical and scientific research on the health effects of particulate matter continued after the adoption of the PM_{10} standard. As a result of further research it was determined that very fine particles in the 2.5 micron size range have the most adverse effects on human health. In response to these new findings the EPA adopted a $PM_{2.5}$ standard which became effective September 16, 1997.

$PM_{2.5}$ is monitored by intermittent type samplers that collect samples over a 24-hour run cycle. While most samplers operate every third day some operate every sixth day and some every day. Samplers operate by drawing a measured volume of air through a pre-weighed filter over a 24 hour sample period. Sample air passes through an impaction chamber where larger particles fall out of the air stream while particles smaller than 2.5 microns pass on to the sample filter where they are collected. After completion of the sample run the filter is collected and reweighed to determine the mass of the particulate collected. Sample results are entered into a data storage system. In 2000, the Division for Air Quality and the Air Pollution Control District of Jefferson County operated a network of twenty-two samplers.

Primary NAAQS:	Annual Arithmetic Mean not to exceed 15 $\mu g/m^3$ (based on a three-year average). 24-hour concentration not to exceed 65 $\mu g/m^3$. (based on a three-year average of the annual 98^{th} percentiles).
Secondary NAAQS:	Same as primary standard.

There were no exceedances of the 24-hour standard in 2000, however all but two samplers exceeded the annual standard. No attainment designations have been made as this was the second year of sampling and attainment designations are based on a three-year average of the means.

A statistical summary of 2000 $PM_{2.5}$ data appears on page 29-30.



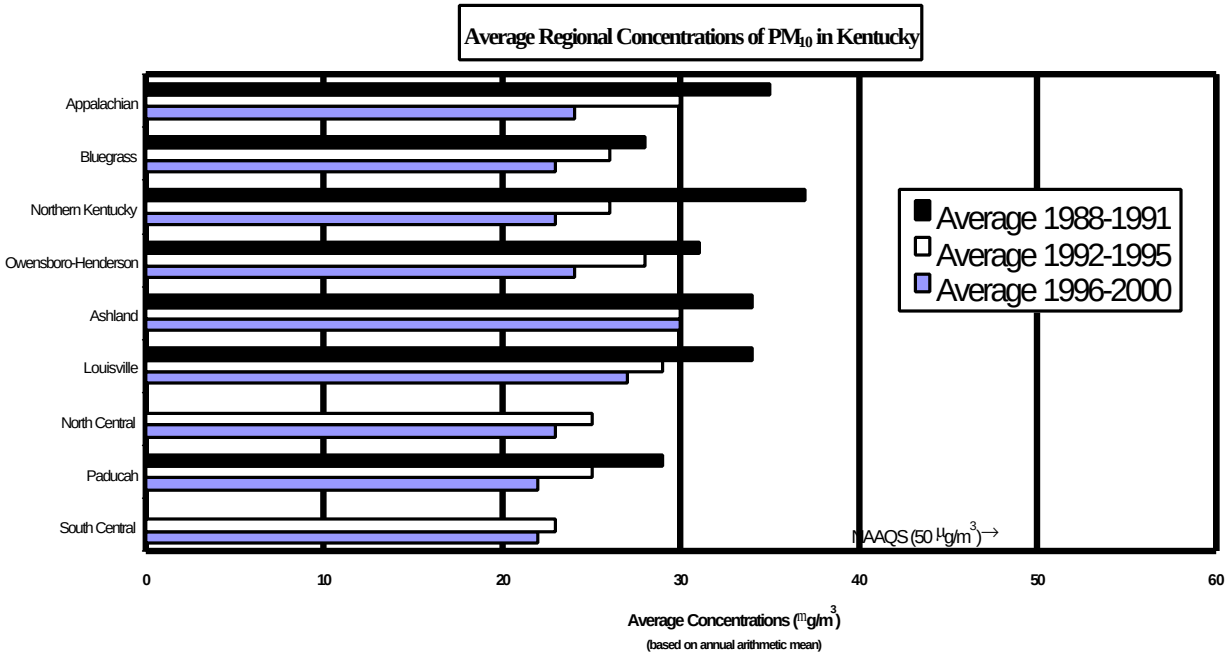
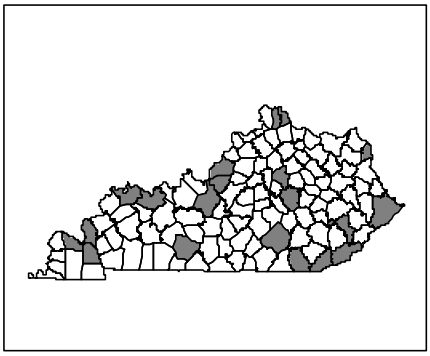


Figure 5. PM_{10} trends

Criteria Pollutant Summary Report - 2000

Pollutant: Particulate Matter PM_{10}
Method: Gravimetric
Data Interval: 24-Hour
Units: Micro-grams per cubic meter ($\mu g/m^3$)



National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean (3yr average) $50 \mu g/m^3$
24-hour average $150 \mu g/m^3$

Secondary NAAQS: Same as Primary Standard

County	Site	AIRS-ID	# Obs	Annual		24-hour Average				
				Obs >50	Mean	Obs >150	1st max	2nd max	3rd max	4th max
Bell	34th & Dorchester Middlesboro	21-013-0002	49	0	26	0	75	54	51	48
Boyd	122 22nd Street Ashland	21-019-0002	53	0	32	0	72	58	58	52
Boyd	32nd and Railroad St Ashland	21-019-0015	325	0	28	0	84	80	72	72
Boyd	2802 Louisa Street Catlettsburg	21-019-2001	57	0	26	0	58	48	48	47
Bullitt	2nd & Carpenter Street Shepherdsville	21-029-0006	49	0	26	0	69	68	64	52
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	39	0	24	0	44	43	42	42
Daviess	US 60 and Pleasant Valley, Owensboro	21-059-0005	347	0	20	0	72	64	50	49
Daviess	1316 W. 4th Street Owensboro	21-059-1001	48	0	25	0	71	50	45	42
Fayette	650 Newtown Pike Lexington	21-067-0012	333	0	21	0	56	49	47	46
Fayette	533 S Limestone Lexington	21-067-0014	53	0	25	0	70	45	42	42
Hardin	801 N Miles Street Elizabethtown	21-093-0006	38	0	19	0	56	44	41	40
Harlan	110 First Street Harlan	21-095-0003	58	0	24	0	50	48	46	43
Henderson	North Green Street Henderson	21-101-0013	265	0	18	0	62	48	47	44
Jefferson[1]	37th & Southern Ave Louisville	21-111-0043	50	0	36	1	152	84	75	72
Jefferson[1]	1032 Beecher Ave Louisville	21-111-0044	42	0	27	0	61	54	51	49
Jefferson[1]	850 Barret Ave Louisville	21-111-0048	42	0	29	0	57	56	50	49
Jefferson[1]	7201 Watson Lane Louisville	21-111-0051	57	0	30	0	83	75	72	67
Jefferson[1]	2425 Portland Ave Louisville	21-111-1009	55	0	31	0	81	71	71	65
Jefferson[1]	7709 Preston Highway Okolona	21-111-3001	51	0	28	0	88	75	54	53

PM_{10} Summary Report Continued

County	Site	AIRS-ID	# Obs	Annual		24-hour Average				
				Obs >50	Mean	Obs >150	1st max	2nd max	3rd max	4th max
Kenton	1401 Dixie Highway Covington	21-117-0007	334	0	19	0	53	50	49	48
Livingston	Bloodworth Farm, Off KY 453	21-139-0004	38	0	19	0	51	49	45	43
McCracken	342 Lone Oak Road Paducah	21-145-1004	40	0	22	0	57	51	43	41
McCracken	2901 Powell Street Paducah	21-145-1024	346	0	21	0	76	74	70	58
Madison	Mayfield School Richmond	21-151-0003	45	0	23	0	54	43	42	40
Marshall	24 Main Street Calvert City	21-157-0010	40	0	23	0	59	54	46	45
Perry	Perry Co Horse Park Hazard	21-193-0003	37	0	26	0	46	45	45	44
Pike	101 North Mayo Trail Pikeville	21-195-0002	273	0	20	0	46	43	42	41
Pulaski	Clifty Street Somerset	21-199-0003	56	0	25	0	57	50	48	40
Warren	16 Chestnut Street Bowling Green	21-227-0004	59	0	19	0	41	35	35	34
Whitley	1990 S Snyder Corbin	21-235-0002	57	0	25	0	60	57	54	54

[1] PM_{10} samplers located in Jefferson County are operated by the Air Pollution Control District of Jefferson County.

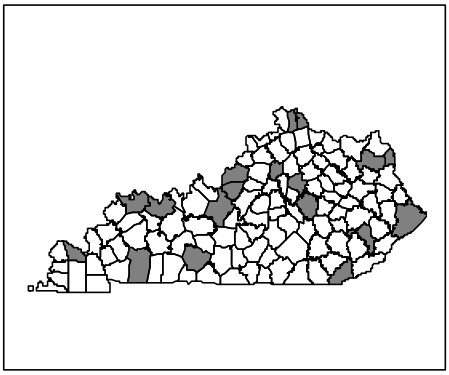
Criteria Pollutant Summary Report - 2000

Pollutant: Particulate Matter $PM_{2.5}$
Method: Gravimetric
Data Interval: 24-Hour
Units: Micro-grams per cubic meter ($\mu g/m^3$)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: Annual Arithmetic Mean (3yr average) $15 \mu g/m^3$
24-hour Average $65 \mu g/m^3$
(3yr average 98th percentiles)

Secondary NAAQS: Same as Primary Standard



County	Site	AIRS-ID	# Obs	Annual Mean	24-Hour Average				
					Obs >65	1st max	2nd max	3rd max	4th max
Bell	34th & Dorchester Middlesboro	21-013-0002	39	18.1	0	41.5	40.2	39.8	32.3
Boyd	2924 Holt Street Ashland	21-019-0017	73	17.2	0	37.2	34.1	34.0	32.6
Bullitt	2nd & Carpenter St Shepherdsville	21-029-0006	67	17.3	0	39.2	35.8	35.2	35.0
Campbell	700 Alexandria Pike Fort Thomas	21-037-0003	79	16.0	0	34.4	34.0	33.0	30.4
Carter	Camp Webb Grayson Lake	21-043-0500	70	15.1	0	29.5	28.8	27.8	27.8
Christian	10800 Pilot Rock Rd Hopkinsville	21-047-0006	64	17.0	0	40.4	39.7	38.3	34.7
Daviess	KY Wesleyan College Owensboro	21-059-0014	78	17.2	0	40.7	39.5	39.5	37.2
Fayette	650 Newtown Pike Lexington	21-067-0012	71	17.2	0	38.6	38.5	36.8	31.9
Fayette	533 S Limestone Lexington	21-067-0014	69	17.5	0	39.5	38.4	38.1	33.0
Franklin	803 Schenkel Lane Frankfort	21-073-0006	79	15.9	0	37.0	36.3	34.2	31.0
Hardin	801 N Miles Street Elizabethtown	21-093-0006	41	16.7	0	39.4	35.0	32.9	32.6
Henderson	Bend Gate School Henderson	21-101-0006	65	15.9	0	38.5	38.3	34.4	27.0
Jefferson[1]	37th and Southern Louisville	21-111-0043	214	16.5	0	43.7	40.5	38.3	38.2
Jefferson[1]	1032 Beecher Ave Louisville	21-111-0044	192	16.1	0	43.2	37.8	37.8	37.4
Jefferson[1]	850 Barret Ave Louisville	21-111-0048	48	14.2	0	32.2	23.6	22.1	21.9
Jefferson[1]	7201 Watson Lane Louisville	21-111-0051	34	15.0	0	32.0	26.8	23.3	22.5

$PM_{2.5}$ Summary Report Continued

County	Site	AIRS-ID	# Obs	Annual Mean	24-hour Average				
					Obs >65	1st max	2nd max	3rd max	4th max
Kenton	1401 Dixie Highway Covington	21-117-0007	71	17.6	0	38.9	38.4	37.2	36.9
McCracken	342 Lone Oak Road Paducah	21-145-1004	41	14.6	0	34.4	29.6	28.2	27.1
Madison	Mayfield School Richmond	21-151-0003	76	15.9	0	37.3	31.2	29.9	28.8
Perry	Perry Co Horse Park Hazard	21-193-0003	35	16.8	0	34.9	33.6	33.4	32.2
Pike	101 North Mayo Trail Pikeville	21-195-0002	69	16.3	0	32.7	31.5	31.3	30.9
Warren	Kereiakes Park Bowling Green	21-227-0007	76	16.2	0	41.8	33.8	32.6	32.3

[1] $PM_{2.5}$ samplers located in Jefferson County are operated by the Air Pollution Control District of Jefferson County.

Industrial Data

Various industries within the Commonwealth of Kentucky operate air monitoring networks and subsequently report the data from these networks to the Division for Air Quality. Monitoring activity designed to measure the background levels of selected pollutants prior to construction of a proposed source or the expansion of an existing source is termed PSD (Prevention of Significant Deterioration of air quality) monitoring. This type of network is normally set up to operate for approximately one year. Monitoring designed to measure the impact of new or expanded sources on the air quality of an area is termed post-construction monitoring. A third type of monitoring is termed compliance monitoring and is usually set up around existing sources to demonstrate compliance with permit conditions and ambient air standards.

Regardless of the type of monitoring undertaken by these industrial networks, all must meet the following requirements.

- The Division must receive and approve a copy of the monitoring plan for each network prior to commencement of monitoring.
- A member of the Technical Services Branch of the Division for Air Quality must inspect the monitoring site(s) before monitoring begins to ensure that applicable siting criteria are met.
- Operators of networks with CO, SO_2, and NO_2 monitors must use gaseous standards that are traceable to National Institute of Standards and Technology (NIST) gaseous Standard Reference Materials (SRM) to generate test concentrations.
- Test concentrations of O_3 must be obtained in accordance with the UV photometric calibration procedure specified in 40 CFR Part 50, Appendix D, or by means of a certified ozone transfer standard.
- Flow measurements must be made with a flow measuring device that is referenced to an authoritative volume or other standard.
- All samplers and monitors used for monitoring criteria pollutants must be approved as EPA reference or equivalent methods.
- All monitors are audited once each calendar quarter by a member of the Division's Quality Assurance Section.
- Air monitoring reports from these networks are due at the Division for Air Quality no later than 90 days after the end of each calendar quarter. These air monitoring reports are to consist of the raw data from each network (usually on a 3.5" diskette), a missing data report (explaining any gaps in the data), monitor calibrations, results from the biweekly precision checks carried out on each automated analyzer, audit reports, and copies of sections of the strip charts (only when requested).

The data from each network is reviewed for completeness and accuracy and to determine if there are any exceedances of any primary or secondary pollutant standards. A letter of receipt is sent to the operator of each network when their data has been received and reviewed. If corrections are deemed necessary, the network operator is notified so the corrections can be made and the data resubmitted.

A statistical summary of industrial data collected in 2000 follows on pages 32-34.

Criteria Pollutant Summary Report - 2000
Sites Operated by Industry

Pollutant: Sulfur Dioxide
Method: Ultra-Violet Fluorescence
Data Interval: Hourly
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

Primary NAAQS:	Annual Arithmetic Mean	0.03 PPM
	24-Hour Average	0.14 PPM
Secondary NAAQS:	3-Hour Average	0.50 PPM

County	Site	Facility-ID	# Obs	Annual Mean	24-Hr Average			3-Hr Average		
					1st max	2nd max	Obs >.14	1st max	2nd max	Obs >.50
Henderson	US 41 & KY 2096 Sebree	Western KY Electric	8315	.003	.018	.014	0	.099	.053	0
Henderson	KY 2097 Sebree	Western KY Electric	8340	.006	.047	.044	0	.260	.102	0
Webster	Bell Gibson Road	Western KY Electric	8272	.006	.097	.092	0	.284	.217	0
Wayne, WV	Spring Brook Dr Kenova, WV	Ashland-Marathon	8682	.011	.049	.046	0	.102	.089	0
Wayne, WV	Route 52 Neal, WV	Ashland-Marathon	8710	.010	.055	.042	0	.100	.098	0
Wayne, WV	Big Sandy Road Neal, WV	Ashland-Marathon	8708	.012	.049	.044	0	.118	.116	0

Criteria Pollutant Summary Report - 2000
Sites Operated by Industry

Pollutant: Nitrogen Dioxide
Method: Instrumental/Gas-Phase Chemiluminescence
Data Interval: Hourly
Units: Parts-per-million (PPM)

National Ambient Air Quality Standards (NAAQS)

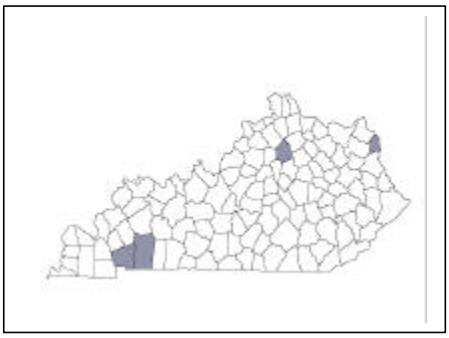
Primary NAAQS: Annual Arithmetic Mean 0.05 PPM

Secondary NAAQS: Same as Primary Standard

County	Site	Facility-ID	# Obs	Annual Mean	1-Hr Average	
					1st max	2nd max
Wayne, WV	Spring Brook Drive, Kenova, WV	Ashland-Marathon	8688	.018	.099	.092

Criteria Pollutant Summary Report - 2000
Sites Operated by Industry

Pollutant: Ozone
Method: Ultra-Violet Photometry
Data Interval: Hourly
Units: Parts-per-million (PPM)



National Ambient Air Quality Standards (NAAQS)

Primary NAAQS: 1-Hour (1 per year/3 years) 0.12 PPM
8-hour (3 year average of 4th max.) 0.08 PPM

Secondary NAAQS: Same as Primary Standard

County	Site	Facility-ID	# Obs	1-Hr Average			8-hour Average				
				Obs >0.12	1st max	2nd max	Obs >0.08	1st max	2nd max	3rd max	4th max
Christian	10800 Pilot Rock Rd Hopkinsville	TVA	4944	0	.104	.099	1	.089	.083	.081	.080
Scott	4673 Muddy Ford Rd Oxford	Toyota	5501	0	.088	.085	0	.084	.082	.081	.077
Trigg	Mulberry Flat Rd Land Between Lakes	TVA	4687	0	.107	.090	1	.091	.080	.077	.076
Wayne, WV	Spring Brook Dr Kenova, WV	Ashland-Marathon	8690	0	.114	.098	1	.094	.083	.081	.079

Acid Rain

Acid rain includes precipitation in the form of snow, sleet, hail, rain or fog that has a low pH level resulting from emissions of pollutants into the atmosphere, especially sulfur dioxide and nitrogen oxides. Acidified rainwater contains combinations of sulfuric and nitric acids that form when water vapor and sulfur dioxide and nitrogen oxides react. Major sources of sulfur dioxide include power plants, paper and wood pulp processing plants and facilities with coal fired boilers. Nitrogen oxides are produced primarily from the combustion of fossil fuels in the engines of cars, trucks and other vehicles and from power plant emissions.

Aquatic life appears to be most sensitive to the effects of acid rain. Small changes in the pH levels of lakes and streams may prevent some fish species and other aquatic life forms from reproducing. Many insects cannot survive in acidic waters and therefore birds and mammals that depend on insects for food may suffer abnormally high mortality rates. Acid rain can also alter soil chemistry and nutrient availability, in turn weakening trees and shrubs and causing them to be more vulnerable to insects, diseases and fungus infestations. Acid rain may also damage agricultural crops and has been blamed for deterioration of monuments and building surfaces.

Acid rain monitoring stations operate on a weekly sampling schedule. Cumulative precipitation events occurring during a seven day period are collected in one container to represent a one-week sample. An automatic wet/dry precipitation collector is used to collect the sample. The sampler consists of two collection containers. The “wet” container is fitted with a clean plastic sample bag for collection of precipitation. The “dry” container, designed for dry particulate collection is not presently utilized for sample collection. The sampler employs a moisture sensor which activates an electrically driven movable container lid that covers the wet container during dry periods and then moves to cover the dry container when precipitation occurs. At the end of each weekly sampling period, the wet container is removed and replaced with a new, clean container for the next sampling period. After the sample is removed, field measurements of pH and conductivity are made and recorded. The remaining sample is then shipped to Frankfort where laboratory analysis is conducted to determine levels for pH, conductivity, sulfates, nitrates, phosphates, ammonia and metal ions. The Division for Air Quality currently operates two acid rain sites, one at Mammoth Cave National Park and one at Grayson Lake State Park.

Annual pH averages for both sites have shown modest upward trends since 1985 meaning that rainfall is gradually becoming less acidic (see Figure 6). This improvement is due at least in part to successful efforts of power plants to curb sulfur dioxide and nitrogen dioxide emissions.

A statistical summary of acid rain data collected in 2000 follows on pages 37-38.

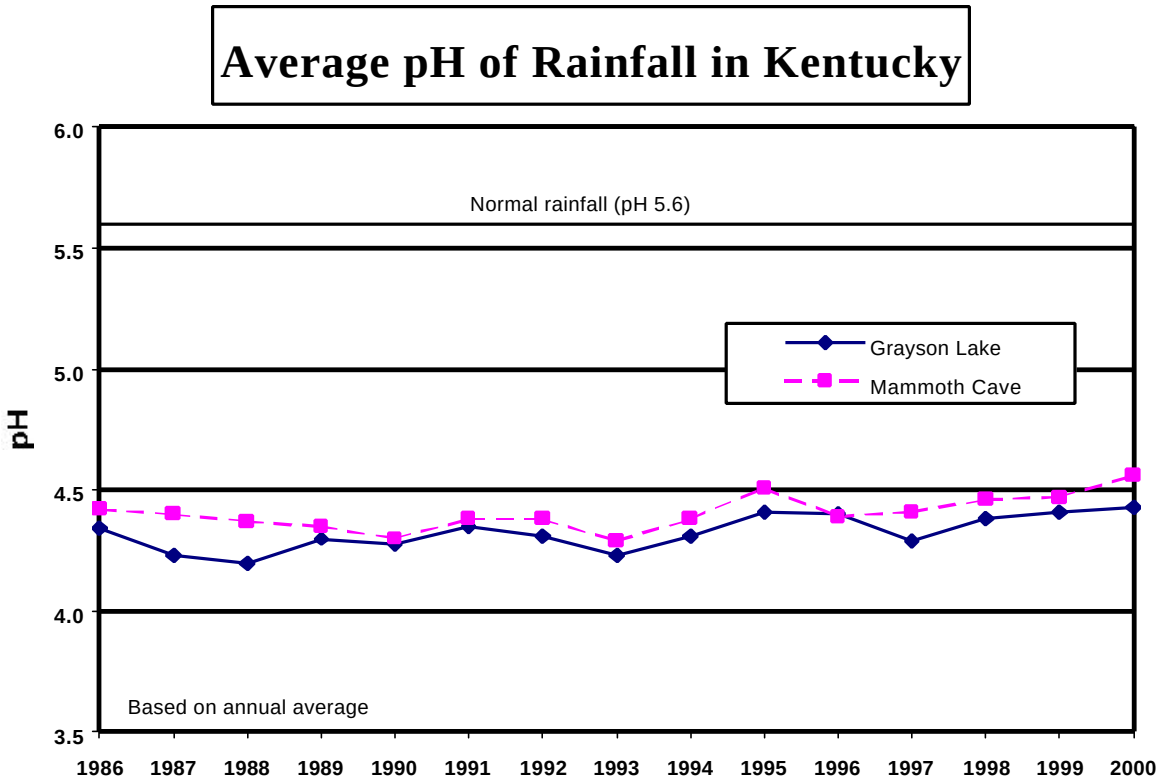


Figure 6. pH trends

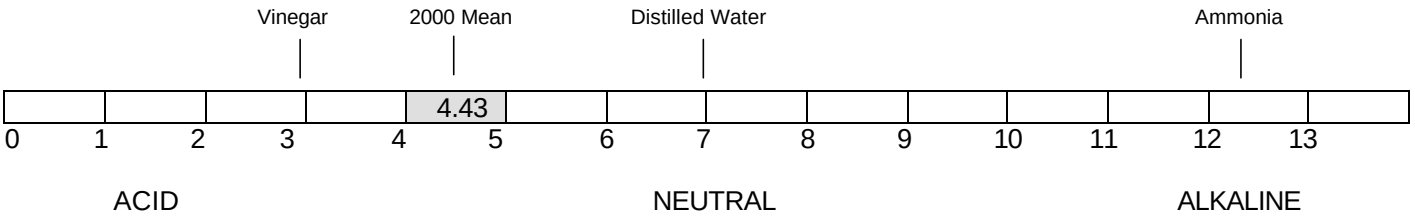
Acid Rain Pollutants Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-043-0500
County: Carter
Location: Grayson Lake, Camp Webb
Method: Wet/Dry Collector
Laboratory Analytical

Parameter	Units	# Obs	Arithmetic Mean	1st Max	2nd Max	3rd Max	4th Max
Acidity	Mg/L	29	4.21	10.70	9.56	6.48	6.02
Ammonia	Mg/L	27	0.46	2.14	1.01	0.99	0.85
Calcium	Mg/L	3	0.48	0.79	0.35	0.29	-
Chloride	Mg/L	30	0.34	1.17	0.64	0.63	0.61
Conductivity	µmho	27	25.18	106.0	69.1	43.4	35.9
Magnesium	Mg/L	3	0.16	0.36	0.06	0.05	-
Nitrate	Mg/L	31	2.12	7.80	4.83	4.20	3.95
Potassium	Mg/L	7	0.09	0.19	0.14	0.11	0.07
Sodium	Mg/L	3	0.91	1.72	0.70	0.30	-
Sulfate	Mg/L	31	2.59	9.93	9.03	7.57	3.45

pH is measured on a scale ranging from zero to fourteen where neutral substances such as distilled water are around seven on the scale. The more acidic substances such as vinegar would be on the lower end of the scale while alkaline substances such as ammonia would be on the upper end of the scale. The chart below indicates where the pH measurements for 2000 at Grayson Lake fall on this scale.

pH Scale



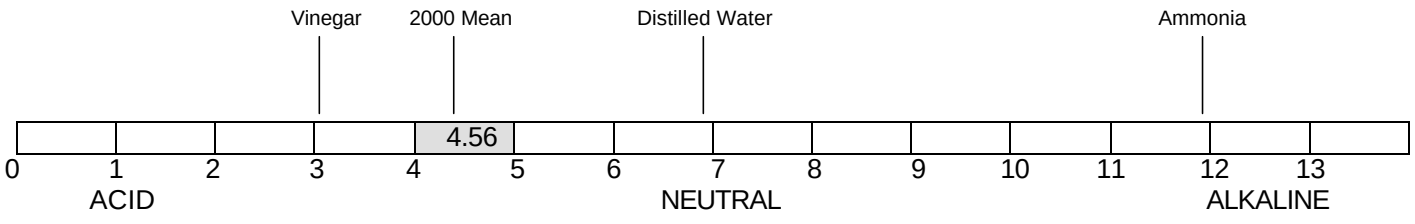
Acid Rain Pollutants Summary Report - 2000

Agency: National Parks Service and Kentucky Division for Air Quality
Site Id: 21-061-0501
County: Edmonson
Location: Mammoth Cave National Park Alfred Cook Road
Method: Wet/Dry Collector Laboratory Analytical

Parameter	Units	# Obs.	Arithmetic Mean	1st Max	2nd Max	3rd Max	4th Max
Acidity	Mg/L	41	3.79	11.80	7.72	5.62	5.61
Ammonia	Mg/L	40	0.44	1.36	0.92	0.78	0.71
Calcium	Mg/L	13	0.45	1.21	0.61	0.55	0.45
Chloride	Mg/L	41	0.57	2.57	1.15	1.03	1.02
Conductivity	µmho	36	22.12	57.1	46.9	40.4	34.6
Magnesium	Mg/L	32	0.16	0.53	0.45	0.37	0.33
Nitrate	Mg/L	41	2.30	8.20	8.01	5.05	4.87
Potassium	Mg/L	18	0.08	0.29	0.18	0.10	0.10
Sodium	Mg/L	9	0.98	5.30	0.69	0.56	0.46
Sulfate	Mg/L	41	2.23	8.80	4.32	4.28	4.20

pH is measured on a scale ranging from zero to fourteen where neutral substances such as distilled water are around seven on the scale. The more acidic substances such as vinegar would be on the lower end of the scale while alkaline substances such as ammonia would be on the upper end of the scale. The chart below indicates where the pH measurements for 2000 at Mammoth Cave fall on this scale.

pH Scale



Air Toxics

In addition to the six criteria pollutants for which National Ambient Air Quality Standards have been adopted, the Division for Air Quality in recent years has conducted sampling to assess the health risks associated with a wide variety of substances classified as toxic air pollutants. Air toxics include substances known or suspected to cause neurological, immunological, reproductive and respiratory disorders, as well as known or suspected human carcinogens. The most significant air toxics fall into four analytical classes: acids and caustics, metals, volatile organic compounds and semi-volatile or extractable organics.

The air toxics monitoring effort is a cooperative effort between the Kentucky Division for Air Quality and the Kentucky Division of Environmental Services, which provides the analytical support. An air toxics study was implemented in six Kentucky metropolitan areas in the spring of 2000 and was completed in 2001. Sample results for the entire study are included in the following pages.

1. Acids and Caustics

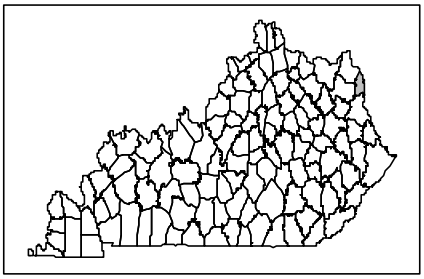
Annular denuders are used to collect reactive acidic and caustic (e.g. basics) gases and particulate matter contained in ambient air. In operation, ambient air is drawn through an inlet assembly, past denuder walls, which have been etched and coated with chemicals that absorb the gaseous pollutants of interest, and is then filtered through membrane filters to capture particulate matter. After collection, samples are sent to the laboratory where pollutant concentrations are quantified using ion chromatography (IC) analysis and /or colorimeter autoanalysis. This method is used to measure the following pollutants:

Ammonia (gaseous)
Ammonia (particulate)
Hydrochloric acid
Hydronium ion
Nitrate (particulate)
Nitric acid (gaseous)
Nitrous acid (gaseous)
Sulfate (particulate)
Sulfur dioxide (gaseous)

Annular denuder sample results are summarized on pages 40-45. Although all compounds were checked for in each analysis, only those compounds detected are included in these reports.

Air Toxics Monitoring Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-019-0015
County: Boyd
Location: Ashland
Group: Acids and Caustics
Method: EPA Method IO-4
Collection: Annular Denuder
Analysis: Ion Chromatography/Colorimetric
Units: $\mu g/m^3$

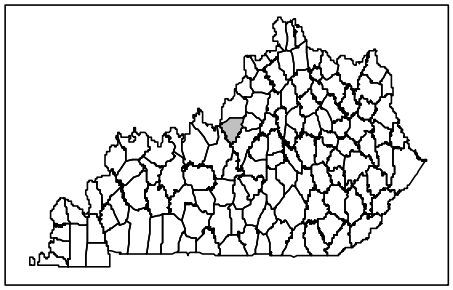


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
Ammonia (gaseous)	28	21	6.24	3.66	3.59	3.42*	0.87
Ammonia (particulate)	28	27	7.91	6.02	5.78	4.31	1.70
Hydrochloric Acid	28	27	9.12	2.45	2.06	1.30	0.621
Nitrate (particulate)	28	28	23.0	19.9	6.63	6.43	1.665
Nitric Acid	28	28	2.46	2.45	2.06	1.56	0.6185
Nitrous Acid	28	27	7.45	7.34*	4.39	2.47	1.15
Sulfate (particulate)	28	28	28.10	13.50	11.20	10.70	4.315
Sulfur Dioxide	28	27	47.30*	33.50	26.70	20.70	8.64

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

Agency:	Kentucky Division for Air Quality
Site ID:	21-029-0006
County:	Bullitt
Location:	Shepherdsville
Group:	Acids and Caustics
Method:	EPA Method IO-4
Collection:	Annular Denuder
Analysis:	Ion Chromatography/Colorimetric
Units:	$\mu g/m^3$

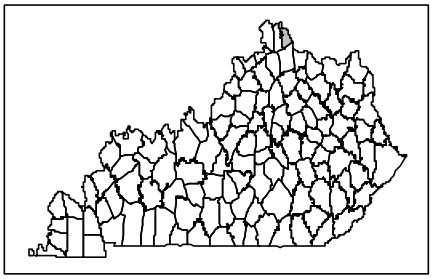


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
Ammonia (gaseous)	24	14	3.40	1.93	1.84*	1.60	1.06
Ammonia (particulate)	24	23	19.10	5.65	3.91	3.74	1.88
Hydrochloric Acid	24	23	3.80	3.51	2.80	2.65	1.05
Nitrate (particulate)	24	20	89.40	9.68	7.96	7.56	2.00
Nitric Acid	24	23	3.67	3.66*	2.81	2.19	0.707
Nitrous Acid	24	24	6.80	4.04	3.58*	3.05	1.17
Sulfate (particulate)	24	24	20.40	11.20	10.30	10.20*	4.86
Sulfur Dioxide	24	23	51.70	28.50	24.50	22.60	10.30

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-037-0003
County: Campbell
Location: Fort Thomas
Group: Acids and Caustics
Method: EPA Method IO-4
Collection: Annular Denuder
Analysis: Ion Chromatography/Colorimetric
Units: $\mu g/m^3$

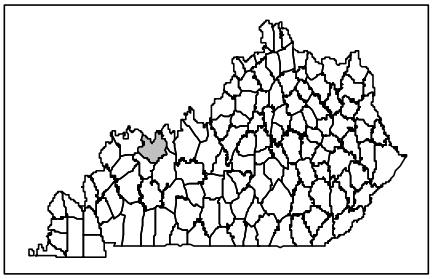


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
Ammonia (gaseous)	28	18	3.87	2.50	2.08	1.92	0.943
Ammonia (particulate)	28	25	5.57	4.31	3.85	3.27	1.95
Hydrochloric Acid	28	28	2.97	2.59	2.53	1.86	0.984
Nitrate (particulate)	28	28	16.60	11.70	8.59	7.90	2.33
Nitric Acid	28	27	3.01	2.69	2.34	2.33*	0.75
Nitrous Acid	28	28	4.23	3.31	2.63	1.90*	1.365
Sulfate (particulate)	28	28	20.50	12.50	10.60	7.21*	3.135
Sulfur Dioxide	28	28	62.90	23.30	18.60	18.00	9.29

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

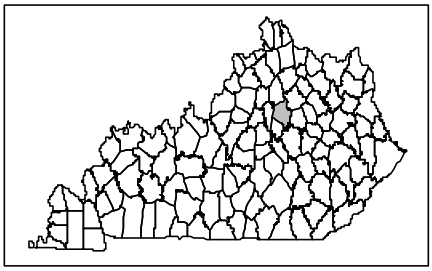
Agency:	Kentucky Division for Air Quality
Site ID:	21-059-0005
County:	Daviess
Location:	Owensboro
Group:	Acids and Caustics
Method:	EPA Method IO-4
Collection:	Annular Denuder
Analysis:	Ion Chromatography/Colorimetric
Units:	$\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
Ammonia (gaseous)	25	16	4.84	2.36	2.22	1.32	0.6175
Ammonia (particulate)	25	24	5.78	5.51	5.07	4.99	2.045
Hydrochloric Acid	25	23	2.60	2.50	2.48	1.77	0.699
Nitrate (particulate)	25	24	16.10	15.40	11.00	8.90	3.65
Nitric Acid	25	23	3.34	2.69	2.23	2.06	0.686
Nitrous Acid	25	25	4.38	2.20	2.02	1.87	1.15
Sulfate (particulate)	25	25	16.50	15.30	12.30	12.20	3.58
Sulfur Dioxide	25	24	38.60	31.30	23.10	19.60	9.655

Air Toxics Monitoring Summary Report - 2000

Agency:	Kentucky Division for Air Quality
Site ID:	21-067-0012
County:	Fayette
Location:	Lexington
Group:	Acids and Caustics
Method:	EPA Method IO-4
Collection:	Annular Denuder
Analysis:	Ion Chromatography/Colorimetric
Units:	$\mu g/m^3$

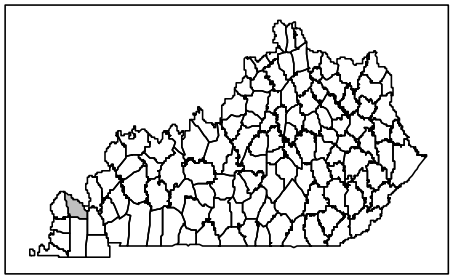


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
Ammonia (gaseous)	30	20	4.48	3.80	2.36	2.00	0.7675
Ammonia (particulate)	30	27	55.00*	45.00*	7.31	5.11	1.94
Hydrochloric Acid	30	27	17.50	2.87	2.68	2.51	0.606
Nitrate (particulate)	30	29	271.0	213.0*	21.90	9.74	3.04
Nitric Acid	30	27	3.86	2.98*	2.91	2.66	0.752
Nitrous Acid	30	29	5.09	3.65	2.35	1.88	1.25
Sulfate (particulate)	30	29	18.30	12.70	10.60	9.00	2.95
Sulfur Dioxide	30	29	37.50	35.20*	28.30	26.40	8.17

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

Agency:	Kentucky Division for Air Quality
Site ID:	21-145-1024
County:	McCracken
Location:	Paducah
Group:	Acid and Caustics
Method:	EPA Method IO-4
Collection:	Annular Denuder
Analysis:	Ion Chromatography/Colorimetric
Units:	$\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
Ammonia (gaseous)	24	16	5.09	2.70	1.98	1.44	0.787
Ammonia (particulate)	24	23	5.94	5.22	4.60	4.39	1.57
Hydrochloric Acid	24	23	2.69	2.38	2.06	1.41	0.622
Nitrate (particulate)	24	24	24.20	17.00	13.50	11.50	2.30
Nitric Acid	24	23	2.62	2.11	2.08	1.87	0.564
Nitrous Acid	24	24	4.09	2.66	2.38	2.11	1.24
Sulfate (particulate)	24	24	31.30	10.90	10.00	8.64	2.57
Sulfur Dioxide	24	24	21.60	10.90	10.40	10.40	5.12

2. Metals

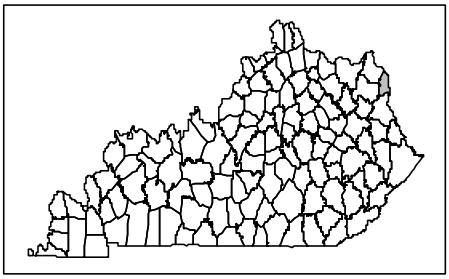
Metals samples are collected using samplers that capture particulates on 8" x 10" glass fiber filters. Samplers operate for 24-hours once in a twelve-day cycle. After the sample run is completed, the filter is removed and sent to the laboratory where it is analyzed by Graphite Furnace. This method is capable of measuring the following metals with detection limits of at least 0.001 µg/m^3:

Aluminum	Magnesium
Antimony	Manganese
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Strontium
Copper	Thallium
Iron	Tin
Lead	Vanadium
	Zinc

Metals sample results are summarized on pages 47-52. Although all compounds were checked for in each analysis, only those compounds detected are included in these reports.

Air Toxics Monitoring Summary Report - 2000

Agency:	Kentucky Division for Air Quality
Site ID:	21-019-0015
County:	Boyd
Location:	Ashland
Group:	Metals
Method:	40 CFR Part 50 Appendix G
Collection:	Hi-Volume Sampler
Analysis:	Graphite Furnace
Units:	$\mu g/m^3$

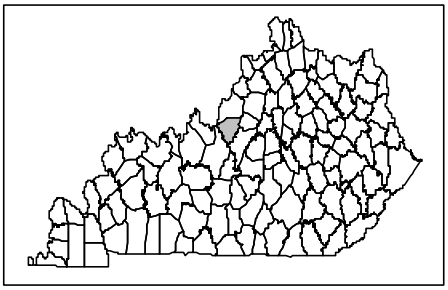


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
Antimony	27	1	0.016	-	-	-	-
Arsenic	27	16	0.006*	0.005	0.004	0.004	0.002
Barium	27	21	0.031	0.026	0.024	0.019	0.006
Cadmium	27	8	0.002	0.001	0.001	0.001	0.001
Chromium	27	14	0.006*	0.005	0.003	0.003	0.0015
Cobalt	27	6	0.002	0.002	0.002*	0.001	0.0015
Copper	27	27	0.368	0.182	0.172	0.170	0.137
Lead	27	25	0.036	0.032*	0.023	0.019	0.007
Manganese	27	27	0.146*	0.120	0.112	0.110	0.032
Molybdenum	27	17	0.015*	0.007	0.004	0.002	0.0015
Nickel	27	18	0.014*	0.004	0.003	0.003	0.002
Selenium	27	19	0.006	0.005	0.004	0.004	0.003
Strontium	27	25	0.016*	0.013	0.012	0.010	0.004
Thallium	27	1	0.001	-	-	-	-
Tin	27	4	0.004	0.003	0.002	0.002	0.0025
Vanadium	27	20	0.011	0.005	0.005	0.004*	0.002
Zinc	27	27	0.227	0.186	0.133	0.116	0.0436

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-029-0006
County: Bullitt
Location: Shepherdsville
Group: Metals
Method: 40 CFR Part 50 Appendix G
Collection: Hi-Volume Sampler
Analysis: Graphite Furnace
Units: $\mu g/m^3$

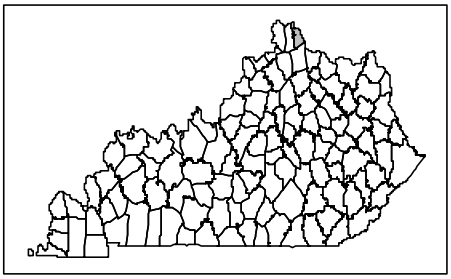


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
Arsenic	23	18	0.006	0.005	0.003	0.003	0.002
Barium	23	22	0.037	0.019	0.015	0.015	0.006
Cadmium	23	10	0.001	0.001	0.001	0.001	0.001
Chromium	23	4	0.002	0.001	0.001	0.001	0.001
Cobalt	23	1	0.001	-	-	-	-
Copper	23	25	0.540	0.421	0.337	0.255	0.138
Lead	23	24	0.010	0.010	0.009	0.009	0.005
Manganese	23	25	0.054	0.041	0.036*	0.033*	0.014
Molybdenum	23	10	0.002	0.002*	0.002*	0.001	0.001
Nickel	23	19	0.009*	0.004	0.003	0.002	0.002
Selenium	23	17	0.005	0.004	0.003	0.002	0.002
Silver	23	1	0.001	-	-	-	-
Strontium	23	25	0.006*	0.006*	0.004	0.004	0.002
Tin	23	2	0.006	0.004	-	-	0.005
Vanadium	23	16	0.002*	0.002*	0.001	0.001	0.001
Zinc	23	25	0.247	0.069	0.058*	0.056	0.032

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

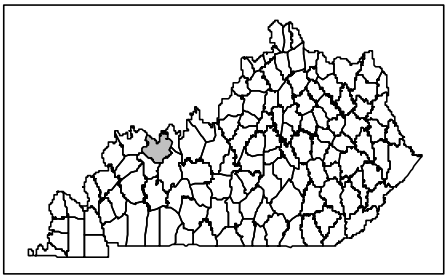
Agency: Kentucky Division for Air Quality
Site ID: 21-037-0003
County: Campbell
Location: Fort Thomas
Group: Metals
Method: 40 CFR Part 50 Appendix G
Collection: Hi-Volume Sampler
Analysis: Graphite Furnace
Units: $\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
Arsenic	25	11	0.005	0.005	0.005	0.004	0.002
Barium	25	20	0.053	0.032	0.026	0.010	0.0065
Cadmium	25	3	0.001	0.001	0.001	-	0.001
Chromium	25	8	0.002	0.002	0.001	0.001	0.001
Cobalt	25	6	0.003	0.002	0.001	0.001	0.001
Copper	25	25	0.285	0.233	0.213	0.196	0.089
Lead	25	25	0.023	0.013	0.012	0.010	0.005
Manganese	25	25	0.031	0.030	0.029	0.028	0.011
Molybdenum	25	12	0.003	0.002	0.002	0.001	0.001
Nickel	25	16	0.003	0.003	0.002	0.002	0.002
Selenium	25	16	0.005	0.004	0.004	0.004	0.002
Silver	25	3	0.005	0.002	0.002	-	0.002
Strontium	25	23	0.012	0.008	0.007	0.006	0.003
Tin	25	6	0.003	0.003	0.003	0.002	0.0025
Vanadium	25	13	0.003	0.003	0.002	0.002	0.001
Zinc	25	25	0.099	0.059	0.056	0.038	0.027

Air Toxics Monitoring Summary Report - 2000

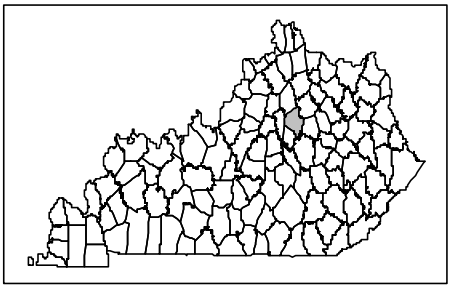
Agency: Kentucky Division for Air Quality
Site ID: 21-059-0005
County: Daviess
Location: Owensboro
Group: Metals
Method: 40 CFR Part 50 Appendix G
Collection: Hi-Volume Sampler
Analysis: Graphite Furnace
Units: $\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
Arsenic	22	13	0.004	0.002	0.002	0.002	0.002
Barium	22	14	0.021	0.018	0.009	0.009	0.0075
Cadmium	22	13	0.001	0.001	0.001	0.001	0.001
Chromium	22	2	0.009	0.001	-	-	0.005
Cobalt	22	2	0.001	0.001	-	-	0.001
Copper	22	22	0.095	0.094	0.090	0.087	0.059
Lead	22	22	0.018	0.011	0.009	0.009	0.004
Manganese	22	22	0.019	0.019	0.017	0.016	0.011
Molybdenum	22	11	0.003	0.001	0.001	0.001	0.001
Nickel	22	11	0.009	0.002	0.002	0.002	0.002
Selenium	22	14	0.006	0.004	0.003	0.003	0.002
Silver	22	1	0.003	-	-	-	-
Strontium	22	22	0.007	0.006	0.005	0.005	0.004
Tin	22	4	0.006	0.006	0.005	0.002	0.0055
Vanadium	22	15	0.003	0.002	0.002	0.001	0.001
Zinc	22	22	0.073	0.045	0.041	0.029	0.0205

Air Toxics Monitoring Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-067-0012
County: Fayette
Location: Lexington
Group: Metals
Method: 40 CFR Part 50 Appendix G
Collection: Hi-Volume Sampler
Analysis: Graphite Furnace
Units: $\mu g/m^3$

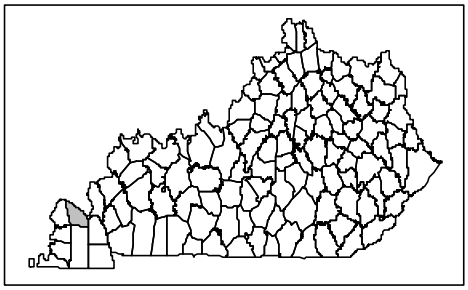


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
Arsenic	27	18	0.003	0.003	0.003	0.002	0.002
Barium	27	22	0.050	0.040	0.030	0.016	0.007
Cadmium	27	18	0.002	0.001	0.001	0.001	0.001
Chromium	27	2	0.001	0.001	-	-	0.001
Cobalt	27	5	0.001	0.001	0.001	0.001	0.001
Copper	27	27	0.410	0.360	0.327	0.272	0.144
Lead	27	27	0.018	0.018	0.011	0.011*	0.006
Manganese	27	27	0.029*	0.025	0.024	0.024	0.011
Molybdenum	27	12	0.004	0.004	0.003	0.003	0.001
Nickel	27	21	0.004	0.004	0.003	0.003	0.002
Selenium	27	20	0.005	0.005	0.004*	0.003	0.003
Strontium	27	25	0.006*	0.005	0.005	0.005	0.004
Thallium	27	1	0.003	-	-	-	-
Tin	27	7	0.007	0.005	0.003	0.003	0.003
Vanadium	27	16	0.003	0.002	0.002	0.002	0.001
Zinc	27	27	0.073	0.058	0.057	0.051	0.036

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-145-1024
County: McCracken
Location: Paducah
Group: Metals
Method: 40 CFR Part 50 Appendix G
Collection: Hi-Volume Sampler
Analysis: Graphite Furnace
Units: $\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
Arsenic	22	10	0.006	0.005	0.003	0.003	0.002
Barium	22	17	0.097	0.024	0.018	0.016	0.006
Cadmium	22	5	0.001	0.001	0.001	0.001	0.001
Chromium	22	5	0.002	0.001	0.001	0.001	0.001
Cobalt	22	2	0.001	0.001	-	-	0.001
Copper	22	22	0.140	0.113	0.104	0.098	0.0665
Lead	22	21	0.036	0.017	0.010	0.009	0.005
Manganese	22	22	0.065	0.045	0.035	0.026	0.013
Molybdenum	22	7	0.003	0.002	0.001	0.001	0.001
Nickel	22	11	0.002	0.002	0.002	0.002	0.002
Selenium	22	6	0.002	0.002	0.002	0.002	0.002
Silver	22	1	0.005	-	-	-	-
Strontium	22	22	0.015	0.012	0.011	0.010	0.006
Tin	22	2	0.004	0.002	-	-	0.003
Vanadium	22	10	0.003	0.002	0.002	0.002	0.001
Zinc	22	22	0.064	0.050	0.043	0.042	0.029

3. Volatile organic compounds

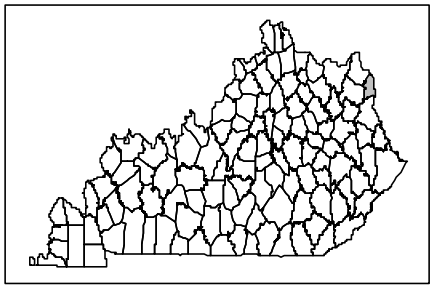
Monitoring for volatile organics is accomplished by collecting whole air 24-hour composite samples in non-reactive stainless steel SUMMA® canisters. Samples are then analyzed in the laboratory with a gas chromatograph/mass spectrometer. Current methodology targets the following compounds with a detection limit of 0.001µg/m^3. Other compounds can be detected by this methodology and are reported if found.

1,1,1,2-Tetrachloroethane	Bromoform
1,1,1-Trichloroethane	Bromomethane
1,1,2,2-Tetrachloroethane	Carbon disulfide
1,1,2-Trichloroethane	Carbon tetrachloride
1,1-Dichloroethane	Chlorobenzene
1,1-Dichloroethene	Chloroethane
1,1-Dichloropropene	Chloroform
1,2,3-Trichlorobenzene	Chloromethane
1,2,3-Trichloropropane	Dibromochloromethane
1,2,4-Trichlorobenzene	Dibromomethane
1,2,4-Trimethylbenzene	Dichlorodifluoromethane
1,2-Dibromo-3-chloropropane	Ethylbenzene
1,2-Dibromomethane (EDB)	Hexachlorobutadiene
1,2-Dichlorobenzene	Isopropyl toluene (Cymene)
1,2-Dichloroethane	Isopropylbenzene (Cumene)
1,2-Dichloropropane	Naphthalene
1,2-Xylene	Styrene
1,3,5-Trimethylbenzene	Tetrachloroethene
1,3-Dichlorobenzene	Toluene
1,3-Dichloropropane	Trichloroethene
1,4-Dichlorobenzene	Trichlorofluoromethane
1-Chlorohexane	Vinyl acetate
2,2-Dichloropropane	Vinyl chloride
2-Butanone (MEK)	cis-1,2-Dichloroethene
2-Chlorotoluene	cis-1,3-Dichloropropene
2-Hexanone (MBK)	n-Butylbenzene
3-Chlorotoluene	n-Propylbenzene
4-Chlorotoluene	sec-Butylbenzene
4-Methyl-2-pentanone (MIBK)	tert-Butylbenzene
Benzene	trans-1,3-Dichloropropene
Bromobenzene	trans-1,3-Dichloroethene
Bromochloromethane	1,3-Xylene
Bromodichloromethane	1,4-Xylene

Volatile organic compounds sample results for are summarized on pages 54-59. Although all compounds were checked for during analysis, only those compounds that were detected are included in these reports.

Air Toxics Monitoring Summary Report - 2000

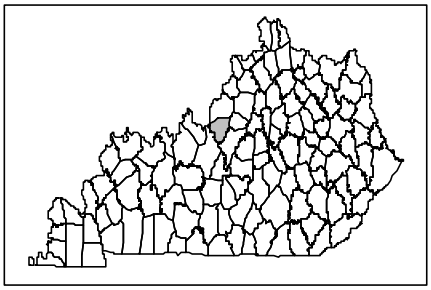
Agency: Kentucky Division for Air Quality
Site ID: 21-019-0015
County: Boyd
Location: Ashland
Group: Volatile Organic Compounds
Method: EPA Method TO14
Collection: Summa Passivated Canisters
Analysis: GC/MS Full-Scan Mode
Units: $\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
1,1,1-Trichloroethane	25	1	2.52	-	-	-	-
1,2-Xylene	25	4	3.90	2.72	2.13	1.92	2.425
1,2,4-Trimethyl-benzene	25	3	3.09	2.52	1.64	-	2.52
1,3-Xylene & 1,4-Xylene	25	10	7.50	6.42	6.06	3.73	3.205
Benzene	25	21	37.20	34.00	22.60	21.60	9.17
Carbon Disulfide	25	1	4.28	-	-	-	-
Chlorobenzene	25	9	3.28	3.04	2.82	2.74	2.72
Chloroethane	25	1	2.91	-	-	-	-
Chloromethane	25	4	2.60	2.32	1.94	1.50	2.13
Dichlorodifluoromethane	25	23	36.00	30.30	25.60	24.20	11.90
Dichloromethane	25	2	54.90	3.01	-	-	28.955
Ethylbenzene	25	3	2.61	2.12	1.78	-	2.12
Isopropylbenzene	25	2	2.57	1.11	-	-	1.84
Naphthalene	25	5	22.40	14.10	10.10	3.27	10.10
Styrene	25	4	3.56	2.45	2.21	2.04	2.33
Tetrachloroethene	25	1	2.24	-	-	-	-
Toluene	25	24	29.60	28.70	26.90	26.10	7.845
Trichlorofluoromethane	25	12	2.95	2.61	2.53	2.38	1.995

Air Toxics Monitoring Summary Report - 2000

Agency: Kentucky Division for Air Quality
Site ID: 21-029-0006
County: Bullitt
Location: Shepherdsville
Group: Volatile Organic Compounds
Method: EPA Method TO14
Collection: Summa Passivated Canisters
Analysis: GC/MS Full-Scan Mode
Units: $\mu g/m^3$

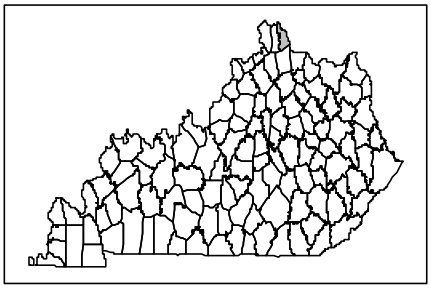


Parameter	# of samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
1,2,4-Trimethylbenzene	30	5	3.30	3.12	1.91	1.76*	1.91
1,2-Xylene	30	4	2.52	2.37	1.91	1.08	2.14
1,3-Xylene & 1,4-Xylene	30	11	6.89	6.36	6.14	3.58*	3.28
Benzene	30	13	4.38	3.02	2.36	2.30	2.14
Bromomethane	30	1	2.40	-	-	-	-
sec-Butylbenzene	30	1	2.63	-	-	-	-
Chloromethane	30	5	4.49	1.52	1.46	1.40	1.46
Dichlorodifluoromethane	30	30	35.60	33.00	30.60	28.20	9.825
Dichloromethane	30	1	67.10	-	-	-	-
Ethylbenzene	30	4	1.74	1.50	1.06*	1.04	1.28
Styrene	30	5	46.20	3.25	2.81	2.12	2.81
Toluene	30	19	25.80	15.40*	11.90	11.10	4.52
Trichlorofluoromethane	30	11	2.40	2.26	2.14	2.10*	1.64

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

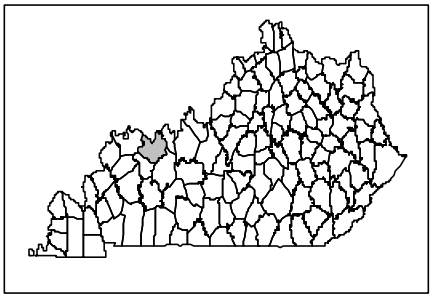
Agency: Kentucky Division for Air Quality
Site ID: 21-037-0003
County: Campbell
Location: Fort Thomas
Group: Volatile Organic Compounds
Method: EPA Method TO14
Collection: Summa Passivated Canisters
Analysis: GC/MS Full-Scan Mode
Units: $\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
1,2,3-Trichlorobenzene	30	1	2.68	-	-	-	-
1,2,4-Trimethylbenzene	30	1	6.24	-	-	-	-
1,2-Xylene	30	2	19.70	2.25	-	-	10.975
1,3-Xylene & 1,4-Xylene	30	6	76.70	4.36	3.85	2.93	3.39
Benzene	30	11	2.68	2.42	2.32	2.13	1.45
sec-Butylbenzene	30	1	2.95	-	-	-	-
Carbon disulfide	30	2	5.72	2.73	-	-	4.225
Chlorobenzene	30	6	3.19	3.18	2.95	2.49	2.72
Chloromethane	30	7	4.90	2.48	2.15	1.85	1.85
Dichlorodifluoromethane	30	30	37.60	31.30	26.60	25.80	8.65
Dichloromethane	30	4	33.00	32.20	12.00	2.62	22.1
Ethylbenzene	30	2	22.1	3.32	-	-	12.71
Naphthalene	30	2	5.13	2.25	-	-	3.69
Styrene	30	4	50.50	3.72	2.70	2.51	3.21
Tetrachloroethene	30	1	1.85	-	-	-	-
Toluene	30	18	305.0	38.60	7.30	4.57	2.845
Trichloroethene	30	3	58.20	2.68	1.40	-	2.68
Trichlorofluoromethane	30	10	2.46	2.28	2.27	2.24	2.21

Air Toxics Monitoring Summary Report - 2000

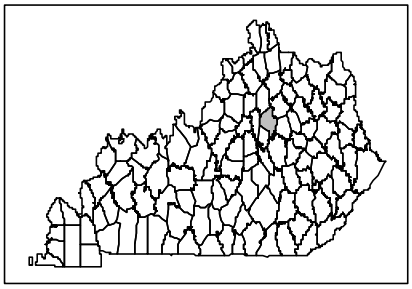
Agency:	Kentucky Division for Air Quality
Site ID:	21-059-0005
County:	Daviess
Location:	Owensboro
Group:	Volatile Organic Compounds
Method:	EPA Method TO14
Collection:	Summa Passivated Canisters
Analysis:	GC/MS Full-Scan Mode
Units:	$\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median Value
1,1-Dichloroethene	14	1	2.01	-	-	-	-
1,2,4-Trimethylbenzene	14	1	2.60	-	-	-	-
1,2-Xylene	14	4	7.35	2.88	2.28	1.21	2.58
1,3-Xylene & 1,4-Xylene	14	8	3.99	3.41	3.36	3.15	2.985
Benzene	14	8	6.42	5.66	5.37	3.19	3.05
Chloromethane	14	7	7.00	4.78	4.07	2.38	2.38
Dichlorodifluoromethane	14	13	30.40	25.20	14.40	14.20	10.30
Styrene	14	3	2.12	1.94	1.41	-	1.94
Toluene	14	10	9.66	6.92	6.85	6.72	5.98
Trichlorofluoromethane	14	6	3.01	3.01	2.23	2.01	2.12

Air Toxics Monitoring Summary Report - 2000

Agency:	Kentucky Division for Air Quality
Site ID:	21-067-0012
County:	Fayette
Location:	Lexington
Group:	Volatile Organic Compounds
Method:	EPA Method TO14
Collection:	Summa Passivated Canisters
Analysis:	GC/MS Full-Scan Mode
Units:	$\mu g/m^3$

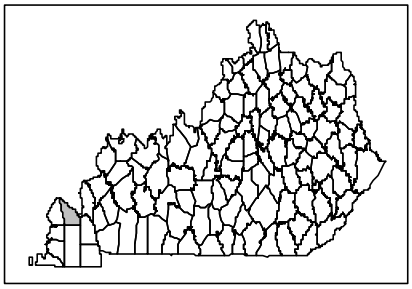


Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
1,2,4-Trimethyl-benzene	32	5	3.32	2.40	2.12	2.1	2.12
1,2-Xylene	32	3	2.60	2.10	1.04		2.10
1,3-Xylene & 1,4-Xylene	32	13	6.30	5.50	4.42	3.44	2.17
Benzene	32	15	5.69	4.46	3.84	3.46*	2.28
sec-Butylbenzene	32	1	3.08	-	-	-	-
Chlorobenzene	32	7	4.33	4.25	3.60*	2.98	2.98
Chloromethane	32	11	2.74	2.57	2.28	2.18	1.57
Dichlorodifluoromethane	32	29	33.30	30.20	28.80	23.70	10.00
Dichloromethane	32	1	2.00	-	-	-	-
Etylbenzene	32	3	3.21	1.86	1.56	-	1.86
Hexachlorobutadiene	32	1	1.95	-	-	-	-
Styrene	32	4	42.10	2.54	2.24	1.93	2.39
Tetrachloroethene	32	2	6.02	1.67	-	-	3.845
Toluene	32	23	11.60	9.74	7.73	5.71*	3.28
Trichlorofluoromethane	32	13	3.00	2.33	2.25	2.15	1.93

* Sample biased by forest fires.

Air Toxics Monitoring Summary Report - 2000

Agency:	Kentucky Division for Air Quality
Site ID:	21-145-1024
County:	McCracken
Location:	Paducah
Group:	Volatile Organic Compounds
Method:	EPA Method TO14
Collection:	SUMMA Passivated Canisters
Analysis:	GC/MS Full-Scan Mode
Units:	$\mu g/m^3$



Parameter	# of Samples	# of times detected	1st max	2nd max	3rd max	4th max	Median
1,2-Xylene	20	5	3.04	2.58	2.22	2.14	2.22
1,2,4-Trichloro-benzene	20	1	1.99	-	-	-	-
1,2,4-Trimethyl-benzene	20	4	5.46	3.38	2.08	1.92	2.73
1,3-Xylene & 1,4-Xylene	20	7	12.40	6.98	5.16	3.04	3.04
Benzene	20	6	3.42	1.81	1.50	1.50	1.50
Carbon disulfide	20	2	4.60	4.15	-	-	4.375
Chloromethane	20	5	2.60	2.38	2.26	2.10	2.26
Dichlorodifluoromethane	20	20	31.20	30.10	22.00	15.90	9.33
Dichloromethane	20	1	3.52	-	-	-	-
Ethylbenzene	20	1	4.46	-	-	-	-
Styrene	20	7	3.16	2.76	2.35	2.05	2.05
Toluene	20	16	32.90	6.82	6.67	6.20	2.465
Trichlorofluoromethane	20	8	2.39	2.23	2.22	1.76	1.59

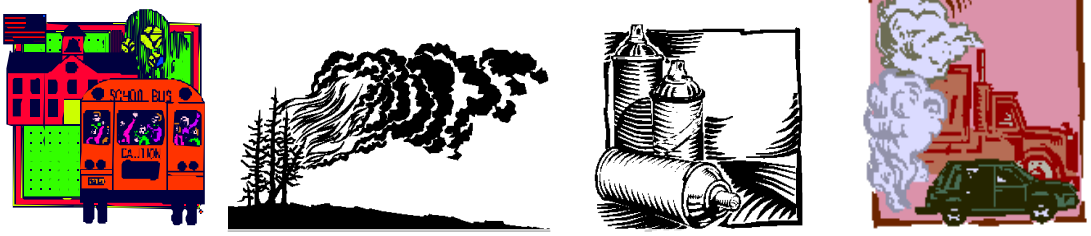
4. Extractable organics (Semi-volatile organic compounds)

Monitoring for semi-volatile organics is accomplished by collecting 24-hour composite samples utilizing Polyurethane Foam (PUF) samplers. Ambient air samples are collected on a four inch micro-quartz particulate filter and on a treated polyurethane foam cartridge for vapor entrapment. Samplers operate for 24-hours once every twelve days. Samples are then analyzed in the laboratory with a gas chromatograph/mass spectrometer. Current methodology targets the following compounds with a detection limit of 0.001 $\mu g/m^3$. Other compounds can be detected by this methodology and are reported if found.

Phenol
Aniline
bis-(2-Chloroethyl)ether
2-Chlorophenol
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Benzyl alcohol
2-Methylphenol
4-Methylphenol
bis-(2-Chloroisopropyl) ether
n-Nitroso-di-n-propylamine
Hexachloroethane
Nitrobenzene
Isophorone
2-Nitrophenol
2,4-Dimethylphenol
bis-(2-Chloroetoxy) methane
Benzoic acid
2,4-Dichlorophenol
1,2,4-Trichlorobenzene
Naphthalene
4-Chloroaniline
Hexachlorobutadiene
4-Chloro-3-methylphenol
2-Methylnaphthalene
Hexa-Cl-1,3-cyclopentadiene
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
2-Chloronaphthalene
2-Nitroaniline
Dimethyl phthalate
Acenaphthylene
2,6-Dinitrotoluene
3-Nitroaniline
Acenaphthene
2,4-Dinitrophenol
4-Nitrophenol
Dibenzofuran
2,4-Dinitrotoluene
Diethyl phthalate
Fluorene
4-Chlorophenyl phenyl ether
4-Nitroaniline
2-Methyl-4,6-Dinitrophenol
n-Nitrosodiphenylamine
4-Bromophenyl phenyl ether
Hexachlorobenzene
Pentachlorophenol
Phenanthrene
Anthracene
Dibutyl phthalate
Fluoroanthene
Benzidine
Pyrene
Butyl benzyl phthalate
3,3-Dichlorobenzidine
Benzo(A)anthracene
Chrysene
bis(-Ethylhexyl) phthalate
Dioctylphthalate
Benzo(B)fluoranthene
Benzo(K)fluoranthene
Benzo(A)pyrene
Indeno(1,2,3-C,D)pyrene
Dibenzo(A,H)anthracene
Benzo(G,H,I)perylene

There are no Semi-volatile organic compounds sample results to report for 2000.

Kentucky
Division for Air Quality



DIRECTORY

Natural Resources and Environmental
Protection Cabinet

July 2000

Kentucky Natural Resources & Environmental Protection Cabinet
Department for Environmental Protection

Division for Air Quality

803 Schenkel Lane
Frankfort, KY 4060l-1403
Telephone: (502) 573-3382
Fax: (502) 573-3787
Web site: http://www.nr.state.ky.us/nrepc/dep/daq/daqhome.html

The Natural Resources and Environmental Protection Cabinet is the state agency responsible for the protection and preservation of Kentucky's land, air and water resources. The Cabinet is divided into three departments: Natural Resources; Surface Mining Reclamation and Enforcement; and Environmental Protection.

The **Division for Air Quality (DAQ)** is in the Cabinet's Department for Environmental Protection. The division is the state agency primarily responsible for enforcing the state and federal air quality standards in the Commonwealth of Kentucky with the goal of protecting public health and welfare.

To achieve that goal, the division operates a multi-faceted program with staff performing separate but interrelated tasks. The Division for Air Quality is organized as follows:

Director's Office
Enforcement Branch
Field Operations Branch (Regional Air Quality Offices)
Permit Review Branch
Special Programs Branch (formerly Asbestos Abatement)
Technical Services Branch (includes air monitoring and emissions inventory)
Program Planning & Administration Branch

Included in this directory are contacts, telephone numbers and information about each branch's responsibilities.

The Division for Air Quality operates a toll-free air quality index message number: **1-800-AIR-IN-KY**. This report on Kentucky's air quality gives the pollutant index number, the pollutant responsible for the index number, and whether the air quality is in the good, moderate, or unhealthy category in Lexington, Northern Kentucky, Owensboro, Henderson, Ashland, Paducah, Bowling Green, Pikeville and Louisville areas.

Director's Office

John E. Hornback, Director
E-Mail: john.hornback@mail.state.ky.us
Diana J. Andrews, Assistant Director;
E-Mail: diana.andrews@mail.state.ky.us

Telephone: (502) 573-3382 Fax: :(502) 573-3787

Mission Statement

The Division for Air Quality's mission is to protect public health and the environment by achieving and maintaining acceptable air quality through maintenance of a comprehensive air monitoring network; effective partnering with air pollution sources and the public to control air pollution; timely dissemination of accurate and useful information; judicious use of program resources; and operation of a reasonable, effective compliance assurance program.

PUBLIC EDUCATION/INFORMATION AND OUTREACH

The primary focus of the division's education and information activities is "*Clean Air for Kentucky.*" This program features a hot air balloon and an Air Quality Resource Guide which provides educational materials for teachers, camp leaders and other educators. This Guide has been developed to supplement textbook information on air pollution. The material can be adapted for use with K-12 grades. The guide contains resource materials, fact sheets, the air pollutant gremlins, classroom activities, games, quizzes, experiments, puzzles, coloring sheets and other helpful information about air quality.

The division's Clean Air for Kentucky educational exhibit includes handout materials and is available upon request for conferences, workshops, convention and other special events. Speakers are also available.

To receive an Air Quality Resource Guide; schedule the exhibit and/or a speaker for your conference, camp or other event; schedule a teacher workshop or in-service day; or receive information on a Clean Air for Kentucky hot air balloon visit (there is a cost) to an environmental event, contact: Lillie Cox through e-mail: lillie.cox@mail.state.ky.us or by regular mail at this address: Division for Air Quality, 803 Schenkel Lane, Frankfort, Kentucky 40601-1403; telephone: (502) 573-3382 or (800)-928-0047 (in Kentucky). Visit our web site: http://www.nr.state.ky.us/nrepc/dep/daq/daqhome.html

Data Management

Gerald Dunn, Resource Management Analyst
E-Mail: gerald.dunn@mail.state.ky.us
Tonya Manley, Systems Support Technician
E-Mail: tonya.manley@mail.state.ky.us

Responsibilities

- Installs and maintains complex equipment and software
- Coordinate data management activities for the Division for Air Quality
- Assist the division's employee training coordinator with developing training opportunities.
- Acts as a network administrator as necessary

Enforcement Branch

Pat Johnston, Manager
E-Mail: pat.johnston@mail.state.ky.us

Branch Responsibilities

- Negotiate enforcement agreements to resolve violations of Division for Air Quality regulations.
- Conduct administrative conferences between violating facilities and division officials.
- Negotiate terms of settlement agreements and/or agreed orders.
- Refer cases to the Cabinet's Office of Legal Services when agreement cannot be reached at the division level.

Field Operations Branch

Bill Clements, Manager
E-mail: bill.clements@mail.state.ky.us
Pat Springston, Complaints Coordinator
E-mail: pat.springston@mail.state.ky.us

Environmental Emergency, 24-hour; (502) 564-2380 or (800) 928-2380

Branch Responsibilities

- Inspect air emission sources.
- Operate air quality monitors.
- Certify gasoline tank trucks.
- Enforce state and federal air quality regulations.
- Initiate enforcement action against violators of air quality regulations.
- Receive and investigate air quality complaints.
- Maintain and update department computer records concerning citizen complaints, release reporting and emergency response.
- Provide technical assistance and training to the regulated community and the general public.
- Inspect asbestos removals and school's asbestos-management practices.

Air Quality Regional Offices

Ashland
Jay Nelson, Supervisor
(P.O. Box 1507), 3700 13th Street
Ashland, KY 41105-1507
Telephone: (606) 920-2067
Fax: (606) 920-2069
E-Mail: jay.nelson@mail.state.ky.us
Bath, Boyd, Bracken, Carter, Elliott, Fleming, Greenup, Lawrence, Lewis, Mason, Menifee, Montgomery, Morgan, Robertson, and Rowan

Bowling Green
William (Bill) Blacketer, Supervisor
1508 Westen Avenue
Bowling Green, KY 42104-3356
Telephone: (270) 746-7475
Fax: (270) 746-7865
E-Mail: bill.blacketer@mail.state.ky.us
Adair, Allen, Barren, Butler, Cumberland, Edmonson, Green, Hart, LaRue, Logan, Marion, Metcalfe, Monroe, Simpson, Taylor, Todd, and Warren

Florence
Miley Twyman, Supervisor
8020 Veterans Memorial Dr, Suite 110
Florence, KY 41042-7570
Telephone: (859) 292-6411
Fax: (859) 292-6657
E-Mail: miley.twyman@mail.state.ky.us
Boone, Campbell, Carroll, Gallatin, Grant, Harrison, Henry, Kenton, Nicholas, Owen, Pendleton, and Trimble

Frankfort
Mark Ritter, Supervisor
643 Teton Trail, Suite B
Frankfort, KY 40601-1758
Telephone: (502) 564-3358
Fax: (502) 564-5043
E-Mail: mark.ritter@mail.state.ky.us
Anderson, Bourbon, Bullitt, Clark, Estill, Fayette, Franklin, Garrard, Hardin, Jessamine, Madison, Mercer, Nelson, Oldham, Powell, Scott, Shelby, Spencer, Washington and Woodford

Hazard
Larry "Jack" Hurt, Supervisor
233 Birch St., Suite 2
Hazard, KY 41701-2179
Telephone: (606) 435-6022
Fax: (606) 435-6025
E-Mail: jack.hurt@mail.state.ky.us
Breathitt, Floyd, Harlan, Johnson, Knott, Lee, Leslie, Letcher, Magoffin, Martin, Owsley, Perry, Pike, and Wolfe

London
Mike Hannon, Supervisor
875 S. Main Street
London, KY 40741-9008
Telephone: (606) 878-0157
Fax: (606) 877-9091
E-Mail: mike.hannon@mail.state.ky.us
Bell, Boyle, Casey, Clay, Clinton, Jackson, Knox, Laurel, Lincoln, McCreary, Pulaski, Rockcastle, Russell, Wayne, and Whitley

Owensboro
Pat Barker, Supervisor
3032 Alvey Park Drive, W., Suite 700
Owensboro, KY 42303-2191
Telephone: (270) 687-7304
Fax: (270) 687-7204
E-Mail: pat.barker@mail.state.ky.us
Breckinridge, Daviess, Grayson, Hancock, Henderson, Hopkins, Meade, McLean, Muhlenberg, Ohio, Union, and Webster

Paducah
Ken Frye, Supervisor
4500 Clarks River Road
Paducah, KY 42003-0823
Telephone: (270) 898-8468
Fax: (270) 898-8640
E-Mail: ken.frye@mail.state.ky.us
Ballard, Caldwell, Calloway, Carlisle, Christian, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, McCracken, Marshall, and Trigg

Permit Review Branch

Allan Elliott, Supervisor, Permit Support Section
E-Mail: allan.elliott@mail.state.ky.us

Section Supervisors

Chemical Section, Sreeni Kesaraju
Combustion Section, Don Newell
Minerals Section, John Castanis
Surface Coating Section, Rick Shewekah
Metallurgy Section, Edd Frazier, P.E.
Permit Support Section, Allan Elliott

Branch Responsibilities

- Review registration forms to determine whether proposed new sources or existing source modifications require permits or permit revisions.
- Provide guidance during reapplication meetings with new sources.
- Review permit applications to determine whether air contaminant sources proposing to construct or operate in Kentucky are able to do so in compliance with state and federal air quality laws.
- Respond to public inquiries concerning permits and other environmental issues.
- Recommend issuance or denial of permits.
- Serve as technical consultant to other branches of the Division for Air Quality relative to regulation development, compliance demonstration tests, and enforcement actions.
- Monitor facility operations during demonstrations of compliance conducted by air contaminant sources.
- Make necessary modifications to permits in response to changes in environmental laws.
- Make confidentiality determinations.
- Operate and maintain the division file room, map room and library.
- Review and comment on environmental impact statements, A-95 applications, U.S. Army Corps of Engineers and Coast Guard public notices, pollution control tax exemption certification applications and wastewater facility plans.

Special Programs Branch

Parker H. Moore, Manager
E-mail: parker.moore@mail.state.ky.us

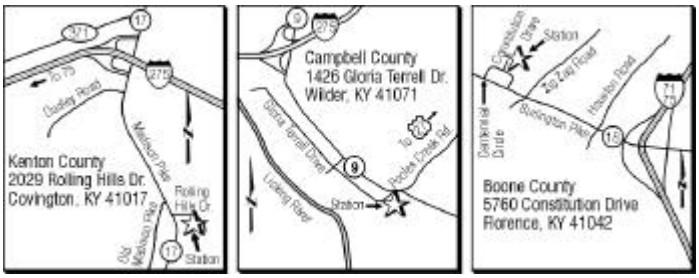
***Branch Responsibilities*:**

- Administer regulations pertaining to asbestos management, vehicle emission testing in Northern Kentucky, and risk management for facilities with hazardous chemicals.
- Certify asbestos abatement professionals.
- Review asbestos ma nagement plans for all school buildings in Kentucky.
- Review facilities' risk management plans for hazardous chemicals.
- Oversee vehicle emissions testing contractor's performance; coordinate with repair industry.
- Provide information to the public regarding asbestos management, Northern Kentucky's vehicle emissions testing program, and hazardous chemicals risk management programs.
- Participate in enforcement proceedings to resolve violations involving asbestos, vehicle emissions testing, and chemical risk management.

Vehicle Testing Program

Hours of Operation

Monday, Wednesday	**8 AM-7 PM**
Tuesday, Thursday, Friday	**8 AM-5 PM**
Saturday	**8 AM-1 PM**
Sunday and Holidays	**Closed**



Barry Adkins
2029 Rolling Hills Dr.
Covington, KY 41017
Phone: (606) 426-3364
Fax: (606) 426-3360

Mia Schmitt
1426 Gloria Terrell Dr.
Wilder, KY 41071
Phone: (606) 442-3370
Fax: (606) 442-8333

Chris Juilfs
5760 Constitution Drive
Florence, KY 41042
Phone: (606) 746-6771
Fax: (606) 746-6771

Technical Services Branch

Larry Garrison, Manager
E-Mail: larry.garrison@mail.state.ky.us

Section Supervisors

Technical Support Section, Roger Cook
Quality Assurance Section, William Sudduth
Source Sampling Section, Gerald Slucher
Emissions Inventory Section, Diana Hogan

Branch Responsibilities

- Plan and support the operation of the air monitoring network.
- Maintain statewide computerized air monitoring data acquisition network; maintain state and federal ambient air quality data bases.
- Observe and evaluate tests performed on air pollution sources to determine compliance with air emission standards.
- Conduct quality assurance programs for ambient and in-stack continuous emission monitoring (CEM) systems.
- Maintain state and federal computerized data base systems of air pollution sources and emissions inventory.
- Prepare and issue air quality reports.
- Prepare and issue emissions inventory reports.
- Prepare and issue the daily air quality index.

Program Planning & Administration Branch

Lona Brewer, Manager
E-Mail: lona.brewer@mail.state.ky.us

Section Supervisors

Evaluation Section, John Gowins
Regulation Development Section, Millie Ellis
Administration Section, Nina Hockensmith

Branch Responsibilities

- Prepare the state implementation plan (SIP) to achieve and maintain national and state air quality standards.
- Draft and process air pollution control regulations.
- Monitor progress toward achieving the division's objectives.
- Measure trends in the reduction of emissions and improvement in air quality.
- Prepare and monitor the division's air quality management plan.
- Examine and evaluate division programs and recommend necessary improvements.
- Prepare and monitor federal grants and division budgets.
- Perform administrative functions for the division such as inventory, personnel actions, purchases and training records.
- Act as Liaison between this agency and the Air Pollution Control District of Jefferson County.
- Represent division on voluntary ozone reduction programs.
- Act as a clearinghouse for information about indoor air quality issues and federal refrigerant programs.
- Coordinate with the Business and Environmental Assistance Program at the University of Kentucky.