Foreword

The Air Pollution Control Division of the Jefferson County Department of Health prepares this report annually. It analyzes the results of air monitoring stations located throughout Jefferson County for the purpose of measuring the outdoor concentrations of those pollutants for which the U. S. Environmental Protection Agency has established ambient air quality standards (with the exception of nitrogen dioxide, which is not necessary in an urban area the size of Birmingham):

- Carbon Monoxide
- Ozone
- Lead
- Particulate Matter
- Sulfur Dioxide

This report includes general discussions of the background information, possible sources, and health effects of each pollutant along with any occurrences of exceedances of air quality standards. Also included is a summary of field enforcement activities. An effective field enforcement program contributes directly to improved air quality and pollutant level measurements within acceptable limits.

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List of Tables and Graphs

List of Acronyms and Symbols

CO	carbon monoxide
EPA	Environmental Protection Agency
NAMS	National Air Monitoring Station
NO_x	oxides of nitrogen
O_3	ozone
Pb	lead
PM10	particulate matter of size 10 microns or less in diameter
ppm	parts per million
SLAMS	State and Local Air Monitoring Station
SMOPs	synthetic minor operating permits
SO_2	sulfur dioxide
SPM	Special Purpose Monitoring
TSP	total suspended particulates
$\mu g/m^3$	micrograms per cubic meter
VOCs	volatile organic compounds

Executive Summary

The uniform air quality index was created for use as a standard measure of overall air quality. It is a national index that was designed to meet the needs of all citizens. The daily index report is based on the uniform pollutants' standards index structure that includes the pollutants for which primary short term National Ambient Air Quality Standards have been established. These pollutants are: particulate matter (PM10), sulfur dioxide (SO_2), carbon monoxide (CO), and ozone (O_3) (see Table 2.1).

The ambient concentration of each pollutant is scaled on a range from zero (0) to five hundred (500) with one hundred corresponding to the National Ambient Air Quality Standard, or level at which the pollutant is considered unhealthful, and five hundred corresponding to the significant harm level. The intermediate range breakpoints of 200, 300 and 400 represent increasing measures toward the significant harm level.

The air quality index is available daily, Monday through Friday, by dialing (205) 933-0583. Or, view the air quality index report on the internet at http://www.jcdh.org. The following table was extracted from the Environmental Protection Agency's Aerometric Information Retrieval System and summarizes the measurements of overall air quality in Jefferson County for 1998:

Air Quality Description	**Number of Days***
Good (1 - 50)	234
Moderate (51 - 100)	127
Unhealthy (101 - 200)	4
Very Unhealthy (201 - 300)	0
Hazardous (301 or above)	0
Total Number of Days	**365**

There were 4 days on which exceedances of the ambient air quality standards occurred in 1998 at National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS). The maximum index reported was 131 and occurred August 28. Overall, the average index was 43.

1.0 Introduction

The Jefferson County Department of Health operates an air pollution control program with its goal being to ensure that citizens of Jefferson County have access to air which meets the health standards as established by the Environmental Protection Agency (EPA). A significant portion of the air pollution resources is devoted to monitoring pollutant levels in the ambient air (that portion of the atmosphere to which the general public has access). Also, the information received from the monitoring network about pollutant levels is used as the basis for developing any control strategies necessary to ensure that health standards are attained and maintained.

2.0 Ambient Air Quality Standards

The Environmental Protection Agency (EPA) has established two national ambient air quality standards: primary and secondary. The primary standards are designed to protect public health with an adequate margin of safety. The secondary standards are designed to protect public welfare related values such as property, materials, plants and animal life. The Air Pollution Control Program of Jefferson County utilizes the standards established by the EPA. Those standards are:

Table 2.1

National Ambient Air Quality Standards

Pollutant and time period*	**Standard (mean levels)**	
	Primary	**Secondary**
PM10 (Inhalable particulates)		
(Micrograms per cubic meter)		
Annual mean level	50	50
24-hour average	150	150
Sulfur dioxide		
(Parts per million)		
Annual mean level	0.03	
24-hour average	0.14	
3-hour average		0.5
Nitrogen dioxide		
(Parts per million)		
Annual mean level	0.053	0.053
Carbon monoxide		
(Parts per million)		
8-hour average	9	None
1-hour average	35	None
Ozone		
(Parts per million)		
1-hour average	0.12	0.12
8-hour average	0.08	0.08
Lead		
(Micrograms per cubic meter)		
3-month mean level	1.5	1.5

*Short-term standards (24-hour and less) are not to be exceeded more than once a year. Long-term standards are maximum permissible mean-level concentrations that are never to be exceeded.

3.0 Monitoring Network Types

Data provided through a complex network of air monitoring stations located throughout Jefferson County determine the quality of the ambient air in the County. In January 1998, this network consisted of 14 monitoring sites and 19 air monitoring devices. There were no modifications to the network during the course of the year. See Table 3.1. The air pollutants monitored at these sites were: ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), and PM10 (particulates 10 microns and less in size). Nitrogen dioxide is not monitored because the county population is less than one million, and monitoring is therefore not required. Each air monitoring device was classified as one of the following: State and Local Air Monitoring Station (SLAMS), National Air Monitoring Station (NAMS), or Special Purpose Monitoring (SPM) based on the general monitoring objectives.

The objective of the SLAMS network is to collect data that provide an overview of the state's air quality used in the development of statewide control strategies.

The primary objective of the NAMS network is to monitor in areas where the pollutant concentration levels and population exposures are likely to be high. EPA uses the data to develop nationwide control strategies.

The objective of the SPM network is to provide data for the development and refinement of local control strategies. The data also verify maintenance of air standards in areas not monitored by either the SLAMS or NAMS networks.

Table 3.1

Jefferson County 1998 Air Monitoring Network

January 1, 1998 - December 31, 1998 Network

Site Location	Pollutants	Monitoring SLAMS	Objective NAMS	SPM
Bessemer	PM10	1	0	0
Dolomite	PM10	0	0	1
East Thomas	CO	0	1	0
Fairfield	CO, O3, PM10, SO2	1	2	1
Hoover	O3	1	0	0
Leeds, Elementary School	PM10	1	0	0
McAdory High School	O3	1	0	0
North Birmingham, Sloss	CO, PM10	0	0	2
North Birmingham, Southern Railroad	PM10	0	1	0
Northside School	PM10	1	0	0
Pinson High School	O3	0	1	0
Tarrant ABC Coke	PM10	0	0	1
Tarrant, Elementary School	PM10, O3	1	1	0
Wylam	PM10	0	1	0

4.0 Description of Pollutants

4.1 Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless and tasteless gas. It is emitted into the atmosphere by both natural and man-made sources. Globally, total emissions of CO are greater than emissions of any other air pollutant, due to the widespread extent of low-level emissions from natural sources.

The major natural source of CO is the spontaneous oxidation of naturally occurring methane. Other natural sources include the oceans, plant growth and decay, terpene oxidation, and forest fires. Globally, natural sources account for nearly 90 percent of CO emissions.

The major man-made source of CO is the incomplete combustion of carbon-based fuels. Gasoline motor vehicles--primarily automobiles and light duty trucks--are the most common source. Other sources include industrial process losses, open burning and industrial or utility boilers.

CO poses a threat to human health because of its ability to react with hemoglobin that carries oxygen to cell tissue. Hemoglobin preferentially absorbs CO, thus reducing the amount of oxygen transported throughout the body. Most people will experience symptoms including dizziness and headaches when exposed to high levels of CO. Eliminating exposure causes blood to return to normal levels of oxygen.

4.2 Lead

Lead is a toxic metal that comes from natural and man-made sources and is also relatively abundant. Typically, lead ingestion is attributed to four components of the human environment: food, inhaled air, dusts of various types, and drinking water.

Calculations of natural contributions using geochemical information indicate that natural sources contribute a relatively small amount of lead to the atmosphere. Natural sources include soil erosion by wind, volcanic dust, forest fires, sea salt, and the decay of radon gas.

The major sources of man-made lead emissions to the ambient air include smelting operations and lead mining. Other sources include coal-fired power plants, lead battery manufacturing, and municipal solid waste incineration. Leaded gasoline has been phased-out and is not a major source.

Lead absorption poses a threat to human health because of its accumulative properties. High concentration of lead in the bloodstream of children causes severe and permanent neurological damage or death. Some lead-containing chemicals have been shown to cause cancer in animals.

4.3 Ozone

Ozone is a highly reactive oxidant gas with a pungent odor and a faint bluish color. Ozone is photochemically produced in the atmosphere when volatile organic compounds (VOCs) combine with oxides of nitrogen (NOx) and carbon monoxide (CO) in the presence of sunlight. In the lower atmosphere, ozone is the predominant component of photochemical smog and is most likely to reach high concentration levels on hot, dry, summer days when sunlight is intense and wind movement is low.

In urban areas, man-made emissions of nitrogen oxides and VOCs lead to the formation of ozone in the lower atmosphere. Nitrogen oxides are primarily emitted from combustion sources such as motor vehicles and boilers. Primary sources of VOCs include motor vehicle exhaust, gasoline evaporation from storage facilities or tanker trucks, paint, and industrial use of solvents or coatings.

Ozone is a pulmonary irritant. Symptoms include irritation of the eyes, nose, throat and lungs as well as reduced lung function, asthma, stuffy nose, reduced resistance to colds and other infections. Ozone also damages plants, trees, rubber and fabrics.

Currently, the Jefferson and Shelby County area is considered marginally nonattainment for ozone. This means that the area is out of compliance with Federal standards. An Ozone Awareness Program has been underway in Jefferson and Shelby Counties since May 1996 to educate citizens about the health and economic effects of being ozone nonattainment. In addition, the program is designed to encourage citizens to take voluntary actions to help decrease ozone levels.

The EPA promulgated new 8-hour primary and secondary standards for ozone on July 18, 1997. Until Jefferson and Shelby Counties reach attainment for the 1-hour ozone standard, the area will continue to function under the 1-hour standard, but will still monitor for 8-hour ozone.

4.4 Particulates

Particulate matter consists of airborne solid particles ranging from about 0.001 to 500 micrometers in diameter. Particulate matter includes: dust, soot and other tiny bits of solid materials released into and moving around in the air. PM10 consists of particles less than or equal to 10 micrometers in diameter and is the basis for the ambient air quality standard. Dustfall is particles larger than 10 micrometers. PM2.5 consists of particles less than or equal to 2.5 micrometers in diameter. Total suspended particulate (TSP) is a measure of the total airborne particles in the air. PM10 and PM2.5 are both subsets of the total airborne particles in the air.

Particulate matter has many sources including: burning of diesel fuels by trucks, buses and other diesel engines; incineration of garbage; mixing and application of fertilizers and pesticides; road construction; vehicular tire wear and exhaust; operation of fireplaces and wood stoves; and industrial processes (such as steel making and mining operations).

Exposure to high concentrations of particulate pollution (PM10) causes eye, nose and throat irritation, aggravation of chronic lung disease, and symptoms of heart and respiratory problems. Particulates are the main source of haze that reduces visibility.

The EPA promulgated new primary and secondary standards for PM2.5 on July 18, 1997. Monitoring for PM2.5 is scheduled to begin on January 1, 1999.

4.5 Sulfur Dioxide

Sulfur dioxide is a colorless, nonflammable gas formed during combustion of sulfur-containing fuels such as coal and oil. Partly converted by photochemical and catalytic reactions in the atmosphere, sulfur dioxide becomes sulfur trioxide, sulfuric acid, and various sulfate particles that can also have adverse health and welfare effects.

Globally, man-made emissions account for one-third of the total emissions of sulfur compounds in the atmosphere. Of the natural emissions, most are hydrogen sulfide released from the decay of organic matter or sulfate particles released in the sea spray. The combustion of sulfur-containing coal and oil in utility and industrial boilers is the major man-made source of sulfur dioxide emissions.

Sulfur dioxide is an irritant to the pulmonary system, primarily affecting the upper respiratory system. Damage to lungs occurs with deep inhalation of particles absorbing sulfur dioxide. Sulfur dioxide plays an important role in the production of acid rain (acid aerosols), which damages trees and lakes. Acid aerosols also erode stone used in buildings, statues, and monuments.

5.0 Monitoring Results

5.1 Carbon Monoxide

In January of 1998, the carbon monoxide monitoring network consisted of 3 monitors (2 NAMS and 1 SPM) strategically located throughout Jefferson County. See Table 3.1. Carbon monoxide was the responsible pollutant 102 (of 365) times in the daily air quality index. The maximum 1-hour CO concentration at monitoring sites during the year generally measured less than 31.6 ppm, which is 90 percent of the 35 ppm 1-hour ambient standard. Maximum 8-hour CO concentrations at monitoring sites during the year generally measured below the 8-hour standard of 9 ppm (see Table 5.6.1 and Graphs 5.6.1 and 5.6.2). However, six exceedances of the 8-hour CO ambient standards were recorded during the year at the North Birmingham, Sloss SPM site. No exceedances were recorded at the NAMS sites.

5.2 Lead

There were no lead monitors in operation during 1998. The monitor supporting the mobile source requirement was shut down as of January 17, 1997 because ambient lead concentrations consistently measured below deminimus values since lead had been removed from gasoline. See Table 5.6.2 and Graph 5.6.3.

5.3 Ozone

In January of 1998, the ozone monitoring network consisted of 5 monitors (3 SLAMS and 2 NAMS) strategically located throughout Jefferson County. The ozone monitors operated from April 1 to October 31 according to EPA regulations. No changes to the network occurred during the year. Ozone was the responsible pollutant 211 (of 365) times in the daily air quality index. Six exceedances of the 1-hr 0.12 ppm ambient standard were recorded on four different days during 1998: June 25, August 28, August 29 and September 5, 1998 (see Table 5.6.3 and Graph 5.6.4). The Fairfield and Hoover sites each recorded 2 exceedances, while the Tarrant and McAdory site each recorded one exceedance in 1998. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to one. An area is classified as attainment when the average number of days over a three-year period, with an hourly concentration above the standard, is one or less at each monitoring site. Jefferson and Shelby counties are currently classified as a marginal nonattainment area for ozone. Table 5.6.5 depicts the current status of ozone nonattainment.

5.4 Particulate Matter

In January of 1998, the particulate matter (PM10) monitoring network consisted of 10 monitors (4 SLAMS, 2 NAMS and 4 SPM) strategically located throughout Jefferson County (see Table 3.1). PM10 was the responsible pollutant 22 (of 365) times in the daily air quality index. The maximum 24-hour PM10 concentration at monitoring sites during the year generally measured less than the 24-hour ambient standard of 150 $\mu g/m^3$. The maximum annual mean concentration at monitoring sites during the year generally measured less than 44 $\mu g/m^3$, which is 88 percent of the 50 $\mu g/m^3$ annual mean standard (see Table 5.6.6 and Graphs 5.6.6 and 5.6.7). One exceedance of the PM10 24-hour standard was recorded at a SPM site during the year. No exceedances were recorded at NAMS or SLAMS sites.

5.5 Sulfur Dioxide

In January of 1998, the sulfur dioxide (SO_2) monitoring network consisted of 1 monitor (1 NAMS) located in Fairfield. SO_2 was the responsible pollutant 29 (of 365) times in the daily air quality index. The maximum 24-hour SO_2 concentration at the monitoring site during the year generally measured less than 0.03 ppm, which is 21 percent of the 0.14 ppm 24-hour ambient standard. The maximum SO_2 annual mean concentration at the monitoring site during the year generally measured less than 0.006 ppm, which is 20 percent of the 0.03 ppm annual mean standard. The maximum 3-hour SO_2 concentration at monitoring the site during the year generally measured less than 0.10 ppm which is 20 percent of the 0.5 parts per million 3-hour ambient standard (see Table 5.6.7 and Graphs 5.6.8, 5.6.9 and 5.6.10). No exceedances of the SO_2 ambient standards were recorded during the year.

5.6 Tables and Figures

Table 5.6.1

Carbon Monoxide Maximum Values

1993 – 1998

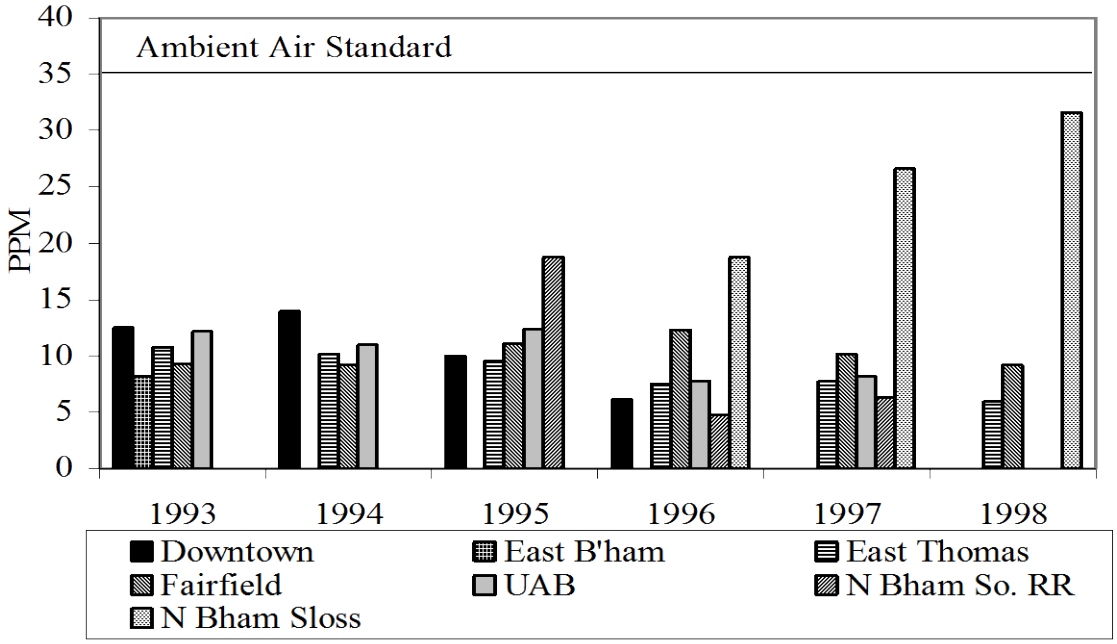
	Year					
Site	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Downtown						
1-hour max.	12.5	14.0	10.0	6.1	Closed	
8-hour max.	6.2	6.9	6.2	4.5	6/16/96	
East Birmingham						
1-hour max.	8.2	Closed				
8-hour max.	5.2	7/8/93				
East Thomas						
1-hour max.	10.8	10.2	9.6	7.5	7.7	5.9
8-hour max.	7.8	6.7	7.0	5.8	7.1	4.5
Fairfield						
1-hour max.	9.3	9.2	11.1	12.3	10.2	9.2
8-hour max.	7.3	7.7	7.2	5.3	6.0	4.9
UAB						
1-hour max.	12.2	11.0	12.4	7.8	8.2	Closed
8-hour max.	6.2	7.2	6.7	6.2	4.4	4/1/97
N Bham, So. RR						
1-hour max.		Opened	18.8	4.8	6.3	Closed
8-hour max.		10/27/94	6.5	3.5	4.1	3/1/97
N Bham, Sloss						
1-hour max.			Opened	18.8	26.6	31.6
8-hour max.			9/25/96	**12.2**	**13.1**	**17.1**

Values measured in parts per million (ppm).
Ambient air exceedances are in bold characters.

Graph 5.6.1

Carbon Monoxide Maximum 1-Hour Averages

1993-1998



Graph 5.6.2

Carbon Monoxide Maximum 8-Hour Averages

1993 - 1998

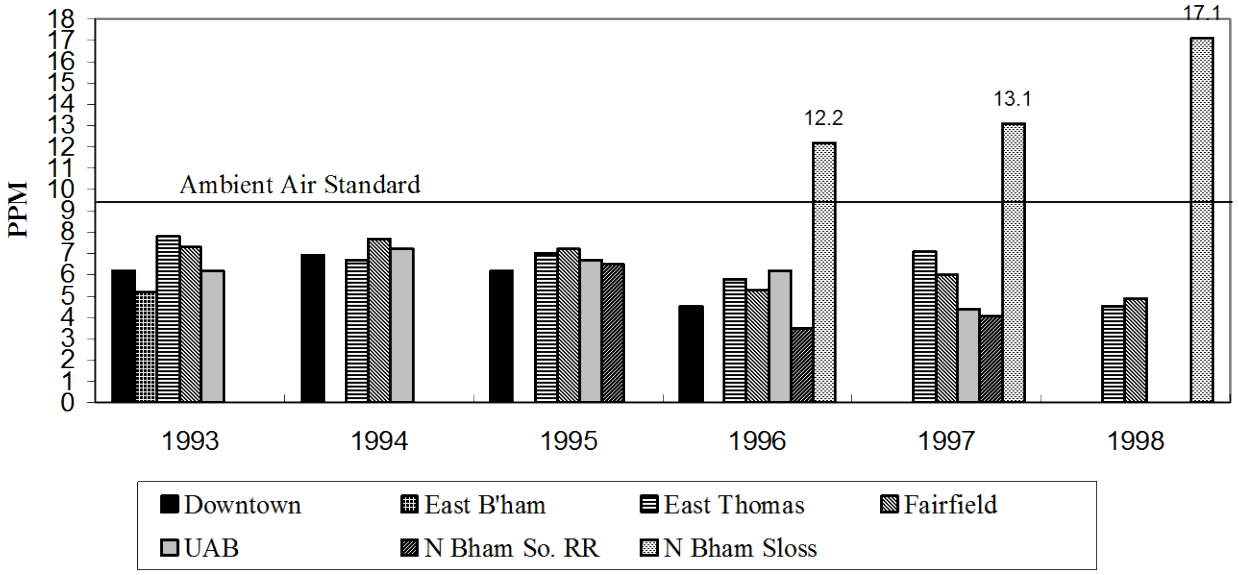


Table 5.6.2

Lead Quarterly Mean Values
1992 - 1997

Monitor Location	Year 1992	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l		0.84	0.29	0.14	0.15
East Birmingham		0.08	0.09	0.1	0.12
East Thomas		0.08	0.08	0.06	0.05
Ilco Pasture		0.28	0.07	0.05	0.07
Leeds Elementary	(Closed 7/1/92)	0.09	0.06		
Montgomery Oil		1.15	0.41	0.18	0.39
New Jerusalem Church	(Closed 7/1/92)	0.35	0.04		

Monitor Location	Year 1993	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Hayes Int'l	(Closed 3/31/93)	0.09			
East Birmingham		0.08	0.06	0.04	0.08
East Thomas		0.06	0.04	0.01	0.07
Ilco Pasture	(Closed 3/31/93)	0.18			
Montgomery Oil		0.28	0.3	0.04	0.1

Monitor Location	Year 1994	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Birmingham	(Closed 3/31/94)	0.11			
East Thomas		0.07	0.07	0.05	0.06
Montgomery Oil		0.07	0.09	0.09	0.11

Monitor Location	Year 1995	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Thomas		0.06	0.06	0.06	0.09
Montgomery Oil	(Closed 1/1/96)	0.05	0.05	0.06	0.07

Monitor Location	Year 1996	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Thomas		0.07	0.04	0.08	0.13

Monitor Location	Year 1997	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
East Thomas	(Closed 1/17/97)				

Values measured in micrograms per cubic meter ($\mu g/m^3$).

Graph 5.6.3

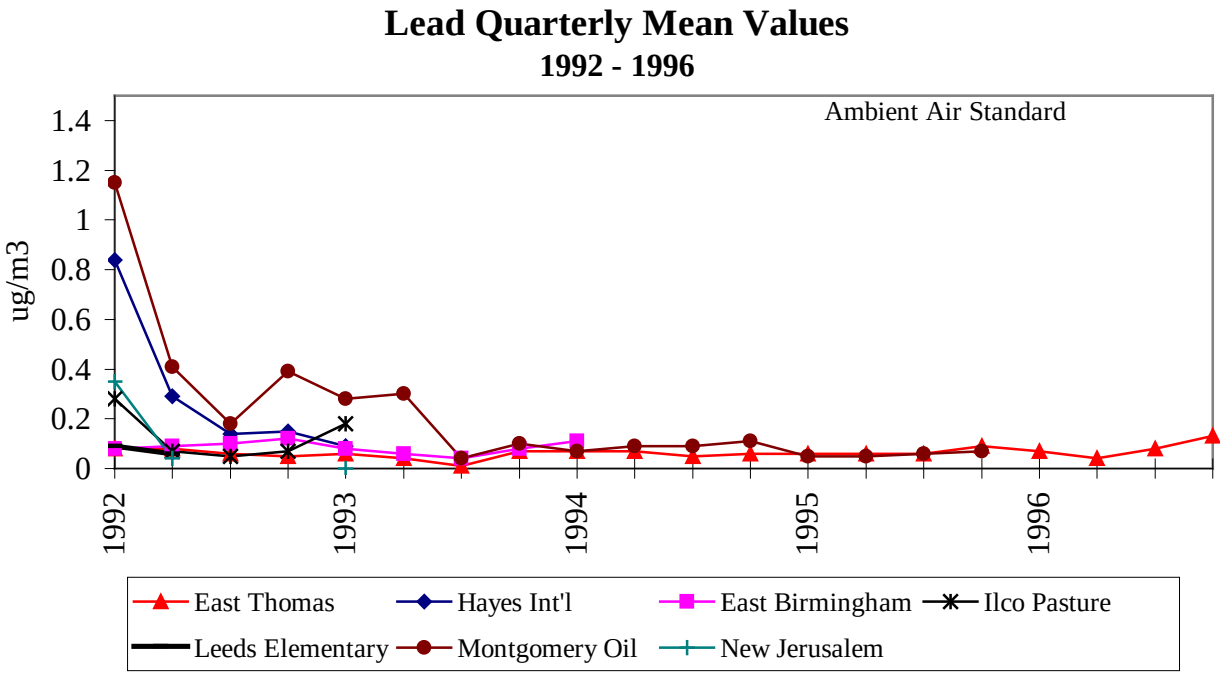

Lead Quarterly Mean Values
1992 - 1996
Ambient Air Standard
ug/m3
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1992
1993
1994
1995
1996
East Thomas
Hayes Int'l
East Birmingham
Ilco Pasture
Leeds Elementary
Montgomery Oil
New Jerusalem

Table 5.6.3

Ozone Maximum 1-Hour Averages

1993 – 1998

		Year					
		1993	**1994**	**1995**	**1996**	**1997**	**1998**
Fairfield	1.	0.120	0.109	0.120	0.117	0.110	**0.139**
	2.	0.111	0.098	0.119	0.117	0.110	**0.127**
	3.	0.108	0.093	0.117	0.116	0.109	0.118
	4.	0.104	0.090	0.113	0.113	0.101	0.116
Tarrant	1.	0.112	0.079	**0.142**	**0.126**	0.115	**0.145**
	2.	0.108	0.079	**0.127**	0.117	0.113	0.117
	3.	0.103	0.078	0.123	0.112	0.113	0.115
	4.	0.095	0.076	0.114	0.107	0.103	0.113
Pinson	1.	0.115	0.099	0.118	**0.131**	**0.135**	0.115
	2.	0.098	0.090	0.115	**0.126**	0.122	0.106 E
	3.	0.098	0.090	0.111	0.114	0.100	0.102
	4.	0.093	0.090	0.107	0.101	0.091	0.102
McAdory	1.	0.106	0.107	**0.153**	**0.144**	0.101	**0.128**
	2.	0.104	0.099	**0.132**	**0.138**	0.096	0.115
	3.	0.102	0.098	**0.128**	0.113	0.094	0.113 E
	4.	0.101	0.096	**0.127**	0.110	0.093	0.111
Hoover	1.	**0.135**	0.116	**0.125**	**0.143**	0.106	**0.131**
	2.	0.113	0.108	**0.125**	**0.141**	0.103	**0.126**
	3.	0.113	0.099	**0.125**	0.123	0.103	0.119
	4.	0.110	0.096	0.124	0.114	0.103	0.108

Ambient air exceedances are in bold characters.
Values measured in ppm.
E - Exceptional event data (forest fire).

Table 5.6.4

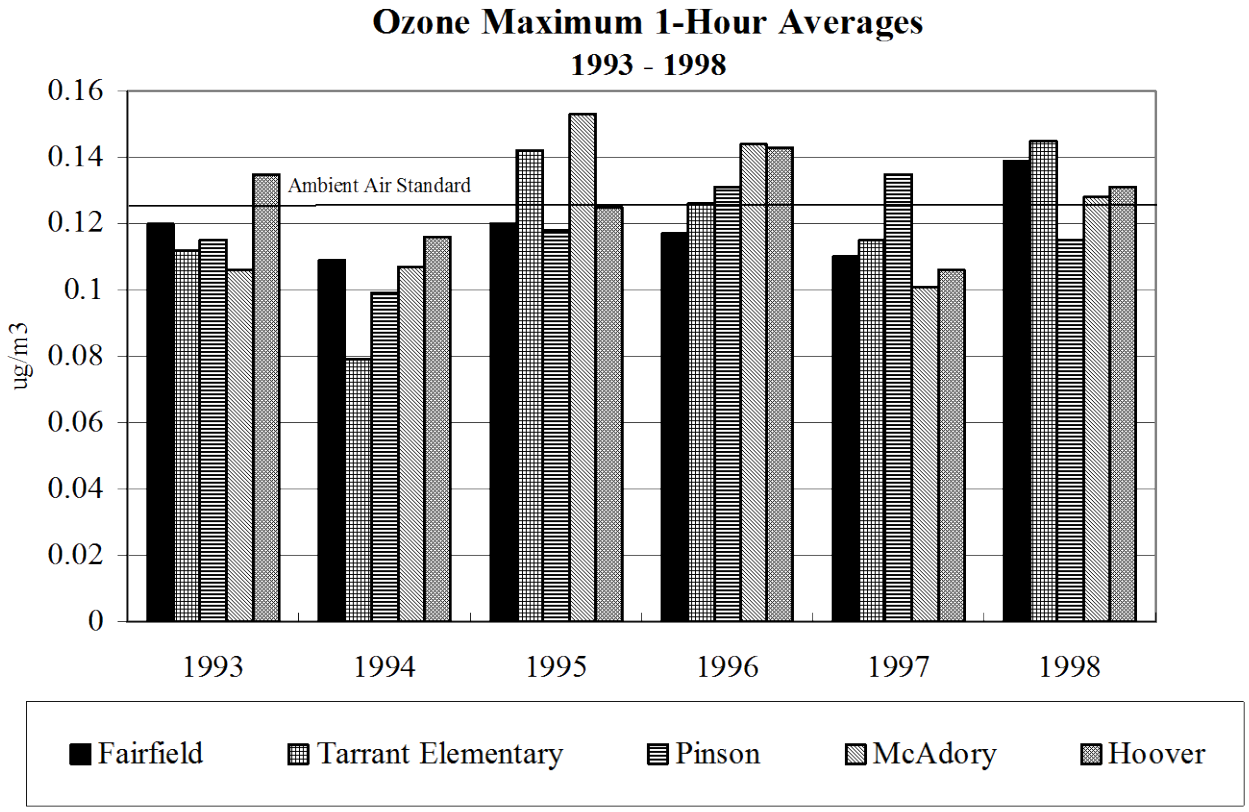
Ozone Maximum 8-Hour Averages

1997 - 1998

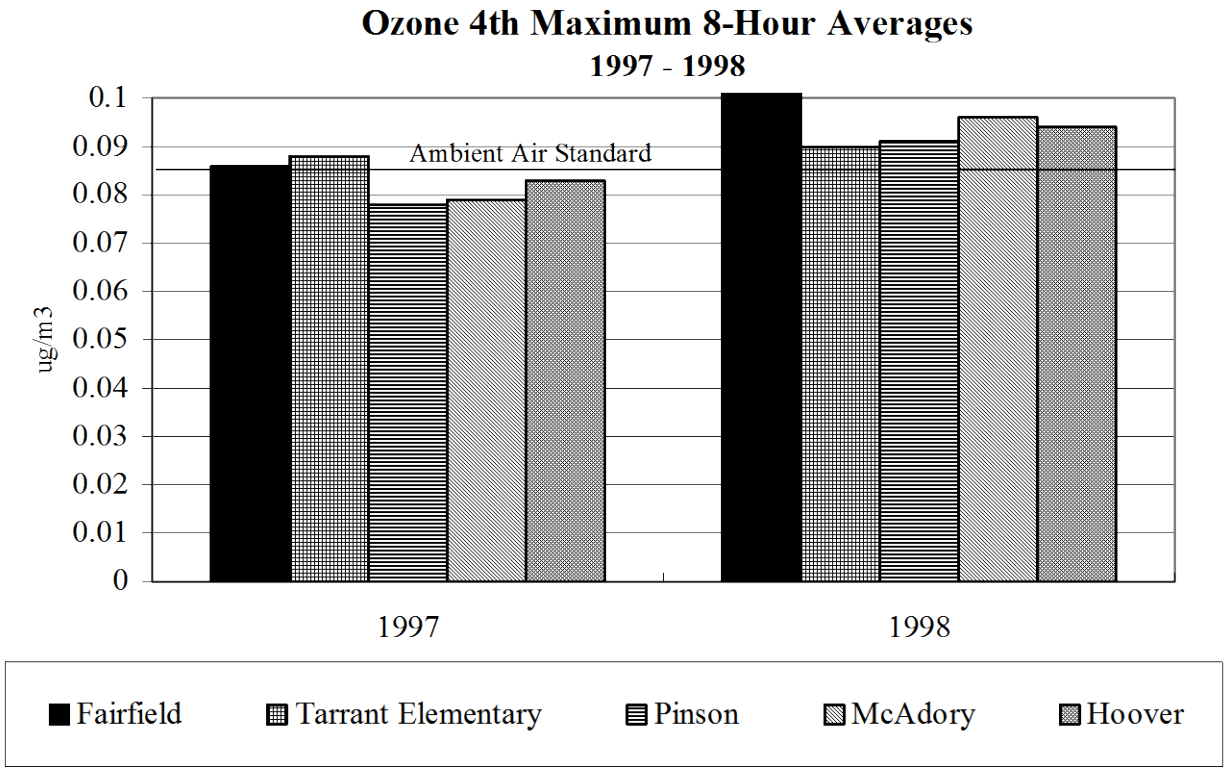
		Year	
		1997	**1998**
Fairfield	1.	0.094	0.110
	2.	0.093	0.110
	3.	0.089	0.101
	4.	**0.086**	**0.101**
Tarrant	1.	0.100	0.112
	2.	0.093	0.101
	3.	0.090	0.100
	4.	**0.088**	0.095E
	5.		**0.090**
Pinson	1.	0.107	0.096
	2.	0.099	0.094E
	3.	0.085	0.094
	4.	0.078	0.092
	5.		**0.091**
McAdory	1.	0.088	0.111
	2.	0.087	0.100
	3.	0.086	0.099
	4.	0.079	**0.096**
Hoover	1.	0.092	0.113
	2.	0.091	0.107
	3.	0.084	0.102
	4.	0.083	**0.094**

An exceedance of the standard occurs when the 4th maximum value recorded during the year is greater than or equal to 0.085 ppm. These ambient air exceedances are in bold characters. Compliance with the 8-hour ozone standard will be determined by averaging the 4th highest 8-hour ozone value at each site over a 3-year period.
Values measured in ppm. Values calculated in accordance with EPA guidelines issued December 1998.
E - Exceptional event data (forest fire). Data flagged due to Central-American forest fires. Values will not be used in determining attainment status.

Graph 5.6.4


Ozone Maximum 1-Hour Averages
1993 - 1998
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
ug/m3
Ambient Air Standard
1993
1994
1995
1996
1997
1998
Fairfield
Tarrant Elementary
Pinson
McAdory
Hoover

Graph 5.6.5



Values for Tarrant and Pinson are the 5th highest values due to flagged data.

Table 5.6.5

The following table is a review of the current status of ozone nonattainment. Based upon three years of collected data, the last column indicates the number of possible 1-hour exceedances allowed in 1999. Due to the violation (four or more exceedances in a three year period) of the standard at the Helena site in 1998 the Jefferson-Shelby county nonattainment area will not be eligible for attainment status until 2001. Upon redesignation to attaiment the area will be subject to the the new 8-hour ozone standard published in the Federal Register on July 18, 1997.

Exceedances of the Birmingham Ozone Nonattainment Area
1996 - 1998

Monitoring Station	1997	1998	# Exceedances Allowed in 1999
Fairfield	0	2	1
Pinson	1	0	2
Tarrant	0	1	2
McAdory	0	1	2
Hoover	0	2	1
Helena	0	4	0
Total	1	10	8

Table 5.6.6

Particulate Matter (PM10) Maximums

1993 - 1998

Year

	1993	1994	1995	1996	1997	1998
Bessemer (m)						
Annual Mean	28	25	27	25	26	27
24-hour Averages						
1st Max	75	69	58	53	70	68
2nd Max	58	50	56	43	62	54
Dolomite (c)						
Annual Mean	--	35	36	33	33	29
24-hour Averages						
1st Max	--	109	118	125	104	91
2nd Max	--	107	109	106	92	83
Inglenook (m)						
Annual Mean	27	25	24	25	Closed 3/3/97	
24-hour Averages						
1st Max	73	50	57	57	24	
2nd Max	62	47	57	51	20	
Leeds Elementary School (m)						
Annual Mean	25	24	25	24	23	25
24-hour Averages						
1st Max	67	56	63	54	54	42
2nd Max	61	48	50	41	52	41
North Birmingham, So. RR (c)						
Annual Mean	36	34	34	34	35	36
24-hour Averages						
1st Max	98	108	123	106	113	110
2nd Max	85	104	95	100	111	109

Table 5.6.6 (continued)

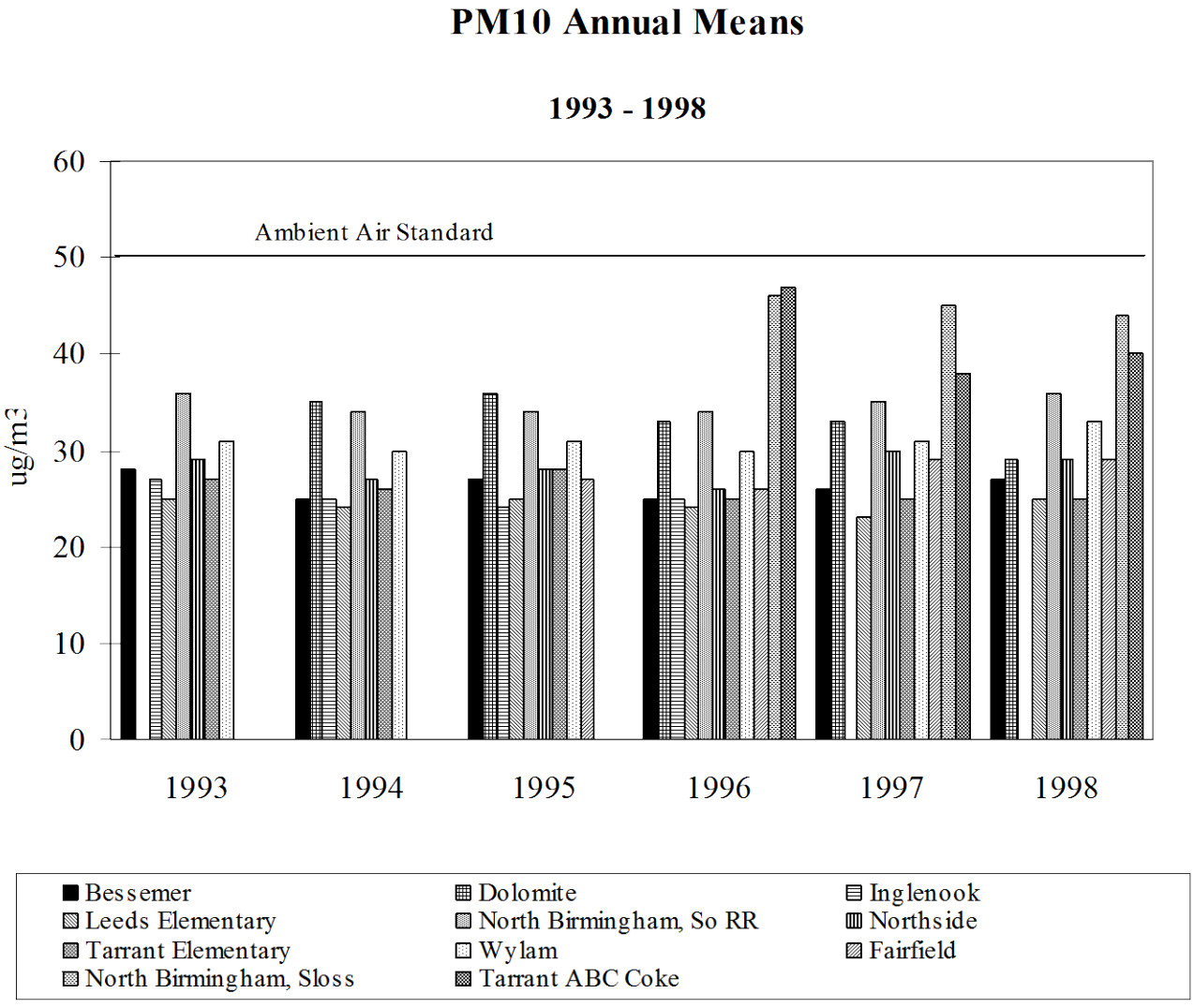
Particulate Matter (PM10) Maximums

1993 - 1998

	Year					
	1993	**1994**	**1995**	**1996**	**1997**	**1998**
Northside (m)						
Annual Mean	29	27	28	26	30	29
24-hour Averages						
1st Max	69	69	52	56	111	79
2nd Max	69	58	52	53	74	54
Tarrant (m)						
Annual Mean	27	26	28	25	25	25
24-hour Averages						
1st Max	72	52	58	58	67	58
2nd Max	58	50	57	46	59	45
Wylam (c)						
Annual Mean	31	30	31	30	31	33
24-hour Averages						
1st Max	81	116	145 E	109	108	109 E
2nd Max	76	83	83	83	95	98
Fairfield (m)						
Annual Mean	--	--	27	26	29	29
24-hour Averages						
1st Max	--	--	54	67	64	77
2nd Max	--	--	54	46	61	51
North Birmingham, Sloss (c)						
Annual Mean	--	--	--	46	45	44
24-hour Averages						
1st Max	--	--	--	**188**	120	112
2nd Max	--	--	--	139	111	108
Tarrant ABC						
Annual Mean	--	--	--	47	38	40
24-hour Averages						
1st Max	--	--	--	**282**	**176**	**162**
2nd Max	--	--	--	**198**	**162**	**145**

Values measured in $\mu g/m^3$.
(c)- continuous monitor; (m) - manual monitor; E - Exceptional event data (forest fire).
Ambient air exceedances are in bold characters.

Graph 5.6.6


PM10 Annual Means
1993 - 1998
60
50
40
30
20
10
0
ug/m3
Ambient Air Standard
1993
1994
1995
1996
1997
1998
Bessemer
Dolomite
Inglenook
Leeds Elementary
North Birmingham, So RR
Northside
Tarrant Elementary
Wylam
Fairfield
North Birmingham, Sloss
Tarrant ABC Coke

Graph 5.6.7

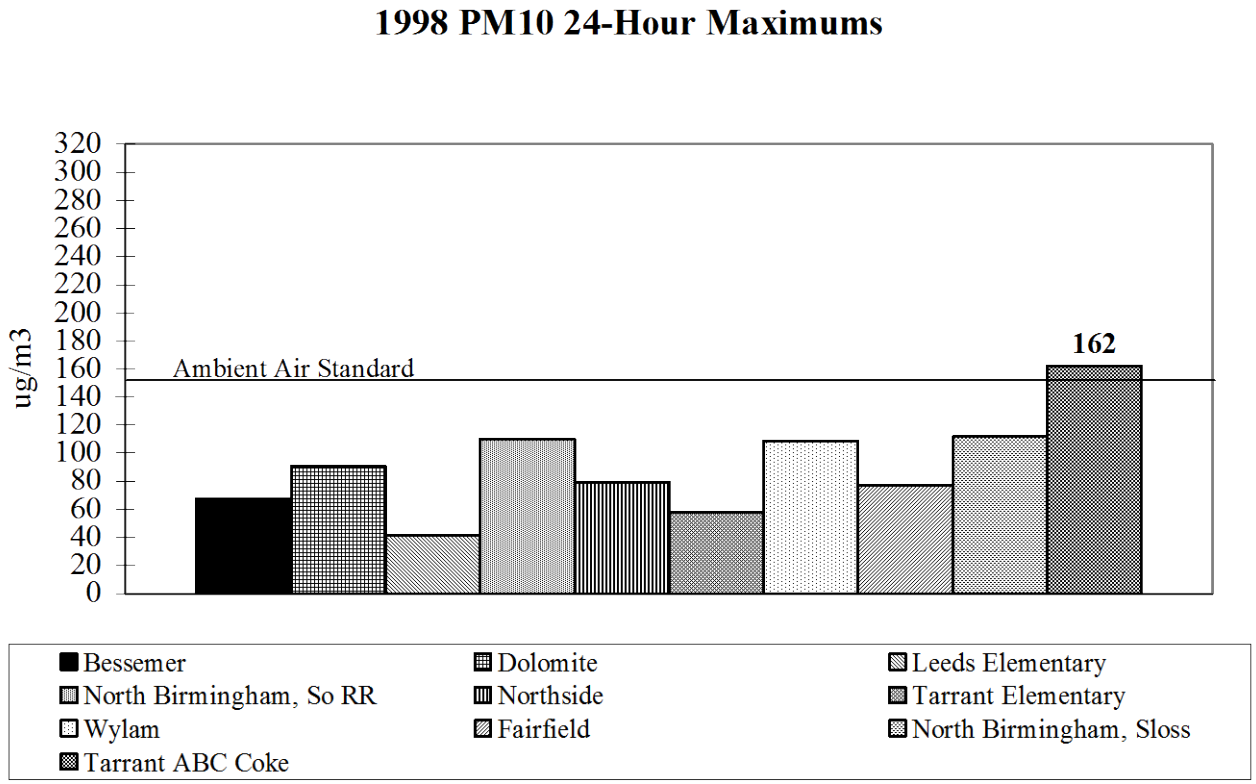

1998 PM10 24-Hour Maximums
ug/m3
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Ambient Air Standard
162
Bessemer
Dolomite
Leeds Elementary
North Birmingham, So RR
Northside
Tarrant Elementary
Wylam
Fairfield
North Birmingham, Sloss
Tarrant ABC Coke

Table 5.6.7

Sulfur Dioxide Maximums and Annual Means
1993 - 1998

Leeds Sunset View Apts.	**1993**	**1994**
Annual Mean	0.01	closed 1/27/94
24-hour Averages		
1st Max	0.02	
2nd Max	0.02	
3-hour Averages		
1st Max	0.062	
2nd Max	0.061	

Fairfield	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Annual Mean	0.01	0.01	0.01	<0.01	<0.01	<0.01
24-hour Averages						
1st Max	0.05	0.05	0.02	0.02	0.02	0.03
2nd Max	0.05	0.04	0.02	0.02	0.02	0.03
3-hour Averages						
1st Max	0.08	0.08	0.05	0.06	0.08	0.10
2nd Max	0.08	0.08	0.04	0.04	0.07	0.06

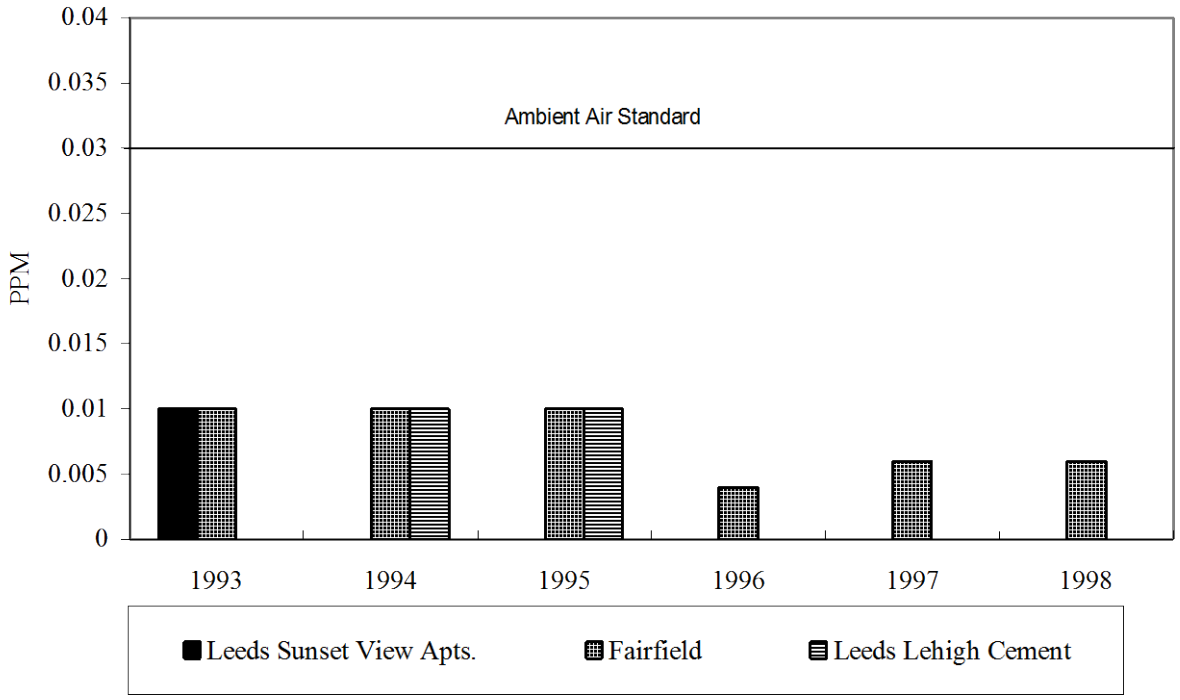
Leeds Lehigh Cement Plant (closed 12/31/95)	**1993**	**1994**	**1995**
Annual Mean	***	0.01	0.01
24-hour Averages			
1st Max	*0.02	0.02	0.02
2nd Max	*0.02	0.02	0.01
3-hour Averages			
1st Max	*0.05	0.07	0.04
2nd Max	*0.04	0.07	0.03

Values measured in ppm.
*Based on 7 months of data.
*** Insufficient number of samples.

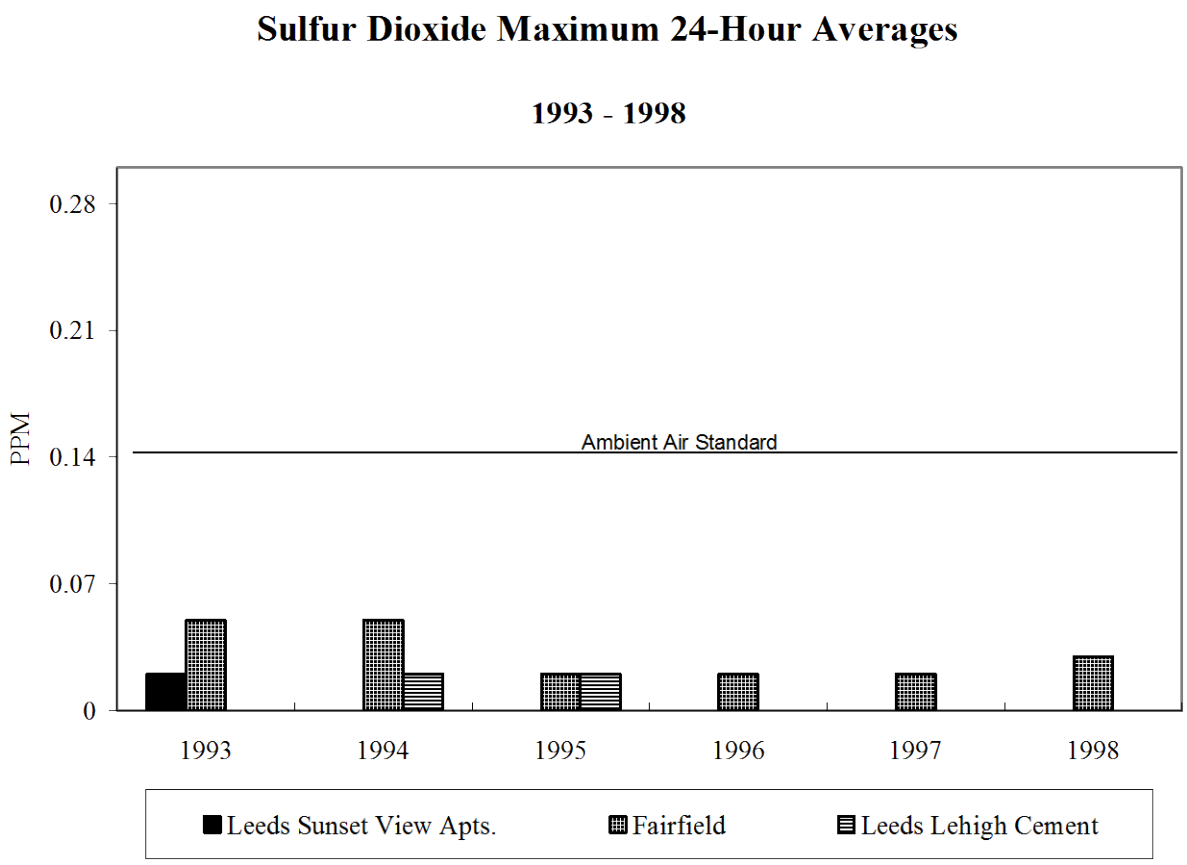
Graph 5.6.8

Sulfur Dioxide Annual Means

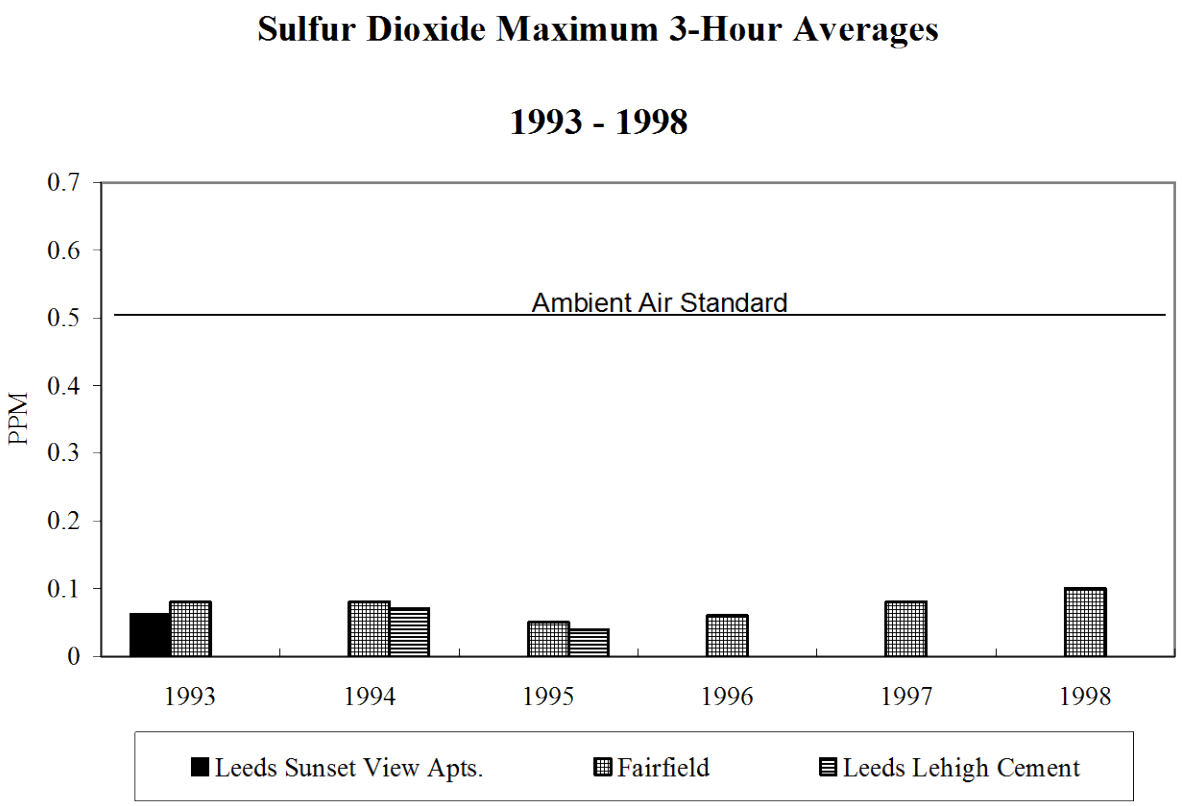
1993 - 1998



Graph 5.6.9


Sulfur Dioxide Maximum 24-Hour Averages
1993 - 1998
0.28
0.21
0.14
0.07
0
PPM
Ambient Air Standard
1993
1994
1995
1996
1997
1998
Leeds Sunset View Apts.
Fairfield
Leeds Lehigh Cement

Graph 5.6.10


Sulfur Dioxide Maximum 3-Hour Averages
1993 - 1998
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
PPM
Ambient Air Standard
1993
1994
1995
1996
1997
1998
Leeds Sunset View Apts.
Fairfield
Leeds Lehigh Cement

6.0 Exceedances of the Ambient Air Quality Standards

An exceedance of an ambient standard is the occurrence of a pollutant concentration that is greater than the numerical value of the standard for a period of time equal to the averaging time specified by the standard (see Table 2.1). A violation of an ambient standard, at a single monitor, is the occurrence of more exceedances of the numerical value of the standard than is allowed within a specified period of time. An excludable exceedance is one that occurred as a result of an unusual natural or man-made event such as a severe drought, wildfire, tornado, structural fire, or temporary construction project near a monitor. The question of whether or not an exceedance will be excluded arises in determining the attainment status of an area. It is not a question of whether or not the exceedance occurred, but rather, of what it represents. An exceedance can only be excluded after consultation with the Alabama Department of Environmental Management (ADEM) and EPA. EPA granted exclusion of Jefferson County's ozone and particulate matter data for May 13, 14, 18, and 19 due to the Central-American forest fires which affected a large portion of the eastern United States. This particular data will not be used in attainment determination.

Ozone measurements exceeded the one-hour ambient standard on four days in 1998 at the NAMS and SLAMS sites. Particulate Matter measurements exceeded the 24-hour ambient standard on one day in 1998 at a SPM site. Carbon monoxide measurements exceeded the 8-hour standard on six separate days in 1998 at SPM sites. Measurements for sulfur dioxide did not exceed ambient standards during 1998.

7.0 Field Enforcement Activities

7.1 Industrial and Commercial Facilities

7.1.1 Inspections

All air pollution sources are subject to compliance monitoring in the field by Environmental Health Specialists (EHS) and air pollution control engineers. Minor and Synthetic Minor air pollution sources receive a comprehensive inspection by the assigned EHS or air pollution control engineer on a biennial basis. Major air pollution sources are inspected annually by an air pollution control engineer assigned to that facility. The inspection includes a review of relevant records and a walk-through of the facility, accompanied by the facility's environmental contact, to check emissions from each source and to ascertain the condition and performance of each control device. A meeting with facility personnel follows the conclusion of the inspection to discuss any problems observed and to establish remedial action if required. The air pollution control engineer or EHS prepares a comprehensive inspection report that is stored in the facility file maintained by the Air Pollution Control Program. Emissions for all sources are calculated annually. During 1998, there were 2464 field observations of commercial and industrial facilities, 166 visible emission evaluations, 884 inspections, and 2 Notices of Violation issued.

7.1.2 Incinerators

General waste incinerators receive a comprehensive inspection by Field Services EHSs biennially. Examination of the unit determines if all burners function properly and if the unit received proper maintenance. Visible emission evaluations during unit operations determine compliance with the visible emission standard. Units with complaints, or those with recent violations documented, receive more frequent inspections. Due to the concern for the potential release of pathogens and hydrochloric acid, the emission limits for medical waste incinerators are more restrictive and the units receive annual inspections. During 1998, there were 43 field observations of incinerators, 5 visible emission evaluations, and 5 inspections. There were no Notices of Violation issued to incinerator sources during 1998.

7.2 Open Burning

Due to smoke nuisance, as well as particulate and volatile organic compound (VOC) emissions, Jefferson County regulates open burning. Generally, open burning is prohibited except under specific circumstances allowed by the regulations. All open burning for construction and right-of-way clearing was prohibited during the months of May, June, July, August, and September of 1998. The issuing of open burning authorizations for land clearing operations requires a site evaluation by a Field Services EHS to determine if the material and the circumstances meet regulation requirements, and to set distance restrictions for the burning site. The Air Pollution Control Program issued 240 open burning authorizations in 1998.

Field Service EHSs also investigate complaints regarding open burning. An Advisory Notice or Official Notice of Violation is issued if the investigation determines a violation of the regulations. Enforcement of the open burning regulations has increased through routine assessment of penalties against repeat violators. In 1998, 452 open burning complaints were investigated, 111 Advisory Notices issued, and 43 Notices of Violation written.

7.3 Other Programs

7.3.1 Gasoline Dispensing Facilities and Tanker Trucks

The Air Pollution Control Program regulates gasoline dispensing facilities and tanker trucks due to emissions of volatile organic compounds (VOCs). Gasoline dispensing facilities must have and use Stage I Vapor Balance equipment while filling storage tanks. Gasoline tanker trucks are required to recover gasoline vapors while filling or emptying the truck vessels. Gasoline tanker trucks must certify vapor tightness annually and display an Air Sticker issued annually by the Air Pollution Control Program. Regulatory activities for this segment of the gasoline marketing industry are handled by the Field Services Section staff. There were 531 Air Stickers issued in 1998. During 1998, there were 152 field patrol observations of gasoline dispensing facilities and tanker trucks. There was 1 Notice of Violation issued in 1998. Also, 482 compliance inspections were conducted to assure that low sulfur/low vapor pressure gasoline was dispensed from gasoline dispensing facilities from June 1st through September 15th, in conjunction with the ozone season.

7.3.2 Asbestos Abatement

The Air Pollution Control Program enforces the National Emission Standard for Asbestos during renovation and demolition operations. A Field Services Environmental Health Program Supervisor serves as the Asbestos Abatement Coordinator for Jefferson County, and is responsible for the regulatory activities in this program area. During 1998, there were 341 regulated asbestos abatement or demolition notifications received and reviewed (of which 244 were subject to Federal asbestos standards), 57 inspections, 4 complaints investigated, and 2 Notices of Violation issued.

7.3.3 Indoor Air Quality

The Air Pollution Control Program acts as an information and referral resource regarding indoor air quality problems. Indoor air quality complaints in public buildings are investigated to a limited degree. Owners are often referred to other resources for more complex investigations or solutions. Individuals complaining about residential indoor air quality problems are also referred to other resources for additional information. The Air Pollution Control Program has no regulations or enforcement policies regarding indoor air quality at this time. Complainants may be referred to other agencies, like the Occupational Health and Safety Administration, if appropriate. During 1998, there were 60 indoor air complaints investigated.

7.3.4 Dry Cleaners

There are 59 dry cleaning facilities in Jefferson County subject to The National Perchloroethylene (Perc) Air Emission Standards for Dry Cleaning Facilities, 40 CFR 63, Subpart M. Of these subject facilities, 40 have been identified as small facilities, 19 as large facilities, and there have been no facilities identified as major sources. Field Services Staff of the Air Pollution Control Program inspected all of the subject facilities during FY 98.

8.0 Air Pollution Source Permitting

Permit applications must be submitted prior to the construction of new sources that have the potential to emit air pollutants and before the modification of existing air pollution sources. The type of emission source determines the information required in the application. The Engineering Section evaluates the degree of air pollution control required for all emission points within each industrial/commercial facility. Field Services Section staff are responsible for processing all permit applications for gasoline tanker trucks and dispensing facilities. Using established emission factors to assure allowable air emission standards, calculations are made to determine the estimated emissions for the proposed source. In 1998, air permits were issued for 175 new or modified sources. The Air Pollution Control Program continues to issue Title V Major Source Operating Permits under Chapter 18 of the Jefferson County Board of Health Air Pollution Control Rules and Regulations. Qualified sources may apply for and receive a Synthetic Minor Operating Permit under Chapter 17 of the Regulations. Minor Sources receive Air Permits under Chapter 2 of the Regulations.

Table 8.1

Source Type	**Number of Permits Issued**
Industrial/Commercial	51
Gasoline Tanker Trucks	109
Gasoline Dispensing Facilities	10
Incinerators	2
UST Soil Remediation	3
Total	**175**

Source of Permits Issued	**Number of Permits Issued**
Title V Major	19
Synthetic Minor	18
Minor	138

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