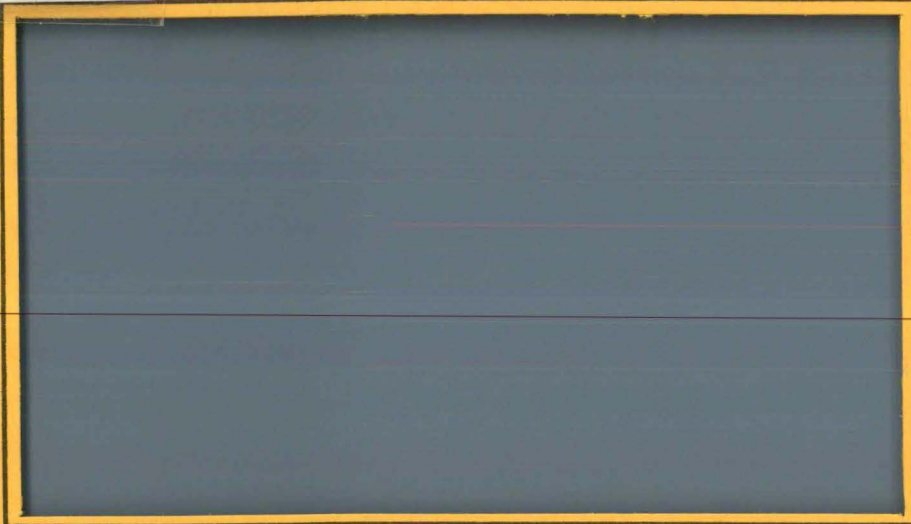


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A REPORT FROM

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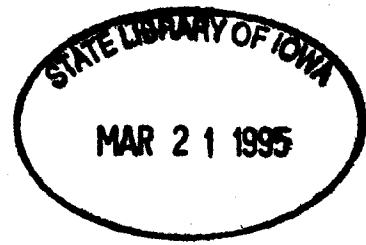
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AIR QUALITY SURVEY

KEOKUK, IOWA

25 September - 6 October, 1972

#73-21

Report on the
Air Quality in Keokuk during
a Twelve-Day Period in September and October

By

P D Larson

Chemist, Air Pollution Section

K H Schultz

Air Pollution Technician

STATE LIBRARY COMMISSION OF IOWA
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DES MOINES, IOWA 50319

Submitted to the Iowa Air Pollution Control Commission by the
State Hygienic Laboratory
9 November 1972

KEOKUK AIR QUALITY SURVEY

On 25 September 1972, the mobile air pollution control laboratory, operated by personnel of the State Hygienic Laboratory, was taken to Keokuk, Iowa for an ambient air quality survey. The survey was conducted during a twelve-day period from 25 September through 6 October 1972. The sites were chosen to be as representative as possible of the general surrounding area, without unduly maximizing or minimizing the effect of any point source of pollution within that area.

Three sampling sites were selected with the advice and cooperation of city officials. The first location at the Water Pollution Control Plant is in an industrial area along the Mississippi River. The Rees Park location, next to U.S. Highway 136, is in a residential area that is strongly influenced by emissions from the industrial area on the south edge of the city. Data from the downtown site at 3rd & Main reflects primarily the influence of traffic on Main Street, the city's major traffic artery. The Water Pollution Control Plant was utilized as a sampling site during the previous survey of Keokuk in February 1969; the other two sites were selected for the current survey.

Data for suspended particulates show a decrease in the geometric mean from 235 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for the previous survey to 141 $\mu\text{g}/\text{m}^3$ for the eight samples collected during the present survey. The latter figure is still more than one and one-half times the Federal Environmental Protection Agency (EPA) primary standard of 75 $\mu\text{g}/\text{m}^3$ annual geometric mean which is to be attained by 1975. Two samples from the Water Pollution Control Plant, and one sample from Rees Park, were greater than the 1975 EPA primary standard of 260 $\mu\text{g}/\text{m}^3$ for a single 24-hour sample, not to be exceeded more than once per year.

Coefficient of Haze (COH) values correlate very well with those for suspended particulates. These averages are among the highest found on a mobile laboratory survey, with one single 2-hour sample at the Water Pollution Control Plant reaching 2.57 COHs. The geometric mean of 0.19 for the survey is approximately half of the St Louis Soiling Index of 0.4, which is used for comparison since there are no Federal or Iowa standards established for coefficient of haze (smoke shade).

Carbon monoxide does not appear to be a problem in Keokuk at the locations sampled. The average values were quite low, with the greatest amounts being detected, as expected, at the 3rd & Main location adjacent to Highways 218-136. During the survey, winds were fairly brisk from the river, providing adequate ventilation for dispersion of carbon monoxide. Calm weather conditions could produce a greater accumulation of carbon monoxide.

Sulfur dioxide (SO₂) was detected at the Water Pollution Control Plant, with a peak value of 0.07 ppm, and a 24-hour maximum average concentration of 0.03 ppm. This concentration is considerably lower than the 1975 EPA primary standard of 0.14 ppm maximum 24-hour concentration, but was maintained at about 0.02 ppm during the sampling period of three days at this location. Sulfur dioxide was detected only briefly at a concentration of 0.02 ppm at one other site, Rees Park. Since fossil fuels are not used to any great extent for heating purposes at this time of year, and there is no stationary power generating plant using fossil fuels, it is assumed that the source of SO₂ in this instance is industrial. The levels of SO₂ present during the winter months will probably be higher.

Ozone concentration generally showed the expected diurnal pattern of fluctuation, falling to low values in the early morning hours, and ~~rising to a daily peak of 20-50 parts per billion (ppb) in late afternoon.~~ An exception occurred between 1900 on 3 October and 0100 on 4 October, when values increased during a thunderstorm from 20 ppb to 38 ppb, then decreasing to a morning low of 9 ppb at 0800. It should be noted that, at Rees Park between 1300 and 1600 on 2 October, the one-hour maximum average concentrations of 72 ppb came close (90%) to the 1975 EPA standard of 80 ppb, not to be exceeded more than once per year.

In conclusion, the data obtained during this survey show that, for this period, the air quality in Keokuk meets the EPA standards, with the exception of suspended particulates. The relatively, but not excessively high COH averages at the Water Pollution Control Plant and at Rees Park should be considered together with the suspended particulate values. Results of the previous and current surveys with respect to sulfur dioxide suggest that this parameter of air quality deserves attention and monitoring, to avoid its becoming a source of concern.

This report is not to be considered a comprehensive treatment of the overall air quality in Keokuk, but rather as an evaluation of specific parameters under prevailing conditions that existed during the 25 September 1972 survey period.

jt

KEOKUK

(Not to Scale)



- 1 Water Pollution Control Plant
- 2 Rees Park
- 3 3rd & Main

RESIDENTIAL

RAND
PARK

COMMERCIAL

2

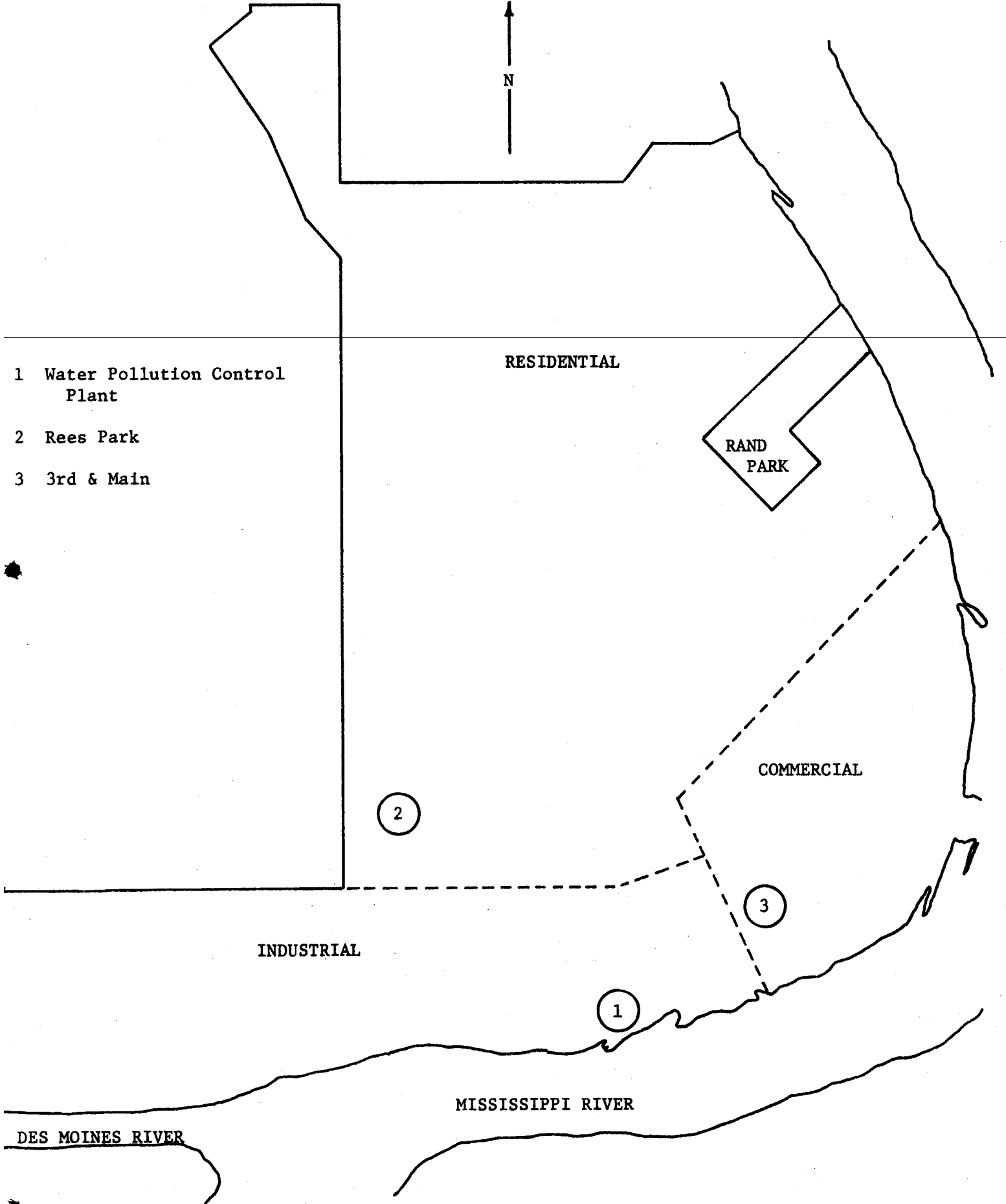
3

INDUSTRIAL

1

MISSISSIPPI RIVER

DES MOINES RIVER



NATIONAL PRIMARY AND SECONDARY
AMBIENT AIR QUALITY STANDARDS

Primary Standard - level of air quality necessary, with an adequate margin of safety, to protect the public health.

Secondary Standard - levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Particulate Matter (primary)

- a. $75 \mu\text{g}/\text{m}^3$ - annual geometric mean

- b. $260 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

Particulate Matter (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ - annual geometric mean
- b. $150 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

Sulfur Oxides (primary)

- a. $80 \mu\text{g}/\text{m}^3$ (0.03 ppm) - annual arithmetic mean
- b. $365 \mu\text{g}/\text{m}^3$ (0.14 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.

Sulfur Oxides (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ (0.02 ppm) - annual arithmetic mean
- b. $260 \mu\text{g}/\text{m}^3$ (0.1 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.
- c. $1,300 \mu\text{g}/\text{m}^3$ (0.5 ppm) - maximum 3-hour concentration not to be exceeded more than once per year.

Carbon Monoxide (primary and secondary)

- a. $10 \text{ mg}/\text{m}^3$ (9 ppm) - maximum 8-hour concentration not to be exceeded more than once per year.
- b. $40 \text{ mg}/\text{m}^3$ (35 ppm) - maximum 1-hour concentration not to be exceeded more than once per year.

National Primary and Secondary Ambient Air Quality Standards (contd)

Ozone Standard (primary and secondary)

160 $\mu\text{g}/\text{m}^3$ (0.080 ppm or 80 ppb) - maximum 1-hour concentration not to be exceeded more than once per year.

Non-methane Hydrocarbons (primary and secondary)

0.24 ppm - maximum 3-hour concentration (6 am to 9 am) not to be exceeded more than once per year.

Oxides of Nitrogen (primary and secondary)

0.05 ppm annual arithmetic mean

Coefficient of Haze

St Louis Soiling Index - 0.4 COH/1000 lineal feet, annual geometric mean

SUSPENDED PARTICULATES
24-Hour Samples

<u>DATE</u>	<u>LOCATION</u>	<u>SUSPENDED PARTICULATE ($\mu\text{g}/\text{m}^3$)</u>
9/25-26/72	WPC Plant	273
9/26-27/72		403
9/27-28/72		55
9/28-29/72	Rees Park	141
10/2-3/72		266
10/3-4/72	3rd & Main	110
10/4-5/72		72
10/5-6/72		87 (14 hour sample)

AVERAGE 176
GEOMETRIC MEAN 141

Particulate Matter (primary)

- a. $75 \mu\text{g}/\text{m}^3$ - annual geometric mean
- b. $260 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

Particulate Matter (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ - annual geometric mean
- b. $150 \mu\text{g}/\text{m}^3$ - maximum 24-hour concentration not to be exceeded more than once per year.

SULFUR DIOXIDE
KEOKUK

DATE	LOCATION	TIME	PEAK	AVERAGE MAXIMUM CONCENTRATION	
				3 HOURS	24 HOURS
9/25/72	Water Pollution Control Plant	1501-1800	0.03	0.02	---
		-2100	0.03	0.02	---
		-2400	0.04	0.03	---
9/26/72	Water Pollution Control Plant	0001-0300	0.04	0.04	---
		-0600	0.04	0.04	---
		-0900	0.04	0.04	---
		-1200	0.04	0.02	---
		-1500	0.07	0.03	0.03
		-1800	0.04	0.03	0.03
		-2100	0.02	0.01	0.03
		-2400	0.01	0.01	0.03
9/27/72	Water Pollution Control Plant	0001-0300	Nil	Nil	0.02
		-0600	Nil	Nil	0.02
		-0900	Nil	Nil	0.01
		-1200	Nil	Nil	0.01
		-1500	0.01	0.01	0.01
		-1800	0.02	0.02	0.01
		-2100	0.02	0.01	0.01
		-2400	0.02	0.01	0.01
9/28/72	Water Pollution Control Plant	0001-0300	0.02	0.01	0.01
		-0600	0.01	0.01	0.01
		-0900	0.02	0.02	0.01
		-1200	0.02	Nil	0.01
10/2/72	Rees Park	1200-1500	0.02	Nil	Nil

Sulfur Oxides (primary)

- a. $80 \mu\text{g}/\text{m}^3$ (0.03 ppm) - annual arithmetic mean
- b. $365 \mu\text{g}/\text{m}^3$ (0.14 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.

Sulfur Oxides (secondary)

- a. $60 \mu\text{g}/\text{m}^3$ (0.02 ppm) - annual arithmetic mean
- b. $260 \mu\text{g}/\text{m}^3$ (0.1 ppm) - maximum 24-hour concentration not to be exceeded more than once per year.
- c. $1,300 \mu\text{g}/\text{m}^3$ (0.5 ppm) - maximum 3-hour concentration not to be exceeded more than once per year.

CARBON MONOXIDE
KEOKUK

(Values in Parts per Million)

DATE	LOCATION	TIME	PEAK	AVERAGE MAXIMUM CONCENTRATION	
				1 Hour	8 Hours
9/25/72	WPC Plant	1401-1500	--	--	--
		-1600	4	1	--
		-1700	1	1	--
		-1800	1	1	--
		-1900	1	1	--
		-2000	2	1	--
		-2100	1	1	--
		-2200	1	1	0.9
		-2300	2	1	1.0
		-2400	1	1	1.0
9/26/72	WPC Plant	0001-0100	--	--	0.9
		-0200	--	--	0.8
		-0300	--	--	0.6
		-0400	1	--	0.5
		-0500	1	1	0.5
		-0600	1	1	0.5
		-0700	1	1	0.5
		-0800	2	1	0.5
		-0900	1	1	0.6
		-1000	5	2	0.9
		-1100	2	1	1.0
		-1200	3	1	1.1
		-1300	1	1	1.1
		-1400	1	1	1.1
		-1500	1	1	1.1
		-1600	1	1	1.1
		-1700	2	1	1.1
		-1800	1	1	1.0
		-1900	3	1	1.0
		-2000	2	1	1.0
-2100	1	1	1.0		
-2200	1	1	1.0		
-2300	0	0	0.9		
-2400	0	0	0.8		
9/27/72	WPC Plant	0001-0100	0	0	0.6
		-0200	0	0	0.5
		-0300	0	0	0.4
		-0400	0	0	0.2
		-0500	0	0	0.1
		-0600	0	0	--
		-0700	3	0	--

DATE	LOCATION	TIME	PEAK	AVERAGE MAXIMUM CONCENTRATION			
				1 Hour	8 Hours		
9/27/72	WPC Plant	0700-0800	2	1	0.1		
		-0900	2	1	0.2		
		-1000	3	1	0.4		
		-1100	2	1	0.5		
		-1200	0	0	0.5		
		-1300	0	0	0.5		
		-1400	0	0	0.5		
		-1500	2	0	0.5		
		-1600	2	1	0.5		
		-1700	0	0	0.4		
		-1800	7	2	0.5		
		-1900	3	1	0.5		
		-2000	0	0	0.5		
		-2100	0	0	0.5		
		-2200	0	0	0.5		
		-2300	0	0	0.5		
		-2400	0	0	0.4		
		9/28/72	WPC Plant	0001-0100	0	0	0.4
				-0200	0	0	0.1
				-0300	0	0	--
-0400	0			0	--		
-0500	4			1	0.1		
-0600	1			1	0.2		
-0700	1			1	0.4		
-0800	2			1	0.5		
-0900	1			1	0.6		
-1000	0			0	0.6		
-1100	1			1	0.8		
-1200	1			1	0.9		
-1300	4			1	0.9		
9/28/72	Rees Park	-					
		1400-1500	1	1	--		
		-1600	1	1	--		
		-1700	1	1	--		
		-1800	1	1	--		
		-1900	1	1	--		
		-2000	3	1	--		
		-2100	1	1	--		
		-2200	0	0	0.9		
		-2300	0	0	0.8		
9/29/72	Rees Park	0001-0100	0	0	0.5		
		-0200	0	0	0.4		
		-0300	0	0	0.2		
		-0400	0	0	0.1		
		-0500	0	0	--		
		-0600	0	0	--		
		-0700	1	1	0.1		
		-0800	2	1	0.2		
		-0900	3	1	0.4		

DATE	LOCATION	TIME	PEAK	AVERAGE MAXIMUM CONCENTRATION			
				1 Hour	8 Hours		
9/29/72	Rees Park	0900-1000	2	1	0.5		
		-1100	1	1	0.6		
		-1200	2	1	0.8		
		-1300	1	1	0.9		
		-1400	2	1	1.0		
		-1500	1	1	1.0		
		-1600	1	1	1.0		
		-1700	2	1	1.0		
		-1800	3	1	1.0		
		-1900	1	1	1.0		
		-2000	3	1	1.0		
		-2100	3	1	1.0		
		-2200	2	1	1.0		
		-2300	1	1	1.0		
		-2400	2	1	1.0		
		9/30/72	Rees Park	0001-0100	2	1	1.0
				-0200	0	0	0.9
				-0300	0	0	0.8
				-0400	0	0	0.6
				-0500	0	0	0.5
				-0600	2	1	0.5
-0700	2			1	0.5		
-0800	6			1	0.5		
-0900	1			1	0.5		
-1000	1			1	0.6		
-1100	1			1	0.8		
-1200	1			1	0.9		
-1300	2			1	1.0		
-1400	1			1	1.0		
-1500	1			1	1.0		
-1600	1			1	1.0		
-1700	1			1	1.0		
-1800	0			0	0.9		
-1900	0			0	0.8		
-2000	0			0	0.6		
-2100	0			0	0.5		
-2200	0	0	0.4				
-2300	0	0	0.2				
-2400	0	0	0.1				
10/1/72	Rees Park	0001-2400	None Detected				
10/2/72	Rees Park	0001-1400	None Detected				
		1401-1500	1	1	--		
		-1600	2	1	--		
		-1700	1	1	--		
		-1800	2	1	--		
		-1900	2	2	--		
		-2000	2	2	--		
		-2100	2	1	--		
		-2200	1	1	1.2		
		-2300	1	1	1.2		
		-2400	0	0	1.1		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 Hour</u>	<u>8 Hours</u>
10/3/72	Rees Park	0001-0100	0	0	1.0
		-0200	0	0	0.9
		-0300	0	0	0.6
		-0400	0	0	0.4
		-0500	0	0	0.2
		-0600	0	0	0.1
		-0700	0	0	--
		-0800	1	1	0.1
		-0900	1	1	0.2
		-1000	3	1	0.4
		-1100	3	1	0.5
		-1200	3	1	0.6
		-1300	2	2	0.9
10/3/72	3rd & Main	1501-1600	7	1	--
		-1700	6	2	--
		-1800	3	1	--
		-1900	6	1	--
		-2000	2	1	--
		-2100	3	1	--
		-2200	1	1	--
		-2300	2	1	1.1
		-2400	3	1	1.1
10/4/72	3rd & Main	0001-0100	1	0	0.9
		-0200	0	0	0.8
		-0300	0	0	0.6
		-0400	0	0	0.5
		-0500	2	1	0.5
		-0600	1	1	0.5
		-0700	4	2	0.6
		-0800	6	2	0.8
		-0900	4	2	1.0
		-1000	3	1	1.1
		-1100	1	1	1.2
		-1200	2	1	1.4
		-1300	5	2	1.5
		-1400	3	1	1.5
		-1500	4	2	1.5
		-1600	19	2	1.5
		-1700	2	1	1.5
		-1800	5	2	1.6
		-1900	3	2	1.8
		-2000	3	2	1.9
-2100	5	2	1.9		
-2200	3	2	2.0		
-2300	2	1	1.9		
-2400	3	1	1.6		

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>AVERAGE</u>	
				<u>1 Hour</u>	<u>8 Hours</u>
10/5/72	3rd & Main	0001-0100	2	1	1.6
		-0200	2	1	1.5
		-0300	2	1	1.4
		-0400	2	1	1.2
		-0500	4	2	1.2
		-0600	3	2	1.2
		-0700	3	2	1.4
		-0800	5	3	1.6
		-0900	7	3	1.9
		-1000	3	2	2.0
		-1100	3	3	2.2
		-1200	9	3	2.5
		-1300	4	2	2.5
		-1400	3	2	2.5
		-1500	4	1	2.4
		-1600	1	1	2.1
		-1700	2	1	1.9
		-1800	3	2	1.9
		-1900	3	2	1.8
		-2000	3	2	1.6
		-2100	4	2	1.6
		-2200	1	1	1.5
		-2300	1	1	1.5
		-2400	0	0	1.4
10/6/72	3rd & Main	0001-0100	0	0	1.2
		-0200	0	0	1.0
		-0300	0	0	0.8
		-0400	0	0	0.5
		-0500	0	0	0.2
		-0600	0	0	0.1

Carbon Monoxide (primary and secondary)

- a. 10 mg/m³ (9 ppm) - maximum 8-hour concentration not to be exceeded more than once per year.
- b. 40 mg/m³ (35 ppm) - maximum 1-hour concentration not to be exceeded more than once per year.

OZONE
KEOKUK

(Values in Parts per Billion)

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 HOUR</u>
9/25/72	Water Pollution Control Plant	1401-1500	58	54
		-1600	57	50
		-1700	52	47
		-1800	48	43
		-1900	45	41
		-2000	41	38
		-2100	41	36
		-2200	37	34
		-2300	38	35
		-2400	38	35
		9/26/72	Water Pollution Control Plant	0001-0100
-0200	32			30
-0300	31			27
-0400	35			29
-0500	37			33
-0600	40			34
-0700	38			29
-0800	31			24
-0900	24			13
-1000	11			8
-1100	10			6
-1200	10			5
-1300	11			6
-1400	20			11
-1500	20			12
-1600	25			14
-1700	25			15
-1800	25			18
-1900	28			20
-2000	20	16		
-2100	28	23		
-2200	27	25		
-2300	26	21		
-2400	19	16		
9/27/72	Water Pollution Control Plant	0001-0100	16	14
		-0200	17	15
		-0300	17	15
		-0400	15	13
		-0500	12	11
		-0600	11	9
		-0700	9	7

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 HOUR</u>
9/27/72	Water Pollution Control Plant	0700-0800	9	7
		-0900	11	8
		-1000	14	10
		-1100	15	12
		-1200	15	13
		-1300	17	14
		-1400	20	18
		-1500	21	19
		-1600	25	22
		-1700	27	23
		-1800	27	20
		-1900	27	19
		-2000	33	24
		-2100	35	32
		-2200	34	30
		-2300	31	27
		-2400	29	25
9/28/72	Water Pollution Control Plant	0001-0100	26	22
		-0200	22	18
		-0300	18	14
		-0400	15	11
		-0500	15	11
		-0600	16	13
		-0700	22	18
		-0800	27	24
		-0900		Malfunction
		-1000	35	31
		-1100	32	29
		-1200	36	32
9/28/72	Rees Park	1301-1400	47	44
		-1500	50	44
		-1600	51	47
		-1700	48	45
		-1800	47	30
		-1900	40	26
		-2000	37	27
		-2100	21	16
		-2200	26	20
		-2300	25	19
		-2400	21	18
9/29/72	Rees Park	0001-0100	21	17
		-0200	23	21
		-0300	22	18
		-0400	19	15
		-0500	16	14

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 HOUR</u>		
9/29/72	Rees Park	0500-0600	15	12		
		-0700	14	10		
		-0800	12	9		
		-0900	16	12		
		-1000	18	15		
		-1100	26	20		
		-1200	30	24		
		-1300	31	27		
		-1400	40	33		
		-1500	40	34		
		-1600	36	32		
		-1700	38	32		
		-1800	36	25		
		-1900	28	21		
		-2000	26	19		
		-2100	25	16		
		-2200	20	15		
		-2300	20	15		
		-2400	21	15		
		9/30/72	Rees Park	0001-0100	16	11
				-0200	13	11
				-0300	12	10
				-0400	11	8
				-0500	11	8
-0600	9			6		
-0700	7			3		
-0800	5			3		
-0900	11			6		
-1000	20			12		
-1100	31			21		
-1200	37			29		
-1300	42			35		
-1400	43			37		
-1500	46			40		
-1600	45			40		
-1700	43			38		
-1800	45			39		
-1900	42			37		
-2000	40			34		
-2100	36			30		
-2200	40			36		
-2300	36			30		
-2400	34			30		

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 HOUR</u>
10/1/72	Rees Park	0001-0100	33	25
		-0200	29	24
		-0300	30	24
		-0400	27	21
		-0500	27	24
		-0600	26	22
		-0700	25	20
		-0800	23	20
		-0900	25	23
		-1000	31	26
		-1100	36	32
		-1200	42	35
		-1300	49	42
		-1400	54	49
		-1500	58	53
		-1600	63	57
		-1700	64	59
		-1800	65	61
		-1900	64	56
		-2000	60	47
		-2100	46	35
		-2200	51	41
		-2300	46	33
		-2400	44	40
10/2/72	Rees Park	0001-0100	41	32
		-0200	38	33
		-0300	38	32
		-0400	36	33
		-0500	33	28
		-0600	31	27
		-0700	30	24
		-0800	31	28
		-0900	35	30
		-1000	42	36
		-1100	49	44
		-1200	66	58
		-1300	73	69
		-1400	78	72
		-1500	77	72
		-1600	77	72
		-1700	76	69
		-1800	66	60
		-1900	61	57
		-2000	58	51
		-2100	47	44
		-2200	43	40
		-2300	43	38
		-2400	40	37

AVERAGE
MAXIMUM CONCENTRATION

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>1 HOUR</u>	
10/3/72	Rees Park	0001-0100	41	37	
		-0200	43	39	
		-0300	45	41	
		-0400	46	41	
		-0500	43	40	
		-0600	45	41	
		-0700	44	40	
		-0800	45	41	
		-0900	46	42	
		-1000	49	44	
		-1100	Instrument Malfunction		
		-1200	53	48	
		-1300	44	49	
		10/3/72	3rd & Main	1601-1700	58
-1800	51			25	
-1900	38			20	
-2000	50			25	
-2100	47			30	
-2200	50			42	
-2300	47			38	
-2400	47			37	
10/4/72	3rd & Main	0001-0100	45	38	
		-0200	43	37	
		-0300	39	28	
		-0400	25	17	
		-0500	32	22	
		-0600	31	24	
		-0700	25	15	
		-0800	23	9	
		-0900	22	14	
		-1000	35	24	
		-1100	40	34	
		-1200	51	40	
		-1300	59	50	
		-1400	59	45	
		-1500	54	42	
		-1600	53	40	
		-1700	52	44	
		-1800	52	38	
		-1900	40	24	
		-2000	38	31	
-2100	33	28			
-2200	33	28			
-2300	27	15			
-2400	27	14			

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>PEAK</u>	<u>AVERAGE</u>	
				<u>MAXIMUM CONCENTRATION</u>	
				<u>1 HOUR</u>	
10/5/72	3rd & Main	0001-0100	23	10	
		-0200	25	6	
		-0300	11	4	
		-0400	6	3	
		-0500	5	3	
		-0600	5	3	
		-0700	4	2	
		-0800	5	3	
		-0900	9	6	
		-1000	14	10	
		-1100	21	15	
		-1200	53	44	
		-1300	55	49	
		-1400	55	48	
		-1500	57	50	
		-1600	59	50	
		-1700	59	44	
		-1800	44	29	
		-1900	34	14	
		-2000	36	20	
		-2100	37	30	
		-2200	33	22	
		-2300	40	32	
		-2400	38	32	
10/6/72	3rd & Main	0001-0100	34	30	
		-0200	27	17	
		-0300	18	14	
		-0400	18	13	
		-0500	17	14	
		-0600	14	8	
		-0700	14	8	
		-0800	13	8	
		-0900	16	11	
		-1000	32	20	

Ozone Standard (primary and secondary)

160 ug/m³ (0.080 ppm or 80 ppb) - maximum 1-hour concentration not to be exceeded more than once per year.

COEFFICIENT OF HAZE
KEOKUK

COH Values - 2-Hour Samples

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
9/25/72	Water Pollution Control Plant	1400-1600	0.04
		1800	0.04
		2000	0.04
		2200	0.00
		2400	0.04
		AVG	0.16
9/26/72	Water Pollution Control Plant	0001-0200	0.04
		0400	0.04
		0600	0.16
		0800	0.16
		1000	0.91
		1200	1.65
		1400	1.65
		1600	1.75
		1800	2.57
		2000	0.20
		2200	0.08
		2400	0.04
		AVG	0.77
9/27/72	Water Pollution Control Plant	0001-0200	0.04
		0400	0.04
		0600	0.04
		0800	0.12
		1000	0.08
		1200	0.04
		1400	0.08
		1600	0.04
		1800	0.08
		2000	0.12
		2200	0.04
		2400	0.04
		AVG	0.06

STATE LIBRARY COMMISSION OF IOWA
Historical Building
DES MOINES, IOWA 50319

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
9/28/72	Water Pollution Control Plant	0001-0200	0.08
		0400	0.12
		0600	0.04
		0800	0.12
		1000	0.04
		1200	0.20
		AVG	0.10
9/28/72	Rees Park	1400-1600	0.40
		1800	0.32
		2000	0.28
		2200	0.04
		2400	0.00
		AVG	0.21
9/29/72	Rees Park	0001-0200	0.04
		0400	0.00
		0600	0.08
		0800	0.00
		1000	0.16
		1200	0.04
		1400	0.08
		1600	0.04
		1800	0.08
		2000	0.04
		2200	0.57
		2400	0.08
		AVG	0.10
9/30/72	Rees Park	0001-0200	0.08
		0400	0.69
		0600	0.08
		0800	0.40
		1000	0.04
		1200	0.08
		1400	0.12
		1600	0.32
		1800	0.57
		2000	0.16
		2200	0.40
		2400	1.50
		AVG	0.37

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
10/1/72	Rees Park	0001-0200	0.82
		0400	0.91
		0600	0.65
		0800	0.32
		1000	0.28
		1200	0.53
		1400	0.61
		1600	1.18
		1800	0.53
		2000	0.24
		2200	0.87
		2400	0.48
10/2/72	Rees Park	0001-0200	0.91
		0400	0.32
		0600	0.16
		0800	0.28
		1000	0.20
		1200	0.08
		1400	0.28
		1600	0.48
		1800	0.57
		2000	0.48
		2200	0.08
		2400	0.48
10/3/72	Rees Park	0001-0200	0.40
		0400	0.16
		0600	0.20
		0800	0.20
		1000	0.28
		1200	0.36
		1330	0.91
10/3/72	3rd Street and Main	1510-1600	0.40
		1800	0.20
		2000	0.24
		2200	0.32
		2400	0.08

<u>DATE</u>	<u>LOCATION</u>	<u>TIME</u>	<u>COH</u>
10/4/72	3rd Street and Main	0001-0200	0.08
		0400	0.44
		0600	0.24
		0800	0.08
		1000	0.16
		1200	0.08
		1400	0.20
		1600	0.04
		1800	0.12
		2000	0.12
		2200	0.16
		2400	0.08

AVG 0.15

10/5/72	3rd Street and Main	0001-0200	0.16
		0400	0.20
		0600	0.12
		0800	0.16
		1000	0.12
		1200	0.12
		1400	0.04
		1600	0.08
		1800	0.44
		2000	0.08
		2200	0.08
		2400	0.16

AVG 0.14

10/6/72	3rd Street and Main	0001-0200	0.20
		0400	0.08
		0600	0.24
		0800	0.20
		1000	0.20
		1100	0.16

AVG 0.09

Average COH for Survey 0.26
 Geometric mean for Survey 0.19

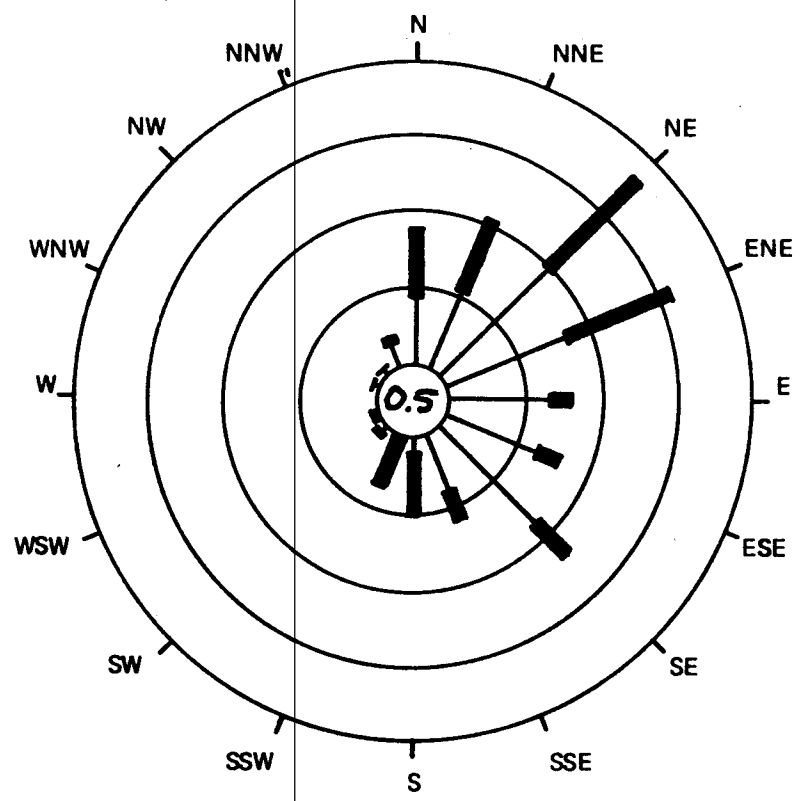
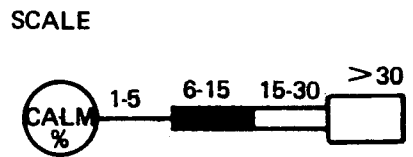
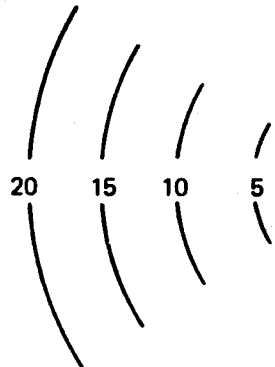
Soiling Index

St Louis 0.4 COH/1000 lineal feet, annual geometric mean

DATE 9/26-28/1972

CITY Keokuk

LOCATION Water Pollution Control Plant

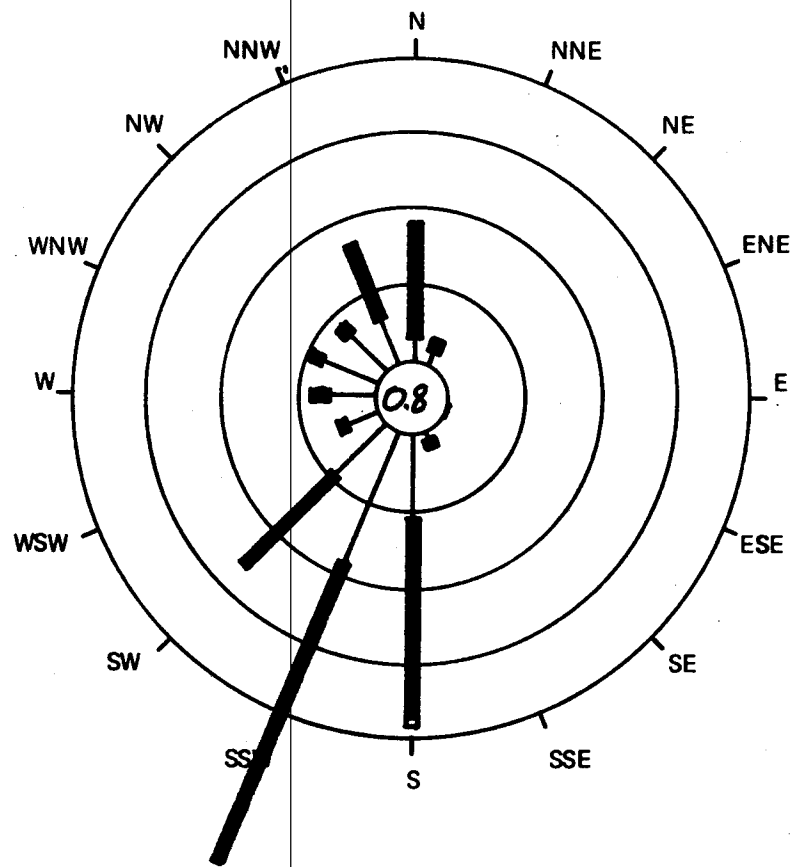
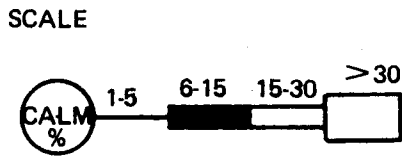
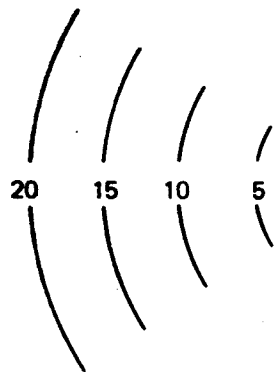


SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1-5.9	4.4	5.4	9.9	8.4	6.4	6.4	8.9	4.0	1.0		0.5			0.5	0.5	1.5	57.9	
6-14.9	4.4	4.9	8.4	7.4	1.5	1.0	2.9	2.0	4.0	3.5	0.5	0.5				0.5	41.6	
15-29.9																		
>30																		
TOTAL	8.8	10.3	18.3	15.8	7.9	7.4	11.8	6.0	5.0	3.5	1.0	0.5		0.5	0.5	2.0	99.5	
																	MISSING	0.0
																	CALM	0.5
																	TOTAL	100.0

DATE 9/28-10/3/1972

CITY Keokuk

LOCATION Rees Park

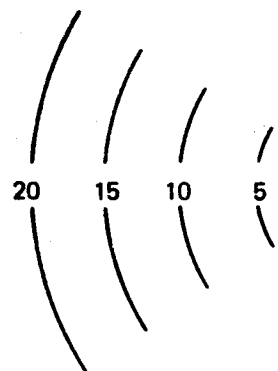


SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1-5.9	1.7	1.0						0.4	5.2	9.0	4.6	2.1	2.9	3.8	3.5	3.1	37.4	
6-14.9	7.1	0.6				0.2		0.6	13.4	21.5	8.4	0.6	1.2	1.0	0.8	5.2	61.0	
15-29.9	0.2	0.2							0.4								0.8	
>30																		
TOTAL	9.0	1.8				0.2		1.0	19.0	30.5	13.0	2.7	4.1	4.8	4.3	8.3	99.2	
																	MISSING	0.0
																	CALM	0.8
																	TOTAL	100.0

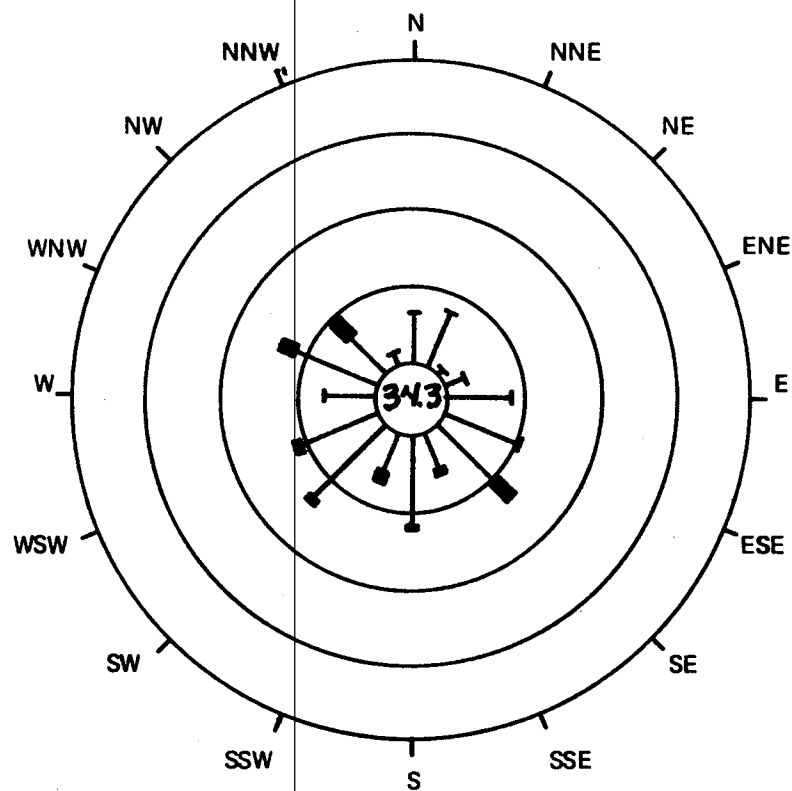
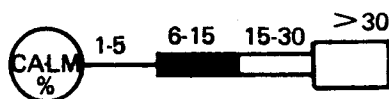
DATE 10/3-5/1972

CITY Keokuk

LOCATION 3rd & Main



SCALE



SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1-5.9	3.3	3.8	0.5	1.4	4.3	5.2	5.2	2.4	5.7	2.4	6.6	5.2	3.3	5.7	3.3	0.9	59.1	
6-14.9							1.4	0.5	0.5	0.9	0.5	0.5		0.9	1.4		6.6	
15-29.9																		
>30																		
TOTAL	3.3	3.8	0.5	1.4	4.3	5.2	6.6	2.9	6.2	3.3	7.1	5.7	3.3	6.6	4.7	0.9	65.7	
																	MISSING	0.0
																	CALM	34.3
																	TOTAL	100.0