# Iowa Ambient Air Monitoring Annual Report: 2008

Air Quality Bureau
Iowa Department of Natural Resources

# Table of Contents


Iowa Ambient Monitoring Network Review: 2008 ..... 3
Introduction ..... 3
2008 Exceedances of National Ambient Air Quality Standards (NAAQS) in Iowa ..... 4
NAAQS Exceedance Locations in Iowa Measured in 2008 ..... 5
$PM_{2.5}$ NAAQS Exceedances in Iowa Measured in 2008 ..... 6
2008 Ambient Monitoring Network Changes ..... 7
Iowa Ambient Monitoring Network ..... 8
2008 Monitoring Site Locations ..... 9
Monitoring Locations in Cedar Rapids ..... 10
Monitoring Locations in Davenport ..... 11
Monitoring Location in Des Moines/Clive ..... 12
Ozone Monitoring Sites ..... 13
Ozone Monitor Locations ..... 14
Comparison of 2008 Ozone Data with National Ambient Air Quality Standards ..... 15
2008 Data Completeness – Ozone ..... 16
$PM_{2.5}$ Monitoring Sites ..... 17
$PM_{2.5}$ Monitor Locations ..... 18
Comparison of 2008 $PM_{2.5}$ Data with National Ambient Air Quality Standards ..... 19
2008 Data Completeness – $PM_{2.5}$ ..... 20
$PM_{10}$ Monitoring Sites ..... 21
$PM_{10}$ Monitor Locations ..... 22
Comparison of 2008 $PM_{10}$ Data with the National Ambient Air Quality Standard ..... 23
2008 Data Completeness – $PM_{10}$ ..... 24
Sulfur Dioxide Monitoring Sites ..... 25
Sulfur Dioxide Monitor Locations ..... 26
Comparison of 2008 Sulfur Dioxide Data with National Ambient Air Quality Standards ..... 27
2008 Data Completeness – Sulfur Dioxide ..... 28
Carbon Monoxide Monitoring Sites ..... 29
Carbon Monoxide Monitor Locations ..... 30
Comparison of 2008 Carbon Monoxide Data with National Ambient Air Quality Standards ..... 31
2008 Data Completene – Carbon Monoxide ..... 32
Nitrogen Dioxide Monitoring Sites ..... 33
Nitrogen Dioxide Monitor Locations ..... 34
Comparison of 2008 Nitrogen Dioxide Data with the National Ambient Air Quality Standard ..... 35
2008 Data Completeness – Nitrogen Dioxide ..... 36
Appendix A ..... 37
Ozone ..... 37
$PM_{2.5}$ ..... 37
$PM_{10}$ ..... 38
Carbon Monoxide ..... 39
Nitrogen Dioxide ..... 39

# Iowa Ambient Air Monitoring Annual Network Report: 2008

Iowa Department of Natural Resources - Air Quality Bureau - Air Monitoring Group

## Introduction

The purpose of this review is to compare ambient air monitoring data gathered in the state of Iowa during 2008 with the National Ambient Air Quality Standards (NAAQS) established by the Environmental Protection Agency (EPA). The EPA has established NAAQS for seven "criteria" pollutants: particulate matter with a diameter less than 10 microns ($PM_{10}$), particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide, ozone, nitrogen dioxide, carbon monoxide, and lead. Continuous monitoring methods have been approved by EPA for all criteria pollutants except lead. Filter samplers and laboratory filter weighing procedures have been approved by EPA for both $PM_{2.5}$ and $PM_{10}$. All data (with the exception of carbon monoxide) summarized in this review was obtained using methods approved by EPA for comparison with the NAAQS. Carbon monoxide is monitored in Iowa with trace-level instruments that have not been approved by the EPA as a Federal Reference or Federal Equivalent Method, but have been recommended for use in quantifying low levels of carbon monoxide typical of most urban areas.

This report is divided into two parts. The first part is an executive summary, indicating where exceedances of the NAAQS were measured in Iowa during 2008. A more comprehensive review, which includes the location and summary data for each monitor in the network, is included in the second part.

Gaseous pollutant monitors (ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide) provide hourly values and operate 24 hours a day, seven days a week. Ozone monitors are operated only when ozone levels are highest, from April through October. Particulate filter samplers run for 24 hours at a time and collect one filter per day. Most $PM_{10}$ and $PM_{2.5}$ filter based monitors are operated at a sampling frequency of one sample every third day. Some particulate monitoring sites are run at frequencies greater than this nominal frequency if they are located in highly populated areas, near pollution sources, or if pollutant levels are close to health standards. Lead was not monitored in Iowa in 2008.

Incomplete data may skew the summary statistics for a monitor. In order to alert the reader to data completeness problems, monitors that were added or removed part way through the year have been indicated by an asterisk, and data completeness statistics have been provided for each monitor. If a monitor collected all of the scheduled samples, then it has an associated data completeness of 100%. If the data capture from a monitor is insufficient to compute a valid annual average according to EPA completeness criteria, then the bar representing the comparison of the annual average to the NAAQS for that specific monitor is shaded to be lighter than the rest of the bars on the corresponding chart. In 2008 there were 25 NAAQS exceedances in the state of Iowa. All of the exceedances were associated with the $PM_{2.5}$ standard and are detailed in this report.

Data used to create this report were gathered by three organizations under contract with the Iowa Department of Natural Resources: the University of Iowa Hygienic Laboratory, the Linn County Public Health Department, and the Polk County Public Works Air Quality Division. Contract funds were provided by US EPA, the state of Iowa legislature, and regulated industry. Air pollution data for Iowa and all other states are available online at: http://www.epa.gov/air/data/. Additional information on the NAAQS is available at: http://www.epa.gov/air/criteria.html.

# 2008 Exceedances of National Ambient Air Quality Standards (NAAQS) in Iowa

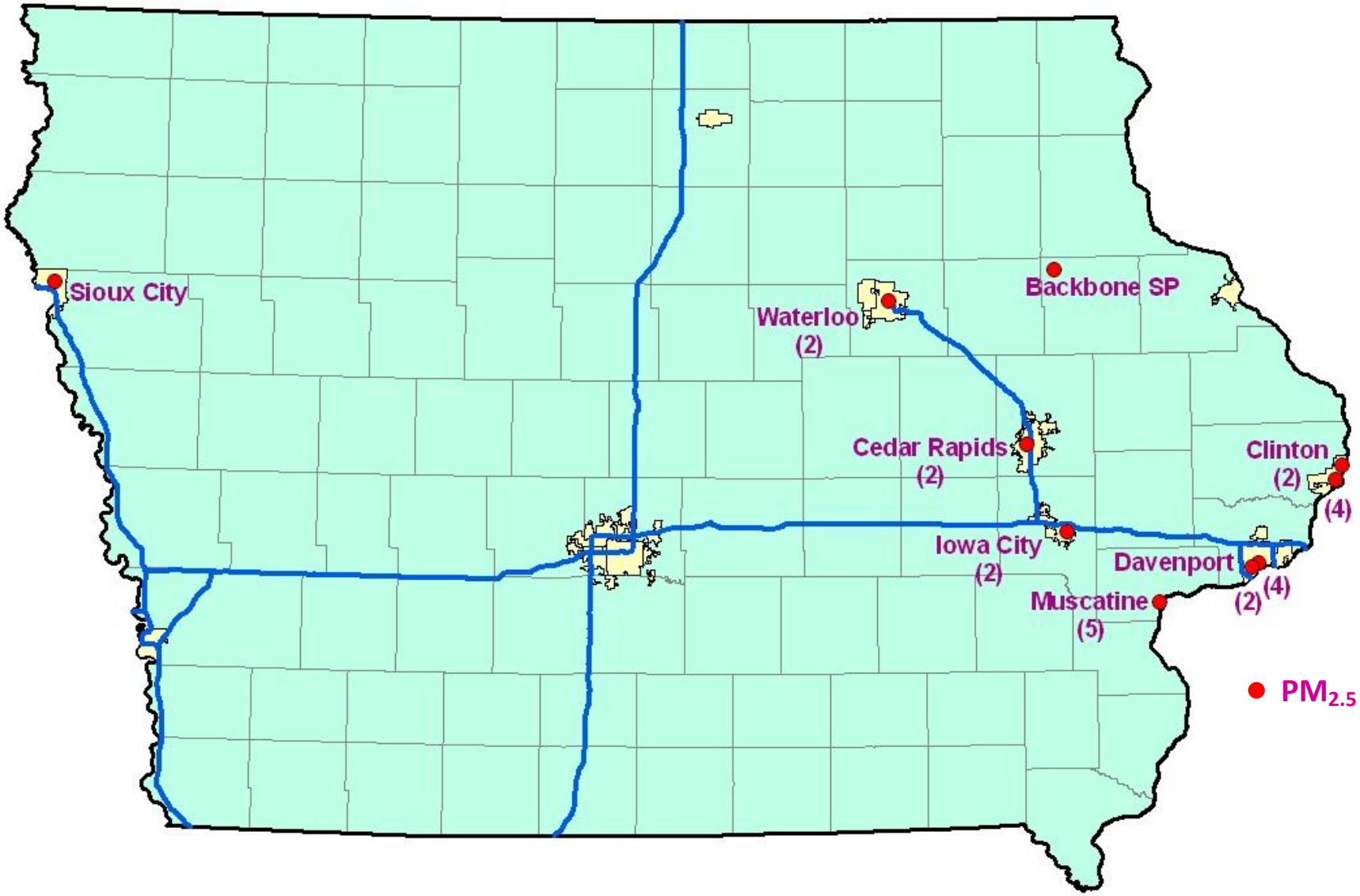
| Pollutant | Averaging Period | Exceedance Level | Units | Number of Exceedances |
|---|---|---|---|---|
| Ozone | 8hr | 0.076* | ppm | 0 |
| PM 2.5 | 24hr | 35.5 | micrograms per cubic meter | 25 |
| | annual | 15.05 | micrograms per cubic meter | 0 |
| PM10 | 24hr | 155 | micrograms per cubic meter | 0 |
| Sulfur dioxide | 3hr | 0.55 | ppm | 0 |
| | 24hr | 0.145 | ppm | 0 |
| | annual | 0.0305 | ppm | 0 |
| Carbon monoxide | 1hr | 35.5 | ppm | 0 |
| | 8hr | 9.5 | ppm | 0 |
| Nitrogen dioxide | annual | 0.0535 | ppm | 0 |
| Lead | quarterly | 1.55** | micrograms per cubic meter | N/A*** |

*The NAAQS for Ozone was lowered from 0.085 parts per million to 0.076 parts per million in May of 2008

**The NAAQS for Lead was lowered from 1.5 to 0.15 micrograms per cubic meter, effective 10/18/2008

***Lead was not monitored in 2008

## NAAQS Exceedance Locations in Iowa Measured in 2008



## $PM_{2.5}$ NAAQS Exceedances in Iowa Measured in 2008

| Sampling Frequency | Daily | Daily | Daily | Daily | 1 in 3 | Daily | Daily | 1 in 3 | 1 in 3 | Daily | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Site | Blackhawk Foundry | Garfield Elementary | Hoover Elementary | Linn Public Health | Grout Museum | Jefferson Elementary | Chancy Park | Lowell Elementary | Backbone State Park | Rainbow Park | |
| Exceedance Date | Concentration (micrograms per cubic meter) | | | | | | | | | | Count |
| 1/27 | | | | | | | 36.3 | | | | 1 |
| 2/3 | | | | | 37.5 | | | 37.6 | 36.8 | | 3 |
| 2/23 | 46.2 | 48.4 | 43.2 | 41.7 | | 43.5 | 50.3 | | | 50.5 | 7 |
| 2/24 | 35.5 | 38.5 | 37.8 | 36.3 | 41.2 | | 49.3 | | | 43 | 7 |
| 3/11 | 45.8 | | | | | | | | | | 1 |
| 4/23 | | 35.6 | | | | | | | | | 1 |
| 7/4 | | | | | | 62.3 | | | | | 1 |
| 9/26 | 36.8 | | | | | | | | | | 1 |
| 10/22 | | 50.7 | | | | | | | | | 1 |
| 10/23 | | 45 | | | | | | | | | 1 |
| 12/18 | | | | | | | 35.6 | | | | 1 |
| **Count** | **4** | **5** | **2** | **2** | **2** | **2** | **4** | **1** | **1** | **2** | **Total= 25** |

# 2008 Ambient Monitoring Network Changes

## Sites Removed at the End of 2007

| Site | Name | City | County | Site Label | Start Date | End Date | Pollutants |
|---|---|---|---|---|---|---|---|
| 191130029 | Science Station | Cedar Rapids | Linn | Cedar Rapids, Science Station | - | 12/31/2007 | $SO_2$ |
| 191390016 | Greenwood Cemetary | Muscatine | Muscatine | Muscatine, Greenwood Cemetary | - | 12/31/2007 | $SO_2$ |
| 191390017 | Muscatine Power & Water | Muscatine | Muscatine | Muscatine, Power and Water | - | 12/31/2007 | $SO_2$ |
| 191530059 | National By-Products | Des Moines | Polk | Des Moines, Nat. By-Products | - | 12/23/2007 | $PM_{2.5}$ |

## Monitors Removed During 2008

| Site | Name | City | County | Site Label | Start Date | End Date | Pollutants |
|---|---|---|---|---|---|---|---|
| 191130038 | Ely Rd. SW | Linn | Cedar Rapids | Cedar Rapids, Ely Rd. SW* | - | 3/31/2008 | $SO_2$ |
| 191130038 | Ely Rd. SW | Linn | Cedar Rapids | Cedar Rapids, Ely Rd. SW* | - | 3/31/2008 | CO |

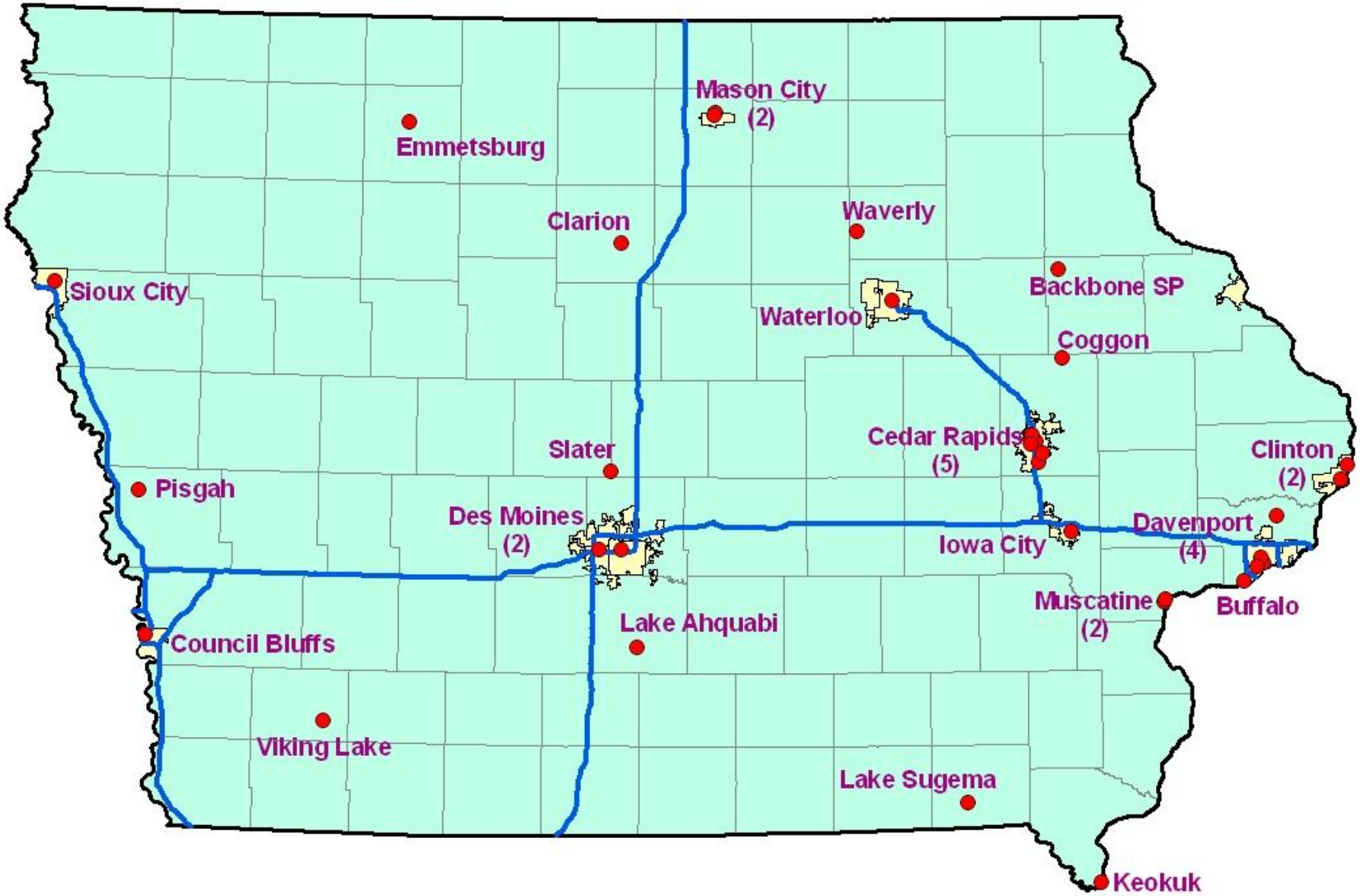
## Monitors Added During 2008

| Site | Name | City | County | Site Label | Start Date | End Date | Pollutants |
|---|---|---|---|---|---|---|---|
| 191130040 | Public Health | Cedar Rapids | Linn | Cedar Rapids, Public Health | 1/15/2008 | - | $PM_{2.5}$ |
| 191130040 | Public Health | Cedar Rapids | Linn | Cedar Rapids, Public Health | 4/11/2008 | - | $SO_2$ |
| 191130040 | Public Health | Cedar Rapids | Linn | Cedar Rapids, Public Health | 4/11/2008 | - | CO |
| 191032001 | Hoover Elementary | Iowa City | Johnson | Iowa City, Hoover Sch. | 1/1/2008 | - | $PM_{10}$ |

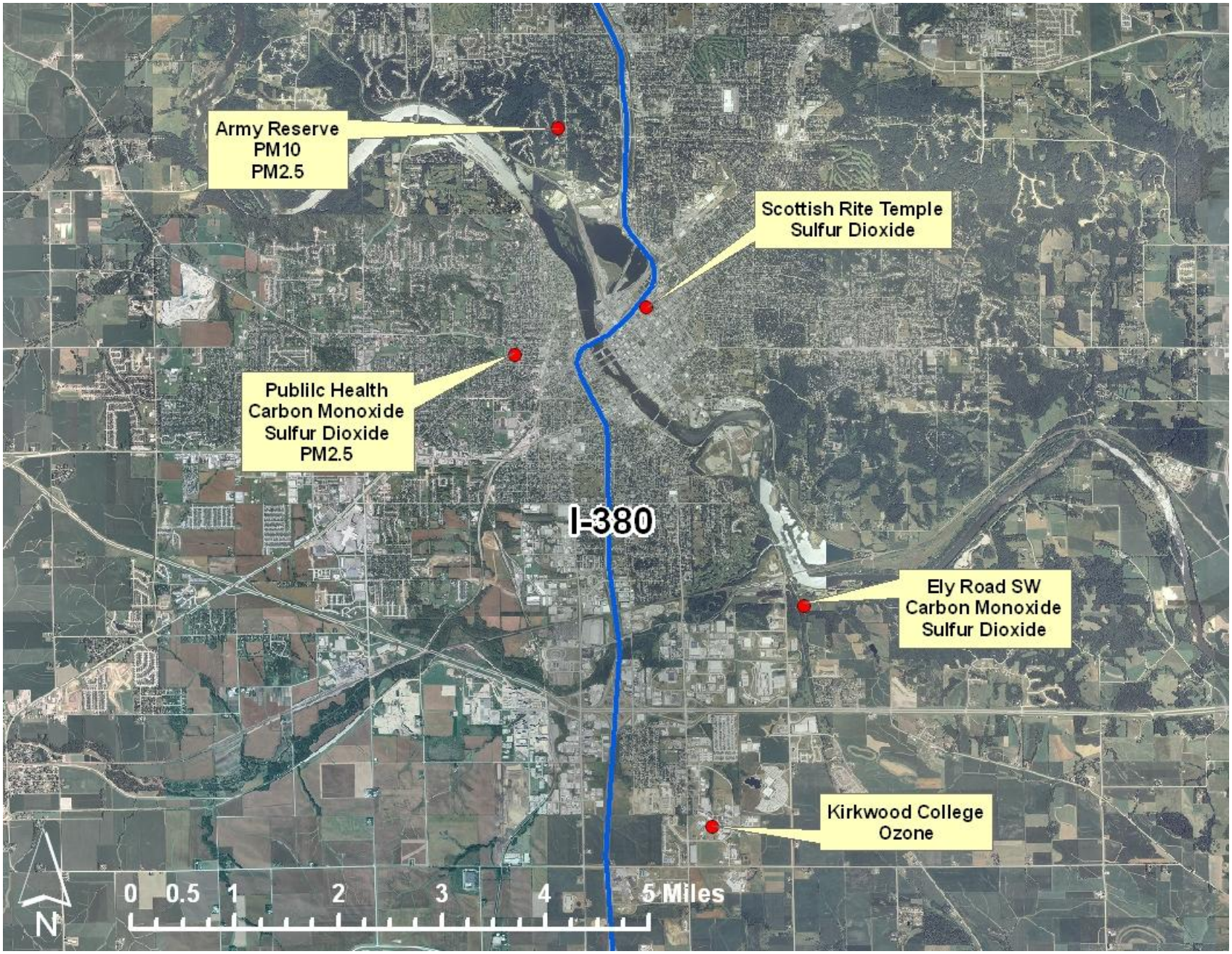
# Iowa Ambient Monitoring Network

| Site ID | Name | City | Address | County | Site Label | Pollutants |
|---|---|---|---|---|---|---|
| 190130008 | Grout Museum | Waterloo | West Park St. & South St. | Black Hawk | Waterloo, Grout Museum | PM10, PM2.5 |
| 190170011 | Waverly Airport | Waverly | Waverly Airport | Bremer | Waverly, Airport | Ozone |
| 190330018 | Holnam Cement | Mason City | 17th St. & Washington St. | Cerro Gordo | Mason City, Holnam Cement | PM10, SO2 |
| 190330020 | Washington Sch. | Mason City | 700 N. Washington Avenue | Cerro Gordo | Mason City, Washington Sch. | PM10 |
| 190450019 | Chancy Park | Clinton | 23rd & Camanche | Clinton | Clinton, Chancy Park | PM2.5, SO2 |
| 190450021 | Rainbow Park | Clinton | Roosevelt St. | Clinton | Clinton, Rainbow Park | Ozone, PM2.5 |
| 190550001 | Backbone State Park | not in a city | Fish Hatchery Backbone State Park | Delaware | Backbone State Park | PM2.5 |
| 190851101 | Highway Maintenance Shed | Pisgah | 1575 Hwy 183 | Harrison | Pisgah, Highway Maintenance | Ozone |
| 191032001 | Hoover Elementary | Iowa City | 2200 East Court | Johnson | Iowa City, Hoover Sch. | PM10, PM2.5 |
| 191110008 | Fire Station | Keokuk | 111S. 13th St. | Lee | Keokuk, Fire Station | PM2.5 |
| 191130028 | Kirkwood College | Cedar Rapids | 6301 Kirkwood Blvd SW (Iowa Hall) | Linn | Cedar Rapids, Kirkwood Coll. | Ozone |
| 191130031 | Scottish Rite Temple | Cedar Rapids | 616 A Ave. | Linn | Cedar Rapids, Scottish Rite Temple | SO2 |
| 191130033 | Coggon Elementary School | Coggon | 408 E Linn St. | Linn | Coggon, Coggon Elementary School | Ozone |
| 191130037 | Army Reserve Center | Cedar Rapids | 1599 Wenig Rd. NE | Linn | Cedar Rapids, Army Reserve | PM10, PM2.5 |
| 191130038 | Ely Rd. SW | Cedar Rapids | Ely Rd. SW | Linn | Cedar Rapids, Ely Rd. SW | CO, SO2 |
| 191130040 | Public Health | Cedar Rapids | 500 11th St. NW | Linn | Cedar Rapids, Public Health | CO, PM2.5, SO2 |
| 191370002 | Viking Lake State Park | not in a city | 2780 Viking Lake Road | Montgomery | Viking Lake State Park | Ozone, PM10, PM2.5 |
| 191390015 | Garfield School | Muscatine | 1409 Wisconsin | Muscatine | Muscatine, Garfield Sch. | PM10, PM2.5 |
| 191390020 | Musser Park | Muscatine | Oregon St. & Earl Ave. | Muscatine | Muscatine, Musser Park | SO2 |
| 191471002 | Iowa Lakes College | Emmetsburg | Iowa Lakes Community College - S Camp | Palo Alto | Emmetsburg, Iowa Lakes Coll. | Ozone, PM10, PM2.5 |
| 191530030 | Public Health Bldg. | Des Moines | 1907 Carpenter | Polk | Des Moines, Public Health Bldg. | CO, NO2, Ozone, PM10, PM2.5, SO2 |
| 191532510 | Indian Hills Junior High | Clive | 9401 Indian Hills | Polk | Clive, Indian Hills Sch. | PM10, PM2.5 |
| 191550009 | Franklin Elementary | Council Bluffs | 3130 C Ave. | Pottawattamie | Council Bluffs, Franklin Sch. | PM10, PM2.5 |
| 191630014 | Scott County Park | Davenport | Scott County Park | Scott | Scott County Park | Ozone |
| 191630015 | Jefferson Elementary | Davenport | 10th St. & Vine St. | Scott | Davenport, Jefferson Sch. | CO, NO2, Ozone, PM10, PM2.5, SO2 |
| 191630017 | Linwood Mining | Buffalo | 11100 110th Ave. | Scott | Buffalo, LW Mining | PM10 |
| 191630018 | Adams Elementary | Davenport | 3029 N Division St. | Scott | Davenport, Adams Sch. | PM10, PM2.5 |
| 191630019 | Black Hawk Foundry | Davenport | 300 Wellman St. | Scott | Davenport, BH Foundry | PM10, PM2.5 |
| 191690011 | Slater Elementary | Slater | 505 Linn St. | Story | Slater, Slater Sch. | Ozone |
| 191770006 | Lake Sugema | not in a city | 24430 Lacey Trl, Keosauqua Lake Sugema | Van Buren | Keosauqua, Lake Sugema | Ozone, PM10, PM2.5, SO2 |
| 191810022 | Lake Ahquabi State Park | not in a city | 1650 118th Ave. | Warren | Lake Ahquabi State Park | Ozone |
| 191930017 | Lowell Elementary | Sioux City | 27th at Morgan | Woodbury | Sioux City, Lowell Sch. | PM10, PM2.5 |
| 191970004 | Jannsen Farm | Clarion | Jannsen Farm | Wright | Clarion, Jannsen Farm | PM2.5 |

# 2008 Monitoring Site Locations



# Monitoring Locations in Cedar Rapids



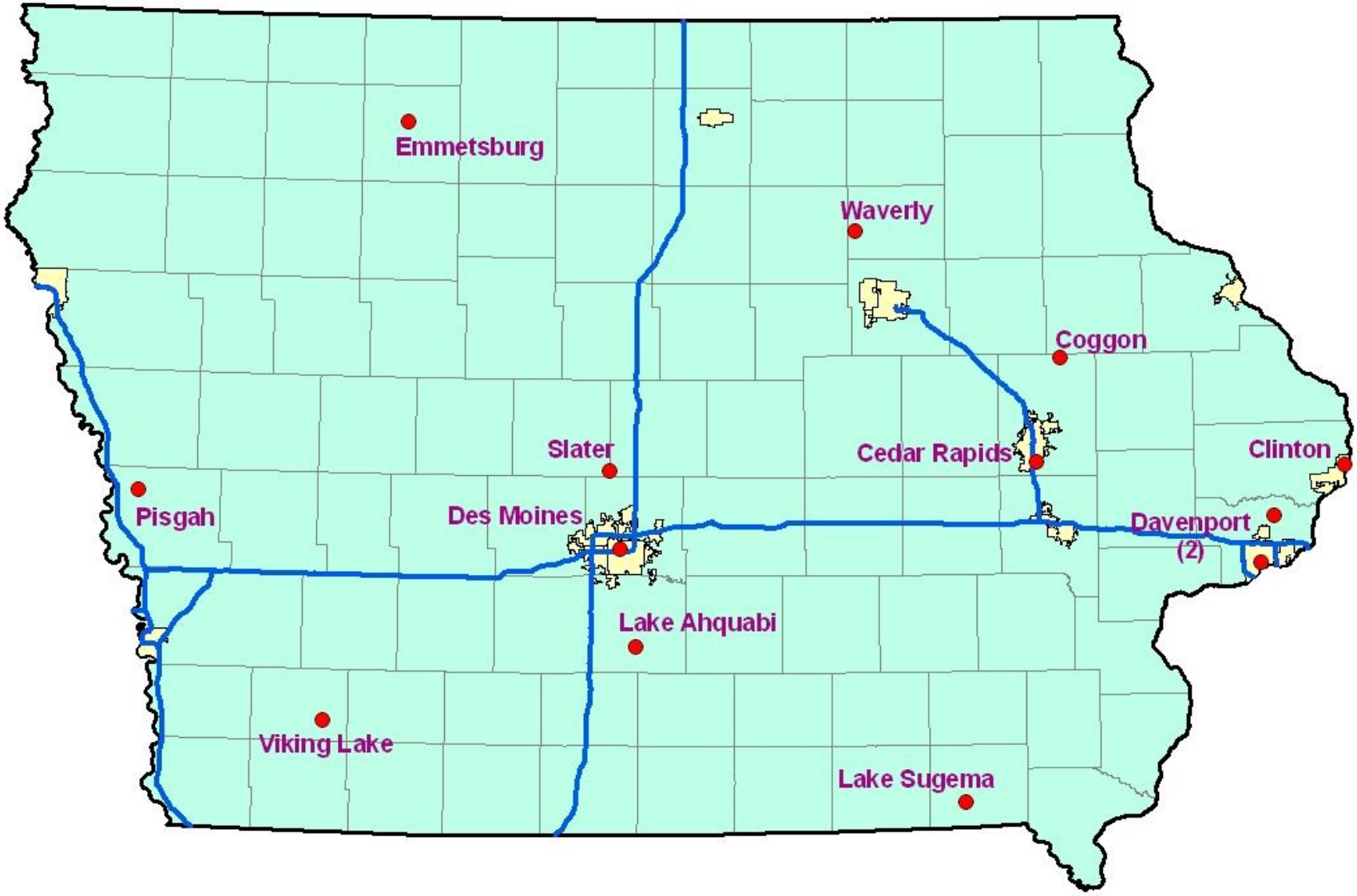
# Monitoring Locations in Davenport

# Monitoring Locations in Des Moines/Clive

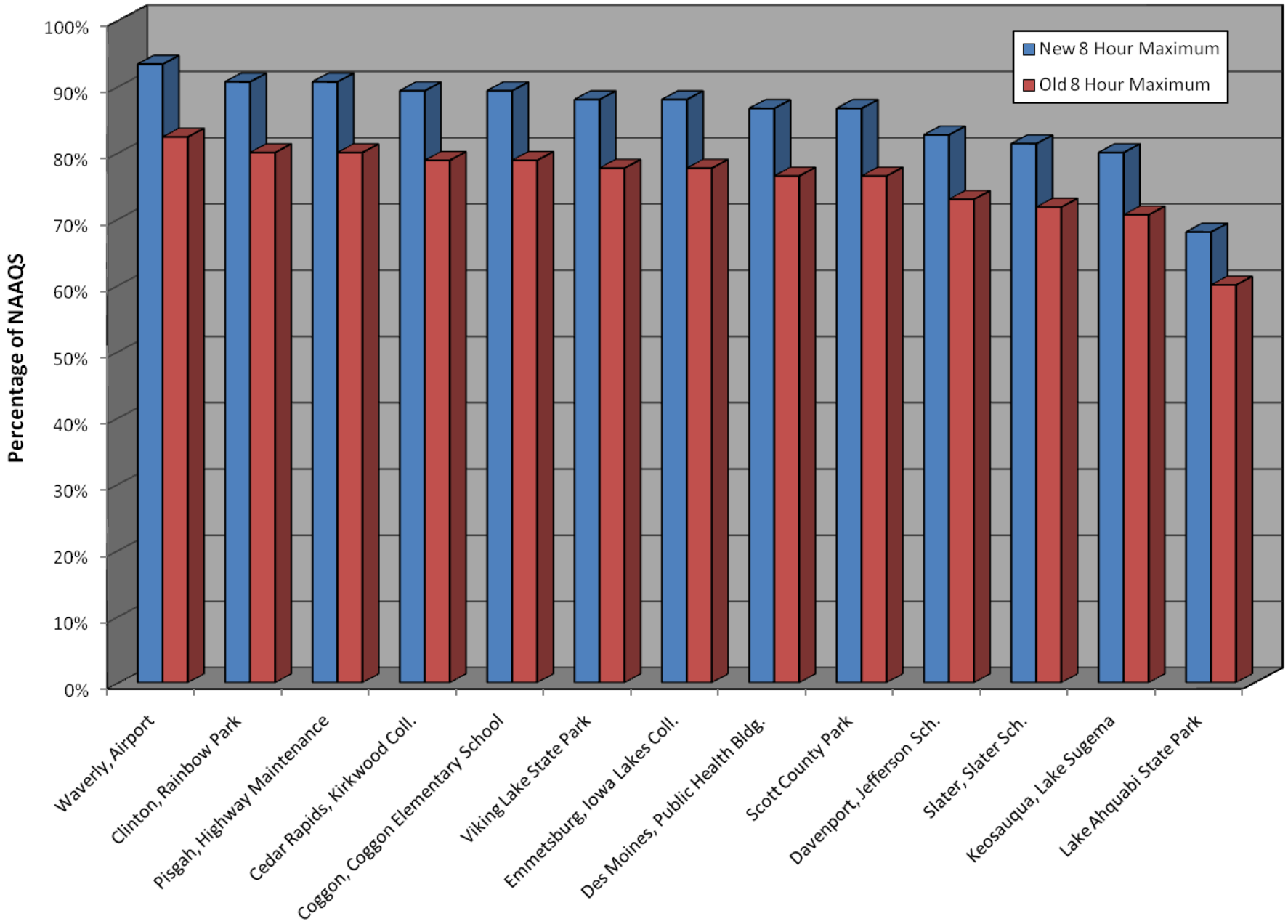
# Ozone Monitoring Sites

| Site | Name | City | County | Site Label |
|---|---|---|---|---|
| 190170011 | Waverly Airport | Waverly | Bremer | Waverly, Airport |
| 190450021 | Rainbow Park | Clinton | Clinton | Clinton, Rainbow Park |
| 190851101 | Highway Maintenance Shed | Pisgah | Harrison | Pisgah, Highway Maintenance |
| 191130028 | Kirkwood College | Cedar Rapids | Linn | Cedar Rapids, Kirkwood Coll. |
| 191130033 | Coggon Elementary School | Coggon | Linn | Coggon, Coggon Elementary School |
| 191370002 | Viking Lake State Park | not in a city | Montgomery | Viking Lake State Park |
| 191471002 | Iowa Lakes College | Emmetsburg | Palo Alto | Emmetsburg, Iowa Lakes Coll. |
| 191530030 | Public Health Bldg. | Des Moines | Polk | Des Moines, Public Health Bldg. |
| 191630014 | Scott County Park | Davenport | Scott | Scott County Park |
| 191630015 | Jefferson Elementary | Davenport | Scott | Davenport, Jefferson Sch. |
| 191690011 | Slater Elementary | Slater | Story | Slater, Slater Sch. |
| 191770006 | Lake Sugema | not in a city | Van Buren | Keosauqua, Lake Sugema |
| 191810022 | Lake Ahquabi State Park | not in a city | Warren | Lake Ahquabi State Park |

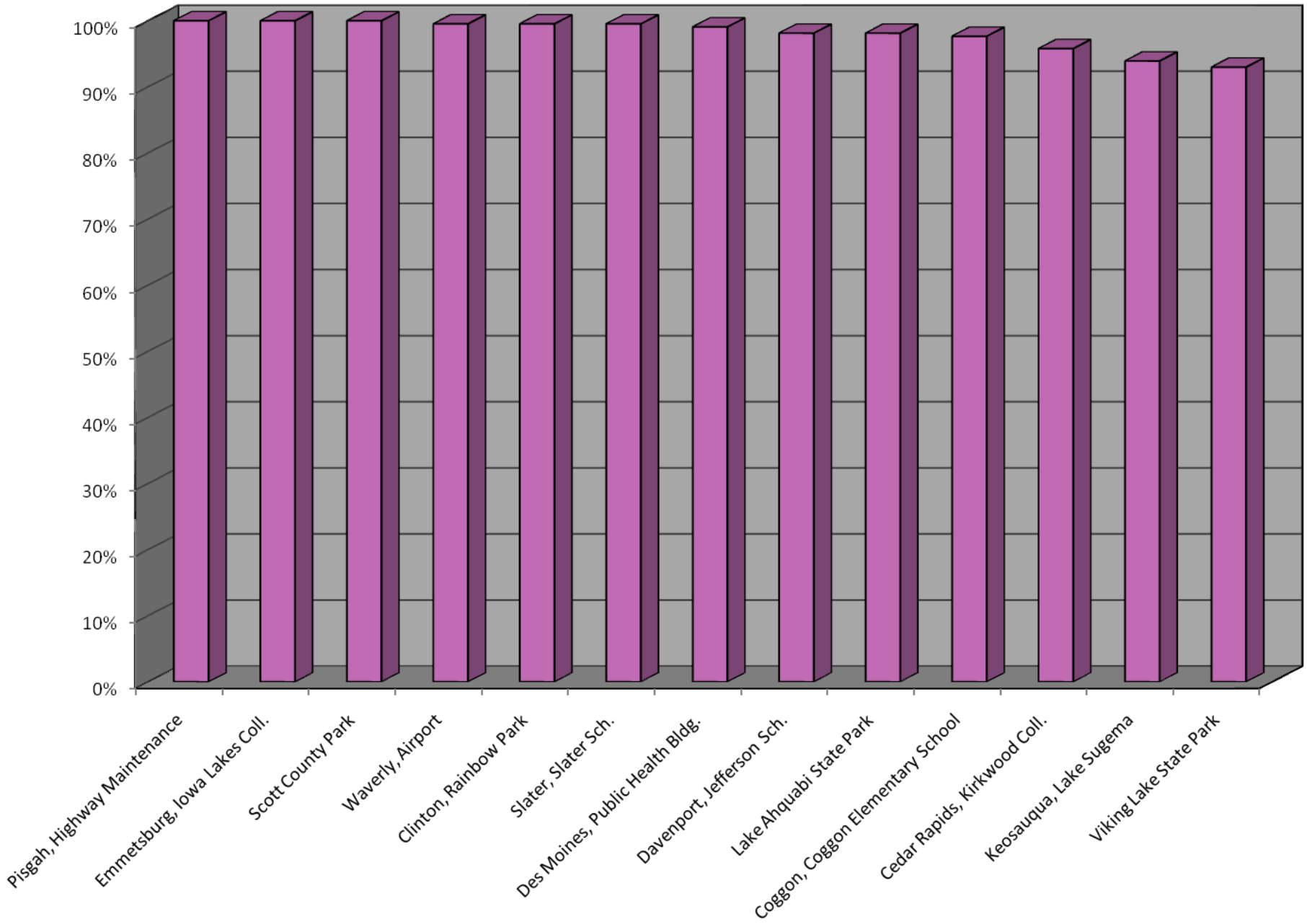
# Ozone Monitor Locations



# Comparison of 2008 Ozone Data with National Ambient Air Quality Standards



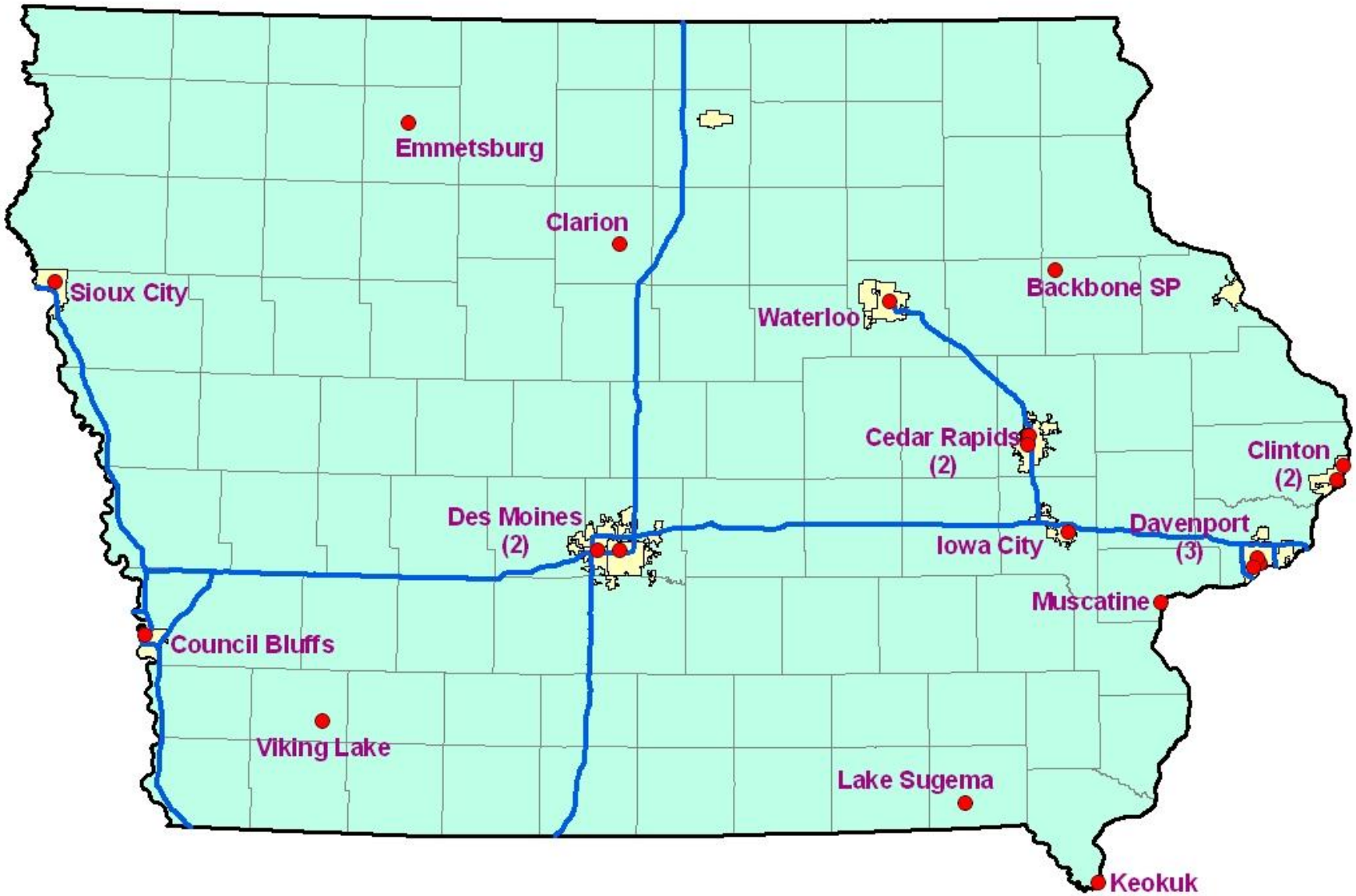
# 2008 Data Completeness – Ozone



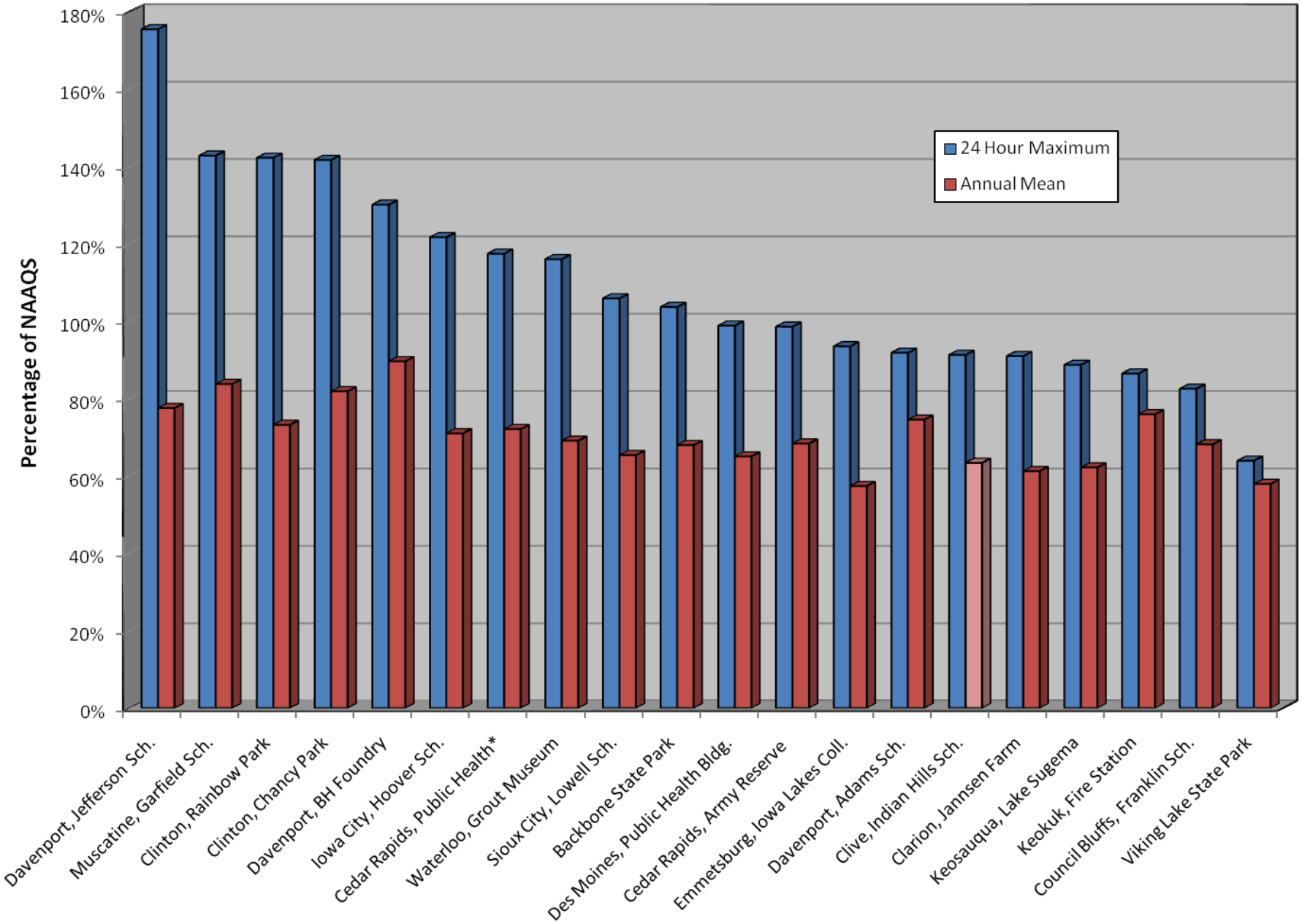
# $PM_{2.5}$ Monitoring Sites

| Site | Name | City | County | Site Label |
|---|---|---|---|---|
| 190130008 | Grout Museum | Waterloo | Black Hawk | Waterloo, Grout Museum |
| 190450019 | Chancy Park | Clinton | Clinton | Clinton, Chancy Park |
| 190450021 | Rainbow Park | Clinton | Clinton | Clinton, Rainbow Park |
| 190550001 | Backbone State Park | not in a city | Delaware | Backbone State Park |
| 191032001 | Hoover Elementary | Iowa City | Johnson | Iowa City, Hoover Sch. |
| 191110008 | Fire Station | Keokuk | Lee | Keokuk, Fire Station |
| 191130037 | Army Reserve Center | Cedar Rapids | Linn | Cedar Rapids, Army Reserve |
| 191130040 | Public Health | Cedar Rapids | Linn | Cedar Rapids, Public Health |
| 191370002 | Viking Lake State Park | not in a city | Montgomery | Viking Lake State Park |
| 191390015 | Garfield School | Muscatine | Muscatine | Muscatine, Garfield Sch. |
| 191471002 | Iowa Lakes College | Emmetsburg | Palo Alto | Emmetsburg, Iowa Lakes Coll. |
| 191530030 | Public Health Bldg. | Des Moines | Polk | Des Moines, Public Health Bldg. |
| 191532510 | Indian Hills Junior High | Clive | Polk | Clive, Indian Hills Sch. |
| 191550009 | Franklin Elementary | Council Bluffs | Pottawattamie | Council Bluffs, Franklin Sch. |
| 191630015 | Jefferson Elementary | Davenport | Scott | Davenport, Jefferson Sch. |
| 191630018 | Adams Elementary | Davenport | Scott | Davenport, Adams Sch. |
| 191630019 | Black Hawk Foundry | Davenport | Scott | Davenport, BH Foundry |
| 191770006 | Lake Sugema | not in a city | Van Buren | Keosauqua, Lake Sugema |
| 191930017 | Lowell Elementary | Sioux City | Woodbury | Sioux City, Lowell Sch. |
| 191970004 | Jannsen Farm | Clarion | Wright | Clarion, Jannsen Farm |

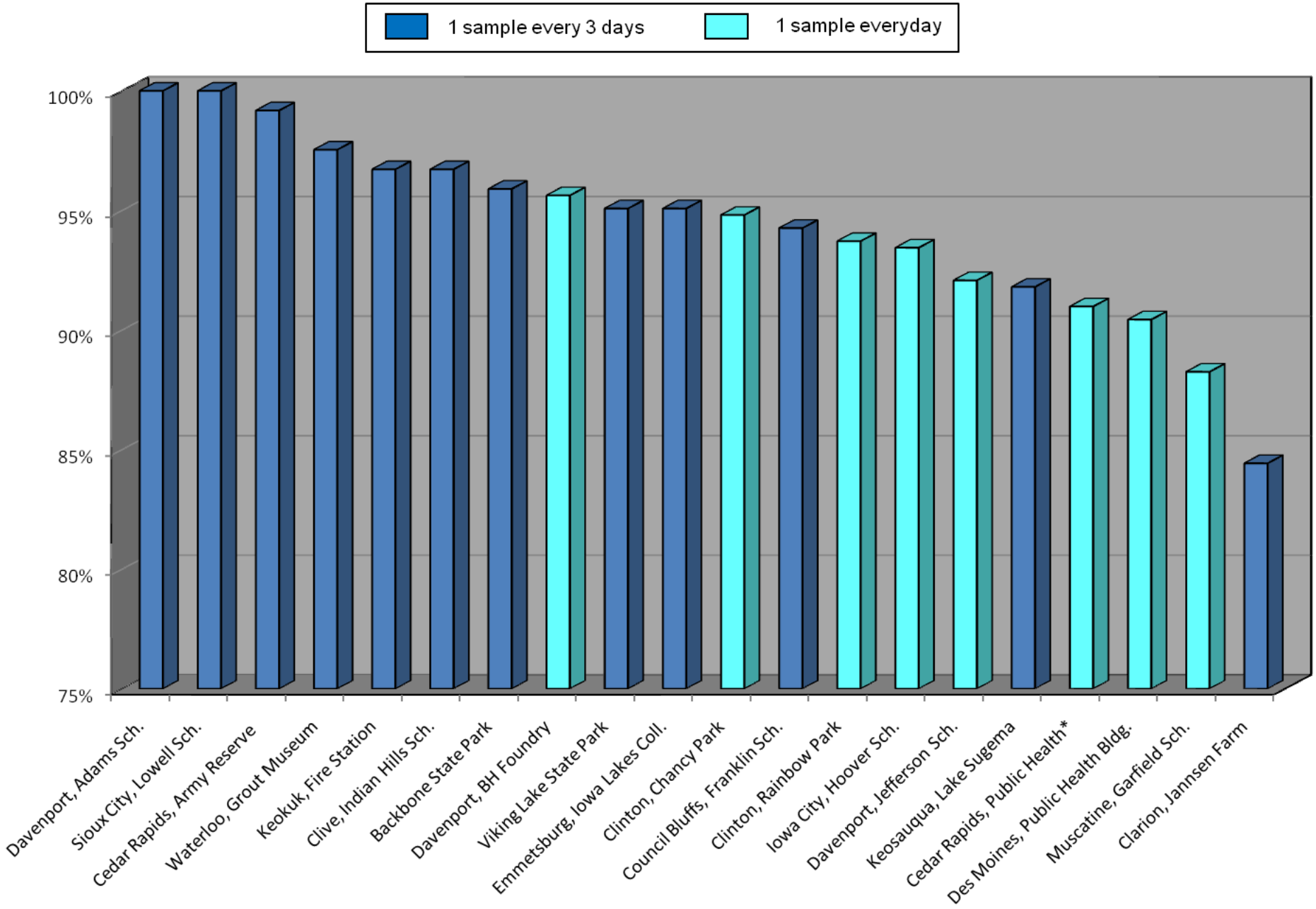
# $PM_{2.5}$ Monitor Locations



# Comparison of 2008 $PM_{2.5}$ Data with National Ambient Air Quality Standards



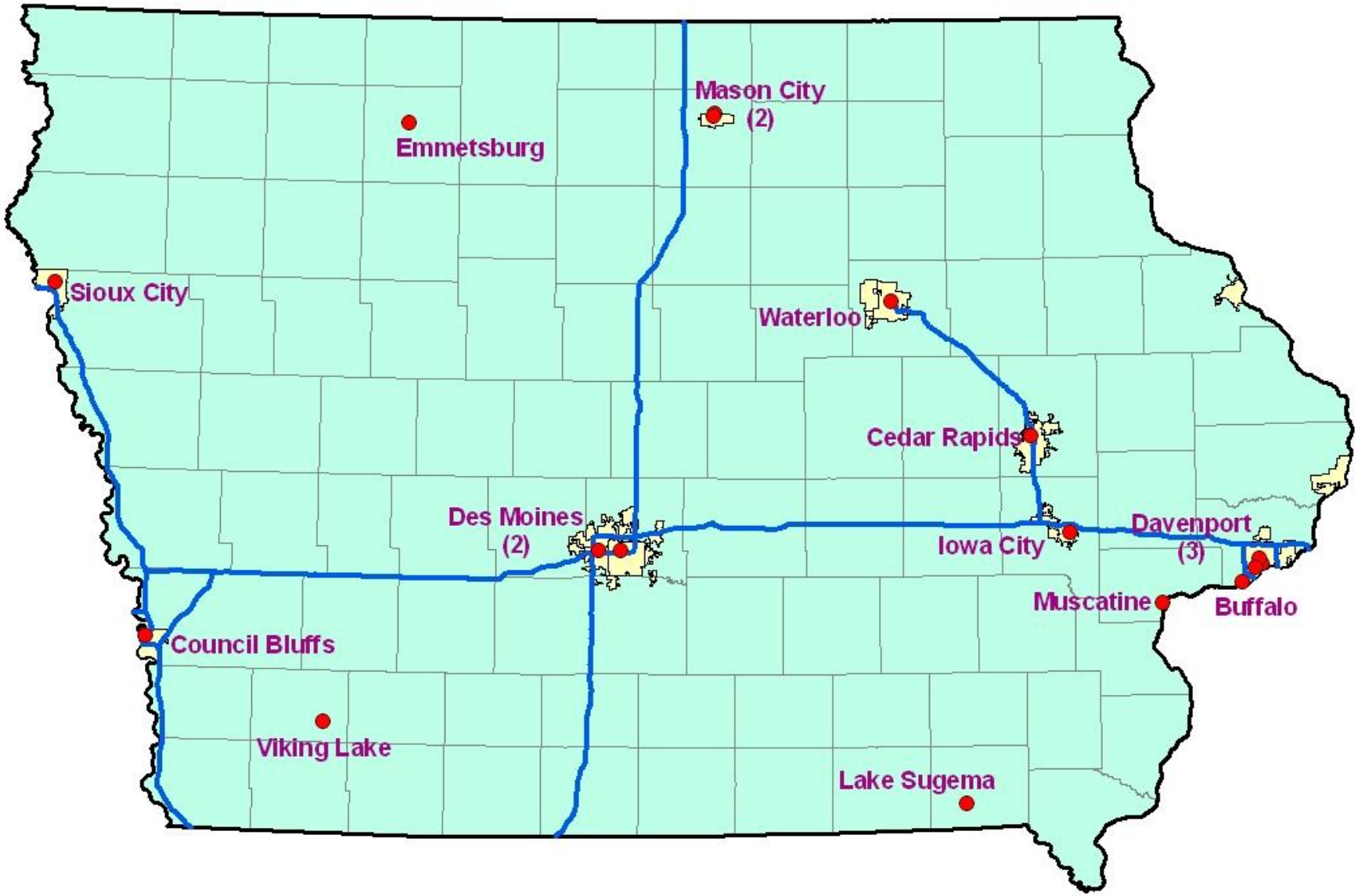
# 2008 Data Completeness – $PM_{2.5}$



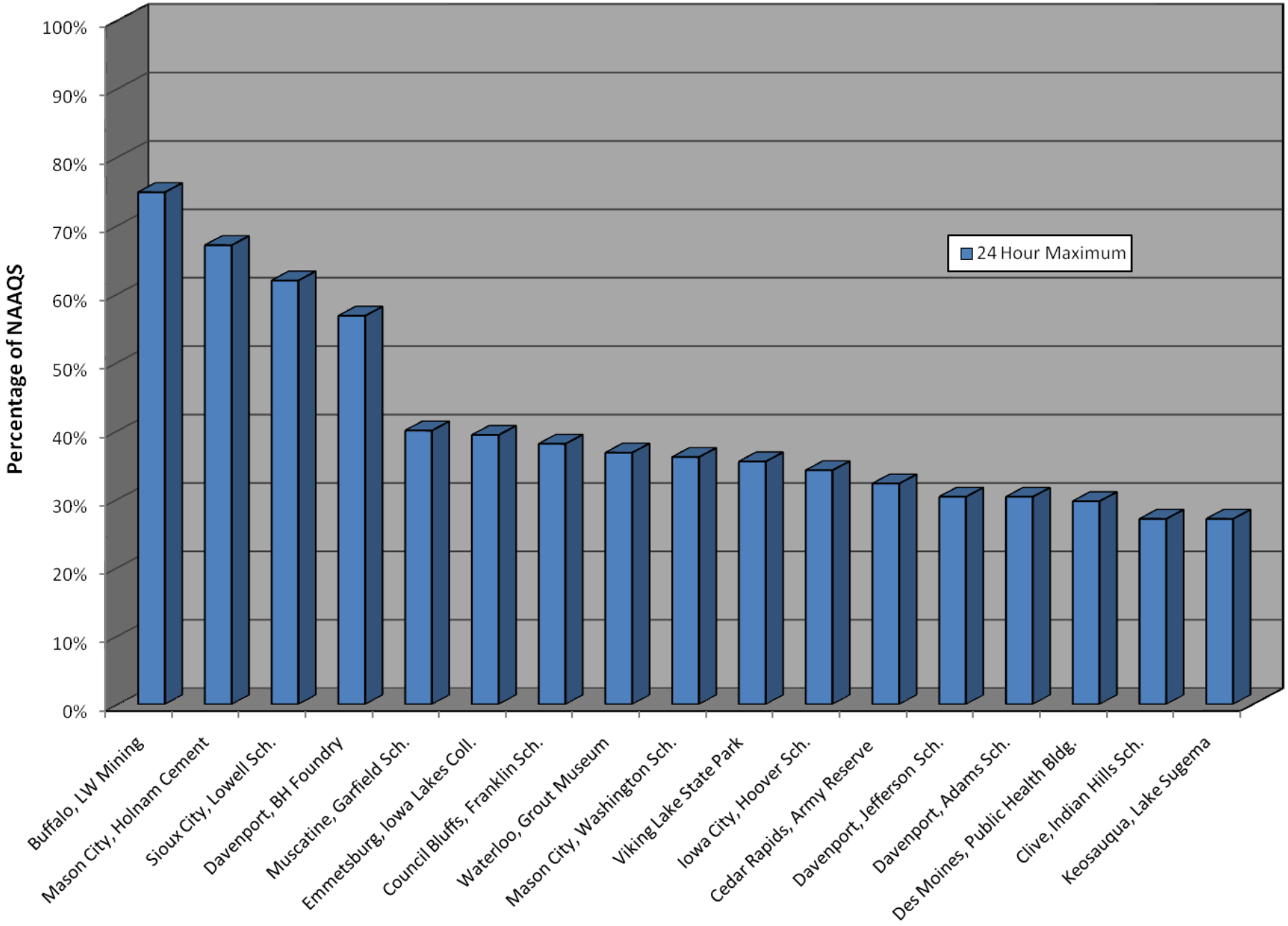
# $PM_{10}$ Monitoring Sites

| Site | Name | City | County | Site Label |
|---|---|---|---|---|
| 190130008 | Grout Museum | Waterloo | Black Hawk | Waterloo, Grout Museum |
| 190330018 | Holnam Cement | Mason City | Cerro Gordo | Mason City, Holnam Cement |
| 190330020 | Washington Sch. | Mason City | Cerro Gordo | Mason City, Washington Sch. |
| 191032001 | Hoover Elementary | Iowa City | Johnson | Iowa City, Hoover Sch. |
| 191130037 | Army Reserve Center | Cedar Rapids | Linn | Cedar Rapids, Army Reserve |
| 191370002 | Viking Lake State Park | not in a city | Montgomery | Viking Lake State Park |
| 191390015 | Garfield School | Muscatine | Muscatine | Muscatine, Garfield Sch. |
| 191471002 | Iowa Lakes College | Emmetsburg | Palo Alto | Emmetsburg, Iowa Lakes Coll. |
| 191530030 | Public Health Bldg. | Des Moines | Polk | Des Moines, Public Health Bldg. |
| 191532510 | Indian Hills Junior High | Clive | Polk | Clive, Indian Hills Sch. |
| 191550009 | Franklin Elementary | Council Bluffs | Pottawattamie | Council Bluffs, Franklin Sch. |
| 191630015 | Jefferson Elementary | Davenport | Scott | Davenport, Jefferson Sch. |
| 191630017 | Linwood Mining | Buffalo | Scott | Buffalo, LW Mining |
| 191630018 | Adams Elementary | Davenport | Scott | Davenport, Adams Sch. |
| 191630019 | Black Hawk Foundry | Davenport | Scott | Davenport, BH Foundry |
| 191770006 | Lake Sugema | not in a city | Van Buren | Keosauqua, Lake Sugema |
| 191930017 | Lowell Elementary | Sioux City | Woodbury | Sioux City, Lowell Sch. |

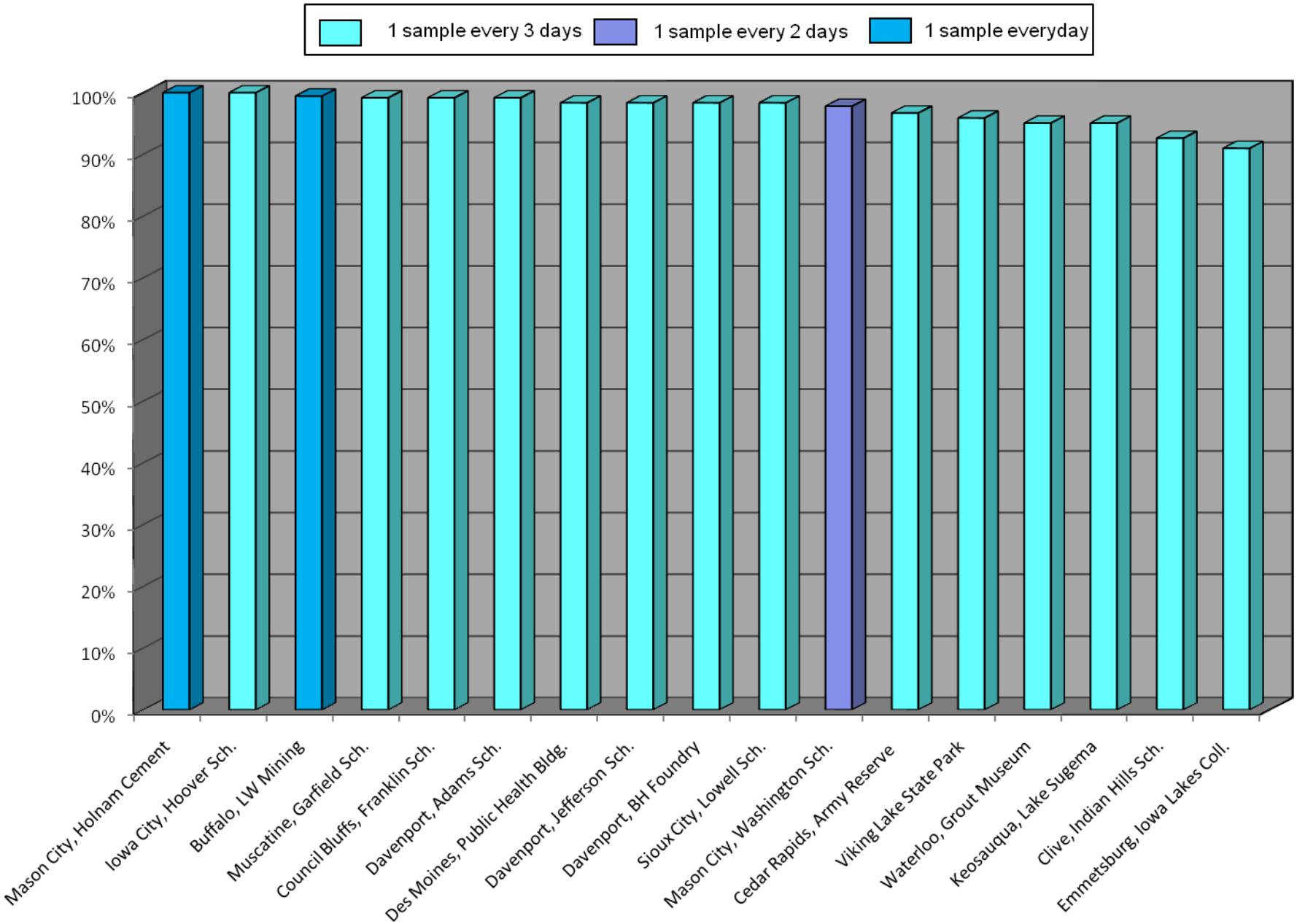
# $PM_{10}$ Monitor Locations



# Comparison of 2008 $PM_{10}$ Data with the National Ambient Air Quality Standard



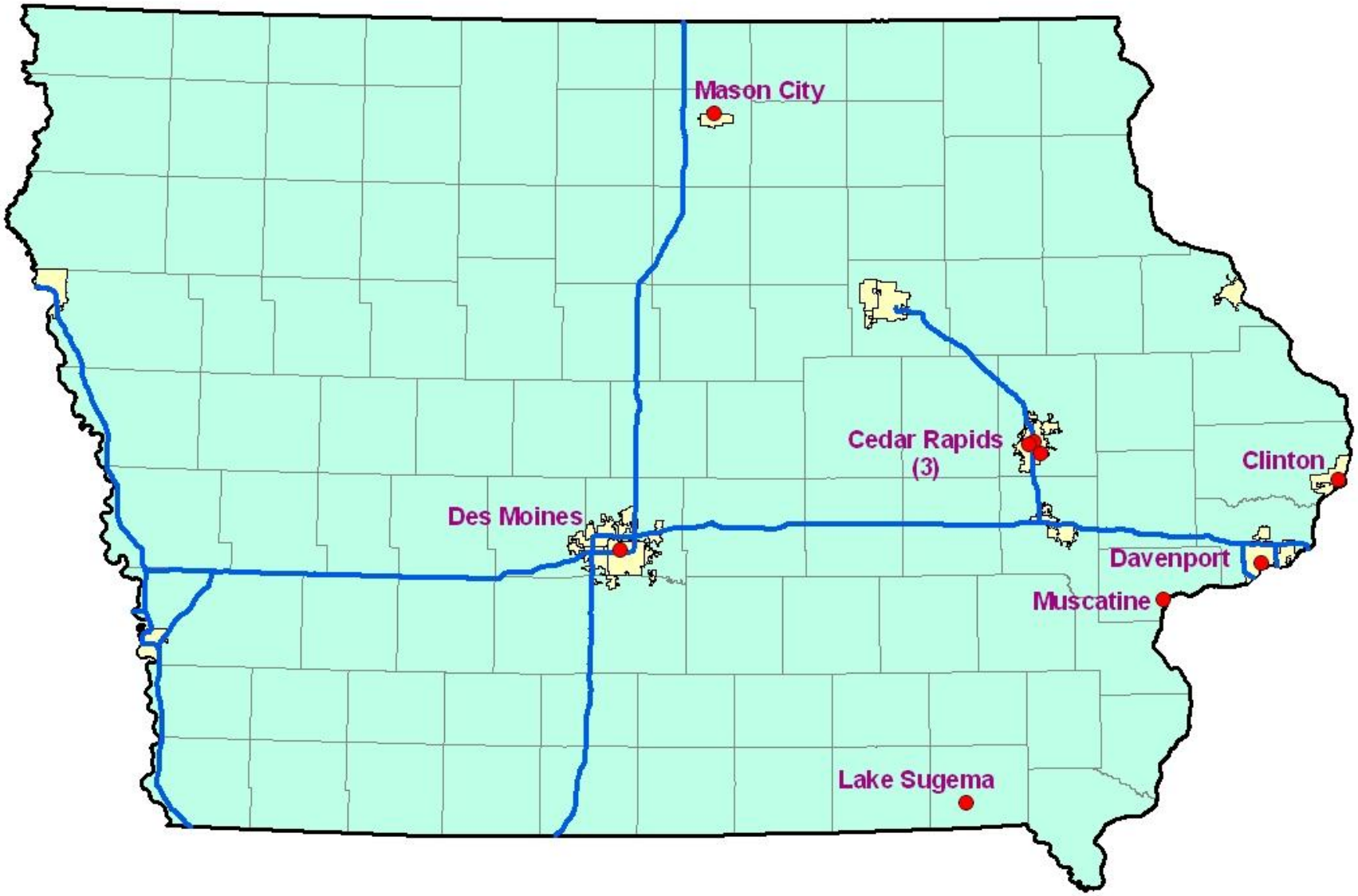
# 2008 Data Completeness – $PM_{10}$



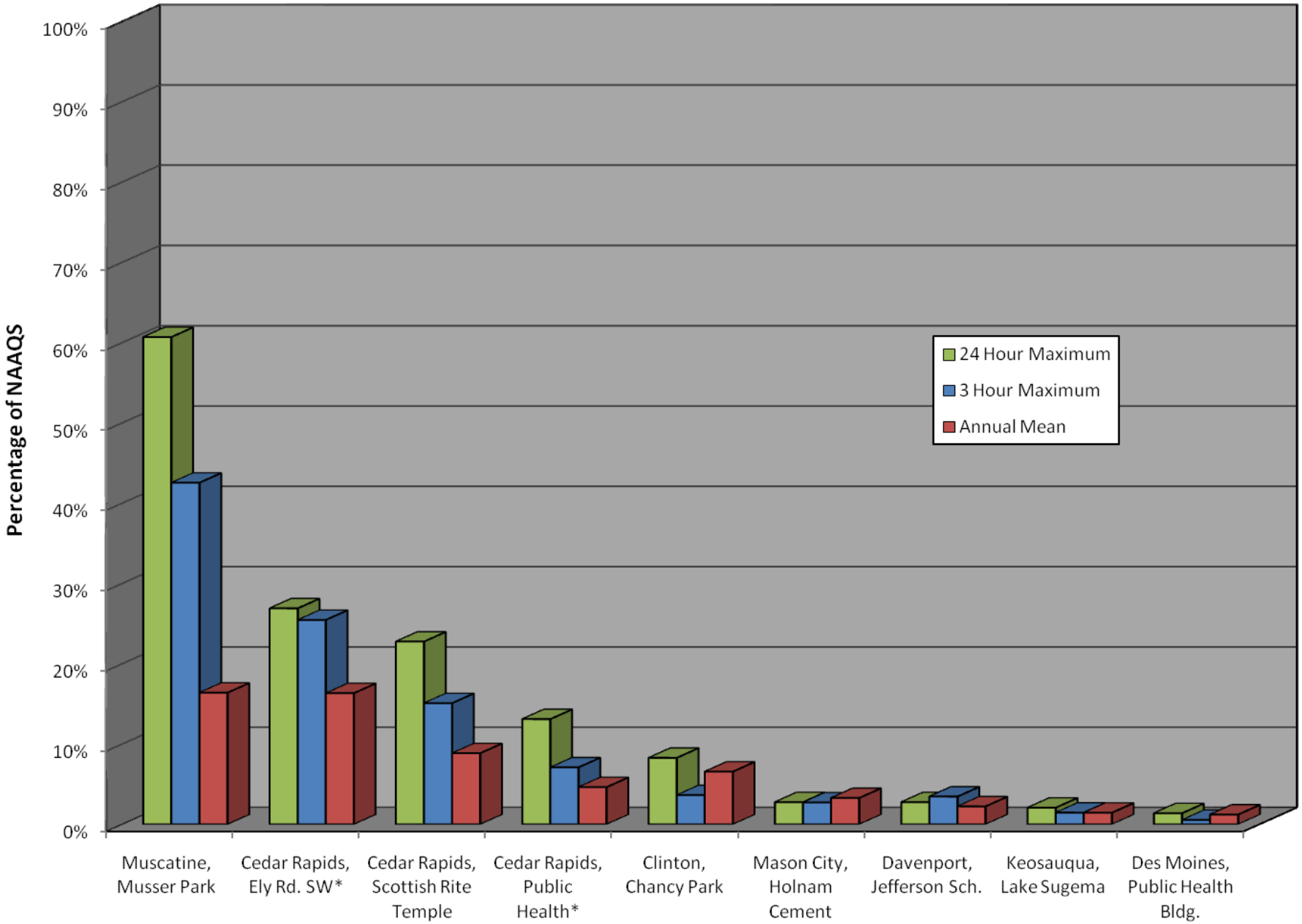
# Sulfur Dioxide Monitoring Sites

| Site | Name | City | County | Site Label |
|---|---|---|---|---|
| 190330018 | Holnam Cement | Mason City | Cerro Gordo | Mason City, Holnam Cement |
| 190450019 | Chancy Park | Clinton | Clinton | Clinton, Chancy Park |
| 191130031 | Scottish Rite Temple | Cedar Rapids | Linn | Cedar Rapids, Scottish Rite Temple |
| 191130038 | Ely Rd. SW | Cedar Rapids | Linn | Cedar Rapids, Ely Rd. SW |
| 191130040 | Public Health | Cedar Rapids | Linn | Cedar Rapids, Public Health |
| 191390020 | Musser Park | Muscatine | Muscatine | Muscatine, Musser Park |
| 191530030 | Public Health Bldg. | Des Moines | Polk | Des Moines, Public Health Bldg. |
| 191630015 | Jefferson Elementary | Davenport | Scott | Davenport, Jefferson Sch. |
| 191770006 | Lake Sugema | not in a city | Van Buren | Keosauqua, Lake Sugema |

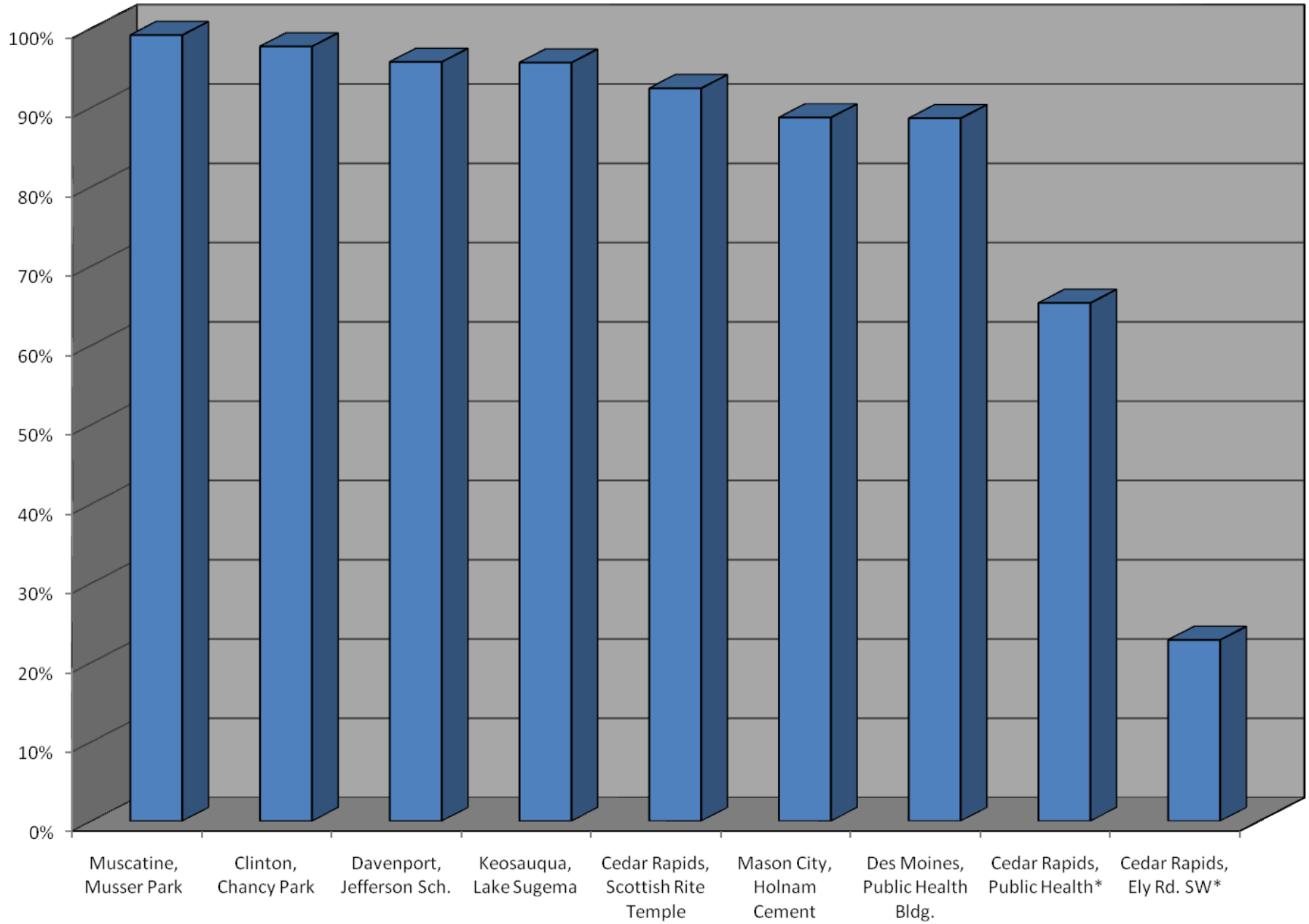
# Sulfur Dioxide Monitor Locations



# Comparison of 2008 Sulfur Dioxide Data with National Ambient Air Quality Standards



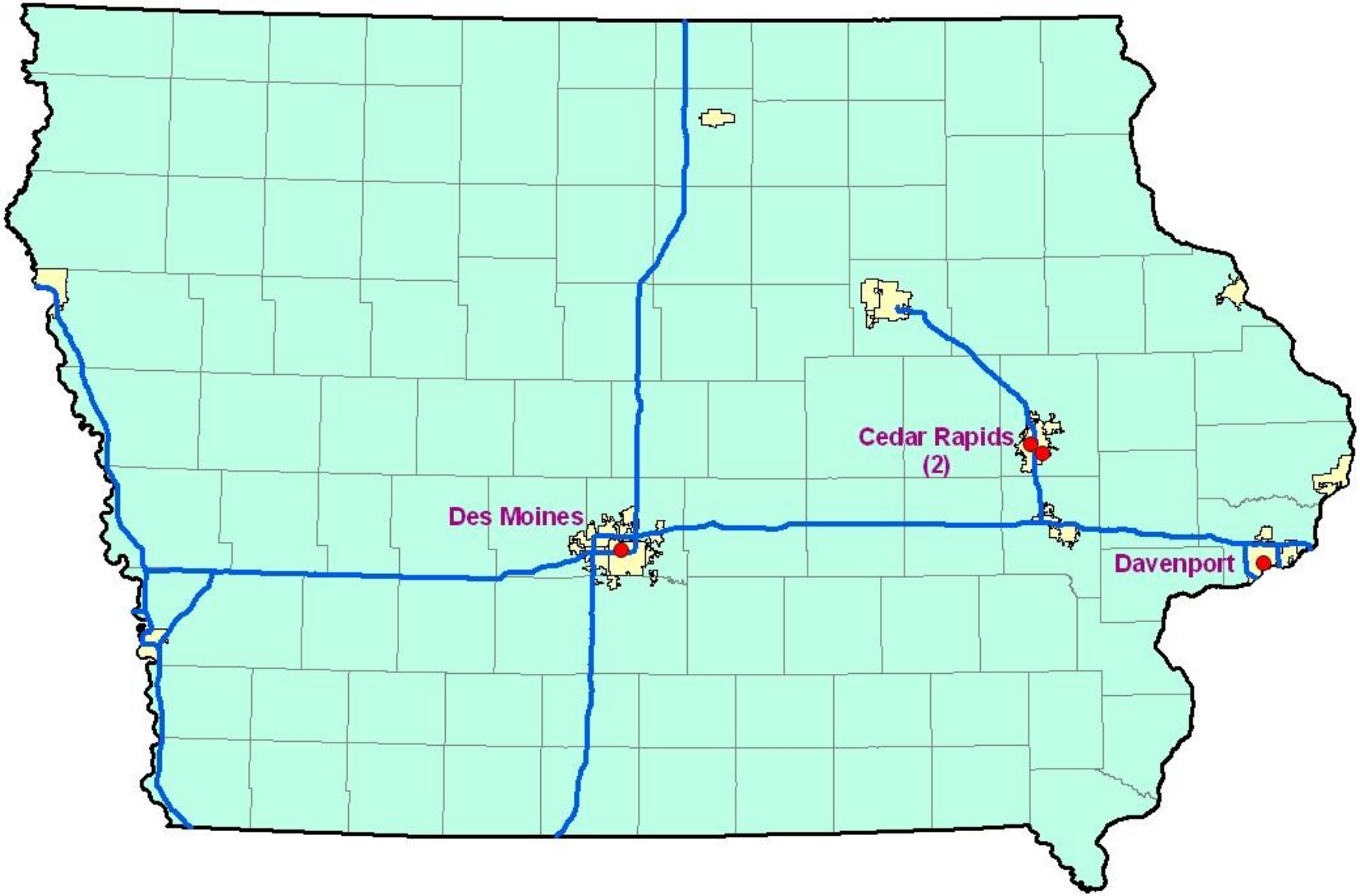
# 2008 Data Completeness – Sulfur Dioxide



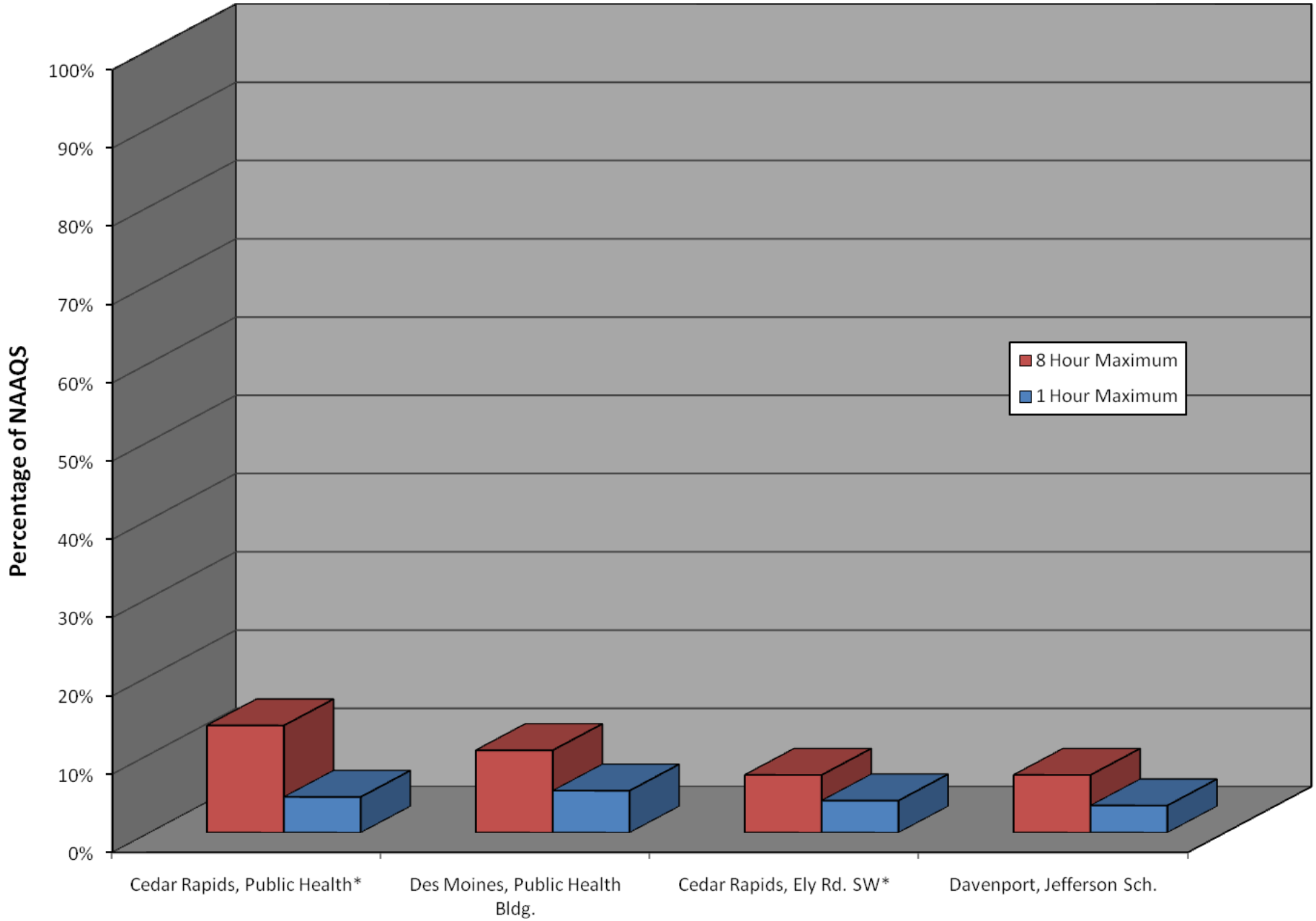
# Carbon Monoxide Monitoring Sites

| Site | Name | City | County | Site Label |
|---|---|---|---|---|
| 191130038 | Ely Rd. SW | Cedar Rapids | Linn | Cedar Rapids, Ely Rd. SW |
| 191130040 | Public Health | Cedar Rapids | Linn | Cedar Rapids, Public Health |
| 191530030 | Public Health Bldg. | Des Moines | Polk | Des Moines, Public Health Bldg. |
| 191630015 | Jefferson Elementary | Davenport | Scott | Davenport, Jefferson Sch. |

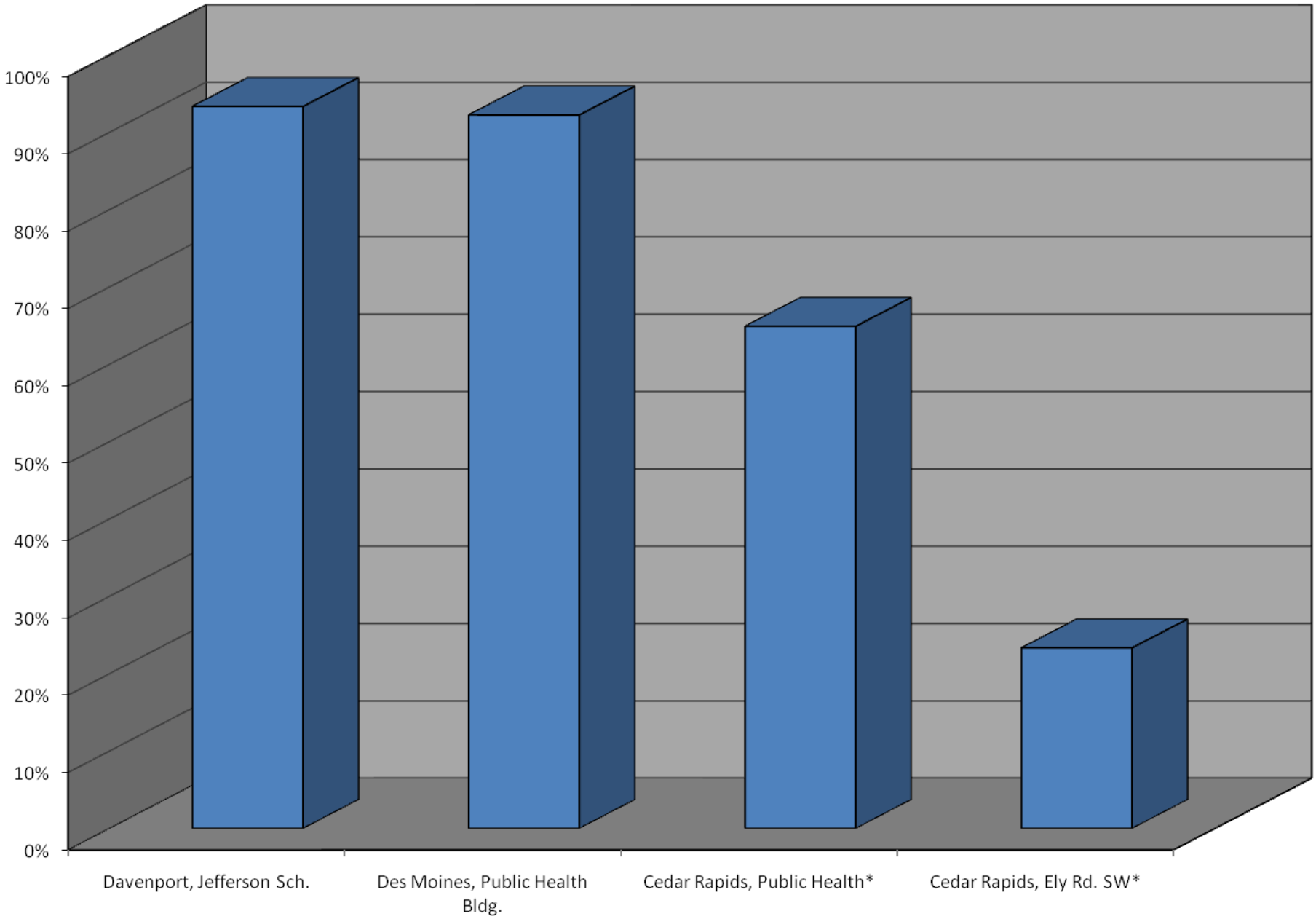
# Carbon Monoxide Monitor Locations



# Comparison of 2008 Carbon Monoxide Data with National Ambient Air Quality Standards



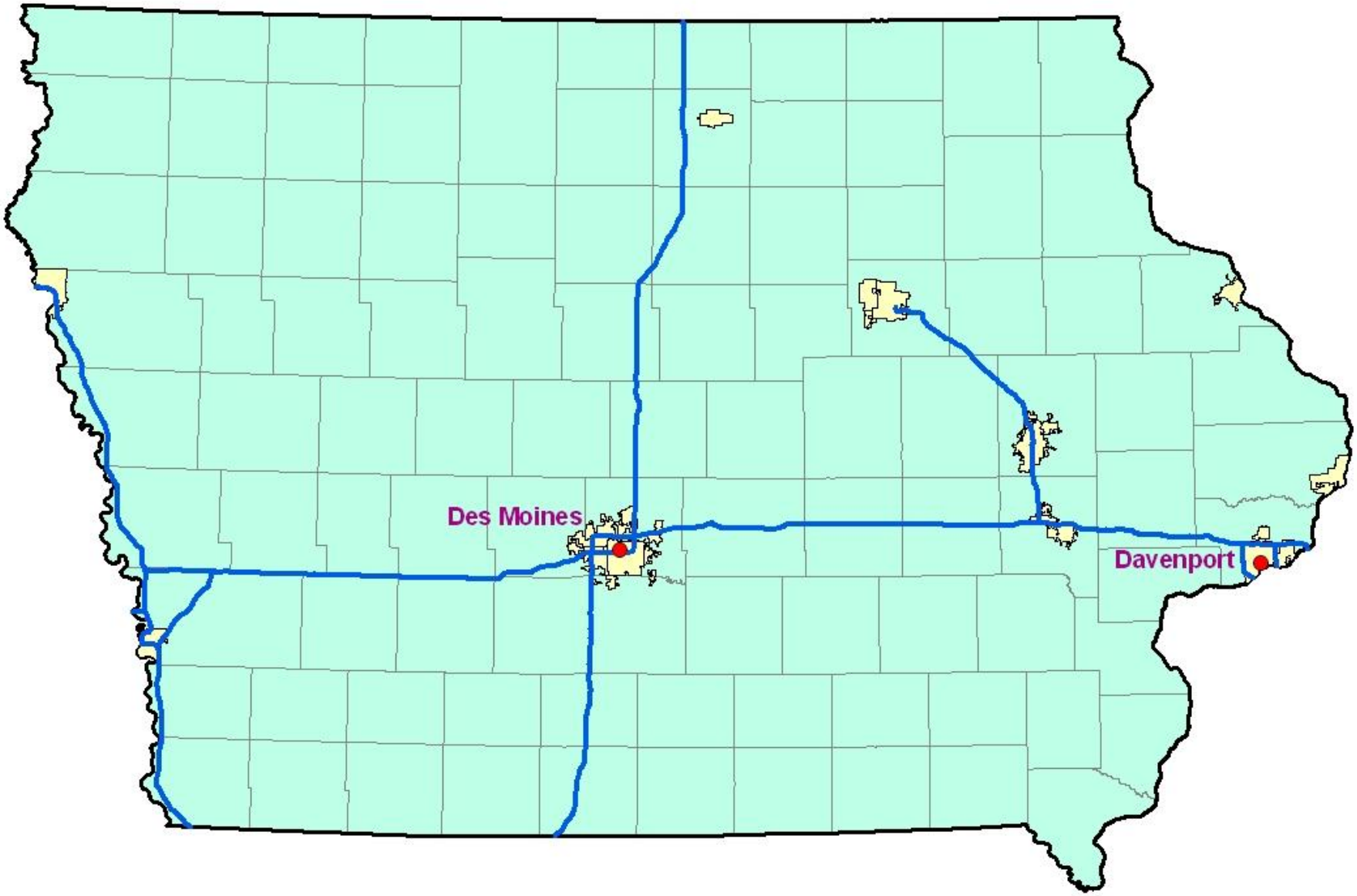
# 2008 Data Completeness – Carbon Monoxide



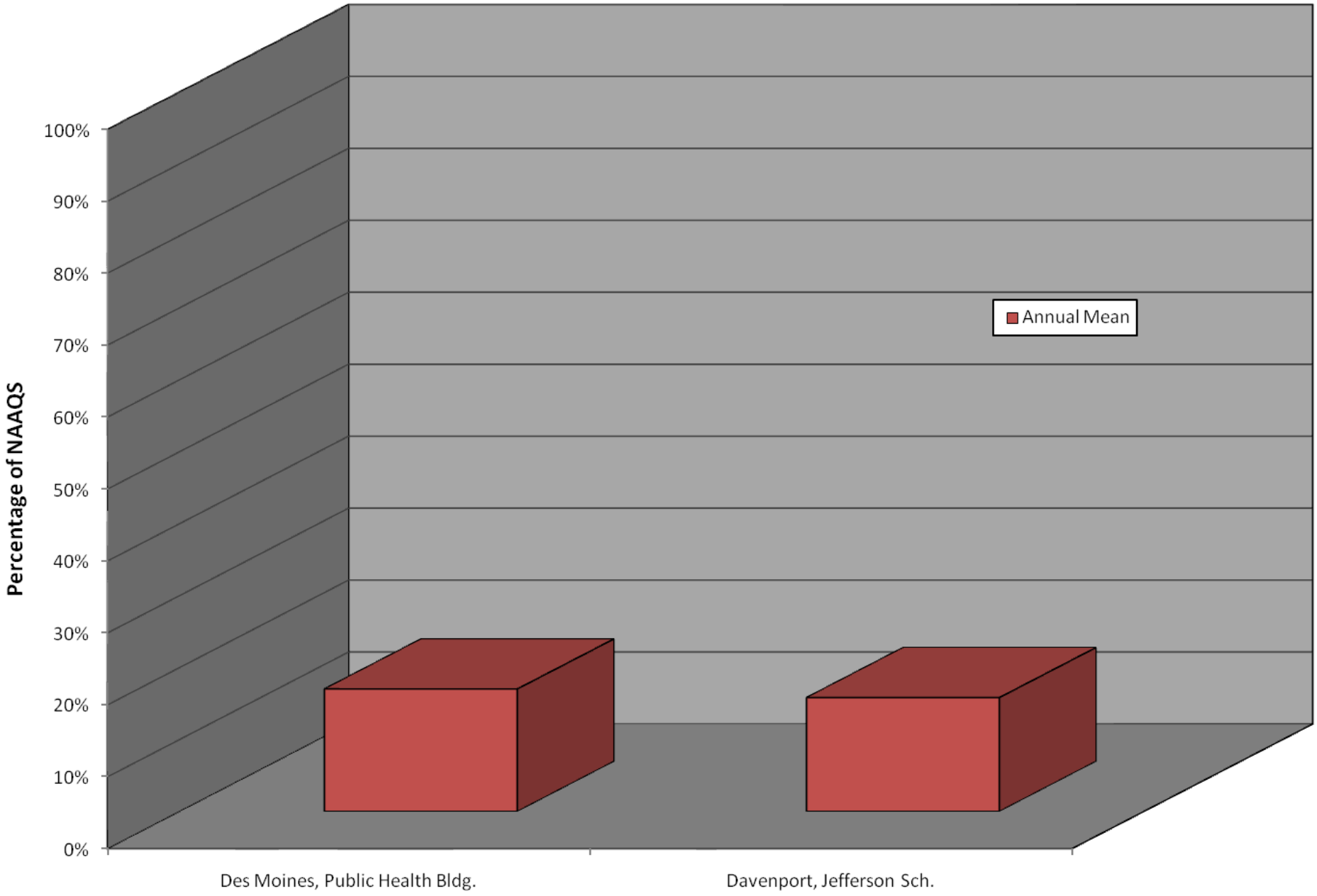
# Nitrogen Dioxide Monitoring Sites

| Site | Name | City | County | Site Label |
|---|---|---|---|---|
| 191530030 | Public Health Bldg. | Des Moines | Polk | Des Moines, Public Health Bldg. |
| 191630015 | Jefferson Elementary | Davenport | Scott | Davenport, Jefferson Sch. |

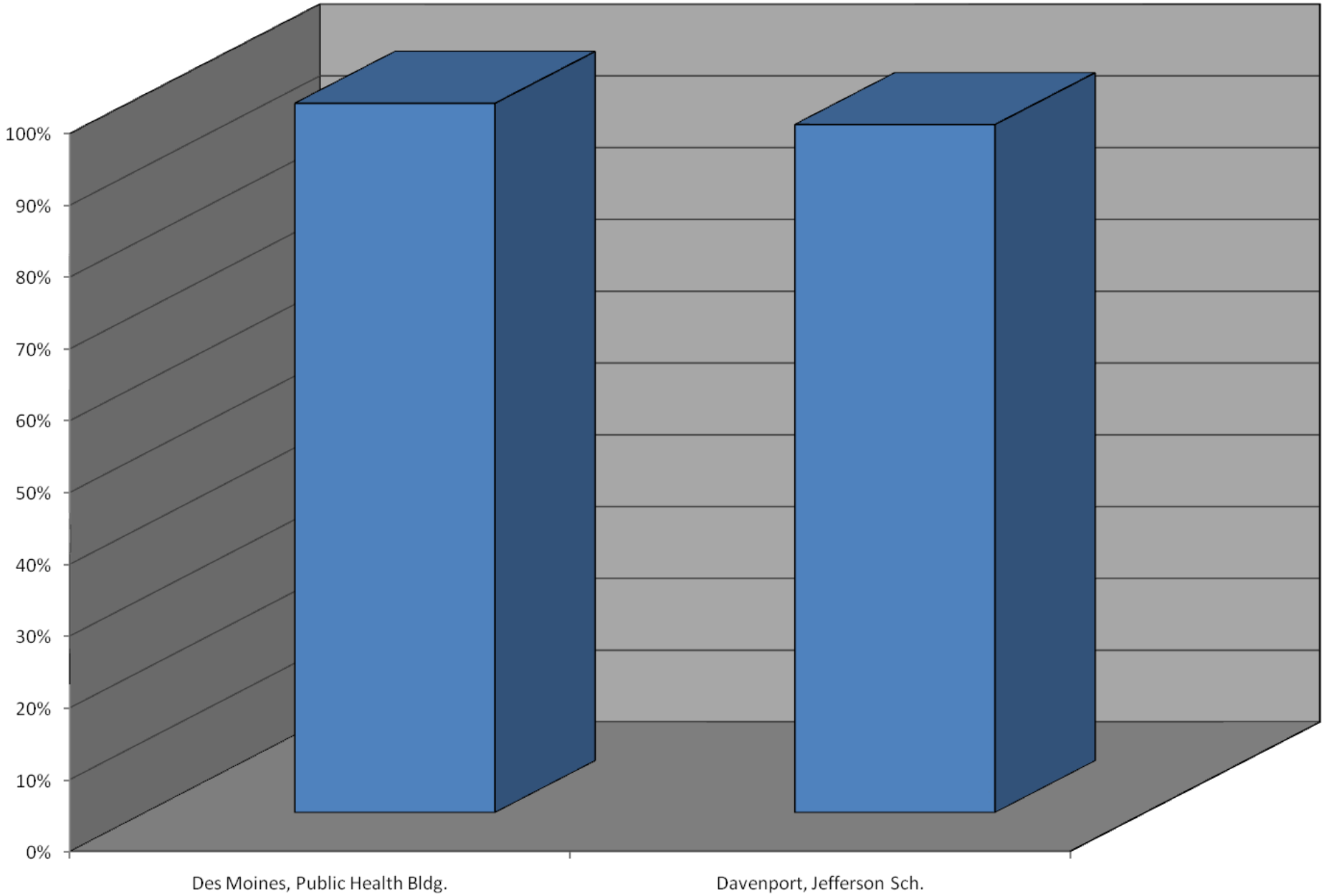
## Nitrogen Dioxide Monitor Locations



# Comparison of 2008 Nitrogen Dioxide Data with the National Ambient Air Quality Standard



# 2008 Data Completeness – Nitrogen Dioxide



# Appendix A

## *Additional Chart Information*

Listed below is additional information that may be useful in interpreting the charts contained in this review

## Ozone

### Comparison of 2008 Ozone Data with National Ambient Air Quality Standards

This chart shows the highest eight-hour ozone average (expressed as a percentage of the "new" 0.076 ppm and "old" 0.085 ppm eight-hour NAAQS) for each ozone monitor operated in 2008. The National Ambient Air Quality Standard for ozone was changed from 0.085 ppm to 0.076 ppm in May of 2008.

Back to Chart

### Data Completeness – Ozone

This chart shows the total number of valid ozone monitoring days (based on 8-hour average, expressed as a percentage of the total number of days in the ozone season) for each ozone monitor operated in 2008. According to EPA guidelines, an ozone monitoring day is considered valid if at least 75% of the hourly averages for the 8-hour period are available. In the event that less than 75% of the 8-hour averages are available, a day is also counted as valid if the daily maximum 8-hour average for that day is greater than the NAAQS (0.076 ppm). Ozone season runs from April through October; this amounts to 214 possible sampling days. An ozone monitor that recorded data for all 214 days of the season would have a data capture rate of 100%.

Back to Chart

## $PM_{2.5}$

### Comparison of 2008 $PM_{2.5}$ Data with National Ambient Air Quality Standards

This chart shows the highest 24-hour value (expressed as a percentage of the 35.5 $\mu g/m^3$ 24-hour NAAQS), and the annual average (expressed as a percentage of the 15.05 $\mu g/m^3$ annual NAAQS) for each $PM_{2.5}$ monitor operated in 2008.

Back to Chart

### Data Completeness – $PM_{2.5}$

This chart shows the fraction of scheduled sampling days for each $PM_{2.5}$ monitor operated in 2008, where a $PM_{2.5}$ sample was actually collected. During 2008, $PM_{2.5}$ samplers in Iowa were scheduled to operate at a sampling frequency of either one sample every third day (122 scheduled samples) or one sample every day (366 scheduled samples). The sampling frequency of each monitor is indicated by the color of the bar.

Back to Chart

# $PM_{10}$

## Comparison of 2008 $PM_{10}$ Data with National Ambient Air Quality Standards

This chart shows the highest 24-hour value (expressed as a percentage of the 155 µg/m$^3$ 24-hour NAAQS) for each $PM_{10}$ monitor operated in 2008.

Back to Chart

## Data Completeness – $PM_{10}$

This chart shows the fraction of scheduled sampling days in 2008, for each $PM_{10}$ monitor operated in 2008, where a $PM_{10}$ sample was actually collected. During 2008, $PM_{10}$ samplers in Iowa were scheduled to operate at a frequency of one sample every third day (122 scheduled samples), one sample every other day (183 scheduled samples), or one sample every day (366 scheduled samples). The sampling frequency of each monitor is indicated by the color of the bar in the chart.

Back to Chart

# Sulfur Dioxide

## Comparison of 2008 Sulfur Dioxide Data with National Ambient Air Quality Standards

This chart shows the highest 3-hour value (expressed as a percentage of the 0.55 ppm 3-hour NAAQS), the highest 24-hour value (expressed as a percentage of the 0.145 ppm 24-hour NAAQS), and the annual average (expressed as a percentage of the 0.0305 ppm annual NAAQS) for each sulfur dioxide monitor operated in Iowa in 2008.

Back to Chart

## Data Completeness – Sulfur Dioxide

This chart shows the total number of hourly sulfur dioxide values (expressed as a percentage of the total number of hours in 2008) for each sulfur dioxide monitor that operated in 2008. A sulfur dioxide monitor that recorded data for all 8784 hours during 2008 would have a data capture rate of 100%.

Back to Chart

# Carbon Monoxide

## Comparison of 2008 Carbon Monoxide Data with National Ambient Air Quality Standards

This chart shows the highest 1-hour value (expressed as a percentage of the 35.5 ppm 1-hour NAAQS) and the highest 8-hour value (expressed as a percentage of the 9.5 ppm 8-hour NAAQS) for each carbon monoxide monitor operated in 2008.

Back to Chart

## Data Completeness – Carbon Monoxide

This chart shows the total number of hourly carbon monoxide values (expressed as a percentage of the total number of hours in 2008). A carbon monoxide monitor that recorded data for all 8784 hours during 2008 would have a data capture rate of 100%.

Back to Chart

# Nitrogen Dioxide

## Comparison of 2008 Nitrogen Dioxide Data with National Ambient Air Quality Standards

This chart shows the annual average (expressed as a percentage of the 0.0535 ppm annual NAAQS) for each nitrogen dioxide monitoring site that operated in 2008.

Back to Chart

## Data Completeness – Nitrogen Dioxide

This chart shows the total number of hourly nitrogen dioxide values (expressed as a percentage of the total number of hours in 2008). A nitrogen dioxide monitor that recorded data for all 8784 hours during 2008 would have a data capture rate of 100%.

Back to Chart